United States
Environmental Protection
Agency

Office of Public Affairs
Region 5
77 W. Jackson Blvd.
Chicago, Illinois 60604

Illinois, Indiana,
Michigan, Minnesota,
Ohio, Wisconsin

Proposed Plan for Clean Up at the Outboard Marine Company/Waukegan Coke Plant Superfund Site

Waukegan, Illinois **February 1999**

This Update Will Tell You About

- site background
- the alternatives considered to address site contamination
- U.S. EPA's proposed clean up plan
- how to learn more about the site

Public Meeting

U.S. EPA will hold a public meeting to describe the results of the on-site investigations and explain the proposed cleanup plan. Oral and written comments will be accepted at the meeting.

Date: **March 3, 1999**

Time: **7 p.m.**

Place: **Waukegan Public Library Auditorium**
128 North County Street
Waukegan, IL

Public Comment Period

U.S. EPA will accept written comments on the proposed plan during a 30-day public comment period from February 22 to March 23, 1999. A pre-addressed comment form is included in this proposed plan.

Si desea recibir este documento en español, favor de llamar al US EPA 312-353-0628.

Introduction

This **Proposed Plan**[1] identifies the United States Environmental Protection Agency's (U.S. EPA) recommendation for cleaning up contaminated soil and ground water at the Outboard Marine Company/Waukegan Coke Plant Superfund Site in Waukegan, Illinois (see Figure 1). U.S. EPA recommends removal and off-site treatment/disposal of tar-, and creosote-contaminated soil and on-site stabilization/solidification of arsenic-contaminated

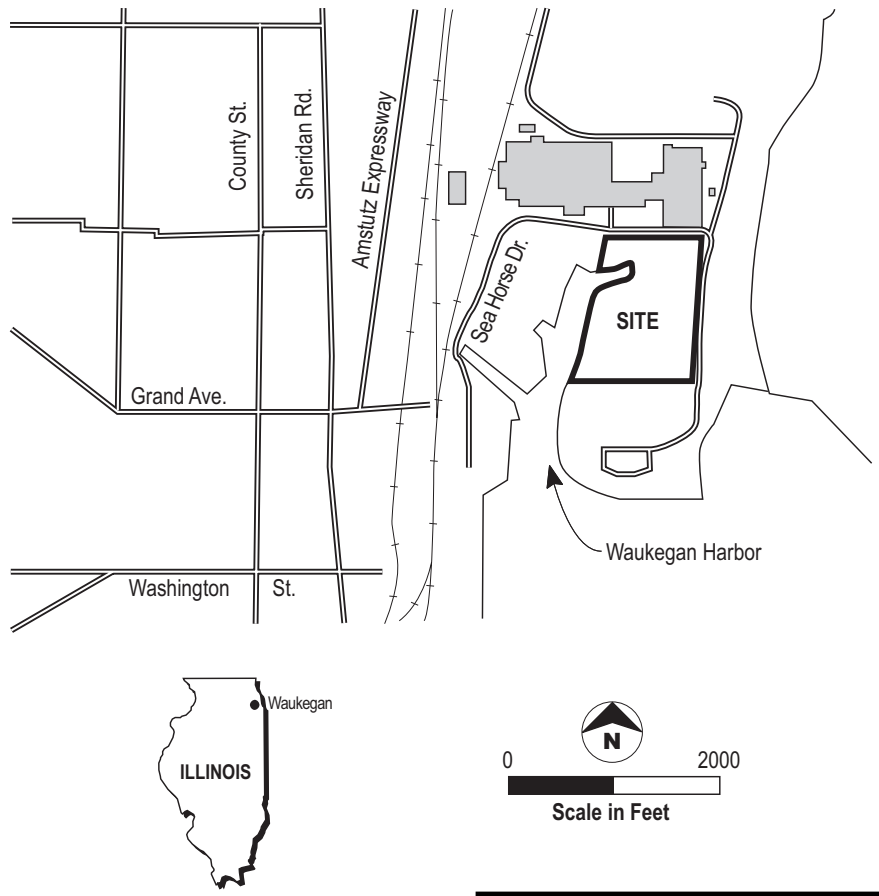

Figure 1 **Site Location Map**

[1] Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires publication of a notice and Proposed Plan for the site remediation. The Proposed Plan must also be made available to the public for comment. This Proposed Plan fact sheet is a summary of information for the Outboard Marine Company/Waukegan Coke Plant site. Please consult the information repository, located at the Waukegan Public Library, for more detailed information.

soil, covering areas of the site with vegetative and asphalt caps, and on-site treatment of contaminated ground water in combination with long-term monitored natural attenuation (see Alternative 3 on page 4 for details).

The site's **Remedial Investigation (RI)** and **Feasibility Study (FS)** and other documents used to develop the Proposed Plan are available for review at the information repository (see page 6). The objective of the RI is to determine the nature and extent of contamination at the site and the purpose of the FS is to evaluate alternatives for cleaning up contamination at the site.

Public input on the cleanup alternatives and the information that supports these alternatives is an important part of the cleanup process. The public is encouraged to review and comment on the alternatives presented in this Proposed Plan (see sidebar on front page and For More Information on page 6).

Site Background

The 36-acre Outboard Marine Company/Waukegan Manufactured Gas and Coke Plant site is located in Waukegan, Illinois, on a peninsula separating Waukegan Harbor from Lake Michigan.

Elgin, Joliet & Eastern Railroad Company (EJ&E) originally purchased the site in 1893. In 1908, EJ&E allowed Chicago Tie and Timber Company to develop the western portion of the site as a creosote wood-treating plant. A manufactured gas and coke plant was built in 1928 and continued operation under various owners until 1969. The coke plant buildings and structures were demolished in 1972. Between 1973 and 1989, Outboard Marine Company used the property for fire training, public parking, snowmobile testing and other activities. Larsen Marine currently uses the northwestern portion of the site for seasonal boat and trailer storage. The Outboard Marine Company data building, administration building, parking lots, and lawn occupy the southeast quadrant. The site and the surrounding area have historically been used as part of the industrial/commercial waterfront in Waukegan. The beach area adjacent to the site on the lakeside is used for public recreation.

The entire Outboard Marine Company/ Waukegan Coke Plant site was listed on the National Priorities List in 1983. The Waukegan Coke Plant contamination was identified during the Outboard Marine Company PCB clean up in 1990.

Remedial Investigation (RI) Results

The RI was completed in 1995. The results of the RI indicate soil at the site is contaminated with coal tar and arsenic as a result of on-site gas manufacturing and creosote from the wood treatment processes. The coal tar and other by-products of gas manufacturing include **polynuclear aromatic hydrocarbons (PAH), phenols, and volatile organic compounds (VOC).** Coal tar contamination is found in discrete deposits in the eastern and southern portions of the site. Arsenic-contaminated soil is found mainly in one location on the eastern part of the site, but lesser concentrations are found along much of the eastern portion of the site (see Figure 2). The creosote contamination was discovered during construction of Slip Number 4 during the Outboard Marine Company polychlorinated biphenyls (PCB) cleanup. A temporary stockpile of creosote-contaminated soil is located south of Slip Number 4 (where the contaminated soils/sediments were removed). Creosote is a combination of distilled coal tar, formed by heating coal, and petroleum oil and is used in pressure treated lumber.

Ground-water contamination occurs in the sand aquifer, which is located from 4.5 feet to 30 feet below the ground surface. The ground water has elevated concentrations of several contaminants.

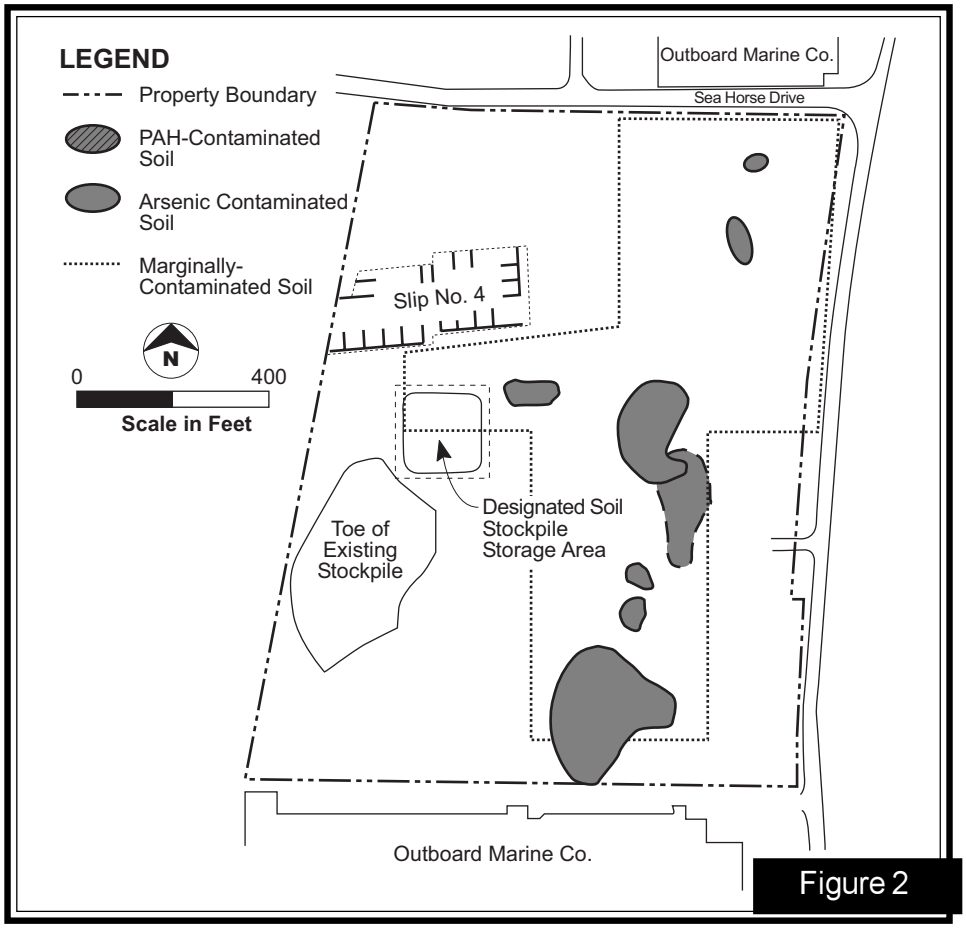

Figure 2

The major contaminants of concern are arsenic, benzene, phenol, thiocyanate and ammonia. The highest concentrations of these contaminants are located in the lower 5 feet of the aquifer. There is a ground-water divide on the eastern portion of the site that results in contaminated ground water being discharged to surface water in Waukegan Harbor to the west and Lake Michigan to the east. In 1996, discharges to Lake Michigan exceeded the State of Illinois Surface Water Quality Standard for open waters for ammonia. However, the ammonia discharge has not exceeded the water quality standards for harbors or breakwaters.

Summary of Site Risks

Surface and subsurface soil samples collected during the RI contained contaminant levels that exceed both State and Federal regulatory standards. **Semi-volatile Organic Compounds (SVOC),** PAHs and inorganic compounds were detected in on-site soil samples in concentrations that could cause potential health risks.

Ground-water sampling at the site and several hundred feet east and south of the site indicates that contaminant concentrations exceed federal Safe Drinking Water Act and State of Illinois Drinking Water Standards.

Human and Ecological Risks

Based on the results of the RI, U.S. EPA evaluated the potential health risks posed by soil and ground-water contamination at the site. The evaluation, called a risk assessment, concluded that the current level of contamination presents a health hazard to people who are exposed to surface and subsurface soil, ground water, and surface water.

The majority of the site has been vacant since the demolition of the buildings in the 1970's, with the exception of the northwest and southeast quadrant of the site. As mentioned above, Larson Marine is currently using the northwest quadrant of the site for boat and trailer storage and an Outboard Marine Company data building, administration building, parking lots, and lawn occupy the southeast quadrant. It is assumed that exposure to surface soils in the northwest quadrant is limited to Larson Marine's boat workers and trespassers. In the southeast quadrant, it is assumed that utility workers are the only people who could be exposed to contaminated subsurface soil.

There are no known uses of ground water on-site; therefore, it is assumed that contaminated ground water does not pose potential health risks to on-site workers or area residents. Access to surface water in Waukegan Harbor is limited, and it is assumed that exposure to contaminated surface water is limited to trespassers. There is also a risk to human health from eating fish from either the lake or the harbor because they may contain small amounts of arsenic.

An ecological assessment was conducted to evaluate the effects of site contaminants on terrestrial and aquatic environments within or near the site. Several site contaminants (phenols, PAHs and metals) were identified that may potentially pose a risk. Observable chemical effects on terrestrial and aquatic organisms were not evident, however on-site studies were limited to qualitative observations only.

Feasibility Study (FS) Results

Summary of Cleanup Alternatives

Based on the results of the RI, U.S. EPA, in consultation with Illinois EPA, evaluated four alternatives, described below, to address soil and ground-water contamination on the site. The FS was completed in 1998. Alternative 1 would take no action to clean up the contamination. Alteratives 2, 3, and 4 involve both on-site treatment and containment and off-site treatment and disposal. These three alternatives consist of two components: one to address soil contamination and one to address ground-water contamination.

Alternative 1 - No Action

The No-Action Alternative involves taking no additional action at the site. The contaminated soil and ground water would remain in place. This alternative is provided as a baseline for comparison to the other alternatives. This alternative would have no associated costs.

Alternative 2 -

Estimated Cost:
Capital - $21,100,000
Operation and Maintenance (O&M)[2] - $17,800,000
Total Cost[3] - $38,900,000

Alternative 2 involves treating and containing contaminated soil and ground water on site.

Soil – The soil cleanup would consist of:

- excavating and treating PAH-contaminated soil off-site by burning at a power plant;
- stabilizing and /or solidifying the arsenic-contaminated soil on-site;
- installing an asphalt cap on the marginally contaminated soil area (see Figure 2);
- a lined storm-water detention basin;
- and land use development restrictions.

Stabilization is accomplished by mixing the arsenic-contaminated soil with a stabilizing agent, such as lime as-

[2] O&M refers to the activities conducted at a site, following remedial actions, to ensure that the cleanup methods are working properly. The O&M costs shown are the annual costs for O&M activities.

[3] The total cost shown is the 30-year present worth costs for the alternative.

phalt or clay. Solidification requires mixing the contaminated soil with Portland cement and allowing it to harden. The asphalt cap could potentially consist of a 12-inch sub base of gravel and a 3-inch layer of asphalt. The purpose of the asphalt cap is to keep precipitation from filtering into contaminated soil and carrying contamination into the ground water beneath the site. The storm-water detention basin is required in order to comply with storm-water discharge permitting requirements for large asphalt parking areas.

Ground water – The ground-water cleanup would consist of developing a containment system on the eastern portion of the site, consisting of a slurry wall system with extraction wells on the inside of the slurry wall to pump out the contaminated ground water. Ground-water treatment cells would be constructed along the beach and harbor where arsenic-, phenol-, organic- and ammonia-contaminated ground water will be treated and then reinjected into the ground (see Figure 3). The ground-water treatment cells consists of a series of extraction and re-injection wells. The contaminated ground water is extracted, treated above ground to reduce the contaminants, and then reinjected into the ground. The ground water will also be monitored inside and outside the cleanup area after the treatment cell process is completed. This alternative would also include monitoring the natural attenuation of the contamination; and institutional controls to prevent the installation of potable water wells.

Variations to Alternative 2 are Alternative 2B which includes disposal of PAH (rather than incineration) and arsenic-contaminated soil at an off-site hazardous waste landfill (rather than stabilization/solidification) and Alternative 2C which includes constructing an on-site containment unit for PAH and arsenic-contaminated soil. The containment unit would consist of a vault that is designed to meet requirements of a hazardous waste landfill.

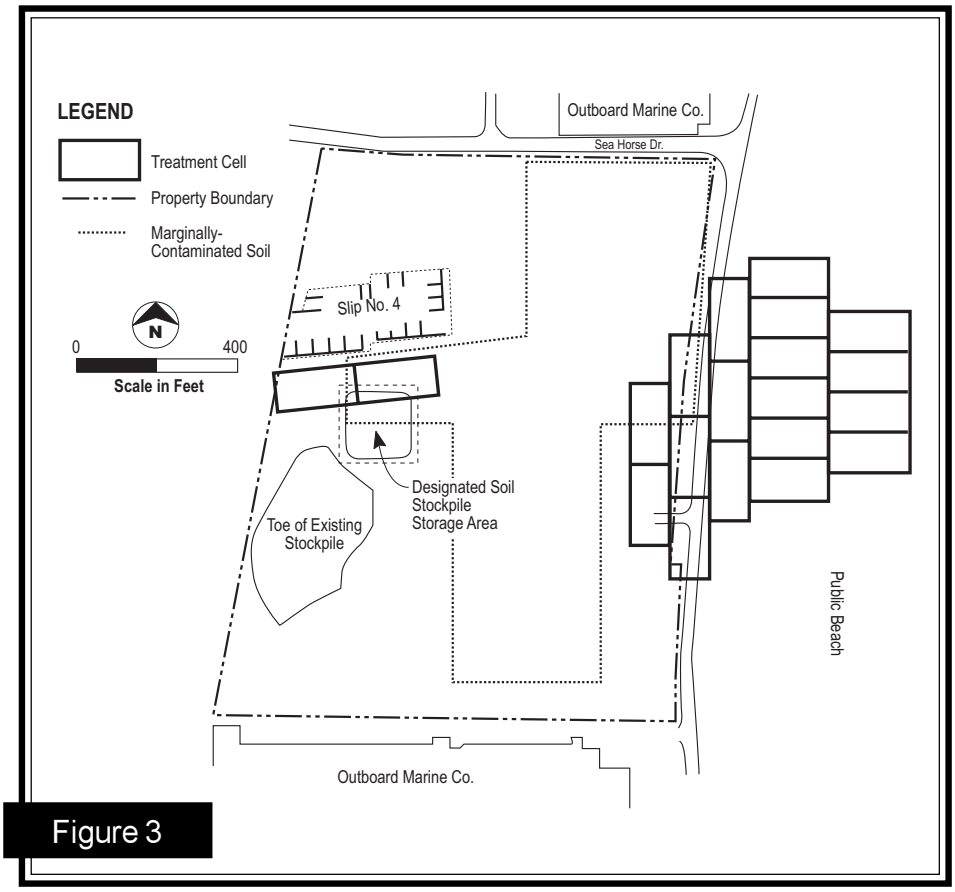

Figure 3

Alternative 3 -

Estimated Cost:
Capital - $14,100,000
Operation and Maintenance (O&M) - $10,900,000
Total Cost - $25,000,000

Alternative 3 involves excavating contaminated soil for both on-site and off-site treatment and disposal and on-site treatment of ground water.

Soil - The soil component consists of excavating the PAH-contaminated soil and treating it through either burning it off-site at a power generating plant or off-site landfill disposal. It also includes stabilizing and solidifying the arsenic-contaminated soil and disposing it on-site, installing a vegetative cover over marginally contaminated areas, implementing institutional controls, and a post-clean up soil management plan.

Ground water - The ground-water clean up is the same as Alternative 2, except for the containment system. The slurry wall system described in Alternative 2 is not a component of Alternative 3.

A variation to this alternative, Alternative 3B, includes disposing all PAH- and arsenic-contaminated soil in a off-site hazardous waste landfill.

Alternative 4 -

Estimated Cost:
Capital - $44,200,000
Operation and Maintenance (O&M) - $56,500,000
Total Cost - $101,000,000

Alternative 4 involves on-site and off-site treatment of soil and both on-site and off-site treatment of ground water.

Soil - The soil cleanup component would consist of treating excavated soil by either burning at a power plant or landfill disposal, stabilizing and solidifying arsenic-conaminated soil and dis-

posing it off-site, and disposing of marginally contaminated soil in a hazardous waste landfill.

Ground water - The ground-water cleanup component involves extracting the contaminated ground water through a series of high-capacity extraction wells and removing the arsenic, phenols, organics, and ammonia prior to discharging the treated ground water to the North Shore Sanitary District. The goal of this alternative is to restore the aquifer to safe drinking water standards.

Evaluating the Alternatives

The U.S. EPA used nine criteria, which are required by law and described below, to evaluate the alternatives. The evaluation criteria are:

1. **Overall protection of human health and the environment** determines whether the alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering measures, or treatment.
2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** evaluates whether the alternative meets Federal and State environmental statutes, regulations and other requirements that pertain to the site.
3. **Long-term Effectiveness and Permanence** considers the ability of the alternative to protect human health and the environment over time and the reliability of such protection.
4. **Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment** evaluates the alternative's effectiveness in the reduction of the harmful effects of principal contaminants, their ability to move in the environment, and the reduction in the amount of contamination present.
5. **Short-term Effectiveness** considers the length of time needed to implement the alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
6. **Implementability** considers the technical and administrative feasibility of implementing the alternative and the availability of goods and services.
7. **Cost** considers the estimated capital, operation and maintenance costs evaluated in the form of present worth costs. Present worth is the total cost of the alternative over time expressed in terms of today's dollars.
8. **State Acceptance** considers whether the State of Illinois agrees with U.S. EPA's analyses

	Alternative 1 No Action	Alternative 2 Containment	Alternative 3 Removal	Alternative 4 Aquifer Restoration
Overall protection of human health and the environment	☐	■	■	■
Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)	☐	■ [1]	■ [1]	■
Long-term Effectiveness and Permanance	☐	■	■	■
Reduction of Contaminant Toxicity, Mobility, or Volume through Treatment	☐	■	■	■
Short-term Effectiveness	☐	■	■	■
Implementability	N/A	■	■	◆
Cost	$0	$38.9 million	$25 million	$101 million
State Acceptance	The Illinois EPA concurs with the recommended alternative.			
Community Acceptance	Community acceptance of the recommended alternative will be evaluated after the public comment period.			

[1] Requires interim waiver of reinjection prohibition.

■ Fully Meets Criteria ◆ Partially Meets Criteria ☐ Does Not Meet Criteria

and recommendations of the studies and evaluations performed.

9. **Community Acceptance** will be addressed in the Record of Decision (ROD). The ROD will include a responsiveness summary, which presents public comments and U.S. EPA's responses to those comments. Acceptance of the recommended alternative will be evaluated after the public comment period.

The **evaluation table** on page 5 compares these four alternatives against these nine criteria.

Recommended Alternative

Based on the information collected to date on soil, ground-water, and surface-water contamination and associated risks to human health and the environment, U.S. EPA recommends a slight modification of Alternative 3 for cleaning up the Outboard Marine Company /Waukegan Coke Plant site.

Under Alternative 3, the creosote-contaminated soil and the coal tar-contaminated soil will be excavated and taken off site for treatment or disposal. Arsenic-contaminated soil will be stabilized/solidified on site. The site will be covered by a combination of vegetation (grass, shrubs, bushes, and trees), asphalt and buildings to reduce infiltration of surface water. Institutional controls and the soil management plan will ensure the future protective use of the site. The groundwater cleanup component includes a combination of on-site treatment and monitored natural attenuation.

The evaluation table shows that Alternative 3 fully satisfies the evaluation criteria for the Waukegan Coke Plant site. Alternative 3 would protect human health and the environment, provide long-term effectiveness, comply with state and federal environmental regulations, be implementable and cost effective. The cost of the recommended alternative is slightly higher than presented in the "Summary of Alternatives" section with the addition of $1.5 million for handling the creosote-contaminated soil. The final cost for Alternative 3, therefore, is $26,500,000. Based on new information or public comments, U.S. EPA, in consultation with the State of Illinois, may later modify the preferred alternative or select another remedial action presented in this Proposed Plan, and in the RI/FS. The public, therefore, is encouraged to review and comment on all of the alternatives identified in this Proposed Plan. The RI/FS should be consulted for more information on these alternatives.

In summary, the recommended alternative is believed to provide the best balance of tradeoffs among the alternatives with respect to the nine criteria used to evaluate the remedies.

For Additional Information

Anyone interested in learning more about the Proposed Plan for the Waukegan Coke Plant site is encouraged to review the information repository located at the Waukegan Public Library, 128 North County Street, Waukegan. An Administrative Record, which contains detailed information upon which the selection of the cleanup plan will be based, is also located at the Waukegan Public Library and at the U.S. EPA Region 5 office in Chicago. For further information about this Proposed Plan, the Waukegan Coke Plant and Outboard Marine Company site please contact:

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Waukegan Citizens Advisory

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CAG Point of Contact
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Waukegan, IL 60079

Next Step

U.S. EPA will consider public comments received during the public comment period before choosing a final cleanup plan for the site. All comments received during the public comment period will be addressed in a "**Responsiveness Summary**," which will be included in the final decision document called a **Record of Decision (ROD)**. The ROD will be available for public review at the information repository.

Glossary

National Priorities List (NPL) - A federal roster of uncontrolled hazardous waste sites that actually or potentially threaten human health or the environment and are eligible for investigation and remediation under the federal Superfund program.

Phenols - organic compounds that are byproducts of petroleum refining.

Polynuclear aromatic hydrocarbons (PAHs) - a group of organic compounds related by their basic chemical structure. These compounds are normally associated with petroleum products, and some are suspected to cause cancer. PAHs are commonly components of petroleum products such as tars and oils that are generated during incomplete combustion of petroleum and coal fuel.

Proposed Plan - A public participation requirement in which U.S. EPA summarizes for the public the preferred cleanup strategy and the rationale for the preference, reviews the alternatives presented in detailed analysis of the remedial investigation/feasibility study, and presents any waivers of cleanup standards which may be proposed.

Record of Decision (ROD) - A legal document signed by U.S. EPA that describes the final cleanup remedy for a Superfund site, why the remedial action was chosen, how much it will cost, and public comments and U.S. EPA's response.

Remedial Investigation and Feasibility Study - A two-part study that is completed before any remedial cleanup can begin. The first part is the remedial investigation, which studies the nature and extent of the problem. The second part is the feasibility study, which evaluates different methods of dealing with the problem and selects a method that will effectively protect public health and the environment.

Responsiveness Summary - A summary of oral and/or written public comments received by U.S. EPA during a comment period on key documents, and U.S. EPA's response to those comments.

Risk Assessment - The part of the remedial investigation report that discusses the potential for human and ecological exposure to site contaminants.

Volatile Organic Compounds (VOC) and Semi-Volatile Organic Compounds (SVOC) - Compounds of primarily carbon, oxygen, and hydrogen characterized by their tendency to evaporate easily and quickly. VOCs are found in liquids such as dry cleaning fluid, lighter fluid, paint thinners, and components of gasoline.

Mailing List Additions

If you did not receive this fact sheet in the mail, you are not on the mailing list for the Waukegan Coke Plant Superfund Site. To add your name, or to make a correction, please fill out this form and mail it to:

Janet Pope
U.S. EPA Region 5
Office of Public Affairs (P-19J)
77 West Jackson Boulevard
Chicago, Illinois 60604

Name _____

Address _____

Affiliation _____

Phone (Daytime) _____ (Evening) _____

Once you are on the mailing list, you will automatically receive information from U.S. EPA regarding the Waukegan Coke Plant Superfund Site.

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