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: Shell Chemical Company & Shell Deer Park Refining Company
Facility Address: 5900 State Hwy 225
Facility EPA ID #: TXD 067285973

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).

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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			**RFI indicates that potential exists for contaminant concentrations in groundwater to exceed appropriate protective risk-based criteria. Voluntary groundwater corrective action is currently on-going at several areas of the facility where SWMUs are located, however the voluntary corrective action was not a result of a release from the SWMUs.**
Air (indoors)[2]		X		**All facilities are maintained with positive pressure. Buildings are not located over SWMUs**
Surface Soil (e.g., <2 ft)		X		**Concentrations of metals identified in surface soils are consistent with regional background concentrations. RFI indicated that organics are not an issue in shallow soils.**
Surface Water		X		**Not required as part of Phase I and initial Phase II RFI**
Sediment		X		**Not required as part of Phase I and initial Phase II RFI**
Subsurf. Soil (e.g., >2 ft)	X			**Organic constituents detected in soil at concentrations above risk-based criteria in several SWMUs.**
Air (outdoors)		X		**Risk-based exceedances in soils a result of potential impact to groundwater and possibly direct contact under a construction worker scenario.**

_____ 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):

The RFI is currently in progress. Additional data collection and analysis is continuing.

Based on a statistical analysis performed in the initial Phase II RFI, concentrations of metals identified in surface and subsurface soils collected from each of the SWMUs during the 1996 RFI sampling were found to be consistent with regional background concentrations and are not indicative of a release from the SWMUs.

In the Phase I and Phase II RFI, soil organic data were compared with groundwater protective Media Specific Concentrations (MSCs) of the TNRCC Risk Reduction Rule Standard No. 2. Organic constituents were detected in soil at concentrations above MSCs in several of the SWMUs. Therefore, potential exists for contaminant concentrations in groundwater to exceed risk-based criteria. However, organic contamination in soil in these areas is consistent with known groundwater plumes identified and being addressed in the groundwater Compliance Plan. Although it can not be conclusively shown that the SWMUs are not a source of the organics in groundwater, it is not possible to determine at this time whether

a release has occurred. Additional data collection and analysis of soils is continuing.

The TNRCC has recently promulgated a new risk program (Texas Risk Reduction Program). Shell is in the process of evaluating the new risk reduction program for integration into the RFI process.

References

- **RCRA Facility Investigation Revised Work Plan, Shell Oil Company, Deer Park Manufacturing Complex. Engineering –Science, March 1993.**
- **RCRA Facility Investigation, Shell Oil Company, Deer Park, Texas. Fugro Environmental, Inc., October 1996.**
- **Phase II RCRA Facility Investigation Report, Shell Deer Park Site. Parsons Engineering Science, Inc., May 1999.**

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.

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	No	No	No	No	No	No
~~Air (indoors)~~	--	--	--	--	--	--	--
~~Soil (surface, e.g., <2 ft)~~	--	--	--	--	--	--	--
~~Surface Water~~	--	--	--	--	--	--	--
~~Sediment~~	--	--	--	--	--	--	--
Soil (subsurface e.g., >2 ft)	No	No	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)

- **Potential construction worker exposure from subsurface soils. Current OSHA health & safety protocols are in-place to mange potential exposure during construction worker scenario.**

- **In the RFI, organic constituents were detected in soil at concentrations above risk-based levels in Units D, B, K, and P. Therefore, potential exists for contaminant concentrations in groundwater in these areas to exceed risk-based criteria. In Units D, K, and P, there are no potential human receptors to contaminated groundwater because the contaminated groundwater in these areas is currently being managed as part of the Corrective Action Program under the existing groundwater Compliance Plan (Number CP-50099-001). The area encompassing Unit D is currently being managed under the Corrective Action Program for the Oil Patch groundwater plume, and the area encompassing Units K and P is being managed under the Corrective Action Program for the SEWMA Aeration Basins/Well 270 Area. Corrective actions in these areas include hydraulic containment of groundwater and monitored natural attenuation. Corrective action at these locations was not initiated as a result of a known release SWMUs. Although there is no corrective action program in place in Unit B, this area is concrete covered, and it is not likely that precipitation or surface water run-off would cause significant soil constituents to leach into groundwater.**

References:

- **RCRA Facility Investigation, Shell Oil Company, Deer Park, Texas. Fugro Environmental, Inc., October 1996.**
- **Phase II RCRA Facility Investigation Report, Shell Deer Park Site. Parsons Engineering Science, Inc., May 1999.**

[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)

- **Current OSHA health & safety protocols are in-place at the Plant to manage potential exposure during construction worker scenario.**
- **Groundwater corrective action is ongoing to eliminate potential pathway.**

References:

- **RCRA Facility Investigation, Shell Oil Company, Deer Park, Texas. Fugro Environmental, Inc., October 1996.**
- **Phase II RCRA Facility Investigation Report, Shell Deer Park Site. Parsons Engineering Science, Inc., May 1999.**

[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.

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 Shell Chemical Company facility, EPA ID #TXD067285973, SWRN 30007, located in Deer Park, TX under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

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Rec'd 2895

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.
(1) **Incomplete information**
(2) **Reports in house, yet to be reviewed**
(3) **Unfamiliar site**

For "NO" or "IN" determination, expected date of "YE" determination _____

Completed by (signature) Maureen Hatfield Date 01/13/2000
(print) Maureen Hatfield
(title) Project Manager

Supervisor (signature) Cathy Remmert Date Jan 24, 2000
(print) Cathy Remmert
(title) Supervisor
(EPA Region or State) TNRCC

Locations where References may be found:

If "YE" Code is assigned then attach a copy of database, highlight the reports which support "YE"determination.

see attached

Contact telephone and e-mail numbers

(name) Ms. Janice Wendel
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(e-mail) jwendel@shell.com

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.

YE based on review of facility input + documents (list attached to TSD checklist).