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: Barksdale Air Force Base
Facility Address: Bossier Parish, Louisiana
Facility EPA ID #: LA9 571924050

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)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Shallow groundwater impact/various
Air (indoors) [2]		X		Only 1 site with structures located over plume/metals
Surface Soil (e.g., <2 ft)	X			Contamination detected/various
Surface Water	X			Limited impact detected/various
Sediment	X			Limited impact in three areas
Subsurf. Soil (e.g., >2 ft)	X			Subsurface soil contamination detected/various
Air (outdoors)		X		No impact detected

_____ 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 impact has been established through investigations culminating with the RFI in 1998. LTM events conducted since the RFI have verified a number of CoCs present at concentrations higher than LDEQ RECAP screening guidelines. A table containing groundwater CoCs, concentrations detected, and sampling dates has been attached for all sites (Atch 1).

Only one site, SWMU 9 – Landfill No.1/POL Bulk Storage, has any occupied structures built over contaminated soils or the groundwater plume. At this site indoor air quality is not an issue because the only contamination of concern is from metals.

Surface soil impact was evaluated during the 1989 SI, the 1993 RI, the 1998 RFI, and one site characterization in 1998/99. A table containing surface soil CoCs, concentrations detected, and sampling date has been included for all sites as Attachment 2.

Surface water impact was evaluated during the 1989 SI and the 1993 RI. Three areas of surface water contamination were identified; Mack's and Cooper Bayous and the Flat River between landfills 2 and 3. A table containing surface soil CoCs, concentrations detected, and sampling date has been included for all sites as Attachment 3.

Sediment contamination was initially detected during the 1989 SI and 1993 RI and has been confirmed during site characterization activities conducted on two bayous in 1998. Three areas of sediment contamination were identified; Mack's and Cooper Bayous and the Flat River between landfills 2 and 3. A table containing sediment CoCs, concentrations detected, and sampling date has been included for all sites as Attachment 4.

Subsurface soil contamination evaluated during the 1989 SI, the 1993 RI, the 1998 RFI, and one site characterization in 1998/99. A table containing surface soil CoCs, concentrations detected, and sampling date has been included for all sites as Attachment 5.

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. 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)

"Contaminated" Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food
Groundwater	no	no	no	yes	yes	yes	yes
Air (indoors)							
Soil (surface, e.g., <2 ft)	no	yes	no	yes	yes	yes	no
Surface Water	no	no	no	yes	yes	yes	yes
Sediment	no	no	no	yes	yes	yes	yes
Soil (subsurface e.g., >2 ft)	no	yes	no	yes	yes	yes	no
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):
The Residents pathway is incomplete due to no contaminated sites located in residential areas, the contaminated shallow groundwater is not drinking water quality, and there is no discernable outdoor air impact. These same factors keep the Day-Care pathway from being complete. The Workers pathway is complete only for surface and subsurface soil contamination; the surface water and sediment contaminant location appears to eliminate possibility of worker exposure. For the other four pathways, there are multiple contaminated media. Contaminated groundwater from landfills 2 and 3 impacts the surface waters of Flat River; this creates exposure potential for both trespassers and construction (maintenance) activities along Flat River. Contaminants in the surface water and sediments of Mack's and Cooper Bayous have also been detected. The presence of these contaminants completes the exposure pathways for the Food and Recreation Pathways also, since the water bodies have been used for fishing, canoeing and other activities. The Construction Pathway is also considered complete for surface and

subsurface soil due to possibly exposure to contaminants during any construction or maintenance activities performed at or adjacent to the sites. The Recreation and Trespassers Pathways are considered complete for surface and subsurface soil media due to potential exposure to contaminants at the former landfills. Landfills 2 & 3 are not within the base restricted area which allows access to these sites. There is some indication that the landfills may be used during the base hunting season.

[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)?

__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):
Health risk assessments were conducted for ten of these sites during the 1993 RI. The results of these human health risk evaluations showed the groundwater pathway presented the greatest potential impact to human health. Since groundwater is not used at the base, the potential health impact is reduced. The health risk assessment information from the RI has been included with this submittal as Attachment 6.

[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): _____

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Barksdale Air Force Base
RCRA Corrective Action (CA725)

Locations where References may be found:

- **Administrative Record, Environmental Mgmt office, 2 CES/CEV**
  334 Davis Ave. W, Ste 208, Barksdale AFB, LA 7110--2078

- **Information Repository, Bossier Parish Library**
  2206 Beckett Street, Bossier City, LA 71111

- **La. Department of Environmental Quality**
  Custodian of Records
  P. O. Box 82231 or
  Room 440 / 7290 Bluebonnet Blvd.
  Baton Rouge, LA 70884-2231

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.