# APPENDIX D

# Examples of Completed Relative Risk Site Evaluation Worksheets

## Army Landfill (Page D-3)

## Navy Fire Training Area (Page D-6)

## Air Force Landfill (Page D-13)

**Note:** Primer users are encouraged to read through the following example site evaluations. They illustrate the type/nature of documentation to be included on worksheets, and provide example language that should be included as **rationale** for MPF and RF factor ratings.

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# RELATIVE RISK SITE EVALUATION WORKSHEET

## SITE[1] BACKGROUND INFORMATION

**Installation/Property Name for FUDS:** Example Army Base

**Date Entered/Updated (day, month, year):** 15 June 1994

**Location (City/County State):** North City, Washington

**Media Evaluated (GW, SW, Sediment, Soil, Sed. Eco., Soil Eco.):** GW

**Site (Name/DSERTS ID)/Project (Name/Project No.) for FUDS:** Landfill 5, ABCDEFGHIJKL

**Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equiv. RCRA Stage):** RD

**Point of Contact (Name/Phone):** J. Johnson

**Agreement Status (enter appropriate DERP Site code):** A

## SITE SUMMARY

(Include only the key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

**Brief Site Description (include site type, materials disposed of, dates of operation, and other relevant information):** *60 acre landfill operated from 1967 through 1990. Materials disposed of include some 77,000 tons of mixed municipal solid waste, 188,000 cubic yards of demolition waste , and dewatered sludge from a nearby sewage treatment plant. Landfill materials were buried in trenches and covered in accordance with State standards. Groundwater is contaminated with volatile organic compounds; surface water sampling revealed no contamination; soil sampling was deemed unnecessary because the landfill cap precludes direct exposure to subsurface soils.*

**Brief Description of Pathways (Groundwater, Soil, Surface Water [Human], Surface Water [Ecological], Sediment [Human], Sediment [Ecological]):** *Site is underlain by a series of glacial and interglacial deposits. The uppermost aquifer, in which the groundwater contamination is found, consists of sand, gravel and glacial till. It is separated from the lower, confined, sand and gravel aquifer by fine sands and silty clays.*

**Brief Description of Receptors (Human and Ecological):** *Groundwater from the upper aquifer is used as the water supply for the nearby town. All water supply wells are upgradient from the site, with the nearest water supply 4,000 feet upgradient. Groundwater in the immediate vicinity of the site and downgradient from the site is not used for domestic or agricultural purposes. Local Tribes conduct salmon fishing in Suqua Creek and in the Bay. Several base employees work adjacent to the west edge of the landfill, but no one resides or works in the landfill area.*

[1]The term *Site* is defined as a discrete area for which suspected contamination has been verified and requires further response action. A *Site* by definition has been, or will be, entered into RMIS/DSERTS. For the FUDS Program, "projects" equates to sites for current installations.

**Example 1**

## GROUNDWATER

**CONTAMINANT HAZARD FACTOR[1] (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[2] |
|---|---|---|---|---|
| 1,1-Dichloroethylene | ca | 6.8 | 4.6 | 1.48 |
| 1,2-Dichloroethylene(cis) | nc | 3.3 | 61 | 0.05 |
| Vinyl Chloride | ca | 3.2 | 2.0 | 1.60 |
| Toluene | nc | 16.0 | 720 | 0.02 |
| Manganese | nc | 10,700 | 180 | 59.44 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | **62.59** |

1 Evaluate for human contaminants only
2 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant (if Total >100)___**

**Moderate (if Total 2-100) X**

**Minimal (if Total <2)___**

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the groundwater is moving or has moved away from the source area

**Potential** - Contamination in the groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates that the potential for contaminant migration from the source via the groundwater is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

**Evident___**

**Potential X**

**Confined___**

Brief Rationale for Selection: *Monitoring well data show very localized contaminant migration not extending beyond the source boundary. GW gradient is nearly flat.*

**RECEPTOR FACTOR (RF)**

**Identified** - There is a threatened water supply downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer)

**Potential** - There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture, (equivalent to Class I, IIA, or IIB aquifer)

**Limited** - There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

(Place an "X" next to one below)

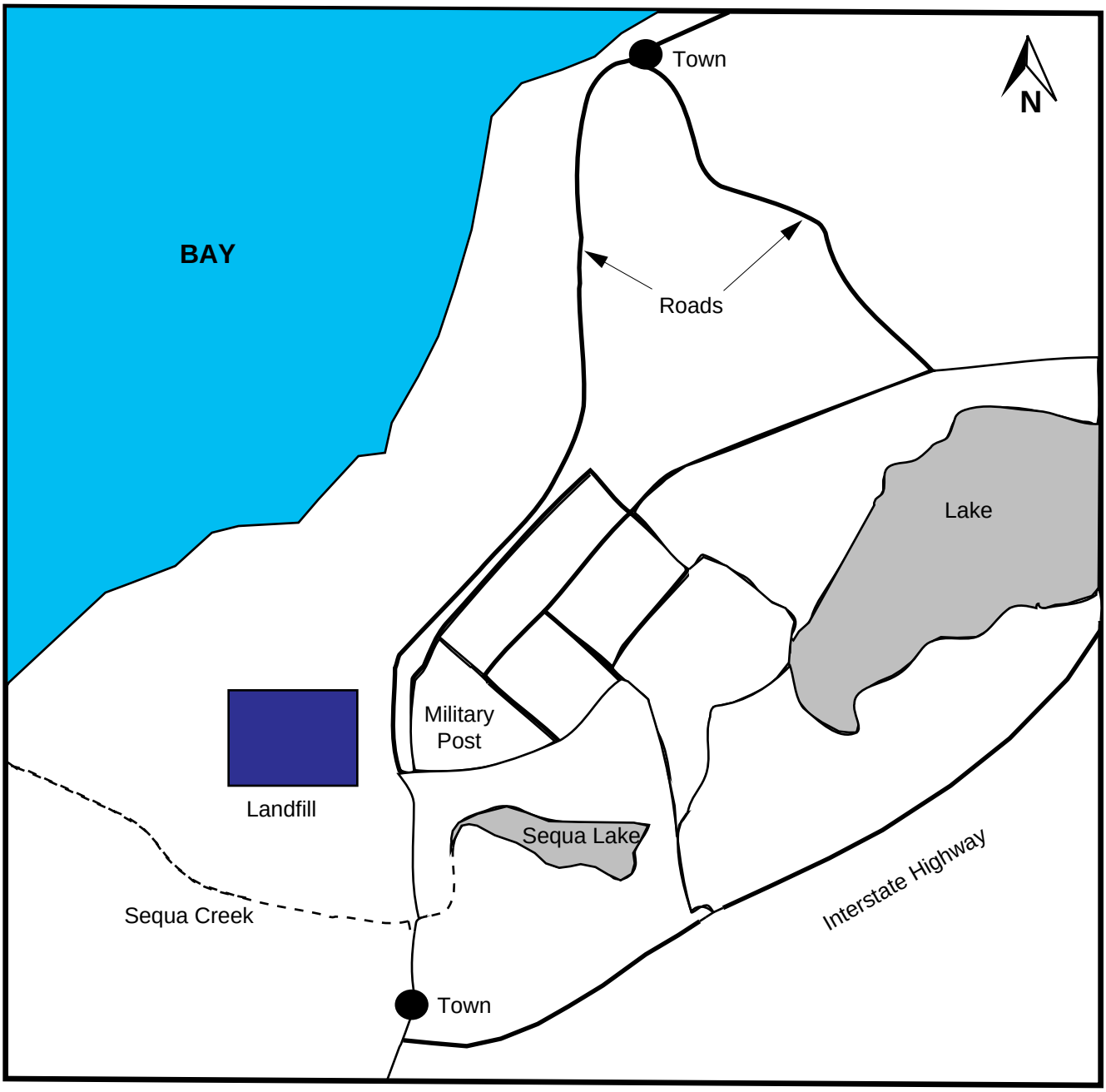
**Identified___**

**Potential X**

**Limited___**

Brief Rationale for Selection: *Groundwater downgradient of site is not currently used, but water is potentially usable.*

**Groundwater Category** (High, Medium, Low) Medium




Example 1. Map View of Landfill and Vicinity at Example Army Base

# RELATIVE RISK SITE EVALUATION WORKSHEET

## SITE[1] BACKGROUND INFORMATION

**Installation/Property Name for FUDS:** Example Navy Base
**Location (City/County State):** South City, New Jersey
**Site (Name/DSERTS ID)/Project (Name/Project No.) for FUDS:** Site 00014
**Point of Contact (Name/Phone):** P. Jackson
**Date Entered/Updated (day, month, year):** 15 June 1994
**Media Evaluated (GW, SW, Sediment, Soil, Sed. Eco., Soil Eco.):** ALL
**Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equiv. RCRA Stage):** RD
**Agreement Status (enter appropriate DERP Site code):** A

## SITE SUMMARY

(Include only the key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

**Brief Site Description (include site type, materials disposed of, dates of operation, and other relevant information):** *1.5 acre fire fighting training area which was in use 1965-1978. Waste oils, fuels and solvents were released. The fire training area is surrounded by a fence and access is restricted. Contamination was found in groundwater, soils, surface water and sediment.*

**Brief Description of Pathways (Groundwater, Soil, Surface Water [Human], Surface Water [Ecological], Sediment [Human], Sediment [Ecological]):** *The site is underlain by 150 feet of sand in which a groundwater plume has been identified several hundred yards downgradient of the site. Surface drainage from the site leads to a large lake. Contaminants have been identified in both surface water and sediments in the lake. The soils in the fire training area are contaminated within the fenced-in area.*

**Brief Description of Receptors (Human and Ecological):** *Groundwater is used for both drinking and livestock watering points downgradient from the site. The lake downstream from the site is used for recreation and is bordered by a State Wildlife Refuge. The site is in a remote area of the base, access is restricted, and there is no evidence of human activity on the site.*

[1]The term *Site* is defined as a discrete area for which suspected contamination has been verified and requires further response action. A *Site* by definition has been, or will be, entered into RMIS/DSERTS. For the FUDS Program, "projects" equates to sites for current installations.

**Example 2**

## GROUNDWATER

**CONTAMINANT HAZARD FACTOR[1] (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[2] |
|---|---|---|---|---|
| Benzene | ca | 130 | 39 | 3.3 |
| 1,1 dichloroethlyene | ca | 2400 | 4.6 | 521.7 |
| Vinyl Chloride | ca | 2000 | 2.0 | 1000.0 |
| Lead | nc | 86 | 4.0 | 21.5 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | **1546.5** |

1 Evaluate for human contaminants only
2 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant (if Total >100) X**

**Moderate (if Total 2-100)___**

**Minimal (if Total <2)___**

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the groundwater is moving or has moved away from the source area

**Potential** - Contamination in the groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates that the potential for contaminant migration from the source via the groundwater is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

**Evident X**

**Potential___**

**Confined___**

Brief Rationale for Selection: *Monitoring data indicate presence of groundwater plume several hundred yards downgradient of source area*

**RECEPTOR FACTOR (RF)**

**Identified** - There is a threatened water supply downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer)

**Potential** - There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture, (equivalent to Class I, IIA, or IIB aquifer)

**Limited** - There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

(Place an "X" next to one below)

**Identified X**

**Potential___**

**Limited___**

Brief Rationale for Selection: *A municipal wellfield is located approximately 1/3 mile downgradient*

**Groundwater Category** (High, Medium, Low) High

## SURFACE WATER/HUMAN ENDPOINT

**CONTAMINANT HAZARD FACTOR[1] (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[1] |
|---|---|---|---|---|
| Lead | nc | 82 | 4.0 | 20.5 |
| 4-4'-DDE | ca | 0.17 | 20 | <.1 |
| 4-methylphenol | nc | 2 | 180 | <.1 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | **20.5** |

1 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant** (if Total >100) __

**Moderate** (if Total 2-100) X

**Minimal** (if Total <2)___

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** X

**Potential**___

**Confined**___

Brief Rationale for Selection: *Contamination was found in surface water several hundred yards downstream of the site.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** X

**Potential**___

**Limited**___

Brief Rationale for Selection: *A recreational lake is located downstream of the site.*

**Surface Water/Human Endpoint Category** High
(High, Medium, Low)

## SEDIMENT/HUMAN ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | Max. Concentration (mg/kg) | Comparison Value (mg/kg) | Ratio[1] |
|---|---|---|---|
| 4-4'-DDE ca | 270 | 130 | 2.1 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | **Total** | 2.1 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)_____

Moderate (if Total 2-100)__X__

Minimal (if Total <2)_____

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** _____

**Potential** __X__

**Confined** _____

Brief Rationale for Selection: *Contamination in sediment is limited to areas immediately downstream of the site and is not extensive.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** _____

**Potential** __X__

**Limited** _____

Brief Rationale for Selection: *A recreational lake is located downstream of the site; there is a potential for humans to access the area of sediment contamination, but this would be unlikely since recreational activities are significantly downstream.*

**Sediment/Human Endpoint Category** Medium
(High, Medium, Low)

## SURFACE WATER/ECOLOGICAL ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[1] |
|---|---|---|---|---|
| Lead | nc | 82 | 3.2 | 25.6 |
| 4-4'-DDE | ca | 0.17 | Not Evaluated | - |
| 4-methylphenol | nc | 2 | Not Evaluated | - |
| | | | | |
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| | | | | |
| | | | | |
| | | | **Total** | 25.6 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)_____

Moderate (if Total 2-100)___X__

Minimal (if Total <2)_____

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** __X___

**Potential** _____

**Confined** _____

Brief Rationale for Selection: *Contamination was found in surface water several hundred yards downstream of the site.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** ___X__

**Potential** _____

**Limited** _____

Brief Rationale for Selection: *A State Wildlife Refuge is located downstream of the site.*

**Surface Water/Ecological Endpoint Category** High
(High, Medium, Low)

## SEDIMENT/ECOLOGICAL ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | Max. Concentration | units | Comparison Value | unit | Ratio[1] |
|---|---|---|---|---|---|
| 4-4'-DDE ca | 0.270 | mg/kg | .005 | mg/kg | 54 g |
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | **Total** | 54 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)_____

Moderate (if Total 2-100)__X__

Minimal (if Total <2)_____

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** _____

**Potential** __X___

**Confined** _____

Brief Rationale for Selection: *Contamination in sediment is limted to areas immediately downstream of the site and is not extensive.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contaminant has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contaminant has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contaminant has moved or can move

(Place an "X" next to one below)

**Identified** ___X__

**Potential** _____

**Limited** _____

Brief Rationale for Selection: *A State Wildlife Refuge is located downstream of the site.*

**Sediment/Ecological Endpoint Category** High
(High, Medium, Low)

## SOIL*

**Contaminant Hazard Factor[1] (CHF)**

| Contaminant | | Max. Concentration (mg/kg) | Comparison Value (mg/kg) | Ratio[2] |
|---|---|---|---|---|
| Lead | nc | 254 | 400 | 0.64 |
| 4-4' DDD | ca | 230 | 190 | 1.21 |
| Xylenes | | 53 | 990 | 0.05 |
| Chloroform | ca | 4 | 53 | 0.08 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | **1.98** |

1 Evaluate for human contaminants only
2 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant** (if Total >100)___

**Moderate** (if Total 2-100)___

**Minimal** (if Total <2) X

**Migration Pathway Factor (MPF)**

**Evident** - Analytical data or observable evidence that contamination is present at, is moving toward, or has moved to a point of exposure

**Potential** - contamination has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

**Evident)**___

**Potential** X

**Confined**___

Brief Rationale for Selection: *No direct evidence of confinement of soil*

**Receptor Factor (RF)**

**Identified** - Receptors identified that have access to contaminated soil

**Potential** - Potential for receptors to have access to contaminated soil

**Limited** - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

**Identified**___

**Potential**___

**Limited** X

Brief Rationale for Selection: *Restricted area in remote portion of base*

**Soil Category** (High, Medium, Low) Low

* Soil samples should be from a depth of 0–6 inches. If samples are not available from the 0–6 inch interval, results from depths up to, but not exceeding, 24 inches can be used.

# RELATIVE RISK SITE EVALUATION WORKSHEET

## SITE[1] BACKGROUND INFORMATION

**Installation/Property Name for FUDS:** Example Air Force Base
**Location (City/County State):** Middle City, Georgia
**Site (Name/DSERTS ID)/Project (Name/Project No.) for FUDS:** Landfill 4, BCCDDEEFHHIJ
**Point of Contact (Name/Phone):** R. Hammond
**Date Entered/Updated (day, month, year):** 15 June 1994
**Media Evaluated (GW, SW, Sediment, Soil, Sed. Eco, Soil Eco):** ALL
**Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equiv. RCRA Stage):** RD
**Agreement Status (Enter appropriate DERP Site code):** A

## SITE SUMMARY

(Include only the key elements of information used to conduct the relative risk site evaluation. Attach map view of site if desired.)

**Brief Site Description (include site type, materials disposed of, dates of operation, and other relevant information):** *45 acre landfill and associated 1.5 acre sludge lagoon operated from 1962-1978. Materials disposed of include general refuse, wastewater treatment plant sludge, electroplating wastes, organic solvents from cleaning operations, and pesticides. Volatile organic compounds and metals detected in groundwater and surface soil/sludge samples; lower levels of metals also detected in surface water and sediment samples in adjacent drainage ditch.*

**Brief Description of Pathways (Groundwater, Soil, Surface Water [Human], Surface Water [Ecological], Sediment [Human], Sediment [Ecological]):** *Site has a vegetative cover. Underlain by alluvial aquifer and deeper gravelly and silty sand aquifer, both of which reveal contaminant migration (e.g., TCE and lead) northeast and east of contamination sources. A mounded water table has been established within the landfill due to infiltration. Runoff from landfill flows to drainage ditch that is part of an operating and compliant non-point-source runoff collection system at the base. Drainage ditch flows to settling basin. Overflow from settling basin drains to wetlands and creek to the east. Drainage ditch sediments and local areas of standing water along the ditch upgradient of the settling basin have been impacted from contaminant migration. Samples show no surface water or sediment contamination beyond settling basin.*

**Brief Description of Receptors (Human and Ecological):** *Groundwater in the vicinity of the site is Class IIIA and is not used for domestic or agricultural purposes. Access to the site is restricted by a locked gate and fence at the landfill entrance. Humans could have access to the drainage ditch area, though access to this areas is limited by wetlands. A portion of the drainage ditch beyond the settling pond leads through critical habitat for an endangered species to a creek which is also part of the critical habitat.*

[1]The term *Site* is defined as a discrete area for which suspected contamination has been verified and requires further response action. A *Site* by definition has been, or will be, entered into RMIS/DSERTS. For the FUDS Program, "projects" equates to sites for current installations.

## GROUNDWATER

**CONTAMINANT HAZARD FACTOR[1] (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[2] |
|---|---|---|---|---|
| 1,2-Dichloroethylene (cis) | nc | 19,000 | 61 | 311 |
| TCE | ca | 21,000 | 160 | 131 |
| Vinyl Chloride | ca | 6,700 | 2 | 3350 |
| Cr | nc | 2,700 | 180 | 15 |
| Pb | nc | 5,240 | 4 | 1310 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | **5117** |

1 Evaluate for human contaminants only
2 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant (if Total >100) X**

**Moderate (if Total 2-100)___**

**Minimal (if Total <2)___**

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the groundwater is moving or has moved away from the source area

**Potential** - Contamination in the groundwater has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates that the potential for contaminant migration from the source via the groundwater is limited (due to geological structures or physical controls)

(Place an "X" next to one below)

**Evident X**

**Potential___**

**Confined___**

Brief Rationale for Selection: *Monitoring well data revealed downgradient plume well beyond source; see map view and cross section*

**RECEPTOR FACTOR (RF)**

**Identified** - There is a threatened water supply downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer)

**Potential** - There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture, (equivalent to Class I, IIA, or IIB aquifer)

**Limited** - There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

(Place an "X" next to one below)

**Identified___**

**Potential___**

**Limited X**

Brief Rationale for Selection: *Groundwater is Class IIIA and is not considered a potential source of water for drinking or agricultural purposes*

**Groundwater Category** (High, Medium, Low) Medium

## SURFACE WATER/HUMAN ENDPOINT

**CONTAMINANT HAZARD FACTOR[1] (CHF)**

| Contaminant | | | Max. Concentration | Comparison Value | Ratio[1] |
|---|---|---|---|---|---|
| Cr | VI | nc | 1,390 | 180 | 8 |
| Pb | | nc | 1,400 | 4 | 350 |
| Cd | | nc | 128 | 18 | 7 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | **365** |

1 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant** (if Total >100) X

**Moderate** (if Total 2-100)___

**Minimal** (if Total <2)___

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident**___

**Potential**___

**Confined** X

Brief Rationale for Selection: *Metals detected in surface water samples in drainage ditch directly adjacent to landfill. The ditch is part of an operating and compliant non-point source runoff collection system at the base. Samples show no contamination in surface water beyond the settling pond.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** ___

**Potential** X

**Limited**___

Brief Rationale for Selection: *Humans could have access to the drainage ditch area, though access to this areas is limited by wetlands.*

**Surface Water/Human Endpoint Category** Medium
(High, Medium, Low)

## SEDIMENT/HUMAN ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | | Max. Concentration (mg/kg) | Comparison Value (mg/kg) | Ratio[1] |
|---|---|---|---|---|
| Cr VI | ca | 880 | 3000 | .29 |
| Pb | nc | 385 | 400 | 0.96 |
| Cd | nc | 10 | 38 | 0.26 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | 1.51 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)_____

Moderate (if Total 2-100)__ ___

Minimal (if Total <2)__X ___

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** _____

**Potential** _____

**Confined** __X___

Brief Rationale for Selection: *Metals detected in sediment samples in drainage directly adjacent to landfill. The ditch is part of an operating and compliant nonpoint source runoff collection system at the base. Samples show no contamination in sediments beyond the settling pond.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** ___

**Potential** __X__

**Limited** ____

Brief Rationale for Selection: *Humans could have access to the drainage ditch area, though access to this areas is limited by wetlands.*

**Sediment/Human Endpoint Category** Low
(High, Medium, Low)

## SURFACE WATER/ECOLOGICAL ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | | Max. Concentration (ug/l) | Comparison Value (ug/l) | Ratio[1] |
|---|---|---|---|---|
| Cr VI | nc | 1,390 | 11 | 126.4 |
| Pb | nc | 1,400 | 3.2 | 437.5 |
| Cd | nc | 128 | 1.1 | 116.4 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | 680.3 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)__X___

Moderate (if Total 2-100)_____

Minimal (if Total <2)_____

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** _____

**Potential** _____

**Confined** __X___

Brief Rationale for Selection: *Metals detected in surface water samples in drainage ditch directly adjacent to landfill. The ditch is part of an operating and compliant non-point source runoff collection system at the base. Samples show no contamination in surface water beyond the settling pond.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contamination has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contamination has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contamination has moved or can move

(Place an "X" next to one below)

**Identified** __X___

**Potential** _____

**Limited** _____

Brief Rationale for Selection: *Overflow from settling pond flows to critical habitat for an endangered species*

**Surface Water/Ecological Endpoint Category** Medium
(High, Medium, Low)

## SEDIMENT/ECOLOGICAL ENDPOINT

**CONTAMINANT HAZARD FACTOR (CHF)**

| Contaminant | | Max. Concentration | units | Comparison Value | units | Ratio[1] |
|---|---|---|---|---|---|---|
| Cr VI | nc | 880 | mg/kg | 26.0 | mg/kg | 33.8 |
| Pb | nc | 385 | mg/kg | 31.0 | mg/kg | 12.4 |
| Cd | nc | 10 | mg/kg | 0.6 | mg/kg | 16.7 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | **Total** | 62.9 |

[1]Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

Significant (if Total >100)_____

Moderate (if Total 2-100)__X__

Minimal (if Total <2)_____

**MIGRATION PATHWAY FACTOR (MPF)**

**Evident** - Analytical data or observable evidence indicates that contamination in the media is present at, moving toward, or has moved to a point of exposure

**Potential** - Contamination in surface water or sediment has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Information indicates a low potential for contaminant migration from the source to a potential point of exposure (could be due to presence of geological structures or physical controls)

(Place an "X" next to one below)

**Evident** _____

**Potential** _____

**Confined** __X__

Brief Rationale for Selection: *Metals detected in sediment samples in drainage directly adjacent to landfill. The ditch is part of an operating and compliant nonpoint source runoff collection system at the base. Samples show no contamination in sediments beyond the settling pond.*

**RECEPTOR FACTOR (RF)**

**Identified** - Receptors identified that have access to surface water or sediment to which contaminant has moved or can move

**Potential** - Potential for receptors to have access to surface water or sediment to which contaminant has moved or can move

**Limited** - Little or no potential for receptors to have access to surface water or sediment to which contaminant has moved or can move

(Place an "X" next to one below)

**Identified** __X__

**Potential** _____

**Limited** _____

Brief Rationale for Selection: *Overflow from settling pond flows to critical habitat for an endangered species*

**Sediment/Ecological Endpoint Category** Low
(High, Medium, Low)

## SOIL*

**Contaminant Hazard Factor[1] (CHF)**

| Contaminant | | Max. Concentration (mg/kg) | Comparison Value (mg/kg) | Ratio[2] |
|---|---|---|---|---|
| Cr | nc | 153 | 3000 | 0.05 |
| Pb | nc | 122 | 400 | 0.3 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | **Total** | **0.35** |

1 Evaluate for human contaminants only
2 Ratio = Max. Concentration/Comparison Value

(Place an "X" next to one below)

**Significant** (if Total >100)___

**Moderate** (if Total 2-100)___

**Minimal** (if Total <2) X

**Migration Pathway Factor (MPF)**

**Evident** - Analytical data or observable evidence that contamination is present at, is moving toward, or has moved to a point of exposure

**Potential** - contamination has moved only slightly beyond the source (i.e., tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined

**Confined** - Low possibility for contamination to be present at or migrate to a point of exposure

(Place an "X" next to one below)

**Evident)** X

**Potential**___

**Confined**___

Brief Rationale for Selection: *Metals have been detected in surface soil/sludge samples outside landfill perimeter*

**Receptor Factor (RF)**

**Identified** - Receptors identified that have access to contaminated soil

**Potential** - Potential for receptors to have access to contaminated soil

**Limited** - Little or no potential for receptors to have access to contaminated soil

(Place an "X" next to one below)

**Identified**___

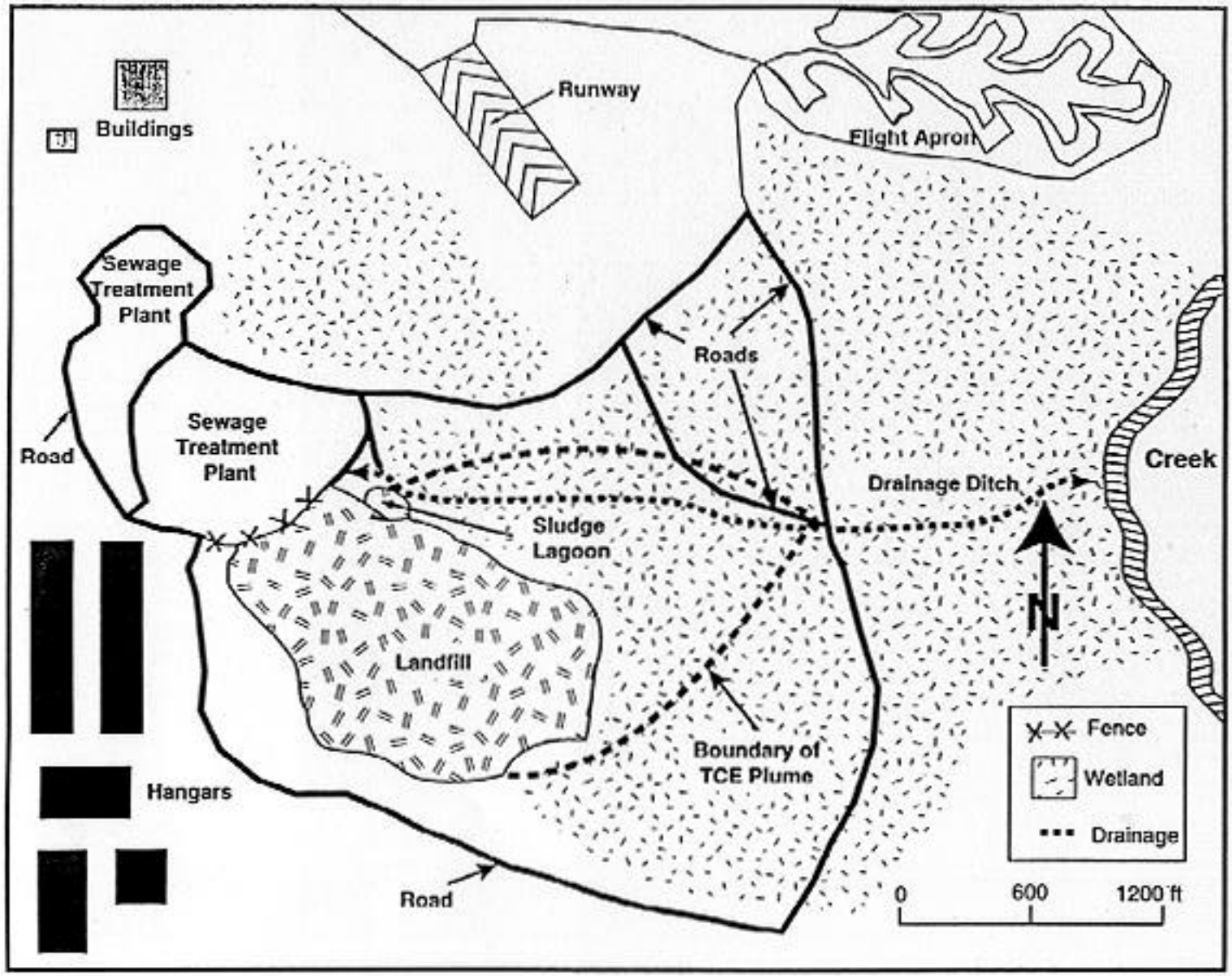
**Potential** X

**Limited**___

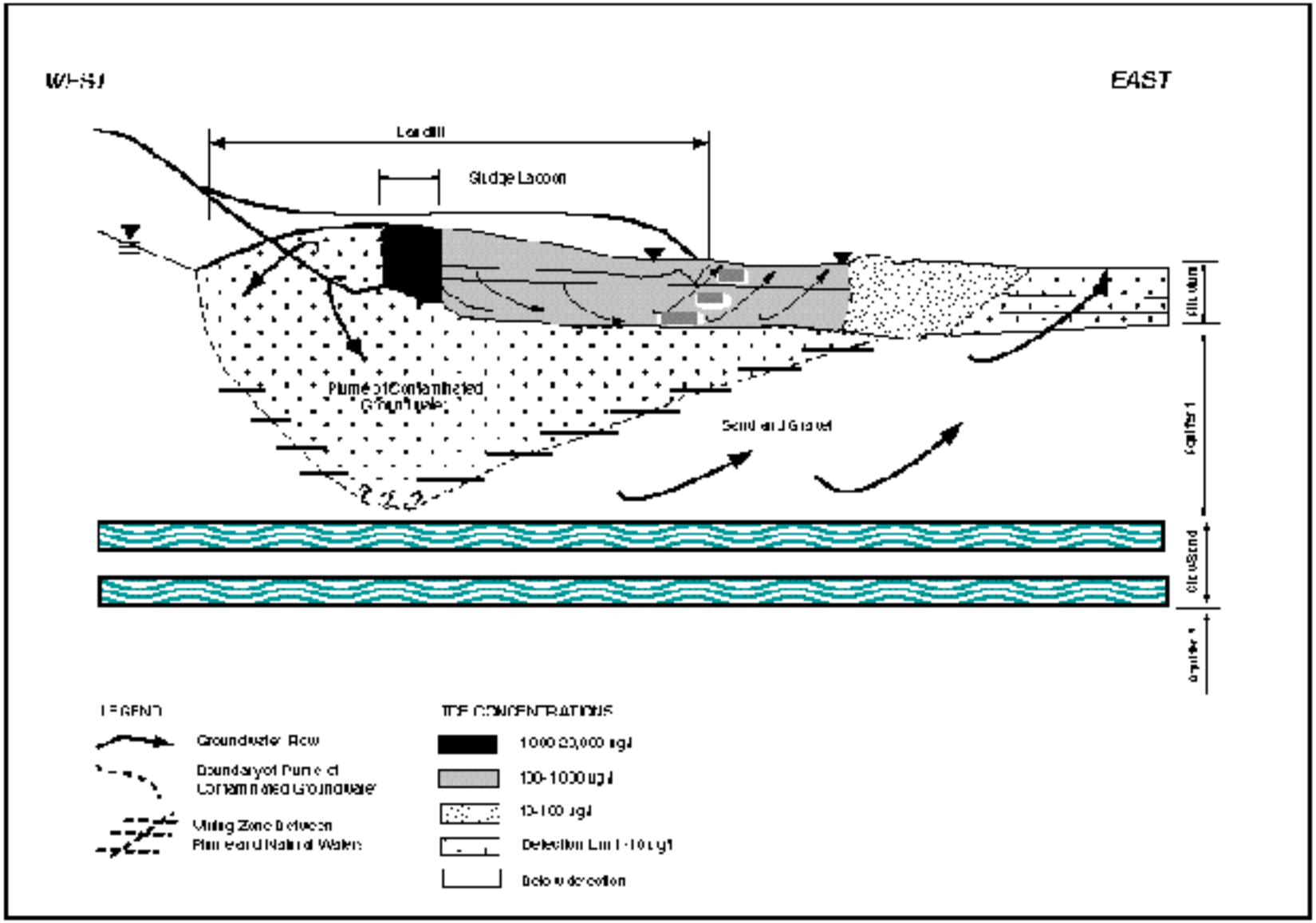
Brief Rationale for Selection: *Human receptors could have access to contaminated soil beyond the fenced area*

**Soil Category** (High, Medium, Low) Medium

* Soil samples should be from a depth of 0–6 inches. If samples are not available from the 0–6 inch interval, results from depths up to, but not exceeding, 24 inches can be used.




Example 3. Map View of Landfill and Sludge Lagoon Site at Example Air Force Base




Example 3. Cross Section View of Landfill and Sludge Lagoon Site Showing at Example Air Force Base

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