

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: Bingham & Taylor
Facility Address: Nalle Place, P.O. Box 939, Culpeper, VA 22701
Facility EPA ID #: VAD 003 064 490

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?

X 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		X		See text below
Air (indoors) ²		X		See text below
Surface Soil (e.g., <2 ft)	X			See text below
Surface Water		X		See text below
Sediment		X		See text below
Subsurf. Soil (e.g., >2 ft)	X			See text below
Air (outdoors)		X		See text below

_____ 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):

Based on the results of a site assessment which took place in October 2002, (ENSAT Corporation, February 13, 2003, see also analytical results of split sampling and discretionary sampling in USACE, February 14, 2003), lead concentrations were detected in samples collected from some surface and subsurface soils in levels that exceeded the action criteria established for the project. Each media identified in this question is discussed briefly below:

1. Groundwater - Lead and cadmium concentrations in filtered and unfiltered groundwater samples from five monitoring wells were well below risk-based standards of 18 ug/L and 15 ug/L for cadmium and lead, respectively. The maximum groundwater result for lead was at the laboratory detection level of 0.01 ug/L.

2. Indoor Air - Volatile organic compounds are generally not chemicals of concern at the facility. There are no known or reasonably suspected impacts to indoor air at the facility..

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. Surface Soils - During the October 2002 site assessment, the facility was subdivided into eight "gridded" subareas of equal area. A total of 96 samples comprising 24 composite samples were taken at the facility. Analytical results of six (6) composited samples from three (3) of these subareas exceeded the residential action levels for lead (400 mg/kg). The maximum reported concentration mean was 1200 mg/kg. No sample exceeded the health base limit for cadmium.

4. Surface Water - No exceedence of any chemical of concern has ever been detected in the adjacent stream.

5. Stream Sediments - Four (4) additional stream sediment samples were analyzed for lead and cadmium in October 2002. Only one sample exceeded the residential action level for lead, 400 mg/kg, at a reading of 580 mg/kg. No sample exceeded the health base limit for cadmium. Analytical results show that lead concentrations in stream sediments samples have not significantly increased from levels reported in 1988. This suggests that the facility is not contributing lead contaminants to stream sediments.

6. Subsurface Soils - Composite samples from two of five subsurface soil borings collected in 2002 yielded lead concentrations above the established action levels of 400 mg/kg for risk-based limits of total recoverable lead and 5 mg/l (by Toxicity Characteristic Leaching Procedure) for federal hazardous waste criteria. The maximum reported concentration was 1900 mg/kg. These two borings were located in the same areas in which some surface soil samples yielded relatively elevated lead concentrations.

7. Outdoor Air - Volatile organic compounds are generally not chemicals of concern at the facility. There are no known or reasonably suspected impacts to indoor air at the facility..

References

ENSAT Corporation. Facility Lead Assessment: Bingham & Taylor. ENSAT Project No. A00-1577. February 13, 2003.

USACE. Analytical Results Quality Assurance Split Sampling and Analysis Onsite Soil and Sediment Sampling, October 28-31, 2002. Bingham & Taylor Foundry. U.S. Army Corps of Engineers. February 14, 2003.

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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)

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

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).
- _____ 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):

A complete pathway does not exist for human exposure to surface or subsurface soils because the area in which contaminated samples were collected has been covered with commercially installed asphalt. This pavement effectively caps the area of concern so that exposure by ingestion or inhalation is eliminated. The potential for contaminants in the soil to migrate to groundwater is also minimized.

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There are no residences, day care activities, recreation, or food storage or processing on the property. The cap eliminates the potential for exposure to workers, construction activities, and trespassers. In the event that excavation takes place within the areas in which contaminated samples were collected, workers should be advised on potential health risks for lead exposure at this facility. Excavation workers should also take appropriate precautionary measures to guard against unnecessary exposure while in an excavated area.

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

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):

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.

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 **Bingham & Taylor** facility, EPA ID # **VAD 003 064 490**, located at **Nalle Place, Culpeper, VA** 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) Denis M. Zielinski Date 9/25/03
(print) Denis M. Zielinski
(title) Senior RPM

Supervisor (signature) Bob Greaves Date 9-26-03
(print) Bob Greaves
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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.