

US EPA ARCHIVE DOCUMENT

## DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

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

**Current Human Exposures Under Control**

<b>Facility Name:</b>	<u>Ispat Inland Inc., Indiana Harbor Works</u>
<b>Facility Address:</b>	<u>3210 Watling Street, East Chicago, IN 46312</u>
<b>Facility EPA ID #:</b>	<u>IND 005 159 199</u>

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.  
 r If no - re-evaluate existing data, or  
 — if data are not available skip to #6 and enterAIN@ (more information needed) status code.  
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**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 ACurrent Human Exposures Under Control@ EI**

A positive ACurrent Human Exposures Under Control@ EI determination (AYE@ status code) indicates that there are no Aunacceptable@ human exposures to Acontamination@ (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 Acontamination@ 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 ACurrent 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).

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**

Page 2

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **Acontaminated@**<sup>1</sup> above appropriately protective risk-based **Alevels@** (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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			Groundwater is not a drinking water source anywhere in the area. Sitewide groundwater concentrations of the following contaminants, however, exceed Tier 1B Screening Levels for manganese, dieldrin, p,p-DDD, p,p-DDE and benzene, following US EPA and IDEM tiered risk assessment guidance.
Air (indoors) <sup>2</sup>		X		Based upon data in the Phase I and Phase II RFI's potential volatilization of contaminants would likely occur in the coking and former by-product recovery areas of SWMAs 3, 5 and 14. Most structures in these SWMAs have been demolished and are no longer operable. In structures that are operable, these structures are very large in size with high rates of air exchange making concentrations of volatile contaminants very unlikely. In addition, indoor air monitoring is done by Health and Safety Staff in compliance with OSHA.
Surface Soil (e.g., <2 ft)	X			Surface soils exceed Tier 1B exposure levels in SWMAs 3, 5, 9, 11 and 14 for benzo-a-pyrene, benzo-a-anthracene, benzo-b-fluoranthene, dibenzo (a,h) anthracene and indeno (1,2,3-cd) pyrene, and in SWMA 2 for lead. Areas exceeding the Tier 1B screening criteria by greater than 500% were either covered with clean slag, or fenced for restricted access. For areas less than 500% in exceedance of Tier 1B criteria of these compounds, risk-based concentrations to plant workers was calculated based upon realistic time-based frequencies of contact that more accurately reflecting worker direct contact risk.
Surface Water	X			Based upon Relative Potential to Exceed (RPE ) analysis conducted by Ispat-Inland in its Facility Perimeter Investigations in the Phase II RFI, conservative site-specific criteria for groundwater discharge rates to surface water bodies, along with dilution potentials were used to assess surface water contamination potential vs. Indiana Ambient Water Quality Criteria. (IAWQC). The RPE analysis concluded that there is no reasonable potential to exceed the IAWQC criteria in Lake Michigan or the Indiana Harbor Ship Canal (IHSC).
Sediment	X			There is no onsite surface water, and as such, no onsite surface sediment on the Ispat-Inland site itself. The surface waters and sediments of the IHSC bordering the facility have been impacted by numerous industrial and municipal sources. Ispat Inland is a party in the The National Resource Damage Assessment (NRDA) settlement, as well as the Supplemental Environmental Projects (Section VIII) under the 1993 Consent Decree with Inland Steel for reparation of IHSC and Indiana Harbor sediments. Thus, the sediments offsite are being handled under these mechanisms.
Subsurf. Soil (e.g., >2 ft)	X			SWMAs 3, 5 and 14 contain coking by-product contamination from historical releases from plant activities. Lesser impacts are evident in the remaining SWMAs, as organic wastes and dredge spoils incorporated in fill material to expand the facility into Lake Michigan. Contaminants include volatile and semi-volatile organic

<sup>1</sup> AContamination@ and Acontaminated@ 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 Alevels@ (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> 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.

Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)

Page 3

Air (outdoors)	X	<p>compounds including benzene, toluene, ethylbenzene, xylenes, naphthalene, fuel oil #6, benzo-a-pyrene, benzo-a-anthracene, benzo-b-fluoranthene, dibenzo (a,h) anthracene and indeno (1,2,3-cd) pyrene, and RCRA Metals including lead, cadmium, chromium, copper, and arsenic. No activities took place outside of the facility boundaries to suggest off-site subsurface soil contamination. The facility perimeter area groundwater investigations in Phase II of the RFI show that contaminated groundwater has not migrated offsite sub-surface soils.</p> <p>The sources for potential volatilization of contaminants to outdoor air exist mainly in SWMAs 3, 5 and 14. Most of the operable structures in these areas have been demolished, and the areas were paved with clean slag or limestone. In addition, surface soil sampling performed as part of the Phase II RFI yielded little to no potential source of volatile compounds. Those areas exceeding direct contact criteria with semivolatile and volatile organic compounds were also either covered with clean slag, or limestone as well. The volatile contaminants from groundwater did not exceed the ASTM industrial ambient vapor inhalation criteria.</p>
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- If no (for all media) - skip to #6, and enter AYE,@ status code after providing or citing appropriate Alevels,@ and referencing sufficient supporting documentation demonstrating that these Alevels@ are not exceeded.
- X — If yes (for any media) - continue after identifying key contaminants in each Acontaminated@ medium, citing appropriate Alevels@ (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 AIN@ status code.

Rationale and Reference(s):

Ispat Inland Indiana Harbor Works (IHW) is a 2400 acre integrated steel making facility. Approximately 2/3 of the IHW is comprised of fill materials, primarily slag, sand, and other materials including construction debris, plant refuse and process related wastes. The natural and filled areas have been extensively graded with clean slag and limestone. The site is divided into 14 solid waste management areas (SWMAs) containing various steel mills that include blast furnaces, electric arc furnaces, steel processing buildings, raw material and finished product storage areas, locomotive filling stations, rail heads and docks, as well as former coke production areas. Lands surrounding the IHW to the south and east are used for commercial and industrial purposes, the use of which is not expected to change at any time in the near future. A considerable portion of the IHW is bounded by the waters of the Indiana Harbor Ship Canal and Lake Michigan. A substantial amount of the flow of groundwater emanating from the IHW is impeded by various installed revetments. The IHW is still actively used for steel making, and this activity is planned to continue for the foreseeable future.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 4

3. Are there **complete pathways** between Acontamination@ 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)

<b>AContaminated@ Media</b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	NO	YES	NO	YES(1)	NA	YES(2)	NO
Air (indoors)							
Soil (surface, e.g., <2 ft)	NO	YES(2)	NO	YES(1)	YES(2)	NO	NO
Surface Water	NO	NO	NO	NO	NO	YES(3)	YES
Sediment							
Soil (subsurface e.g., >2 ft)	NO	NO	NO	YES(1)	NO	NO	NO
Air (outdoors)							

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 AContaminated@ Media - Human Receptor combination) - continue after providing supporting explanation.

— If unknown (for any AContaminated@ Media - Human Receptor combination) - skip to #6 and enter AIN@ status code.

**Rationale and Reference(s):**

(1) - **Groundwater, surface soil and subsurface soil pathway for construction workers** - The on-site construction/excavation worker is potentially exposed to constituents in all environmental media while repairing subsurface utility lines, performing remedial activities or short-term construction. Subsurface soil depths for direct contact exposures by this receptor are defined as 2 to 12 feet bgs based on past activity at the facility and the location of utilities on-site. Groundwater occurs at depths ranging from 3 to 10 feet bgs at the site; therefore, direct contact with groundwater may also occur during intrusive activities.

(2) - **Surface Soil Pathway for Onsite Workers and Trespassers** - Onsite workers are exposed to surface soils while walking to and from the work site from their vehicles in parking lots, and while performing certain activities outside. Exposures to soils are limited to a maximum of 2-3 hours per day, 5 days per week, 48-50 weeks per year. Trespasser access is improbable due to 24 hour security patrols, and site fencing, however, trespassers would also have limited, infrequent exposure to surface soils via direct contact as well.

(3) - **Groundwater and Surface Water pathways for recreational users** - The beneficial use of groundwater by recreational users lies in the groundwater discharge of RCRA contaminants to the surface water in Lake Michigan. The only observed forms of recreation in surface water is boating and fishing from the adjacent marina. The vast majority of groundwater at Ispat Inland is restricted from flowing offsite by sheet pile, cellular or rip-rap revetments. Additionally, a large section of the Lake Michigan shoreline adjacent to the facility is walled off from the rest of the lake by revetments. However, some contaminated groundwater does flow into adjacent surface water areas.

(4) - **Food pathway via surface water** - As stated in (2) above, some fish is consumed from recreational fishing activities in surface water areas adjacent to the facility.

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

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 5

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **Asignificant**<sup>4</sup> (i.e., potentially **Aunacceptable**@ 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 **Alevels**@ (used to identify the **Acontamination**@); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable **Alevels**@) could result in greater than acceptable risks)?

— If no (exposures can not be reasonably expected to be significant (i.e., potentially **Aunacceptable**@) for any complete exposure pathway) - skip to #6 and enter **AYE**@ status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to **Acontamination**@ (identified in #3) are not expected to be **Asignificant**@.

**X** — If yes (exposures could be reasonably expected to be **Asignificant**@ (i.e., potentially **Aunacceptable**@) for any complete exposure pathway) - continue after providing a description (of each potentially **Aunacceptable**@ exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to **Acontamination**@ (identified in #3) are not expected to be **Asignificant**@.

— If unknown (for any complete pathway) - skip to #6 and enter **AIN**@ status code  
— **Rationale and Reference(s):**

The following complete exposure pathways were evaluated in Step Four of the EI determination process:

**Ground water:** Under current land use conditions, groundwater is not used on-site for potable or industrial uses. Under future land use conditions, a deed restriction prohibiting the use of shallow groundwater will be put in place for the site. Due to the shallow depth of groundwater in some portions of the site, exposure may occur during construction/ excavation activities. In the risk assessment, no unacceptable health risks (cancer risk range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  and total HI of less than 1) from exposure to shallow groundwater were identified for these potential receptors. Additionally, Ispat Inland Health and Safety staff have implemented a construction permit program, where no construction activities (including excavation) are allowed without a permit, and accompaniment by Ispat Inland trained Health and Safety staff. All construction workers in exposure controlled areas must be current in the 40 hour field safety training.

**Surface soil:** Most of the open areas on the Ispat Inland site have been paved with clean slag, or asphalt. Areas which exceeded the Tier IB screening criteria for dermal contact (eg. SWMAs 3,5, and 9) have been covered in August of 2005 with 6 additional inches of clean slag or limestone fill. CAMU areas are fenced off and are restricted access areas. Time weighted exposures to plant workers in the rest of the site. meet the Tier IB criteria. Additionally, the site is surrounded by security fencing and access is controlled by security guard stations and patrols. The industrial worker was used as a conservative surrogate for trespassers.

**Subsurface soil:** Under both current and future land use conditions, the receptor with the greatest potential for exposure is the on-site construction/excavation worker, where a greater likelihood of direct contact with impacted surface and subsurface soil is associated with intrusive activities. As stated for the groundwater pathway above, Ispat Inland Health and Safety staff have implemented a construction permit program, where no construction activities (including excavation) are allowed without a permit, and accompaniment by Ispat Inland trained Health and Safety staff. All construction workers in exposure controlled areas must be current in the 40 hour field safety training. Personal protective equipment applicable to the contamination in question will be required.

**Surface water:** The Reasonable Potential to Exceed (RPE) analysis concluded that there is no reasonable potential to exceed the IAWQC criteria in Lake Michigan or the Indiana Harbor Ship Canal (IHSC). RPE analysis (the basis of which is promulgated by IDEM under 327 IAC 5-2-11.5) considers surface water body size, flow, use/classification, and contaminant loading limits, including background concentrations, in determining

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<sup>4</sup> If there is any question on whether the identified exposures are **Asignificant**@ (i.e., potentially **Aunacceptable**@) consult a human health Risk Assessment specialist with appropriate education, training and experience.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 6

if contaminant discharges are protective of human health uses of surface water resources.

Further, fish consumption advisories exist for Lake Michigan.

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

X

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

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

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If unknown (for any potentially Aunacceptable@ exposure) - continue and enter AIN@ status code

**Rationale and Reference(s):**

Most of the open areas on the Ispat Inland site have been paved with clean slag, or asphalt. Areas which exceeded the Tier IB screening criteria for dermal contact (eg. SWMAs 3,5, and 9) have been covered in August of 2005 with 6 additional inches of clean slag or limestone fill. CAMU areas are fenced off and are restricted access areas. Time weighted exposures to plant workers in the rest of the site. meet the Tier 1B criteria

Ispat Inland Health and Safety staff have implemented a construction permit program, where no construction activities (including excavation) are allowed without a permit, and accompaniment by Ispat Inland trained Health and Safety staff. All construction workers in exposure controlled areas must be current in the 40 hour field safety training. Personal protective equipment applicable to the contamination in question will be required.



**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 7

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, ACurrent Human Exposures Under Control@ has been verified. Based on a review of the information contained in this EI Determination, ACurrent Human Exposures@ are expected to be AUnder Control@ at the \_\_\_\_\_ facility, EPA ID # \_\_\_\_\_, located at \_\_\_\_\_ 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** - ACurrent Human Exposures@ are NOT AUnder Control.@

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

Completed by	(signature)		Date	9/1/2005
	(print)	Brian P. Freeman,		
	(title)	Senior Chemist, Project Manager		

Supervisor	(signature)		Date	
	(print)	George Hamper		
	(title)	Chief, Corr. Action Section, ECAB		
	(EPA Region or State)	Region 5		

Locations where References may be found:
US EPA Region 5 Records Center 77 W. Jackson, 7 <sup>th</sup> Floor Chicago, Illinois 60604

Contact telephone and e-mail numbers

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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.