**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action**
**Environmental Indicator (EI) RCRIS code (CA725)**

**Current Human Exposures Under Control**

| | |
|---|---|
| **Facility Name:** | USS Lead Refinery, Inc. |
| **Facility Address:** | 5300 Kennedy Avenue, Lake County, Indiana |
| **Facility EPA ID #:** | IND 047 030 226 |

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

X If yes - check here and continue with #2 below.

____ If no - re-evaluate existing data, or

____ if data are not available skip to #6 and enter"IN" (more information needed) status code.

## BACKGROUND

### Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

### Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

### Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

### Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

| | Yes | No | ? | Rationale / Key Contaminants | Notes |
|---|---|---|---|---|---|
| Groundwater | X | | | Antimony, arsenic and cadmium | A |
| Air (indoors)[2] | | X | | No buildings | E |
| Surface Soil (upland) | | X | | — | B |
| Surface Water (upland and wetland) | X | | | Antimony and arsenic | C |
| Sediment (wetland) | X | | | Lead, antimony, arsenic and cadmium | D |
| Subsurface Soil (upland) | | X | | — | B |
| Air (outdoors) | | X | | — | E |

____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

_X_ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The U.S.S. Lead Refinery Inc. (USS Lead) facility is a former primary/secondary lead smelter located in East Chicago, Lake County, Indiana. Facility operations ceased in 1985. The facility property includes a 39-acre wetland area adjacent to the Grand Calumet River. Soil from residential areas located within one-mile north of the site have been impacted by former airborne metal releases from the facility, mainly lead (refer to site figure attached) . On November 18, 1993, U.S. EPA issued an Administrative Order on Consent (AOC) to USS Lead under RCRA 3008(h) authority. The AOC required USS Lead to implement interim measures for on-site areas and

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

conduct an off-site investigation. The interim measures consisted of removal of contaminated soils and disposal in a Corrective Action Management Unit. These corrective action activities have been coordinated with closure and post-closure for the CAMU and groundwater monitoring requirements from the Indiana Department of Environmental Management (IDEM). Maintenance and construction workers are expected to conduct operation and maintenance activities during CAMU post-closure. Post-closure activities will take place in upland areas in the vicinity of the CAMU (outside of wetland areas).

A) Groundwater

The table below summarizes information on groundwater contamination.

| **Contaminant in groundwater** | **Safe Drinking Water Act Maximum Contaminant Levels (MCLs) (ppb)** | **Maximum concentration in groundwater (ppb)** |
|---|---|---|
| Antimony | 6 | 20 |
| Arsenic | 10 | 22 |
| Cadmium | 5 | 180 |

B) Surface and subsurface soil

Concentrations for metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) and polychlorinated biphenyls (PCBs) in on-site upland areas in the vicinity of the CAMU do not exceed the construction worker protection criteria from IDEM's Risk Integrated System of Closure (RISC). Contamination in soils from off-site areas, including residential areas to the north of the site, is deferred to the Superfund program. Therefore, the soil contamination related to the USS Lead facility in the residential areas is outside the scope of this EI determination.

C) Surface water

| **Contaminant** | **Indiana Water Quality Criteria for Human Health (IWQC) (mg/l)** | **Maximum concentration in on-site surface water (mg/l)** | |
|---|---|---|---|
| | | **Upland** | **Wetland** |
| Antimony | 0.146 | 0.17 | 0.027 |
| Arsenic | 0.158 | 0.61 | 0.24 |

The surface water at the site associated with the wetland and canal and swales from upland areas does not support a recreational fishery (no appeal to recreational anglers).

Surface water from the Grand River is not expected to be currently impacted by groundwater discharges from the site because contaminant concentrations in groundwater at the groundwater-surface water interface do not exceed the corresponding MCLs or IWQC. Contamination in runoff may have migrated into surface water from the Grand

Calumet River. However, present releases of runoff into surface water are not considered significant because the contaminant sources from the site have been removed through excavation. It is expected that any contamination from past releases related to groundwater discharge and runoff into the Grand Calumet River has been contained in the river sediments (refer to sediment evaluation).

D) Sediments

Metal contamination is present in surface and subsurface sediment from the wetland. Neither VOCs, SVOCs and PCB concentrations in wetland sediments, nor any constituent concentrations in sediment from the on-site canal (upland), exceed the IDEM's RISC construction worker protection criteria.

Any potential contamination in sediments from the Grand Calumet River is deferred to National Resources Damage Assessment authorities. Therefore, any sediment contamination in the Grand Calumet River related to the USS Lead facility is outside the scope of this EI determination.

| **Contaminant** | **Maximum concentrations of major constituents in sediment from wetland (mg/kg)** | | **RISC construction worker protection criteria *** |
|---|---|---|---|
| | **Surface** | **Subsurface** | |
| Lead | 20,000 | 3,200 | 970 |
| Arsenic | 5,700 | 920 | 320 |
| Antimony | 3,710 | 380 | 460 |

* The RISC construction worker protection criteria is used as a surrogate for trespassers or recreational/visitor scenarios.

E) Air (indoors and outdoors)

All buildings at the site have been demolished. Also, the CAMU cover prevents any migration of particulate from contamination sources into outdoor air. Constituents present in groundwater at this site do not volatilize significantly and, therefore, do not pose risk through inhalation.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

| **"Contaminated" Media** | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food[3] |
|---|---|---|---|---|---|---|---|
| Groundwater | no | no | no | yes | no | no | no |
| ~~Air (indoors)~~ | | | | | | | |
| ~~Surface soil (upland)~~ | | | | | | | |
| Surface Water (upland) | no | yes | no | yes | no | no | no |
| Surface Water (wetland) | no | no | no | no | yes | no | no |
| Sediment (wetland) | no | no | no | no | yes | no | no |
| ~~Subsurface Soil (upland)~~ | | | | | | | |
| ~~Air (outdoors)~~ | | | | | | | |

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

**X** If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

Incomplete pathways

Groundwater at the site is not used as a source of drinking water or for industrial purposes. The site does not include any residential use and it does not house any recreational, health- or day-care facilities. No recreational areas are located within the facility boundary, and no growth of crops, grazing of livestock, or harvesting of fish occurs on the property.

Complete pathways

Maintenance and construction workers may get in contact with contamination from arsenic and antimony in surface water from upland areas. Also, any construction workers conducting excavation may get exposed to contamination from antimony, arsenic and cadmium in groundwater.

Trespassers may access the wetland areas and get in contact with contamination from metals in sediment and surface water. No worker activity is expected in the wetland areas.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude and contaminant concentrations could result in greater than acceptable risks)?

X If no (exposures can not be reasonably expected to be "significant" for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" are not expected to be "significant."

____ If yes (exposures could be reasonably expected to be "significant" for any complete exposure pathway - continue after providing a description and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" are not expected to be "significant."

____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

The CAMU post-closure activities will involve specialized trained personnel using appropriate protective and safety gear. Therefore, the workers will have no contact with metal contamination in groundwater and surface water from areas in the vicinity of the CAMU (upland).

Trespassers who may access the wetland areas may get in contact with contamination from metals in sediment and surface water. However, trespassing is expected to be very infrequent because the wetland area is covered by a thick vegetation of *Phragmites australis* and the site can only be accessed by boating through the Grand Calumet River. In addition, trespassers will be expected to experience minimal contact with soil and surface water contamination due to the thick mat of vegetation.

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the USS Lead Refinery facility , EPA ID # IND 047 030 226, located in East Chicago, IN, Lake County, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____
(print) Mirtha Cápiro
(title) Environmental Scientist

Supervisor (signature) _____ Date _____
(print) George Hamper
(title) Chief, ECAB Corrective Action Section
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Locations where References may be found:
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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**