

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**Revised 11/8/00**

**RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA725)**

**Current Human Exposures Under Control**

**Facility Name:** Vulcan Chemicals  
**Facility Address:** P.O. Box 12283, Wichita, Kansas 67277  
**Facility EPA ID #:** KSD 007 482 029

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?

YE 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”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act] 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	<u>X</u>	___	___	<p><u>There are substantial records documenting groundwater contamination such as the Vulcan semi-annual groundwater reports for the periods of April 2000, October 1999, April 1999, October 1998, &amp; April 1998 with the major concerns being chlorinated solvents such as carbon tetrachloride, trichloroethene, etc. Vulcan onsite wells routinely exceed MCLs such as IW32 (Carbon Tetrachloride-1300 PPB). Some wells farthest from the facility periodically exceed MCLs such as MW3S1 (Tetrachloroethene-7.9 ppb).</u></p>
Air (indoors)	___	<u>X</u>	___	
Surface Soil (e.g., <2 ft)	___	___	<u>X</u>	
Surface Water	___	___	<u>X</u>	
Sediment	___	___	<u>X</u>	
Subsurf. Soil (e.g., >2 ft)	___	___	<u>X</u>	
Air (outdoors)	___	___	<u>X</u>	

\_\_\_\_\_ 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.

YE 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): Though most of the onsite Vulcan property is covered with concrete, it is likely that there is soil and sediment contamination due to historical practices which will be addressed in the Onsite RCRA Facility Investigation. The Vulcan Offsite RCRA Facility Investigation Report (April, 1993) identifies hexachlorobenzene, hexachlorocyclohexanes, hexachlorobutadiene, and hexachloroethane in the soil on the north side of 63<sup>rd</sup> St. South between the closed landfill and Hoover Road, these levels exceeded the proposed Subpart S action levels. Perchloroethylene production waste constituents were found south of the facility in the soil along with trace levels of dioxins with decreasing concentrations with increasing distance from the facility. The groundwater plume has been expanding to the southeast off the plant property. The primary contaminants are chlorinated solvents such as carbon tetrachloride, trichloroethene, etc. as evidenced by recent semi-annual groundwater reports from 4/98 to present. Vulcan has started the process of institutional controls such as hooking up neighbors to Clearwater water supplies, providing bottled water to affected neighbors, or buying water rights and homes from affected neighbors.

Footnotes:

<sup>1</sup> “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).

<sup>2</sup> 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)

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

Yes 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): Construction work performed by either Vulcan employees or contractors who would have to penetrate the concrete overlying the plant or affected offsite soil may be exposed to the soil contamination listed in item #2 or any other unknown constituent from historical industrial practices if the soil has not been tested and/or if appropriate personal protective equipment is not worn. (Note: The plant is approximately 70%-80% paved)

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

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- 4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (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)?

NO 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): There are substantial records documenting groundwater contamination such as the Vulcan semi-annual groundwater reports for the periods of October 2000, April 2000, October 1999, April 1999, October 1998, & April 1998 with the major concerns being chlorinated solvents such as carbon tetrachloride, trichloroethene, etc. Vulcan has started the process of institutional controls, such as hooking up affected neighbors to Clearwater water supplies, providing bottled water to affected neighbors, buying affected neighbor water rights and homes. Any affected neighbor with confirmed trace detections of chlorinated solvents or other chemical contaminants in their well have been placed on another source of water for domestic use. A few affected neighbor wells have contaminant levels exceeding MCLs or in the absence of MCLs, EPA Region IX Preliminary Remediation Goals. The remaining neighbors are either hooked up to Clearwater water, using bottled water, or have their water being treated by a carbon filtration system. There are no known residents currently using contaminated drinking water for domestic uses. Though most of the onsite Vulcan property is covered with concrete, there is an assumption that there is soil and sediment contamination due to historical practices which will be addressed in the Onsite RCRA Facility Investigation. The Vulcan Offsite RCRA Facility Investigation Report (April, 1993) identifies hexachlorobenzene, hexachlorocyclohexanes, hexachlorobutadiene, and hexachloroethane in the soil on the north side of 63<sup>rd</sup> St. South between the closed landfill and Hoover Road. Perchloroethylene production waste constituents were found south of the facility in the soil along with chlorinated dioxins with decreasing concentrations with increasing distance from the facility. Currently there are no known receptors that are affected by either groundwater or soil contamination. Vulcan has taken steps to provide a safe environment for both local residents and workers. Vulcan has taken additional protective measures as evidenced by Vulcan’s Plant Safety Manual which defines the safety protocol that workers will take when performing both onsite and offsite construction work. This would occur when concrete on the plant would be disturbed due to construction, etc. (Note: The plant is approximately 70%-80% paved). The Vulcan Plant Safety Manual spells out the procedures to prevent exposure to soil contamination listed in item #2 or any other unknown constituent from historical industrial practices.

<sup>4</sup> 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):Vulcan has sampled the groundwater semi-annually onsite and offsite along with the neighbor wells. The groundwater monitoring results show that there are exceedances of the maximum contaminant levels (MCLs) and/or preliminary remediation goals (PRGs) in some nearby residential wells. The groundwater has been contaminated with constituents including carbon tetrachloride, tetrachloroethene, trichloroethene, vinyl chloride, chlorophenols, and pesticides. The highest concentrations of contaminants are onsite with constituent levels decreasing with distance away from the Vulcan facility. Many of the Vulcan neighbors are no longer using their groundwater for all domestic purposes. Vulcan has bought neighboring properties to the east of the facility, hooked up neighbors to the Clearwater Water District lines, installed carbon filtration systems and bought neighbor water rights as prudent steps in protecting human health. There are still neighbors who are using their groundwater for household purposes. Recently there have been neighbors who have had detections of pesticides in their water (a-BHC, b-BHC). Vulcan continues to periodically monitor these wells and is taking actions to prevent further exposure to contaminated groundwater.

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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**     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 Vulcan Chemicals facility, EPA ID #KSD007 482 029, located at 6200 S. Ridge Road, Wichita, Kansas 67215 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	<u>(signature) Original signed by</u> <u>(print) David Garrett</u> <u>(title) Project Manager</u>	Date <u>7/17/2002</u>
Supervisor	<u>(signature) Original signed by</u> <u>(print) John Smith</u> <u>(title) Chief of RCRA Corrective Actions and</u> <u>Permitting Branch</u> <u>(EPA Region) Region VII, Kansas City, KS.</u>	Date <u>7/17/2002</u>

Locations where References may be found:

EPA Region VII Records Center  
901 N. 5<sup>th</sup> St.  
Kansas City, Kansas 66101

Contact telephone and e-mail numbers

(name) David Garrett  
(phone #) (913)551-7159  
(e-mail) [Garrett.David@EPA.GOV](mailto:Garrett.David@EPA.GOV)

**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.**