

**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:** Atlantic Research Corporation  
**Facility Address:** 5945 Wellington Road  
Gainesville, Virginia 20155-1699  
**Facility EPA ID #:** VAD 02 374 1705

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”**<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	<b>X</b>			<b>VOCs (PCE, 1,1-DCE,, TCE, 1,1,1-TCA, 1,2- and cis-1,2-DCE, and VC) and perchlorate. Contaminants detected above perchlorate DWEL (1 ppb) and site specific risk-based levels and MCLs (listed below) for VOCs.</b>
Air (indoors) <sup>2</sup>		X		
Surface Soil (e.g., <2 ft)				
Surface Water	<b>X</b>			<b>VOCs (PCE, TCE, 1,1,1-TCA, VC) and perchlorate above perchlorate DWEL (60 ppb).</b>
Sediment		X		
Subsurf. Soil (e.g., >2 ft)		X		
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.

**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):**

**Groundwater:**

**Maximum Contaminant Levels (MCLs):**

tetrachloroethene (PCE)	<b>5.0 (parts per billion (ppb))</b>
trichloroethene (TCE)	<b>5.0 ppb</b>
1,1,1-trichloroethane (TCA)	<b>200.0 ppb</b>
1,2-dichloroethene (1,2-DCE)	<b>5.0 ppb</b>
cis-1,2-dichloroethene (cis1,2-DCE)	<b>70.0 ppb</b>
1,1-dichloroethene (1,1-DCE)	<b>7.0 ppb</b>
vinyl chloride (VC)	<b>2.0 ppb</b>

**Deep Groundwater Remediation Levels (RLs):**

PCE	<b>5.0 ppb</b>
1,1,1-TCA	<b>200.0 ppb</b>
1,1-DCE	<b>7.0 ppb</b>

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**Surface Water (CMI Consent Order Point of Compliance Stream RLs\*):**

<b>1,1-DCA</b>	<b>6,700 ppb</b>
<b>1,1-DCE</b>	<b>510 ppb</b>
<b>1,1,1-TCA</b>	<b>18,000 ppb</b>
<b>1,2-DCE</b>	<b>12,000 ppb</b>
<b>Bromodichloromethane</b>	<b>600 ppb</b>
<b>Carbon Tetrachloride</b>	<b>540 ppb</b>
<b>Chlorobenzene</b>	<b>50 ppb</b>
<b>Chloroform</b>	<b>900 ppb</b>
<b>Dibromochloromethane</b>	<b>1,000 ppb</b>
<b>Methylene Chloride</b>	<b>4,300 ppb</b>
<b>PCE</b>	<b>800 ppb</b>
<b>TCE</b>	<b>3,900 ppb</b>
<b>VC</b>	<b>140 ppb</b>

**\* Measures effectiveness of soil remediation for shallow groundwater discharge**

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 Trespassers	Construction Recreation	Food <sup>3</sup>
Groundwater	no	yes	no	yes	no
Air (indoors)	---	---	---	---	---
Soil (surface, e.g., <2 ft)	---	---	---	---	---
Surface Water Sediment	yes	yes	no	no	yes
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).

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):**  
**Receptors (Reference CMI Consent Order, page 6, paragraph U):**

**Surface Water:**

**Contaminant shallow groundwater discharges into streams on-site creating potential for exposure to workers, construction workers and trespassers.**

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**Groundwater:**

**Deep groundwater supplements production water usage at facility creating a potential for worker and construction worker exposure. Facility and community on public water supply.**

<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)?

**X** 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):**

**To limit exposure to trespassers, access to the facility is through controlled gates. Also, the Facility perimeter is surrounded by a barbed wired fence and patrolled every hour by security personnel. The workers and construction workers personnel attend annual health and safety training and are required to wear appropriate safety equipment to limit exposure.**

<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 (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 **Atlantic Research Corporation** facility, EPA ID # **VAD 02 374 1705**, located at **5945 Wellington Road, Gainesville, Virginia 20155** 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) \_\_\_\_\_ Date 08-23-02  
(print) Linda Holden  
(title) Remedial Project Manager

Supervisor (signature) \_\_\_\_\_ Date 09-30-02  
(print) Robert E. Greaves  
(title) Chief, General Operations Branch  
(EPA Region or State) EPA, Region 3

**Locations where References may be found:**

RCRA Corrective Action File Room  
U. S. Environmental Protection Agency (Region III)  
1650 Arch Street  
Philadelphia, PA 19103 **AND**

Prince William County Library  
Information Repository  
8601 Mathis Avenue  
Manassas, VA 22111  
(703)361-8211

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