

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: Occidental Chemical Corporation
Facility Address: 301 West DuPont Avenue, Belle, WV 25015
Facility EPA ID #: WVD 00 501 0277

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?

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			See below.
Air (indoors) ²	X			See below.
Surface Soil (e.g., <2 ft)	X			See below.
Surface Water	X			See below.
Sediment	X			See below.
Subsurf. Soil (e.g., >2 ft)	X			See below.
Air (outdoors)	X			See below.

_____ 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): See Page 3.

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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Groundwater: Ground water is contaminated with several inorganic and volatile organic constituents above drinking water standards (i.e., MCLs and tap water RBCs for those constituents without MCLs). Primary constituents detected at the greatest concentrations in ground water include chloroform, carbon tetrachloride and methylene chloride.

Air (indoors): A preliminary evaluation of indoor air using a USEPA approved model suggest that predicted indoor air concentrations could be above risk-based levels. This evaluation suggested that the key constituents that may contribute to indoor air contamination were chloroform and carbon tetrachloride.

Surface and Subsurface Soil: Findings of the Phase I and Phase II RCRA Facility Investigations, as presented in the Phase I Addendum 2 RFI Report and the Phase II Interim Data Report indicate that residual concentrations of organic (VOC and SVOC) and inorganic constituents remain at the Facility. The primary constituents detected at the greatest concentrations in site soils include chloroform and carbon tetrachloride.

Surface Water and Sediment: Low levels of organic (specifically SVOCs) and inorganic constituents were reported to be above conservative risk-based concentrations in both surface water and sediment of Reynolds Branch and the Kanawha River. Since many industrial facilities are located along the river, it is difficult to directly attribute the presence of some of the constituents with practices that occurred at the former OxyChem Facility.

Air (outdoor): The levels of organic and inorganic constituents detected in surface and subsurface soil reported as findings of the Phase I and Phase II RCRA Investigations suggested that concentrations of

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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>	<u>Residents</u>	<u>Workers</u>	<u>Day-Care</u>	<u>Construction</u>	<u>Trespassers</u>	<u>Recreation</u>	<u>Food</u> ³
Groundwater	No	No	No	No			Yes
Air (indoors)	No	Yes	No				
Soil (surface, e.g., <2 ft)	No	Yes	No	Yes	No	No	No
Surface Water	No	Yes			Yes	Yes	Yes
Sediment	No	Yes			Yes	Yes	Yes
Soil (subsurface e.g., >2 ft)				Yes			No
Air (outdoors)	Yes	Yes	No	Yes	Yes		

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): See Page 5.

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

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Ground water: The ground water pathway is not applicable for residents, daycare, due to current and future site use as commercial/industrial. Ground water pathway for workers is not complete because potable water is provided by municipal supply. Construction activities that could include contact with soil and ground water are and will be addressed by health and safety (OSHA) requirements and/or engineering controls (including PPE). Impact to the surface water from the site groundwater was evaluated, but the results were inconclusive.

Indoor Air: Under current site conditions, the indoor air pathway is not applicable for residents or daycare. Three buildings from the former industrial operations remain at the site, with one building used by MRSM employees.

Surface Soil: Currently, perimeter fencing restricts access to the site preventing exposure (i.e., incomplete pathways) to trespassers, residents, day care, or food. Potential exposures to current MRSM employees (i.e., construction/worker receptors) is controlled by health and safety (OSHA) requirements and engineering controls (including PPE) to prevent contact with the surface soil. No exposure pathway to surface soil currently exists.

Surface Water and Sediment: Surface water and sediment pathways are complete and were evaluated for the recreational user (and/or trespasser) and for human ingestion of fish in the Human Health Risk Assessment for Surface Water and Sediment (July 10, 2001).

Subsurface Soil: Under current conditions, no complete pathway to the subsurface soils exists. Potential future exposure for the construction worker will be addressed by health and safety (OSHA requirements) and engineering controls (including PPE) to prevent direct contact.

Air (outdoors): Outdoor air is a complete pathway and was evaluated in the Human Health Assessment Supplemental: Inhalation of Volatile and Particulate Emissions Evaluation (January 24, 2003).

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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)?

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 Page 7.

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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Ground Water: While it is unclear whether the current groundwater discharge is affecting surface water or sediment quality, the Human Health Risk Assessment for Surface Water and Sediment (July 10, 2001) evaluated the fish ingestion pathway and concluded that this pathway is not a concern.

Air (Indoors): Air sampling was conducted as specified in the approved Air Sampling Work Plan (November 2001) and revisions provided as response to comments (dated March 2002) to evaluate the indoor air pathway. Direct air sample results did not exceed OSHA PELs, nor did they exceed the more conservative NIOSH RELS where available. The complete results of this evaluation are provided in the Inhalation of Volatile and Particulate Emissions Evaluation (December 2002).

Surface and Subsurface Soil: NA

Surface Water and Sediment: Potential exposures for recreational users (and/or trespassers) of Reynolds Branch and the Kanawha River were evaluated and reported in approved Human Health Risk Assessment for Surface Water and Sediment (August, 2002). No significant risks were identified in this evaluation.

Air (Outdoors): Results of air modeling, as reported in Inhalation of Volatile and Particulate Emissions Evaluation (December 2002) indicate that potential exposures for both on-site and off-site receptors to fugitive volatile and dust emissions in outdoor air do not result in unacceptable risks.

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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): _____
