

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: St. Marys Refining Company
Facility Address: 201 Barkwill Street, St. Marys, West Virginia 26170
Facility EPA ID #: WVD 004 337 135

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).

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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			For contaminants discussion, see details below
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)	X			
Surface Water	X			
Sediment	X			
Subsurf. Soil (e.g., >2 ft)	X			
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):

St. Marys Refining Company (SMRC) is a 70-acre facility that began producing petroleum products in 1913. SMRC acquired the facility in 1991, and currently the facility is only used for storage and distribution of petroleum products. Corrective Action (CA) investigations began over a decade ago, and is almost finished. Details of the recent comprehensive investigations are in the Draft RCRA Facility Investigation (RFI) Report (June 2003). Historic releases of hydrocarbons occurred primarily in the main process area (Northern Refinery area) where petroleum was refined until 1993. The primary media impacted by contamination are soil and ground water. Fifteen Solid Waste Management Units (SWMUs) and five Areas of Concern (AOC) were identified and investigated.

1. Groundwater: Data from 73 on- and off-site monitoring wells has been collected, with some wells with over 10 years of data. Constituents found in on-site wells at levels above the EPA maximum contaminant levels (MCLs) for drinking water are benzene, ethylbenzene, toluene and arsenic. Other petroleum related contaminants such as polynuclear aromatic hydrocarbons (PAHs) exceed MCLs or EPA Region III Tap Water Risk-Based Concentrations (RBCs) on a limited basis, generally near source areas. Benzene and arsenic were found in off-site wells at levels above MCLs/RBCs. Primary sources of ground water contamination are contaminated soils and free product. These source areas are located towards the center of the facility, within property boundaries. Currently, free product is recovered by pumping, and by two soil vapor extraction (SVE) systems. Some metals (antimony, barium, cadmium, chromium, lead, manganese, mercury, nickel, and selenium) also exceed MCLs or USEPA Region III Tap Water RBCs. Ground water from the site and neighborhood is not used. The facility and surrounding community are supplied by public water.

2. Indoor Air: The few buildings used by workers were evaluated using EPA’s Draft Vapor Intrusion Guidance (2002). Based on the distances from the buildings to SWMUs and AOCs and soil and ground water results, indoor air contamination from soil vapor intrusion is unlikely. Also, potential vapor intrusion in off-site homes/businesses from contaminated ground water is not indicated by the off-site ground water results.

3. Surface Soil: Extensive surface soil samples were collected at the Facility. The most frequent constituents found above the RBCs are arsenic, antimony, and selenium. However, based on background soil results, the levels of antimony detected across the Facility are within natural background levels. Selenium levels in the Bluff area are also within background. Results for arsenic across the Facility and selenium in the Northern Refinery are below natural background concentrations in many of the samples, however, some of the concentrations exceed background calculated for the Facility and are possibly contaminant related. VOCs (mostly benzene and ethylbenzene) and SVOCs (mostly benzo(a)pyrene and naphthalene) were elevated in at least one surface soil sample from each of the SWMUs and AOCs, except for SWMU-13, the Waste Water Treatment Area, which had no elevated VOCs/SVOCs.

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4. Sediment: One small intermittent stream was identified on the site, on the bluff. Four sediment samples were collected from this stream. Arsenic exceeded the EPA Region III soil RBCs in three of the four samples, but was below soil background results in all but one sample. No other constituents exceed the RBCs.

5. Surface Water: Four surface water samples were also collected from sediment locations at the intermittent stream on the Bluff. Both arsenic and antimony exceeded MCLs/RBC levels in at least one sample. The stream is in a fenced area of the Facility and is small and intermittent in nature and would not be used for recreation or for water supply.

6. Subsurface Soil: Subsurface soil samples were collected from the same SWMUs and AOCs as surface soil samples. Similar to the surface soils, the constituents found above the RBCs most frequently in subsurface soils are arsenic, antimony, and selenium. Concentrations of antimony detected across the Facility are within natural background levels. Selenium in the Bluff area is also related to background conditions. The results for arsenic across the Facility and selenium in the Northern Refinery are below natural background concentrations in many of the samples, although some results are above background levels. VOCs (mostly benzene and ethylbenzene) and SVOCs (mostly benzo(a)pyrene and naphthalene) were elevated in at least one subsurface soil sample from each of the SWMUs and AOC's.

7. Air (outdoors): SMRC operates within it's WV air permit requirements and outdoor air contamination has not been identified.

References: (1) Draft RFI Report, June 2003, Shaw Environmental Inc.
(2) Results of the Expanded Ground Water Survey, SMRC, 2001, IT Corporation.
(3) Results of the Ground Water Survey, SMRC, 1997, HMI.

Footnotes:

"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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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	No	No	No	No	No	N/A	N/A
<u>Air (indoors)</u>							
Soil (surface, e.g., <2 ft)	No	No	No	No	Yes	N/A	N/A
Surface Water	No	No	No	No	Yes	N/A	N/A
Sediment	No	No	No	No	Yes	N/A	N/A
Soil (subsurface e.g., >2 ft)	No	No	No	Yes	No	N/A	N/A
<u>Air (outdoors)</u>							

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):

1. Groundwater: The facility and surrounding community use public water, and ground water from the site and neighborhood is not used. Ground water is below normal construction depth. Possible vapor intrusion to homes is not indicated in off-site areas.
2. Surface and subsurface soil exposures: Worker dermal exposure is unlikely because grass or concrete covers the surface, and any incidental exposure would not be significant. Contractor exposure during construction, or during environmental work is possible, however no construction is currently planned for the site, and site environmental workers control exposure by following the OSHA Health and Safety Plan. The entire facility is fenced, with 24-hour security. Soil exposure to any trespassers would be incidental and insignificant.
3. Surface Water and Sediment: The small intermittent stream on the Bluff is in a fenced area. Workers do not work in this area and exposure is unlikely. Exposures to any trespassers in the creek would be incidental and insignificant. Also, environmental workers

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could contact the creek, but OSHA Health and Safety precautions would prevent exposure. No construction is planned.

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

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)?

 X 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): See discussion under Question 3, Rationale and Reference(s).

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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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):

SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.