

**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:** Eastman Specialties  
**Facility Address:** 10380 Worton Road Chestertown, MD 21620  
**Facility EPA ID #:** MDD001890060

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 #8 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”<sup>1</sup> 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			Bis (2-ethylhexyl) phthalate, Toluene
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment	X			Bis (2-ethylhexyl) phthalate
Subsurface Soil (e.g., >2 ft)	X			Bis (2-ethylhexyl) phthalate
Air (outdoors)		X		

- 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.
- 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):

**Groundwater:**

Quarterly groundwater sampling data is screened against drinking water Maximum Contaminant Levels (MCLs). Bis (2-ethylhexyl) phthalate (BEHP) and Toluene were detected above MCLs in the vicinity of the Former Wastewater Treatment Lagoons and Impoundments (Areas 308, 309, 310 & 314). Exceedances for both contaminants were found in monitoring wells MW-12 and MW-19, which are screened in the upper unconfined aquifer. Concentrations for BEHP were as high as 48,000 ug/L which concentrations for toluene were up to 8,000 ug/L. The drinking water MCL for BEHP is 6 ug/L, while the MCL for Toluene is 1,000 ug/L.

**Sediment:**

Sediment in a 5.5 acre storm water pond was sampled as part of the Phase I Site Characterization plan in 2009. Eleven sample locations at a depth range of 0-6” had concentrations of BEHP ranging from 0.32 mg/kg to 12 mg/kg. The BEHP Threshold Effect Concentration (TEC) is 0.18 mg/kg and the Probable Effect Concentration (PEC) is 2.6 mg/kg.

**Subsurface Soil:**

Subsurface soil samples were collected at 5 foot intervals from 5’-20’ below ground surface as part of the Phase II Site Characterization plan in 2010. Only one constituent, BEHP, exceeded the risk-based screening level for industrial soils. The industrial soil screening level for BEHP is 160 mg/kg. The highest detected concentration of BEHP was 2,400 mg/kg at 5 feet below ground surface in the vicinity of the Former Wastewater Treatment Lagoons and Impoundments.

**Reference:**

1. Site Characterization Report, Premier Environmental Services Inc., November 24, 2009
2. Site Characterization Report – Phase II, Premier Environmental Services Inc., August 13, 2010

3. Remedial Action Effectiveness Report, EarthCon Consultants Inc., April 26, 2013
4. Quarterly Progress Report #21, Eastman Specialties Corporation, October 23, 2013
5. Quarterly Progress Report #22, Eastman Specialties Corporation, January 24, 2014

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

The exposure pathways are based on current site conditions and uses.

**Groundwater:** Groundwater monitoring results indicate BEHP and toluene contamination is limited to the upper unconfined aquifer or Aquia aquifer. The facility uses four onsite wells for a potable water supply. These wells are screened in the confined aquifer or Monmouth aquifer. Results from monitoring wells screen in this confined aquifer indicated no contamination has leached through the confining clay layer, which separates the two aquifers. There are multiple private supply wells within a mile radius of the facility. All of the public supply wells within this radius are screened at least 25 feet below ground surface and draw water from the Monmouth formation. No public water supply wells exist within a mile of the facility. No residential or industrial wells are screened in the plume area. There are no day care facilities on site.

Future projects involving construction in the vicinity of the former wastewater treatment lagoons and impoundments is a possibility. In this situation, construction workers may be exposed to contaminated groundwater.

**Subsurface Soil:** Surface soil associated with the former wastewater treatment impoundments and lagoons was removed to prevent potential surface water impacts from runoff. Considering that the extent of soil contamination is limited to this former impoundment area and is now encountered approximately 5-15 feet below ground surface, it is unlike that significant exposure could occur other than excavation via construction. There is no food grown/produced in the contaminated soil area. Future projects involving construction in the vicinity of the former wastewater treatment lagoons and impoundments is possible. In this situation, construction workers may be exposed to contaminated subsurface soils.

**Sediment:** The pond where sediment contamination was found is used for storm water purposes. Therefore, exposure is highly unlikely for residents, workers, and recreation. No construction at the pond is anticipated in the near future.

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

Reference:

1. Site Characterization Report, Premier Environmental Services Inc., November 24, 2009
2. Site Characterization Report – Phase II, Premier Environmental Services Inc., August 13, 2010

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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)?
- 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):**

Although contaminated surface soil has been excavated, subsurface soils and groundwater still pose a potential risk to onsite construction workers who may be required to excavate. However, these prudent work practices and PPE are required to manage exposure to an acceptable risk.

- 1) Contractor Safety Orientation (per SS-4, Appendix I)
  - a. This includes PPE requirements for the task. Standard PPE for ALL contractors include hard hat, safety glasses, steel toed chemical resistant work boots, pants, long sleeved shirt and gloves per SS-8, Personal Protective Equipment.
- 2) Safe Work Permit
  - a. The Safe Work Process Procedure, SS-53.7, includes review of job safety requirements and hazards.
  - b. Hazard information:
    - i. location of eyewashes/safety showers,
    - ii. chemical hazard ratings (if applicable),
    - iii. notification of specific job/area hazards at the work location,
    - iv. notify others in the area who may be affected by the work,
    - v. review and walk down of potential hazards that may be introduced as a result of the work to be performed
- 3) Excavation Permit
  - a. An excavation permit is required per SS-47, Excavation, Trenching and Breakthrough.
  - b. If excavation is planned in the area near the former impoundments (Northwest corner of the site) the work will need to be approved by the EHS Manager and special instructions will be added to the Excavation Permit for Personnel protection and if deemed applicable, instructions for excavated material handling, profiling and disposal.

This will ensure that the magnitude (intensity) of the exposure pathway for construction workers will be limited, and therefore, exposures cannot be reasonably expected to be significant.

<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.

Reference: Safe Work Practices for Contractors (email), Eastman Specialties, September 9, 2016

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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):



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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 (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 Eastman Specialties facility, EPA ID # MDD001890060, located at 10380 Worton Road Chestertown, Maryland 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) *John Hopkins* Date 9/13/16  
 (print) John Hopkins  
 (title) Remedial Project Manager

Supervisor (signature) *Luis Pizarro* Date 9/13/16  
 (print) Luis Pizarro  
 (title) Associate Director  
 (EPA Region or State) EPA, Region 3

Locations where References may be found:

US EPA Region III  
Land & Chemicals Division  
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