

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: Union Carbide Corporation, A Subsidiary of DOW
Facility Address: 3301 5th Avenue South, Texas City, TX 77592-0471
Facility EPA ID #: TXD000461533

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).

Air (Outdoors): There is no current impact to outdoor air. Soil contamination associated with the Main Plant Facility is related to spills and leaks that are historical in nature that occurred 30 to 60 years ago. The Main Plant Facility is predominantly covered by building structures, one and half foot of hard-packed caliche (crushed rock fill material) or vegetative cover that inhibits the release of particulates and volatiles associated with soil into the atmosphere.

Surface Water: There are no surface water bodies in the vicinity of the Main Plant Facility that receive groundwater discharge. Stormwater from the northern half of the Plant is pumped or drains by gravity to Moses Lake. Stormwater from the southern half of the Plant drains by gravity to the Forebay of the US Corps of Engineers Flood Protection Station.

Sediment: There is no sediment associated with the Main Plant Facility. The majority of the Main Plant Facility is covered by building structures, vegetative cover or one and half foot of hard-packed caliche that precludes sediment accumulation on-site.

Footnotes:

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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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_	Yes_	No_	Yes_	No_	No	No
Air (indoors)	___	___	___	___	___	___	___
Soil (surface, e.g., <2 ft)	No_	Yes_	___	No_	Yes_	No_	No_
Surface Water	___	___	___	___	___	___	___
Sediment	___	___	___	___	___	___	___
Soil (subsurface e.g., >2 ft)	No	Yes	No	Yes_	No	No	No_
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):

Shallow groundwater under the Main Plant is approximately 10 to 40 feet below ground surface (bgs). Due to poor yield and water quality (fresh to slightly saline), the shallow groundwater is not used as a potable water supply. Due to the surrounding industrial areas and open areas owned and completely fenced in by UCC, there are no recreational areas on or adjacent to the Main Plant Facility and thereby no complete exposure pathways for recreational receptors.

Groundwater: Groundwater with concentrations of metals , semi-volatile organics, and volatile organics may be encountered during infrequent construction and maintenance activities that require subsurface intrusion to depths 10 feet bgs in the area of groundwater contamination.

Surface Soil: The majority of the ground surface at the Main Plant is covered with buildings, vegetative cover or one and a half foot of hard-packed caliche across the facility. Potentially complete exposure pathways to human receptors include incidental ingestion, dermal contact, and inhalation of vapors by workers during infrequent, short-term construction or maintenance activities.

Subsurface Soil: It is possible that impacted subsurface soil could be contacted during construction or maintenance activities that involve digging or excavation.

On-site potential worker exposures are controlled through normal operating practices and the site health and safety programs, including engineering controls, industrial hygiene surveillance and a hazard communication program.

The use of health and safety programs including personal protective equipment, industrial hygiene surveillance and a hazard communication programs ensures that potential worker exposures are within acceptable limits. These programs have been audited by a third party, as required by 30 Texas Administrative Code (TAC), Chapter 350, Texas Risk Reduction Program and certified by the auditor to meet OSHA requirements.

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):

Construction Worker Scenario: On occasion, maintenance or construction activities may be conducted in the vicinity of contaminated soil or groundwater media. Work permits and construction plans are reviewed to assess whether there is potential for workers to be exposed to constituents in soil and groundwater. All workers involved with RCRA corrective action are OSHA Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) trained. Required adherence to safe work practices (i.e., protective clothing and equipment, work site monitoring, and respiratory protection and dust suppression measures when appropriate) as established in site-specific health and safety plans will control worker exposures.

The use of health and safety programs including personal protective equipment, industrial hygiene surveillance and a hazard communication programs ensures that potential worker exposures are within acceptable limits. These programs have been audited by a third party, as required by 30 Texas Administrative Code (TAC), Chapter 350, Texas Risk Reduction Program and certified by the auditor to meet OSHA requirements.

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): **N/A**

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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):

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 Union Carbide Corporation facility, A Subsidiary of DOW, EPA ID #TXD000461533, located at 3301, 5th Avenue South, Texas City, TX 77592-0471 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

Murali Padaki
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Project Manager

Date April 21, 2005

Supervisor

Cathy Remmert
Cathy Remmert
Supervisor
Texas Commission on Environmental Quality

Date April 21, 2005

Locations where References may be found:

TCEQ Central Records, Austin, Texas.

Contact telephone and e-mail numbers:

Project Manager listed above
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Final Note: The purpose of the Human Exposures EI is to qualitatively screen exposures based on current land and groundwater use. A "YE" determination does not constitute a screening tool that ends the corrective action process. The "YE" determination may be changed at any time as new information becomes available.