

**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:** Former Kop-Flex Facility  
**Facility Address:** 7565 and 7555 Harmans Road, Hanover, Maryland  
**Facility EPA ID #:** MDD 043373935

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			1,1,1-TCA, 1,1-DCA, 1,1-DCE, 1,4-Dioxane
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2 ft)	X			See below.
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):

Subsurface soil:

A Phase I Environmental Site Assessment conducted in 1996 of the Kop-Flex Site identified eight potential areas of concern (AOCs) where releases of oil or hazardous materials may have occurred:

- AOC 1 – Chemical product and metal chip storage area
- AOC 2 – Caustic wastewater treatment area
- AOC 3 – Forge building transformers and metal scale locations
- AOC 4 – Forge washwater collection tank
- AOC 5 – Aboveground diesel fuel storage tank
- AOC 6 – Former sanitary wastewater treatment plant
- AOC 7 – Oil cooling unit spill remediation plant
- AOC 8 – Floor of the Kop-Flex facility

Subsequent site investigations confirmed that releases occurred in four of the AOCs (AOC 1, AOC 2, AOC 3, and AOC 7). The multi-phase investigations also served to delineate the nature and extent of the releases in soil and groundwater. Data from the investigations in the identified AOCs showed that no VOCs or semi-volatile organic compounds (SVOCs) are present at concentrations of concern in subsurface soil. PCBs were detected above the soil comparative criteria in shallow subsurface soil in AOC-1. Metals (arsenic, mercury, and thallium) were detected at concentrations above the commercial/industrial screening criteria in surface soil samples from AOC-1 and AOC-2. Metal concentrations were compared to Anticipated Typical Concentrations (ATCs) for eastern Maryland, which are based on measured background levels. The maximum detected thallium concentration was below the ATC, so thallium is not considered a contaminant of concern at the site. Arsenic and mercury concentrations exceeded the soil comparative criteria and the ATCs in surface soil, although there is no known source of arsenic or mercury related to historical facility operations.

Onsite groundwater:

Contaminants of concern in groundwater (surficial and lower Patapsco aquifer) above MDE groundwater quality standards at the former Kop-Flex site consist of chlorinated VOCs (1,1,1- TCA, 1,1-DCA, and 1,1-DCE). Also, 1,4-dioxane was

detected above the MDE comparative criteria which is based on an evaluation of calculated risk-based concentration in groundwater, using current default exposure factors developed by USEPA and a target cancer risk factor. The highest VOC levels in shallow groundwater are found in the identified source areas below and to the east of the former Kop-Flex manufacturing building and decrease in the direction of groundwater flow. No site-related VOCs appear to be migrating offsite at levels of concern in the shallow portion of the groundwater system. VOC impacts in the deeper groundwater extend from the identified source area east of the former manufacturing building to the offsite areas south-southeast of the former Kop-Flex facility. The highest onsite VOC concentrations occur in the vicinity of monitoring wells located immediately downgradient of the source area. Elevated VOC concentrations were also detected in samples from a well located along the southern property boundary.

#### Offsite groundwater:

A subset of site-related VOCs has been detected in offsite groundwater monitoring wells located to the south-southeast of the former Kop-Flex facility. Evaluation of the sampling data indicates chlorinated VOCs and 1,4-dioxane associated with the former Kop-Flex site are limited to the thick, predominately sand deposits present in deeper confined portions of this aquifer that overlie the Arundel Clay confining unit. Within the impacted interval of the Lower Patapsco aquifer, the highest VOC concentrations were detected in samples from paired wells located in the Harmans Woods community. 1,1-DCE and 1,2-DCA were detected above the MDE groundwater quality standards and the concentration of 1,4-dioxane was above the MDE-calculated risk-based level. Sampling data from deep monitoring wells located further south contained trace to very low concentrations of site-related VOCs. All residential wells that have been found to have exceedances have been decommissioned and the residences provided with public drinking water.

#### REFERENCES:

WSP. 2015c. Kop-Flex VCP # 31, Hanover, Maryland, Quarterly Status Report No. 6. August 18.

WSP. 2015d. Groundwater Monitoring Plan, Former Kop-Flex Facility, Hanover, Maryland, VCP # 31. June 2.

Environmental Strategies Corporation, 1996, Phase I Environmental Site Assessment, Kopflex Inc., Hanover, Maryland

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

Instructions for Summary Exposure Pathway Evaluation Table:

- Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
- 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):**

Surface and subsurface soils located in AOC- 1 and AOC-2 containing levels of VOCs above 10 milligrams per kilogram were removed during a previous remedial action. Soil was excavated to depths ranging from 15 to 23 feet below ground surface (bgs) in AOC - 1 and AOC – 2. Manufacturing operations ceased in 2012 and the plant is currently vacant with a small number of office employees remaining at the site. The site is fenced and areas where VOC-containing subsurface soil remains are covered by pavement and the concrete slab of the vacant manufacturing building; the remaining office workers do not access these areas and the fence limits access by trespassers. Therefore, based on current site conditions, there is no current human exposure to surface and subsurface soil contaminants. Future use of the property will be commercial with the construction of warehouse facilities and potential exposures to VOCs will be eliminated by engineering controls that will be implemented as part of site redevelopment. The anticipated controls include a vapor mitigation system in future site

buildings, maintaining the concrete slabs as part of the re-development, and paving surfaces to the west of the building. In addition, a soil management plan has been developed to eliminate potential exposure pathways from any excavation work conducted at the Kop-Flex site. Groundwater occurs at depths of 10 to 15 feet bgs on the former Kop-Flex property and is not used as a potable source of water. Therefore, there is currently no unacceptable human exposure to the identified contaminants of concern in groundwater. Institutional controls will ensure that there is no future use of onsite groundwater. Potable water supply wells in the area south of the former Kop-Flex property and Maryland Route 100 were sampled from late 2012 to early 2015. Water samples from eight wells had site-related VOC concentrations above either federal or state groundwater quality standards, or MDE risk-based criteria. These potable wells were decommissioned and the associated homes were connected to the municipal water system. Based on the current offsite groundwater conditions, there is no unacceptable human exposure to contaminants of concern. Groundwater sampling of potable wells and monitoring wells in the impacted area south of the former Kop-Flex property is being conducted to ensure no potential exposure to VOC-affected groundwater by other well owners.

<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)?
- 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):

<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):

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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 Radford Army Arsenal Plant facility, EPA ID # VA 1210020730, located at Route 114, Radford, VA 24141-0100 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) Erich Weissbart Date 10/7/15  
(print) Erich Weissbart  
(title) Project Manager

Supervisor (signature)  Date 10/13/15  
(print) Luis Pizarro  
(title) Associate Director  
EPA Region III

Locations where References may be found:

US EPA Region III  
Land & Chemicals Management Division  
1650 Arch Street  
Philadelphia, PA 19103

Contact telephone and e-mail numbers

(name) Erich Weissbart  
(phone #) 410-305-2779  
(e-mail) weissbart.erich@epa.gov