

## On September 3, 2005...

...the floodwaters of Hurricane Katrina slid an oil holding tank off its base and carried over a million gallons of crude oil through St. Bernard Parish. The oil sat atop flood waters inside homes for weeks, and when it receded, oil marks were left on the siding of homes. Residents then observed stains in the driveways and hard, cracked soil in their yards.

We are four graduate students from the University of Michigan. Our research group visited St. Bernard Parish in the spring and summer of 2006. In speaking with St. Bernard Parish residents, we found that residents were concerned about the lack of information about health risks from contamination, particularly related to the Murphy Oil spill and soil contamination.

This handbook is a direct response to our experiences in St. Bernard in 2006.

It is an effort to build on the past successes of the Parish and the greater New Orleans community, and to provide information that will help promote continuing victories in the protection of the health and well-being of St. Bernard Parish residents.

### “IN YOUR WORDS”

*What are the health risks, besides the respiratory problems everybody seems to have? Will we all get cancer five years from now from the oil? I wish there was some place we could go that would say, “Yes, it is safe to return to your home.”*

—St. Bernard resident

*It just seems like nobody can give you a straight answer.*

—St. Bernard resident

*You want to come back, but you just don't know. If I go back to Chalmette, I'm not living in the house that got flooded and maybe had oil in it. I just can't do that to my children. I'm not going to risk that. People are not thinking about these things because they're thinking with their hearts.*

—St. Bernard resident

*[I want] to know how and what signs to look for to see if myself or my family may be ill due to contaminants in the soil or air.*

—St. Bernard resident

*Stop sugar-coating it. Just give it to us.*

—St. Bernard resident



**“PEOPLE  
ARE  
THINKING  
WITH THEIR  
HEARTS”**

—ST. BERNARD RESIDENT

# **RESPOND :**

## **A RESIDENTIAL OIL SPILL IN ST. BERNARD PARISH**

For community members  
and grassroots leaders

•

*We dedicate this work to the people of Saint Bernard Parish.*

•

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## FORWARD

A group of four interdisciplinary graduate students at the University of Michigan School of Natural Resources and Environment decided to devote their time and energy to help survivors of Hurricane Katrina. This was a social disaster of catastrophic proportions resulting from years of political neglect of nature's gifts. This event not only wreaked havoc upon an entire region, but it redefined the lives of people who lived there. It brought out both the best and worst in us as people across the nation opened their homes to people in need and donated to relief organizations. At the local level, people helped each other to safety and to find their loved ones.

One of the political lessons learned is that citizens in a crisis situation must learn how to depend upon themselves as first responders and less upon those sworn to protect them. When the infrastructure they depended upon—police and fire protection, public transportation, garbage collection, cooling and heating, food and drinkable water, health and welfare services, communication, and economic transactions—suddenly collapsed, this rendered the government impotent. It was unable to respond immediately to people in need.

Over the years, power has been usurped and decision-making has been taken from citizens as knowledge has become more abstract, specialized, and concentrated in the hands of the professional class. This document brings these matters to the fore in a series of thoughtful, detailed, and provocative exercises to help the reader think and participate strategically and democratically. It is an attempt to bring democracy back to a common level: to help people ask informed questions, to read and understand scientific documents, to weigh alternatives, and to make the best decision possible based on available knowledge.

Understanding science alone or using organizing tactics alone will often yield few results. Yet understanding scientific knowledge in tandem with community organizing can be a formidable force for intentional social change. We feel that what is written herein can help people rebuild their lives and their communities to be productive, healthy, safe, and nurturing.

People all over the country are struggling to protect their communities from environmental harm. Although the characters are different, the issues are the same. If you find this document to be helpful to you, share it with your friends and with people engaged in similar struggles. We can no longer rely on others to tell us that our communities are safe. We must act now or it may be too late.

While this document focuses upon crisis conditions, we must become more proactive to prepare for all types of events. We must get to the root cause of those forces that enable such a cataclysmic event as Hurricane Katrina and its aftermath. We must question and support efforts to divorce ourselves from the fossil fuel economy—an economy that contributes to global warming, frequent and more intense weather conditions, and social upheaval. We can have an economy fueled by a different energy source, and one that is clean and safe, while maintaining our quality of life. In this country, we have the know-how to solve many of these problems. The question is whether we have the political will.

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*We are grateful to all of the citizens of St. Bernard who shared your stories with us. We will not forget your strength and spirit.*

## PREFACE

Following most technological disasters, there is often a lack of conclusive scientific evidence that can resolve questions about the potential health effects of many toxic chemicals. There are often no clearly calibrated and safe exposure levels. There is also often considerable scientific uncertainty about the combined effects of environmental toxins.

Usually, such events as Hurricane Katrina generate a climate of controversy within both the scientific and medical communities and in the affected communities. Typically, scientists, engineers, and medical experts disagree about the need for remedial efforts. In such situations, citizens can become disillusioned about the reliability of scientific evidence. Science

and medicine, which are traditionally seen as ultimate authorities, can be perceived to be lacking in certainty and incapable of predicting the future. Many communities have successfully overcome this air of uncertainty and ambiguity by breaking down the barriers between experts and lay people. They do this by forming grassroots networks to educate and empower themselves.

Thus, communities such as Love Canal, NY, Woburn, MA, Detroit, MI, Baton Rouge, LA, and San Diego, CA, among others, have been successful in taking an active role in their community's destiny. An important component of risk analysis and management is public access to information. Manuals and handbooks such as this can help communities understand some of the scientific background of the challenges facing their community and potentially provide them with some solutions. Or, at the very least, such manuals and handbooks can provide communities with the ability to take those necessary first steps for dealing with the dilemmas they face.

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Mike Collins: The Dolphin - A shrimp boat that was swept in from the Gulf, Chalmette, LA, December 31, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."





## INTRODUCTION

### **“Katrina has made an environmentalist out of everybody.”**

—Monique Harden, New Orleans area  
human rights attorney

Before Hurricanes Katrina and Rita, New Orleans and surrounding communities were working successfully to address contamination concerns. Citizens were working to beautify St. Bernard Parish, protect wetlands and wildlife, close Mississippi River Gulf Outlet, and monitor air quality. Now, as people rebuild their lives post-hurricane, they are meeting new environmental challenges. Residents are working to win safe yards, improved air quality, and safe drinking water.

Katrina and Rita resurrected old pollution problems in New Orleans, but they also gave St. Bernard Parish lagniappe by swirling a million gallons of crude into the mix. The Murphy Oil spill was the biggest residential oil spill in U.S. history. The hurricanes swept up preexisting contaminants and combined them with oil, swirling the mixture through churches, gardens, schools, and living rooms. Then the water receded, leaving behind a long list of contamination problems. Parish residents, who were dealing with more immediate concerns like housing and insurance, were concerned with the contamination but had little energy to

deal with its immediate effects.

We surveyed over 200 parish residents, asking how they get their news about contamination and which issues are of the greatest concern. We found that 43 percent of parish residents felt that they had not received the information they need to make informed decisions regarding health risks potentially caused by Hurricane Katrina. While no one can tell residents with absolute certainty whether it is safe to return to their homes, we created this handbook in an attempt to assist parish residents in making decisions about contamination issues.

Chapter 1 shares public agencies’ key findings related to contamination after Hurricanes Katrina and Rita. It admits that scientists, at present, do not know the answers to all of your questions related to contamination. This chapter presents the Precautionary Principle as a way to protect public health in the face of uncertainty, and it explains how you can apply it in your everyday life.

Chapter 2 highlights questions raised by St. Bernard citizens related to environmental contamination. It explains the important contaminants found in the parish, shows where they have been found, and describes how they may impact our health.

## CLIMATE CHANGE AND YOUR SECURITY

Human-induced climate change may have contributed to the destructive forces of Hurricanes Katrina and Rita.

Climate includes temperature, precipitation, and weather patterns. According to the Times-Picayune, the global warming forecast for Louisiana “includes rising seas, more intense hurricanes and a combination of more frequent rainstorms and drought conditions.”<sup>2</sup> As one St. Bernard resident put it, “The warmer the weather, the more the storms develop.” In our survey, 32 percent of the St. Bernard residents surveyed felt that global warming posed a risk to their family’s health.

Fossil fuel burning is the main human cause of climate change. The U.S. Energy Information Administration reported that “during 2005, about 83 percent of [U.S. climate changing emissions] were made up of carbon dioxide from burning fossil fuels, such as petroleum, coal and natural gas.” People in refinery communities like St. Bernard along the coast get hit twice when they experience the chronic health effects of industrial pollution as well as shoulder the most devastating weather changes linked to global warming. Although climate change will have major global effects, people in coastal areas such as St. Bernard Parish will be most impacted. Mayor Nagin has publicly announced that New Orleans is the North American city most vulnerable to climate change.

### INTRODUCTION *continued*

Chapter 3 focuses on soil lab reports and provides residents with tools to help make sense of soil testing data. By learning how to read data, you and your neighbors can decide for yourselves whether you feel the situation is safe or unsafe.

Chapters 4 and 5 turn to the future and focus on the ways that you and your neighbors can effectively take charge of the clean-up process. Chapter 4 suggests ways that you can improve the health of the parish, and Chapter 5 provides tools intended to help you pursue your goals. It shares organizing resources for parish residents who want to start a campaign to clean up existing pollution or prevent future threats.

This handbook attempts to help you find answers to your questions. The scientist Margaret Mead once said, **“Never doubt that a small group of concerned citizens can change the world. Indeed, it’s the only thing that ever has.”** We hope you find the information provided in the following pages useful and that the success stories of citizen action inspire you.

## “TERRE AUX BOEUF” AND LANDSCAPE LEGACY

Beginning 4,000 years ago, the Mississippi River created the landmass that is Saint Bernard Parish. In 2004, the parish occupied 265 square miles five miles southeast of Orleans Parish along the Gulf Coast. It consists mainly of saltwater marshland with interspersed swampland areas.

Isleños, or Canary Islanders, first inhabited Saint Bernard in the 1720s under Spanish rule, and French Acadian refugees came to settle in the area later in the century. The area became known as “Terre aux Boeufs” for the wild oxen that roamed the Chalmette region. Residents historically lived in close communion with nature through fishing and agriculture. The population changed little until the 1940s, when the arrival of industries to Chalmette sparked a population increase that rapidly increased to 65,554 residents

by 1980.<sup>1</sup> During that time, Saint Bernard came to house Kaiser Aluminum, American Sugar refinery, Tenneco Oil refinery, Murphy Oil refinery, and Chalmette Refining

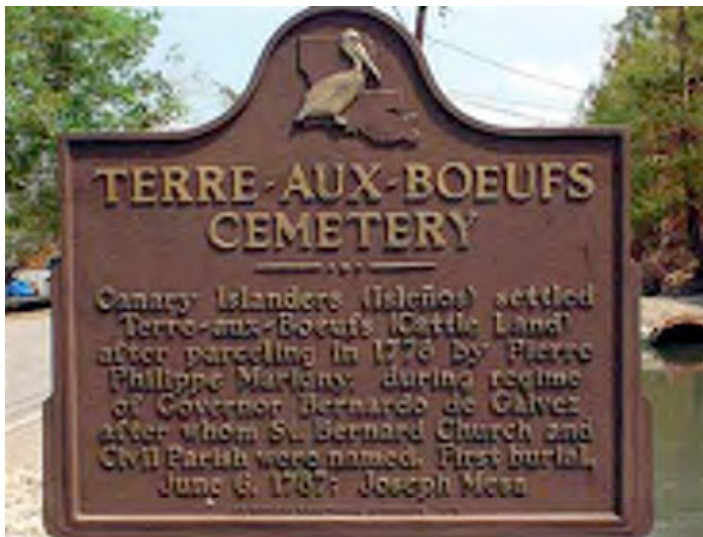


Image Credit: Canary Islanders Heritage Society of LA, [www.canaryislanders.org/stbernard4.htm](http://www.canaryislanders.org/stbernard4.htm).  
Reproduced with Permission.

In order to accommodate development, many swamps have been drained for agriculture fields and housing developments, and navigational channels, such as the Mississippi River Gulf Outlet (MRGO), have been dug. Thousands of miles of canals further cut into the marshes for oil and natural gas exploration. The river that created the parish has been returning land to sea for the last century, although Hurricanes Katrina & Rita took the most land from the parish with a 1.2 million acre loss.

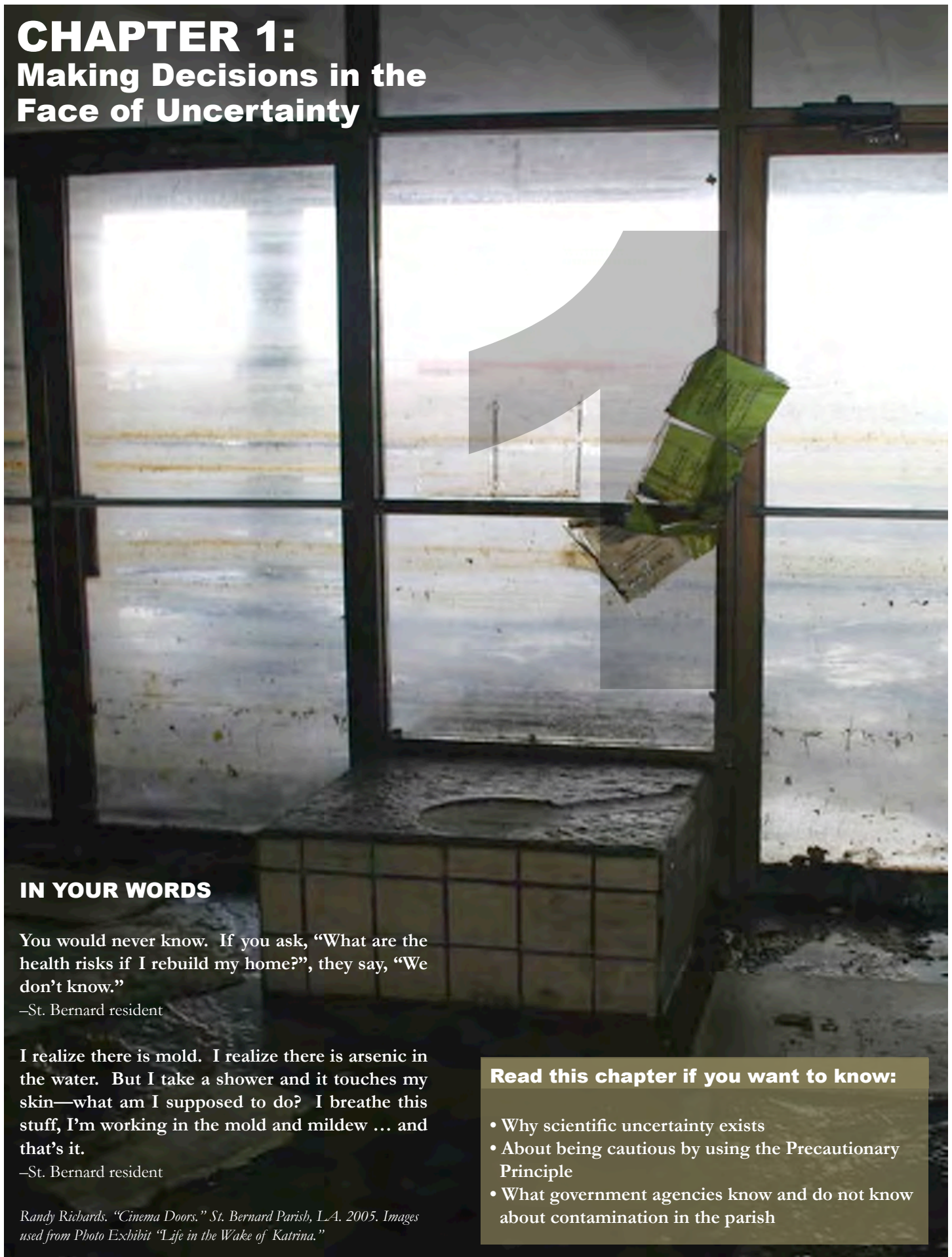
Development of the parish has been a blessing and a curse; increased industry has significantly contributed to economic development, but it has also created a landscape legacy of environmental pollution.

### FOOTNOTES

<sup>1</sup>The 2000 Census recorded 67,229 residents in St. Bernard Parish.

<sup>2</sup>Times Picayune article citing a federal scientist based in LA., who was discussing the February, 2007 release of an important international climate report. Schleifstein, Mark. “Global Warming Could Hit N.O. Hard: stronger hurricanes, rising seas are seen.” *The Times Picayune*. February 03, 2007.

# CHAPTER 1: Making Decisions in the Face of Uncertainty



## IN YOUR WORDS

You would never know. If you ask, “What are the health risks if I rebuild my home?”, they say, “We don’t know.”

—St. Bernard resident

I realize there is mold. I realize there is arsenic in the water. But I take a shower and it touches my skin—what am I supposed to do? I breathe this stuff, I’m working in the mold and mildew ... and that’s it.

—St. Bernard resident

*Randy Richards. “Cinema Doors.” St. Bernard Parish, LA. 2005. Images used from Photo Exhibit “Life in the Wake of Katrina.”*

## Read this chapter if you want to know:

- Why scientific uncertainty exists
- About being cautious by using the Precautionary Principle
- What government agencies know and do not know about contamination in the parish



# INTRODUCTION

Many of you have expressed uneasiness about contamination in St. Bernard Parish, and these concerns have shaped this chapter. It reflects on what the U.S. Environmental Protection Agency (U.S. EPA) and others have been saying about contamination; this chapter does not attempt to give final answers for how to deal with potential contamination, nor does it judge the parties involved.

In this chapter, we present the **Precautionary Principle** as a lens through which to view contamination issues. This principle provides individuals and communities with a way to approach technical problems when science does not provide all the information they need. We hope it will be a resource to you as you address uncertain contamination situations.

## THINKING BACK...

The first time you come back to your property after the hurricane, you see an oil line on your house. Your neighbor tells you that the U.S. Environmental Protection Agency (U.S. EPA) website says that children and pets shouldn't enter the oil spill area.

You wonder: How bad it is really? The U.S. EPA Website seems to say one thing, and an agent from the Louisiana Department of Environmental Quality (LDEQ) says another. When I called Murphy Oil, someone told me I don't have a problem. What am I supposed to do about everyone saying different things?

Since January, your neighbors have gotten together over coffee to talk about issues in the parish. These meetings have helped connect you with neighbors and stay informed about what others are saying. During one meeting, someone raises an issue that you have also wondered about:

I feel like I should do something to clean up my property and make sure it's ok – I want to know for sure.

You take that one step further and ask:

How am I supposed to know what to do if I don't even know what contamination exists on my property, especially this long after the storm?

How would you best answer these questions?

## August 2006 Survey

- **61 percent (32 out of 53) of respondents who had contact with the Parish Government were dissatisfied or very dissatisfied with the information they received on health risks due to contamination.**
- **66 percent (23 out of 35) of respondents who had contact with the U.S. Environmental Protection Agency (U.S. EPA) were dissatisfied or very dissatisfied with the information they received on health risks due to contamination.**



Terry Stubbs. "Katrina Takes Aim" St. Bernard Parish, L.A. 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

**HOW AM I  
SUPPOSED TO  
KNOW WHAT TO  
DO?**

-ST. BERNARD RESIDENT



Frank Chadwick. "I Wanna Go Home." St. Bernard Parish, LA. October 27, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

### What is Scientific Uncertainty?

- Scientific uncertainty is when future conditions are not fully understood.
- It can lead to different professional opinions and unanswered questions.
- It can be related to how information is collected and explained.
- It can result from not having enough time, money, or people to assess a situation quickly.

## RESPONDING TO UNCERTAINTY

After Katrina, soil and water contamination, sewage, mold, and toxic debris were all of great concern. Government officials, scientists, non-profit organizations, and health professionals have offered various, and sometimes differing, opinions on how the New Orleans area should approach these contaminants. Some of these different opinions have resulted from scientific uncertainty. Scientific uncertainty refers to a situation when science does not answer all your questions.

## I STILL WANT TO KNOW ...

Please record your concerns before reading Chapter 1.



<p><b>TOPIC: Pollution</b>  <i>My Concern (example): There is mold in my house that reappeared with the warmer weather.</i>          My Concern:</p>	<p><b>TOPIC: Gaining Necessary Resources</b>  <i>My Concern (example): Who will listen?</i>          My Concern:</p>
<p><b>TOPIC: Personal and Family Health</b>          My Concern:</p>	<p><b>TOPIC:</b> _____  <i>(fill in the blank)</i>          My Concern:</p>

# THE PRECAUTIONARY PRINCIPLE:

## A Decision-Making and Political Process

“When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically.”

- *Wingspread Statement on the Precautionary Principle, January 1998*<sup>1</sup>

Imagine that you might be exposed to a potentially dangerous chemical. The Precautionary Principle says that exposure to potential dangers should be minimized even if you're not positive they will harm you. In other words, decisions should be made to protect public health even without complete scientific evidence that a situation could be dangerous.

The six measures associated with this principle are as follows:<sup>2</sup>

- Take precaution before trying to complete the science
- Plan your future based on goals
- Develop and evaluate alternatives
- Those that have the most power and resources should bear the responsibility of specific action or inaction
- These actors must prove that an activity will not cause harm, and they should take financial responsibility of the activity or the harm done if no activity should occur
- Responsible actors also have the “duty to monitor, understand, investigate, inform, and act”

## VERSUS THE U.S. Environmental Protection Agency Risk Assessment Practices



**What is it?** - “Risk assessment is a process in which information is analyzed to determine if an environmental hazard might cause harm to exposed persons and ecosystems.”

“EPA conducts risk assessment to provide the best possible scientific characterization of risk based on a rigorous analysis and **AVAILABLE INFORMATION and KNOWLEDGE**”

*(Taken from U.S. Environmental Protection Agency: An Examination of EPA Risk Assessment Principles and Practices. March 2004. Available at: <http://www.epa.gov/OSA/pdfs/ratf-final.pdf>)*

*Painting by R.L. Johnson, located at [www.ntktrainings.com/open.htm](http://www.ntktrainings.com/open.htm). Reproduced with Permission.*

# TAKE PRECAUTION BEFORE TRYING TO COMPLETE THE SCIENCE

# APPLYING THE PRINCIPLES OF PRECAUTION

Feel free to use the following chart to help you organize your thoughts and brainstorm how you might apply the Precautionary Principle to your own life.



GOAL	QUESTION	POSSIBLE ACTIONS
<p><i>Take Precaution</i></p>	<p><i>(Example)</i>  <i>What can I do to protect my child's health?</i></p> <p><i>Add more questions below</i></p>	<p><i>(Example)</i>  <i>Make sure that my children wash their hands after playing outside</i></p> <p><i>Talk with my doctor</i></p> <p><i>KEEP GOING ... write your ideas here:</i></p>
<p><i>Plan Based on Goals</i></p>		
<p><i>Develop and Weigh Alternatives</i></p>		
<p><i>Bearing the Responsibility</i></p>		
<p><i>Fill-in:</i></p>		
<p><i>Fill-in:</i></p>		

# U.S. ENVIRONMENTAL PROTECTION AGENCY CONCLUSIONS FOR SEDIMENT CONTAMINATION

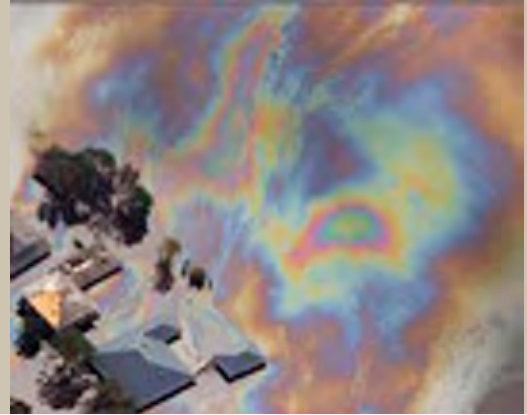


Image Credit: Canary Islanders Heritage Society of Louisiana, located at <http://www.canaryislanders.org/siberhard.html>. Reproduced with Permission.

**What we know ...** in August 2006 the U.S. Environmental Protection Agency (U.S. EPA) reported that sediment contamination throughout the New Orleans area does not pose a significant health threat.<sup>3</sup> The agency said that, in general, diesel and oil range organic chemicals have naturally broken down. Also, other harmful chemicals have been sampled at or below acceptable health standards set by the U.S. EPA and the Louisiana Department of Environmental Quality (LDEQ). These agencies continued to perform confirmatory sampling into the fall of 2006 and did not express concern from the results of these samples.

The general conclusions reported by the U.S. EPA in August 2006 are as follows:<sup>4</sup>

- High levels of arsenic were likely caused by herbicides used at or near golf courses.
- Higher levels of benzo(a)pyrene found near the Agricultural Street Landfill Superfund site is of concern and will be appropriately addressed by the Housing Authority of New Orleans.
- Concentrations of diesel and oil range organic chemicals have been decreasing as time passes, and hotspots will be monitored to ensure safe levels remain in those isolated areas.
- Lead contamination is not new. The levels detected after Katrina are similar to pre-Katrina levels and are comparable to cities similar to New Orleans.



Mike Collins. Untitled. St. Bernard Parish, LA. October 15, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

**What we don't know ...** Do you question agency conclusions because, for instance, you saw your devastated house and property coated in mold, oil, and debris? Other residents expressed that they hadn't received the information they needed to understand the conclusions of agencies overseeing sediment sampling and clean up. These are valid concerns and other professionals such as attorneys and scientists have expressed similar questions.

**"My biggest concern is that I just don't think that the agencies have enforced the normal standards in the same way they normally would if it was a smaller, less overwhelming spill in a less overwhelming circumstance."**

**-St. Bernard Toxicologist**

## Overall

*U.S. EPA: August 17, 2006*

"The results indicate that, in general, the sediments left behind by the flooding from the hurricanes are not expected to cause adverse health impacts to individuals returning to New Orleans. A few localized areas were re-assessed due to elevated levels of arsenic, lead, benzo(a)pyrene, and diesel and oil range organic petroleum chemicals."<sup>5,6</sup>

# Diesel and Oil Range Organic Chemicals

*U.S. EPA: August 17, 2006*

“Petroleum chemicals associated with oil and diesel fuel were found in concentrations above the Louisiana Risk Evaluation/Corrective Action Plan (RECAP) values in approximately 150 samples collected during all the phases of sediment sampling, excluding the Murphy Oil spill ... The results of this analysis indicate that the concentrations of these chemicals are decreasing over time through a combination of factors, including natural degradation processes and sediment displacement or removal at all but one location.”<sup>7</sup>

To See Table of Concentration Trends, visit: [www.epa.gov/katrina/testresults/sediments/summary.html](http://www.epa.gov/katrina/testresults/sediments/summary.html)

**Basically ...** Diesel range organic chemicals were found at levels higher than state standards in 150 cases. Repeating sampling has shown that these concentrations have decreased with time. This summary excludes samples taken from the oil spill area.

**Risk Evaluation/Corrective Action Plan (RECAP)** - RECAP is the regulation that was established in October 2003 to set minimum clean-up standards for contamination in the State of Louisiana. RECAP includes a range of screening standards and management options that apply to different situations (*See Chapter 3 for more information on these standards*).

## PRECAUTIONARY RECOMMENDATIONS FROM THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY (ATSDR)<sup>9</sup>

*After the oil spill, the ATSDR recommended that the public take the following precautions:*

- Reinhabiting homes with visible oil contamination is not recommended because of the potential for skin exposure to oil substances. If people choose to reenter the affected area before remediation, they should take precautions to avoid contact with oil substances. Sensitive individuals, including children and people with recently healed or open wounds, should avoid all exposure to oil substances.
- Because children are more likely to be exposed to contaminated soil, local officials should consider restricting children from entering areas containing oil-related waste.
- Residents may be exposed to soil contaminants from contact with their pets; therefore, local officials should consider restricting pets from entering oil-contaminated areas.

## ASK YOURSELF ASK YOUR NEIGHBOR

- **Were you aware of these recommendations?**
- **In what ways do you think that these recommendations still apply?**

**PEOPLE  
SHOULDN'T EVEN  
HAVE BEEN GIVEN  
AN OPTION TO  
GO BACK IN [THE  
PARISH]<sup>10</sup>**

-ENVIRONMENTAL CHEMIST IN NEW IBERIA, LA

## DID THEY TAKE ENOUGH SAMPLES?

**What we know ...** The U.S. Environmental Protection Agency (U.S. EPA) tested approximately 1,800 soil and sediment samples in Jefferson, Orleans, Plaquemines, and St. Bernard Parish between September 2005 and August 2006.<sup>13</sup> This sampling occurred in four separate phases (*see Appendix D*), and the U.S. EPA determined the health risks of contamination by comparing the results to state health standards. (*See Chapter 3 for more information on contamination standards.*) In total, the U.S. EPA oversaw 8,808 sediment samples in the Murphy Oil spill area.<sup>14</sup>

**What we don't know ...** People question whether enough soil samples have been taken to accurately assess conditions in the parish. In an August 2006 sampling, a U.S. EPA Senior Policy Analyst stated:

**“The EPA has done limited air, water, and soil sampling. We still don't have an adequate mapping of the contamination on the ground from all the sediments that have settled in the area, so we don't know where all the hotspots are that need removal. We're a year later and that mapping still hasn't been done ... It's money versus people.”<sup>15</sup>**

## STOP AND ASK



“It's money versus people.”

**Can you think of people, organizations, or resources that you feel are working for the people?**

“We don't know where all the hotspots are that need removal.”

**What does this mean for your property and neighborhood?**

*Please see soil contamination maps for St. Bernard Parish in Chapter 2.*

## THE UNKNOWN: AN EXAMPLE

Murphy did not extensively test for lead or arsenic in the oil spill area because these are not components readily found in crude oil. This can be considered a gap in important information for those returning to that specific area.<sup>11,12</sup>

## Murphy Oil Spill

*U.S. EPA: August 31, 2006*

“The level of diesel range organics in a confirmatory sample collected on July 14th exceeded the RECAP standard of 650 ppm. The same location was re-sampled on August 31st, and the levels of all spill-related compounds detected were below their respective RECAP standards. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz (a,h) anthracene were also detected in the August 31st sample at 4,200 ug/kg, 4,000 ug/kg, 2,900 ug/kg, and 410 ug/kg, respectively. Although the levels of these compounds detected in the August 31st sample exceed their RECAP values, the levels fall within a risk range of 1 in 1,000,000 to 1 in 10,000 risk of an individual developing cancer over a lifetime from exposure to those concentrations, which the U.S. EPA has found acceptable in other contexts.”<sup>18</sup>

**Basically ...** Diesel range organic chemicals and other harmful chemicals were found at levels higher than state RECAP standards in confirmatory sampling during the summer of 2006. The U.S. Environmental Protection Agency (U.S. EPA) has deemed these samples acceptable, however, by comparing contaminant levels to a 1 in 10,000 to 1 in 1,000,000 risk of developing cancer.

## PERSPECTIVES FROM GOVERNMENTAL AGENCIES

### U.S. Environmental Protection Agency

August 2006

“The EPA has done limited air, water, and soil sampling. [But] we still don’t have an adequate mapping of the contamination on the ground from all the sediments that have settled in the area. **So we don’t know where all the hotspots are** that need removal. We’re a year later and that mapping still hasn’t been done because if you do that type of detailed mapping, then you’re going to spend more money in more removal actions. And they’re already having a difficult time with the rubbish they have to deal with right now. If you do the adequate monitoring to identify all the hotspots for remediation, you’re going to have a lot more hazardous material to deal with, and it’s going to be a lot more expensive. So, again, **it’s money versus people.**”<sup>16</sup>

### Louisiana Department of Environmental Quality

August 2006

“Let’s look at this as a global issue. If you sample [one] property, do you have to sample everybody’s property? And then do you have to sample the whole New Orleans area? And then, who does it?”<sup>17</sup>

### Agency for Toxic Substances and Disease Registry

February 2006

“Because concentrations of oil-related chemicals in sediment samples from most properties within the Murphy Oil spill area are below the Agency for Toxic Substances and Disease Registry (ATSDR) comparison values and levels that would meet the LDEQ and RECAP standards, short-term or long-term exposures to such sediments on these properties do not pose a public health hazard. However, before properties are reoccupied, other potential health hazards such as indoor mold and structural damage should be evaluated.”<sup>18</sup>

### Louisiana Department of Health and Hospitals

February 2006

“...People should take precaution to avoid contact with oil substances or nearby homes/properties still contaminated with oil. Sensitive individuals ... should avoid exposure to oil substances. Because children are more likely to be exposed to contaminated soil, consider restricting children from entering areas containing oil-related waste.”<sup>19</sup>



Photo Credit: Mary Beth Sessions. “Matt.” St. Bernard Parish, L.A. 2005. Images used from Photo Exhibit “Life in the Wake of Katrina.”



# Getting An Agency's Ear

Pine River Superfund Citizen's Task Force  
Gratiot County, Michigan

*Gratiot County, MI has been home to a chemical manufacturing plant, a refinery, and several other industrial facilities. Many sections of the local river are now so polluted that fishing and swimming are prohibited. Professor Murray Borrello, Director of the Departments of Geology and Environmental Studies at Alma College, works with colleagues & community members who have formed a Citizen's Advisory Group (CAG). The CAG meets on a monthly basis & oversees the U.S. EPA and the Michigan Department of Environmental Quality (MDEQ) as they clean-up toxins in the soil & river.*

**[QUESTION]** The Pine River Citizen's Advisory Group (CAG) was effective in getting the U.S. Environmental Protection Agency (U.S. EPA) and the Michigan Department of Environmental Quality (MDEQ) to work for them. How can other communities get an agency's ear?

**[BORRELLO]**

- **Find the infrastructure that supports community outreach or community information** (the Freedom of Information Act (FOIA) is powerful here). Then, use that. For example, the EPA has to, by their own rules, communicate with communities that organize around the CAG guidelines. Every state should have some aspect of community involvement or outreach that you quote to [state officials] demanding they be responsive to your needs.
- We organized regular meetings in which we invited the regulatory agency people as well as local, regional, and federal politicians or their representatives. If the agency people (U.S. EPA/MDEQ) see that [state politicians'] representative will be at the meeting, [the agency officials] will definitely want to be there, as well, to tell their side of the story.
- Another thing to do is conduct regular calls, e-mails, and letters to the pertinent people within the regulatory agencies you work with the most. Establishing a relationship with them first is essential. Many times they are on your side and it is the bureaucracy that gets in the way.
- **Keep your local, regional, and federal political representatives informed** of what it is you want and what it is you aren't getting. Let them work for you – even if it is a small thing like writing a letter or making a phone call.

**[QUESTION]** Why was the remediation option the agencies chose [a soil cap] an unsatisfactory solution [to soil pollution]? What alternatives would have been preferable?

*Note: A cap is a clean up or remediation strategy commonly used to address soil contamination. Caps are used on soil-contaminated areas in an effort to*

*help isolate contamination and prevent it from spreading.*

**[BORRELLO]**

- **Any solution that does not offer permanence & flexibility in redevelopment is short-sighted & unacceptable.** Caps will always fail. There is no exception to this rule. All caps will fail. All landfills will leak, it is just a matter of time. A stop-gap effort of remediation such as capping or developing a slurry wall around contamination is & will always be an interim solution. The contamination will, in time, need to be addressed again but at a much higher cost. It is always most cost effective to do the most protective remedy early.

When selecting a remedy, the following should take precedence over any other considerations:



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Protection of human and environmental health. This means protection to the highest standard. For example, consider the effects of exposure of chemicals to a fetus, a small child, or a pregnant mother who already has a level of contaminant “burden” (i.e. total body burden) in her blood. Remedies are protective to a 75 kg man in most cases, and multiple contaminants are not considered as to their potential synergistic effects. **[Generate the] most options for redevelopment.** The remedy should allow unlimited redevelopment possibilities, if possible. Environmental liabilities should be turned into economic opportunities. The greater the options for economic opportunities, the better the remedy.

- **Notice that the ‘cost’ of clean up is not on the list.** We need to develop an attitude that contaminated sites are akin to natural disaster areas. We must take whatever steps are necessary to clean them up & restore the environment & economy. We accept this as standard operating procedure for natural disasters. Why can't we adopt the same perspective with hazardous waste sites? Unlike natural disasters, cost of hazardous waste cleanups can be shared by those that cause it.

If you'd like to learn more about Gratiot County's Citizen Action Group, visit their Web site at: <http://pineriver.alma.edu/stakeholders/citizen/cag.htm>. If you have specific inquiries for the CAG, you can e-mail them at: [pineriver@alma.edu](mailto:pineriver@alma.edu)

## LONG-TERM CONTAMINATION

**What we know ...** Long-term soil testing is critical. It lets us know if chemicals of concern remain in the soil. Future testing also reminds us to check what might be beneath the surface before we undertake landscaping and building projects. There are many contaminants that stay in our environment for a long period of time, such as lead and arsenic. Others, such as diesel range organic chemicals, will naturally break down and become less harmful over a shorter period of time than elements such as lead. However, ongoing monitoring is unlikely to happen unless environmental agencies determine an area unsafe for long-term human exposure.

*Please see Chapter 4 for more information on what environmental factors influence metal and oil contamination and how best to address uncertain contamination issues. Chapter 5 will provide you with additional community organization and media tools.*

### IN THE WORDS OF A COMMUNITY MEMBER...

**“The greatest falsehood of all is that once the grass is green, the pollution is gone.”**

– St. Bernard Resident

**What we don't know ...** Who will conduct future testing? By holding community meetings and getting media attention, residents of other communities have gained cooperation from industrial neighbors (e.g. refineries in their neighborhoods) and from the government.

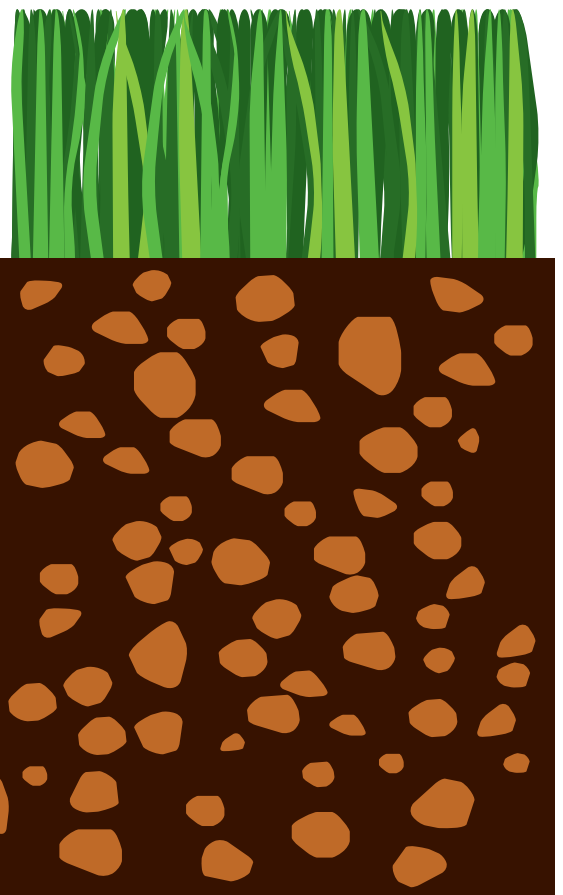
You have the right to protect your community's long-term health. Remember: the more people behind you, the stronger your voice.

Getting cooperation from industrial neighbors can be a challenge. How might we get Murphy Oil to work with us in the years to come? Are my individual concerns ever going to be heard? Who will be our best ally? The Precautionary Principle can be useful in guiding our thoughts and next steps.

The table on the following page, can be used to brainstorm how the principle can be applied to organize a community campaign to accomplish our goals.



**WHO WILL CONDUCT FUTURE TESTING?**



POTENTIALLY  
DANGEROUS  
CHEMICALS  
SHOULD BE  
CONSIDERED  
GUILTY UNTIL  
PROVEN  
INNOCENT

## CONCLUSION

“When we make judgments affecting the environment and public health, understanding what we do not know, and why, is as important as pinning down facts.”

-The Precautionary Principle in Action: A Handbook <sup>20</sup>

Combating contamination today, regardless of the type, is one of the best tactics you can use to reduce future risks. To do this, you can organize a strong movement within your neighborhood and community. Target your message to those you feel have the monetary and human resources to implement your plan and reach your goal. Most importantly, **do not give up.**

With the information in this chapter and the Precautionary Principle in mind, please use the following chapters as resources to help you find answers to questions of concern. In the following pages, you will find information on health risks, maps of contamination in St. Bernard Parish and the Murphy Oil spill area, how to understand lab reports and environmental clean-up standards, ways to move forward by addressing potential contamination on your property and in your neighborhood, and tools you can use to develop a strong campaign to create a community movement.



Photo Credit: Randy Richards United, Chalmette, LA, September 26, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

### WHAT NEXT? The Questions...



What are the biggest risks in our community?

What resources do we have in our community that can help us minimize risk?

Who will support our movement and cause?

Who do we want to listen and act?

## CHAPTER SUMMARY

- The Precautionary Principle is a way to approach potentially hazardous situations when there is incomplete scientific information.
- The Precautionary Principle puts the most emphasis on protecting human health.
- In August 2006, The U.S. Environmental Protection Agency concluded that “In general, the sediments left behind by the flooding from the hurricanes are not expected to cause adverse health impacts to individuals returning to New Orleans.”
- Several environmental experts have expressed concern regarding the limited number of soil and sediment samples.
- Due to scientific uncertainty, questions remain regarding contamination and its long-term effects.
- The Precautionary Principle can help us minimize risk in the face of uncertainty.

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## WEB RESOURCES

*(Source: Detroiters Working for Environmental Justice. Available at: <http://www.dwej.org/resources.htm>)*

**Scorecard** - Get an in-depth pollution report for your county, covering air, water, chemicals, and more.  
<http://www.scorecard.org/>

**Associated Press Report** - In December 2005, the Associated Press reported about the health risks of industrial pollution in the U.S. Below is a link to the three-part series of articles:  
<http://wid.ap.org/air/index.html>

**Government Health Risk Score** - The following link goes to an interactive search that shows the government’s health risk score from industrial air pollution for a specific U.S. address.  
[http://hosted.ap.org/dynamic/external/onlinenews.ap.org/pollution/test\\_searchy.html?](http://hosted.ap.org/dynamic/external/onlinenews.ap.org/pollution/test_searchy.html?)

*The organizations listed below are good resources for information on environmental, health, and educational issues on the topic of environmental justice.*

**National Institute of Environmental Health Sciences**  
<http://www-apps.niehs.nih.gov/outreach-education/>

**Clark Atlanta University Environmental Justice Resource Center**  
*Led by renown author and environmental justice researcher Dr. Robert Bullard*  
<http://www.ejrc.cau.edu/>

**Deep South Center for Environmental Justice**  
*Headed by Dr. Beverly Wright, leading scholar on environmental justice issues*  
<http://www.dscej.com/>

**U.S. Environmental Protection Agency Office of Environmental Justice**  
*Home for federal activity on environmental justice*  
<http://www.epa.gov/compliance/environmentaljustice/index.html>

**United Parents Against Lead**  
*A parent organization for the prevention of lead poisoning and environmental hazards*  
<http://www.upal.org/>

**People Organized in Defense of Earth and her Resources**  
*Also known as PODER, this organization, based in Austin, Texas, is one of the leading examples of grassroots environmental justice work.*  
<http://www.poder-texas.org/index.html>

**Alliance for Healthy Homes**  
*This organization works to prevent and eliminate hazards in homes that can harm the health of children, families, and other residents. These hazards include lead, mold, carbon monoxide, radon, pests, and pesticides.*  
<http://www.afhh.org/>

## FOOTNOTES

- <sup>1</sup>The Global Development Research Center, Urban Governance. Wingspread Statement on the Precautionary Principle, 1998. <http://www.gdrc.org/u-gov/precaution-3.html>.
- <sup>2</sup>Tickner, Joel., Raffensperger, Carolyn. The Precautionary Principle in Action: A Handbook. The Lowell Center for Sustainable Production and the Science and Environmental Health Network. <http://www.biotech-info.net/handbook.pdf>
- <sup>3</sup>United States Environmental Protection Agency. Last updated on September 28th, 2006. Environmental Protection Agency Summary Results of Sediment Sampling Conducted by the Environmental Protection Agency in response to Hurricane's Katrina and Rita. <http://www.epa.gov/katrina/testresults/sediments/summary.html#a>.
- <sup>4</sup>Ibid.
- <sup>5</sup>U.S. E.P.A., Washington, D.C. - August 17, 2006), Press Release: "On August 17, 2006, the Environmental Protection Agency (EPA) released the final summary of sediment sampling conducted in response to Hurricanes Katrina and Rita. In total, the U.S. EPA and the Louisiana Department of Environmental Quality collected approximately 1,800 sediment and sediment/soil samples since the hurricane flooded New Orleans and the surrounding parishes. Most of these samples were analyzed for over 200 metals and organic chemicals. The results indicate that, in general, the sediments left behind by the flooding from the hurricanes are not expected to cause adverse health impacts to individuals returning to New Orleans. A few localized areas were re-assessed due to elevated levels of arsenic, lead, benzo(a)pyrene, and diesel and oil range organic petroleum chemicals. These sampling results served as the basis for a series of recommendations and advisories provided by local government. The final summary provides an extensive picture of the conditions in the flood impacted areas." Contact Information: Dale Kemery, (202) 564-4355 / [kemery.dale@epa.gov](mailto:kemery.dale@epa.gov)
- <sup>6</sup>United States Environmental Protection Agency, email alert message to author, released August 17th, 2006. EPA Posts Summary of Final Sediment Sample Results Taken in Hurricane Katrina Response.
- <sup>7</sup>United States Environmental Protection Agency. Last updated September 28th, 2006. Summary Results of Sediment Sampling Conducted by the Environmental Protection Agency in Response to Hurricanes Katrina and Rita. [www.epa.gov/katrina/testresults/sediments/summary.html](http://www.epa.gov/katrina/testresults/sediments/summary.html)
- <sup>8</sup>United States Environmental Protection Agency. Last updated on December 19th, 2006. Response to 2005 Hurricanes: The Murphy Oil Spill, Data Evaluation – Confirmatory Sampling. <http://www.epa.gov/katrina/testresults/murphy/>
- <sup>9</sup>Agency for Toxic Substances and Disease Registry (ATSDR). November 2005. Health Consultation: Murphy Oil Spill. Department of Health and Human Services, Centers for Disease Control and Prevention. <http://www.bt.cdc.gov/disasters/hurricanes/katrina/murphyoil/> (Retrieved April 5, 2007).
- <sup>10</sup>McKay, Betsy. 2006. Polluted Options: Katrina Oil Spill Clouds Future Of Battered Suburb. The Wall Street Journal, January 3rd, (Eastern Edition).
- <sup>11</sup>Email communication with the Louisiana Department of Environmental Quality, September 27, 2006 - "Whereas sampling efforts throughout the Katrina impacted area focused on a wide range of analytes, sampling in the Murphy spill zone focused on an analyte list specific to petroleum releases. As typical of all site investigations, sampling efforts in the Murphy Oil Spill zone were focused on the identification and quantification of constituents known to be present in the released oil. Since lead and arsenic are not constituents of concern for crude oil releases, they were not included on the analyte list. Therefore, lead and arsenic data are not available for the spill zone area. However, lead and arsenic data are available for areas of St. Bernard Parish outside of the spill zone."
- <sup>12</sup>Louisiana Department of Environmental Quality, email to author, September 27, 2006.
- <sup>13</sup>United States Environmental Protection Agency. Last updated September 28th, 2006. Environmental Protection Agency Summary Results of Sediment Sampling Conducted by the Environmental Protection Agency in response to Hurricane's Katrina and Rita. <http://www.epa.gov/katrina/testresults/sediments/summary.html#a>
- <sup>14</sup>United States Environmental Protection Agency. Last updated on December 19th, 2006. Response to 2005 Hurricanes: The Murphy Oil Spill. Available at: <http://www.epa.gov/katrina/testresults/murphy/>
- <sup>15</sup>Bennett, Jessica. 2004. Its Incompetence: An environmental expert fears that Gulf Coast residents and volunteers exposed to deadly toxins could experience health effects similar to those of 9/11 workers. Newsweek National News. August 24th. <http://www.msnbc.msn.com/id/14497763/site/newsweek/>
- <sup>16</sup>Ibid.
- <sup>17</sup>Personal Communication with author, August 2006.
- <sup>18</sup>United States Environmental Protection Agency. February 2006. Murphy Oil Fact Sheet. [http://epa.gov/region6/katrina/pdfs/murphy\\_oil\\_fct\\_sht\\_2\\_2006.pdf](http://epa.gov/region6/katrina/pdfs/murphy_oil_fct_sht_2_2006.pdf)
- <sup>19</sup>Louisiana Department of Health and Hospitals. February 2006. Protecting Health and Promoting Safety During Cleanup at the Murphy Oil Spill Site in St. Bernard, LA. <http://www.dhh.louisiana.gov/offices/publications/pubs-145/Trailer%20Occupant.pdf>
- <sup>20</sup>Tickner, Joel., Raffensperger, Carolyn. The Precautionary Principle in Action: A Handbook. The Lowell Center for Sustainable Production and the Science and Environmental Health Network. <http://www.biotech-info.net/handbook.pdf>

# CHAPTER 2: Contamination & Our Health

## IN YOUR WORDS

What are the health risks, besides the respiratory problems everybody seems to have? Will we all get cancer five years from now from the oil? I wish there was some place we could go that would say, "Yes, it is safe to return to your home." They've taken so few samples.

– St. Bernard resident

They should let the public know what the contamination is, how bad it is, and what the long-term effects are on your health. So I think they're holding information back. ... People have the right to know.

– St. Bernard resident

### Read this chapter if you want to know:

- Possible health effects associated with exposure to sediment contamination
- The kinds of concerns St. Bernard citizens have regarding contamination and health
- Explanations of soil and sediment contaminants found in the parish:
  - Oil range organic chemicals
  - Diesel range organic chemicals
  - Benzo(a)pyrene
  - Arsenic
  - Lead
- About maps that summarize the levels of these contaminants found in the parish

# DID ANYONE SAY ANYTHING ABOUT THE HEALTH EFFECTS OF OIL?

–ST. BERNARD RESIDENT



Photo Credit: Roy O. "Scooter" Kloeber, II. Flooded street in Chalmette, LA. 2005 Images used from Photo Exhibit "Life in the Wake of Katrina."

# INTRODUCTION

As a resident of St. Bernard, you are not alone if you have questions about environmental contamination. Important questions remain unanswered in the minds of many people:

What are the health effects of exposure to oil?  
Will we have an increased risk of developing cancer if we stay in the parish?  
Is it safe to plant a vegetable garden?

The purpose of this chapter is to highlight questions raised by St. Bernard citizens and to provide you with information regarding soil contamination in the parish.

In effort to address concerns regarding health and contamination, the U.S. Environmental Protection Agency (U.S. EPA) tested numerous sediment and soil samples. In the minds of many scientists and government officials, contamination is no longer a significant problem except in a few designated areas. Nonetheless, there is a need for continued monitoring, discussion, and education regarding contamination and our health.

Our survey in St. Bernard revealed that members of the parish have not received the information they need regarding health and contamination. The next few pages outline some of the concerns that residents of St. Bernard expressed to us in August 2006.

## THINKING BACK...

**You have been down to St. Bernard a few times since the storm** to visit friends and talk with the St. Bernard Parish Government Office. You are still living with your in-laws up in Baton Rouge and trying to figure out what to do next. You've been on the list to have your house gutted for weeks, and you're sick of waiting. So, you and some of your new friends from church decide to just come down and get it done yourselves.

You stop by the hardware store and pick up some face masks and rubber gloves, load up your tools, and head down to your old place in the parish. When you push the door to your living room, you realize it is blocked by a bookshelf and every other piece of furniture in your house. After working at it for a while, you and your friends finally get the door to open.

Stepping over the debris and entering the living room, you are hit with the stench. Looking around, you see that the walls and the ceiling are covered with mold. Looking closer, you see a black bathtub ring about seven feet from the ground.

As you adjust the straps on your face mask and pull on your work gloves, questions roll through your mind: Is it safe to be here? **Did anyone say anything about the health effects of oil? What about all of this mold?**

You step outside and take a deep breath. You grab a crow bar and head back to the house. Then, you look toward your friends, "Let's get this done, y'all."

## ASK YOURSELF ASK YOUR NEIGHBOR

- **When you returned to your home in the parish, what information did you receive regarding possible health hazards?**
- **Did anyone recommend that you use protective gear when you entered your home after the flood? What safety recommendations were you given?**
- **After you entered the parish, did you or your family experience any unusual health symptoms? If yes, did you have someone that you could talk with about these symptoms?**
- **How can you work together with your neighbors to ensure your health is protected?**



## Your Contamination Concerns

*Nobody knows what's going on. So you can't go by what's out there because you never get enough information to make a decision on what ... is best for you to do.*

—St. Bernard resident

*There doesn't seem to be a system set up to get unbiased information. ... You get inspectors to inspect inspectors ... I really believe that people don't care about their jobs, they just care about their personal gain. ... If you're the Bucket Brigade, you're gonna beat the drums. If you're Murphy, nothing's wrong. It's just a game.*

—St. Bernard resident

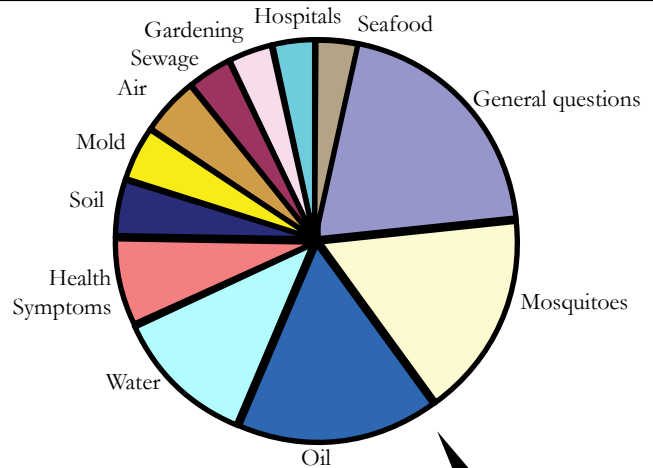
*Murphy Oil after the storm — we never did get the facts on how dangerous it is for your animals or anything.*

—St. Bernard resident

In August 2006, we asked St. Bernard residents, "What information do you need regarding potential health hazards in the parish?" We received a variety of responses that ranged from "Just honest information" to "What do my soil samples taken from my property mean?"

The survey revealed that nearly half (43 percent) of the survey respondents felt they did not have enough information regarding health and contamination. The pie chart below summarizes the overall health and contamination concerns expressed by respondents. As you can see, the biggest slice of the pie is reserved for "general questions." This means that the majority of the survey respondents who wanted additional information did not state a specific question. They simply wanted general information regarding pollution and health. Other residents raised specific questions regarding mosquitoes, oil, and water pollution. Issues were also raised related to health symptoms, oil, and mold. And still other resident concerns included air pollution, drainage and sewage, gardening, hospitals, and seafood.

Topic of Concern	Residents Expressing Concern <sup>1</sup>
General questions <i>(general information regarding pollution and health)</i>	21%
Mosquitoes	14%
Oil	13%
Water	11%
Health Symptoms <i>(rashes, breathing difficulties)</i>	9%
Soil	6%
Mold	6%
Air	4%
Drainage and Sewage	4%
Gardening	4%
Hospitals	4%
Seafood	4%



## ASK YOURSELF ASK YOUR NEIGHBOR

- **What are your greatest concerns in this pie chart?**
- **How might you find out answers to these concerns?**

You might start with the following resources:  
 Agency for Toxic Substances and Disease Registry: <http://www.atsdr.cdc.gov/toxfaq.html>  
 U.S. Environmental Protection Agency (U.S. EPA) Integrated Risk Information System <http://www.epa.gov/iris>  
 Natural Resources Defense Council <http://www.nrdc.org/health/ef-facts/katrinadata/sedimentepa.pdf>



**"I'M  
SCARED TO  
EAT  
ANYTHING  
OUT OF THE  
GROUND."**

**-ST. BERNARD RESIDENT**



Photo Credit: Heather Morgan. "A cumquat tree growing in toxic soil." St. Bernard Parish, LA. February 28, 2006. Images used from Photo Exhibit "Life in the Wake of Katrina."

## CITIZEN PROBLEM SOLVING RESPONDING TO YOUR CONTAMINATION CONCERNS

The first step to creating the change we want see in our communities is to believe in our own strengths and abilities. Too many people feel that there is nothing they can do about pollution problems in the parish. Some survey respondents commented that pollution existed before the storm and felt that nothing would ever change. But change does happen. All over the country small groups of motivated people have created change in their communities. We each have strengths that we can use to address the issues we face.

In this handbook you'll find numerous success stories of citizens who have fought and won campaigns to protect their communities from environmental hazards. These stories prove that by working together, ordinary citizens can create significant change. With determination, we can make our community into a better place.

Use the table below to list the problems that you see in the parish, and brainstorm ways that you and your neighbors can address these problems.

What's the problem?	What can we do?
<p>"Nearby industry is giving off awful smells that wake me up at night."</p>	<ul style="list-style-type: none"> <li>• Call Ken Ford and the St. Bernard Citizens for Environmental Quality.</li> <li>• Keep records of the day and time along with a description of the odors.</li> <li>• Write your parish council member.</li> <li>• Organize a meeting with your neighbors.</li> <li>• Write to your congressperson.</li> </ul> <p><i>(See Chapter 5 for contact information for all of the above strategies.)</i></p> <p>KEEP GOING ... Talk to your neighbors. List your ideas here: _____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>"My neighbor just told me he has cancer, and it seems I know just too many people that have cancer in the parish."</p>	<ul style="list-style-type: none"> <li>• Organize a letter-writing campaign to demand more cancer research in St. Bernard. <i>(See Chapter 5 for ideas.)</i></li> <li>• Create a support group for friends and family who have loved ones with cancer.</li> </ul>
<p>"I don't know if the soil is contaminated."</p>	<ul style="list-style-type: none"> <li>• Check the contamination maps in this chapter.</li> <li>• Contact a local organization to help you test your soil. <i>(See Chapter 4 for contact information.)</i></li> <li>• Initiate a soil clean-up project with your neighbors. <i>(See Chapter 4 for ideas.)</i></li> </ul>
<p>List other issues here:</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>



# EXPLORING SOIL CONTAMINATION

*I know that nature has her way of bringing things back, but I'm scared to eat anything out of the ground.*

—St. Bernard resident

Between September 2005 and July 2006, the U.S. Environmental Protection Agency (U.S. EPA) tested for contaminants in hundreds of soil and sediment samples. This section focuses on the following five contaminants for which the U.S. EPA tested in the parish:

- Components of Crude Oil
  - Oil range organic chemicals
  - Diesel range organic chemicals
- Benzo(a)pyrene
- Arsenic
- Lead

In this section you will find definitions of these chemicals, maps that illustrate the levels found in the parish, and descriptions of some of the health effects associated with these chemicals.

## Crude Oil

### What is crude oil?

Crude oil is formed over millions of years when intense heat and pressure in the earth's crust transform decomposed plants and other carbon-based materials into liquid called petroleum. Crude oil breaks down naturally over time.<sup>2</sup> It is the basis of all refined petroleum products such as gasoline and diesel. Many of the items in our lives such as cars, plastics, and nylon are made through the use of petroleum.

### How can exposure to crude oil affect my health?

Exposure to crude oil may cause short-term health effects such as itching skin and breathing difficulties. In some cases, exposure to crude oil may be linked to cancer. Certain types of crude oil, when repeatedly applied to the skin of mice, have caused skin tumors (Clark, Walter et al. 1988).

One study found that workers at a petroleum chemical research facility had an increased incidence of brain cancer and thyroid cancer. However, the difference in thyroid cancer incidence may have been due to chance or other chemicals at the research facility (Sathiakumar, Delzell et al. 2001).



Frank Kolanda. Eight months after the Murphy Oil spill, oil still covers many properties and streets. Chalmette, LA, June 7, 2006. Images used from Photo Exhibit "Life in the Wake of

Another study found that workers at an oil refinery who were regularly exposed to crude oil tripled their risk of stomach cancer and esophageal cancer. They also doubled their risk of lung cancer (Hanis, Stavrakys et al. 1979). However, in an analysis of cancer in over 350,000 petroleum industry workers, a recent study concluded that exposed workers did not experience higher death rates caused by lung cancer, bladder cancer, kidney cancer, brain cancer, or cancers of the digestive system (Wong and Raabe 2000).

Although some studies indicate that exposure to crude oil may be associated with cancer in humans and other animals, the International Agency for Research on Cancer (IARC) states that the evidence is inadequate to prove a cause-and-effect relationship between exposure to crude oil and cancer in humans (International Agency for Research on Cancer 1998).

In spite of the difficulties of determining the health effects of crude oil, we can benefit by looking at other communities that have been impacted by oil spills. Studies have shown that humans exposed to crude oil from the Sea Empress, Nakhodka, and Shetland oil spills experienced increased short-term health effects of upper respiratory tract irritation, worsened asthma, vertigo, headache, and back and leg pains (Janjua, Kasi et al. 2006). Longer-term problems included psychological effects such as anxiety and depression (Lyons, Temple et al. 1999).

## Oil Spills and Our Health

St. Bernard Parish is not the first community to face a massive oil spill. Over the past three decades, across the world, numerous communities have dealt with oil spills along their coastlines and in their neighborhoods. By looking at the stories of other oil spills, we can learn about the possible health effects of exposure to crude oil. In turn, this information can help us better understand how we can protect ourselves and our community.

As you read the stories of these oil spills, it is important to remember that crude oil does break down naturally in the environment over time. Since oil is a mixture of many dif-

ferent chemicals, the heavy chemicals stay in the soil and the light chemicals evaporate. So, if an area is contaminated with oil, the chemicals present in the soil will be very different after two years than the chemicals present immediately after the spill.

Another important consideration is the fact that the immediate, or acute, health effects that the oil spill clean-up workers experience may be quite different from the long-term, or chronic, health effects of residents. The following stories of other oil spills describe acute health effects—the symptoms that people experienced immediately after an oil spill.

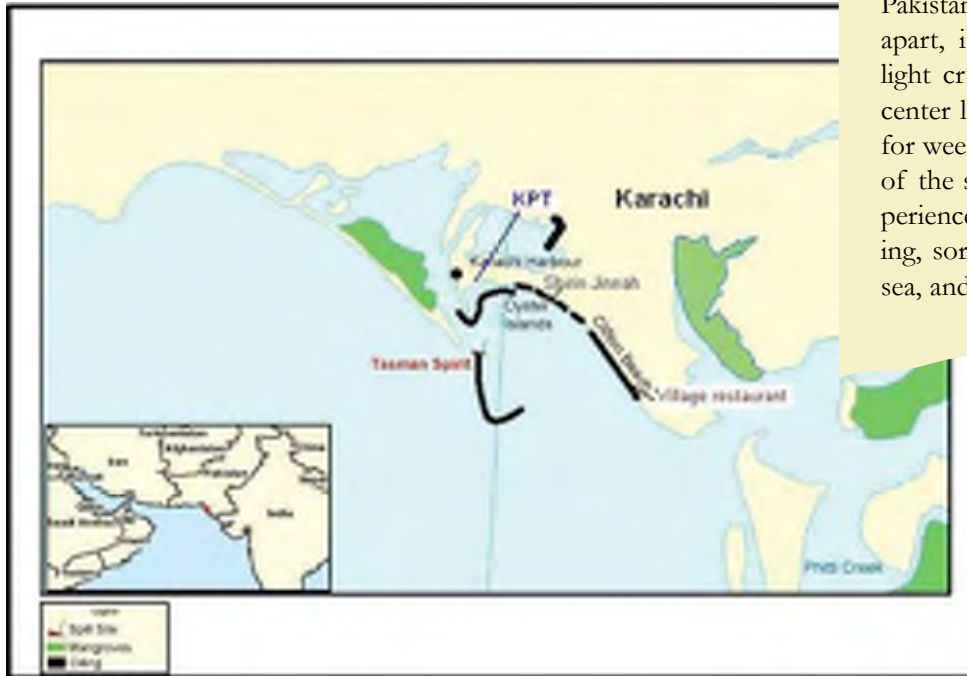


Image Credit: Janjua, Kasi et al. 2006

## The Tasman Spirit Oil Spill in Pakistan

### *A Study of Short-Term Health Effects on a Coastal Community*

(Janjua, Kasi et al. 2006)

In the summer of 2003, the *Tasman Spirit* oil tanker ran aground off the coast of Pakistan. When the ship eventually broke apart, it released 35,000 tons of Iranian light crude oil onto the coast. (See map center left.) The smell of oil filled the air for weeks. Clean-up workers and residents of the surrounding coastal community experienced increased problems with breathing, sore eyes, sore throat, headache, nausea, and vomiting (Janjua, Kasi et al. 2006).

## The Prestige Oil Spill in Spain

### *A Government's Reaction to a Catastrophe*

(Bosch 2003)

In November 2002, an oil tanker known as *The Prestige* spilled nearly 77,000 tons of oil off the coast of Spain. Afterward, over 700 workers and volunteers sought medical examination. They reported symptoms such as conjunctivitis (167 cases), headache (138 cases), sore throat (137 cases), breathing difficulty (115 cases), vomiting (103 cases), skin rash (73 cases), and abdominal pain (42 cases). Due to the alarming number of people who reported acute symptoms, the prime minister of Spain created a registry containing those who had been exposed to the oil.

## The Sea Empress Oil Spill in Wales

### *A Study of Acute Physical and Mental Health Effects in an Urban Area*

(Lyons, Temple et al. 1999)

On February 15, 1996, the *Sea Empress* ran aground on rocks off the west coast of Wales. Over the course of a week, an estimated 72,000 tons of light crude oil contaminated and spread along 200 kilometers of coastline. Immediately after the spill, researchers examined acute health effects by comparing people who were exposed to the oil to those who were not. They found that people exposed to the oil reported a greater number of headaches, sore eyes and throat, and significantly increased levels of anxiety and depression. This was one of the first studies to examine the relationship between exposure to crude oil and mental health.

# The Erika Oil Spill in France

*Cleaners, Sunbathers, and Swimmers*

(Baars 2002)

In December 1999, the oil tanker Erika spilled approximately 30 tons of heavy fuel oil off the coast of France. The pollution stretched over 500 kilometers of coastline. This study not only assessed the health risk of the clean-up workers but also of the tourists. The results showed that acute symptoms of exposure (skin and eye irritation) were limited to those who handled the oil with their bare hands. Direct contact with oil usually occurred by those cleaning oil soaked birds.

The study also considered whether the handlers were at risk for longer-term skin tumors, but due to the brief time of exposure, skin tumors were highly unlikely for them. For the sunbathers and swimmers, the study concluded that the cancer impacts were very small, if not negligible, for both children and adults. It was assumed that sunbathers and swimmers were exposed to benzo(a)pyrene through their skin and ingestion with their mouths.



Photo Credit: Darryl Mabe-Wright, Untitled, St. Bernard Parish, LA, November 27, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

# The Exxon Valdez Oil Spill in Alaska

*The Links between Environmental Health and Human Health*

(Palinkas, Petterson et al. 1993; Neff, Bence et al. 2006)

March 24, 1989, an estimated 11 to 30 million gallons of oil spilled from the Exxon Valdez into Prince William Sound. The initial impact to both wildlife and humans was horrific. This spill, however, has allowed people to study the long-term ecological effects of the oil spill. Thirteen years after the spill, researchers reassessed the amount of polycyclic aromatic hydrocarbons (PAHs) available to animals along the coast. Researchers knew oil residue still remained buried in the inter-tidal areas exposed to a significant amount of oil. By studying levels of PAHs in the tissues of various plants and animals along the shore, the study can be used as an indicator of the fate of these toxic chemicals over the decade

following the spill.

PAHs can enter human food supplies through contaminating natural food chains. Plants and animals such as sea lettuce, worms, oysters, mussels, and hermit crabs that rely on the inter-tidal area for food and shelter can become contaminated with toxins in the environment. Once these smaller organisms become contaminated, it is possible that fish, shorebirds, and otters will consume these contaminants. Eventually, humans may consume these contaminated foods.

In the end, the study found that the tested coastal plants and animals had low concentrations of PAHs in their tissues, which indicates that these toxins are fairly unavailable to these organisms in the environment. This is good news for the wildlife and even better news for the communities that rely on these coastal areas for their livelihoods.

# The Nakhodka Oil Spill in Japan

*A Community Works to Clean up the Spill*

(Morita, Kusaka et al. 1999)

On January 2, 1997, the Russian oil tanker *Nakhodka* ran aground off the coast of Japan and spilled more than 6,000 tons of crude oil onto the Oki Islands in the Sea of Japan. Due to the remoteness of the area, machines could not be used to clean up the oil. Instead, workers and volunteers had to use ladles and buckets to remove the oil.

During the clean up, many of the workers visited the medical aid station located on-site. Clean-up workers and residents reported high levels of skin and eye irritation. Others reported longer lasting effects such as headaches and nausea. Out of those who gave urine samples, only a few showed signs of hydrocarbon ingestion. Upon a second examination, these signs of hydrocarbon ingestion were negligible.

## ASK YOURSELF ASK YOUR NEIGHBOR

- **Do you identify with the stories of oil spills that occurred in other parts of the world? If yes, explain how you feel. Which stories seem to strike chords with your own experiences?**
- **How can an individual or community use information about previous oil spills to learn from our mistakes, move on, and make it better?**

# The Shetland Oil Spill off the Coast of Scotland

*Residents Face Unanswered Questions*

(Campbell 1993; Button 1995)

In January 1993, the American tanker *Baer* spilled 84,413 tons of Norwegian crude into the North Sea off the coast of the Shetland Islands. Immediately after the spill, government officials decided to use chemicals to disperse the oil. Residents were not told what chemicals were present in the agents that were used to clean up the oil. Many people were concerned that the chemically-based clean-up measures would actually increase the negative health effects of exposure to the oil.

The fact that government officials did not provide residents with information regarding contamination led to widespread feelings of concern and anxiety. The Shetland Island oil spill demonstrates that access to information is crucial part of disaster recovery.

## ABOUT THE MAPS

The maps in this handbook were created with software called Geographic Information Systems. The maps display the U.S. Environmental Protection Agency's (U.S. EPA's) sediment sampling results from September 2005 to July 2006. To construct these maps, we used data from the U.S. EPA's Katrina Central Data Warehouse (available online).<sup>3</sup> If two samples were taken twice at one location during two or more different time periods, we displayed the lowest detected level of the contaminant.

The purpose of these maps is to help us better understand the various levels of sediment contamination measured by the U.S. EPA.

Due to the following reasons, these maps may not be representative of current conditions:

1. Sediment samples have not been taken throughout the entire parish.
2. Maps may not reflect current diesel and oil range organic contamination due to the natural breakdown of these compounds.
3. Predictive maps have been created from sampling points. The maps may contain inaccuracies and are only estimations.
4. Maps may not tell you exactly what contamination levels exist on or around your property. Elements of the maps have been enhanced to easily communicate contamination trends.
5. Maps do not display the last round of confirmatory sampling performed by the U.S. EPA in August 2006.
6. Potential environmental health risks in the parish include possible air and water contamination, not merely soil contamination.
7. Associated health risks cannot be fully determined by these maps' assessment of sediment contamination due to these limitations.

For more information, please see the *Appendix D* Understanding the Sediment Contamination Maps.

# Oil Range Organics

## What are oil range organics?

Oil range organics (OROs) are one group of chemicals found in petroleum. Oil range organics (OROs) can be broken down into more specific compounds, but OROs are an easy indicator of the presence of oil because they are heavier organic compounds. This means that OROs may take a while to break down in the soil.

## What did they find?

Take a look at the map labeled OILRANGE ORGANICS on page 25. All of the dots on the map represent places where the U.S. Environmental Protection Agency (U.S. EPA) took a sediment sample. On the maps, there are a lot of green dots. These green dots represent samples that had relatively low levels of oil range organics. The yellow dots represent samples with medium levels of oil range organics that were still below the Management Option 1 (MO-1) standard. The red dots represent areas that exceeded MO-1.

If you look at the table, you'll see that the U.S. EPA tested for oil range organics in 1,261 samples of soil in the parish between September 2005 and July 2006. The U.S. EPA did not find oil range organics in 146 of the samples. About 83 percent of the samples had levels that were well below the MO-1 standard. Two percent of the samples taken in the parish exceeded the Louisiana State standard for oil range organics.

The U.S. EPA found higher levels of oil range organics closer to the Murphy Oil refinery. According to these maps, there are several potential *hotspots*<sup>5</sup> toward the center of the oil spill area. It is possible that these oil range organics resulted from the oil spill or other sources such as cars, private fuel tanks, or lawn mowers. There are scientific methods called *fingerprinting* that allow scientists to distinguish different types of oil.<sup>6</sup>

## LEVELS OF OIL RANGE ORGANICS IN ST. BERNARD

Number of samples tested – 1,261

	Zero (No oil range organics detected)	Low Levels (1 – 900 parts per million)	Medium Levels (900.1 – 1,800 parts per million)	High Levels* (1,800.1 – 10,000 parts per million)**
Percent of Samples	11.7%	83.5%	2.8%	2%
Number of Samples	147	1,053	35	26

\*"High levels" are sediment samples that exceeded 1,800 parts Oil Range Organics per million parts soil. This is a standard stated in the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP) Management Option 1 (MO-1).

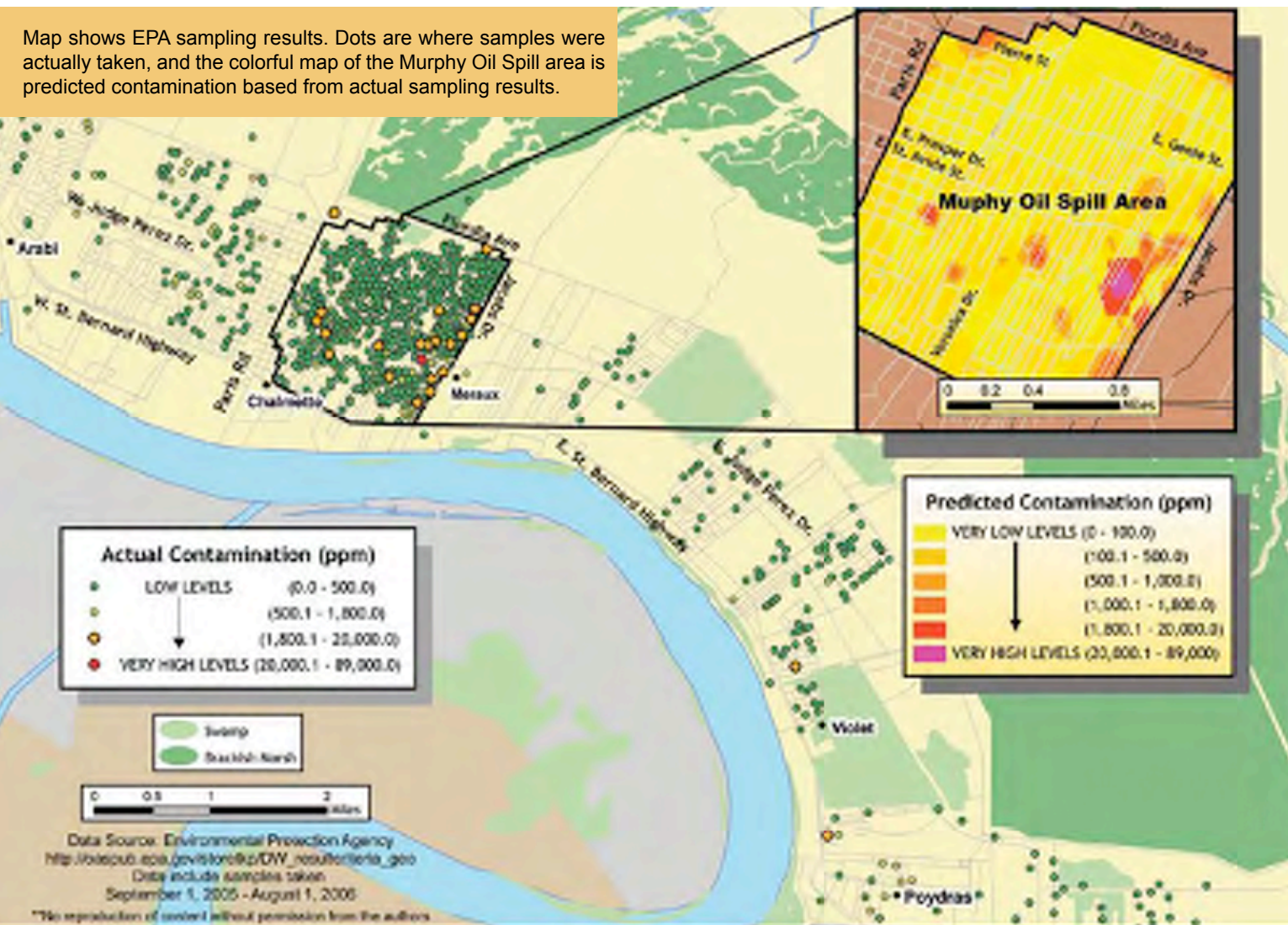
\*\*Parts per million: When we measure contamination, we ask: "In one million cups of soil, how many cups of contamination would I find?" This is what it means to measure contamination in parts per million (ppm).

*For more information on how scientists measure contamination see Appendix A.*

## [OVERALL]

**In about 83 percent of the samples, they found levels that were well below the Louisiana standard called Management Option 1 (MO-1). The U.S. EPA found higher levels of oil range organics closer to the Murphy Oil refinery. There are several potential "hotspots" toward the center of the oil spill area.**

Map shows EPA sampling results. Dots are where samples were actually taken, and the colorful map of the Murphy Oil Spill area is predicted contamination based from actual sampling results.



**I DON'T SEE  
 HOW YOU  
 CAN GET  
 FOUR FEET  
 OF CRUDE  
 OIL ON YOUR  
 HOUSE AND  
 YOU DON'T  
 GET ANY IN  
 YOUR YARD**

-ST. BERNARD RESIDENT

## MAKING SENSE OF STATE CONTAMINATION STANDARDS

### Risk Evaluation/Corrective Action Plan (RECAP)

RECAP is the regulation that was established in October 2003 to set minimum clean-up standards for contamination in the state of Louisiana. RECAP includes a range of screening standards and management options that apply to different situations.

### Management Option 1 (MO-1) Standards

MO-1 standards let us know which areas may have a contamination problem. If a soil sample exceeds MO-1, this means that the area where the sample was taken should be tested again and re-evaluated. MO-1 standards were used to evaluate contamination levels after Katrina.<sup>4</sup>

If you would like to know more, please take a look at the Louisiana Department of Environmental Quality's web site:

<http://www.deq.state.la.us/portal/tabid/131/Default.aspx>

# Diesel Range Organics

*It's not safe. It's not safe for the baby. ... I mean look at this—a newborn baby! I mean, I have toddlers; I have a four-year-old that loves to fish. I can't bring those kids around here...*  
 –St. Bernard resident

## What are diesel range organics?

Diesel range organics (DROs), like oil range organics, are petroleum-based chemicals (Louisiana Department of Environmental Quality 2003). As with oil range organics, there are various types of diesel range organics. Many of these compounds degrade naturally with time.

## What did they find?

Take a look at the table labeled “LEVELS OF DIESEL RANGE ORGANICS.” As you can see, the U.S. Environmental Protection Agency (U.S. EPA) tested for diesel range organics in 1,319 sediment samples between September 2005 and July 2006. The U.S. EPA found that approximately 75 percent of the samples had low levels of diesel range organics. On the other hand, they found high levels of diesel range organics in five percent of the samples.<sup>8</sup> These high levels exceeded the Management Option 1 standard.

Most of the sediment samples with high levels of diesel range organics were found in the oil spill area. The map suggests that diesel range organic contamination is greater in the southeast region of the Murphy Oil spill near Jacob's Drive.

## LEVELS OF DIESEL RANGE ORGANICS IN ST. BERNARD

Number of samples tested – 1,319

	Zero (No diesel range organics detected)	Low Levels (1 – 65 parts per million)	Medium Levels (66– 650 parts per million)	High Levels (651 – 55,000 parts per million)
Percent of Samples	13%	48%	34%	5%
Number of Samples	176	630	446	67

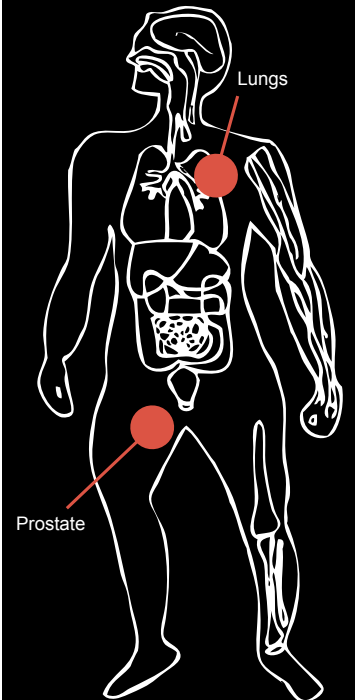
### [OVERALL]

**Seventy five percent of the samples taken from St. Bernard Parish had low levels of diesel range organics. There were high levels of diesel range organics in five percent of the samples.<sup>9</sup> Most of the samples with high levels of diesel range organics were found in the oil spill area.**

## How can diesel range organics affect my health?

According to the International Agency for Research on Cancer (IARC), a few studies indicate that humans exposed to high levels of diesel fuel may have an increased risk of lung and prostate cancers (International Agency for Research on Cancer 1998). However, a great deal of research is still required to establish a causal link between chemicals and cancer. Therefore, the IARC states that that evidence is inadequate to conclude that diesel fuels definitely cause cancer in humans. Additionally, the IARC states that it cannot classify whether light diesel fuels cause cancer in humans and that marine diesel

# HOW CAN DIESEL RANGE ORGANICS AFFECT MY HEALTH?



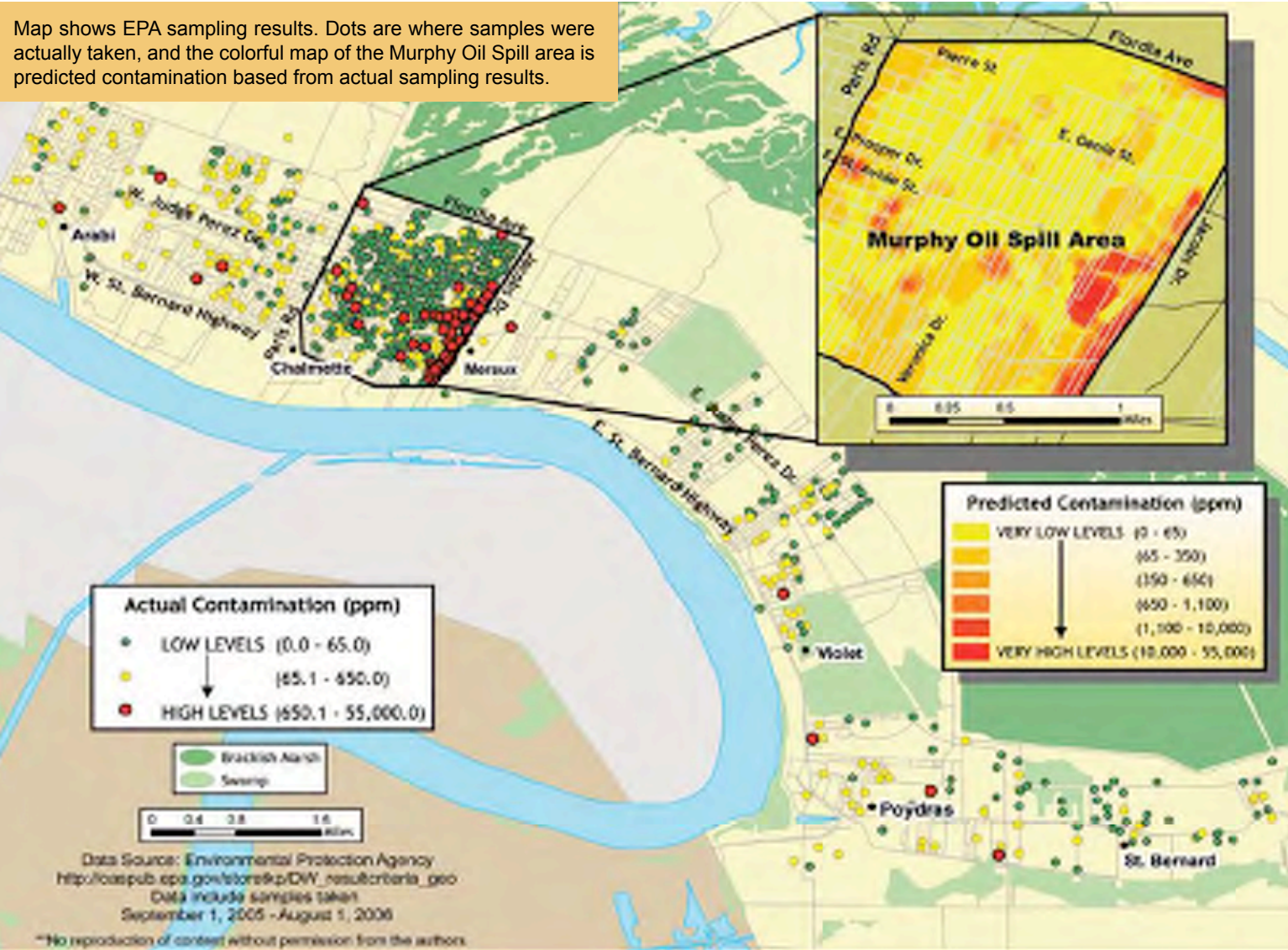
**People who are exposed to substantial amounts of diesel fuel may have an increased risk of:**

- lung cancer
- prostate cancer

*(International Agency for Research on Cancer 1998)*



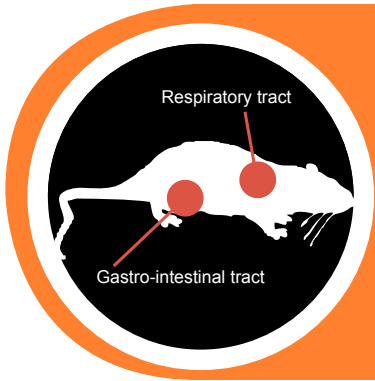
Map shows EPA sampling results. Dots are where samples were actually taken, and the colorful map of the Murphy Oil Spill area is predicted contamination based from actual sampling results.



**ASK YOURSELF  
ASK YOUR NEIGHBOR**  
Some studies have shown that there may be a link between exposure to diesel fuel and cancer. However, evidence is not strong enough to prove a cause-and-effect link between exposure to diesel & cancer. How might we apply the Precautionary Principle to this situation? (See Chapter 1)

fuels<sup>10</sup> possibly cause cancer in humans.

Researchers often use mice & hamsters to study the health effects of hazardous chemicals. Scientific studies have found that mouse embryos exposed to diesel range organics develop tumors (Curren 1980; Brune 1981). Exposure to diesel range organics has also been linked to gene mutation in hamsters (Lewtas 1983). In other studies, when marine diesel fuel was applied to the skin of mice, the animals developed skin ulcers (International Agency for Research on Cancer 1998). Overall, the IARC states that there is limited evidence demonstrating a link between exposure to diesel fuel and cancer (International Agency for Research on Cancer 1998).



- **Mouse embryos exposed to diesel range organics developed tumors.**
- **Exposure to diesel range organics has been linked to gene mutation in hamsters.**
- **When marine diesel fuel was applied to the skin of mice, it caused skin ulcers.**

(Curren 1980; Brune 1981; Lewtas 1983; International Agency for Research on Cancer 1989 updated 1998).

# Benzo(a)pyrene

*In the first couple of months after the storm, I knew there were health hazards. But they did not want to tell anyone because they didn't want to alarm people because they wanted them to come back.*

—St. Bernard resident

## What is benzo(a)pyrene?

Benzo(a)pyrene is one type of chemical found in petroleum. It is also found in other substances such as coal, tar, and charred food. Benzo(a)pyrene is part of a group of carbon-based chemicals known as polycyclic aromatic hydrocarbons (PAHs).

## What did they find?

Benzo(a)pyrene was not found in 86 percent of the sediment samples tested in the parish. However, 14 samples (one percent) of the samples taken in the parish did exceed a state standard for benzo(a)pyrene.<sup>11</sup>

## How can benzo(a)pyrene affect my health?

The IARC classifies benzo(a)pyrene as a probable human carcinogen. Some studies have shown that inhalation of benzo(a)pyrene is associated with lung cancer in humans (Chang, Lee et al. 1999).

Although we need additional evidence to determine whether benzo(a)pyrene causes cancer in humans, a number of laboratory studies demonstrate that benzo(a)pyrene does indeed cause cancer in rats and other rodents. Studies with guinea pigs, hamsters, and rats have shown that benzo(a)pyrene can produce tumors in the respiratory tract and gastro-intestinal tract (Brune 1981; Knauf 1992). Exposure to polycyclic aromatic hydrocarbons (PAHs) such as benzo(a)pyrene in the air is associated with lung cancer (Boffetta, Jourenkova et al. 1997). When applied to these animals' skin, PAHs may lead to skin cancer (Boffetta, Jourenkova et al. 1997).

### [OVERALL]

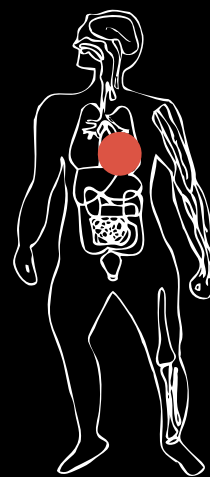
**Within the oil spill area, only one sample had high levels of benzo(a)pyrene. This sample did exceed the Management Option 1 state standard. Most of the samples that exceeded the standard were found west of the oil spill area, between Arabi and Chalmette.**

## LEVELS OF BENZO(A)PYRENE IN ST. BERNARD

Number of samples tested— 1,329

	Zero (No benzo(a)pyrene detected)	Low Levels (0.1-160 parts per million)	Medium Levels (160-330 parts per million)	High Levels (330.1-5,520 parts per million)
Percent of Samples	86%	10%	3%	1%
Number of Samples	1,146	134	35	14

## HOW CAN BENZO(A)PYRENE AFFECT MY HEALTH?



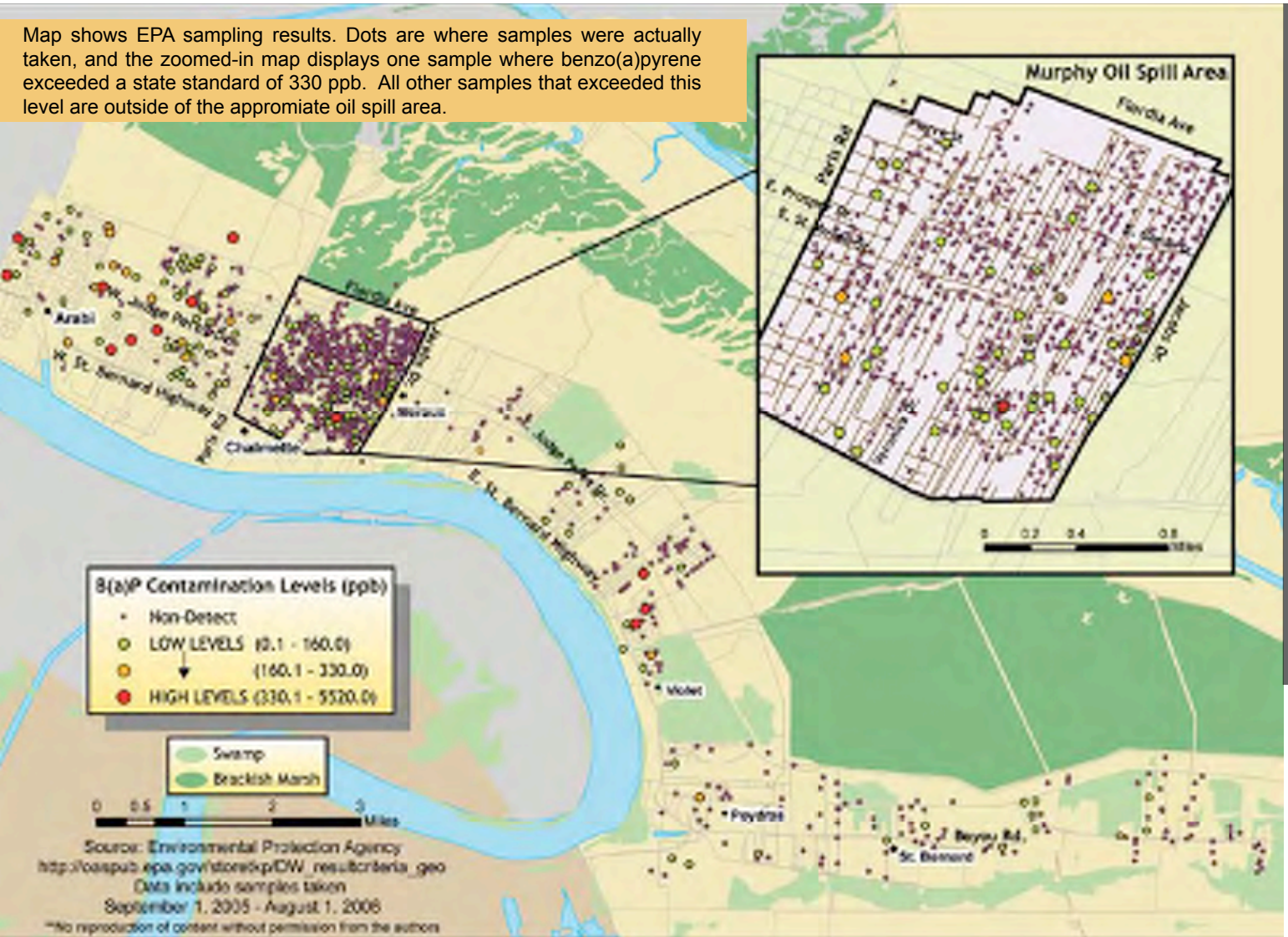
**In guinea pigs, hamsters, and rats, Benzo(a)pyrene ingestion has caused tumors of the:**

- **Respiratory tract**  
(Knauf 1992)
- **Gastro-intestinal tract**  
(Brune 1981; Chen, Chuang et al. 1985; Knauf 1992)

**Also, when applied to the skin, PAHs may lead to skin cancer**  
(Boffetta, Jourenkova et al. 1997)

**Inhalation of benzo(a)pyrene has been associated with lung cancer in humans.**  
(Chang, Lee et al. 1999)

Map shows EPA sampling results. Dots are where samples were actually taken, and the zoomed-in map displays one sample where benzo(a)pyrene exceeded a state standard of 330 ppb. All other samples that exceeded this level are outside of the appropriate oil spill area.



*There is not one house on this street without someone who either has cancer or has died of cancer.*

**–St. Bernard resident**

*I have skin cancer, throat cancer, and bladder cancer. The EPA don't control nothing.*

**–St. Bernard resident**

*The flood ain't gonna kill you but breathing and drinking will.*

**–St. Bernard resident**

# Arsenic

*This is cancer alley all along the river—that's why people don't want to bring their kids back. I don't even want to grow vegetables here.*

—St. Bernard resident

## What is arsenic?

Arsenic is a metal that occurs naturally in the earth's crust. It is commonly used in chemicals such as pesticides, herbicides, insecticides, and as a treatment for wood. Arsenic contaminates our soil and water when we do not properly dispose of arsenic-treated wood, and when we use pesticides and herbicides that contain arsenic.

## What did they find?

Because arsenic is not associated with crude oil, the U.S. Environmental Protection Agency (U.S. EPA) did not extensively test for arsenic within the Murphy Oil spill area.<sup>12</sup> The majority of the sediment samples tested in the parish indicated low levels of arsenic. Approximately five percent of the samples taken in the parish exceeded a state standard.<sup>13</sup>

Although five percent of the samples exceeded the state standard of 12 parts per million, all of the samples were below a standard set by U.S. EPA at 39 parts per million.<sup>14</sup> The samples that exceeded the state standard for arsenic tended to be found in or near Arabi and Poydras. Residents may wish to conduct additional testing and clean up in these areas.

*For ideas on how to organize with your neighbors and take clean up into your own hands, please see Chapters 4 and 5 of this handbook.*

## How can arsenic affect my health?

The U.S. Environmental Protection Agency (U.S. EPA) states that arsenic is known to cause cancer. Multiple studies have demonstrated that arsenic in drinking water causes skin, lung, and bladder cancers (Tseng 1977; Smith 1998; International Agency for Research on Cancer 2004). Arsenic exposure also increases the risk of stroke (Chiou, Huang et al. 1997; Navas-Acien, Sharrett et al. 2005; Chiu, Lin et al. 2007). Communities that are exposed to high concentrations of arsenic in drinking water experienced skin lesions, skin cancer, and problems with blood circulation that led to gangrene (decay of body tissue) (Tseng 1977). High levels of arsenic in soil, food, and water have been consistently related to skin lesions and skin cancer (Patel, Shrivastava et al. 2005). In one study, men living in communities with high levels of arsenic contamination in the soil experienced an increased risk of lung cancer (Xu, Blot et al. 1991).

## LEVELS OF ARSENIC IN ST. BERNARD

Number of samples tested— 501

	Zero (No arsenic detected)	Low Levels (1-6 parts per million)	Medium Levels (6.1-12 parts per million)	High Levels (12.1 -25 parts per million)
Percent of Samples	3%	68%	24%	5%
Number of Samples	15	341	117	26

## HOW CAN ARSENIC AFFECT MY HEALTH?

**Members of a community who were exposed to arsenic in their drinking water experienced:**

- Skin lesions
- Problems with blood circulation which led to gangrene

(Tseng 1977)

**Arsenic exposure at high levels is also associated with the incidence of stroke**

(Chiou, Huang et al. 1997; Chiu, Lin et al. 2007)

**Some studies have found an association between arsenic exposure and low birth weight while other studies have not found an association**

(Kwok, Kaufmann et al. 2006)

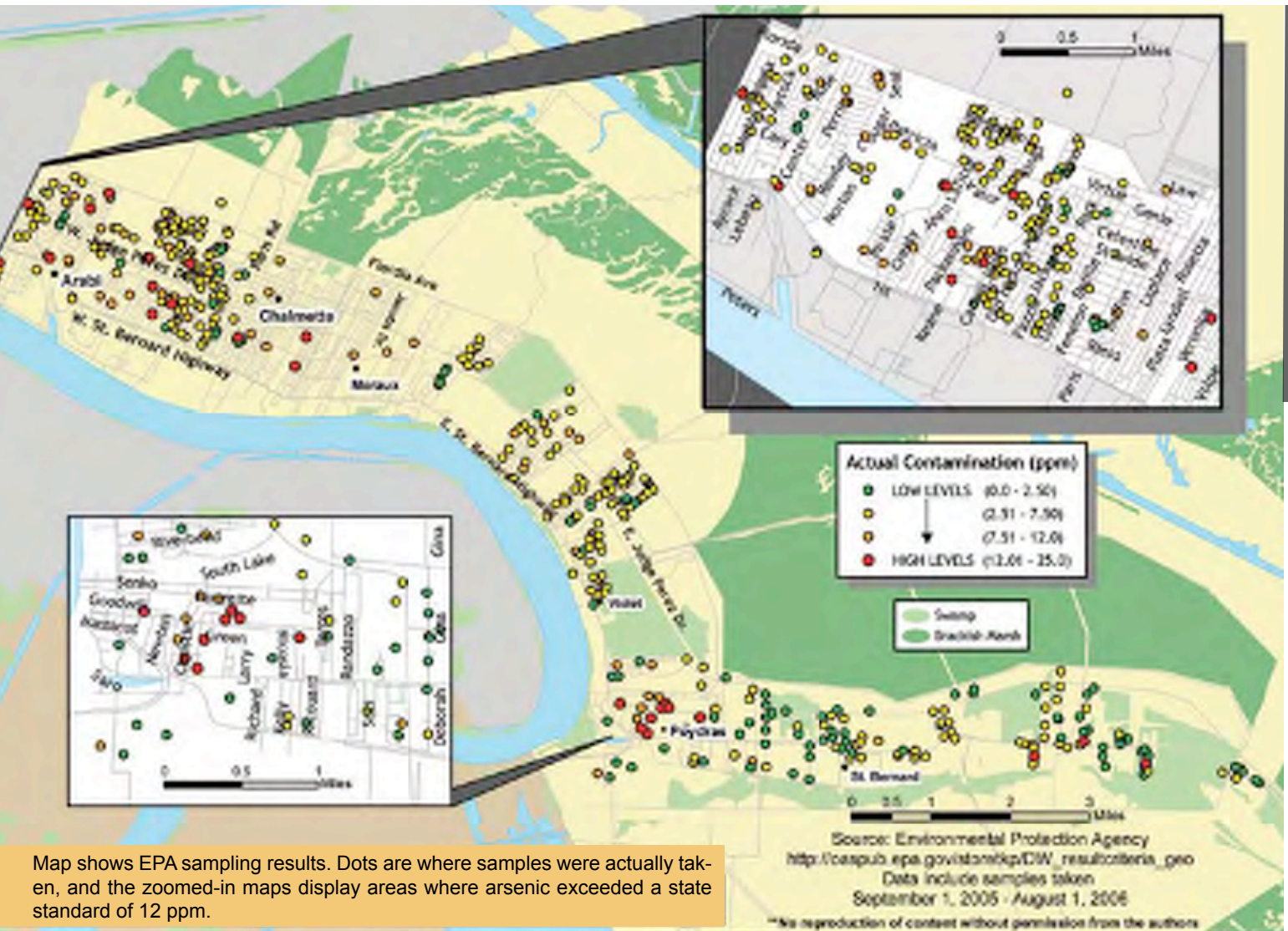
**Arsenic exposure is also linked with high blood pressure and other forms of cardiovascular disease**

(Rahman 2002; Navas-Acien, Sharrett et al. 2005)

**Arsenic in drinking water is linked to:**

- Skin cancer
- Lung cancer
- Bladder cancer

(Chen, Chuang et al. 1985; Smith 1998)



## CANCER ALLEY

As we talked with residents in the parish over the past year, we continually heard stories of friends and family facing cancer. Many residents just accept cancer as a normal part of life: we live in cancer alley. Is it true that cancer rates are higher in St. Bernard than the rest of the nation? Is this really “cancer alley”? Is this normal? Is this something that we should accept? What is the cause of these cancer cases?

It is difficult to pinpoint what exactly causes cancer. There are many types of cancer caused by many different things. Cancer may be caused by many factors, including genetics, nutrition, or dangerous chemicals in the environment. Cancer can affect many different parts of the body, including the brain, bone marrow, breasts, bladder, prostate, stomach, skin, and throat, to name a few.

According to the National Cancer Institute, the overall rates of cancer in St. Bernard Parish are higher than the rest of the nation (National Cancer Institute 2004). For every 100,000 people living in St. Bernard Parish, approximately 252 people will die each year from cancer.

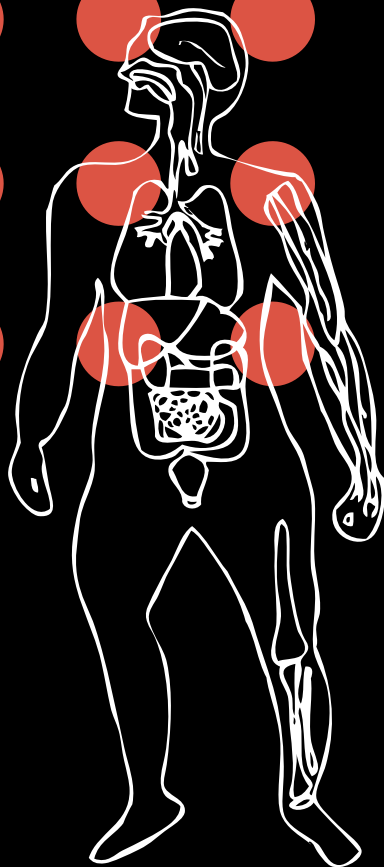
This is higher than the national average cancer death rate, which is 196 deaths per 100,000 people (National

Cancer Institute 2004). We need more research to help us understand why St. Bernard has an elevated cancer death rate.

Some studies indicate that refinery workers may have an increased risk of lung cancer (Raabe 1998), stomach cancer (Hannis, Stavrakys et al. 1979) and increased overall cancer risk (Chan 2006). People who live near a refinery may have a greater risk of developing lung cancer (Gottlieb 1982). Residents living near oil fields in Ecuador appear to have an increased risk of developing all forms of cancer (San Sabastian 2001). On the other hand, some studies have found that people who work in the petroleum industry or live near refineries experience no significant increase in cancer risk (Wong and Foliart 1993; Rosamilia 1999; Tsai, Chen et al. 2004).

This conflicting information is difficult and frustrating. The question of cancer alley has not been answered, so we must continue to search for answers. Instead of waiting for conclusive evidence, we can be cautious and take steps to protect ourselves from potential health hazards—even if we are uncertain about the severity of those hazards. To read about scientific uncertainty and precaution, see Chapter 1.

# ARSENIC



## [OVERALL]

The majority of the sediment samples tested in the parish indicated low levels of arsenic. Approximately five percent of the samples taken in the parish exceeded a state standard of 12 ppm.

## ASK YOURSELF ASK YOUR NEIGHBOR

- How many people do you know who have cancer? In your neighborhood? In your church? In your family?
- What types of cancer do they have?
- Do you think that cancer is a normal part of life?
- What factors do you think cause cancer in your neighborhood? What can you do to address these factors?
- What steps can you take to reduce your exposure to substances that may cause cancer?

# Lead

## What is lead?

Lead is a naturally occurring metal found in small amounts in the surface of the earth. Lead pollution usually comes from the wastewater from lead-based industries, urban and agricultural runoff, and mining waste (Agency for Toxic Substances and Disease Registry 2005). In the past, lead was used in many products such as gasoline and paint. However, industries are reducing their use of lead because it poses a serious health risk to humans. Lead is still used in a number of products, including batteries, paint, ammunition, and other metal products such as pipes, ceramic glazes, medical, and military equipment (Agency for Toxic Substances and Disease Registry 2005).

## What did they find?

Based on the 497 samples taken throughout the parish, lead does not appear to be a significant problem in St. Bernard. Ninety-nine percent of the sediment samples were below a state standard for lead.<sup>15</sup> The eight samples that had high levels of lead were dispersed throughout the parish. Nevertheless, precaution should be routine, particularly with children. In St. Bernard, crude oil is not generally associated with the presence of heavy metals such as lead. Therefore, the U.S. Environmental Protection Agency (U.S. EPA) conducted sparse sampling for lead in the oil spill area compared to the rest of St. Bernard Parish.

## How can lead affect my health?

According to the U.S. Environmental Protection Agency (U.S. EPA), people are usually exposed to lead by swallowing small bits of lead-based paint or inhaling particles of lead dust. Additionally, humans may be exposed to lead by ingesting contaminated drinking water. Lead commonly enters the water supply via corroded lead-based solder and piping (*Environmental Protection Agency 2005*).

Human health effects of lead exposure are well known. In children, lead exposure leads to problems with the development and function of the brain and nervous system (Lidsky and Schneider 2003; Patrick 2006). In adults, lead exposure may also lead to kidney problems (Staessen, Yeoman et al. 1990) and to high blood pressure (Harlan 1988; Patrick 2006). Lead exposure is also linked to reproductive disorders in both men and women. Lead exposure has been linked to menstrual irregularities, spontaneous abortion in women (*Xuezhi, Youxin et al. 1992; Tang and Zhu 2003*), decreased volume of ejaculation, and reduced sperm count in men (*Hu, Wu et al. 1992; Xuezhi, Youxin et al. 1992*).

## How can I reduce my exposure to these chemicals?

This chapter presented information that focused on soil contamination. However, we can be exposed to toxic chemicals in a variety of ways: we can breathe toxins, drink them, eat them, or come into contact with them with our skin. The health effects of a toxic chemical depends on the level of exposure and whether we eat it, breathe it, or rub it on our skin. The most likely way that we will be exposed to contaminants in our soil is by coming into contact with it through our skin.

## HOW CAN LEAD AFFECT MY HEALTH?

### Exposure to lead can cause:

- **Problems with brain development**
- **Problems with the nervous system**
- **Increased blood pressure**
- **Kidney problems**

### Exposure to lead is associated with the following reproductive problems:

#### In WOMEN:

- **Menstrual irregularities**
- **Spontaneous abortion**

#### In MEN:

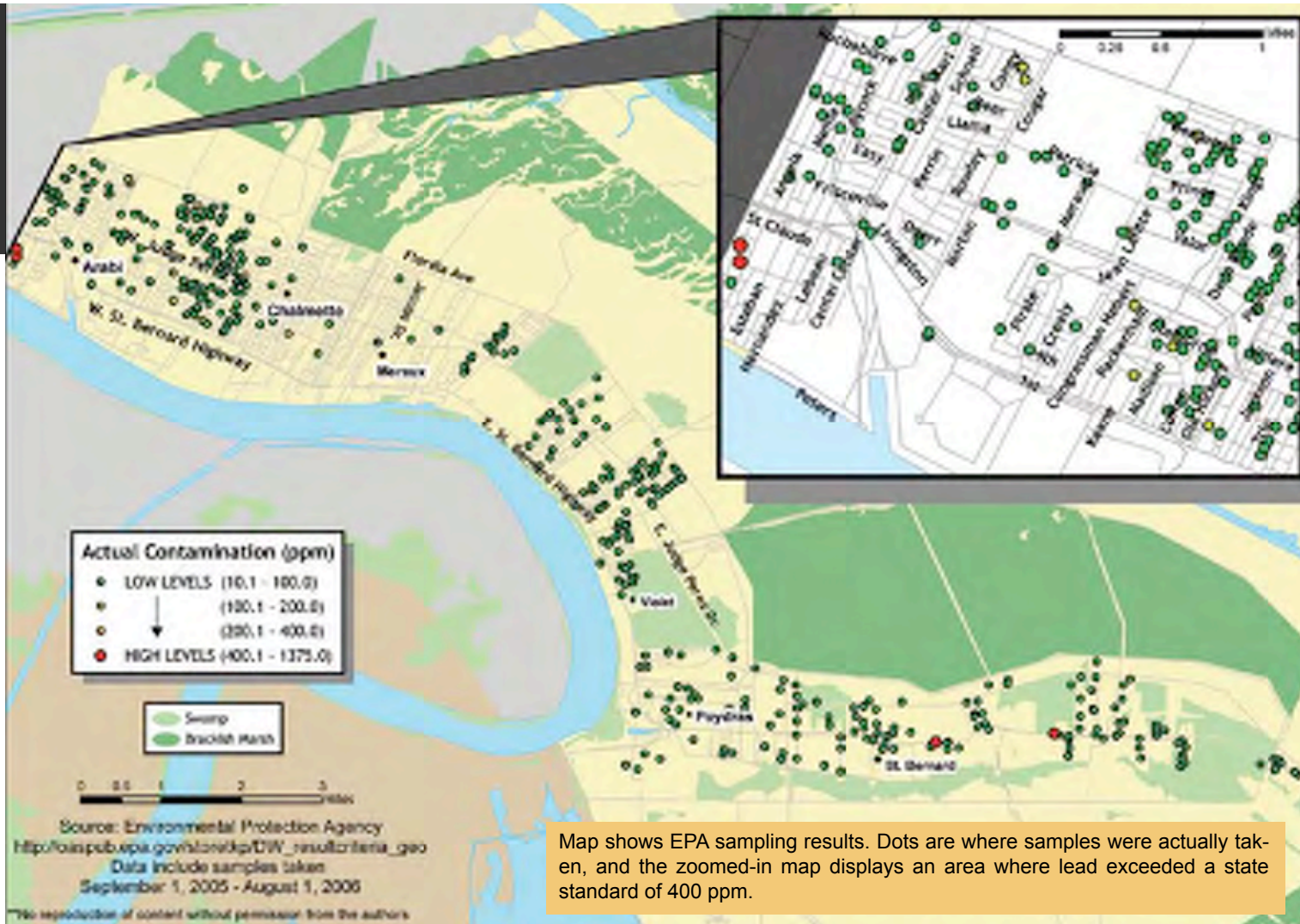
- **Reduced sperm count**
- **Decreased volume of ejaculation**

*Read more about these studies to your left.*

### **YOUNG CHILDREN and fetuses are particularly at risk for negative health effects associated with lead exposure, mainly because of the following:**

1. Children's nervous systems are still developing;
2. Young children are more likely to come into contact with lead contamination by eating lead paint chips or ingesting soil;
3. Children absorb lead quickly into the lining of their stomachs; and
4. When children are deficient in vitamins, their bodies easily absorb lead

*(Agency for Toxic Substances and Disease Registry 2005)*



Map shows EPA sampling results. Dots are where samples were actually taken, and the zoomed-in map displays an area where lead exceeded a state standard of 400 ppm.

## ASK YOURSELF

### ASK YOUR NEIGHBOR

- If you have questions about a particular source of contamination in your community, have you talked with your neighbors? What have you said to your neighbors?
- What kind of special abilities and skills could you contribute to a campaign to protect the health of your family?
- Which of your neighbors have skills and/or contacts that could help your campaign?

Refer to Chapter 5 to learn about community organizing strategies.

## LEVELS OF LEAD IN ST. BERNARD

Number of samples tested— 501

	Zero (No lead detected)	Low Levels (1 - 200 parts per million)	Medium Levels (200.1 - 400 parts per million)	High Levels (400.1 - 1,500 parts per million)
Percent of Samples	0%	99%	0%	1%
Number of Samples	0	986	0	8

### [OVERALL]

**Ninety-nine percent of the sediment samples were below the state standard of 400 parts per million for lead. The eight samples that had high levels of lead were dispersed throughout the parish.**



## REDUCE YOUR EXPOSURE:

1. Try to avoid skin contact with soil.
2. Wash your & your children's hands after contacting soil.
3. Make sure your children do not track dirt into the house.
4. Avoid planting vegetables in soil that you have not tested for contamination.
5. If you would like to plant a vegetable garden, use large containers or try creating raised garden beds with impermeable lining & filling them with clean planting soil.
6. Create buffers between yourself & potentially contaminated soil by planting shrubs or grass.
7. You can use certain plants and bacteria to clean up the soil. For ideas on how you can clean up the soil, see Ch. 4.
8. If you are concerned about your exposure to contamination, let your voice be heard. Organize a letter-writing campaign to your representatives in the local, state, and federal governments.

## Citizen Success at Love Canal

### Residents working together to protect the health of their children

Back in 1978, residents of Love Canal, New York started noticing strange odors in their neighborhood. They detected unusual substances surfacing in their yards and on the school playground. Lois Gibbs, a mother, was living in Love Canal at the time. When Ms. Gibbs' 7-year-old child became sick, she started looking for more information regarding environmental hazards. She soon discovered that her neighborhood was built on top of a landfill.

Although Ms. Gibbs had no prior community organizing experience, she joined with her neighbors and formed the Love Canal Homeowners' Association. Ms. Gibbs and her neighbors successfully won funds to help 800 families move away from the toxic site. Additionally, their efforts led to the passage of national laws that protect communities from toxic wastes. Lois Gibbs' campaign started with a simple strategy: she talked with other parents in her community about their children's health. She found out that hundreds of other families were



Photo Credit: Katie Schneider

concerned about health hazards in the community. So, she formed a concerned parents' group to work for a solution. When other community members joined the campaign, Ms. Gibbs' group of concerned parents became a larger group, eventually known as Love Canal Homeowners' Association. The association included over 500 families, most of which worked at local industries.

The story of Love Canal shows that, even with no prior experience, concerned families can act together to achieve major results. Today, Lois Gibbs serves as director of a group she created called the Center for Health, Environment and Justice (CHEJ). If you would like to learn more about the organization Ms. Gibbs formed, contact:

*Center for Health, Environment and Justice (CHEJ) • Contact: Main Office • Phone: (703) 237-2249 • E-mail: [chej@chej.org](mailto:chej@chej.org)*

## CONCLUSION

Overall, the severity of sediment contamination varies throughout St. Bernard Parish. It is important to think about contamination levels throughout your neighborhood, not only the contamination that may be present on your property. As you digest this information, keep in mind that soil contamination levels may be very different from place to place and even within different places in your backyard.

Crude oil and other organic compounds do break down naturally in the environment, which may be encouraging for St. Bernard residents. Lead and arsenic, however, persist in the environment for a much longer time period than diesel range organics and oil range organics. The results of these sediment samples show relatively low levels of arsenic and lead—two metals in the environment that warrant attention if detected at high levels. Lead and arsenic have been detected at significantly higher levels in other areas of New Orleans that are closer to highly industrial areas.

The health effects of exposure to these contaminants depend on whether we drink these chemicals in our water, eat them in our vegetables, breathe them in the air, or absorb them through our skin. This chapter focused on soil contamination, but we must remember that contaminated soil may lead to water pollution. The information offered in this chapter is not meant to offer the final word on the health effects of these contaminants. Rather, we hope that this chapter has provided you with tools to help you piece together answers regarding potential health risks in the parish.

We must find opportunities to coordinate clean-up efforts. We hope that this chapter aids you as you consider options for creative rebuilding, appropriate placement of buffers, and community enhancement projects.

*Please refer to Chapter 4 to learn more about what you can do to address contamination in your community.*

## CHAPTER SUMMARY

- St. Bernard residents have expressed a need for more information regarding contamination and their health.
- The U. S. Environmental Protection Agency tested for numerous chemicals, including diesel range organics, oil range organics, benzo(a)pyrene, arsenic, and lead.
- Contamination levels in St. Bernard vary in type, location, and severity.
- Diesel and oil range organic contamination in the oil spill area appears higher closer to the refinery.
- Exposure to oil above safe levels has been associated with breathing problems, sore eyes, sore throat, headache, nausea, and vomiting.
- Benzo(a)pyrene was not consistently detected in high concentrations. However, several samples did exceed Louisiana Department of Environmental Quality's Management Option 1 standard for residential soil.
- High levels of lead and arsenic were spotty throughout the parish.
- We must continue to monitor areas that have medium and high levels of contamination.
- Based on overall patterns of contamination, we must work together to continue to monitor and clean up contamination in the parish.

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## FOOTNOTES

<sup>1</sup> Out of 205 respondents, 125 felt they did not have enough information about risks in the parish; 43 percent of these 125 respondents stated that they required additional information regarding health and contamination.

<sup>2</sup> To see concentration levels over time, please visit <http://www.epa.gov/katrina/testresults/sediments/summary.html#e> - Hurricane Katrina Diesel Range Organic/Oil Range Organic Concentration Trends

<sup>3</sup> [http://oaspub.epa.gov/storetcp/dw\\_home](http://oaspub.epa.gov/storetcp/dw_home)

<sup>4</sup> FEMA Mitigation Assessment Team Report. July 2006.

[http://www.fema.gov/library/file.jsp?sessionid=BA71E431E57DB48E930F6A978B47D569?type=originalAccessibleFormatFile&file=fema549\\_apndx\\_i.txt&fileid=996f95f0-3f1d-11db-a421-000bdba87d5b](http://www.fema.gov/library/file.jsp?sessionid=BA71E431E57DB48E930F6A978B47D569?type=originalAccessibleFormatFile&file=fema549_apndx_i.txt&fileid=996f95f0-3f1d-11db-a421-000bdba87d5b)

<sup>5</sup> Hotspots are areas with high levels of contamination.

<sup>6</sup> Scott A. Stout, Glenn C. Millner, Dyron Hamlin, Bo Liu. The Role of Chemical Fingerprinting in Assessing the Impact of a Crude Oil Spill Following Hurricane Katrina. *Environmental Claims Journal*. Boca Raton: Spring 2006. Vol. 18(2): 169-184.

<sup>7</sup> Hot spots are areas with high levels of contamination.

<sup>8</sup> "High levels" are sediment samples that exceeded 650 parts DROs per million parts soil. This is a standard stated in the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP) Management Option 1 (MO-1).

<sup>9</sup> "High levels" are sediment samples that exceeded 650 parts DROs per million parts soil. This is a standard stated in the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP) Management Option 1 (MO-1).

<sup>10</sup> Marine diesel fuel is an "intermediate" type of fuel, which means that it contains a mixture of heavy residual fuel oil and lighter, distilled fuel oil. For more information, consult the following agencies:

Agency for Toxic Substances Disease Registry: <http://www.atsdr.cdc.gov/toxprofiles/tp75-c3.pdf>

U.S. Environmental Protection Agency: <http://www.epa.gov/otaq/regs/nonroad/marine/ci/fr/dfuelrpt.pdf>

<sup>11</sup> These samples exceeded the standard for benzo(a)pyrene stated in Management Option 1 of the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP).

<sup>12</sup> LDEQ Official. Personal communication. September 2006.

<sup>13</sup> These samples exceeded 12 parts per million, which is the standard for arsenic stated in Management Option 1 of the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP).

<sup>14</sup> LDEQ. Arsenic Sampling Explained. <http://deq.louisiana.gov/portal/portals/0/news/pdf/arsenicexplainedjan10.pdf>. (last visited 3/22/07)

<sup>15</sup> The state standard for lead is 400 parts per million as stated in Management Option 1 of the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/ Corrective Action Plan (RECAP).

## CHAPTER 3: Decoding the Data

### IN YOUR WORDS

I have children. I would love to come back to my house ... [But] I can't live on [my lot] because my soil was tested and I don't know the results ... because I can't understand the paperwork ... I just want someone to tell me if it is safe for my kids to play in the front yard!

—St. Bernard resident

[I was informed] that our property was tested. I have been forwarded a copy of the results and I have reviewed the data. Like many others, I have trouble comprehending the test data even though I have some scientific background. The data appears to be of a foreign nature to me ... I would be grateful if you could interpret the data for me and point out any problem areas for me.

—St. Bernard resident



Photo Credit: Piper Hanson, "Turf Files" Images used from Photo Exhibit "Life in the Wake of Katrina."

### Read this chapter if you want to know:

- How to read a lab report
- State and federal environmental standards
- How to compare sediment sampling results to state and federal standards

**3**

**“I JUST WANT SOMEONE TO TELL ME IF IT IS SAFE FOR MY KIDS TO PLAY IN THE FRONT YARD”**

—ST. BERNARD RESIDENT

# INTRODUCTION

Scientific information may look intimidating, but you don't need to be a professional to understand its meaning. By learning the language of the lab reports, you'll have a better understanding of the health of your environment without needing to reconcile conflicting reports. You and your neighbors can look at data and decide for yourselves whether you feel the situation is safe or unsafe. Your knowledge regarding contamination is a powerful tool that you can use to protect your health by holding polluters and regulatory agencies accountable to environmental standards.

The purpose of this chapter is to provide you with tools to help make sense of the soil testing data. We hope that the information in this chapter helps you to independently determine whether the contamination levels present in St. Bernard Parish are acceptable.

## THINKING BACK...

**You were staying at your mother-in-law's in Baton Rouge when you heard the news:** Katrina's surge spewed nearly one million gallons of oil from the Murphy Oil refinery into the neighborhoods of St. Bernard Parish. Your mind filled with questions:

*Was my home affected by the oil spill?*

*Will we get sick if we come back to a neighborhood that's been covered in oil?*

You stop by the Parish Government Office to find out more about the oil spill. At first, you're relieved to find out your house is not in the official oil spill area. But when you return to your home, you notice a strange black bathtub ring about seven feet from the ground. Out back, there is dark and dried mud that looks like broken bits of asphalt.

It's not long before you find out that your neighbors, Joe and Deanna across the street, are in the official oil spill area. You wonder, *How is it that the oil stopped exactly in the middle of the road and did not cross over into my property?* Joe and Deanna tell you that Murphy Oil tested their soil for contamination. When the results come in the mail, Deanna comes by to show them to you.

*What in the world is tri-chlo-ro-ben-zene?* Deanna asks as she holds up the piece of paper from the lab. It has a list of long chemical names and numbers.

*I don't know,* you reply. *But I have heard of benzene; and I know that stuff might cause cancer. I wonder if this tri-chlo-ro-ben-zene is related to benzene ...?*

You take a look at the rest of the chemicals and the numbers next to them. You can tell that the numbers indicate how much of each chemical was found on the property, but you can't tell what the numbers mean. More questions swirl in your head:

*How can I find out if there is a safe level of each of these chemicals?*

*If the chemicals are above safe levels, how can I clean them up?*

*Is the contamination on my property similar to the contamination at Deanna's place since we live just two blocks away from each other?*

*Photo Credit: Piper Hanson. St. Bernard Parish, L.A. 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."*



# READING A LAB REPORT FOR SOIL

*"[I was informed] that our property was tested. I have been forwarded a copy of the results and I have reviewed the data. Like many others, I have trouble comprehending the test data even though I have some scientific background. The data appears to be of a foreign nature to me ... I would be grateful if you could interpret the data for me and point out any problem areas for me."*

—St. Bernard resident

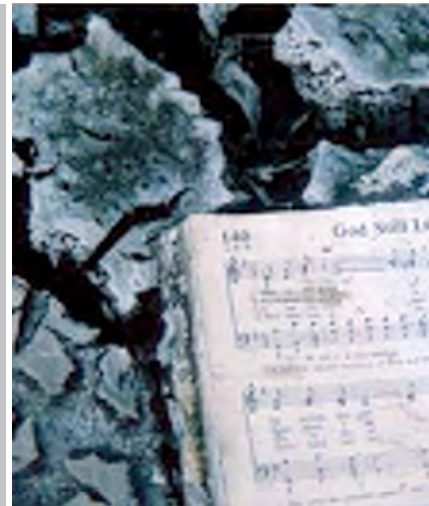


Photo Credit: Marlene Hines, "God Still Lives," St. Bernard Parish, LA, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."

You decide to send a soil sample from one of your rental properties to a lab for testing. When you open the envelope with the results, you feel even more confused than you did before.

You decide to figure it out for yourself. You spread the results across your mother-in-law's kitchen table and stare at the paperwork all afternoon. Some numbers look high, but you wonder, "How high is too high?"

**Using an example of real soil lab report from a property in St. Bernard, this section will:**

- **Explain the meaning of the abbreviations found the lab reports, and**
- **Clarify the units of measurement used in the lab reports**

“Is it safe to return to my property?  
Does this report show I have a  
contamination problem?”

**If you have a lab report, read on. If you have not yet had your property tested, go to Chapter 2 to see what levels of contamination were found in and around your neighborhood.**

## MAKING SENSE OF THE MEASUREMENTS



### CONVERTING MEASUREMENTS

**1000 micrograms ( g) = 1 milligram (mg)**

**1000 milligrams (mg) = 1 gram (g)**

**1000 grams (g) = 1 kilogram (kg)**

**1,000,000 milligrams = 1 kilogram (kg)**

**1,000,000,000 micrograms ( g) = 1 kilogram (kg)**

**2.2 pounds = 1 kilogram (kg)**

**Parts per million (ppm)**— This is the same as milligrams per kilogram (mg/kg). For example, 4 milligrams per kilogram is equivalent to 4 parts per million.

**Parts per billion (ppb)**—This is equivalent to micrograms per kilogram (ug/kg). For example, 4 micrograms per kilogram is equivalent to 4 parts per billion. Since one billion is 1000 times more than one million, 4 milligrams per kilogram is equivalent to 0.004 parts per billion.

*For more information on measuring contamination, see Appendix A.*

# AN EXAMPLE OF A LAB REPORT FOR SOIL



## “ORO” = THE CONTAMINANT TESTED

**ORO=Oil Range Organics**

**ORO are chemicals found in petroleum.**

*For more details, see Chapter 2*

## “RDL” = REPORTING DETECTION LIMIT

**If the concentration of a chemical in your soil is lower than this level, the lab cannot detect the chemical in the sample.**

SW-846 8015B ORO						
Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/23/2005 22:00	310957	3550B	1	12/24/2005 12:42	DLB	311245
CAS#	Parameter	Result	RDL	REG LIMIT	Units	
60511-00-44	Oil Range Organics	1 020 000	130 000		ug/kg	

## RESULTS

**In this sample, the lab found 1,020,000 micrograms per kilogram (ug/kg) of oil range organics in the soil sample.**

**If we get rid of the last three zeros, we can convert this number to 1,020 milligrams per kilogram (mg/kg).**

**The state of Louisiana says that ORO concentrations below 1,800 (mg/kg) do not pose a substantial risk to human health.**

**1,020 mg/kg is less than Louisiana’s standard of 1,800 mg/kg for residential soil.**

**This means that according to the state of Louisiana, the area where this soil sample was taken probably does not need to be tested again.**

## UNITS

**The samples were measured in micrograms per kilogram (ug/kg). This is the same as parts per billion.**

*For more details see Appendix A*

## ‘U’ = Undetected

**This mean the chemical was too low to be detected in this sediment sample.**

## CHEMICAL GROUP

**A chemical is *semi-volatile* if it evaporates somewhat readily at room temperature. Therefore, if your property is tested for one of these chemicals once, and then tested again in the future, it is likely that the results the second time will be lower.**

## 8270C, SemiVolatiles

Prep Date	Prep Batch	Prep Method	Dilution	Analyzed	By	Analytical Batch
12/23/2005 21:00	310955	3550B	1	12/29/2005 23:29	BSPT	311291
CAS#	Parameter	Result	RDL	REG LIMIT	Units	
120-82-1	1,2,4-Trichlorobenzene	3040 U	3240		ug/kg	
50-32-8	Benz[a]pyrene	96 U	98		ug/kg	

## ‘PARAMETER’=THE LIST

**This is a partial list of the semi-volatile chemicals that the lab tested for in this sediment sample. If one of these chemicals was detected on your property, you can learn about its negative health effects by checking with the Agency for Toxic Substances and Disease Registry:**

<http://www.atsdr.cdc.gov/toxfaq.html>

**You can also call:  
1-800-311-3435**

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extractor
C10.C28.D60	900	17	1	3/17/06	3/21/06	JWC0000020



**Reading a lab report for the first time can seem a bit confusing, but we hope that these examples help you to make better sense of your soil testing report that you may have received.**

**If you’d like to talk with someone about your lab report, you can contact one of the following organizations:**

**People’s Environmental Center  
Phone: (504) 821-5853  
E-mail: [peoplesenvironmentalcenter@yahoo.com](mailto:peoplesenvironmentalcenter@yahoo.com)**

**Louisiana Bucket Brigade  
1661 Canal Street - Suite 2500  
New Orleans, LA 70806  
Phone: (504) 522-0500  
Fax: (504) 617-6909  
Email: [info@labucketbrigade.org](mailto:info@labucketbrigade.org)**

**Columbia Analytical Services, Inc.  
1317 South 13th Avenue  
Kelso, WA 98626  
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Fax: (360) 425-9096**

# Clean Air Success Story

## St. Bernard Citizens for Environmental Quality

In 1990, St. Bernard resident Pam Nevel organized her friends and neighbors around their common concern for environmental quality in St. Bernard Parish. Pam took a job with the parish, and her efforts led to the creation of the parish beautification committee. After winning many awards for her leadership in the parish, Pam handed over her presidency of the citizen group she'd formed—the St. Bernard Citizens for Environmental Quality, or “SBCEQ,” to long-time parish resident Kenneth Ford.

Mr. Ford moved to the parish in 1962 and has since been concerned about the impact of certain types of pollutants from nearby facilities on his family's and neighbors' health. Under Mr. Ford's leadership, and with the help of the nonprofit organizations Refinery Reform and the Louisiana Bucket Brigade, SBCEQ and the Tulane Environmental Law Clinic fought a successful citizen lawsuit against Chalmette Refining for violations of the Clean Air Act.

Although the Murphy Oil spill has directed media attention away from St. Bernard's air quality problems, SBCEQ is still fighting for clean air in the parish. SBCEQ has teamed up with the Bucket Brigade to create Louisiana's first real-time air monitoring system. The **Chalmette Air Monitoring Project (CHAMP)** uses the same kind of air monitors used by federal environmental agencies. The CHAMP's monitors are set up across the road from Chalmette Refining. They sample for five chemicals of particular concern and report them on a Web site that is updated every minute. To complement the CHAMP program, Mr. Ford and his group have also posted billboards, attended public meetings to speak on behalf of clean air, and been awarded the prestigious “Human Development Award” from Catholic Charities.

The group's latest project was the development of a **post-Katrina vision** for a peaceful relationship between their neighborhood, Chalmette Vista, and Exxon's Chalmette Refining. They have created a three-point plan that calls for **improved air monitoring, a buffer zone around the refinery, a phase out of a dangerous chemical, and a safety siren warning system**. Mr. Ford understands that everyone is busy dealing with what has happened to his or her home and life, but he says that he will continue to fight for the environment, children, and future of the parish. To learn more about the efforts of St. Bernard Citizens for Environmental Quality, or the CHAMP project, contact:

**St. Bernard Citizens for Environmental Quality**  
**Contact: Kenneth Ford, President**  
**E-mail: [webmaster@environmentwatchdog.com](mailto:webmaster@environmentwatchdog.com)**  
**Web site: [www.environmentwatchdog.com](http://www.environmentwatchdog.com)**

**Chalmette Air Monitoring Project**  
**Web site: <http://www.airmonitorchalmette.com>**



Photo Credit: Heather Morgan. "Ken Ford Explaining Refinery" Chalmette, LA, February 28, 2006. Images used from Photo Exhibit "Life in the Wake of Katrina."

“There's gotta be something in the soil besides the lead that was there before the storm. I'm just hoping that all of my kids would just move across the lake.”

—St. Bernard Resident



# UNDERSTANDING CONTAMINATION STANDARDS

*There's gotta be something in the soil besides the lead that was there before the storm. I'm just hoping that all of my kids would just move across the lake.*

—St. Bernard resident

**After an afternoon at the kitchen table, you've made sense out of your lab report.** You wonder how your results compare to levels that government agencies say are safe.

You wonder:

*Where do I find information on safe levels?*

*How do my lab results measure up to these standards?*

This section will help you answer some of your questions about safe contamination levels. It will provide examples of screening standards set by state and federal environmental agencies, the Louisiana Department of Environmental Quality (LDEQ) and the U.S. Environmental Protection Agency (U.S. EPA).

## Contamination Standards

The following table offers contamination standards for residential areas set by the U.S. Environmental Protection Agency (U.S. EPA) and the Louisiana Department of Environmental Quality (LDEQ). Environmental agencies set screening standards to help them to identify areas with contamination problems. If a sediment sample from a certain area exceeds a screening standard, this means that this area should be tested again to see whether and how it should be cleaned up. Screening standards can vary from state to state. However, by comparing the contamination levels found in your community with the screening standards, you can determine whether you would like to retest and perhaps clean your property.

In the table to the right, there is a space to compare your results to the screening values for these five contaminants: arsenic, benzo(a)pyrene, oil range organics (OROs), diesel range organics (DROs), and lead. OROs and DROs are found in petroleum products. See Chapter 2 for more information about these contaminants.

Photo: Haason, "A Kitchen." Images used from Photo Exhibit "Life in the Wake of Katrina."



# YOUR MIND FILLS WITH QUESTIONS

Let's figure out how fill in the "Comparing My Soil Sampling Results" table. To help you identify where to find this information, see the following example lab report for diesel range organics.


**The Contaminant Tested: Diesel Range Organic (DRO)**  
**C10-C28 refers to the number of carbons present in DRO.**

Analyte Name	Result Q	MRL	Dilution Factor	Date Extracted
C10-C28 DRO	560	17	1	3/17/08
Units:	mg/kg			
Basic:	Dry			
Level:	Low			

Use your own lab report to fill in the "Comparing My Soil Sampling Results" table.

If you are interested in comparing levels for other contaminants on your lab report, please refer to the following Risk Evaluation/ Corrective Action Plan (RECAP) table provided by the Louisiana Department of Environmental Quality: <http://www.deq.louisiana.gov/portal/Portals/0/technology/recap/2003/RECAP%202003%20Text%20Tables%202,3,%20Appendix%20H%20Table%205.pdf>.

# COMPARING MY SOIL SAMPLING RESULTS WITH STATE AND FEDERAL STANDARDS

<b>CONTAMINANT</b> 	<b>ENVIRONMENTAL PROTECTION AGENCY<sup>1</sup></b>  <b>FOR RESIDENTIAL SOILS</b>	<b>LOUISIANA DEPT. OF ENVIRONMENTAL QUALITY<sup>2</sup></b>  <b>FOR NON-INDUSTRIAL SOILS</b>	<b>RECORD YOUR SAMPLE HERE</b>  <b>RECORD THE AMOUNT OF THE CHEMICAL INDICATED IN YOUR LAB REPORT<sup>3</sup></b>  <b>NOTE THE UNITS OF MEASUREMENT!</b>	<b>COMPARE YOUR SAMPLE TO STATE STANDARDS</b>  <b>IF THE # FROM YOUR LAB REPORT IS HIGHER THAN THE STATE STANDARD, MARK "+"</b>  <b>IF IT IS EQUAL MARK "="</b>  <b>IF IT IS LOWER MARK "-"</b>
<b>EXAMPLE:</b> DIESEL RANGE ORGANICS	N/A	650 MG/KG	960 mg/kg	+
DIESEL RANGE ORGANICS (DRO)	N/A	650 MG/KG		
OIL RANGE ORGANICS (ORO)	N/A	1800 MG/KG		
ARSENIC	0.39	12 MG/ KG		
BENZO(A)PYRENE	0.015 MG/KG	0.33 MG/KG		
LEAD	400 MG/KG	400 MG/KG		

## ASK YOURSELF ASK YOUR NEIGHBOR

- What levels of each chemical can I be exposed to and still be safe?
- After looking at the table with state and federal contamination standards, what levels of contamination would cause you concern?
- If you worked at a chemical plant and you knew that you had a 1 in 100,000 chance of becoming sick as a result of chemical exposures, would you continue to work there? Why or why not?
- How would you feel if the odds of becoming ill were 1 in 10,000? Or 1 in 1,000?
- How do you feel about the fact that government agencies often decide acceptable risk levels without consulting the citizens?
- How can you use your understanding of the contamination levels in the parish to protect the health of your family? and community?

## CONCLUSION

We hope that this chapter has helped you gain a better understanding of the potential contamination in your neighborhood. Now, with these new tools to decode your data, what are you going to do with your knowledge regarding soil testing, contamination, and screening standards? If you are concerned about contamination sampled from your property, Chapter 4 will help you and your neighbors explore clean-up options.

## CHAPTER SUMMARY

- Using the tools in this chapter, you can make sense of sediment sampling results.
- Government agencies determine acceptable risk levels. You can decide for yourself whether you feel they are acceptable.
- Your knowledge regarding contamination is a powerful tool that you can use to protect your health and the health of those you love.

## WEB RESOURCES

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*If you would like more information on contamination and screening standards, please visit these websites:*

U.S. Environmental Protection Agency (U.S. EPA) Integrated Risk Information System Toxicological Profiles:

<http://www.epa.gov/iris>

Agency for Toxic Substances and Disease Registry ToxFaqs: <http://www.atsdr.cdc.gov/tfacts2.html>

Natural Resources Defense Council Health Effects Data: <http://www.nrdc.org/health/effects/katrinadata/sedimentepa.pdf>

## FOOTNOTES

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<sup>1</sup>United States Environmental Protection Agency. 2007. Region 6 Human Health Medium Specific Screening Levels, 2007. Retrieved February 26, 2007. [http://www.epa.gov/earth1r6/6pd/rcra\\_c/pd-n/screenvalues.pdf](http://www.epa.gov/earth1r6/6pd/rcra_c/pd-n/screenvalues.pdf)

<sup>2</sup>Louisiana Department of Environmental Quality (LDEQ). 2003. Risk Evaluation and Corrective Action Plan (RECAP) Table 2, Management Option 1 Standards for Soil (mg/kg). Retrieved February 26, 2007. <http://www.deq.louisiana.gov/portal/Portals/0/technology/recap/2003/RECAP%202003%20Text%20Tables%202,3,%20Appendix%20H%20Table%205.pdf>

<sup>3</sup> If you have not had your property tested, you can check the maps in Chapter 2 to see what level of contamination the U.S. Environmental Protection Agency (U.S. EPA) found closest to your property.



## Read this chapter if you want to know:

- How crude oil breaks down in the soil
- How to clean soil of crude oil, lead, and arsenic using plants and bacteria
- How to protect your community from contamination by:
  - Creating a buffer area between industries and residential areas
  - Designing & planting open space to improve public & environmental health
- Organizations & funding opportunities that can make your ideas a reality

# CHAPTER 4: Cleaning Up & Moving Forward

## IN YOUR WORDS

A month ago, my daughter and I were looking at our old house, and she said, “Mama, please don’t tear it down.” Now can you tell me—do I donate a contaminated house to my daughter?

—St. Bernard resident

Initially, I thought this was an opportunity to redesign the whole parish. ... You have certain things you can utilize: the port, the refineries, and the fishing, and you could have rebuilt in a way that [improved the parish], whether for apartments you put parking on the bottom floor, or ... there are all sorts of things. You could probably elevate the whole area between the levees and raise the whole land mass. But people were just saying, “Come back and rebuild.”

—St. Bernard resident



Photo Credit: Mike Collins. “A view of New Orleans.” St. Bernard Parish, LA. September 17, 2005. Images used from Photo Exhibit “Life in the Wake of Katrina.”

# INTRODUCTION

**Finally, the inevitable question: Now what?** Now that I've learned about what scientists have found in the soil and what health effects might result, now what do I do?

**You and your neighbors can take charge of the clean up in St. Bernard.** Be ready to roll up your sleeves, get out your gardening gloves, and round up some friends, because that's what you'll need to get started.

**This chapter explains how you can begin this process.** It explains some options that you and your neighbors have in recovering the health and beauty of St. Bernard Parish. It provides instructions for ways that you can immediately use plants and small organisms to take toxins out of the soil and beautify the landscape. Looking ahead, it explores changes, including buffer zones and open space design, that St. Bernard can make that will carry enormous long-term health and environmental benefits.

**When we clean up the soil, we begin to heal years of environmental contamination.** Cleaning involves removing contaminants and improving the health of our soil, air, and water, which are very closely related to each other. This chapter focuses on soil restoration, although its strategies can apply to air and water quality as well.

**As we heard one resident say, "Initially, I thought this was an opportunity to redesign the whole parish."** As we continue to find our bearings after the storm, change is not possible—it is necessary. We now have a chance to ask, How do we want the parish to be for our children? And it is a chance to act on our dreams.

## THINKING BACK...

**For weeks** you witnessed Murphy Oil contractors removing the top six inches of soil from several of your neighbors' yards.

One day, you approach a worker who's busy spreading clean soil on your neighbor Sandy's house.

"How is it," you ask, pointing, "that this yard needs cleaning and mine doesn't?"

The man looks at you gruffly and tells you he's not allowed to talk to residents. You frown and try to protest, but it does you no good. You walk away.



*Photo Credit: Alberta Lewis, "Planting of Neutral Ground at St. Bernard Highway," Chalmette, LA, March 4, 2006. Images used from Photo Exhibit "A Life in the Wake of Katrina."*

## August 2006 Survey

- 59 percent (120 of 205) of St. Bernard respondents told us that they felt soil contamination poses a health risk for them; 15 percent (30 of 205) said that they weren't sure.

## ASK YOURSELF ASK YOUR NEIGHBOR

- What would you do next?
- Who would you contact?
- How would you find out more information?

# HOW DOES OIL BREAK DOWN?

The process by which chemicals break down is called “degradation.” Many of then chemicals in crude oil break down easily by interacting with nature.<sup>1</sup> Does this mean that we do not need to worry about the remaining crude oil in the soil?



Photo Credit: Piper Hanson. “Nine months after the oil spill and it still seeps up through the pipes and oozes out into residents’ yards.” *Chalmette, LA, July 18, 2006. Images used from Photo Exhibit “Life in the Wake of Katrina.”*

U.S. Environmental Protection Agency (U.S. EPA) Engineer James Mullins says, “EPA testing confirmed that the biodegradation is moving smartly ahead. This is a subtropical climate and degradation rates are relatively high.”<sup>2</sup> The unstable components of the oil have likely left the soil and entered the air as a gas. University of Michigan Environmental Engineer, Jeremy Semrau, adds that the heavier and more stable components will remain in the soil for “quite some time.”<sup>3</sup>

**The contaminants will probably not move up to the surface without disturbance to the soil,** such as digging new utilities or tilling the soil.<sup>4</sup> “Closure Plan: Murphy Oil Spill Response,” created by U.S. EPA together with other public agencies, noted that local soil types typically inhibit movement of fluids through soils and, as a result, make it less likely that contamination would travel through the soil.<sup>5</sup>

**Regarding water contamination, experts do not agree about the possible risks that the oil spill pose to groundwater in St. Bernard.** Gina Solomon, senior scientist at the Natural Resources Defense Council (NRDC), has expressed concern that oil may have reached the groundwater.<sup>6</sup> A Louisiana toxicologist noted a “potential for migration” of contamination to the groundwater due to the shallow location of the groundwater in St. Bernard Parish, but concluded that “there’s not enough to know.”<sup>7</sup> The Closure Plan stated that groundwater contamination is “unlikely” because St. Bernard soils slow down the movement of fluids through soils.<sup>8</sup>

Jeremy Semrau recommends monitoring the soil throughout the parish in areas with high levels of contamination. Monitoring ought to involve “sampling 10-20 sites annually/biannually (soil, plants, and groundwater) to determine the amount and vertical location of petroleum contamination and the rate of pollutant degradation.” He also suggests public announcement of these results, as these periodic updates would help to “remind residents of any long-term contamination issues, and to remind residents how to minimize exposure to any pollution.”<sup>9</sup>

**EXPERTS DO NOT AGREE ABOUT THE POSSIBLE RISKS THAT THE OIL SPILL POSE TO GROUNDWATER IN ST. BERNARD**

## AN ENGINEER’S RECOMMENDATIONS FOR ST. BERNARD PARISH

Select 10-20 sites with demonstrated soil contamination

Conduct soil, plant, and groundwater samples

Test annually or biannually

Publicly announce testing results to remind residents of any long-term issues and ways to minimize exposure to pollution

- Jeremy Semrau

## MURPHY OIL'S CLEAN UP METHOD

### Who determined the method?

In September 2005, four public agencies, U.S. EPA Region VI, Louisiana Department of Environmental Quality (LDEQ), Agency for Toxic Substance Disease Registry (ATSDR), and Department of Health and Human Services (DHH), wrote a document called the “Closure Plan: Murphy Oil Spill Response.” This document outlined ways to pursue “a cleanup that is protective of public health and the environment at the Murphy Oil spill site.”<sup>10</sup> Here, an engineer from U.S. EPA discusses the clean up process.

### Interview with U.S. EPA Engineer Jim Mullins

#### What was EPA's role in managing the Murphy Oil cleanup?

[JM] *All testing, soil, air, and water testing, is being done by Murphy Oil. 100% of it is being done by them. They have a clean up plan, which the State of Louisiana and the EPA have approved... EPA elected to split 10% of soil samples collected by Murphy work forces and run independent analyses of them... About 98% of the time we have a good agreement between the EPA and Murphy Oil analytical testing results.*

#### Could you describe Murphy Oil's clean up standards and cleanup process?

[JM] *The idea is that the soil is removed, and the remaining soil lab-tested. If contamination above the cleanup standard remains, an additional “lift” of soil is removed, and the process is repeated. This...process continues until the remaining soil is free of the contamination or at least is below the state-specified clean up [standards]... The machinery [can excavate] a minimum of 6” ‘lift’ of soil. I do not remember a single residential case where removal of a 6” lift has not been sufficient to remove the oil to below the cleanup standard.*

#### What is the average time that Murphy takes to clean individual properties?

[JM] *The biggest timeline [barrier] to getting Murphy Oil work forces to work on any particular resident's property has been obtaining landowner permission to access the property... Essentially all of the residents of the area relocated immediately before or immediately after the storm... and it is difficult to track them down because they often left in haste with little/no forwarding information... [Mr. Mullins then explains other issues U.S. EPA has heard based on local ‘bearsay’.] All of these factors lead to a generically slow public response to grant Murphy Oil voluntary access to cleanup property... [The class action lawsuit] considerably complicated the communications between Murphy Oil and the general population of the area. This had an additional slowing effect on gaining voluntary access to large numbers of properties.<sup>11</sup>*

*“Please understand there was not one oil spill during Katrina, there were hundreds of them.”*

—U.S. EPA Engineer Jim Mullins

*I've talked with EPA and DEQ extensively about their protocols, and...their data's validation doesn't seem to have been as rigorous as is normally required.... If your data isn't worth anything your risk assessment isn't worth anything....[The oil] may get off the property a little ways, or it might have been an underground leak under a neighborhood, but it's not normally right there on the surface on people's soil... There's just no standard for that.*

— Louisiana toxicologist

## REMEDIATION TOOLS

### To Clean Up Your Community

Ecological health begins with the way individual residents treat their yards. **By improving soil health, selectively using native plants, and managing their growth, you can make strides to both decrease pollution and create a healthier parish.** Healthy soil cleans water and enables trees to grow that, in turn, can clean air. Clean soils affect our total environment.

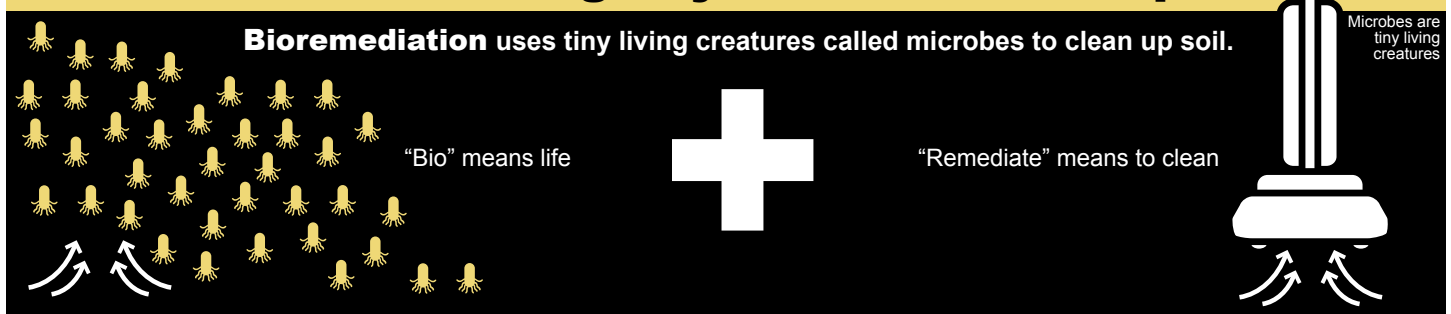
Everything in the environment is interconnected: birds, people, wetlands, oil refineries; soil, air, and water. A tree needs fresh water, healthy soil, and clean air to survive. A city needs trees to absorb air pollution and pesticides in the water.

Design of open space can increase or limit these connections. Healthy environments benefit from a diversity of native plants. In contaminated areas, limiting these interconnections prevents the movement of contamination—and its potential consumption by wildlife. Sometimes an area may be clean enough for humans to live, but it may negatively impact the wildlife. For example, if a native plant grows in contaminated soil, it may absorb toxins into its leaves. If an animal eats the leaves, it may become sick or die.

**This chapter describes how we can use nutrients and plants to improve environmental health by:**

- **Breaking down or removing contaminants in the soil**
- **Providing a vegetative cover that protects soil from erosion and reduces exposure to contaminated soil**
- **Knowing when to plant native and non-native plants to protect wildlife and humans**

# BIOREMEDIATION: Using Tiny Critters to Clean Up Soil



Microbes eat the harmful chemicals and transform them into less dangerous substances. Applying microbes on contaminated soil speeds up its recovery process.<sup>16</sup> A healthy soil mix enables more and different types of plants to grow. Using a combination of plant types also gives the ecological system “flexibility to adapt under stress and to persist over time.”<sup>17</sup> Healthy soil and a high diversity of plants create a healthy, resilient landscape.

One way you can apply bioremediation to soil is to create a nutrient-rich fertilizer, or compost, to spread on the soil. You can also create a liquid fertilizer, or compost tea, which you ‘brew’ for several days and then spray on the soil.

Remember to give the microbes the right temperature, nutrients, and enough oxygen in the soil and groundwater. Once the conditions are right, microbes will remain in the soil until they have eaten all of their available food. The organizations below can help you create the right nutrient mix for your soil.

## HOW TO CREATE A COMPOST TEA

### The basic compost tea formula:

- 1 five gallon bucket, filled halfway with finished compost, OR with 5 cups of worm castings
- Five gallons of water
- 1 tablespoon of unsulfured molasses
- Aerator (you can use the air pump for a large fish tank and tubes to hang down into bucket)

**Instructions:** Add compost or castings to bucket, fill almost to the rim with water, add molasses, and then hook up the water pump and tubes so that the tubes hang down into the compost/water/molasses mix. As it is brewing, stir the tea at least once a day, and let it brew for two-three days with the aerator on the whole time and the tubes always hanging down. Strain the tea through nylon stockings into a watering can or sprayer, and then apply directly to soil.

**Compost for bioremediation can consist of** food scraps, cotton, wool, burlap, woody materials, paper products, yard trimmings, and by-products (hair, blood, cow manure, etc). Earthworms are great for building healthy soil.<sup>18</sup>

## RESOURCE LIST

### Soil-testing Services & Outreach New Orleans area

#### Common Ground Relief

Bioremediation & Garden Dept.

Phone: (504) 913-5635

E-mail: [healthysoilproject@gmail.com](mailto:healthysoilproject@gmail.com)

*Common Ground Relief is a community-initiated organization whose goal is to provide support in rebuilding the communities affected in the New Orleans area. Its Bioremediation & Garden Department currently provides five services for residents:*

- Testing – Provide access to soil testing and helping residents analyze soil data
- Education – Connect residents to data mapping done in the region
- Outreach – Help residents develop a soil remediation plan for their property & provide worms to residents to make compost tea<sup>12</sup>

#### People’s Environmental Center

Phone: (504) 821-5853,

E-mail: [peoplesenvironmentalcenter@yahoo.com](mailto:peoplesenvironmentalcenter@yahoo.com)

*The People’s Environmental Center is a community-based organization created*

*to provide residents and environmental organizations with three key services to start the summer of 2007. These services include:*

- Testing – Access to lab testing for air, water, soils, and mold
- Outreach – Household level inspection and remediation assistance to help residents assess the environmental health of their property and improve it
- Education and Research – Workshops and training about how to inspect one’s house, how to take samples, safe work and cleanup practices, understanding environmental testing results, and environmental health impacts.<sup>13</sup>

#### RePlant New Orleans

Phone: (504) 235-2732, (415) 806-9859

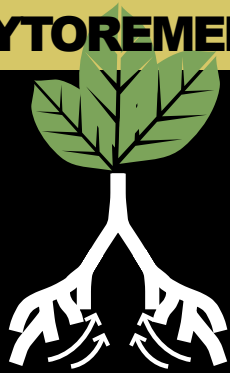
E-mail: [trees@replantneworleans.org](mailto:trees@replantneworleans.org)

*RePlant New Orleans is a community-based organization that seeks to help the residents of New Orleans create a lush, healthy, and vibrant urban environment post-Hurricane Katrina.*<sup>14</sup> *Its services include:*

- Testing – Providing access to soil testing
- Education – Sharing ways to build healthy soil through bioremediation (Its remediation services will begin during the summer of 2007)
- Provision of trees, shrubs, and other vegetation including edible plants
- Composting program (Summer 2007) – Create a city-wide, neighborhood-by-neighborhood composting program<sup>15</sup>

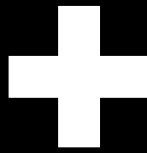


# PHYTOREMEDIATION: Using Plants To Clean Up Soil

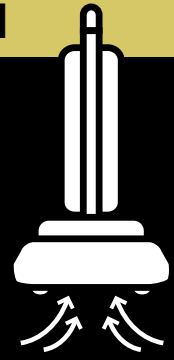


Phytoremediation uses plants to clean up soil.

"Phyto" means plant



"Remediate" means to clean



## How do plants clean up soil?

Some plants help break down contaminants. Either they break down the contaminant in their leaves, stems, or roots, or they stimulate microbial breakdown of the contaminant in their root zones.

- Potential Risk: Since these types of plants do not accumulate toxins, contact poses no risk to human beings or wildlife.<sup>20</sup>
- Contaminant focus: Many plants that remediate oil fall into this category.

**Other plants pull contamination out.** The roots of the plants pull contaminants out of the soil. The contamination travels from the roots into the leaves or the plant holds the contamination in its roots.

- Potential Risk: These plants could negatively impact animal communities in the area. If a creature consumes part of a plant that contains contamination, such as its leaves or fruit, there may be a chance that it will become sick and/or die.

**A precautionary approach would avoid planting these types of plants in order to ensure the health of local wildlife.**

- Contaminant Focus: Many plants that remediate heavy metals, such as arsenic and lead, fall into this category.

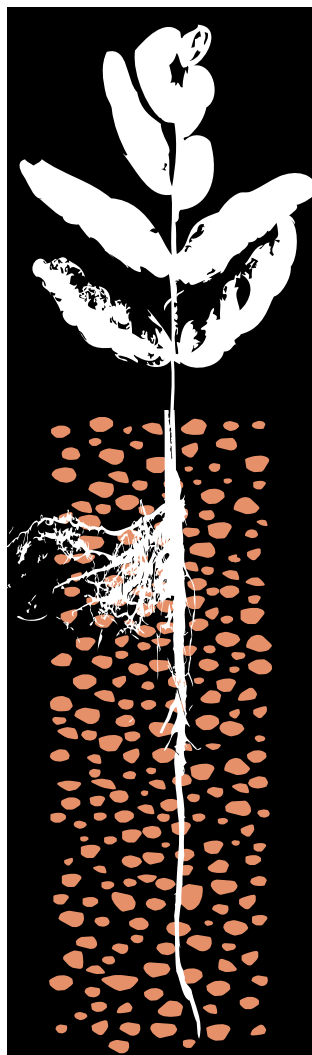
**They cover contamination up.** Plants also provide a dense vegetative cover over soil. This cover decreases human exposure to the contaminants. It also can prevent wind and water from spreading the contaminated soil to other locations.<sup>21, 22</sup>

**They rehabilitate the soil.** With the proper drainage, aeration, fertilization, and composition, microbes associated with plant roots will improve the health of the soil.

**How long will it take to clean up the soil using plants?** First you need to ask a few questions.

## IS PHYTOREMEDIATION RIGHT FOR MY PROPERTY?<sup>19</sup>

	Yes!	Probably Not
What type of soil?	Good garden soil (loamy soil); high oxygen and drainage	Clay soil; soil with low oxygen and drainage
How much contamination?	Low to medium contamination	Lots of contamination
Where is the contamination?	Near the surface (within plants' root zones; within bacteria's reach)	Deep in the ground (below plants' root zones; out of bacteria's reach)



### QUESTIONS TO ASK BEFORE YOU BEGIN A PHYTOREMEDIATION PROJECT:

**What kind of soil is present? Phytoremediation works well in good garden soil with good drainage and aeration.**

**What kinds of contamination is in the soil?**

**Different plants are suited to different contaminants, and some contaminants are less suitable for phytoremediation.**

**How much contamination is in the soil?**<sup>23</sup>

**Phytoremediation is more suitable for lower to moderate levels of contamination.**

**How deep in the soil is the contamination?**

**Plants are effective at cleaning contamination within 1 cm of their root zones.**

**How many types of plants do you want?**

**More of various types of plants tend to clean the soil faster than fewer of a single type.**

*Soil tests can answer these questions.*

## CLEANING IT UP: STEP-BY-STEP

**Combining plants and compost is a very effective way of cleaning oil from soil. Get out your pencil and let's get started.**

1. **Talk with your neighbors.** Explain to them that plants and compost can clean soil contamination. Ask if they are interested in putting plants in their neighborhood that can clean the soil.

**What are you and your neighbors' ideas?** \_\_\_\_\_

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**Who else can you talk with to help you get started?**

*For example: My church, a parish beautification committee, the local school, etc.* \_\_\_\_\_

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2. **Visit local community gardens to see how phytoremediation and bioremediation works.** Common Ground and Replant New Orleans run community gardens where you can

- Find out how bioremediation and phytoremediation works
- Receive guidance on cleaning up your own soil.

3. **Select plants.** Find plants that are suitable for cleaning crude oil in Saint Bernard's climate.<sup>24</sup> Look at page 50 for a list of plants. RePlant New Orleans and Common Ground can help you choose the right plants for your neighborhood.

**Which plants might you use?** \_\_\_\_\_

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4. **Create a compost fertilizer.** You can obtain earthworms at either Common Ground or Replant New Orleans.

5. **Plant your neighborhood.** Find people to help you plant. Talk to church groups, school groups, scout troops, and other community organizations. **List your dream planting team here:** \_\_\_\_\_

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6. **Be safe.** Phytoremediation is considered safe for humans to touch and handle. Knowing how your plants remove contamination from the soil helps you take the proper precautions in handling plant material.

- If a plant breaks down contaminants, you will not risk exposure of contact with the contaminants by handling the plant.
- If the plant pulls toxins out of the soil, the whole plant needs to be properly disposed of at a toxic waste site. When disposing of the plant material, please use work gloves and avoid contact with your skin. Sampling of plant material and soil helps you measure progress.
- In lesser common situations, plants transform the toxin to a less toxic form in the atmosphere. Sampling of plant material and monitoring of air around the plant is recommended.

**How do your plants remove contamination?** \_\_\_\_\_

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7. **Watch for the magic.** It is important to actively take care of your plants and monitor their progress to make sure that your clean up project is working.

- Too much soil contamination will cause plants to die.
- Soil and climatic conditions heavily influence the clean up process.
- Different combinations of plants and fertilizer impact contaminants in different ways.
- If a plant accumulates toxins, sample and analyze the parts of the plant that uptake the toxin (i.e. roots, stem, etc.). Plant scientists will be important to monitor this progress. Testing soil conditions beneath the plants' root zones can tell you whether toxins still exist in the soil. Consult the People's Environmental Center by phone to request soil monitoring services (refer to page 50 for contact information).

Come up with a timeline for testing your project's effectiveness. Put a check mark in each month you monitor your plants.

JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC

Don't forget to mark your calendar!

8. **Be a citizen scientist. Keep records.** You can contribute to scientific knowledge. Not only will regular record-keeping help ensure the success of your project, this information can help scientists and community members better understand the usefulness of phytoremediation. Jot your notes here: \_\_\_\_\_



9. Let others know!

## Here are some plants that you can use to clean up diesel fuel:




PLANT		CLEAN UP METHOD	ORIGIN
Common Name	Latin Name		
<p>St. Augustine Grass</p> 	<i>Stenotaphrum secundatum</i>	Microbes break down contamination near roots	FL, southern US
<p>Cereal Rye</p> 	<i>Secale cereale</i>	Microbes break down contamination near roots	southwestern Asia
<p>Oyster Mushroom</p> 	<i>Pleurotus ostreatus</i>	Microbes break down contamination near roots	northern US

Photo Credit: USDA NRCS Big Blue PMC. 2007. The PLANTS Database (plants.usda.gov). 6 May 2007. Reproduced with Permission.

Photo Credit: Larry Allain. USDA, NRCS. 2007. The PLANTS Database (plants.usda.gov). 6 May 2007. Reproduced with Permission.

Photo Credit: Hiroshi Takekoshi. <http://kenokeyo.sakuramag.jp/>. Reproduced with Permission.

# WHO'S GOING TO PAY FOR IT?

You have options to pay for materials to clean your yard:

- Funding opportunities, such as the ones listed in this chart and for free trees on page 63, are available.
- You can do a community-fundraiser within the parish.
- If you can show that a certain entity caused your soil contamination, you and your neighbors can convincingly argue that it pay for your neighborhood's clean up expenses. Refer to Chapter 5 for details about how to create a community campaign.

## FUNDING SOURCES FOR COMMUNITY & ENVIRONMENTAL PROJECTS

<b>Chalmette Refining</b>	<i>"Powering Progress" Campaign</i> Neighborhood Grant \$100-\$5,000 for landscape design Contact Brenda Arnoult at (504) 281-1869.
<b>Entergy</b>	<i>Community Partnership Grants and Environmental Stewardship Program</i> Up to \$1,000 for community and environment-related projects. Please refer to this website for deadline and application information: <a href="http://www.energy.com/our_community/environmental_grants.aspx">http://www.energy.com/our_community/environmental_grants.aspx</a>
<b>Louisiana Speaks</b>	<i>Federal and State Funding Opportunities</i> Comprehensive online database for recovery-related grants. Refer to: Housing and Community Development, Environment <a href="http://www.louisianaspeaks-parishplans.org/Resources_Partners.cfm">http://www.louisianaspeaks-parishplans.org/Resources_Partners.cfm</a>

## REMEDIATION: Other Techniques

Through soil, water, and air testing, you may find the presence of more & persistent contaminants. If so, you and your neighbors may become interested in exploring more remediation options. Many technologies are currently being developed to treat different types of soil contamination. Nutrients and plants can be combined with other techniques, which use oxygen, air, thermal heat, water, and even electric currents to clean soil.

### A few things to note before you begin:

- Each clean up plan is site-specific, relying on environmental factors
- Each clean up plan is contaminant-specific (both number and types)<sup>25</sup>
- Combinations of contaminants and techniques have different results.<sup>26</sup>
- Contaminants that degrade over time, such as crude oil, create "windows of opportunity" for which clean up techniques may be effective.<sup>27</sup>

To learn more about these options, you may contact the following sources:



Frank Rando, United Chabrerie, L.A.  
June 7, 2006. Images used from Photo  
Exhibit "Life in the Wake of Katrina"

## RESOURCE LIST

### Technical Expertise for Remediation: LA & National

**Hazardous Substance Research Center (HSWC)**  
Phone: (225) 578-6497  
E-mail: [dmr@eng.lsu.edu](mailto:dmr@eng.lsu.edu)

The HSWC has two programs geared toward community outreach based in Baton Rouge. Technical Outreach Services for Communities (TOSC) program "uses university educational and technical resources to help community groups understand the technical issues" of local contamination issues.<sup>28</sup> Technical Assistance to Brownfields Communities (TAB) program "helps communities to clean and redevelop properties that have been damaged...by environmental contamination."<sup>29</sup>

**Technology Innovation Program**  
U.S. Environmental Protection Agency  
Website: [www.clu-in.org/techfocus/](http://www.clu-in.org/techfocus/)

The Technology Innovation Program is the technical arm of the U.S. Environmental Protection Agency in researching, educating, and communicating hazardous waste clean up information. Its self-defined focus is: "providing information about innovative treatment and site characterization while acting as a forum for all waste remediation stakeholders."<sup>30</sup>

# COMMUNITY DESIGN TOOLS

Protecting Community Health

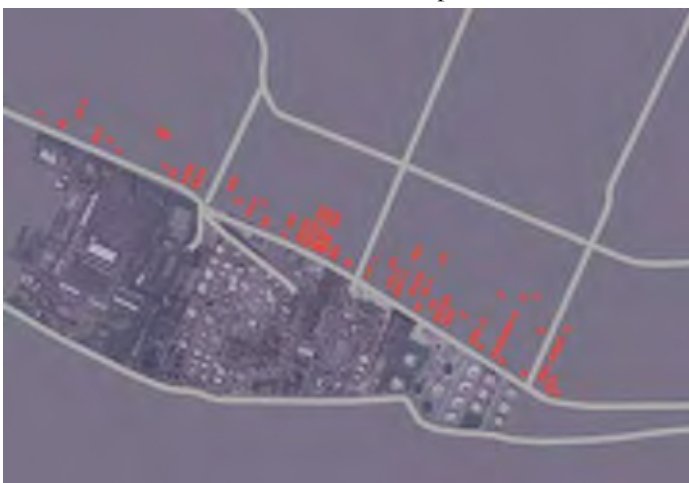
## This section

looks at ways that design can respond to contamination. By physically organizing our community, we can help ensure the health of current and future residents and wildlife as well. Two methods we consider here are:

- **Creating a buffer zone**
- **Designing community open space**

## Design of communities creates relationships between humans and our environment

An industry next to a residential community creates economic and environmental relationships.



Residences



Refinery

## Design of communities creates relationships between wildlife and our environment.

Using native plants creates food & homes for wildlife, whereas non-native plants do not. Joan Nassauer, Landscape Ecologist and Professor of Landscape Architecture, designed these two images to show different ways of designing open space according to environmental health. On the left, the image shows a landscape with native wildflowers and grasses. This design would be appropriate for clean soils. The image on the right shows a landscape with mown lawn (non-native). This design would be appropriate for contaminated soils, as it discourages wildlife from living there and eating its vegetation.



Design for clean soils

*Image Credit (above): Joan Iverson Nassauer, Alejandra Chiesa, and Robert C. Corry. December 2001. Principles for Ecological Landscape Design in Brownfield Business Parks. USDA FS Project # 00-JV-11231300-033. DRAFT. Reproduced with permission.*



Design for contaminated soils

*Image Credit (above): Joan Iverson Nassauer, Alejandra Chiesa, and Robert C. Corry. December 2001. Principles for Ecological Landscape Design in Brownfield Business Parks. USDA FS Project # 00-JV-11231300-033. DRAFT. Reproduced with permission.*

## BUFFER ZONES

A “buffer zone” is an area of land that separates people and nature from environmental hazards such as contamination.

Industrial buffers usually separate industries from residential areas. Risks of living or working near an industry may include hazardous pollution, accidents, noise, and lighting.

- Alternative: If an industry can reduce its potential impacts on neighboring areas by sufficiently regulating its emissions, it may not need to create a buffer.
- Potential Risk: Native plants in a buffer zone may draw wildlife to an unhealthy area, so it is advisable to avoid creating habitat within the buffer zone unless it is known that the soil is clean enough to create homes for wildlife.

### August 2006 Survey

- **72 percent (136 out of 190) of respondents told us they felt it was Murphy Oil’s responsibility to initiate an optional buyout plan that would relocate impacted properties.**

## Words Of Advice: Citizens Cleaning Up

**Three community organizers in Detroit** used a U.S. Environmental Protection Agency (U.S. EPA) grant to get high school students to look at soil contamination. During a semester, they studied soil science, media relations, and movement building. During that semester, the organizers continually asked students questions to get them to think about the history of their neighborhood and Detroit, as well as to become engaged with their neighbors and the land.

At the end of the semester, the students were able to compare the food that they bought at the corner store with produce grown in healthy soils, and they

were able to compare the amount of air pollution in a normal kitchen with the pollution emitted by a normal car.

### Words of advice they have for other communities responding to soil contamination:

*I think it is a hard line to walk between fear and knowledge. It was one that we had a hard time with. While the soil in some of the residents’ homes was bad, we did not want them to be afraid to go outside. We wanted them to be aware of the dangers and what they could do about them. Most of the residents we worked with were aware that their living conditions were not ideal. We felt that it would not be helpful*

*at all to tell them that it was worse than they thought. We wanted to come to them with helpful solutions that could protect their families and beautify their homes at once. This involved bringing in organic matter and discussing phytoremediation solutions such as planting sunflowers. We also discussed healthy foods they could bring into their homes that can ease the effects of lead contamination. We had the students research and make up informational packets for the residents.*

–Kevin Bingham, community organizer

### Detroit Summer

Phone: (313) 438-2254

E-mail: [info@detroitsummer.org](mailto:info@detroitsummer.org)

**I THINK IT IS A HARD LINE TO WALK BETWEEN FEAR AND KNOWLEDGE**

–DETROIT COMMUNITY ORGANIZER

## THINKING ABOUT A BUFFER ZONE FOR YOUR NEIGHBORHOOD

1. How many large industrial neighbors do you have (refineries, chemical plants, factories)?

\_\_\_\_\_

2. How big is the closest industrial facility? \_\_\_\_\_



3. Who are the neighbors of this facility?

(an elementary school, shopping mall, etc.) \_\_\_\_\_

\_\_\_\_\_

4. What are the positive and negative impacts of living and working near this industry?

*Positive*

*Negative*

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. How big is the area that the industry negatively impacts?

\_\_\_\_\_

6. How much space would be needed to avoid these impacts?

\_\_\_\_\_

7. Do you think a buffer zone is a good idea for your neighborhood? Why or why not?

\_\_\_\_\_

8. Would you want to relocate farther from the refinery if you were offered a fair price for your property?

\_\_\_\_\_

9. Who would you ask to compensate you for your property?

\_\_\_\_\_

10. How would you and your neighbors gain support for a buyout? Who might you contact? (For ideas, please see Chapter 5.)

\_\_\_\_\_

### EXPERTS AGREE: Buffer Zones Make Sense

In Plaquemines Parish in 1991, Dow Chemical created a buy-out zone adjacent to its plant. Guy Barone, spokesperson for Dow, explained the decision to create a buyout program by saying, **“There is a risk of an acute accident, and we want to protect people living adjacent to the fence lines.”**<sup>31</sup> Within a 5-year timeframe, Dow, Shell, and Exxon had all created buffer zones in coastal Louisiana. In two of the three cases, chemical explosions catalyzed the buyouts. At Exxon, two workers were killed; at Shell, seven workers were killed.

Dr. Paul Templet, secretary of the Louisiana Department of Environmental Quality (LDEQ) at the time, commented, **“There are some things you just should not mix, including houses near these industrial facilities.”** But the issue, he added, had not been sufficiently considered by state officials.

Michael Lythcott, a New York consultant who helped design Dow’s relocation scheme, noted that industrial buy-outs of residential areas had become a trend among oil and chemical industries across the country. **“From a business sense, it is economically sound....** if there is an accident, it has an impact on worldwide sales. It makes sense in putting a program together instead of waiting for an accident and lives to be lost.”<sup>32</sup>

How would you feel if your industrial neighbor proposed a buffer zone in your neighborhood?

## SUCCESS STORY

# Norco Residents Win Buffer Campaign

Twenty-five miles north of New Orleans, a small refinery town called Norco grew tired of air that was making them sick. Industrial accidents had killed seven of their neighbors and forced an evacuation of thousands of people. The tight-knit community had lived in Norco for generations. The residents began doing their own air sampling and launched a media campaign to convince the refinery to become a “good neighbor.” The residents asked the refinery to either clean up the air or buy out neighboring residents’ properties. They campaigned for over a decade and received national attention. Environmental organizations including the Deep South Center for Environmental Justice at Xavier University, the Sierra Club, the Louisiana Bucket Brigade, and Greenpeace all assisted with the campaign. The effort was driven by concerned residents that refused to give up. Margie Richards, a retired school teacher, even traveled to the Netherlands to Shell’s headquarters to speak on her neighbors’ behalf.

After a long battle, the community won fair compensation for their properties and **300 families received money to relocate.** The refinery offered residents two choices: they could sell their homes to the refinery at an appraised value or remain in their homes and receive a no-interest home improvement loan. Norco’s story shows that a determined community can make refineries act like good neighbors.

### Refinery Reform

Phone: (415) 643-1870

E-mail: [dennylarson@earthlink.net](mailto:dennylarson@earthlink.net)



# REFINERIES CAN BE GOOD NEIGHBORS



### BUFFER ZONE OR LAWSUIT?

Buyouts can be a better choice for residents than pursuing litigation. The community of Garyville/Reserve, LA hired Joel Waltzer for an environmental lawsuit regarding the Marathon/Ashland refinery. Upon some investigation, he said, “It was clear that a buyout was a better strategy. Even successful litigation would not change the unhealthy diet of permitted pollution being fed daily to fence-line residents.”<sup>33</sup> Within one year, they achieved a deal. And in another year, homeowners relocated to their new homes. He reports that 85% of the homeowners participated in this program, costing Marathon/Ashland around \$2 million in funds to homeowners.<sup>34</sup>

Photo Credit: Heather Morgan, Untitled, St. Bernard Parish, LA, February 27, 2006. Images used from Photo Exhibit “Life in the Wake of Katrina.”





Photo Credit: Alberta Lewis, Chalmette, LA, March 4, 2006. Images used from Photo Exhibit "Life in the Wake of Katrina."

## OPEN SPACE

Open spaces create a sense of place and community. Plazas, parks, and even streets are places where people meet, celebrate their family and community, and relax. Besides social and recreational purposes, open spaces also provide important environmental and health benefits, as well.

### IMPORTANT PURPOSES OF OPEN SPACES INCLUDE:

- **Creating community** – for example: “Community gardens have helped bring residents out of their homes by giving them an opportunity to interact with one another.” – RI resident
- **Attracting businesses & stabilizing property values** – for example: “Parks and recreation areas can increase the value of nearby building sites by 15-20%.”<sup>36</sup>
- **Creating plant & wildlife habitat** – for example: Jean Lafitte National Park  
*Caution: this purpose is not recommended for areas with potential contamination*
- **Celebrating local culture** – for example: Chalmette battlefield and cemetery
- **Improving water, air, and soil quality** – for example: Trees catch fertilizers and pesticides before they run into water bodies.<sup>38</sup>
- **Creating buffer zones** – for example: “Open space buffers along rivers...significantly reduce runoff into urban fresh water and marine systems.”
- **Promoting public health through exercise and recreation** – for example: Lafitte Corridor Greenway (proposed)<sup>39</sup>

*Caution: this purpose is not recommended for areas with potential contamination*

## ASK YOURSELF ASK YOUR NEIGHBOR

- **What are the most important features of the parish that you want to preserve?**
- **Which elements of the parish would you like to change?**
- **Where would you like to see open space (parks, gardens, etc.) in the parish?**
- **Are there areas where a buffer area would be appropriate? Where would these areas be?**

## BRAINSTORMING OPEN SPACE

How do we create positive relationships among people, our environment, and our economy?

After the hurricanes, we can create these relationships in two ways:

- We can use public and vacant areas to clean up and beautify the Parish
- We can make urban planning efforts to account for and respond to soil contamination

### Public land and vacant areas

Equipped with some friends, soil tests, and trees & shrubs provided by the organizations on page 50, you can effectively clean and beautify community space in the parish. A number of lots remain vacant, and some of them still have soil contamination. They provide an opportunity for you to target certain lots for neighborhood planting and design efforts.

This map ranks vacant lots according to their suitability for remediation. Areas with high levels of diesel contamination and a lot of trees define highly suitable areas for remediation.

**COMMUNITY GARDENS HAVE HELPED BRING RESIDENTS OUT OF THEIR HOMES BY GIVING THEM AN OPPORTUNITY TO INTERACT WITH ONE ANOTHER**

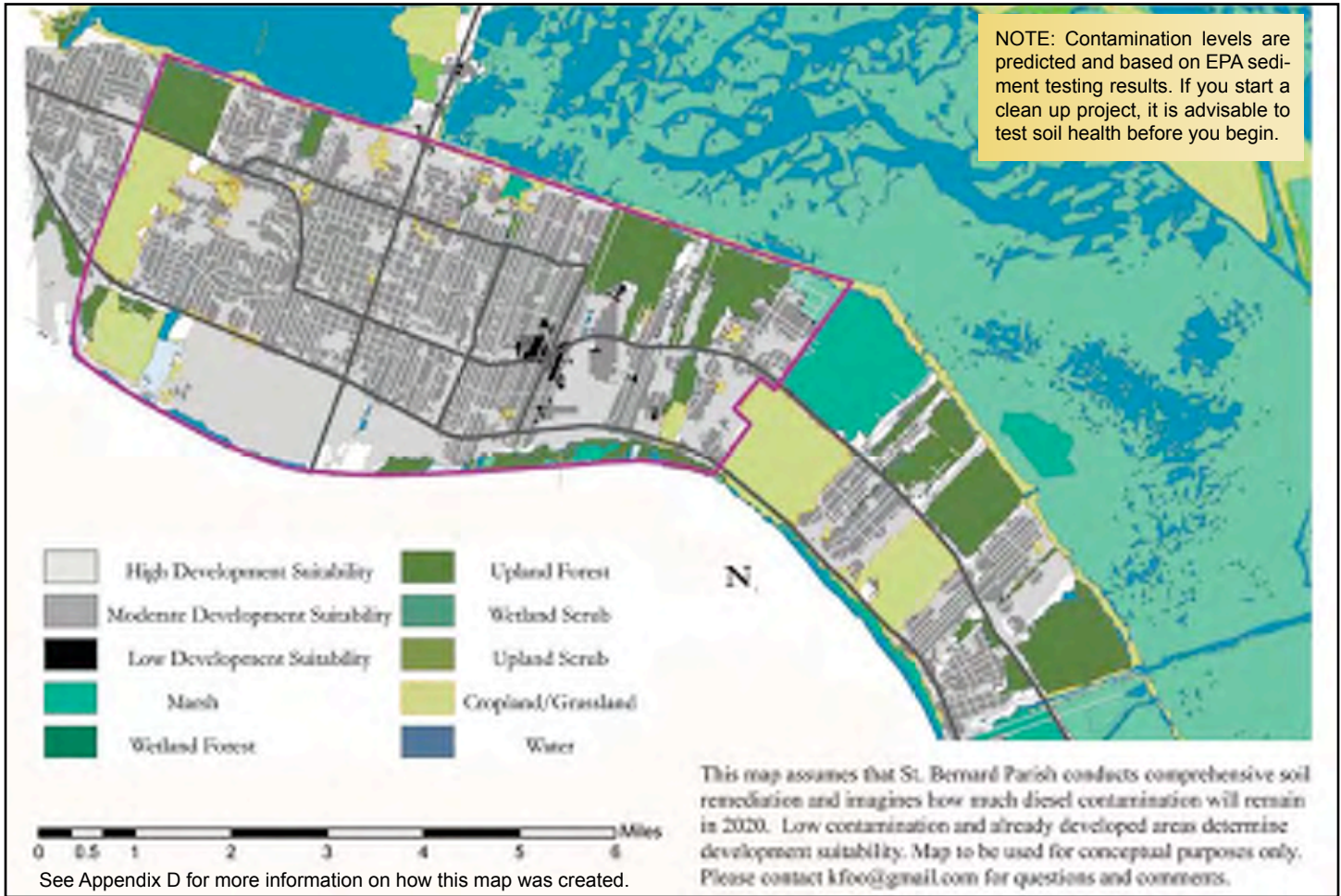
-COMMUNITY GARDENER FROM RI

### Clean-up Priorities among Vacant Lots in St. Bernard Parish, LA



See Appendix D for more information on how this map was created.

# Development Suitability of St. Bernard Parish in 2020 .... with comprehensive remediation



## Urban planning and design

Soil health determines an area’s suitability for human use. If it is very contaminated, its uses should be limited to activities with minimal exposure to humans and wildlife, such as industry or a parking lot, for example. The way we treat contaminated areas now impacts their suitability for different uses in the future, such as for housing and commercial development.

If the parish undertakes comprehensive remediation right now, more land could be suitable for development in the future. If, on the other hand, area surrounding a contaminated parcel becomes high real estate, but the parcel is not remediated, it may not be suitable for its best land-use. These two maps show two hypothetical future scenarios for St. Bernard depending on its response to soil contamination.

In these hypothetical maps, the darker colors indicate areas that are not very suitable for development, and the lighter colors show areas that are very suitable for development. As you can see, lack of intervention in the present may constrain future planning.

Comprehensive soil, air, and water data is essential for good urban planning. Residents can consult the local environmental organizations on page 50 and/or even initiate their own air testing with the help of the Louisiana Bucket Brigade (see page 75).

Public participation creates smarter planning decisions and a stronger community. U.S. Environmental Protection Agency awarded St. Bernard Parish government a competitive CARE grant to address toxins in the environment (see sidebar called “St. Bernard Takes Care of Toxics!”) By getting involved in this program, you can participate in planning for a healthier, safer future for the parish.

## ST. BERNARD TAKES CARE OF TOXICS!

St. Bernard Parish received a Level I CARE grant. CARE is a U.S. EPA grant program that stands for Community Action for a Renewed Environment. In 2007-2008, Parish government and local organizations will come together to complete these 5 steps:

- Build collaboration and support
- Identify issues
- Educate about these issues
- Prioritize these issues
- Plan to reduce these toxins

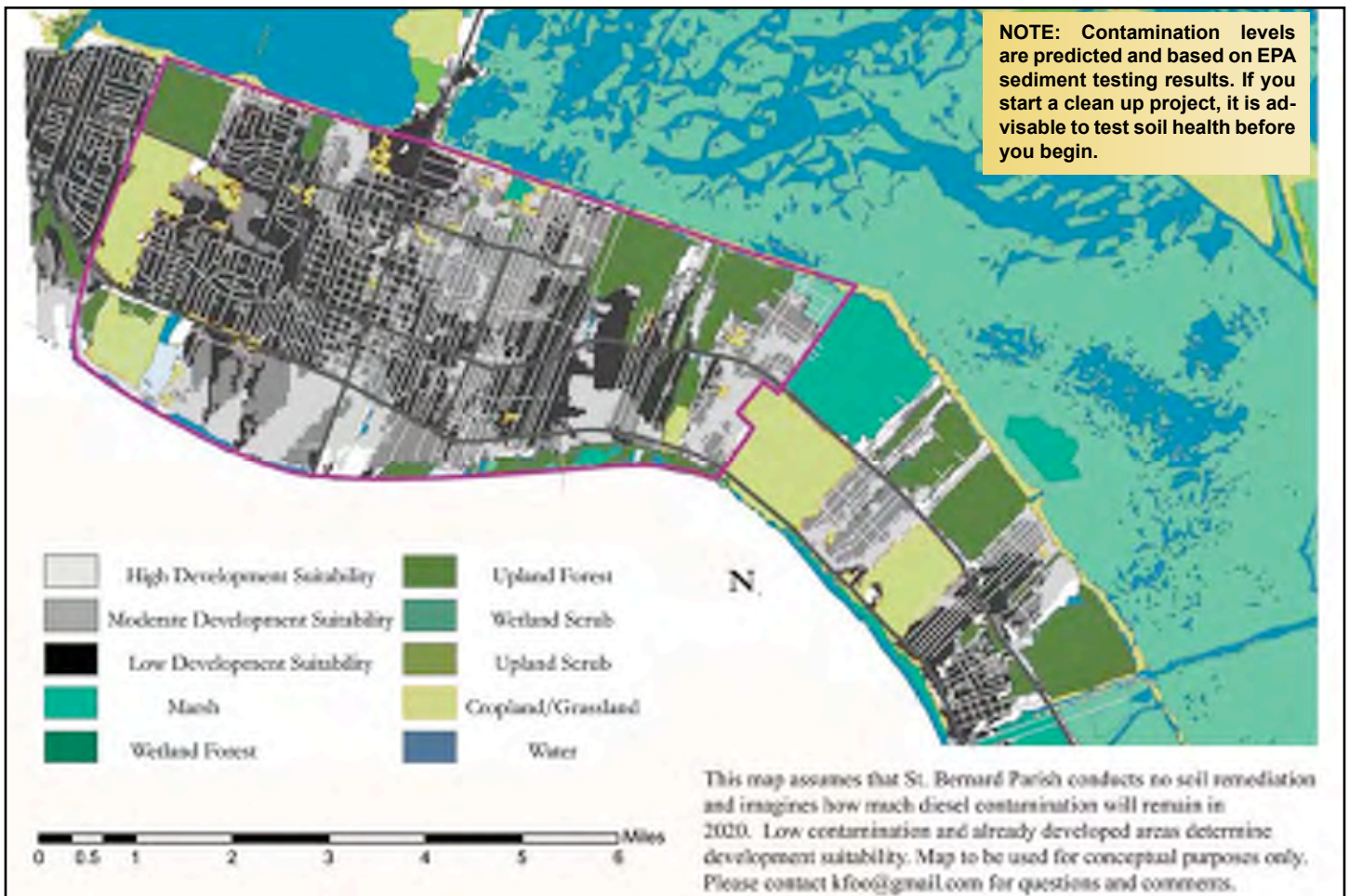
After this process is completed, the Parish government may apply for a Level II CARE grant that would enable the parish to initiate programs to reduce these toxics.

St. Bernard Parish Government Community Profile for its CARE Grant:

*Issues prevalent in the Parish pre-Katrina included suburban sprawl, and attendant traffic and air quality issues, public water supply and water quality issues, and public health and safety issues associated with the transportation of petroleum and petroleum-related products. Hurricane Katrina adds the challenging element of dealing with these issues on a large scale level as the Parish undergoes redevelopment with an uncertain return of residential and business populations. Current population estimates are between 10,000 and 12,000, with more than 100 businesses re-opening, since Katrina.*

Jerry Graves, Jr.  
Phone: (504) 278-1032

## Development Suitability of St. Bernard Parish in 2020 .... with no remediation



See Appendix D for more information on how this map was created.

## RE-BEAUTIFYING THE PARISH

St. Bernard residents have begun to take back the landscape by replanting Val Riess Park as part of a Rediscover District C campaign.<sup>41</sup> The main organizers see their efforts as important steps in re-beautifying the landscape and generating a spirit of “civic activism”. They have collaborated with Councilman Kenny Henderson to “address ‘quality of life’ issues that might not exactly be on the government’s front burner post-Katrina.”<sup>42</sup>

The group’s enthusiasm is catching on. Before the storm, the campaign had a hard time getting people involved. But at their January 2007 meeting, over 20 residents showed up with rakes, shovels, gloves, and plant bulbs. One resident commented, “Before, it was like, someone else would take care of it. ... Now, it’s like, ‘What can I do?’”<sup>43</sup>

Rediscover District C

E-mail: [howard@rediscoverdistrictc.com](mailto:howard@rediscoverdistrictc.com)

Website: <http://www.rediscoverdistrictc.com/>

## CONCLUSION

After the storms, oil contamination has naturally decreased in the soil, although potential risks may persist in the environment. Heavier parts of the oil may remain in the soil for quite some time. It is possible, but unknown, that crude oil may have leaked into groundwater in St. Bernard. Long-term annual monitoring of soil contamination throughout the parish would ensure the safety of the environment and awareness of residents about potential risks.

Many tools exist to help you and your neighbors create a safer, healthier future for St. Bernard Parish. The first step in getting started is to get the right data through soil, air, and water testing and understanding Murphy Oil’s clean up methods. You can gauge whether the data present risks that are too high for you and then become involved in a community project if you choose. Possible projects include the use of bacteria (or ‘compost’) and plants to clean up soil, advocating for a buffer zone, planting vacant lots, and participating in planning efforts. Using maps can help community members and officials approach urban planning in a strategic way. Through these strategies, residents may be able to reduce your exposure to environmental hazards.

Remember: soil, air, and water systems are closely related and heavily influence each other, so monitoring and clean up of air and water systems are also very valuable in ensuring a healthy future for the parish. Open space fills important social, psychological, and environmental functions.

## RE-LEAF AND RECOVERY

As part of a “ReLeaf the City” campaign, Mandeville Mayor Eddie Price initiated a program in January 2007 in which the municipal government will give away 1,000 trees as seedlings for free to community members. These trees include live oak, dogwood, river birch, bald cypress, rough-leaf, swamp red maple, holly, parsley hawthorn, mayhaw, and cherry wax myrtle.<sup>44</sup>

For free trees for public space, please contact:

Hilltop Arboretum  
11844 Highland Rd.  
Baton Rouge, LA  
(225) 767-6916

Shreveport Green  
3625 Southern Ave.  
Shreveport, LA 71104  
(318) 219-1888

For free trees & vegetation for private space, contact:

Replant New Orleans  
New Orleans, LA  
(504) 235-2732

Planting native species of plants creates healthy homes for wildlife in clean areas, and planting non-native species in contaminated areas protects wildlife from eating toxins and becoming sick.

We hope that this chapter has provided you with the inspiration to organize your community and take clean up into your own hands. The next chapter provides ways that you can use these ideas as tools to get media exposure, the attention of government and industry, and grant money.

# CHAPTER SUMMARY

- Oil contamination has naturally decreased in the soil, although potential risks may persist in the environment
- Crude oil may have leaked into groundwater in St. Bernard
- Long-term monitoring of soil contamination throughout the parish is critical
- Comprehensive and up-to-date soil, air, and water data is essential for good urban planning
- Soil, air, and water systems are closely related and heavily influence each other
- Bacteria and plants are two ways to improve soil health
- Planting vacant lots and advocating for buffer zones are two community tools that can ensure long-term community health
- Open spaces fulfill many important functions for humans, wildlife, and our environment
- Avoid planting native species in contaminated areas to avoid hurting our precious wildlife
- St. Bernard Takes Care of Toxics! You can get involved in an innovative public participation and planning program.

## FOOTNOTES

<sup>1</sup> Osuji, Leo C. et al. April 2006. "Attenuation of Petroleum Hydrocarbons by Weathering: A Case Study." *Chemistry & Biodiversity*. Vol. 3, Issue 4. 422-433.

<sup>2</sup> James Mullins. Engineer. U.S. Environmental Protection Agency. Personal communication with the author. December 19, 2006.

<sup>3</sup> Jeremy Semrau. Associate Professor of Environmental Engineering. University of Michigan. Personal communication with the author. February 6, 2007.

<sup>4</sup> Jeremy Semrau. Associate Professor of Environmental Engineering. University of Michigan. Personal communication with the author. February 6, 2007.

<sup>5</sup> U.S. EPA, LDEQ, ATSDR, and Louisiana DHH. "Closure Plan: Murphy Oil Spill Response." Murphy Oil USA, Inc., Refinery. Judge Perez Crude Oil Spill. St. Bernard Parish, LA. September 2005.

<sup>6</sup> McKay, Betsy. "Polluted Options: Katrina Oil Spill Clouds Future Of Battered Suburb; Health Concerns Loom Large For Waiting Homeowners; No Clear Official Guidance; Taking Off the Rubber Gloves." *Wall Street Journal* (Eastern edition). New York, N.Y.: January 3, 2006. A.1

<sup>7</sup> Anonymous. Personal communication with author. August 2006.

<sup>8</sup> U.S. EPA, LDEQ, ATSDR, and Louisiana DHH. "Closure Plan: Murphy Oil Spill Response." Murphy Oil USA, Inc., Refinery. Judge Perez Crude Oil Spill. St. Bernard Parish, LA. September 2005.

<sup>9</sup> Jeremy Semrau. Associate Professor of Environmental Engineering. University of Michigan. Personal communication with the author. February 6, 2007.

<sup>10</sup> U.S. Environmental Protection Agency Region VI. Et al. Closure Plan: Murphy Oil Spill Response. Murphy Oil USA, Inc. Refinery. Judge Perez Crude Oil Spill, St. Bernard Parish, LA. September 2005.

<sup>11</sup> James Mullins. Engineer. U.S. Environmental Protection Agency. Personal communication with the author. December 19, 2006. [JM's explanation of the way EPA determined the oil spill boundaries] "Please understand there was not one oil spill during Katrina, there were hundreds of them... EPA and Murphy agreed [to conduct a] "chemical fingerprint" analysis of the oil present... The fingerprint gives an excellent idea if these two oils are (or are not) of the same origin..."

Murphy employed a contractor who performed a visual field survey of the area [and produced a map showing the oil spill boundaries shaded in baby blue]... EPA commissioned several studies driving around and boating around at about the same time and slightly later... Murphy adopted cleanup responsibility for the combined "baby blue" and EPA defined visual areas. ...

A satellite photo... from September 2 or 3... showed that our combined areas of visual delineation was actually quite accurate. Therefore 3 complementary methods determined the areal extent of Murphy oil spill... visual on the ground surveys (two surveys independently performed by Murphy and EPA); analytical fingerprint samples from about 5000+ area samples; and a satellite photo."

<sup>12</sup> Emily Posner. Meg Perry Healthy Soil Project. Common Ground Collective. Personal communication with author March 22, 2007.

<sup>13</sup> W. Brice White. People's Environmental Center Funding Proposal. Fall 2006.

<sup>14</sup> RePlant New Orleans. <http://www.replantneworleans.org/>

<sup>15</sup> Hillary Strobel. Executive Director. RePlant New Orleans. Personal Communication with author. April 6, 2007.

<sup>16</sup> Lin, Qianxin and Irving A. Mendelsohn. 1998. "The combined effects of phytoremediation and biostimulation in enhancing habitat restoration and oil degradation of petroleum contaminated wetlands." *Electrical Engineering*, Vol. 10. 263-274.

<sup>17</sup> U.S. Geological Survey and U.S. Department of the Interior. Native Plants for Effective Coastal Wetland Restoration. Fact Sheet 090-03. September 2003.

<sup>18</sup> Hillary Strobel. Personal Communication with author. March 26, 2006.

<sup>19</sup> Adapted from: Pivetz, Bruce E. Phytoremediation of Contaminated Soil and Ground Water at Hazardous Waste Sites. Technology Innovation Office, Office of Solid Waste and Emergency Response, U.S. EPA, Washington D.C. EPA/540/s-01/500. February 2001. [http://clu-in.org/download/remed/epa\\_540\\_s01\\_500.pdf](http://clu-in.org/download/remed/epa_540_s01_500.pdf)

<sup>20</sup> Nassauer, Joan Iverson et al. Principles for Ecological Landscape Design in Brownfield Business Parks. USDA FS Project #00-JV-11231300-033.



December 2001. Draft.

- <sup>21</sup> Technology Innovation Program, United States Environmental Protection Agency. Citizen's Guide to Phytoremediation. <http://www.clu-in.org>
- <sup>22</sup> Northwestern University's Civil Engineering Department Homepage. Section 3: General Phytoremediation. [http://www.civil.northwestern.edu/ehe/HTML\\_kag/Kimweb/MEOP/Section3.htm](http://www.civil.northwestern.edu/ehe/HTML_kag/Kimweb/MEOP/Section3.htm)
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- <sup>25</sup> Lin, Qianxin and Irving A. Mendelsohn. 1998. "The combined effects of phytoremediation and biostimulation in enhancing habitat restoration and oil degradation of petroleum contaminated wetlands." *Electrical Engineering*. Vol. 10. 263-274. Pivetz, Bruce E. *Phytoremediation of Contaminated Soil and Ground Water at Hazardous Waste Sites*. Technology Innovation Office, Office of Solid Waste and Emergency Response, U.S. EPA, Washington D.C. EPA/540/s-01/500. February 2001. [http://clu-in.org/download/remed/epa\\_540\\_s01\\_500.pdf](http://clu-in.org/download/remed/epa_540_s01_500.pdf)
- <sup>26</sup> McCullough, Matthew L. and Jeffrey V. Dagdigian. August 2006. "Evaluation of remedial options for treatment of heavy metal and petroleum hydrocarbon contaminated soil." *Remediation*. 3(3):265-286.
- <sup>27</sup> Scott, Duncan I. and C. Paul Nathanail. Summer 2005. "Application of the operating window concept to remediation-option selection." *Remediation*. 15(3): 65-82.
- <sup>28</sup> Hazardous Substance Research Centers. South & Southwest. Technical Outreach. <http://www.hsrb-ssw.org/outreach-intro.html>
- <sup>29</sup> Ibid.
- <sup>30</sup> Technology Innovation Program. U.S. Environmental Protection Agency. [www.clu-in.org](http://www.clu-in.org)
- <sup>31</sup> Schneider, Keith. "Chemical Plants Buy Out Neighbors for Safety Zone." *New York Times* Nov 28, 1990.
- <sup>32</sup> Ibid.
- <sup>33</sup> Joel Waltzer. Lawyer. Waltzer & Associates. E-mail message to author. March 8, 2007.
- <sup>34</sup> Ibid.
- <sup>35</sup> Parks for People, New England. Benefits of Urban Open Space. Trust for Public Land. [http://www.tpl.org/tier3\\_cd.cfm?content\\_item\\_id=1242&folder\\_id=905](http://www.tpl.org/tier3_cd.cfm?content_item_id=1242&folder_id=905)
- <sup>36</sup> Kerlinger, Paul. *Economics of Open Space Conservation*. 1999. *Strategies for Bird Conservation: The Partners in Flight Planning Process*. Cornell Lab of Ornithology. <http://birds.cornell.edu/pifcapemay>
- <sup>37</sup> Parks for People, New England. Benefits of Urban Open Space. Trust for Public Land. [http://www.tpl.org/tier3\\_cd.cfm?content\\_item\\_id=1242&folder\\_id=905](http://www.tpl.org/tier3_cd.cfm?content_item_id=1242&folder_id=905)
- <sup>38</sup> Parks for People, New England. Benefits of Urban Open Space. Trust for Public Land. [http://www.tpl.org/tier3\\_cd.cfm?content\\_item\\_id=1242&folder\\_id=905](http://www.tpl.org/tier3_cd.cfm?content_item_id=1242&folder_id=905)
- <sup>39</sup> Friends of Lafitte Corridor. <http://www.folc-nola.org/gr-projupdate.htm>
- <sup>40</sup> September 2006 St. Bernard Parish government data
- <sup>41</sup> Warren, Bob. "Determined residents boost St. Bernard." *Times-Picayune*. January 20, 2007.
- <sup>42</sup> Ibid.
- <sup>43</sup> Ibid.
- <sup>44</sup> Shiner, Teddie. "Replacing trees is focus of city's ReLeaf project Mandeville to offer seedlings giveaway." *Times-Picayune*. January 24, 2007.

# CHAPTER 5:

## Organizing Toolkit

Resources to help you and your neighbors re-create and maintain a safe environment

### IN YOUR WORDS

[In order to force me to move], they'd have to shoot me — 'cause I've lived here, my parents, my parents' parents, my cousins and uncles are from here ...

—68-year-old lifelong St. Bernard resident



### Read this chapter if you want to know:

- How to get neighbors organized to work for a safer environment
- How to use media, science, policy, and legal tools to achieve your goals



# INTRODUCTION

## Defending Your Home

When people in other parts of the country talk about Katrina, they sometimes blame coastal residents for choosing to live below sea level in hurricane country. But people in other parts of the nation live in arid deserts, over earthquake faults, and in the shadows of volcanoes. Unlike many of these Americans, coastal Louisianans' predecessors have been thriving in the Gulf region for hundreds or even thousands of years.

The reasons the Gulf is now unsafe have little to do with your decision to stay. In large part, the danger you and your families now face results from wetland destruction, historic tinkering with the flow of the Mississippi River, construction of the Mississippi River Gulf Outlet, poor maintenance of levees and drains, and of course, air, soil, and water pollution.

Depending on your individual circumstances, you may or may not have chosen to remain at your pre-Katrina residence. For those of you who stayed, however, we'd like you to know we believe St. Bernard Parish was your home first, and you have every right to defend it from future harm.

Citizen organizing is an effective way to produce change at the local level. We know you are all busy rebuilding your lives, but by splitting up organizing tasks amongst fellow volunteers and experts in your neighborhood, you can make big changes in the place you live. The following pages will walk you through the basic steps of starting a campaign and will provide resources to help you make it successful.

**DEFEND  
YOUR HOME  
FROM FUTURE  
HARM**



*Photo Credit: Historic Chalmette Battlefield, courtesy of Greg Chase and [www.stbernardparish.net](http://www.stbernardparish.net)*

### Example agenda of a House Meeting

1. The host welcomes attendees, provides refreshments, and makes introductions.
2. Another group member explains the reason for the meeting.
3. The group discusses possible goals.
4. The group takes a vote on which goal(s) to pursue.
5. Each attendee agrees to bring two more people to the next meeting. Then, you will identify your group resources and potential obstacles. (See below for an exercise to facilitate this.)
6. As a group, you discuss your level of commitment of achieving your goals.
7. The meeting closes and the group evaluates how it went.

## GETTING ORGANIZED

### Getting People Together

**It's easy to start organizing. Big campaigns start with a single conversation, and anyone can have a conversation.**

If you're concerned about an environmental threat in your community, the first step is to get people discussing the problem. Talk with neighbors, parents at your children's school, or members of your church. Invite concerned friends, family, and neighbors to attend a meeting at your home. You may even wish to go door-to-door in your neighborhood to see who shares your concern and is interested in attending your meeting. Call people who are interested in attending a couple of days before the meeting to remind them.

To the left is an example meeting agenda. At your first meeting, you should get to know attendees and everyone should share his or her concerns. At the next meeting, you might develop a goal and choose the tools you'll use to accomplish that goal. Below are several exercises to help your group develop goals and choose the right tools. At every meeting, your group should work to identify and develop skills of group members. For example, attendees might take turns running the meeting or recording meeting minutes.

# SETTING GOALS AND OVERCOMING OBSTACLES

Once you and your neighbors have identified a common concern and are ready to take action, it's often helpful to develop a concrete goal. The best way to develop a concrete goal is to identify two things:

- 1) **What resources do we already have that can help us achieve our goal?**
- 2) **What are the possible road blocks that might prevent us from reaching our goal?**



Photo Credit: Piper Hanson. "The Marcella Gang" Images used from Photo Exhibit "Life in the Wake of Katrina."

## Begin by stating a goal.

Imagine, for example, that you live near the edge of a refinery and are trying to decide whether to sell your property. Although you think the soil is safe, you are concerned about ongoing air pollution because your daughter's asthma is getting worse. Moreover, you are having a hard time sleeping because the smell of pollution from the refinery is unbearable at night.

You have called friends and gone door-to-door, asking what your neighbors are going to do. A few of your neighbors expressed similar concerns about air quality and their families' health. Some neighbors want the refinery to buy their homes and pay for their relocation. Others want to stay in St. Bernard Parish and start a campaign for cleaner air. You decide to hold a meeting at your house with coffee and snacks. You make an agenda that focuses on how you might work together to solve the problem. The first item on the agenda is introductions. Next, you ask why people came to the meeting. Then, you and your neighbors talk about the goals you want to reach. After some discussion, you set the following goal:

*We want the biggest air polluters in the neighborhood to reduce their pollution and to buy the homes of those who want to move away.*

Once you've set a goal, the next step is to identify the resources of the group and potential obstacles working against you. For example, the resident in the example above might identify the following resources and potential obstacles:<sup>1</sup>

THINGS YOU HAVE GOING FOR YOU:	POTENTIAL OBSTACLES:
<i>We have a tight-knit community. ►</i>	◀ <i>The industry has no reason to listen to us</i>
<i>There's a possibility of lots of media and political attention to this issue because these polluters have violated environmental laws in the past, and state and national elections are coming up. ►</i>	◀ <i>Some people have already opted into the class action lawsuit, taken their money, and moved away.</i>
<i>We have several local "experts," or neighbors who have skills in running meetings, public speaking, or writing, who are interested in helping with the campaign. ►</i>	◀ <i>Some neighbors never returned, and those who have are too busy rebuilding their own lives to organize with neighbors.</i>

**You can record your own group's goal on the next page**

## In what ways might you use the group resources you've identified to break through the potential obstacles in your way?

In this example, your group would probably decide to increase its numbers so that you and your busy neighbors have more help with your campaign. You would identify neighbors who were not at your first meeting but should be at the next one. Furthermore, industries care about their reputations, so you would also spend time talking about how you could use the media to get the attention of the polluter. Near the end of the meeting, you would ask each person to bring two new people to the next meeting.

Three times as many people might show up to the next meeting and the buzz in the neighborhood will build. Your campaign may soon take off, and eventually the polluters could pledge to reduce emissions and to buy homes around the refinery to create a buffer zone. It only takes a spark to ignite a prairie fire.

### WHAT ARE YOUR REBUILDING GOALS?

Below is a blank goal identification chart for you and your neighbors to fill in. As you fill in the table, some of “things you have going for you” may be rather abstract. It is important to think about which of your community strengths and abilities you can use to organize your campaign. On the other hand, as you list potential obstacles, it is important to think about which of the obstacles you can realistically overcome by organizing your community.

### GOAL:



THINGS YOU HAVE GOING FOR YOU:	POTENTIAL OBSTACLES:
▶	◀
▶	◀
▶	◀
▶	◀
▶	◀

### “Setting Goals and Overcoming Obstacles”

is based on a campaign that citizens in St. Bernard Parish are currently pursuing. St. Bernard Citizens for Environmental Quality is involved in a campaign for cleaner air in the parish. To learn more about their organizing work, contact the group’s president, Mr. Ken Ford, at:

*St. Bernard Citizens for Environmental Quality*  
 Phone: 554-994-5563  
 Web site: [www.environmentwatchdog.com](http://www.environmentwatchdog.com)  
 E-mail: [webmaster@environmentwatchdog.com](mailto:webmaster@environmentwatchdog.com)

If you are interested in the kind of organizing work that other refinery communities are doing, you may wish to contact the following group:

*Refinery Reform*  
 Phone: (415) 643-1870  
 Web site: [www.refineryreform.org](http://www.refineryreform.org)  
 E-mail: [dennylarson@earthlink.net](mailto:dennylarson@earthlink.net)

For more information or assistance with conducting meetings and developing campaigns, you may wish to consult the following source:

*Center for Health, Environment, and Justice (CHEJ)*  
 Phone: (703) 237-2249  
 Web site: [www.chej.org](http://www.chej.org)  
 E-mail: [chej@chej.org](mailto:chej@chej.org)

(The work of CHEJ is featured in the Love Canal success story in Chapter 2)

## RISK AND COMMITMENT

Once you have a goal to address pollution in your parish, it's time for you and your fellow organizers to consider the possible actions you're willing to take. Below is a list of possible actions. Put a plus (+) next to those you would be willing to risk. If you are unsure, put a zero (0) by the statement. Put a minus (-) by statements you feel are too risky for you. Discuss your answers with others in your group.

- ( ) Write a letter to your congressperson.
- ( ) Write letters to editors of local newspapers.
- ( ) Work for the election of an environmentalist to public office.
- ( ) Take a more active role in environmental groups. For example, become the leader of a task force to get cleaner air in the parish.
- ( ) Participate in a vigil or demonstration.
- ( ) Go door-to-door to organize neighbors to get a local company to stop polluting.
- ( ) Visit corporate management or boards of directors to confront them on their policies.
- ( ) Encourage people to boycott the products of a company until it changes its policy.
- ( ) Run for public office yourself.
- ( ) Disrupt a stockholder's meeting.
- ( ) Join a nonviolent civil disobedience action to get companies to change their policies.



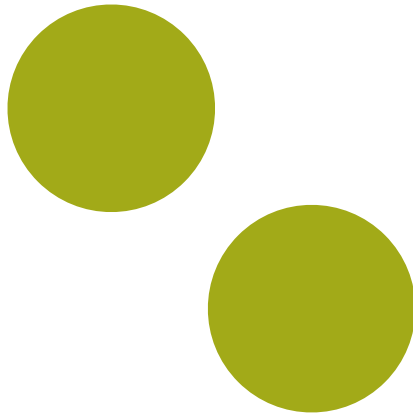
Mike Collins, "Give Peace a Chance," St. Bernard Parish, LA, October 9, 2005. Images used from Photo Exhibit "Life in the Wake of Katrina."



Now, individually fill in the Risk and Commitment chart below,<sup>2</sup> and then discuss it in your group. Discuss what the risks mean to you personally. Not everyone is prepared to take the same risks. However, participants should support and encourage each other to take some risks.

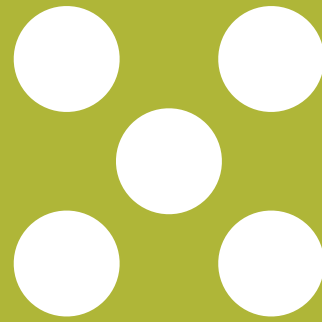


Risk and Commitment		
Kinds of Risks <i>(Check those that you're willing to risk)</i>	What I am committed to risking in order to accomplish? Your goal: _____	Likelihood of this risk eventually occurring
Economic loss?		
Physical danger?		
Loss of self-esteem?		
Legal action?		
Loss of public credibility?		
Career threats?		
_____?		
_____?		
_____?		



## BUILDING COALITIONS

Once your group has a clear sense of its mission, it could be useful to explore building coalitions with other groups. Especially in post-Katrina New Orleans and surrounding parishes, several groups may be involved in similar campaigns. Therefore, sharing resources could be advantageous to all groups. For example, if your group is worried about lead in the soil, you might hold a press conference with a couple of groups from surrounding parishes that are also working on soil contamination.



*Below are only some of the citizen groups in NOLA, followed by a list of some of the issues they're working on:*

### **The New Orleans Chapter of the Sierra Club**

Phone: (504) 836-3062

Web site: <http://louisiana.sierraclub.org/neworleans/>

E-mail: [barbara.vincent@sierraclub.org](mailto:barbara.vincent@sierraclub.org)

(The New Orleans Chapter's campaigns include levee protection, climate change, and replanting trees destroyed in Katrina.)

### **The Alliance for Affordable Energy**

Phone: (504) 525-0778

Web site: [www.all4energy.org](http://www.all4energy.org)

E-mail: [mwalker@all4energy.org](mailto:mwalker@all4energy.org)

(The Alliance for Affordable Energy's campaign focuses on getting affordable and renewable energy for New Orleans.)

### **The Bucket Brigade**

Anne Rolfes, Program Director

Phone: (504) 522-0500

Web site: [www.labucketbrigade.org](http://www.labucketbrigade.org)

E-mail: [info@labucketbrigade.org](mailto:info@labucketbrigade.org)

(In St. Bernard Parish, the Bucket Brigade was involved with soil testing after the Murphy Oil spill. It is currently teaming with St. Bernard Citizens for Environmental Quality to improve air quality and get an optional buffer zone next to the Exxon oil refinery.)

### **St. Bernard Citizens for Environmental Quality**

Phone: (554) 994-5563

Web site: <http://www.environmentwatchdog.com>

E-mail: [webmaster@environmentwatchdog.com](mailto:webmaster@environmentwatchdog.com)

(St. Bernard Citizens for Environmental Quality is working to improve air quality and get an optional buffer zone next to the Exxon oil refinery.)

### **Louisiana Environmental Action Network**

Phone : (225) 928-1315

Web site : [www.leanweb.org](http://www.leanweb.org)

E-mail : [lean@leanweb.org](mailto:lean@leanweb.org)

(Louisiana Environmental Action Network (LEAN) is a statewide network of 106 member groups and over 1700 individual members. Their issues include hurricane debris waste management and post-Katrina environmental health.)

*The above organizations are only a few Louisiana-based groups that are working to protect their environment. A more comprehensive list can be found by visiting the LEAN website (above). Another list, put together by Louisiana State University, can be found at: <http://www.leeric.lsu.edu/erd/stateorg.htm>.*

## INFORMATION GATHERING

Once you've identified a goal, it's important to arm yourself with as much information as possible about the actual problem. Federal law says that you have a right to know about activities and decisions that affect your health and the environment

### Choosing the Right Tools

The nature of your problem will determine the best arsenal of tools for your campaign. For example, if there's ongoing pollution in your backyard, you'll want to request information on toxic releases to make sure industrial neighbors are complying with environmental laws. If you're worried about a planned facility or an expansion, you'll need to learn how to influence the permitting process. If you think that building political pressure might influence your situation, you will want to use the media strategically. Below are several tools and an accompanying description of how they might best serve your campaign.

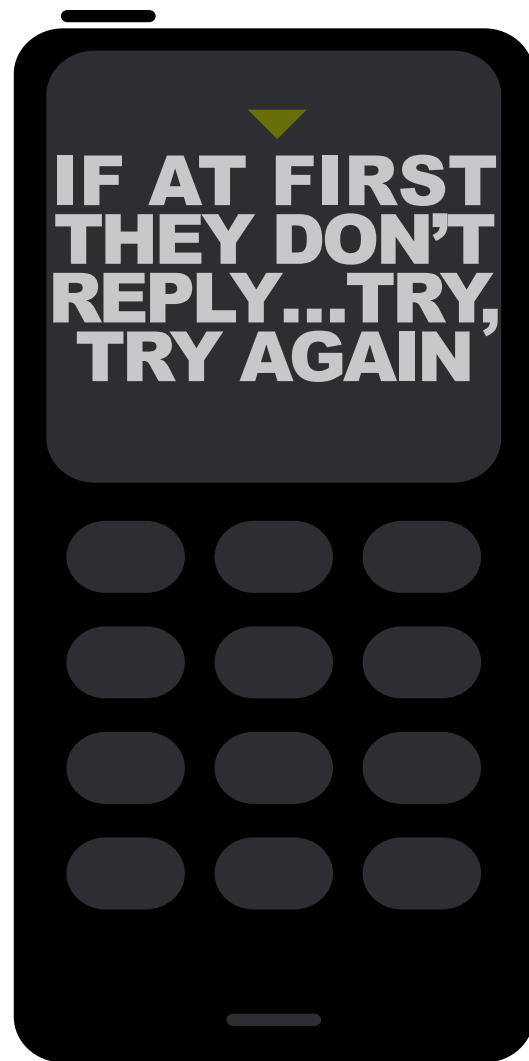
### Environmental Scorecard

If you have a computer and Internet access, a quick and easy way to get detailed information about your community's environment is to put your zip code into the Scorecard Web site. When you put St. Bernard's zip code into Scorecard, among the things it tells you are the names of major polluters in the parish and the kinds of toxins they release. Scorecard also predicts the cancer risks posed to the parish by pollution.

**To use Scorecard, visit [www.scorecard.org](http://www.scorecard.org).**

The U.S. Environmental Protection Agency (U.S. EPA) has a similar tool on its Web site where you can search by zip code for detailed information regarding pollution where you live.

To use this tool, visit [www.epa.gov/epahome/commsearch.htm](http://www.epa.gov/epahome/commsearch.htm).



**When we surveyed St. Bernard Parish** residents about their frustrations trying to get information about Katrina's effects on their health, a big complaint was that state and federal officials often failed to return their calls or "passed the buck" to other offices. Some people just gave up because they were never able to get a straight answer.

Unfortunately, the same thing could happen as you try to gather information for your campaign. You must be persistent and patient. Remember that agencies are often under-funded and their employees over-worked. Nonetheless, they have an obligation to respond to the public. Keep making phone calls and writing letters until you get an answer. If you remain calm, you are more likely to get a helpful response. Enlist the help of professors or elected officials you think might be able to help you get the information you need, and never, ever, give up.

# THE FREEDOM OF INFORMATION ACT (FOIA)

The FOIA allows you to write to any government agency and request information on particular things such as the reasons for making specific regulatory decisions. The government charges a fee for filling the FOIA requests, but your group can get a fee waiver if your request is likely to contribute to public understanding of government operations and is not motivated by a commercial inter-

est. In your request letter, you should make sure to state the reasons why your group should be granted a waiver.

Be aware that it can take agencies a long time to fill requests. Once you have the information, however, it can be extremely useful to your campaign. You can then appeal an agency's denial to fill your request. Below is a sample FOIA letter.

Agency Head  
Agency Name  
Address  
City, State, Zip Code

Re: Freedom of Information Act Request

Dear \_\_\_\_\_ : [Name of person responsible for FOIA requests]  
[You'll have to call the agency or check its Web site for this information. If you can't find this information, you can simply write 'To Whom It May Concern'.]

This is a request under the Freedom of Information Act 5 U.S.C. § 552. I request a copy of all documents containing the following information: \_\_\_\_\_  
\_\_\_\_\_ [Identify the kind of information you want with as much specificity as possible. If possible, list specific documents that you want.]

I am \_\_\_\_\_ [Describe yourself and the group you're affiliated with, as well as the purpose of your request. Say that you will not use information you receive for commercial use.] I request a waiver of all fees for this request. Disclosure of the requested information to me is in the public interest because \_\_\_\_\_ [Explain how the information will benefit the public].

If I am not granted a fee waiver, I am willing to pay up to \$\_\_\_\_\_ in fees. If you estimate that the fees will exceed this limit, please inform me first. If you deny any part of this request, please note the specific reason that justifies your refusal and notify me of appeal procedures available under the law.

Please contact me if you have any questions processing this request. Thank you for your consideration.

Sincerely,

Name  
Address  
City, State, Zip Code  
Telephone Number  
E-mail address [if available]

## **The Agency for Toxic Substances and Disease Registry (ATSDR)**

The Agency for Toxic Substances and Disease Registry (ATSDR) is an independent government agency with the mission to prevent public exposure to hazardous substances. The ATSDR's Web site provides detailed information sheets on over 100 chemicals. To check the ATSDR's toxics database for information on the health effects of a specific substance, visit <http://www.atsdr.cdc.gov/toxfaq.html>.

If you are concerned about a toxic chemical, paste this link into your browser, scroll down, and then click on the name of that chemical.

Agency staff can also tell you where to find health clinics with specialists who can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. If you have concerns about exposure to toxic substances, or if you have general questions about toxic substances, contact the regional or national offices at:

**ATSDR Region VI:**  
Phone: (214) 665-6615

**Houston Field Office:**  
Phone: (281) 983-2191

**George Pettigrew**  
Senior Regional Representative  
(214) 665-8361  
E-mail: [gpettigrew@cdc.gov](mailto:gpettigrew@cdc.gov)

**National Office:**  
Phone: 1-888-42-ATSDR  
(1-888-422-8737)  
E-mail: [ATSDRIC@cdc.gov](mailto:ATSDRIC@cdc.gov)

The Louisiana Department of Health and Hospitals (LDHH) is also working with residents about post-Katrina health concerns, including questions about the

Murphy Oil spill. To speak with the Department about your public health concerns, contact:

### **Louisiana Department of Health and Hospitals**

Collette Stewart-Briley, Educator  
Phone: (888) 293-7020

### **The Emergency Planning and Community Right-to-Know Act (EPCRA) and the Toxics Release Inventory (TRI)**

The Emergency Planning and Community Right-to-Know Act (EPCRA) says that communities have the right to information about potential threats to community safety and health from facilities that have a certain amount of toxic waste. If a facility in your neighborhood is subject to the EPCRA reporting requirements, you can access emissions data to make sure the facility is following environmental laws.

The Toxics Release Inventory (TRI) is the U.S. Environmental Protection Agency (U.S. EPA) database that contains information on toxic chemical releases and waste management activities from facilities that have to comply with the EPCRA. To get information about toxics released in your community, either contact the U.S. EPA or put your zip code into the "TRI explorer" on its Web site.

### **Environmental Protection Agency, TRI Program Division**

Phone: (202) 566-0250  
Web site: <http://www.epa.gov/triexplorer/>  
E-mail: [tri.us@epa.gov](mailto:tri.us@epa.gov)

## **How to Get Help from College Professors and Student Volunteers**

Professors at colleges and universities can help with complicated scientific or policy questions, and student volunteers can be enormous assets to your campaign. Below are some tips for recruiting help from colleges:

1. Have a clear description of your campaign ready, and know exactly what kind of information or help you're going to ask for.
2. Call or e-mail the particular department or community service organization from which you're interested in seeking help.
3. Try a couple of different institutions to see what kind of services they offer.

Below is a list of just a few university programs at which you might find help:

### **Community Service**

*Loyola University Community Action Program (LUCAP)*

Phone: (504) 865-2140 extension #2140

Web site: [www.loyno.edu/lucap/](http://www.loyno.edu/lucap/)

E-mail: [wperagin@loyno.edu](mailto:wperagin@loyno.edu) or [acalcaza@loyno.edu](mailto:acalcaza@loyno.edu)

*Tulane Center for Public Service*

Phone: (504) 862-8060

Web site: <http://cps.tulane.edu>

### **Science/Environment Questions**

*Center for Bioenvironmental Research (CBR) at Tulane and Xavier Universities*

Phone: (504) 988-6612

Web site: [www.cbr.tulane.edu/](http://www.cbr.tulane.edu/)

E-mail: [cbr@tulane.edu](mailto:cbr@tulane.edu)

### **Legal Questions**

*Tulane Environmental Law Clinic*

Phone: (504) 865-5789

Web site: [www.tulane.edu/~telc/](http://www.tulane.edu/~telc/)

E-mail: [lswanner@tulane.edu](mailto:lswanner@tulane.edu)

*If these groups are unable to help you, ask them to refer you to other professors or academic organizations in the area.*



# CITIZEN SCIENCE

## The Bucket Brigades



**Did you see the movie “Erin Brockovich”?** The story was based on a real-life attorney named Ed Masry. In 1994, Mr. Masry was suing a refinery on behalf of residents in California. The industry and government officials kept telling residents that emission levels from the refinery were not harmful, but people’s illnesses told them otherwise. Then, Masry got an engineer to design an air sampling bucket.

*Photo Credit: Ken Ford. “Louisiana Bucket Brigade taking soil samples after the Murphy Oil Spill.” St. Bernard Parish, L.A. 2005. Images used from Photo Exhibit “Life in the Wake of Katrina.”*

The bucket was based on a design used by government agencies, but it was made from parts that you can find at a hardware store. In all, it only costs \$125 to make. Also, the bucket takes reliable air samples that can be sent to a lab and analyzed. The U.S. Environmental Protection Agency (U.S. EPA) performed a quality assurance evaluation of the data gathered from the bucket and now accepts bucket results.

Today, grassroots groups around the world use the bucket to take their own air samples. They call themselves “Bucket Brigades” after the lines of people that used to form from a water source to a burning building, passing buckets to put out the fire. Bucket Brigades have recently added to their arsenal of citizen science tools; they are now taking soil samples and “swipe tests” for solid particles, and they’ve developed a “Bucket Brigade strategy” around which they can structure their entire campaigns. Global Community Monitor (GCM) provides training and support for Bucket Brigades around the world.

### **To learn more about the Bucket Brigades, contact:**

Jeanne Luse, Administrative Assistant  
Phone : (415) 643-1870  
Web site : [www.gcmonitor.org](http://www.gcmonitor.org)  
E-mail: [jeanne@gcmonitor.org](mailto:jeanne@gcmonitor.org)

### **Did You Know?**

You have a Bucket Brigade right here in Louisiana. The program director, Anne Rolfes, led a citizen soil sampling event in St. Bernard after the hurricane. Anne is now working on making the parish safer by asking for an emergency siren warning system that would go off in the event of accidents. She is also working to limit human exposures to cancer-causing chemicals in the parish by conducting air monitoring tests. Additionally, she is asking for a voluntary property buyout around the Exxon-Mobile refinery.

### **To get involved with the Louisiana Bucket Brigade, contact:**

Anne Rolfes, Program Director  
Phone: (504) 522-0500  
Web site: [www.labucketbrigade.org](http://www.labucketbrigade.org)  
E-mail: [info@labucketbrigade.org](mailto:info@labucketbrigade.org)

*You can read the Louisiana Bucket Brigade’s 4-point plan for St. Bernard Parish at this website:*

*[www.labucketbrigade.org/press/four\\_point\\_plan.shtml](http://www.labucketbrigade.org/press/four_point_plan.shtml)*



# CATCHING THE MEDIA'S EYE

Your campaign is much more likely to be successful when you use the media to get exposure for your issue. Stories on the television or in the paper will attract more members for your group, give your group legitimacy in the eyes of donors, and pressure the source of your problem to change. TV exposure is the most effective way to get your point across to a large audience quickly, and radio and newspaper coverage are also important. Below are steps you should take in organizing your media strategy:

## **Develop talking points and stay "on message"**

Before you start planning any kind of media event, it is important to develop your main talking points. The four or five talking points you create should be the main ideas you want to get across. They should convey a clear picture of your campaign goals and let your target audience know what you want it to do. For example, talking points for the hypothetical group that formed to address air pollution in the parish might include the following:

1. [Industry name \_\_\_\_\_] has violated the Clean Air Act [number of violations \_\_\_\_\_] times in the past past year for [name of toxic chemical \_\_\_\_\_], a cancer-causing substance.
2. The cancer rate in the parish is [number of times \_\_\_\_\_] times greater than the national average.
3. [Group name \_\_\_\_\_] demands air that is safe for all fenceline families.
4. [Group name \_\_\_\_\_] wants [industry name] to offer to purchase our properties at pre-Katrina prices so we can move a safe distance away.
5. [Group name \_\_\_\_\_] encourages all parish residents to come with it to a [industry name] shareholder meeting on [date] at [place and time], where it will ask shareholders to clean up [industry name] or withdraw their financial support.

## Brainstorm about your own talking points here:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



*Important: Before the event, make sure all present group members know your talking points and that they only talk about these points to the press.*

## Writing a Press Release

You'll need to get the word out about your event in a press release. This is a short description of the event that news media can use. They will also use the press release to decide whether to cover your event, so try to make it catchy.

### Press Release Checklist:

*Always keep the following guidelines in mind when writing a press release. A sample release can be found in the following pages.*

- Do you have a one-line title?
- Does your press release express one central idea?  
*(The biggest mistake people make is confusing their message with more than one issue.)*
- Have you written the correct time/date?
- Does your opening sentence contain the most important part of your story?
- Have you emphasized the importance of your story to local people?
- Do you use common words?
- Are your sentences and paragraphs short and concise?
- Have you written your quotations to sound as though the person said the words rather than wrote them?  
Have you attributed your quotations to the right person(s)?
- Did you double-check all spelling and punctuation?
- Did you double-check all facts for accuracy?
- Have you included names and phone numbers for further information?
- Have you checked with the paper to see if there are any special formatting guidelines and followed the accepted format?
- Have you double-spaced your lines?

### More Tips for Getting Your Story Published

Newspapers receive hundreds of press releases on a daily basis. In order for your press release to be taken seriously, it has to follow a standard press release template. Editorial staffs often spend only a few seconds reviewing each release before throwing them away. In order for them to take the time to read the entire release, you need to be sure to prepare the release in the simple format described below.

Writing a release is not difficult. What is difficult is getting editors and reporters to follow up on the story and use it. Literally thousands of stories compete every day for a very limited amount of news coverage. It is important to write concisely and follow standard formatting guidelines. A news release is one way reporters decide whether to cover a story. Your release has to catch an editor's or reporter's eye if you want your story covered. Above all, you must be sure that all the information in the release is accurate.

Finally, journalists follow strict deadlines and you must observe these deadlines or your press release will not even be read. Newspapers, radio, television, and the like have different deadlines. Be sure to find out the deadlines of each news media you send your release to. And be sure to find out the correct name of the individual to send the release to, along with his or her fax number, e-mail address, or mail address. *Rules to follow on next page*

# TIPS FOR GETTING YOUR STORY PUBLISHED

## Here are some important and simple rules to follow:

1. As a guideline, you should be describing WHO, WHAT, WHY, WHERE, and WHEN.
2. The first paragraph is the most important. If it is not concise, accurate, and eye-catching, the editor will not finish reading the release. The WHO and WHAT are important here.
3. It is good to **have a strong quote in the first paragraph.**
4. The second paragraph should address the others.
5. Be sure that the most important information you are trying to convey is in the first two paragraphs.
6. If your organization has its own letterhead, use it.
7. Specify the date of the release.
8. List the contact name and phone number clearly, and be sure that the contact person can be reached during the time period of the release. Many press releases fail because an editor or reporter cannot contact the person listed.
9. Have a **short, one-line headline** that accurately reflects what the story is about.
10. Indent paragraphs by five spaces.
11. Double-space all text.
12. Use 1 + 0.5 inch margins.
13. Press releases should not be long—three pages at the most. Number the bottom of each page, and use the word “more” at the bottom of each page if the text continues to the next page.
14. Be sure to include the title of any person you are writing about, and the full name of individuals.
15. Opinions should be in quotes.
16. It is good to have a standard closing paragraph that simply states the mission or purpose of your group or campaign.
17. Don't just state what the problem is if you are trying to gain attention to the problem. **Journalists want to hear what you think the solution is.** Be sure to develop a media strategy before you seek the media's help. Make sure you are pitching a story—not simply an issue! Try translating an individual problem into a social issue. Then, assign responsibility for the problem, and propose a reasonable solution.
18. In many cases, you have to attach a fact sheet to the press release. Be sure to note at the end of the release that there is such an attachment. On this sheet, list pertinent facts and remember to double-check their accuracy. Be sure to list all the official sources for the facts and figures. List the names, addresses, and phone numbers of key people or experts that the journalists can contact. You may also wish to cite relevant news, academic articles, or official documents. By doing so, you are demonstrating that your group is well-informed. Equally important to remember is that **journalists are more likely to pick up a story if you have done some of the initial “homework” for them.**



Photo Credit: Frank Chadwick. St. Bernard Parish, LA. Images used from Photo Exhibit “Life in the Wake of Katrina.”

## Sample Press Release

Below is a sample press release based on the hypothetical situation discussed earlier in this chapter in “Setting Goals and Overcoming Obstacles.”

Imagine that the group that formed to address air pollution was going to hold a press conference along the fenceline of a group member’s backyard.

Here’s what your announcement might look like:

For Immediate Release

[today’s date]

Contact:

[Name]

[Phone Number]

[Email Address]

\_\_\_\_\_ [Your Organization Name] calls for shareholders to withdraw support of \_\_\_\_\_ [Industry name] responsible for threatening health in the parish.

[St. Bernard Parish] - How does the air outside smell to you? Do your children have asthma? Does the rotten-egg smell in the air keep you up at night?

\_\_\_\_\_ [Organization Name] announces its plan to get \_\_\_\_\_ [Industry Name] to clean up its act by getting shareholders to withdraw their support. You’re invited to join [Organization Name] at a protest outside the annual shareholder meeting at \_\_\_\_\_ [Place] on [Time and Date].

[Industry Name] is responsible for violating the Clean Air Act \_\_\_\_\_ [Number of times] in the past year by releasing illegal amounts of benzene, a carcinogen. Local hospitals report \_\_\_\_\_ [Number of visits] emergency room visits by children with asthma from the parish last month. Moreover, St. Bernard Parish residents are \_\_\_\_\_ [Number of times] more likely to develop cancer than the average American.

“I’ve seen more kids with asthma in the past month than I have the rest of the year put together,” says Tom Jones, a nurse at St. Mary’s clinic.

“My daughter, Sara, had to quit the soccer team because she was having so much trouble breathing,” says Lucy Smith, who’s daughter attends \_\_\_\_\_ [School Name].

As a part of its campaign to get \_\_\_\_\_ [Industry Name] to clean up its act, [Your Organization] held a press conference on the fenceline this weekend. [Your Organization] asked [Industry Name] to clean up its act by complying with clean air laws and also requested that [Industry Name] offer optional property buyouts to fenceline residents who are sick of breathing dirty air. [Your Organization] plans to protest at an upcoming [Industry Name] shareholder meeting next month.

“\_\_\_\_\_ [Industry name] shareholders must not know what it’s like to live next door. Otherwise, they would never support industry name financially,” said Lucy Smith. “I encourage everyone who is sick from the air to attend the shareholder meeting protest.”

\_\_\_\_\_ [Your Organization] encourages residents who aren’t able to attend to handwrite personal letters to the shareholders. You may bring your letter to the protest, where \_\_\_\_\_ [Your Organization] will be presenting them to shareholders. If you want to write a letter but are unable to attend, send your letter to \_\_\_\_\_ [Your Organization] at the address below.

To learn more about the work of \_\_\_\_\_ [Your Organization], contact Lucy Smith at (xxx) xxx-xxxx or e-mail \_\_\_\_\_ [Your Organization]@mail.com. \_\_\_\_\_ [Your Organization] meets on Wednesday nights at 7 p.m. at the home of Jerry Jones, xxx Campaign Street. The public is welcome.

[At the end of every press release, include a paragraph that states general information about your group. It should look something like this:]

About \_\_\_\_\_ [Your Organization]

\_\_\_\_\_ [Your Organization] seeks to improve the health of St. Bernard Parish by working for clean air and a safe environment. [Include any other general information about who you are and what you do that seems relevant.] \_\_\_\_\_ [Your Organization] may be contacted at: [phone, e-mail, and address]

## Holding the Press Conference

If you have vital information to release to the press, you can follow up your press release with a press conference. Be cautioned, though, that if you waste a journalist's time with just one run-of-the-mill press conference in which there is no real news story, the media aren't likely to show up again.

When you do have a big enough announcement to warrant a press conference, you'll need to make sure you're prepared for the event. You'll want to nominate one or two group members to speak at the event, and every group member in attendance should know your main talking point(s). When speaking to the press, stick to the talking points and keep it simple. This will ensure that whatever sound bites get printed or receive airtime contain the message you want to get across. Attention-getting props help, too. You and your neighbors might all wear respiratory masks (the kind you get at a hardware store if you're going to sand paint). The newspapers and television stations are more likely to give you coverage if there's an exciting visual to go with your message. Last but not least, it is important to be strategic about the timing and location of the press conference. Think about where the press would be willing to travel, and what time you need to talk to reporters in order to be covered on the evening news.

## Letters to the Editor

Many people regularly read letters to the editor, and key decision-makers follow them closely. Use letters to try and influence decisions that impact your campaign, and in your letter, urge community members to think and take action. Letters to the editor are also a good way to challenge positions the paper has recently taken. Consult the following "Checklist for an Effective Letter to the Editor" for tips on writing and submitting your letter.

## Checklist for an Effective Letter to the Editor

- Keep it short and to the point. The biggest mistake people make is discussing more than one issue. Discuss only your most important point. Your letter should be around 250 words.
- Try to come up with a catchy opening sentence.
- Make your letter "hit home" by discussing how families and individuals in the community are affected.
- Conclude by encouraging other community members to take action.
- Sign the letter, and provide your address and phone number so the newspaper can call you to verify that you wrote the letter.
- Check the paper to make sure you've followed their submission rules. The box on this page contains contact information for several local and national papers.

## Local and National Newspapers

*The Times-Picayune*

Phone: 1-800-925-0000

Web site: [www.nola.com](http://www.nola.com)

E-mail: [letters@timespicayune.com](mailto:letters@timespicayune.com)

*St. Bernard Voice*

Phone: (504) 279-7488

Web site: [www.thestbernardvoice.com](http://www.thestbernardvoice.com)

E-mail: [roy@lastbv.nocoxmail.com](mailto:roy@lastbv.nocoxmail.com)

*USA Today*

Phone: 1-800-872-7073

Web site: <http://www.usatoday.com/marketing/questions.htm#letterEditor>

**“WE TURNED IT INTO  
A PARTNERSHIP”**

– Lead Organizer, Detroit MI

# Using the Media: A Success Story

Detroit, Michigan Medical Incinerator Shuts Down



Photo Credit: © 2007 Sierra Club  
All Rights Reserved

“Shut it Down, Henry Ford,” and “Stop Smoking” read signs posted on the yards throughout a Detroit, Michigan neighborhood. Henry Ford, a large health care system, had a history of burning medical waste that contributed to poor air quality and high child asthma rates in a predominately African American neighborhood. Henry Ford had long since shut-down its medical waste incinerators in more affluent neighborhoods north of Detroit, but this inner-city incinerator continued to ooze harsh chemicals.

In 1998, when the struggle to close the incinerator began, the hospital burned approximately 6 million pounds of medical and solid waste every year. Still, the incinerator operator claimed, **“We know it operates within all the requirements and is safe.”**

A neighborhood coalition formed between citizens, local and national non-profits, and county politicians who fought to shut down the incinerator. After three years of continuous pressure from the coalition, Henry Ford agreed to close the waste incinerator—a monumental victory for the community and coalition.

## How Did the Coalition Do It?

The coalition’s message was always shaped in a positive light as it attempted to develop a partnership with Henry Ford:

*We never attacked the hospital in an adversarial way. ... Our approach was that this was something the hospital would want to do if it was interested in the health of the neighborhood. We went to them and said, “We’ll help you in any way we can.”*

–Lead Organizer

The collective voice of the coalition was a strong force that helped the neighborhood reach its goal of shutting down the incinerator.

*The hospital also recognized the strength and staying power of the coalition, said a lead organizer. They shuffled us around at first. Then they realized we weren’t going away.*<sup>3</sup>

## Questions to Consider

- What are the messages that you want to convey?
- What is the tone of the community action you would like to create?
- How is your opponent likely to respond to the way you’ve framed your talking points?
- Is there a way that your media message can be framed to give agencies and politicians a chance to shine without compromising your goal?

For more information on how you might create a similar neighborhood coalition, please contact:

### Detroiters Working for Environmental Justice

Ms. Donele Wilkins, Director

E-mail: [DWDWEJ@aol.com](mailto:DWDWEJ@aol.com)

Source: The Sierra Club. The Planet Newsletter, “Henry Ford (Cough) Quits Smoking Detroit Coalition Forces Hospital Incinerator Shutdown”. Author John Byrne Barry, October 2001. Available at: <http://www.sierraclub.org/planet/200110/victory.asp>.



“Using the Media” is a success story of a group from Michigan that used the media to win its campaign for a safe environment. As you read the success story, you should pay close attention to the way the group developed its talking points in a non-adversarial way. This was a strategic decision on the citizens’ part. By saying that the facility should want its neighboring communities to be healthy, the community gave the facility the opportunity to both comply with the community’s demands and to come across in the press as a good neighbor.

In the end, good public relations for the facility translated into a win for the community.

## INFLUENCING GOVERNMENT DECISIONS THAT AFFECT YOUR COMMUNITY PERMITTING DECISIONS

Whenever a new facility is planned or a substantial change is made to an existing facility, the owners will likely need a new permit from the government. During the permitting process, there is a lot of opportunity for public participation, and you can use permitting notice and comment hearings to challenge a decision or to get it modified in your favor. Proposed permits will be posted in public places, usually in the newspaper.

If you're concerned about a facility, you can call local environmental groups or state and national environmental agencies to ask if a permit is going to be required for the facility. Be sure to get concerned people in your community to submit comments, and attend the meetings if possible.

*See Chapter 1 for environmental group contact information, and Chapter 5 for U.S. Environmental Protection Agency (U.S. EPA) and Louisiana Department of Environmental Quality (LDEQ) contact information.*

### Capitalizing on Political Opportunity

Politicians can make or break your campaign. Smart groups know how to make the most out of political opportunity. The first step to effectively gaining political support is to get to know the elected officials who you may be able to win over. The box at right will help you get started.



### POTENTIAL POLITICAL ALLIES

When and where does the St. Bernard Parish Council meet?	Time: _____ Place: _____
Who on the council is likely to be an ally to your campaign? <i>(For example, is there an individual who is up for reelection and would jump at the opportunity for lots of media exposure? If so, you may want to ask him or her to publicly support your campaign.)</i>	Name: _____ Phone: _____ E-mail: _____
Who do you contact to sign up to testify or to get your issue discussed at the St. Bernard Parish Council meetings?	Name: _____ Phone: _____ E-mail: _____
Who is your representative in the Louisiana House of Representatives?  Who is your representative in the Louisiana State Senate? <i>(Call the St. Bernard Registrar at (504) 278-423, or visit <a href="http://www.legis.state.la.us">www.legis.state.la.us</a> to find out)</i>	State Representative: _____ Phone: _____ E-mail: _____ Address: _____  State Senator: _____ Phone: _____ E-mail: _____ Address: _____
Is either your state senator or state representative likely to be an ally in your campaign? How could you motivate him or her to help you?	Potential Ally: _____ Phone: _____ E-mail: _____ Motivating Tactics: _____ _____
Who is your representative in the United States House of Representatives?  Who is your United States senator? <i>(Call (202) 785-8683, or put your zip code into the search box on the League of Conservation Voters Web site to find out: <a href="http://www.lcv.org">http://www.lcv.org</a>)</i>	U.S. Representative: _____ Phone: _____ E-mail: _____ Address: _____  U.S. Senator: _____ Phone: _____ E-mail: _____ Address: _____
Is either your U.S. senator or U.S. representative likely to be an ally in your campaign?  The Web site, <a href="http://www.opensecrets.org">www.opensecrets.org</a> , is a great place to find out who the major donors are to your congressman or congresswoman. Also, <a href="http://www.lcv.org">www.lcv.org</a> can tell you how he/she voted in the past on issues like environmental protection.  Based on your research, how could you motivate your congressperson to help you?	Potential Ally: _____ Phone: _____ E-mail: _____ Motivating Tactics: _____ _____ <i>Additionally, be sure to write letters to potential political allies explaining the problem and asking for help. Invite them to group events such as press releases and meetings.</i>





## USING CREATIVITY IN YOUR CAMPAIGN

Using creativity in your campaign can renew interest in your cause and give your campaign renewed momentum. Using theater, photographs, and art are some creative ways you can bring attention to your campaign.

In the summer of 2006, St. Bernard residents displayed pictures of their experiences with Katrina at a photo exhibit organized by Piper Hansen, a Smith College student, and sponsored by the St. Bernard citizens for Environmental Quality and Louisiana Bucket Brigade. The photo show, held at Flour Power on Paris Road, got people together to talk about their experiences with Katrina. The exhibition also got television coverage. Pictures from the show are featured throughout this handbook.

*What are some of the ways your campaign could use your creativity to gain support?* \_\_\_\_\_

## TAKING YOUR CAMPAIGN TO COURT—THE LAST RESORT

When many people think of *conflict* in the context of communities organizing to prevent environmental hazards, they often think of a David and Goliath-type struggles that often involve courtrooms. Conflict can be much more creative than this, however, and the courts are not usually your best bet. Turning your campaign into a legal battle takes many decisions out of the hands of the community, and it can result in years of painful and expensive trials with little likelihood of success.

You want to maintain control of the direction of your campaign. So, when it comes to getting lawyers involved, your attorney should be “on tap, not on top.”<sup>4</sup> By handing over your campaign to attorneys, you run the risk of overspecializing and complicating things. It can’t hurt to consult environmental attorneys about your issue, but think carefully before taking legal action.

Organizational strategies that combine media and political tools are usually the most effective. Taking your campaign to court is an expensive gamble—in some cases, you might win a judicial mandate for clean up or a substantial pay-out for you and your neighbors. But if a court rules against you, that decision could seriously undermine your efforts, drain precious resources, and add many years to your campaign.

Luke Cole, one of the foremost environmental justice lawyers in the country, says the following:

*[E]nvironmental hazards are not legal problems, but political problems. Someone in the government has decided to allow a company to dump in their neighborhood, or to pollute their air. Thus, a political tool is required to change that decision: a community-based movement to bring pressure on the person or agency making the decision. Using a legal strategy rather than a political one would likely fail these communities; a legal victory does not change the political and economic power relations in the community that led to the environmental threat in the first place.<sup>5</sup>*

In certain circumstances, however, lawsuits have been effective. For example, a Texas refinery citizen group won the equipment currently being used to monitor the air in Chalmette in a lawsuit. Within the Gulf area, there are several good public-interest legal resources that you can contact to set up an appointment and find out whether litigation is the right option for you. Below are two public interest law firms and clinics that you may wish to contact.

*Tulane Environmental Law Clinic*

Phone: (504) 865-5789

Web site: [www.tulane.edu/~telc/](http://www.tulane.edu/~telc/)

E-mail: [lswanner@tulane.edu](mailto:lswanner@tulane.edu)

*Wildlaw's Assisting Communities with Environmental Solutions (ACES) Program*

Phone: (850) 878-6895

Web site: [www.wildlaw.org](http://www.wildlaw.org)

E-mail: [jeanne@wildlaw.org](mailto:jeanne@wildlaw.org)

## GETTING MONEY FOR YOUR CAMPAIGN: YOU GOTTA ASK FOR IT

There are a lot of dollars set aside for campaigns just like yours. **Someone wants to give your group money, but you're not going to get any if you don't ask for it.** The resources below will help you in your search for prospective funding sources and guide you through the steps of writing a great grant proposal. Don't forget to thank your funders! Thanking donors and staying in touch will help you maintain a good relationship with them, and it may make them more likely to donate again if you need additional funds in the future.

*The U.S. Environmental Protection Agency (U.S. EPA)* provides a step-by-step guide to grant writing at:

<http://www.epa.gov/ogd/recipient/tips.htm>

*The Foundation Center* is a great resource for foundation money: <http://www.foundationcenter.org/>

The federal government maintains a Web site where community groups can search for federal dollars to help with their campaigns:

<http://www.grants.gov>

## POTENTIAL SOURCES OF ADDITIONAL SUPPORT

Aside from money, your group may need professional consultation about legal, political, or scientific matters. The following national environmental organizations have expressed a desire to support community campaigns and may be interested in helping. Be sure, though, that you stay in control of your campaign every step of the way. Before contacting a national organization for help, be ready to clearly define the kind of assistance you're going to ask for. Although these organizations are experts on environmental matters, many of them are used to working at the national level and not with individual communities. Community groups can lose control of their campaigns when they give away their decision-making power to others. Work with these groups but retain decision-making control. Your campaign is yours, and you should control its direction from start to finish.

### **Earthjustice**

Phone: (800) 584-6460

Web site: [www.earthjustice.org](http://www.earthjustice.org)

E-mail: [info@earthjustice.org](mailto:info@earthjustice.org)

### **Environmental Defense - Southeast Office**

Phone: (919) 881-2601

Web site: [www.environmentaldefense.org](http://www.environmentaldefense.org)

### **Natural Resources Defense Council**

Phone: (212) 727-2700

Web site: [www.nrdc.org](http://www.nrdc.org)

E-mail: [nrdcinfo@nrdc.org](mailto:nrdcinfo@nrdc.org)

## FURTHER INSPIRATION

*The Ohio Citizen Action group has put together a wonderful book full of advice on fighting pollution. The book, "Good Neighbor Campaign Handbook: How to Win," is available at online booksellers such as Powells.com. Alternatively, you can download a copy for free at the following link: <http://www.ohiocitizen.org/about/finalinside.pdf>.*

*The U.S. Environmental Protection Agency (U.S. EPA), through its Community Action for a Renewed Environment (CARE) program, provides a detailed online guide to organizing and running a campaign. The guide has several useful links that cover everything from understanding risk to reducing your exposure. To view the guide, visit the following link:*

*[http://www.epa.gov/osp/care/library/CARE\\_Resource\\_Guide.pdf](http://www.epa.gov/osp/care/library/CARE_Resource_Guide.pdf)*

## CELEBRATING YOUR SUCCESSES

We know coastal Louisianans don't need much instruction about how to celebrate; however, we want to stress how important it is that you and your fellow campaigners celebrate every success along the way. People want to join successful organizations. So, it is important to choose issues that are winnable, and to keep people's spirits up by celebrating each success that comes your way.

While reading the success stories that were included in this handbook, it is important to remember that all of the people in them faced great difficulties. You, too, are likely to face resistance when you begin organizing. However, it is important to celebrate each victory, no matter how small. Getting media coverage for your campaign, meeting with industry or government representatives, or gaining a member are all important successes. Celebrate each success, no matter how small. Parties, recognition, and awards keep momentum in your campaign and encourage more community members to support you.

**YOU  
CAN  
CHANGE  
THE SITUATION**

## CHAPTER SUMMARY

- Getting organized is easy: start by having conversations about issues that concern you.
- Use tools such as the media to make your campaign successful.
- Be persistent and never give up hope! You CAN change the situation.
- You don't need to work alone. Contact other organizations that are addressing similar issues.
- Celebrate your successes--large and small!

## FOOTNOTES

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<sup>1</sup> Adopted from the “force field analysis,” a method developed by psychologist Kurt Lewin in 1947, and expanded upon in Bunyan Bryant’s “Social and Environmental Change: A Manual for Advocacy and Organizing”

<sup>2</sup> Adopted from “Social and Environmental Change: A Manual for Advocacy and Organizing” by Bunyan Bryant.

<sup>3</sup> Barry, John, B. 2001. Henry Ford (Cough) Quits Smoking Detroit Coalition Forces Hospital Incinerator Shutdown. The Sierra Club, The Planet Newsletter, October 2001. <http://www.sierraclub.org/planet/200110/victory.asp>.

<sup>4</sup> Quote attributed to environmental justice activist Pat Bryant.

<sup>5</sup> Luke Cole “Empowerment as the Key to Environmental Protection: The Need for Environmental Poverty Law” 19 Ecology L.Q. 619, 648 -649

WHAT YOU SAID

**We are coming back stronger than ever [and] with more empathy than before. We are going to be a smaller community, but we will be a tighter community.**

—St. Bernard resident



## Concluding Thoughts

In the summer of 2006, you graciously took the time to talk with us about your concerns regarding health and potential contamination in your community. Each of us was sincerely moved by the conversations that we had with you.

As you know, the purpose of our research in St. Bernard was to understand your questions and concerns about health, the environment, and the Murphy Oil spill. This handbook is an attempt to objectively address these concerns; we hope that the information we provided has helped you find answers to some of your questions.

During the time we spent talking with you, we observed connections between residents' access to information and their levels of anxiety and feelings of powerlessness. In a democratic society, citizens must have equal access to information. It is critical that communities with more than their fair share of environmental risks have adequate access to information about contamination and its associated health risks.

When we began writing this handbook, we realized that the information you needed was not always easy to find. We consulted professors, government agencies, and non-governmental organizations in an effort to present you with the best information we could find. Additionally, we aimed to plant seeds of hope by sharing the stories of other communities that have successfully found solutions to similar contamination issues.

Of course, there were limitations: we did not have enough time, and we could not answer all of your questions. Ideally, we would have moved to southern Louisiana immediately after the storm and collaborated with residents in the development of this handbook. That way, this information would have been in your hands six months after the storm as opposed to two years later. Unfortunately, the academic calendar made this impossible for us to do.

In our survey, St. Bernard residents raised a host of concerns. However, it was beyond the scope of this handbook to address issues related to air pollution, water pollution, West Nile virus, Mississippi River Gulf Outlet, mold, and other concerns expressed to us. Along with these concerns, long-term issues that are related to climate change, wetland loss, land loss, and cultural preservation also require immediate attention. We hope that you found our focus of soil and sediment contamination helpful.

Please remember that with persistence we can bring change. In the words of Saint Francis of Assisi, **“Start by doing what’s necessary; then do what’s possible; and suddenly you are doing the impossible.”**

We encourage you to contact us with comments, concerns, and feedback to this handbook. Please e-mail us at [st.bernard.survey@umich.edu](mailto:st.bernard.survey@umich.edu).

We would like to express our many thanks to all who aided this research. We'd also like to especially thank the residents of St. Bernard Parish.

**Thank You.**

*Katherine Foo, Heather Gott, Meredith Haamen, and Suzanne Perry*

**School of Natural Resources and Environment  
University of Michigan, Ann Arbor  
Spring 2007**

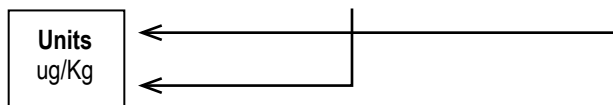


Photo Credit: Frank Chadwick. St. Bernard Parish, LA. Images used from Photo Exhibit "Life in the Wake of Katrina."

# Appendix A

## The Citizen Scientist's Toolbox: Making Sense of Measurements

When you opened up your lab report, did you notice word “Units” written near the top of the page? Next to the word “units”, you may have seen “mg/kg” or “ug/kg”

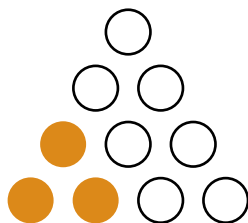


Often, scientists look for how many micrograms ( $\mu\text{g}$ ) of each chemical are present in each kilogram (kg) of soil. In other words, they look for the *ratio* between the chemical and the soil.

Need a refresher on ratios? Imagine that your child took an unknown amount of orange juice concentrate and mixed it with water. You might wish that you could test the mixture to find out the how much orange juice concentrate your child added to the water. You would be trying to find the *ratio* of concentrate to water. This is similar to what happens when hazardous chemicals mix into our soil—scientists must test the soil to find out the ratio of the chemical to the soil.

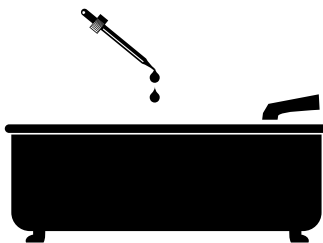
### EXAMPLE #1 Remembering Ratios

In the figure below, as you can see, there are 10 balls. Three out of the 10 balls are orange. So, there is a three to ten (3 of 10) of orange balls.



### EXAMPLE #2 Making Sense of Parts per Million in the Bath

We can make sense of parts per million using the example of water in a bathtub. One million drops of water is approximately equal to 27 gallons. A normal bathtub is usually 25 to 35 gallons.



Let's say that there are arsenic levels in the water are 15 parts per million (ppm). This means that the arsenic contamination is equivalent to 15 drops of arsenic in a bathtub of water.

### EXAMPLE #3 Making Sense of Parts per Million in my soil

Imagine that the lab found 15 milligrams per kilogram (mg/kg) of arsenic in your soil. This is the same as 15 parts per million. This means that in each kilogram of soil (approximately 2 ½ pounds of soil) they found 15 milligrams of arsenic (less than a vitamin capsule).



## FOOTNOTES

<sup>xxxii</sup> If there are larger amounts of the chemical in the soil, scientists will look for milligrams per kilogram (mg/kg).

# Appendix B

## The Citizen Scientist's Toolbox: Comparing Your Data to Dollars and Cents

The chemicals on your lab report were most likely measured using the metric system. This table will help you brush up on milligrams and kilograms - the units used to explain the amount of contaminants in your soil.

The following is an exercise for you to become a little more familiar with how contamination is measured. Units on lab reports are can be converted so that you get a better sense of what the amounts mean. First, though, we need to practice converting into different units. We will use money as an example.

Try converting measurements with units of money. Cents (¢) are the smallest unit of money and can be converted to larger units such as a dollar (\$).

<i>Smaller</i> ----->	<i>Larger</i>
<i>Cents (¢)</i> ----->	<i>Dollars (\$)</i>

A handy trick for converting units is to jump the decimal point right or left. Start by remembering that when you have one dollar, you have one-hundred cents.

<i>\$ 1.00 (ONE DOLLAR)</i>	=	<i>100.00 ¢ (One hundred CENTS)</i>
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So, if you have \$1.00, you can move the decimal point after the ONE two spots to the right to show that you have 100.00 CENTS.

### **Unit Conversions Helpful for Soil Sample Reports**

The numbers on your lab report may be confusing because you are not familiar with the units of measurement and the amount of contaminants found in your samples seems unclear. For example, your soil report might present your results in milligrams per kilogram but government standards for soil safety use words like parts per million (ppm) and parts per billion (ppb). While these measurements may appear different, they actually are related. Take a look at Appendix A for more details on parts per million.

We can convert all these various numbers just like we changed dollars to cents. It's all about the zeros and decimals.

1,000,000,000 Micrograms (µg) ---> 1,000,000 Milligrams (mg) ---> 1000 Grams (g) ---> 1 Kilogram (kg)	
<i>Smaller Units</i> ----->	<i>Larger Units</i>

# Appendix C

## The Citizen Scientist's Toolbox: Understanding Probability and Risk

If one million people buy a raffle ticket and just one person can win, what is the probability that you will win the raffle?

$$\frac{1 \text{ person wins}}{1,000,000 \text{ people buy a raffle ticket}} = 1 \text{ in } 1,000,000 \text{ probability of winning}$$

How does a raffle apply to our health? Our understanding of probability helps us to understand the risk that we will get sick as a result of exposure to a hazardous chemical. Let's look at an example:

Imagine that there is a community with a drinking water supply that is contaminated with a chemical called benzo(a)pyrene. Benzo(a)pyrene is found in crude oil, tar, cigarettes, burned food, and other places. Benzo(a)pyrene causes cancer in animals.

Let's say that there are 0.5 micrograms of benzo(a)pyrene in each liter of tap water. Imagine that 10,000 people in the community drink water from the tap. One person drinking water from the tap develops cancer as a result of exposure to benzo(a)pyrene .

What is the probability (or risk) of developing cancer as a result of benzo(a)pyrene exposure in this community?

$$\frac{1 \text{ person develops cancer}}{10,000 \text{ people exposed to benzo(a)pyrene}} = 1 \text{ in } 10,000 \text{ risk of developing cancer}$$

If the probability of developing cancer is 1 in 10,000 or less, government agencies often consider this to be an acceptable risk level.

### What level of risk do you feel is acceptable?

#### FOOTNOTES

<sup>xxxiii</sup> To know that the cause of cancer was due to exposure to a specific chemical, we would control for other factors that may cause cancer (such as cigarette smoking, diet, etc.).



# Appendix D

## Understanding the Soil Contamination Maps

These maps were created with software called Geographic Information Systems. The time range of samples displayed in these maps is from September 2005 through July 2006. The data displayed in the maps were taken from the U.S. Environmental Protection Agency's (U.S. EPA's) Katrina Central Data Warehouse, which is accessible online. Downloadable text files of contamination levels in sediments were used to create the maps. No contamination values were changed in this manipulation, and if two samples were taken twice at one location during two or more different time periods, the lowest detected level was used.

The purpose of these maps is to provide you with a general understanding of the various levels of sediment contamination measured by the U.S. EPA. It is not our intention to make a final judgment on whether conditions are safe to remain or return to the parish. This is because the following is true:

- 1) Sediment sampling has not covered the entire parish.
- 2) Potential health risks in the parish extend beyond soil contamination.
- 3) There are inherent limitations to interpreting the health risks associated with levels of contamination displayed on the maps.

Rather, it is our goal to provide you a few tools that will hopefully allow you to see potential contamination throughout the parish and Murphy Oil spill area.

You will find two different types of maps in this handbook:

- Point Maps

*Point maps display actual contamination levels that are broken down into categories based on the Louisiana Department of Environmental Quality RECAP standards, which vary for each contaminant. 'High levels' indicate where samples exceeded a Management Option-1 RECAP standard and indicates that further investigation and monitoring should occur.*

- Predictive Maps

*You will find predictive maps of diesel range and oil range organic contamination in the approximate Murphy Oil spill area based on actual point sampling. The purpose of these maps is to give you a general idea of possible contamination trends in the area most likely affected by the oil spill. It is important to stress that these maps are predictive and contamination levels should not be taken literally at every point in the oil spill area. As with any predictive model, there is always room for variation from the predicted value. In other words, actual contamination levels could be greater or less than what is shown on the maps. With this in mind, simply know these maps depict an abstracted picture of contamination and not actual contamination.*

Many contaminants were tested for and not found; therefore, we chose to focus on five different contaminants that were detected in St. Bernard Parish.

- Diesel Range Organics (DROs)

- Oil Range Organics (OROs)

*DROs and OROs were tested for in and out of the Murphy Oil spill area. The presence of these contaminants may indicate the presence of Murphy Oil, particularly closest to the refinery. It is important to understand, however, that the presence of DROs and OROs does not necessarily indicate the presence of Murphy oil – experts have employed advanced techniques to determine if oil came from Murphy Oil, Co.*

- Benzo(a)pyrene (B(a)P)

*B(a)P is known to cause various types of cancer in animals and is potentially very harmful to humans. B(a)P is found in petroleum products.*

- Lead (Pb)

- Arsenic (Ar)

*Pb and Ar were not extensively sampled in the oil spill area as these heavy metals are not readily found in crude oil. While the sources of these metals may be different from the Murphy Oil spill, it is still important to investigate the presence of these metals because they do not break down in soil very quickly.*

**Advantage:** Mapping is a powerful tool that allows you to visualize what contamination may be present in your neighborhood.

**Limitations:** Although we stand behind these maps as an important resource for St. Bernard residents, it is essential that you understand the limitation of these maps. The following are several points that need to be considered when viewing contamination levels visually expressed by the maps:

- Samples displayed in the maps were taken from September 2005 to July 2006.
- Maps may not reflect accurate, real-time diesel and oil range organic contamination due to the natural breakdown of these compounds.
- Predictive maps display samples compounded over time.
- Maps will not tell you exactly what contamination levels may exist on or around your property – elements of the maps have been enhanced to easily communicate contamination trends.
- Arsenic and lead were not extensively sampled in the Murphy Oil spill area as these heavy metals are not readily found in crude oil.
- Maps do not display the last round of confirmatory sampling performed by the U.S. EPA in August 2006.

# Understanding the Open Space Maps

## Priority Areas for Remediation

### Purpose

The purpose of this map is to provide one strategy for addressing vacant lots and diesel oil contamination in St. Bernard Parish. This strategy considers all vacant lots in the parish, which are the points on the map. High priority for remediation is determined by areas that exhibit high levels of diesel range organic (DRO) contamination (areas where one or more sediment sample was greater than 650 ppm) and high levels of vegetation (areas that were classified as undeveloped natural resource areas, such as wetland, marsh, parkland, upland forest, etc.). If an area is classified as very highly contaminated and has many trees and plants, the map assumes that it would be more suitable for remediation. If an area is marginally contaminated and highly developed, the map assumes that it would not be suitable for remediation.

### Criteria

	Low contamination (<65 ppm)	Medium contamination (65-650 ppm)	High contamination (>650 ppm)
Low vegetation	4	3	2
Medium vegetation	4	2	1
High vegetation	4	2	1

1 = Highest priority for clean up

2 = Second priority for clean up

3 = Third priority for clean up

4 = No clean up necessary

### Data Types and Sources:

**Landcover** - National Land Cover Data from 2001 (found at <http://www.epa.gov/mrlc/nlcd.html>).

**Diesel Range Organics** - The time range of diesel range organics soil samples displayed in these maps is from September 2005 through July 2006. The data displayed in the maps were taken from the U.S. Environmental Protection Agency's (U.S. EPA's) Katrina Central Data Warehouse, which is accessible online. Downloadable text files of contamination levels in sediments were used to create the maps. No contamination values were changed in this manipulation, and if two samples were taken twice at one location during two or more different time periods, the lowest detected level was used.

**Vacant Lots** - St. Bernard Parish government data from September 31, 2006 accessed in October 2006 (found at <http://www.sbp.net/>).

### Limitation

This map only considers one group of soil contaminants, diesel range organic (DRO) chemicals, because U.S. EPA data showed that DROs were prevalent in the soils after the hurricanes. This map does not consider the potential effects of the combined presence of DROs with other contaminants, such as heavy metals or other oil contaminants. Additional studies could investigate the potential compound effects of many contaminants in the soil.

## Development Suitability Maps

### Purpose

The purpose of these maps is to help the viewer imagine how current contamination levels might impact future development suitability in the parish. In the maps, development suitability is defined by low levels of contamination, high levels of existing development, and presence of vacant lots. Comprehensive remediation is defined by the application of remediation techniques across the Parish, and no remediation is defined by no application of remediation techniques across the Parish. The difference between the two scenarios is the rate of degradation of diesel range organic chemicals. In the comprehensive remediation scenario, the contaminants degrade four times faster than the no remediation scenario (see "criteria" section for more details). These maps are intended for conceptual purposes and produce two resulting maps that imagine the way that present remediation practices may influence future land suitability. They suggest that comprehensive remediation practices now will allow the parish a broader range of options in future urban planning.

### Criteria

The rate of degradation for the no remediation scenario is defined as having a half-life of 12 years.<sup>xxxiv</sup> This means that the amount of diesel chemicals in the soil would decrease by one-half over a span of 12 years, and then another one-half over the next 12 years, and so on. The rate of degradation for the comprehensive remediation scenario was generalized to break down diesel chemicals four times faster, with a half-life of 3 years. This means that the amount of diesel chemicals in the soil would decrease by one-half

over a span of 3 years, and then another one-half after another 3 years, and so on.

Matrices were created for each indicator (land use, vacancy, and DRO contamination) so that the lower numbers indicated suitability for open space and the higher numbers indicated suitability for development, with residential inbetween.

### Open Space

1	Vegetated open developed	3	Non-vegetated open developed
2	Vegetated low developed	5	Non-vegetated low developed
4	Vegetated medium developed	7	Non-vegetated medium developed
6	Vegetated high developed	8	Non-vegetated high developed

### Vacant

1	Vacant
10	Occupied

### DRO Contamination

1	High Contamination (>650 ppm)
2	Medium Contamination (65-650 ppm)
3	Low Contamination (<65 ppm)

Then a composite map was developed through the following steps:

1. Each of the indicator maps were reclassified from 1-10 for proper calculation
2. Clipped to the proper extent, raster calculator was utilized to perform a weighting and rating analysis as follows: [vacant areas]\*0.2 + [landcover]\*0.3 + [phyto\_contamination]\*0.5
3. Resulting maps were reclassified using equal interval classification to show areas suitable for open space, residential, and commercial/industrial

### Data Types and Sources:

**Landcover** - National Land Cover Data from 2001 (found at <http://www.epa.gov/mrlc/nlcd.html>) was combined with Louisiana State University's GAP Analysis 2001 landcover data (<http://atlas.lsu.edu/rasterdown.htm>) and then simplified into three categories: high, medium, and low vegetation.

**Diesel Range Organics** - The time range of diesel range organics soil samples displayed in these maps is from September 2005 through July 2006. The data displayed in the maps were taken from the U.S. Environmental Protection Agency's (U.S. EPA's) Katrina Central Data Warehouse, which is accessible online. Downloadable text files of contamination levels in sediments were used to create the maps. No contamination values were changed in this manipulation, and if two samples were taken twice at one location during two or more different time periods, the lowest detected level was used.

**Vacant Lots** - St. Bernard Parish government data from September 31, 2006 accessed in October 2006 (found at <http://www.sbp.net/>).

### Limitation

These maps are a beginning point for understanding the ways that our responses to soil contamination may influence future urban planning. They can be developed in a number of ways. This type of scenario-building involves simplifying a number of complex & dynamic factors in order to better understand some of the factors. These maps do not account for the following: transportation paths, transit oriented development, population change, sea level rise, changing economic opportunities, other soil contaminants besides diesel range organics, water contamination, air contamination, and more.

In addition to considering the half-life of DROs, it may be important to look specifically at the type of petroleum hydrocarbon.

xxxv

## FOONOTES

<sup>xxxiv</sup> 2005. Howard P., Meylan W., et al. "A new biodegradation prediction model specific to petroleum hydrocarbons." *Environmental Toxicology and Chemistry*. Aug. 24(8):1847-60

<sup>xxxv</sup> 1995. Huesemann, Michael. "Predictive model for estimating the extent of Petroleum Biodegradation in Contaminated Soils."

# Appendix E

## Summary of Phase Sediment Sampling performed by the U.S. Environmental Protection Agency, Sept. 2005 - Aug. 2006

Between September 2005 and August 2006, the U.S. Environmental Protection Agency (U.S. EPA) and the Louisiana Department of Environmental Quality (LDEQ) sampled in four phases throughout the New Orleans area:

1. Phase I – Sediment from floodwaters
2. Phase II – Sediment from floodwaters
3. Phase III – Focused sampling of flood-impacted soil and sediments
4. Phase IV – Sampling of residual sediment in flood impacted areas

Here are the important details on each sampling phase:

**Phase I** – The Phase I sampling occurred from September 10, 2006 to October 14, 2005. During this time, the U.S. EPA collected approximately 450 samples throughout New Orleans in areas that had been impacted by floodwaters. The primary purpose of Phase I sampling was to assess:

- Whether hazardous chemicals were present in samples
- Whether immediate conditions posed short-term dangers to emergency workers and residents

**Conclusion from Phase I:** Conditions were not immediately dangerous to emergency workers or residents, and the higher levels of lead and arsenic pre-dated the hurricane.

The U.S. EPA decided that out of the 450 samples taken, 145 areas should be reassessed due to higher levels of contamination. In order for re-sampling to occur, though, sediment must have been a certain depth. *Due to this restraint, the U.S. EPA was only able to re-sample 14 out of these 145 areas.*

**Phase II** – The Phase II sampling occurred between October 29, 2005 and November 27, 2005. The sampling was focused in the Ninth Ward and in St. Bernard Parish where floodwaters were significant. Approximately 280 samples were taken, and the U.S. EPA reports that only four samples had lead that were above acceptable risk levels (400 ppm) – all four of these samples were taken in St. Bernard Parish. All other chemicals were below levels that would warrant the concern of the U.S. EPA and LDEQ.

**As a result of Phase I & II sampling,** the U.S. EPA and LDEQ released a brief summary of results and indicated that only a few locations in the flood-impacted area needed more detailed assessment. This conclusion was not explained further.

**Phase III** – The U.S. EPA and LDEQ continued to investigate 43 sites of potential concern—the exact areas were not specified. The difference between these samples is that the U.S. EPA performed “composite sampling.” This is where the U.S. EPA sampled the soil and sediment in a general area of concern and mixed these samples together to develop what they refer to as a “characterization of the average concentrations of chemicals around the original sampling area.”

The conclusions reported by the U.S. EPA from the Phase III sampling are as follows:

1. “The sediment left behind by the flooding did not contain arsenic at levels that would result in non-cancer impacts or exceed the EPA’s 1 in 10,000 excess lifetime cancer risk.”
2. “A very localized area of benzo(a)pyrene contamination is present in the northwest corner of the Agricultural Street Landfill Superfund site.”
3. “Lead was found in soil samples at several locations in excess of the EPA and LDEQ screening level of 400 ppm.”

\*\*The U.S. EPA contributes the higher levels of lead to exterior lead-based paint and reports that these levels are not unique to New Orleans. Similar levels are found in other older cities throughout the United States, and most of the lead contamination in the area pre-date Katrina.

**Phase IV** – A fourth phase of sampling occurred between February and June 30, 2006 in areas that had been heavily impacted in Orleans and St. Bernard Parishes. The U.S. EPA used these results to 1) generate a map that shows where sediment still exists, and 2) update sampling that occurred in Phase I & II.

The U.S. EPA visited 1,676 locations in these two parishes and sampled at 586 of these locations. Duplicate samples were taken at 126 of these locations. Additional samples were not taken when one of the following conditions were met:

1. The sampling area was in a commercial area.
2. The sediment was not deep enough to take a sample.
3. There was no sediment.

The U.S. EPA did not find anything unexpected nor inconsistent with what they had found in previous phases of sampling; arsenic, lead, and benzo(a)pyrene were each detected in only one sample. All three of these samples were taken from St. Bernard Parish.

# Appendix F

## A Note on Our Research Methods

Research in a post-disaster situation can rarely adhere to the ideals of academia. Under ordinary circumstances, we would have had a list of home addresses in the parish, clustered those addresses according to demographic factors, and taken a random sample of each cluster. However, the devastation created by Katrina made it nearly impossible to adhere to the sampling methods advised in textbooks.

Before the storm, the population of the parish was over 65,000. Now, the population is approximately 8,000. We arrived in St. Bernard Parish with a list of returning residents in hopes of randomizing the list and collecting an unbiased sample of survey respondents. We discovered, however, that “returning” often had more to do with one’s intentions and one’s state of mind than it had to do with one’s actual place of residence.

We quickly realized that we had get out from behind our laptop lists and simply go knock on the doors of FEMA trailers, sit down next to people in laundry mats and barber shops, and simply listen to what they had to say. Although our plan was to collect quantitative survey data, we soon found that the qualitative information that residents shared with us was far more salient than the results of a 2 sample t-test.

Thus, we collected an opportunistic sample—we spoke with whomever was willing to speak with us. We found that the vast majority of individuals we approached were quick to respond with a warm reply colored with a twinge of sadness, “Sure honey, take a seat. What do you want to know?”

Our sampling methodology was less than ideal, and the generalizability of our quantitative survey data is limited. However, we feel that the questions and concerns expressed by survey respondents do indicate a wider need for information in the parish. Furthermore, the stories and perspectives that residents shared are extremely powerful and cannot be ignored.