

# **Health Consultation**

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**PREMCOR REFINERY SITE**

**BLUE ISLAND, COOK COUNTY, ILLINOIS**

**EPA FACILITY ID: ILN000508156**

**MAY 18, 2006**

**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**Public Health Service**

**Agency for Toxic Substances and Disease Registry**

**Division of Health Assessment and Consultation**

**Atlanta, Georgia 30333**

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

PREMCOR REFINERY SITE

BLUE ISLAND, COOK COUNTY, ILLINOIS

EPA FACILITY ID: ILN000508156

Prepared by:

Illinois Department of Public Health  
Under Cooperative Agreement with the  
U.S. Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry

## **Purpose**

The Illinois Department of Public Health (IDPH) conducted this health consultation for the Premcor Refinery site, Blue Island, Illinois, under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR), a public health agency of the U.S. Department of Health and Human Services. IDPH conducted this health consultation at the request of the Children's Cancer Cluster Coalition, the citizens of Blue Island, and the Illinois Environmental Protection Agency (Illinois EPA). IDPH evaluated the potential for vapor intrusion and exposure to chemicals associated with the Premcor Refinery site. The conclusions are based on a review of information provided by Illinois EPA. The actions recommended for the site are intended to reduce or prevent potential adverse health effects and to identify any areas for which additional data are needed to assess potential health effects.

## **Background and Statement of Issues**

### **Site Description and History**

The Premcor Refinery site is in Blue Island, Illinois. It occupies approximately 156 acres on the southwestern edge of Blue Island. It is bordered on the north and east by 127<sup>th</sup> street and a railroad line, to the south by the Calumet Sag (Cal Sag) Channel and to the west by an industrial area. The site was first known as the Great Lakes Refinery where refining operations began in the mid 1920s. The site was later known as the Clark-Blue Island Refinery. The refinery's last full year of operation was 1997, and the refinery was completely shut down in 2001 (1).

Residential property exists south of the refinery between 131<sup>st</sup> street and the Cal Sag Channel. The area south of the Cal Sag Channel, the Village of Robbins, is predominantly residential. East and northeast of the adjacent industrial area is the Village of Blue Island, which is also predominantly residential. Public golf courses, parks and several schools are all located within 1 mile of the site (1).

In March 2004, Illinois EPA and the Illinois Attorney General's Office signed an enforceable Consent Order with Premcor requiring them to perform a Remedial Investigation (RI) at the site (1). The Consent Order divided the site into seven different areas to be assessed. The areas of division are based on the type of activity that took place during the operation of the refinery, or known areas of contamination.

The RI will characterize the extent of environmental contamination in the formerly industrialized sections of the site, the Northwest Terminal, Southwest Terminal and Triangle property (Attachment 1). Soil and groundwater samples have been collected by URS, the environmental consulting firm working for Illinois EPA, in the two Terminal areas that would be expected to have the greatest amount of contamination on the site. These sections of the site were tank storage areas where several petroleum releases occurred in the past. The Northwest Terminal is the area closest to the Blue Island residential community. It is several hundred feet from the closest residential property (2).

## Discussion

### Chemicals of Interest

IDPH compared the results of each of the available groundwater samples with the appropriate ATSDR screening comparison value used to select contaminants for further evaluation for carcinogenic and noncarcinogenic health effects. Chemicals found at levels greater than comparison values and those for which no comparison values exist were selected for further evaluation. A discussion of each comparison value used can be found in Attachment 2.

Benzene, toluene, ethylbenzene, and xylene (BTEX) were the chemicals of interest in the shallow (3 to 8 feet) on-site groundwater samples. The highest level of benzene found was 880,000 parts per billion (ppb).

### Exposure Evaluation

IDPH evaluates human exposure pathways to determine the potential for development of adverse health effects resulting from exposure to contaminants. Exposure pathways are separated into completed and potential exposure pathways. An exposure pathway consists of five elements: 1) a source of contamination; 2) transport through an environmental medium; 3) a point of exposure; 4) a route of human exposure; and 5) a receptor population.

In completed exposure pathways, all five exposure elements must exist and exposure has occurred, is occurring, or will occur without some type of intervention. In potential exposure pathways, at least one element is missing, but the missing element could exist in the future. Potential exposure pathways suggest that exposure may have occurred, could be occurring, or may occur in the future. An exposure pathway is eliminated if one or more of the elements is missing and will never be present.

### *Groundwater*

Elevated levels of BTEX compounds were found in the on-site groundwater samples; however, people are not drinking this water. The groundwater elevations suggest that the groundwater moves southeast toward the canal on part of the site, and northwest on other parts of the site. Neither of these directions is toward the homes, which are mainly south, northeast, and north. The nearest school and homes are about 0.5 miles (2,600 feet away) (3). Concentrations of BTEX compounds rapidly drop to no detections at the perimeter of the site. Off-site groundwater should not be contaminated with site-related chemicals.

### *Vapor Intrusion*

According to the U.S. Environmental Protection Agency vapor intrusion guidance, factors that influence contaminant migration and vapor intrusion include:

- the depth, type and concentration of the contaminants,
- the distance of structures from the vapor source, and

- the moisture and porosity of soils through which vapors must travel.

The guidance states that if a building is vertically or laterally greater than 100 feet from the source of potential vapors, the building is expected to be too far away from the source to be affected by vapor intrusion (4).

Based on the data reviewed and the information in the guidance, it is unlikely that BTEX compounds are migrating off the site and into buildings half a mile away. Groundwater at the perimeter of the site does not contain detectable levels of BTEX compounds. Therefore, vapor intrusion from the former Premcor Refinery should not be occurring in the Blue Island residential community.

### **Community Health Concerns**

Several members of the Blue Island community have stated concerns regarding vapor intrusion issues from the former refinery site. Based on the site perimeter shallow groundwater samples reviewed to date, vapor intrusion should not be occurring in Blue Island homes.

The IDPH Division of Epidemiologic Studies is responding to a request from the Children's Cancer Cluster Coalition to evaluate cancer data for zip codes including and surrounding the Premcor Refinery site. A report of their findings is expected in late 2006.

### **Child Health Considerations**

IDPH and ATSDR recognize that children are especially sensitive to some environmental contaminants. For that reason, IDPH includes children when evaluating exposures to contaminants. Children are the most sensitive population considered in this health consultation. Given the site conditions, available data, and the site's limited access, children are not currently being exposed to site-related chemicals.

### **Conclusions**

On the basis of available information and site conditions, IDPH concludes that persons are not currently exposed to chemicals in the groundwater at the Premcor Refinery site and no adverse health effects would be expected. IDPH further concludes that the site currently poses *no public health hazard*.

In the future, if the on-site groundwater contamination moves, site conditions could change. Therefore, continued sampling is recommended to better define the location and amount of chemicals present in groundwater. Area residents remain concerned about potential exposure to contaminants and about subsequent health effects of such exposure. IDPH will review any new information as it becomes available and determine the potential for any adverse health effects.

## **Recommendations**

IDPH recommends the following activities for the site:

- Illinois EPA will continue sampling on and off the site to determine the extent of contamination.
- Illinois EPA will sample off-site groundwater to determine if the contamination is migrating off of the site.

## **Public Health Action Plan**

IDPH staff have reviewed the results from the 2005 URS investigation from the Northwest and Southwest Terminals. IDPH has responded to several citizen inquiries regarding health concerns related to the site. When additional environmental sampling is performed, IDPH staff will provide a health-based evaluation of these data for the residents and participating agencies.

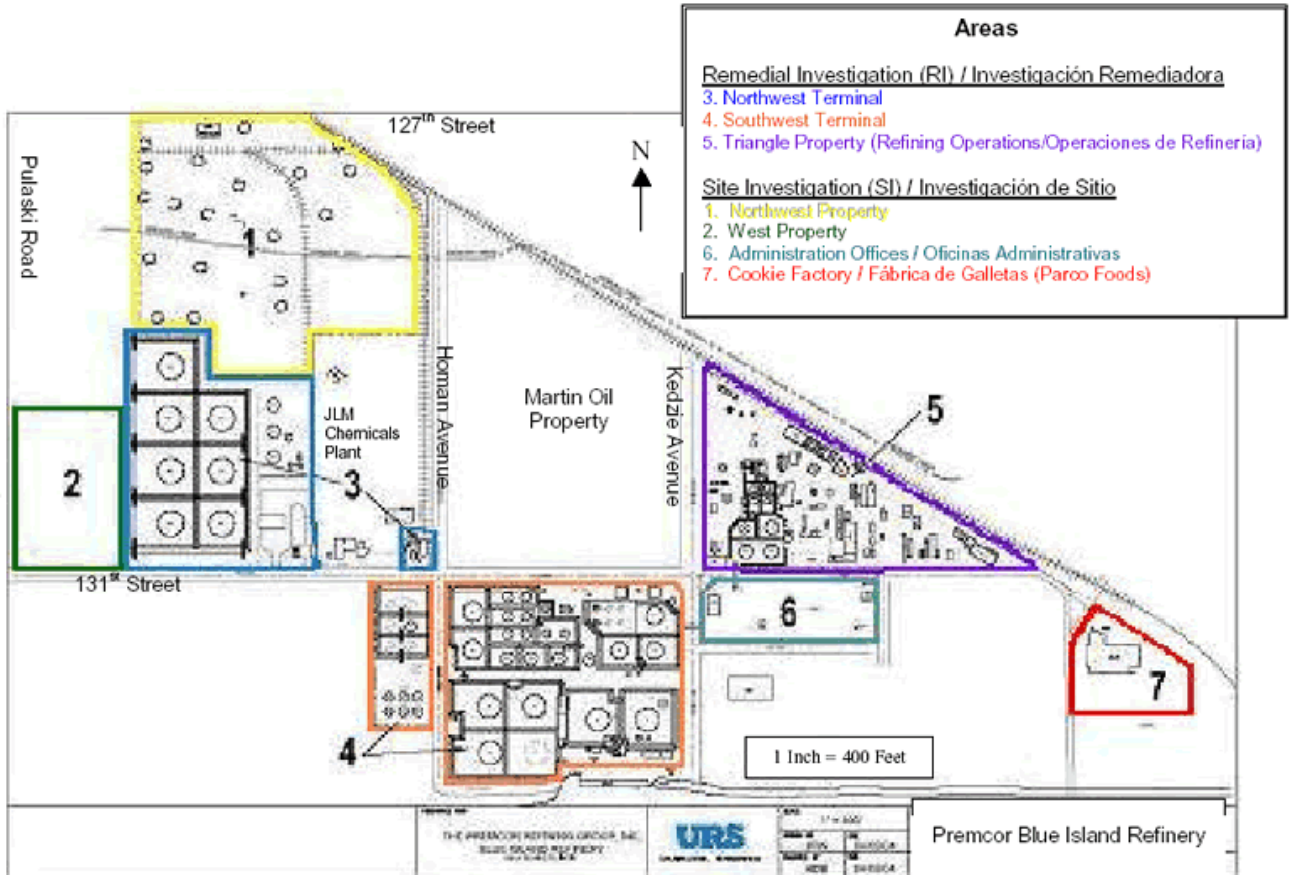
### **Preparer of Report**

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Illinois Department of Public Health

## **References**

1. Illinois Environmental Protection Agency. Former Premcor Refinery Environmental Investigations, Fact Sheet #1. Springfield: Illinois Environmental Protection Agency; 2004.
2. URS Corporation. Hollow Stem Auger Rationale Northwest Terminal (Area 3). Milwaukee, WI: URS Corporation; 2005(Feb.).
3. URS Corporation. Hollow Stem Auger Rationale Southwest Terminal (Area 4). Milwaukee, WI: URS Corporation; 2005 (Jan.)
4. US Environmental Protection Agency. Guidance Document on Vapor Intrusion. Available at <http://www.epa.gov/correctiveaction/eis/vapor.htm>. Accessed April, 2005.

# Attachment 1





## **ATSDR Comparison Values Used in Screening Contaminants for Further Evaluation**

**Environmental Media Evaluation Guides (EMEGs)** are developed for chemicals based on their toxicity, frequency of occurrence at National Priorities List (NPL) sites, and potential for human exposure. They are not action levels but are comparison values. They are developed without consideration for carcinogenic effects, chemical interactions, multiple route exposure, or exposure through other environmental media. They are very conservative concentration values designed to protect sensitive members of the population.

**Reference Dose Media Evaluation Guides (RMEGs)** are another type of comparison value. They are developed without consideration for carcinogenic effects, chemical interactions, multiple route exposure, or exposure through other environmental media. They are very conservative concentration values designed to protect sensitive members of the population.


**Cancer Risk Evaluation Guides (CREGs)** are estimated contaminant concentrations based on a probability of one excess cancer in a million persons exposed to a chemical over a lifetime.

**Maximum Contaminant Levels (MCLs)** have been established by the U.S. Environmental Protection Agency (USEPA) for public water supplies to reduce the chances of occurrence of adverse health effects from use of contaminated drinking water. These standards are well below levels for which health effects have been observed and take into account the financial feasibility of achieving specific contaminant levels. MCLs are limits that public water supplies must meet, and they are enforceable by USEPA.

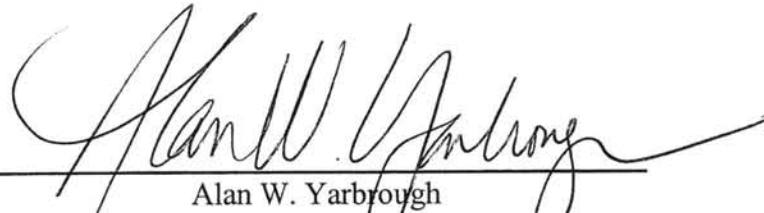
**Lifetime Health Advisories (LTHAs)** USEPA has established LTHAs for drinking water. LTHAs are concentrations of specific chemicals in drinking water that are not expected to cause any adverse, noncarcinogenic health effects over a lifetime (70 years) of exposure. These are conservative values that incorporate a margin of safety.

## Certification

This Premcor Refinery Site Public Health Consultation was prepared by the Illinois Department of Public Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.

  
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The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

  
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