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:	Clean Harbors of Cleveland
Facility Address:	2900 Rockefeller Avenue, Cleveland , OH
Facility EPA ID #:	OHD 000 724 153

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

☐ 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).

Current Human Exposures Under Control
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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)?

Media of Concern	Yes	No	?	Rationale / Key Contaminants
Groundwater		x		No groundwater constituents were above screening levels.
Air (indoors)[2]		x		There are no volatile organic carbon contaminants as a concern.
Surface Soil (e.g., <2 ft)	x			Arsenic concentrations were above screening levels for an industrial land use scenario.
Surface Water		x		Cuyahoga River is approximately 800 ft from the site, and the groundwater results were all below screening levels (Ohio Water Quality Standards for Human Health).
Sediment		x		Cuyahoga River is approximately 800 ft from the site. Surface water run-off on site is contained and therefore does not reach the river.
Subsurface Soil (e.g., >2 ft)		x		There were no constituents above screening levels in the subsurface soil.
Air (outdoors)		x		Soil or groundwater constituents did not exceed the screening criteria.

☐ If no (for all media) - skip to #6, and enter a YE status code after providing or citing appropriate "levels", and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

☒ 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.

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[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) suggests 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.

Rationale and Reference(s):

Consent Decree between United States and Clean Harbors of Cleveland, Inc., September 26, 1990
Report of Subsurface Investigation, Clean Harbors of Cleveland, Inc., February 25, 1991
Subsurface Investigation Report for Clean Harbors of Cleveland, July 1991
Sampling and Analysis Results Former ChemClear Property, March 2006

Background

Clean Harbors of Cleveland is a wastewater treatment facility located in Cleveland, OH. It encompasses a 5.5 acre area and is located in a heavily industrial area of Cleveland. A consent order was made between EPA and Clean Harbors on September 28, 1990. The consent order detailed what actions should be taken to mitigate risks to the environment made by Clean Harbors' predecessor, ChemClear.

It was ordered by the U. S. EPA to empty and properly dispose of the contents of three aboveground storage tanks (tanks 1, 2, and 3). ChemClear verified that this had been done and proceeded to construct a concrete containment area around the tanks. After construction of the containment area was completed, EPA ordered that soil sampling be performed around this area for the hazardous constituents that were contained in the tanks. Those hazardous constituents were the following: maleic acid, vanadium, total cyanide, arsenic, barium, cadmium, chromium, lead, mercury, selenium, methanol, cadmium, hexavalent chromium, nickel, cyanide (complexed), cyanide salts, lead, maleic anhydride, 1,4-napthaquinone, toluene and phenol. A subsurface soil investigation was performed and a report was submitted to EPA in 1991.

On August of 1985, a cracked pipe fitting in a recessed portion of a receiving tank resulted in a chromic acid release to the environment. It was estimated that approximately 2,500-3,000 gallons of chromic acid was released. A recovery system was subsequently installed, which recovered approximately 500 gallons of the spilled chromic acid. The Order required ChemClear to perform a soil and groundwater investigation of the spill area for total chromium (Exhibit C of the 1990 Consent Order). The results of the investigation are detailed in Report of Subsurface Investigation Chromic Acid Spill Area, February 25, 1991.

Summary of Investigations and Results

Soil:

For this EI determination, the soil sampling results were compared against Region 9 industrial Preliminary Remediation Goals (R9 PRGs) for direct contact and particulate using a targeted excess cancer risk of $1x10^{-5}$ and site specific background. The 1991 results revealed a sample result of 260 mg/kg for arsenic at the 2-4 ft. depth. The other sample locations showed results ranging from 13 mg/kg to 35 mg/kg. Therefore, the location was re-sampled in September 2005. The sample results revealed that at the surface (0-2 ft.), arsenic was 33.5 mg/kg and decreased to 13 mg/kg at the 2-4 ft. depth and further decreased to 6.8 mg/kg at depth of 4-6 ft. In addition, sampling location B-11 showed arsenic above the background level at a concentration of 35 mg/kg. In the chromic acid spill area, the highest total chromium concentration in the soil was 682 mg/kg in the surface soil and 1,030 mg/kg in the subsurface soil. The screening criterion for chromium in soil for an industrial use is 4,500 mg/kg and therefore the results were below the screening criterion.

Groundwater:

The groundwater results were compared against Maximum Contaminant Level (MCLs) for total chromium and it was found that no results were above the MCL for total chromium. Also, as part of a preliminary screening, for this EI determination, constituents in the soil were additionally screened against migration to groundwater screening levels. It was found that they were all below their respective screening levels; therefore groundwater was not sampled in the diked area.

Surface Water/Sediment:
The groundwater results were also compared against the Ohio Water Quality Standards for Human Health exposure to assess whether contaminated groundwater from the site could adversely affect the river where a recreational user might come into contact with the surface water. It was found that the groundwater results were also below this screening criterion. In addition, any surface water run-off from the site is collected and treated on site and/or discharged to the Northeast Ohio Regional Sewer.

Outdoor Air:
The screening tool used to assess potential risks to industrial workers was the R9 PRGs for particulate matter. The onsite arsenic at a maximum concentration of 33.5 mg/kg and total chromium concentration at a maximum concentration of 1,030 mg/kg did not exceed the ambient air inhalation screening criteria of 4,500 mg/kg for total chromium and 1,300 mg/kg for arsenic.

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"	Resident	Worker	Day Care	Construction	Trespasser	Recreation	Food[3]
~~Groundwater~~							
~~Air (indoors)~~							
Soil (surface <2 ft.)	No	Yes	No	Yes	Yes	No	No
~~Surface Water~~							
~~Sediment~~							
~~Soil (subsurface >2 ft.)~~							
~~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).

☒ 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): *Report of Subsurface Investigation, Clean Harbors of Cleveland, Inc., February 25, 1991*
Subsurface Investigation Report for Clean Harbors of Cleveland, July 1991
Sampling and Analysis Plan Former ChemClear Property, July 26, 2005
Sampling and Analysis Results Former ChemClear Property, March 3, 2005

Industrial Worker, Construction Worker, and Trespasser Exposure Scenarios

Surface Soil: There were 9 surface soil samples that were above the R9 PRG for an industrial worker at a $1x10^{-5}$ targeted excess cancer risk for arsenic. This screening level is 16 mg/kg. The 2005 sampling event showed arsenic to be above the screening level at 33.5 mg/kg. Exposure to contaminated arsenic concentration in the surface soil is therefore a complete pathway for routine industrial workers, construction workers and trespassers.

Other Exposure Scenarios

The facility is located in a heavily industrialized area. There are no residents or daycare centers in the area. In addition the land is not used for gardening. Therefore the exposure scenario associated with the above receptors is incomplete.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[3] (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)?

☒ 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): *Report of Subsurface Investigation, Clean Harbors of Cleveland, Inc., February 25, 1991*
Subsurface Investigation Report for Clean Harbors of Cleveland, July 1991
Sampling and Analysis Results Former ChemClear Property, March 3, 2006

Surface Soil
Human health risk associated with exposure of routine workers to onsite surface soil arsenic contamination was evaluated. Two sampling points exceeded the site-specific background concentration of 26.6 mg/kg. These exceedances were in the diked area, which is a vegetated area at which a limited amount of time is spent by the facility workers performing landscaping work. Therefore, a site-specific risk calculation was performed based on the assumption that an industrial worker would only spend 2 hours per day in the diked area for 160 days accounting for the warm period of the year. The excess cancer risk was calculated to be 4.6×10^{-6}. This risk is well within the EPA's acceptable target risk range of 1×10^{-4}-1×10^{-6}. The site-specific noncarcinogenic hazard quotient was also calculated and found to be 0.003. A hazard quotient below one means that the noncarcinogenic risk is acceptable. Therefore, the risk to workers from arsenic contamination in the surface soil is not significant.

[3] 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):

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA750)

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 Clean Harbors of Cleveland facility, EPA ID # OHD 000 724 153, located at 2900 Broadway, Cleveland , OH 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	(signature)	Jill Groboski	Date 3/21/06
	(print)	Jill Groboski	
	(title)	Environmental Engineer	
Supervisor	(signature)	George Hamper	Date 3-21-06
	(print)	George Hamper	
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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.