

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: ATK Elkton LLC  
Facility Address: Elkton, Maryland  
Facility EPA ID #: MDD003067121

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).

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)?

### Reference Attachment 1-Question 2 Chart

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

Attachment 2-Table 1 presents a list of the site SWMUs, a description of the site history, identifies the key contaminants, and indicates the current status for each. Attachment 3-Tables 2 through 12 present medium-specific data from the SWMUs involved in RCRA Corrective Action or corrective action implementation with other state agencies (as noted in Table 1 and listed below.) These tables are located in the attachment section of this environmental indicator report.

The site is adjacent to the Little Elk Creek. Because the creek itself does not fall within any particular SWMU, surface water and sediment data are presented separately in Tables 11 and 12. Results of extensive sampling of Little Elk Creek (ARCADIS, 2000) demonstrated that surface water and sediment in the creek do not present a potential threat to human health.

The Sand Pit (E7), located within the Pesticide Area AOC SWMU (E6), is listed as No further Action area based on the findings of SWMU investigations that show no levels of contamination above regulatory standards and/or action levels. Therefore, this environmental indicator report does evaluate this unit in a separate section, as with the other units where contamination has currently been detected. Specifically, the environmental indicator report focuses on the areas of the site where corrective action is pending or in progress. The SWMUs that currently are involved in RCRA Corrective Action or corrective action implementation with other state environmental agencies include the following:

#### **Groundwater**

Tables 2 and 7 indicate that one or more constituent concentrations in groundwater at SWMUs 1

through 7 exceed applicable groundwater standards.

**TCE AREA SWMU(EI):** TCE, 1, 1-DCE, 1, 1,2,2-TCA and dichloromethane. Based on the findings of the supplemental phase of the RFI investigation in 2004, concentrations of these constituents in groundwater exceeds either the USEPA Region III tap water RBCs or the USEPA MCL within the site boundary and at off-site locations. In addition to VOCs and perchlorate was detected at elevated levels in groundwater. Additionally, residential drinking water wells in the vicinity of the SWMU were most recently investigated and sampled in April 15, 1999, November 5, 1999, August 2002, and February 26, 2004. Results are summarized in Table 3.

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**A-Area SWMU (ES):** TCE levels in GM-1B and GM-24 are above the USEPA MCL. Data is provided in Table 2.

**Still Bottoms SWMU (3):** Recent groundwater sampling in 2004 at the Still Bottoms SWMU indicates that concentrations of chlorobenzene, TCE, iron, and various pesticides (alpha-BHC and beta-BHC) exceeded either the USEPA Region III tap water RBCs or the USEPA MCL. A summary of the analytical results are provided on Table 4.

**Beryllium SWMU (E4):** Observed concentration exceeding either the MCL or an RBC included Dibenz(A,H)anthracene, Indeno(1,2,3-Cd)Pyrene, beryllium, chromium, iron, thallium. In addition, perchlorate was detected above current standards. A summary of the analytical results are provided on Table 5.

**Closed Incinerator Feed Surface Impoundment SWMU (E5):** Reference the separate environmental indicator report (Attachment 4) in the attachment for this RCRA Permitted Unit.

**Pesticide AOC SWMU (E6):** Recent groundwater data showed exceedances of Maryland Groundwater Cleanup Standards from alpha-BHC, beta-BHC, delta-BHC, and dieldrin in groundwater in the Pesticide Area SWMU AOC. Data were reported in the Interim Site-Wide Investigation Technical Report and Work Plan and the current Site Investigation Technical Report and Work Plan and the current Site Investigation Report (ARCADIS, June 19, 2003; ARCADIS, 2004). Recent (May, 2004) groundwater monitoring results are presented in Table 7.

**Air-Indoors**

In December 1, 2004 a site in-door air survey was conducted. The results of the survey identified the area where further and/or confirmatory sampling for in-door air. Those areas would include the southeast off-site area of the TCE Area near the Little Elk Creek, incorporating the YMCA and Crouse Brother's property. Pending weather conditions, additional monitoring will be conducted in the near future as part of the Supplemental RFI for the ATK RCRA CA Permit Project. Based on the evaluation of the shallow groundwater and

soil gas data collected in the area of the TCE Area SWMU, in the residential and YMCA, to date preliminary determinations do not indicate migration of contaminants to indoor air (see Tables 2 through 6).

### **Surface and Subsurface Soil**

Tables 8 through 10 indicate that one or more constituent concentrations in soil at SWMUs 3, 4, and 6, exceed applicable screening levels.

**TCE AREA SWMU (E1):** Soil data is unavailable for this unit. Available shallow groundwater data and historical waste handling and maintenance practices were evaluated to make preliminary human health environmental indicator determinations for this unit. ATK used TCE until 1974. There weren't any spill sites or known TCE land disposal practices documented. It is also documented that adjacent off-site sources are believed to be the potential sources of the TCE contamination. (Investigation of Groundwater Report, Geraghty & Miller, July 1995). In addition, TCE levels in shallow groundwater do not indicate the presence of a continuing source area within the SWMU. The majority of the plume has migrated from the main plant area towards Little Elk Creek, also indicating the lack of an on-going source.

**A-Area SWMU (E2):** Two soil investigations were performed in the A-Area. The first included a soil gas screening at 256 locations using a PID field screening for volatile organic compounds and the collection of 69 soil samples for nitrate and perchlorate analysis. The second investigation included the selection of 28 of the preliminary soil gas locations for off-site laboratory analysis of VOCs by USEPA SW-846 Method 8260. Soil samples were collected between 3 and 3.5 feet below ground surface. Results are summarized in Table 8. Based on the characteristics of the historical contaminants it appears that the existing soil data has migrated to the shallow and intermediate groundwater zones. Furthermore, the results conclude that there was no comparison of the data to current USEPA Region III Risk-Based concentrations for residential soil indicate that observed concentrations are less than health-

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based screening levels. Therefore, exposure to contamination based on direct contact to soil is unlikely.

**Still Bottoms SWMU (E3) :** Although several VOC, SVOCs, pesticides, herbicides and metals are present in the soil samples, with the exception of n-nitroso-di-n-propylamine, observed concentrations are less than residential soil RBCs (organics) or are within naturally occurring levels (metals) (Geraghty & Miller, Inc., 1995). However, it is known that source materials disposed in this area are still present in the subsurface (approximately 30 to 50 buried drums). A comparison of detected results to screening levels is presented on Table 9.

**Beryllium SWMU (E4)U:** No soil samples have been collected within the Beryllium SWMU because of physical hazards. Spurious SVOCs were detected in soil samples collected from the perimeter; however, observed concentrations were less than industrial soil RBCs (organics) or within background level (metal). A comparison of soil data to health-based screening levels is presented in Table 10.

**Closed Incinerator Feed Surface Impoundment SWMU (E5):** Impacted soil were excavated under a Corrective Measures (Thiokol, 1992).

**Pesticide AOC SWMU (E6):** Surface and subsurface soil contain levels of chlorinated pesticides, primarily DDT and its metabolites, above Region 3 RBCs for industrial soil. (Additional Data Collection Final Report, WWC, June 16, 1992 and Data Gap Analysis Report, WCC, August, 1993). A comparison of reported soil concentrations to RBCs was also presented in Section 3 of the "Technical Memorandum, Remedial Action Objectives, Pesticide Areas" (URS, September 14, 2001).

#### **Surface Water and Sediment**

The site is adjacent to the Little Creek; therefore, potential impacts to surface water and sediment, are a concern. Tables 11 and 12 present measured chemical concentrations in surface water and sediment, respectively. The chemical concentrations in surface water and sediment are compared to health-based screening levels in that table. The results indicate no potential threats to human health for Little Elk Creek surface water or sediment.

#### **Air-Outdoor**

No concentrations of volatile organic chemicals above Region 3 industrial soil RBCs have been reported in surface soil for any of the SWMUs (Table 8 through 10 and Technical Memorandum, Remedial Action Objectives, Pesticide Areas, URS, September 14, 2001). In addition, heavy vegetation within many of the SWMUs precludes generation of fugitive dust that could transport non-volatile constituents in air.

#### 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?

#### **Reference Attachment 5-Question 3 Table Summary Exposure Pathway Evaluation Table**

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):

##### **Groundwater**

Groundwater is not used for drinking at the facility. Groundwater pumped by ATK for use at the facility undergoes treatment for VOCs and perchlorate. Residential wells known to be currently in use and that are within the limits of the groundwater plumes are monitored. Historically, residential wells suspected to be located within the groundwater plume zone with detection of contamination were placed on public water supply. The residential well monitoring program is in place to continue to confirm the limits of the plume. Water level data has been collected from shallow and intermediate wells along the groundwater plumes. Exposure for construction workers is eliminated by the implementation of standard operating procedures in place by the ATK facility. Health and Safety procedures are required for all construction and/or investigative activities undertaken at the facility. These procedures and plans are subject to the approval of the MDE and/or EPA. Water level data has been collected from shallow and intermediate wells along the Little Elk Creek that indicates an upward hydraulic head near the creek. This indicates discharge of groundwater to the creek. During 2004, data was collected from the east side of Little Elk Creek at the toe of the plume that concludes that plume is essentially bounded by Little Elk Creek, with a minor amount of TCE diffused across the creek. In addition, this investigation included well installation and data collection to delineate the shallow zone extent of the plume in offsite areas including residential areas north of Route 40 and offsite areas down-gradient along the axis of the plume. Re-sampling of the northern facility wells indicated that VOC and perchlorate constituents have migrated to Little Elk Creek and that the plume extents are controlled.

##### **Surface and Subsurface Soil**

**Still Bottoms SWMU (E3):** Pending EPA and MDE approval, drums and overlying soil anticipated to be excavated

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and disposed of off-site, subject to an approved health and safety plan in the fall of 2005. The removal of the drums will effectively eliminate future exposure to impacted soil.

**Beryllium SWMU (E4):** This area is not used for any purpose at this time, nor is any future use planned. Access to the area is controlled by a fence and locked gate to prevent trespassing. The fence and area are inspected on a regular basis. There is no evidence of tampering to the fence by trespassers documented. No construction activities are expected to occur.

**Pesticide AOC Area SWMU (E6):** Potential exposure to soil in the Pesticide AOC Area SWMU is limited to workers who occasionally are present for inspection, maintenance or site investigation activities. No construction activities are occurring or are anticipated with the possible exception of future corrective measures that would be subject to an approved health and safety plan. No other use of the area is occurring or anticipated. A security fence has been installed around the perimeter of the AOC to deter trespassing.

<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”** (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)?

**E3,E4,E6** 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):

Not applicable based on the results of item #3 (no human exposure pathways to the contaminated media.)

**Still Bottoms SWMU (E3):** Only one soil sample contained slightly elevated levels of one chemical. The concentrations were within a factor of 10 of the RBC indicating that the worst-case human health risk would be less than  $1 \times 10^{-6}$ .

**Beryllium SWMU (E4):** While no shallow soil data has been analyzed here, there is no basis for the presence of significant shallow soil contamination based on the description of the SWMU creation. Waste was buried in trenches and during closure, the area was covered with soil. There is no evidence of pre-existing soil contamination in the area or soil impacts outside of the fenced area.

**Pesticide AOC Area SWMU (E6):** No routine operations are occurring or are anticipated for the Pesticide AOC Area SWMU. The Pesticide AOC Area SWMU is heavily wooded. Potential exposures to surface soil are limited to workers conducting site inspections (non-intrusive), and investigation/remediation workers who are subject to a health and safety plan approved by EPA and/or MDE developed to minimize the potential for unacceptable exposures.

Low concentrations of pesticides were detected in surface soil just outside the fence-line south of the Pesticide AOC Area SWMU, in a small grassy area between the fence and Nottingham Road (Interim Site-Wide Investigation Technical Report and Work Plan, ARCADIS, June 19, 2003, Section 3.5.2.) All reported concentrations were below Region III RBCs for industrial soil with one exception, dieldrin (0.58 mg/kg), which was less than two times the industrial RBC (0.326 mg/kg.). In the Little Elk Creek sediments, a single pesticide was detected above the screening criterion in only one location downstream of

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the Pesticide Area. This single exceedance does not constitute a threat to aquatic life. Considering that any potential exposure to this material would be on a very limited basis, much less than for routine industrial exposure, the potential health threat associated with this material is negligible for current and anticipated future conditions.

<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):**

In the Little Elk Creek sediments, a single pesticide was detected above the screening criterion in only one location downstream of the Pesticide Area. This single exceedance does not constitute a threat to aquatic life.

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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 ATK Elkton, LLC facility, EPA ID #MDD003067121, located at Elkton, Maryland 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) \_\_\_\_\_ /s/ \_\_\_\_\_                      Date 8/2/05  
                  (print)  
                  (title)

Supervisor       (signature) \_\_\_\_\_ /s/ \_\_\_\_\_                      Date 8/2/05  
                  (print)  
                  (title)  
                  (EPA Region or State) \_\_\_\_\_

Locations where References may be found:

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Contact telephone and e-mail numbers

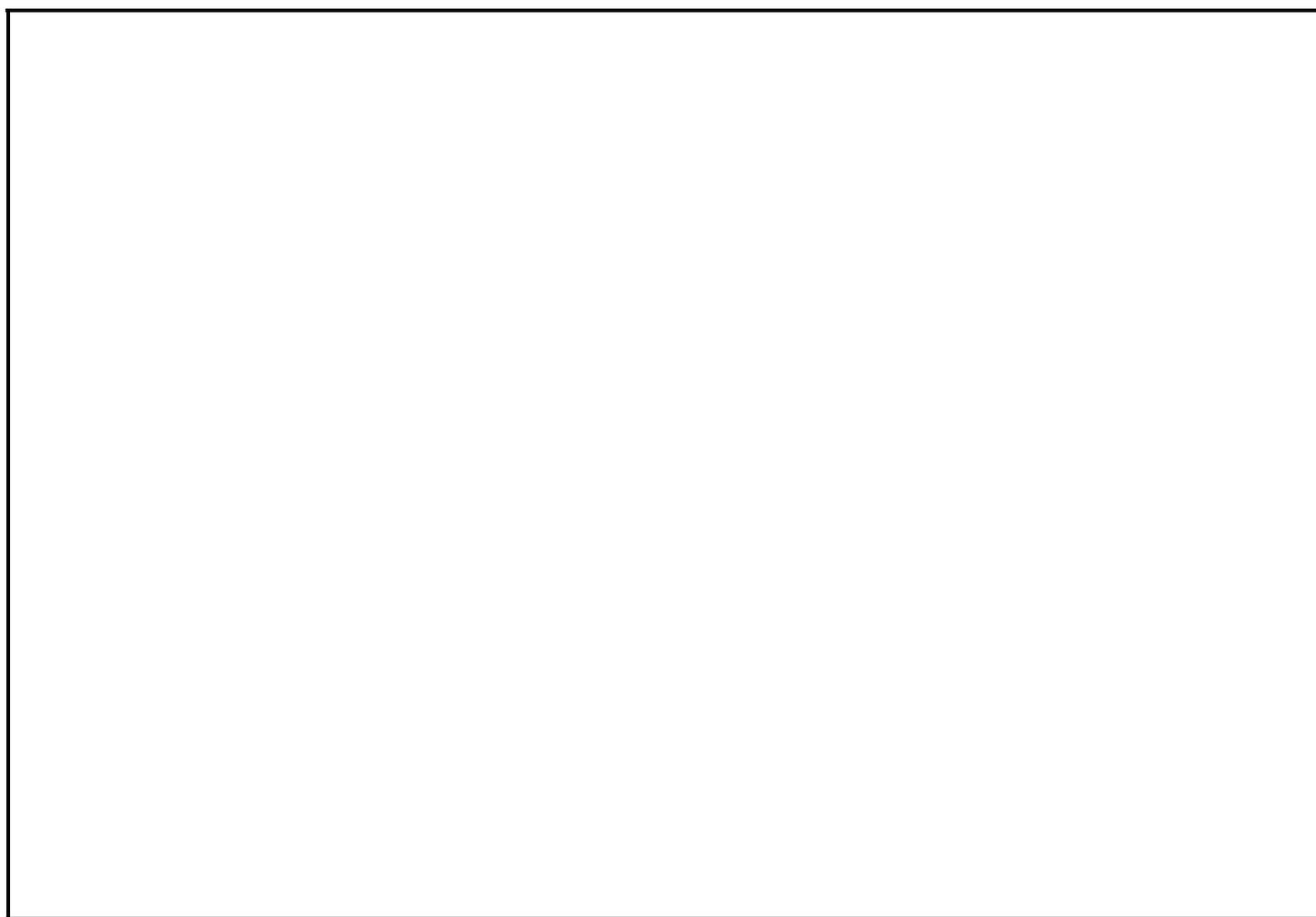
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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

## ATTACHMENT 1

### Question 2 Chart

Media	Yes	NO	?	Rational/Key Contaminant
Groundwater	E1	E7		See Table 1
	E2			
	E3			
	E4			
	E5			
	E6			
Air(in-doors) <sup>2</sup>		E1		Sampling indicates no levels of concern
		E2		
		E3		
		E4		
		E5		
		E6		
		E7		
Surface Soil (e.g., <2ft)	E3	E1		See Table 1
	E4	E2		
	E6	E5		
Surface Water		E1		
		E2		
		E3		
		E4		
		E5		
		E6		
Sediment		E1		
		E2		
		E3		
		E4		
		E5		
		E6		
Subsurf. Soil (e.g.,>2 ft)	E3	E1		See Table 1
	E4	E2		
	E6	E5		
Air (outdoors)		x-all		See Table 1







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).