



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: Cummings Beverly Center (Former USM Machinery Division North Parcel)
Facility Address: 181 Elliot Street
Beverly, MA 01915
Facility EPA ID #: MAD 043415991

- 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... 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).

RCRA RECORDS CENTER
FACILITY Cummings Center
I.D. NO. MAD043415991
FILE LOC. R-13
OTHER # 108415

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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	___	<u>X</u>	___	_____
Air (indoors) <sup>2</sup>	___	<u>X</u>	___	_____
Surface Soil (e.g., <2 ft)	___	<u>X</u>	___	_____
Surface Water	___	<u>X</u>	___	_____
Sediment	___	<u>X</u>	___	_____
Subsurf. Soil (e.g., >2 ft)	___	<u>X</u>	___	_____
Air (outdoors)	___	<u>X</u>	___	_____

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): See Attached Sheets  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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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**Question #2 – Rationale and References**

The Cummings Beverly Center (Former USM Machinery Division North Parcel) is a subset of the entire property that was the Former USM Machinery Division. There is also a South Parcel of the Former USM Machinery Division which is located on the south side of Elliot Street (Route 62). Environmental response actions at the Former USM Machinery Division property have been performed under the requirements of the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. The property was reported to the Massachusetts Department of Environmental Protection (MADEP) in 1989. Extensive environmental site characterization occurred at the property from 1987 to 1990 with samples collected throughout the property primarily relating to soil and groundwater, but samples of surface water and sediment at the Upper and Lower Shoe Ponds (located on the property) were also taken. Samples were analyzed for total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs) and metals. Sampling strategies and results are documented in "Phase II – Comprehensive Site Assessment, United Shoe Machinery Facility, Beverly, Massachusetts" by Haley & Aldrich, Inc., June 1991. As described in the Phase II report, soil samples from across the facility contained detectable levels of metals, VOCs, SVOCs, and TPH. PCBs were detected in only a limited number of soil samples and typically at concentrations less than 1 ppm. The majority of groundwater samples from across that site did not contain VOCs, PCBs, or SVOCs, but did typically contain some metals and TPH at low concentrations.

The Phase II report references a separate human health risk characterization report ("Phase II Risk Characterization for the USM Site" by Cambridge Environmental Inc., June 1991). Results of the risk characterization indicated that, for most of the USM facility, risk estimates were below the MCP risk criteria. The risk characterization was performed using an unrestricted use scenario (i.e., residential use), and identified possible future risk at five property locations under this scenario. SVOCs in soil were the primary contaminants contributing to the risk.

A Phase III Final Remedy Response Plan was completed in August 1992 by Haley & Aldrich. As future property development plans were for commercial use and did not include residential use, the Phase III report developed a remedial plan based on a restricted commercial use scenario. Under this scenario, soil remediation by excavation and on-site cold-mix batching was selected as the remedial alternative. Soil remediation would take place at the five locations as identified in the Phase II Risk Characterization report.

In April 1996, an Activity and Use Limitation (AUL) was placed on the entire Northern Parcel property to prohibit future residential site use and limit site use to commercial and industrial uses. As part of the AUL, use of the on-site ponds was restricted prohibiting recreational uses, such as boating, swimming, and fishing.

Soil remediation occurred from October 1996 to July 1997 and is documented in the report "Phase IV Final Inspection Report" by Haley & Aldrich, October 1997. The primary locations of soil remediation are shown in the attached Figure 1. The soil remediation goals were those as established by the MCP for non-residential use. These included a soil remediation goal for TPH of 10,000 ppm, a PCB goal of 2 ppm, and a goal for lead of 600 ppm. Confirmatory samples collected during soil remediation documented successful

achievement of these goals. Sample results are included in the Phase IV report. No groundwater remediation was necessary as existing groundwater well concentrations were in compliance with the MCP standards for non-drinking water. Oil non-aqueous phase liquid (NAPL) was encountered during the soil excavation of the area known as the former Chip Grind Shed. The NAPL source was believed to have been from oil in abandoned utility lines from the adjacent Powerhouse (now known as Building 900). Groundwater samples collected subsequent to the NAPL removal and soil excavation did not detect the presence of NAPL in any monitoring well or dissolved concentrations above MCP standards.

After the completion of the remediation documented in the Phase IV report, the North Parcel property was closed with a Response Action Outcome (RAO) Statement (Haley & Aldrich, October 1997) in accordance with the MCP. The RAO documented that a condition of no significant risk to human health existed at the site as long as the site use remained restricted in accordance with the AUL, which it has through the date of this audit.

Between 1997 and 2008, the AUL was amended five times to allow alternative uses at portions of the property that were originally not allowed under the AUL. These amendments included allowing the use of the interior spaces of all buildings for unrestricted use, the use of certain outdoor areas for child day care play areas, and the allowing of light recreational use of the land area surrounding the Upper and Lower Shoe Ponds. For each amendment, additional site assessment and/or risk characterization was performed to document that the removal of certain AUL restrictions would not result in a significant increase in total site risk.

As part of the 2008 AUL amendment process, soil gas testing was performed around the buildings to determine if vapor intrusion was present due to any residual contaminants that remained in the subsurface. The conclusion of the soil gas testing and risk characterization was that no substantial vapor intrusion was present in the buildings. This information is included in the Fifth Amendment to the Activity and Use Limitation, and was recorded with the South Essex County District Registry of Deeds in September 2008.

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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>“Contaminated” Media</b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	___	___	___	___			___
Air (indoors)	___	___	___				
Soil (surface, e.g., <2 ft)	___	___	___	___	___	___	___
Surface Water	___	___		___	___	___	
Sediment	___	___					
Soil (subsurface e.g., >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): \_\_\_\_\_

Footnotes:

<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): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Footnotes:

<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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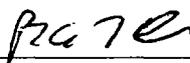
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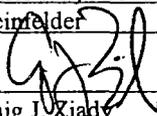
6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

X 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 at the Cummings Beverly Center (Former USM Machinery Division North Parcel) facility , EPA ID # MAD 043415991, located at 181 Elliot Street, Beverly, MA 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  Date 6/23/10  
Bruce A. Hoskins, P.E., LSP  
Senior Project Manager  
Kleinfelder

Reviewed by  Date 6/24/10  
Craig J. Ziady  
General Counsel  
Cummings Properties, LLC

Locations where References may be found:

Massachusetts Department of Environmental Protection Northeast Regional Office  
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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.**