

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: Koppers Inc.
Facility Address: 4020 Koppers Rd; Salem, VA 24153
Facility EPA ID #: VAD003125770

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 #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).

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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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	___	___	RFI data – PAHs (A)
Air (indoors) ²	___	<u>X</u>	___	Exposure to indoor air is occupational. OSHA addresses occupational exposures (B)
Surface Soil (e.g., <2 ft)	<u>X</u>	___	___	RFI soil data – Risk Characterization (C)
Surface Water	___	___	___	RFI groundwater data, NPDES data (D)
Sediment	___	___	___	
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	___	___	RFI soil data – Risk Characterization (C)
Air (outdoors)	___	<u>X</u>	___	Based on estimated concentrations using EPA calculation based on soil concentrations (E)

___ 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):

- A. Groundwater monitoring data collected for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and quarterly post-closure monitoring for the closed RCRA surface impoundments show that VOCs and SVOCs are present in groundwater at concentrations exceeding Groundwater Protection Standards and Region 3 Risk-Based Criteria (RBCs).

RCRA Facility Investigation Report, September 2003 (BBL)
Annual Groundwater Monitoring Report, June 2004 (RETEC)

- B. “Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils” (OSWER, November 29, 2002). According to this guidance, “OSHA and EPA have agreed that OSHA generally will take the lead role in addressing occupational exposures.” “In general, therefore, EPA does not expect this guidance to be used for settings that are primarily occupational.”

- C. Surface and subsurface soil data collected for the RFI show that VOCs and SVOCs are present in soil at concentrations exceeding Region 3 risk-based soil screening concentrations. Although, a Site-specific Risk Characterization shows that hazard indices associated with potential

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exposure to on-Site surface soil and subsurface soil are less than 1.0, indicating that no adverse noncarcinogenic health effects are expected to occur, individual data point screening values that exceeded the RBC-Soil (Industrial) have been evaluated for exposure. Similarly, this evaluation indicates that potential excess lifetime cancer risks fall within EPA's allowable risk range of 1×10^{-6} to 1×10^{-4} for all receptors included in the risk assessment.

Potential excess lifetime cancer risk (ELCR) is below EPA's allowable risk range (i.e., less than 1×10^{-6}), for the KI Worker in the Active Process Area and the trespasser in the Active Non-process area. The ELCR for the KI Worker in the Active Non-process area was at 2×10^{-5} , which is within EPA's allowable risk range. However, the carcinogenic risks for this area are due to elevated detections of carcinogenic PAHs in one sample located in a vegetated field in an unused portion of the property (SB-216, 0 to 2 feet). The likelihood of either receptor being exposed to this single data point is slim. Therefore, actual risks are likely lower than those calculated in this evaluation.

Attachment A – Focused Human Health Risk Assessment – Supplement to Environmental Indicator Form for KI Roanoke Site, AMEC, September 2004.- *available upon request*

- D. Groundwater monitoring data collected for the RFI and quarterly Post-closure monitoring for the closed RCRA surface impoundments indicate that Site-related constituents are not likely to have migrated via groundwater to the Roanoke River. Preliminary results of an ongoing dye trace study also indicate that Site-related constituents do not appear to be migrating via groundwater to the Roanoke River. Stormwater outfalls are monitored routinely pursuant to the facility NPDES permit.
- E. Outdoor air concentrations were estimated based on soil concentrations using EPA's recommended calculation.

Attachment B – BOXMODEL.

EI Form 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.

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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)

	“Contaminated” Media	Residents	Workers	Day-Care	Constuction	Trespassers	Recreation
Food ³	Groundwater		<u>no</u>		<u>no</u>		<u>no</u>
	Air (indoors)						
	Soil (surface, e.g., <2 ft)		<u>yes</u>		<u>yes</u>		<u>yes</u>
	Surface Water						
	Sediment						
	Soil (subsurface e.g., >2 ft)		<u>yes</u>		<u>yes</u>		<u>no</u>
	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.

- X 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): **Groundwater:** There are no users of groundwater at the Site; therefore, there is no groundwater pathway for workers. Wells of potential downgradient users of groundwater are monitored as part of the ongoing RCRA monitoring. Construction workers are not likely to contact groundwater as it is

typically approximately 12 feet below ground surface. Groundwater beneath the Site is not used to irrigate food crops.

Trespassers are unlikely to encounter subsurface soils.

³ 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”**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)?

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): **Soil** – Workers, construction and trespassers

Subsurface Soil – Workers and construction

Please see the attached explanation

Beazer submitted the Current Human Exposures Under Control Environmental Indicator (EI) (CA 725) for the Koppers, Inc. (KI) plant in Salem, Virginia in draft form to the Virginia Department of Environmental Quality (VADEQ) on September 16, 2004. In the EI form, Beazer acknowledges that concentrations of site-related constituents (SRC) exceeded United States Environmental Protection Agency (USEPA) Region 3 Risk-based Screening Criteria (RBC) in soils at the plant. To further quantify human health risks potentially caused by exposure to soils containing SRCs, AMEC, on behalf of Beazer, performed a Focused Human Health Risk Assessment and included it as an attachment to the EI form. The results of the Focused Human Health Risk Assessment show that

there are no expected adverse health effects and that potential excess lifetime cancer risks fall within USEPA's allowable risk range of 1×10^{-6} to 1×10^{-4} for all receptors included in the risk assessment.

Following their review of the draft EI form, VADEQ requested further clarification on the type of controls that are in place at the plant to mitigate potential exposures to sampling points where concentrations of SRC exceeded USEPA Region 3 RBC.

Figure 1 shows the locations of soil samples collected during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) (BBL, September 2003), with those sample locations where RBC were exceeded circled in orange. With the exception of two soil sample locations, soils with SRC exceeding RBC are located in the process and drip track area. A description of the controls that are in place at the plant to mitigate exposure to soils containing SRC is provided in the following sections.

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General Plant Area

The KI plant is bounded on the north and south by rail lines (Figure 1), which minimize the likelihood of unauthorized trespassers accessing the property from those directions. The Roanoke River borders the plant property along the west and forms a natural boundary to the KI property. There are no public access points from the KI property to the River. The eastern end of the property, which is unused and densely vegetated, is bounded by Krogers. The Krogers property is fenced to minimize the potential for trespassing. Garman Road lies between the KI property and the Krogers fence. The only access to the KI property from the eastern side is via a dirt road. A locked gate across this road prevents access to this portion of the property.

The KI plant operates three shifts per day, seven days per week. This schedule is expected to continue through 2005 (M. Franck, plant manager). During off-shifts, KI always has two employees on site. The process area is always manned, reducing the likelihood of trespassers from entering the property and process area. In the event that the plant is unmanned, KI locks the gates to the roads providing access to the plant via the main entrance and the dirt road at the eastern edge of the property.

Process and Drip Track Area

As shown on Figure 1, the soil samples with SRC exceeding RBC are concentrated in the area around the wood treating process area and drip track area, with four of those locations in the drip track portion of the process area. KI has a worker protection policy in place to mitigate exposures to workers in these areas. The KI worker protection policy requires process and drip track area workers to wear long-sleeved shirts, gloves and hard hats.

Nonprocess Area

Only two samples in the nonprocess area showed SRC in excess of RBC. Both of these samples are located in the southeastern portion of the KI property (Figure 1). This area consists of dense waist-

high grass and low vegetation, and is not used by KI workers. Due to the remote location of these samples, it is not expected that trespassers would be present on this portion of the property. If a trespasser were present in this area, the thick vegetation cover would prevent contact with the soils containing SRC.

Summary

Current Human Exposures at the KI Salem plant appear to be under control. Trespassers are not likely to be on the property due to physical restrictions to the property and the around-the-clock presence of KI personnel. Work-place protections are in place for KI workers who may contact soils in the process and drip track area, thereby mitigating the potential for exposure. Direct contact with the two soil samples exceeding RBC in the non-process area is not likely due to their remote location and the dense vegetation cover on this portion of the property.

KI Salem will be required to implement interim measures for all areas where human exposures are not currently under control.

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.

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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):

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 **Koppers Inc.** facility, EPA ID # **VAD003125770**, located at **Salem, Virginia** under current and reasonably expected conditions. This determination will be re-evaluated when the 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.

Locations where References may be found:

Attachment A- available upon request
Attachment B- available upon request
Attachment C - Map of Sampling Locations
RFI Workplan

Completed by (signature)
(print) Julia M. King-Collins
(title) Environmental Engineer Senior

Date 9/30/04

Supervisor (signature)

Date 9/30/04

(print) Leslie A. Romanchik
(title) Office Director
(State) VA

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Locations where References may be found:

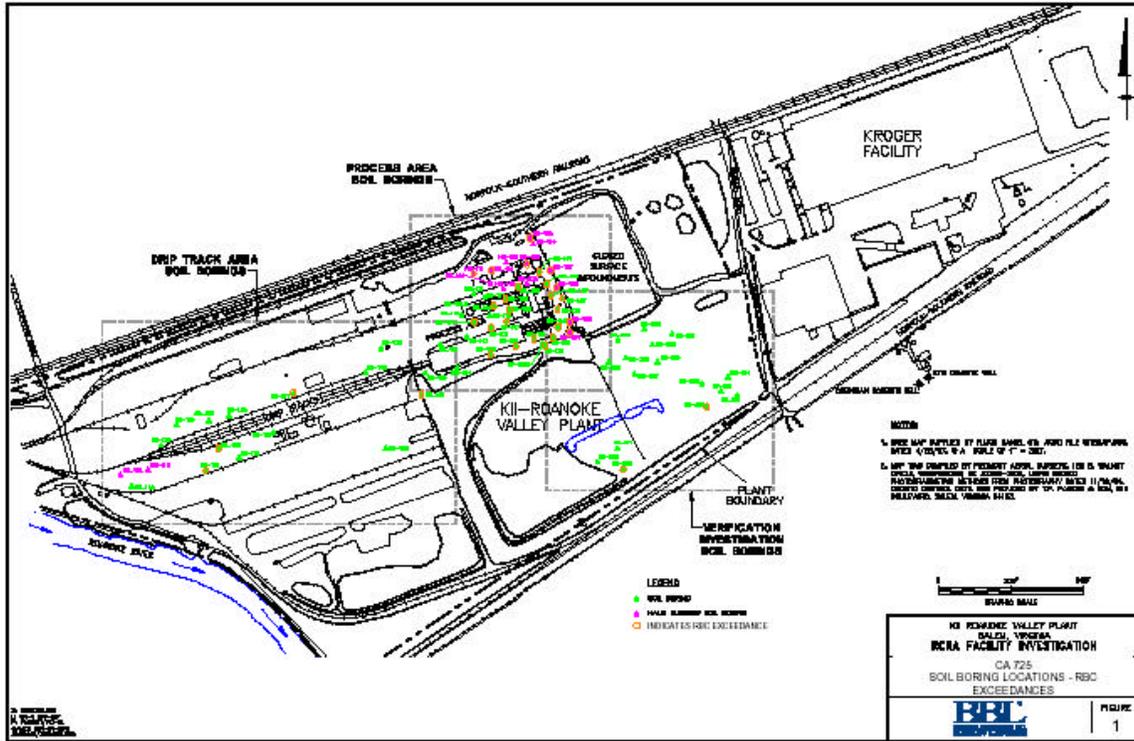
Department of Environmental Quality
Office of Waste Permitting
P.O. Box 10009629 E. Main St.
Richmond, Virginia 23240-0009

Contact telephone number and e-mail:

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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.

ATTACHMENT C



Koppers Industries Roanoke Site

AMEC

September 2004