APPENDIX K
RELATIVE RISK AOC EVALUATIONS

K.0 PRIORITIZATION

The DoD has developed a prioritization method for the Defense Environmental Restoration Program (DERP) called the Relative Risk Site Evaluation (RRSE) method (DoD, 1994). The method requires three primary types of information to be generated for each site:

- the contaminant hazard - chemical data are used to develop the Contaminant Hazard Factors (CHF) for each site. Site CHFs are "low" (<2 times risk screening levels), "medium" (2 - 100 times risk screening levels), or "high" (> 100 times risk screening levels);

- the potential for contaminant migration away from the source - sites may be ranked low, medium, or high; and

- potential receptors - potential receptors may be ranked low, medium, or high.

The primary requirement for ranking a site using this method is the availability of reliable chemical concentration data for each of the three environmental media: groundwater, surface water/sediment, and soil. These data are now available for the AOCs investigated during the Phase I RI. Table K.1 provides a summary of the ranking results. Detailed information used to perform the ranking is provided in the attached scoring sheets following Table K.1.

Table K.1 Summary of risk ranking results

Site #	Site	Groundwater	Surface water		Sediment		Soil	RRSE Score
			Human	Ecological	Human	Ecological		
RVAAP-02	Demolitian Area 2	NE	NE	NE	Low	Low	**High**	**High**
RVAAP-08	Load Line 1	**High**	NE	NE	**High**	**High**	**High**	**High**
RVAAP-09	Load Line 2	**High**	NE	NE	**High**	**High**	**High**	**High**
RVAAP-10	Load Line 3	NE	NE	NE	Medium	**High**	**High**	**High**
RVAAP-11	Load Line 4	**High**	NE	NE	Low	Low	Low	**High**
RVAAP-12	Load Line 12	NE	NE	NE	**High**	**High**	**High**	**High**
RVAAP-05	Winkelpeck Burning Ground	NE	NE	NE	Low	Low	**High**	**High**
RVAAP-13	Building 1200	NE	NE	NE	Low	Low	Medium	Medium
RVAAP-19	Landfill N. of Winkelpeck BG	Low	NE	NE	Low	Low	Low	Low
RVAAP-29	Cobbs Pond	Medium	NE	NE	Low	Medium	NE	Medium

NE = not sampled

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Demolition Area #2 / #2 RVAAP-04
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): SOIL, SED
Site Type: XE
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Demolition Area #2, a horseshoe-shaped area ~8 ha (20 acres) in size, used from 1948 to detonate large-caliber munitions and "off spec" bulk explosives. Within this AOC, there are five areas: 1. Open Detonation Area - detonation was accomplished in backhoe-dug pits - a minimum depth of 1.2 m (4 ft.), metal parts were removed from the site, and the pits backfilled, mulched, and seeded; 2. Open Burning Area [~0.1 ha (0.25 acre) horseshoe-shaped bermed area] -- 1981 - 1986, the sludge from Load Line 6 Evaporation Unit was thermally destroyed here. 3. Prototype Testing Range--projectiles fired into targets here. 4. Burial Site - scrap bombs buried in area ~3 x 61 m (10 x 200 ft) x 1.2 m (4 ft) deep in NW Demolition Area. 5. Past Disposal Area - 21.3-m (70-ft) embankment overlooking Sand Creek.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Available data indicates no migration has occurred away from the source. Migration to a nearby creek is possible. Creek joins Sand Creek and eventually exits the facility 2.5 to 3 miles to the north.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead to center of facility and eventually to Sand Creek.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total = 100):
Moderate (If Total 2-100):
Minimum (If Total = 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants	0.00		
		Total	

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Groundwater Category: NE

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Mimimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Mimimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

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 — Evident:

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined — Potential:

Confined - Information Indicates that the potential for contaminant migration from the source is limited (due geological structures or physical controls). — Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment — Identified:

Potential - Potential for receptors to have access to surface water or sediment — Potential:

Limited - Little or no potential for receptors t have access to surface water or sediment — Limited:

Brief rationale/source for selection:

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Sediment - Ecological Category: LOW

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100): X
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Lead	1,900,000.00	400,000.00	4.75
Dinitrotoluene mixture	2,600.00	65,000.00	0.04
Cadmium and compounds	3,100.00	38,000.00	0.08
Beryllium and compounds	510.00	14,000.00	0.04
Barium and compounds	593,000.00	5,300,000.00	0.11
Arsenic	30,800.00	22,000.00	2.36
		Total	7.38

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident:
Potential: X
Confined:

Brief rationale/source for selection: No apparent migration to sediment. Groundwater parthway not sampled.

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

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Ssite drains to Sand Creek and exits facility approximately 2.5 miles to north. No immediate current ecological receptors.

Soil Category: HIGH

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Building 1200 and Dilution/Settling Pond, / BSPRVAAP-13
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/28/97
Media Evaluated (GW, SW, Sediment, Soil): SOIL, SED
Site Type: CB
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: MEDIUM

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Building 1200, the Ammunition Sectioning Area, is a half concrete, half transite-sided building approximately 9.1 m x 6.1 m (30 x 20 feet) with a 3.7 m (12-foot) peak. Building 1200 was used from 1941 to 1971 for ammunition demilitarization. Munition rounds were checked for flaws, steam cleaned, and the wastewater drained, via a pipe, through a crushed slag gravel bed and into a ditch and finally into a 0.2 ha (0.5-acre) sedimentation pond.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Potential contamination in soils surrounding Building could migrate to downstream drainages; however, no elevated contamination was detected in soils; downgradient sediments contained only low levels (below screening levels) of explosives and metals

Brief Description of Receptors (Human and Ecological):
Limited access by work force; removed from stream/wetlands areas.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total = 100)
Moderate (If Total 2-100)
Minimum (If Total = 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants	0.00		
		Total	

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source. Evident

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined. Potential

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

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer). Identified

Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer). Potential

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

Brief rationale/source for selection:

Groundwater Category: NE

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100)
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

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 — Evident:

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined — Potential:

Confined - Information Indicates that the potential for contaminant migration from the source is limited (due geological structures or physical controls). — Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment — Identified:

Potential - Potential for receptors to have access to surface water or sediment — Potential:

Limited - Little or no potential for receptors t have access to surface water or sediment — Limited:

Brief rationale/source for selection:

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

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 — Evident:

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined — Potential

Confined - Information Indicates that the potential for contaminant migration from the source is limited (due geological structures or physical controls). — Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment — Identified:

Potential - Potential for receptors to have access to surface water or sediment — Potential:

Limited - Little or no potential for receptors t have access to surface water or sediment — Limited:

Brief rationale/source for selection:

Sediment - Ecological Category: LOW

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Benzo(a)pyrene	160.00	6,100.00	0.03
Beryllium and compounds	600.00	14,000.00	0.04
		Total	0.07

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: No apparent migration from source to sediments.

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

Identified:
Potential: X
Limited

Brief rationale/source for selection: Limited access by site personnel.

Soil Category: MEDIUM

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Upper Lower Cobbs Pond / CSPRVAAP-29
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/28/97
Media Evaluated (GW, SW, Sediment, Soil): GW, SED
Site Type: SI
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: MEDIUM

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
The Upper and Lower Cobbs Pond complex was active from 1941 to 1971 as sedimentation basins for explosive pink wastewater. The Upper and Lower Cobbs Ponds complex consisted of two unlined ponds that recieved the effluent from RVAAP-10 (Load Line 3) and RVAAP-12 (Load Line 12) sawdust filtration units and storm and surface water runoff. Overflows from Upper Cobbs Pond discharged to Lower Cobbs Pond and from there to a receiving stream prior to exiting the facility. Upper Cobbs Pond is approximately 2 ha (5 acres) in size and Lower Cobbs Pond is approximately 1.2 to 1.6 ha (3 to 4 acres) in size.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Ponds feed downstream creek. Contaminant migration to creek is possible but not evident. Creek joins Sand Creek and eventually exits the facility 2.5 to 3 miles to the north.

Brief Description of Receptors (Human and Ecological):
Evident wildlife at pond. Sand Creek exits factiliy 2.5 to 3 miles to the north.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100) X
Minimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Manganese and compounds	3,020.00	180.00	16.78
		Total	16.78

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential X
Confined

Brief rationale/source for selection: Manganese detected in both groundwater and sediments.

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified
Potential X
Limited

Brief rationale/source for selection: No human receptors at site or downgradient; potential ecological receptors.

Groundwater Category: MEDIUM

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Mimimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Mimimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential
Confined

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified
Potential
Limited

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Copper and compounds	316,000.00	2,800,000.00	0.11
Chromium VI and compounds	329,000.00	380,000.00	0.87
		Total	0.98

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: Metals detected in sediments do not appear to be moving away from pond.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential: X
Limited:

Brief rationale/source for selection: No human receptors; potential ecological receptors.

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Copper and compounds	316,000.00	70,000.00	4.51
Chromium VI and compounds	329,000.00	80,000.00	4.11
		Total	8.63

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: Metals detected in sediments do not appear to be moving away from pond.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential: X
Limited:

Brief rationale/source for selection: No human receptors; potential ecological receptors.

Sediment - Ecological Category: MEDIUM

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident
Potential
Confined

Brief rationale/source for selection:

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

Identified
Potential
Limited

Brief rationale/source for selection:

Soil Category: NE

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Load Line 12 / L12RVAAP-12
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/28/97
Media Evaluated (GW, SW, Sediment, Soil): SOIL, SED
Site Type: WL
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
From 1946 to 1950, Load Line 12 was used to produce 470,080 metric tons (518,264 tons) of fertilizer grade ammonium nitrate. Then, Load Line 12 was primarily used for the demilitarization of munitions. Explosives were melted out of bomb casings and shipped off site. Buildings were washed down weekly and the water was guttered and flowed into two stainless-steel tanks, one tank was used for settling, and one for filtration. Approximately 324,000 L (85,536 gallons) of pink water were generated per month in the 1950s. Load Line 12 Pink Wastewater Treatment Plant was installed in 1981 to process pink water from demilitarization operations at Building FJ-904. The plant averaged 19,000 L (5000 gal) per day. The plant currently has an active NPDES permit for the disposal of stormwater from Load Line 12.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Prior to 1981, Load Line 12 tank effluent was ditched from Building FJ-904 to the Load Line 12 settling pond, where ultimately the water drained into Upper and then Lower Cobbs Ponds.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead to center of facility and eventually to Sand Creek. Sand Creek exits facility 2.55 to 3 miles to the north.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total = 100):
Moderate (If Total 2-100):
Minimum (If Total = 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants	0.00		
		Total	

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Groundwater Category: NE

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	794,000.00	23,000,000.00	0.03
Silver and compounds	58,000.00	380,000.00	0.15
Nickel and compounds	59,700.00	1,500,000.00	0.04
Mercury and compounds (methyl)	1,200.00	20,000.00	0.06
Copper and compounds	399,000.00	2,800,000.00	0.14
Arsenic	217,000.00	22,000.00	16.64
		Total	17.07

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals detected at source and in downgradient sediments above screening levels

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to Cobbs Ponds, and on to Sand Creek.

Sediment - Human Category: HIGH

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	794,000.00	120,000.00	6.62
Silver and compounds	58,000.00	1,000.00	58.00
Nickel and compounds	59,700.00	30,000.00	1.99
Mercury and compounds (methyl)	1,200.00		
Copper and compounds	399,000.00	70,000.00	5.70
Arsenic	217,000.00	33,000.00	6.58
		Total	78.88

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals detected at source and in downgradient sediments above screening levels

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to Cobbs Ponds and on to Samd Creek.

Sediment - Ecological Category: HIGH

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
2,4,6-Trinitrotoluene	19,000,000.00	4,800,000.00	3.96
RDX (Cyclonite)	6,800,000.00	400,000.00	17.00
Benzo(a)pyrene	12,000.00	6,100.00	1.97
Polychlorinated biphenyls (PCBs)	2,600.00	6,600.00	0.39
Lead	589,000.00	400,000.00	1.47
Dinitrotoluene mixture	13,000.00	65,000.00	0.20
Beryllium and compounds	1,500.00	14,000.00	0.11
		Total	25.10

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Indirect contact exposures via migration to sediments/surface water; same COPCs detected in source and media; future potential direct contact by on-site receptor.

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

Identified:
Potential: X
Limited

Brief rationale/source for selection: Site drains to Cobbs Ponds and then to Sand Creek; Sand Creek exits facility approximately 2.5 miles to north.

Soil Category: HIGH

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Landfill N. of W. Burn. Ground / LFLRVAAP-19
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): GW, SOIL, SED
Site Type: LF
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: LOW

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Landfills at RVAAP were used to bury waste from industrial and sanitary sources. Potential contaminants from these areas include explosives and explosive wastes, mustard agent, and metals (arsenic, chromium, mercury, and lead). The Landfill North of Winklepeck Burning Grounds is an unlined 4-ha (10-acre) landfill site used for general refuse disposal from 1969 to 1976. An unknown quantity of material was landfilled at the site, including munitions, booster cups, aluminum liners, sanitary waste, and possible explosive and munitions waste and ash from Winklepeck Burning Grounds.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Landfill is situated in the center of the facility. No clear drainages at the site. Contaminants do not appear to be leaching to groundwater.

Brief Description of Receptors (Human and Ecological):
Limited access by work force.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2) X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Nickel and compounds	110.00	730.00	0.15
		Total	0.15

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential: X
Confined

Brief rationale/source for selection: Nickel in groundwater not in source.

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified
Potential
Limited: X

Brief rationale/source for selection: limited

Groundwater Category: LOW

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total = 100):
Moderate (If Total 2-100):
Mimimum (If Total = 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Mimimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential
Confined

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified
Potential
Limited

Brief rationale/source for selection:

Surface Water - Ecological Category: NI

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

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 — Evident:

Potential - Possibility for contamination to be present at or migrate to a point of exposure; or information is not sufficient to make a determination of Evident or Confined — Potential

Confined - Information Indicates that the potential for contaminant migration from the source is limited (due geological structures or physical controls). — Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment — Identified:

Potential - Potential for receptors to have access to surface water or sediment — Potential:

Limited - Little or no potential for receptors t have access to surface water or sediment — Limited:

Brief rationale/source for selection:

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Sediment - Ecological Category: LOW

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Minimum (If Total 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Beryllium and compounds	530.00	14,000.00	0.04
		Total	0.04

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident:
Potential: X
Confined:

Brief rationale/source for selection: No apparent migration.

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

Identified:
Potential:
Limited X

Brief rationale/source for selection: Minimal to no contact by site personnel; no aquatic receptors.

Soil Category: LOW

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Load Line 1 / LL1RVAAP-08
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): GW, SOIL, SED
Site Type: WL
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Load Line 1 was in operation from 1941 to 1971. Pink water generated from the munitions assembly operations was collected in concrete sumps located throughout the load line. The wastewater was then pumped to a sawdust filtration unit for de-chlorofication and removal of nitro compounds prior to discharge. The sawdust filtration unit consisted of a set of three parallel 3 x 9.1 x 0.9 m (10 x 30 x 3 ft) concrete settling tanks and a set of three 1.5 x 4.6 x 0.9 m (5 x 15 x 3 ft) filter blocks in the bottom of the filtration tanks.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Potential contamination in soils surrounding load lines could migrate to downstream drainages; plant effluent was introduced into the top of one end of the filtration unit and discharged to an earthen settling pond (Griggy's Pond) via an unlined ditch. The discharge from the impoundment immediately exits the installation. Low levels of metals and explosives were detected in sediments.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead directly offsite and eventually feed Reservoir. Possible sensitive ecological receptors.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Manganese and compounds	3,120.00	180.00	17.33
Arsenic	64.10	3.80	16.87
		Total	34.20

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: As and Mn were detected at source and in groundwater; however, both may be present at naturally occurring levels.

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Potential sensitive ecological receptors in pond; potable water reservoir downgradient/downstream of site.

Groundwater Category: HIGH

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited

Brief rationale/source for selection:

Surface Water - Human Category: NI

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NI

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100): X
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	2,530,000.00	23,000,000.00	0.11
Lead	2,220,000.00	400,000.00	5.55
Cadmium and compounds	26,900.00	38,000.00	0.71
Antimony and compounds	2,460,000.00	31,000.00	79.35
		Total	85.72

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals detected at source and in downgradient sediments above screening levels.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to wetlands area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Sediment - Human Category: HIGH

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100): X
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	2,530,000.00	120,000.00	21.08
Lead	2,220,000.00	35,000.00	63.43
Cadmium and compounds	26,900.00	5,000.00	5.38
Antimony and compounds	2,460,000.00	2,000.00	1,230.00
		Total	1,319.89

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals detected at source and in downgradient sediments above screening levels.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to wetlands area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Sediment - Ecological Category: HIGH

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100): X
Minimum (If Total 2).

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
2,4,6-Trinitrotoluene	5,800,000.00	4,800,000.00	1.21
Polychlorinated biphenyls (PCBs)	36,000.00	6,600.00	5.45
Lead	3,610,000.00	400,000.00	9.03
Beryllium and compounds	2,500.00	14,000.00	0.18
Arsenic	77,000.00	22,000.00	5.91
		Total	21.77

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Indirect contact exposures via migration to sediments/surface water; future potential direct contact by on-site receptor.

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

Identified: X
Potential:
Limited

Brief rationale/source for selection: Site drains to wetlands area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Soil Category: HIGH

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Load Line 2 / LL2RVAAP-09
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): GW, SOIL, SED
Site Type: WI
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage):
RI
Agreement Status (enter the appropriate DERP regulatory agreement code):
Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Load Line 2 was used to melt and load TNT and Composition B into large caliber shells and bombs. It operated from 1941 to 1971. Pink wastewater was similarly collected in concrete sumps connected to settling tanks. After settling, the water was pumped by low-pressure steam ejectors to two tanks, approximately 26,200 liters (6900 gallons) in volume for cooling. When the water cooled to 80 degrees F, it was pumped through an overhead pipe to a sawdust filtration unit, configured identically to that in Load Line 1. When the facility was at full capacity, Load Line 2 generated approximately 9,211 kilograms (kg) (20,310 lbs) of Composition B and 3,192,000 L (842,688 gallons) of pink water per month. In addition, chromic acid waste was discharged from Building 802 into a ditch that ultimately empties into the West Branch of the Mahoning River.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
The effluent from the sawdust filtration units was discharged to Kelly's Pond, a triangular, unlined earthen settling impoundment, approximately 0.8 ha (2 acres) in size and 1.8 to 2.4 m (6 to 8 ft) deep. The discharge from the impoundment was channeled to a surface stream that immediately exits the installation south of the load line. No contaminants detected in groundwater.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead directly offsite and eventually feed Reservoir. Possible sensitive ecological receptors.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2) X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Dinitrotoluene mixture	0.34	9.90	0.03
		Total	0.03

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Site chemicals detected in sediments. Groundwater flows to off-site reservoir.

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site upgradient of drinking water reservoir.

Groundwater Category: HIGH

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Mimimum (If Total 2)

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident
Potential
Confined

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified
Potential
Limited

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100):
Mimimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100)
Moderate (If Total 2-100)
Minimum (If Total 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	299,000.00	23,000,000.00	0.01
Silver and compounds	23,100.00	380,000.00	0.06
Benzo(k)fluoranthene	19,000.00	610,000.00	0.03
Copper and compounds	167,000.00	2,800,000.00	0.06
		Total	0.16

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals and PAHS detected at source and in downgradient sediments above screening levels.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited

Brief rationale/source for selection: Site drains to area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Sediment - Human Category: HIGH

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	299,000.00	120,000.00	2.49
Silver and compounds	23,100.00	1,000.00	23.10
Benzo(k)fluoranthene	19,000.00		
Copper and compounds	167,000.00	70,000.00	2.39
		Total	27.98

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Several metals and PAHS detected at source and in downgradient sediments above screening levels.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to area with potentially sensitive eological receptors; drainage to off-site Reservoir.

Sediment - Ecological Category: HIGH

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total 100):
Moderate (If Total 2-100): X
Minimum (If Total 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
2,4,6-Trinitrotoluene	12,000,000.00	4,800,000.00	2.50
1,3,5-Trinitrobenzene	160,000.00	3,300.00	48.48
Thallium	7,600.00		0.00
RDX (Cyclonite)	9,800,000.00	400,000.00	24.50
Benzo(a)pyrene	2,300.00	6,100.00	0.38
Polychlorinated biphenyls (PCBs)	6,000.00	6,600.00	0.91
Lead	881,000.00	400,000.00	2.20
Cadmium and compounds	22,700.00	38,000.00	0.60
Beryllium and compounds	2,900.00	14,000.00	0.21
		Total	79.78

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Indirect contact exposures via migration to sediments/surface water; future potential direct contact by on-site receptor.

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

Identified:
Potential: X
Limited

Brief rationale/source for selection: Site drains to wetlands area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Soil Category: HIGH

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Load Line 3 / LL3RVAAP-10
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): SOIL, SED
Site Type: WL
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Load Line 3 operated from 1941 to 1971. Pink water generated from the assembly of munitions was also collected in concrete sumps located throughout the Load Line 3 area, and pumped into settling tanks via steam ejectors. Sawdust used in filtration tanks and the settled sludge were periodically removed and destroyed at Winklepeck Burning Grounds. Approximately 9,173 (20,226 lbs) of scrap and sludge, and 304,800 L (80,467 gallons) of pink water were generated per month when the facility was at full capacity.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
The effluent was discharged via an unlined drainage ditch that emptied into Upper Cobbs Pond and ultimately Lower Cobbs Pond for settling. Cobbs Pond eventually exits to Sand Creek, which leaves the facility 2.5 to 3 miles to north.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead to Cobbs Pond in middle of facility. Possible sensitive ecological receptors in pond.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants	0.00		
		Total	

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Groundwater Category: NE

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	560,000.00	23,000,000.00	0.02
Silver and compounds	2,420.00	380,000.00	0.01
		Total	0.03

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: Two metals detected in downgradient sediments above screening levels are likely not source related.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains to Cobbs Pond, Sand Creek, north to facility boundary.

Sediment - Human Category: MEDIUM

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Zinc	560,000.00	120,000.00	4.67
Silver and compounds	2,420.00	1,000.00	2.42
		Total	7.09

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: Two metals detected in downgradient sediments above screening levels are likely not source related.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Sete drains to area with potentially sensitive ecological receptors; drainage to off-site Reservoir.

Sediment - Ecological Category: HIGH

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100): X
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
2,4,6-Trinitrotoluene	390,000,000.00	4,800,000.00	81.25
1,3,5-Trinitrobenzene	110,000.00	3,300.00	33.33
Benzo(a)pyrene	1,000.00	6,100.00	0.16
Polychlorinated biphenyls (PCBs)	21,000.00	6,600.00	3.18
Lead	2,620,000.00	400,000.00	6.55
Heptachlor	90.00	9,900.00	0.01
Chlordane	590.00	34,000.00	0.02
Beryllium and compounds	1,200.00	14,000.00	0.09
Arsenic	23,200.00	22,000.00	1.78
		Total	126.37

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: Indirect contact exposures via migration to sediments/surface water; future potential direct contact by on-site receptor.

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

Identified: X
Potential:
Limited

Brief rationale/source for selection: Site drains to Cobbs Pond.

Soil Category: HIGH

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Load Line 4 / LL4RVAAP-11
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/31/97
Media Evaluated (GW, SW, Sediment, Soil): GW, SOIL, SED
Site Type: WL
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
Load Line 4 operated from 1941 to 1971. Pink water from munitions assembly operations was again collected in concrete sumps, pumped to a sawdust filtration system, and discharged to a surface ditch. Effluent from the filtration unit was conveyed to a 0.8 ha (2 acre) settling pond within the Load Line 4 area. This pond discharges to a surface stream that exits the RVAAP facility south of the Load Line 4. Sludge and spent sawdust from the filtration unit were periodically removed and destroyed at Winklepeck Burning Grounds. Approximately 11,930 kg (26,305 lbs) of scrap, sludge, and dust; 14,900,000 m3 (421,917 ft3) of dust; and 3,390,000 L (894,960 gallons) of pink water were generated per month when the load line was at full capacity.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Potential contamination in soils surrounding load lines could migrate to downstream drainages; low levels of metals, explosives detected in sediments; Drainage from LL4 exits facility 1200 ft from site.

Brief Description of Receptors (Human and Ecological):
Limited access by work force; drainages lead directly offsite and eventually feed Reservoir. Possible sensitive ecological receptors.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100): X
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Manganese and compounds	2,670.00	180.00	14.83
		Total	14.83

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: Manganese detected in groundwater, may be naturally-occurring.

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified: X
Potential:
Limited:

Brief rationale/source for selection: identified

Groundwater Category: HIGH

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: No chemicals detected in downgradient sediments.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Sites drain off-site to downgradient Reservoir.

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential: X
Confined:

Brief rationale/source for selection: No chemicals detected in downgradient sediments.

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified: X
Potential:
Limited:

Brief rationale/source for selection: Site drains off-site to downgradient Reservoir.

Sediment - Ecological Category: LOW

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2): X

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
Thallium	13,300.00		0.00
Benzo(a)pyrene	2,700.00	6,100.00	0.44
Polychlorinated biphenyls (PCBs)	4,500.00	6,600.00	0.68
Beryllium and compounds	3,600.00	14,000.00	0.26
Aldrin	43.00	2,600.00	0.02
		Total	1.40

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident:
Potential: X
Confined:

Brief rationale/source for selection: No soil contamination detected in sediments; potential for migration off-site exists.

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

Identified:
Potential: X
Limited

Brief rationale/source for selection: Downgradient receptors; site drains to Reservoir.

Soil Category: LOW

RELATIVE RISK EVALUATION WORKSHEET

PROJECT BACKGROUND INFORMATION

Property Name for FUDS:
RVAAP
Location (City/County and State):
Ravenna, Ohio
Project Name/ RMIS ID:
Winkelpeck Burning Ground / WBGRVAAP-05
Point of Contact (Name/Phone):

Date Entered (month/day/year): 3/28/97
Media Evaluated (GW, SW, Sediment, Soil): SOIL, SED
Site Type: AB
Phase of Execution (SI, RI, FS, EE/CA, IRA, RD/RA, or equivalent RCRA Stage): RI
Agreement Status (enter the appropriate DERP regulatory agreement code): Z - No agreements

NPL/Proposed NPL (Y/N):

Overall Project Risk: HIGH

PROJECT SUMMARY

Brief Project Description (include site type, materials disposed, dates of operation, and other relevant information)
The burning grounds have been in operation since 1941, and occupy ~ 80.9 ha (200 acres). Prior to 1980, ordnance waste burning was carried out in 4 pits, burning pads, and occasionally along roads. Seventy burning pads were identified from historical drawings and aerial photographs; the actual number of pads is unknown. The pads consisted of 6 x 12.2 m (20 x 40 feet) areas without berms. The pits consisted of areas bermed on three sides, ~ 15.2 x 22.9 m (50 x 75 feet) in size. Burns were conducted using scrap wood, straw, and No. 2 fuel oil. The fire would cause the explosives to melt and flow out of the projectiles and burn. Occasionally, projectiles would explode and be ejected into the surrounding area. Many of the further flung projectiles are still in the field. In some instances, high energy material such as black powder and explosives were laid out in a string along a road and burned.

Brief Description of Pathways (Groundwater, Soil, Surface Water (human), Surface Water (ecological), Sediment (human), Sediment (ecological)):
Contamination mainly in surface soils; may migrate to nearby ditch sediments; groundwater not sampled during Phase 1.

Brief Description of Receptors (Human and Ecological):
Limited access by work force. Limited terestrial species.

GROUNDWATER

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total = 100):
Moderate (If Total 2-100):
Minimum (If Total = 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants	0.00		
		Total	

MIGRATION PATHWAY FACTOR (MPF):

Evident - Analytical data or observable evidence indicates that contamination in the media is moving away from the source.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - There is a threatened or potentially threatened water supply downgradient of the source. The groundwater (contaminated or not) is a current source of drinking water or source of water for other beneficial uses such as irrigation/agricultures (equivalent to Class I or IIA aquifer).
Potential - There is no potentially threatened water supply well downgradient of the source. The groundwater is potentially usable for drinking water, irrigation, or agricultures, but is not presently used (equivalent to Class IIB aquifer).
Limited - There is no potentially threatened water supply well downgratient of the source. The groundwater is not considered a potential source of drinking water or is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only)

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Groundwater Category: NE

SURFACE WATER - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Human Category: NE

SURFACE WATER - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Mimimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

MIGRATION PATHWAY FACTOR (MPF):

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

Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due to geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF):

Identified - Receptors identified that have access to surface water or sediment.

Potential - Potential for receptors to have access to surface water of sediment.

Limited - Little or no potential for receptors to have access to surface water or sediment.

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Surface Water - Ecological Category: NE

SEDIMENT - HUMAN

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			0.00
		Total	0.00

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Sediment - Human Category: LOW

SEDIMENT - ECOLOGICAL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100):
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
No Contaminants			
		Total	

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 - Possibility for contamination to be present at or migrate to a point of exposure; 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 is limited (due geological structures or physical controls).

Evident:
Potential:
Confined:

Brief rationale/source for selection:

RECEPTOR FACTOR (RF

Identified - Receptors identified that have access to surface water or sediment

Potential - Potential for receptors to have access to surface water or sediment

Limited - Little or no potential for receptors t have access to surface water or sediment

Identified:
Potential:
Limited:

Brief rationale/source for selection:

Sediment - Ecological Category: LOW

SOIL

CONTAMINANT HAZARD FACTOR (CHF):

Significant (If Total > 100): X
Moderate (If Total 2-100):
Minimum (If Total < 2):

Contaminant	Max Concentration (ppb)	Standard (ppb)	Ratio
2,4,6-Trinitrotoluene	3,800,000.00	4,800,000.00	0.79
1,3,5-Trinitrobenzene	490,000.00	3,300.00	148.48
RDX (Cyclonite)	9,500,000.00	400,000.00	23.75
Lead	916,000.00	400,000.00	2.29
Cadmium and compounds	877,000.00	38,000.00	23.08
Beryllium and compounds	2,600.00	14,000.00	0.19
Barium and compounds	7,780,000.00	5,300,000.00	1.47
Arsenic	21,600.00	22,000.00	1.66
		Total	201.71

MIGRATION PATHWAY FACTOR (MPF)

Evident - Analytical data or observable evidence that contamination is present at, is moving towards, or has moved to a point of exposure.
Potential - Possibility for contamination to be present at or migrate to a point of exposure; 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

Evident: X
Potential:
Confined:

Brief rationale/source for selection: evident

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

Identified: X
Potential:
Limited

Brief rationale/source for selection: identified

Soil Category: HIGH