

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: U.S. Steel - Fairless Works
Facility Address: Fairless Hills, PA 19030
Facility EPA ID #: PAD002375376

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, GPRRA). 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).

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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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			Groundwater Data
Air (indoors) ²		X		Groundwater Data
Surface Soil (e.g., <2 ft)		X		Soils Data
Surface Water		X		Groundwater Data
Sediment		X		Groundwater Data
Subsurf. Soil (e.g., >2 ft)	X			Soils Data
Air (outdoors)		X		

_____ 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):

Rationale is below. References are listed after Question 4.

General

The characterization conducted at the U.S. Steel Fairless Works Plant divided the site into several sections, the Solid Waste Management Unit (SWMU) areas, the non-SWMU areas, and Site-wide Groundwater. Characterization and remediation will be discussed for each of the areas at the site. The site is zoned commercial/industrial, therefore non-residential health-based standards have been used for determining whether the soil is contaminated above acceptable levels.

Non-SWMU Areas

U.S. Steel’s redevelopment of the Fairless property began with the characterization of the non-SWMU areas. These areas are generally on the perimeter of the site, and have not been greatly impacted by industrial activity. Historical waste handling and waste storage have not been located at these areas. Characterization of the soils has shown very little contamination. Primarily inorganic constituents have been detected and the data shows that almost all the constituents are below the non-residential health-based standards.

SWMU areas

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.

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U.S. Steel's redevelopment plan for Fairless Works also includes re-use of most of the SWMU areas. Much of this area consists of filled-in borrow-pits. The pits are found throughout the central portion of the site and were originally dug to move soil to the section of the site where the buildings were constructed. The borrow-pits were then filled with slag, construction debris and other waste materials. Currently the surface material of these borrow-pits is slag and/or soil. Surface soil sampling has occurred at or near some of the borrow-pits. Results show low levels of inorganic constituents, such as lead and iron, spread across the borrow-pit areas. Some localized organic contamination, primarily naphthalene, has been found. Contamination is generally in the 10^{-5} risk range for non-residential soils.

Currently, one parcel of the SWMU areas has been redeveloped. The Fairless Energy Works now sits on 45 acres, half of which is atop an old borrow-pit. Surface and subsurface soils were characterized and the acreage showed manganese, iron, and arsenic. These contaminants were found in the subsurface, not at the surface, therefore direct contact is not an exposure pathway. Some organic constituents were found at one sampling point, primarily poly-aromatic hydrocarbons such as benzo(a)pyrene and benzo(a)anthracene. The organic constituents were found in the subsurface and are localized both horizontally and vertically, eliminating direct contact as an exposure pathway.

Another area being leased by a rock crushing business has had surface and subsurface investigations completed. The surface and subsurface soils showed no hazardous contaminants above health-based limits.

A closed surface impoundment is located at the western edge of the site. The surface impoundment was closed under the direction of PADEP with a cap to eliminate direct contact with hazardous constituents. The cap is maintained under a post-closure permit program run by PADEP.

The Terminal Treatment Plant lagoons, Borrow Pit-35 and Borrow Pit-13A currently have Interim Measures attached to them, provided for in EPA's Administrative Order on Consent. These Interim Measures provide for wildlife deterrent devices, fencing, netting and geotextile covers, intended to keep birds and other wildlife out of the borrow-pits. U.S. Steel maintains the Interim Measures and provides a bi-monthly progress report on these activities and a Wildlife Observation Report.

Presently, the only activity on the site is in areas that have been fully characterized. Other areas, with only surface soil sampling or groundwater sampling completed are not accessible to the public. Access is restricted by a guarded gate.

Groundwater

A limited number of areas throughout the Fairless Works property were found to be sources of contamination to groundwater. These areas are localized, contributing small amounts of organic contaminants, such as TCE, benzene, and naphthalene and inorganic constituents, such as mercury, lead, and iron. The groundwater results show levels elevated above the drinking water standards, however, the water under the site is not used as a drinking water source.

The groundwater under the site is flowing to the Delaware River. Perimeter sampling at 30 groundwater monitoring wells, some at the surface water interface with the Delaware River, has shown that the Fairless Works groundwater contamination is mostly localized, and has not migrated.

Delaware River

Expected in-stream concentrations using a mass-balance equation for each contaminant of concern found in groundwater at Fairless Works was calculated and compared to the in-stream criteria found in Pennsylvania's Water Quality Toxics Management Strategy. The results indicated that the concentrations of the constituents of concern are below the in-stream standards.

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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)

<u>“Contaminated” Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	N	N	N	Y	N	N	N
Air (indoors)	—	—	—	—	—	—	—
Soil (surface, e.g., <2 ft)	—	—	—	—	—	—	—
Surface Water	—	—	—	—	—	—	—
Sediment	—	—	—	—	—	—	—
Soil (subsurface e.g., >2 ft)	N	N	N	Y	N	N	N
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):

Rationale is below. References are listed after Question 4.

General

The site is zoned for commercial/industrial activities, not for residential use or food production. The current redevelopment plans call for the majority of the site surface to be covered by building footprints and paved parking

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

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areas. These measures will prevent incidental contact with the soil by anyone on the site (workers and trespassers). There is no potable groundwater pumping on site and all well-heads are locked. Accidental contact with the groundwater by anyone on the site is highly unlikely.

Non-SWMU Areas

The non-SWMU Areas do not pose a direct contact threat, as the soils show levels of constituents below the non-residential health-based standards.

SWMU Areas

The SWMU area that is under redevelopment has been fully characterized. There was one location in the subsurface where detections were above limits; it is not a direct contact threat. Construction workers have a potential exposure, however any construction will have health and safety plans associated with the work to be performed.

Presently, the only activity on the site is in areas that have been fully characterized. Other areas, with only surface soil sampling or groundwater sampling completed are not accessible to the public. Access is restricted by a guarded gate. There are no exposure pathways at this time.

The Terminal Treatment Plant lagoons, Borrow Pit-35 and Borrow Pit-13A currently have Interim Measures attached to them, provided for in EPA's Administrative Order on Consent. These Interim Measures provide for wildlife deterrent devices, fencing, netting and geotextile covers, intended to keep birds and other wildlife out of the borrow-pits. U.S. Steel maintains the Interim Measures and provides a bi-monthly progress report on these activities and a Wildlife Observation Report.

Groundwater

The site-wide groundwater investigation has shown that construction workers are the only individuals potentially exposed to the groundwater. There are no drinking water wells on the site and all monitoring well-heads are locked. Accidental contact with the groundwater by anyone on the site is highly unlikely.

The groundwater on-site is not currently used as a drinking water source. Additionally, all leases and sales of property restrict the use of groundwater, prohibiting groundwater wells from being installed for potable purposes. The groundwater is flowing toward the Delaware River, not toward any residential areas. Sampling has shown that only low levels of contaminants are entering the Delaware River, therefore no trespassers or recreational users of the surface waters are exposed to hazardous contaminants.

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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 (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) 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” (identified in #3) are not expected to be “significant.”

If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

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

Rationale and Reference(s):

Rationale:

Construction workers, involved in the current redevelopment, have the only potentially complete exposure pathway, as discussed in the Rationale to Questions 2 and 3, above. Any construction will have health and safety plans associated with the work to be performed. These health and safety plans will contain provisions for worker training and procedures for safely handling any contaminated soil and groundwater encountered.

Present and Future:

The Human Exposures Under Control Environmental Indicator is intended to evaluate current conditions at the facility. At this time, EPA has assessed the environmental investigations information and planned redevelopment projects and has determined that human exposures are under control.

EPA expects that additional redevelopment, outside what is currently planned at this site will, occur over a number of years. As this happens, the exposure assumptions discussed in Questions 2 and 3 may no longer be valid. At the time of further redevelopment, EPA will re-evaluate this Human Exposures Under Control Environmental Indicator and assess the potential exposure pathways. Therefore, EPA’s determination of Human Exposures Under Control may be modified in the future, according to new environmental data presented.

References for Questions 2, 3, and 4

SWMU and Non-SWMU areas

Final Administrative Order on Consent, USX Corporation Fairless Hills, PA, EPA Docket No. RCRA-III-065-CA, signed April 20, 1993.

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.

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Descriptions of Current Conditions, Fairless Works, Volumes I, II, and III, July 1993, prepared by BCM Engineers Inc.

Phase I RCRA Facility Investigation Final Report, U. S. Steel Fairless Works, September 1997, prepared by BCM Engineers Inc.

Response to EPA Comments, Phase I Final Report, U.S. Steel Fairless Works, April 3, 1998, prepared by Fleming & Blair.

Quality Assurance Project Plan, Act 2/RCRA Corrective Action, U.S. Steel Fairless Works, July 2001, prepared by ENSR Corporation.

Bi-Monthly Progress Reports, 1993-2004

Dar Mold Analytical results, November 05, 2001 (Fax), and December 06, 2001

Fairless Works Energy Center

Test Pit Sampling Program, USS Fairless Works, May 4, 2000 (electronic submission)

Fairless Works Energy Center Final Report, U.S. Steel Fairless Works, June 2002, prepared by ENSR Corporation.

PADEP Approval of Fairless Works Energy Center Final Report, Liability Release, July 26, 2002

Groundwater

Request for Non-Use Aquifer Determination, January 19, 1999, prepared by Civil & Environmental Consultants, Inc.

PADEP Approval of Request for Non-Use Aquifer Determination, April 9, 1999.

Perimeter Groundwater Sampling Plan, U.S. Steel Fairless Works, September 22, 2000, and modifications electronically submitted November 06, 2000, prepared by ENSR.

Perimeter Groundwater Sampling Analytical Results, January 2001.

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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 US Steel - Fairless Works facility, EPA ID # PAD002375376, located in Fairless Hills, PA, 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 04/16/2004
 (print) Linda A. Matyskiela
 (title) Senior Project Manager

Supervisor (signature) _____ Date 04/16/2004
 (print) Paul Gotthold, Chief
 (title) PA Operations Branch
 (EPA Region or State) EPA Region III

Locations where References may be found:

WCMD Records Center
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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.

