

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: University of Alaska Fairbanks _____
Facility Address: Tanana Drive, Fairbanks, AK _____
Facility EPA ID #: AKD 04867 9567 _____

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, 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_ | ___ | _____ |
| Air (indoors) ² | ___ | _x_ | ___ | _____ |
| Surface Soil (e.g., <2 ft) | ___ | _x_ | ___ | _____ |
| Surface Water | ___ | _x_ | ___ | _____ |
| Sediment | ___ | _x_ | ___ | _____ |
| Subsurf. Soil (e.g., >2 ft) | ___ | _x_ | ___ | _____ |
| Air (outdoors) | ___ | _x_ | ___ | _____ |

 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):

The RCRA Facility Assessment Report (RFA Report, September 1996) listed eight solid waste management units (SWMUs) and areas of concern (AOCs) that had medium to high potential for release of hazardous wastes or constituents. Of these units, EPA believes that the Security Yard has the highest potential for release. The Security Yard and two SWMUs that were listed as having low potential for releases (the West Ridge Bunker and the Hazardous Materials Loft) are being clean closed according to the closure standards found in 40 CFR Part 265 Subpart G, as required by a 1990 Consent Order (Docket Number 1089-08-28-3008[a]).

As part of the closure, UAF has conducted sampling at the 3 units. UAF submitted the data in its Closure Certification and accompanying documentation (*Final Report UAF RCRA Closure Security Yard, West Ridge Bunker, and Hazardous Materials Loft*) on October 9, 2002.

Security Yard: Due mainly to matrix interferences, there were some quality assurance/quality control (QA/QC) problems associated with the analyses for contaminants in the Security Yard. Despite these shortcomings, EPA believes that the data are usable for determining whether the human exposure EI is met.

Except for chromium, barium, arsenic, and methylene chloride, all contaminants that were detected in the soil samples in the Security Yard are present at concentrations below residential Preliminary Remediation Goals (PRGs) and the soil cleanup levels established by Alaska Department of Environmental Conservation (ADEC) in Table B1 of the Alaska Administrative Code at 18 AAC 75.341. Except for chloromethane, all contaminants that were detected in the soil samples in the Security Yard are present at concentrations below levels that could cause exceedences of risk-based concentrations for residential indoor air.

Chromium, barium, and arsenic are all commonly found in the Fairbanks area in concentrations greater than or equal to those found in the Security Yard. Under 75 AAC 75.340(h)(1), background concentrations may be used as cleanup levels if they exceed the Table B1 levels. Based on discussion with

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ADEC, EPA believes that the metals in the soil of the security yard represent background.

Methylene chloride is a common laboratory contaminant. A review of the QA/QC information submitted with the data confirmed that the methylene chloride data did, in fact, result from laboratory contamination.

Chloromethane was detected in one soil sample at concentrations that could result in exceedences of the risk-based concentrations for residential indoor air. The Security Yard is a fenced area that will be used for storing vehicles. There are currently no structures in the Security Yard and none are planned for the future. Therefore, there is no completed pathway for residential indoor air.

West Ridge Bunker: Due to the nature of the medium (concrete flooring), there were quality assurance/quality control (QA/QC) problems associated with the analyses for contaminants in the West Ridge Bunker, particularly with respect to pesticides and herbicides. Despite these shortcomings, EPA believes that the data are usable for determining whether the human exposure EI is met.

With the exception of one sample, no contaminants were found at levels above the residential Preliminary Remediation Goals (PRGs). One sample contained concentrations of dieldrin above the residential PRG but below the industrial PRG. Because of the construction of the bunker, it is usable only as a storage space and residential use is precluded. Therefore, the threat to humans and the environment from exposure has been minimized.

Hazardous Materials Loft: Sampling of flooring in the loft found no contaminants above the minimum detection level (MDL).

Other Sources: Based on the information developed as part of the RFA, there are no data showing releases of hazardous constituents from any of the other SWMUs at the Facility. Because releases from the other units are less likely than from the Security Yard, EPA has concluded that the human exposures EI has been met.

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Notes:

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” (verified or reasonably suspected) 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 | Construction | Trespassers | Recreation | Food ³ |
|-------------------------------|-----------|---------|----------|--------------|-------------|------------|-------------------|
| Groundwater | ___ | ___ | ___ | ___ | ___ | ___ | ___ |
| Air (indoors) | no_ | no_ | no_ | ___ | ___ | ___ | ___ |
| 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.

- 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):

As discussed under question #2, there are no completed pathways for any units at which a release was suspected.

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):

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):

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" 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 3/17/03 _____
(print) Carla Fisher _____
(title) Environmental Engineer _____

Supervisor (signature) _____ Date 3/17/03 _____
(print) Richard Albright _____
(title) Director, Office of Waste and Chemicals Management _____
(EPA Region or State) EPA R10 _____

Narrative including locations where References may be found:

Contact telephone and e-mail numbers

(name) Carla Fisher _____
(phone #) 206 553-1756 _____
(e-mail) fisher.carla@epa.gov _____

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.

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)**

Migration of Contaminated Groundwater Under Control

Facility Name: University of Alaska Fairbanks _____
Facility Address: Tanana Drive, Fairbanks, AK _____
Facility EPA ID #: AKD 04867 9567 _____

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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 #8 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

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. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?
- _____ If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.
- X If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”
- _____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The RCRA Facility Assessment Report (RFA Report, September 1996) listed eight solid waste management units (SWMUs) and areas of concern (AOCs) that had medium to high potential for release of hazardous wastes or constituents. Of these units, EPA believes that the Security Yard has the highest potential for release. The Security Yard and two SWMUs that were listed as having low potential for releases (the West Ridge Bunker and the Hazardous Materials Loft) are being clean closed according to the closure standards found in 40 CFR Part 265 Subpart G, as required by a 1990 Consent Order (Docket Number 1089-08-28-3008[a]).

As part of the closure, UAF has conducted sampling at the 3 units. UAF submitted the data in its Closure Certification and accompanying documentation (*Final Report UAF RCRA Closure Security Yard, West Ridge Bunker, and Hazardous Materials Loft*) on October 9, 2002.

Security Yard: Due mainly to matrix interferences, there were some quality assurance/quality control (QA/QC) problems associated with the analyses for contaminants in the Security Yard. Despite these shortcomings, EPA believes that the data are usable for determining whether the groundwater migration EI is met.

Except for chromium, barium, arsenic, and methylene chloride, all contaminants that were detected in the soil samples in the Security Yard are present at concentrations below residential Preliminary Remediation Goals (PRGs) and the soil cleanup levels established by Alaska Department of Environmental Conservation (ADEC) in Table B1 of the Alaska Administrative Code at 18 AAC 75.341. Because the Table B1 levels include protection from migration of contaminants from the soil to groundwater, meeting these levels ensures that both soil and groundwater are protected.

Chromium, barium, and arsenic are all commonly found in the Fairbanks area in concentrations greater than or equal to those found in the Security Yard. Under 75 AAC 75.340(h)(1), background concentrations may be used as cleanup levels if they exceed the Table B1 levels. Based on review of the data and discussion with ADEC, EPA believes that the metals in the soil of the security yard fall within normal background concentrations.

Methylene chloride is a common laboratory contaminant. A review of the QA/QC information submitted with the data confirmed that the methylene chloride data did, in fact, result from laboratory contamination.

West Ridge Bunker: No contaminants were found above the Practical Quantitation Limit (PQL) in soils beneath the concrete flooring. Therefore, there is no known or suspected source of groundwater contamination.

Hazardous Materials Loft: No contaminants were present above the minimum detection level (MDL) in samples of the loft flooring. In addition, this SWMU is a loft located inside a building. Therefore, there is no pathway to groundwater.

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Other Sources: Based on the information developed as part of the RFA, there are no data showing releases of hazardous constituents from any of the other SWMUs at the Facility. Because releases from the other units are less likely than from the Security Yard, EPA has concluded that the groundwater EI has been met.

Notes: 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 appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control". Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

NO - Unacceptable migration of contaminated groundwater is observed or expected.

IN - More information is needed to make a determination.

Completed by (signature) _____ Date 3/17/03 _____
 (print) Carla Fisher _____
 (title) Environmental Engineer _____

Supervisor (signature) _____ Date 3/17/03 _____
 (print) Richard Albright _____
 (title) Director, Office of Waste and Chemicals Management _____
 (EPA Region or State) EPA R10 _____

Narrative including locations where References may be found:

Contact telephone and e-mail numbers

(name) Carla Fisher _____
(phone #) 206 553-1756 _____
(e-mail) fisher.carla@epa.gov _____