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1.0 INTRODUCTION

This report documents the results of Landfill North of Winklepeck Burning Grounds (LNW) (AOC-19) sampling effort which was completed as part of the characterization activities conducted at 14 Ravenna Army Ammunition Plant (RVAAP) Areas of Concern (AOCs). The field activities were conducted from October 2004 to May 2005.

1.1 PURPOSE AND SCOPE

Characterization activities were conducted at LNW to collect sufficient data for all applicable media to allow efficient planning and execution of future environmental actions.

The characterization effort for the LNW was undertaken to accomplish the following:

- Collect characterization data using multi-increment (MI) sampling to provide data for future risk assessments that may be conducted;
- Develop and/or update the Conceptual Site Model to identify the key elements that should be considered in future actions;
- Assess AOC-specific physical characteristics;
- Assess potential sources of contamination;
- Allow initial assessment of the nature and lateral extent of soil, sediment, surface and groundwater contamination (the depth of contamination was not evaluated for this characterization effort); and
- Conduct a preliminary human health and ecological screening.

The investigation approach to the LNW involved a combination of field and laboratory activities to characterize the site. Field investigation techniques included surface soil (0-1 ft) samples (MI and discrete), soil boring and sampling, surface water, monitoring well installation and development, groundwater sampling, sample and monitoring well location survey, and aquifer testing. The rationale for the AOC specific sampling plan was biased based on historical information including past usage, past investigations, ecological settings, climatic conditions, and geological and hydrologic characteristics. The field program was conducted in general accordance with the revised (USACE, 2001a) and the Final Sampling and Analysis Plan Addendum FSAP for the characterization of 14 RVAAP AOCs (MKM, 2004).

1.2 BACKGROUND INFORMATION

This section briefly describes LNW and previous inspections, assessments and investigations conducted at LNW.

1.2.1 AOC Description and History

The landfill located north of LNW is an unlined 10-acre landfill used for general refuse and burning operations. The landfill is located east of George Road and north of Winklepeck Burning Ground. The landfill was operational from 1969 to 1978. An unknown quantity of material was land filled at this AOC including booster cups, aluminum liners, sanitary waste; and possibly explosives, munitions waste and ash. Debris and garbage protrude through the landfill surface in several areas. The appearance and

location of the landfill suggests it was created using a trench and fill method of operation. The top of the landfill area has an elevation approximately 15 ft higher than the wetlands that are adjacent to the northern boundary.

1.2.2 Previous Investigation

The following assessments, inspection and investigation have been conducted at the LNW:

1.2.2.1 Installation Assessment of Ravenna Army Ammunition Plant (USATHAMA 1978)

This assessment identified the following conditions at RVAAP:

- Areas of RVAAP, including the productions areas (i.e. LL-5, LL-7, LL-8, LL-10 and LL-12), burning grounds, test areas and demolition areas were identified as sites contaminated with explosive waste which included: TNT, Composition B, lead azide, lead styphnate and black powder.
- Surface waters exiting the installation were not required to be monitored for nitrobodies and heavy metals.
- Analysis of the well water indicated potable quality.
- UXO items were identified in the demolition area.
- No environmental stress was identified at RVAAP.
- The chemical agent mustard may be buried within the old demolition grounds.
- The Ramsdell Quarry site landfill was identified as having a potential leaching problem.
- Trace quantities of 2,4,6-TNT was identified in the wells indicating that some leaching had occurred.

1.2.2.2 Preliminary Review and Visual Site Inspection conducted as a part of Resource Conservation and Recovery Act (RCRA) Facility Assessment conducted by the USEPA. (Jacobs Engineering Group, Inc. 1989

This document could not be located.

1.2.2.3 Preliminary Assessment for the Ravenna Army Ammunition Plant (USACE 1996)

This assessment identified the following conditions at RVAAP:

- Potential chemicals of concern (PCOCs) at RVAAP sites were identified explosives (TNT, RDX, HMX, RDXX, composition B, and lead azide) and heavy metals (lead and mercury).
- The primary sources of potential contamination at RVAAP were identified as wastewater effluent from munitions assembly and demilitarization process, open burning and detonation of explosives, and landfill operations.
- Primary contaminant release mechanisms from load lines were process effluent discharges to surface water (drainage ditches, settling ponds, and streams) and process building wastewater wash-out on to surface soils. Media of concern were identified as a soil, sediment, groundwater and surface water.

- The greatest potential for release of contaminants to groundwater from load lines likely was identified as wastewater effluent discharge to unlined earthen settling ponds. Concrete settling tanks, open drainage ditches, and storm sewers were also identified as a concern relative to groundwater.
- The primary contaminant release mechanism from open burning and detonation areas resulted from the burning and detonation of off-specification explosives on the ground surface. Media of concern was identified as soils, groundwater, surface water and sediment.
- The primary release mechanism at landfills was identified as a result of potential leaching of contaminants from buried/disposal materials. Groundwater and soils were selected as media of concern.
- Known releases of contamination to surface water and soils have occurred from load line (assembly and demilitarization) operations, and from open burning and detonation operations.
- Known releases of contamination to groundwater were noted to have occurred from quarry landfill operations.
- The greatest potential for off-site migration of contaminants during load line operations was identified as surface water. The greatest potential for current off-site migration of contaminants was identified as groundwater and surface water.

Based on qualitative assessment of the potential hazards, release mechanisms, and environmental conditions at RVAAP, LL-12, Building 1200 and the Landfill N. of Winklepeck Burning Grounds were considered among the higher priority sites in this assessment.

Based on interviews with former employees of varying expertise, the Pistol Range and NACA Test Area were also cited in this assessment. At the time these sites had no documentation to support their existence and were listed as undocumented sites.

1.2.2.4 Phase I Remedial Investigation for High-Priority Areas of Concern at the Ravenna Army Ammunition Plant (SAIC 1998)

No widespread organic contamination was detected in the nine trench samples from the landfill area. Low levels of pesticides and PCBs (e.g. <0.1 mg/kg) were detected in some samples. Nickel was detected in groundwater slightly above the maximum contaminant level risk screening level (110 vs. 100 mg/kg). Scattered detections of inorganic were observed above soil background criteria in sediments from drainage leading to and from the beaver pond north of the landfill with the highest concentrations occurring downstream of this pond. There does not appear to be a defined source of contamination or evidence of contaminant migration was not identified in the area, based on the samples collected.

1.2.3 Regulatory Authorities

Volume I, section 1.2.3 identifies the regulatory authorities that oversee remedial activities for this AOC.

1.2.4 Regulatory Status of The Landfill North of Winklepeck Burning Grounds

Volume I, Section 1.2.4 identifies the regulatory status for this AOC.

2.0 ENVIRONMENTAL SETTING AT THE LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS

This section describes the physical characteristics of the LNW and its adjacent environment that are factors in interpreting the potential contaminant transport pathways, receptor populations, and exposure scenarios with respect to the evaluation of human health and ecological risks. The area immediately surrounding LNW is forested except for the clearing that defines the landfill, operational areas, and the wet land which forms the north AOC boundary. An unnamed stream flows through the wet land from northwest to south east. This stream intersects Sand Creek near the Central Burn Pits AOC. This AOC is approximately 1500 feet north of the Winklepeck Burning Grounds and 750 feet north of the PIR AOC. The north bank of the landfill (adjacent to the wet land) was observed to be littered with landfill debris. The AOC surface water flows to the east/southeast. George Road is located approximately 500 to the west.

2.1 SURFACE FEATURES

The topography at the LNW is generally flat and slopes radially in all directions. The elevations of contours within this AOC range between 1127 ft amsl to 1138 ft (amsl). A topographic high exists in the western portion of the AOC. The lowest elevations are found in the far southeastern portion of the AOC. The elevation of the main road, located west of the landfill, is 1150 ft amsl (USGS Topographic Map, Windham Quadrangle 1994).

2.2 METEOROLOGY AND CLIMATE

Meteorology and climate are addressed in Section 2.2 of Volume I.

2.3 SURFACE WATER HYDROLOGY

Surface water drainage generally follows the topography of the AOC and flows mostly toward the southeast. "Several drainage ditches located within the AOC flow intermittently during precipitation events. The ditches tend to hold water for extended periods of time due to the low permeability of soils. Surface water levels fluctuate at the AOC based upon seasonal precipitation and biological activity that changes the surface water elevations and configuration especially in the wetland.

2.4 GEOLOGY

Lithologic logs from four borings, advanced during the characterization activities and completed as monitoring wells, have been used to characterize the surface and subsurface geology at the landfill. Weathered shale was encountered at the range of 9 to 24 ft. The boring logs, which detail the vertical lithologic sequences, are found in Appendix H.

2.4.1 Glacial Deposits

Subsurface lithology at the landfill consists mostly of clay to sand-rich silt tills with interbedded sands scattered throughout. These deposits are generally firm, moderately plastic, and tend to hold water where encountered. Groundwater was encountered 10 to 17 ft bgs during drilling of the groundwater monitor wells. Deposits with higher concentrations of sand and gravel generally control the elevation of the shallow water table zone, and biological activity has been observed to act as a conduit for the local

shallow water table at various landfill locations. Cross-sections of the subsurface at landfill illustrate the lateral distribution and variation of these discontinuous glaciated sediments (Figures LNW-1 to LNW-4).

2.4.2 Sedimentary Rocks

Weathered shale was encountered at the range of 9 to 24 ft when installing the monitoring wells at the landfill.

2.5 SOIL

Three soil types are found at this AOC: the Mahoning silt loam (0 to 2 percent and 2 to 6 percent slopes) on the west and southwestern portion of the AOC, cut and fill on the eastern portion of the AOC, and Ellsworth silt loam (6 to12 percent slopes) on northern part of the AOC. Sloped soil along drainage pathways, rapid runoff and severe erosion are characteristics of the Ellsworth silt loam. The Mahoning silt loam is characterized by gently sloped land, medium to rapid runoff, severe seasonal wetness and slow permeability.

2.6 HYDROGEOLOGY

This section describes the unconsolidated sediments and bedrock characteristics, as well as information regarding groundwater, found in the vicinity of the LNW.

2.6.1 Unconsolidated Sediments

Unconsolidated sediments at the LNW are consistent with the description in Volume 1, Section 2.6.1, which describes the unconsolidated sediments that influence the hydrogeological characteristics at RVAAP.

2.6.2 Bedrock

Weathered shale was encountered at the range of 9 to 24 ft when installing the monitoring wells at the landfill.

2.7 DEMOGRAPHY AND LAND USE

Demographics and land use are discussed in Volume 1, Section 2.7.

2.8 ECOLOGY

Ecological information is provided in Volume I, Section 2.8.

3.0 CHARACTERIZATION ACTIVITIES AT THE LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS

This section describes the field and analytical methods identified during the characterization of the LNW. The field and analytical programs were conducted in accordance with the RVAAP Facility Wide Sampling and Analysis Plan (FWSAP) (USACE, 2001b) and the RVAAP 14 AOC FWSAP Addendum (MKM, 2004). Investigation objectives, rationale for sampling locations, sampling methods, and sampling locations are briefly discussed in this section.

3.1 FIELD ACTIVITIES

AOC-specific field activities conducted from October 2004 thru May 2005 included:

- Excavating of test trenches (10-09-04 – 10-10-04);
- Collecting MI surface soil (0-1 ft) samples (10-25-04 – 11-01-04);
- Collecting MI sediment samples from drainage pathways (11-02-04 – 11-03-04);
- Collecting subsurface soil samples using hydraulic push technology (Geoprobe) (11-09-04 – 11-10-04);
- Collecting surface water samples from drainage pathways (11-02-04 – 12-06-04);
- Installing four groundwater monitoring wells (12-13-05 – 12-15-04);
- Collecting groundwater samples from monitoring wells (01-12-05 – 01-26-05);
- Collecting geotechnical samples from the borings (11-02-04 – 12-15-05);
- Conducting well slug tests (02-01-05); and
- Conducting a sampling location and monitoring well survey (12-13-05 – 01-28-05).

Sampling points for the characterization of this AOC were located to assess the impact that the landfill operations may have had on soil, sediment, surface water, and groundwater; and to evaluate where contaminants related to the former operations may have impacted the AOC. The following sections describe the rationales for sample locations and methods employed to collect samples during the characterization activities.

Information from previous assessments, evaluations and investigations plus institutional knowledge about the disposal that occurred at the landfill were used to determine the sampling locations, type of media collected, analyses run and numbers of samples collected for this characterization activity. Table LNW-1 summarizes the types and numbers of samples that were collected and the analyses conducted on the samples. A photo log of the investigation activities is provided in Appendix C. Figure LNW-5 shows the monitoring well locations; Figure LNW-6 shows the sample locations for MI surface soil (0-1 ft), sediment, and surface water at this AOC; and Figure LNW-7 shows the Geoprobe® boring locations.

3.1.1 Trenching Activities

Before initiating drilling operations, one test trench was excavated near the potential tracer burning area. This area is located south of the landfill along George Road. The trenching activities provided information about the soil stratification profile, depth to groundwater and depth to bedrock. Additionally, the tracer burning area was targeted for the trenching operations to investigate the potential existence of subsurface MEC in that location.

Trenching was halted upon encountering saturation. The test trench at the landfill was terminated when bedrock was encountered at 5.0 ft. bgs. No suspect soil or MEC was encountered during the trenching operation. Trenching activities were conducted as explained in Volume I, Section 3.1.5.

3.1.2 MI Surface Soil (0-1 ft) Sampling

Fifteen MI surface soil (0-1 ft) grids were sampled at this AOC to:

- Assess the potential impact of landfill operations on the soils within the AOC;
- Evaluate soil quality in the potential tracer burning areas; and
- Determine the nature and extent of identified contamination (if present).

The landfill was divided into 14 grids. One MI surface soil (0-1 ft) sample was collected from each grid. Twelve of the MI samples were located in the immediate vicinity of the landfill and two MI samples targeted the potential tracer burn area to the southwest of the landfill and adjacent to and east of George Road. Multi-increment samples were collected as described in Volume I, Section 3.1.10.1. Two split samples were collected and submitted for analysis to an independent, USACE-approved laboratory. Analysis of MI surface soils (0-1 ft) for LNW included the following parameters: TAL Metals, Explosives and SVOCs.

VOC samples were collected as discrete samples to fulfill the 10 percent full suite requirement and the FWSAP approved VOC collection methods. Section 3.1.10.3 of Volume I describes the procedure used to collect discrete surface soil (0-1 ft) samples. Discrete VOC samples were not subjected to MI sample drying or processing. Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. Field sampling forms documenting the surface soil (0-1 ft) sampling activities are presented in Appendix E.

3.1.3 MI Sediment Sampling

MI sediment samples were collected at this AOC to:

- Evaluate whether sediments are being impacted via surface water runoff at the landfill;
- Evaluate the migration pathway for contaminants that may have been suspended in surface water runoff; and
- Evaluate whether contaminants may have migrated beyond the AOC boundaries.

Five MI sediment samples and one discrete VOC sample were collected. The locations were selected to evaluate whether the drainage system at the landfill allowed contaminants to migrate beyond the site boundary. The MI sediment samples were co-located with the associated surface water sample. All MI sediment sampling grids were located in areas containing shallow water and, as a result, samples were able to be collected on foot, using the procedures described in Section 3.1.10.4 of Volume I. One split sample was collected and submitted for analysis to an independent, USACE-approved laboratory. Analysis of sediment for LNW included the following parameters: TAL Metals, Explosives, SVOCs, TOC and grain size.

The VOC sample was collected as a discrete sample to fulfill the 10 percent full suite requirement and the FWSAP approved VOC collection methods. Section 3.1.10.5 of Volume I describes the procedure used to collect discrete sediment samples. Discrete VOC samples were not subjected to MI sample drying or

processing. Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. Field sampling forms from MI sediment sampling are presented in Appendix Q.

3.1.4 Subsurface Soil Samples (Geoprobe®)

As per the May 2004 SOW, 17 subsurface soil samples (Geoprobe®) were collected at this AOC to:

- Assess the potential impact of landfill operations on subsurface soil;
- Characterize the soil outside the main landfill area;
- Determine the horizontal extent of the landfill; and
- Determine nature of contamination.

A Geoprobe® Model 54LT was used to advance 17 soil borings to a depth of 10 ft. A dual tube system utilizing a 2.15 in diameter by 3 ft long probe with a 1 in. diameter acetate liner was used to collect and retrieve the subsurface soil samples. A sample was collected from each two foot interval (2 to 4 ft, 4 to 6 ft, 6 to 8 ft bgs and 8 to 10 ft bgs), and the interval with the highest PID reading was sent to the laboratory for analysis. Boring locations were determined during site walks, through information gathered during previous investigations of the landfill's extent and through real-time field determinations during the Geoprobe® operations. Subsurface soil samples were collected using hydraulic direct-push technology per Section 4.4.2.1.5 of the FWSAP. Analysis of surface water at LNW included the following parameters: TAL Metals, Explosives, Propellants, VOCs, SVOCs, Pesticides and PCBs.

Two split samples were collected and submitted for analysis to an independent, USACE-approved laboratory. Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. Field sampling forms documenting the sampling activities are presented in Appendix A of this report.

3.1.5 Surface Water Sampling

Surface water samples were collected at this AOC to:

- Evaluate whether surface water is being impacted by runoff or leachate from the landfill; and
- Identify the migration pathways for contaminated runoff or leachate (if any) from the landfill.

Six locations were selected to evaluate whether contaminants could be impacting surface water within the AOC boundary. Surface water samples were collected from a streambed located east of the landfill. Samples were collected beginning with the furthest downstream point and moving upstream, to minimize the turbidity effects on water quality. Water quality measurements (pH, conductivity, dissolved oxygen content, and temperature) were recorded just prior to sample collection. Surface water samples were collected using the direct fill method, as referenced in Volume I, Section 3.1.10.9. One split sample was collected and submitted for analysis to an independent USACE-approved laboratory. Analysis of surface water at LNW included the following parameters: TAL Metals, Explosives, Propellants, VOCs, SVOCs, Pesticides and PCBs. Field sampling forms for surface water sampling are presented in Appendix O.

3.1.6 Groundwater Investigation Activities

Three of the four boreholes were advanced into bedrock with borehole termination depth ranging from 19.0 to 25.0 ft bgs. The groundwater activities were conducted at this AOC to:

- Determine whether leachate from the landfill operations had adversely impacted groundwater quality underlying the AOC;
- Evaluate the quality of groundwater upgradient of the landfill; and
- Collect data pertaining to the groundwater flow regime at the landfill.

Three monitoring wells (LNWmw-025, LNWmw-026 and LNWmw-027) were located downgradient of the landfill to evaluate potential subsurface contamination. One monitoring well (LNWmw-024) was located upgradient of the landfill.

One round of groundwater sampling and slug tests were conducted and three rounds of water level data were collected.

3.1.6.1 Monitoring Well Installation and Development

An 8.25 in. OD, hollow-stem auger was used to advance the borehole through unconsolidated material to an average depth of 7.01 m (23.00 ft) bgs. Weathered bedrock was encountered in three of the four boring locations at depths of 10 ft bgs (LNWmw-027), 12 ft bgs (LNWmw-025) and 17.5 ft bgs (LNWmw-024).
In one boring, bedrock was not encountered to a depth of 24 ft bgs.

Monitoring well installation and development at the LNW followed the procedures reported in Volume I, Section 3.1.6. Well construction diagrams and well development records are provided in Appendix H.

3.1.6.2 Geotechnical Sample Collection

Geotechnical analysis was conducted during groundwater monitoring well installation. Two Shelby tubes were collected at monitoring well locations LNWmw-024 (4 to 6 ft) and LNWmw-025 (2 to 4 ft) and sent to the laboratory for analysis. Geotechnical sample collection was conducted in accordance with Section 4.4.2.4.1 of the FWSAP. Geotechnical analysis of Shelby tubes included the following parameters: Atterberg Limits, moisture content, total organic content, specific gravity and pH. The geotechnical analytical data can be found in Appendix J.

3.1.6.3 Groundwater Sampling

Four ground water samples were collected at LNW. (No detections were observed in the PID readings for the wells at The LNW. This information is provided on the field forms located in Appendix H. Specific information related to the type of PID used and calibration is included in Section 3.1.5 of Volume 1.) Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. One split sample was collected and submitted for analysis to an independent, USACE-approved laboratory. Analysis of groundwater at LNW included the following parameters: TAL Metals, Explosives, Propellants, VOCs, SVOCs, Pesticides and PCBs. Well purging and sampling records are provided at Appendix H and analytical results from the samples are presented in Appendix L. All groundwater sampling was

conducted in accordance with the procedures provided in Section 4.3.4 and 4.3.5 of the FWSAP. Section 3.1.10.11 of Volume 1 also discusses the groundwater sampling procedures used for this project.

3.1.6.4 In-Situ Permeability Testing

Slug tests were performed at the four monitoring wells, located at the LNW, as discussed in Volume I, Section 3.1.10.12. Slug test data records are provided at Appendix K.

3.1.6.5 Water Level Measurements

Static water level and total depth measurements were taken and recorded at each monitoring well on three separate occasions to provide data on the groundwater flow regime underlying the landfill. These water level readings were collected during February 2005, March 2005, and May 2005. Water level measurement were collected in accordance with Section 4.3.2.6 of the FWSAP. Groundwater elevation data are included in Appendix K. Well survey information is included in Appendix S.

3.1.7 Sampling Location and Monitoring Well Survey

The sampling location and monitoring well survey at the LNW was conducted per the specifications in Section 3.1.11, in Volume I of this characterization report. The monitoring well survey report can be found in Appendix N and sampling location survey data in Appendix S.

3.2 DEVIATIONS FROM THE WORK PLAN

Every effort was made to complete the field activities as outlined in the FWSAP and the approved RVAAP 14 AOC FWSAP Addendum. However, in some instances, circumstances or field conditions necessitated a modification. Changes made during the characterization activities at the LNW are noted below.

- Samples were collected from 17 rather than 18 soil borings. One soil boring was abandoned because it was within the confines of the landfill.
- Well LNWmw-025 was relocated because the original location was on the landfill.
- Two contingency samples were collected: LNWss-042M was collected at the Old Barn footprint and LNWsw-052-SW was collected by seep on the downhill slope of LNWss-038M.
- Saturated MI sediment samples were not dried or sifted. Saturated MI sediments were homogenized in their saturated state and placed incrementally into the appropriate pre-cleaned sample containers.
- Well construction deviations were identified on monitoring wells MW-024, MW-025 and MW-026 due to the shallow depth of the well. Wells LNWmw-024, LNWmw-025 and LNWmw-026 were constructed with 2 ft of sand above the screen rather than the FWSAP approved construction requirement of 3 ft. In addition, the three wells were constructed with 2 ft of bentonite rather than the FWSAP approved construction of 3 ft of bentonite. LNWmw-025 was constructed with a 6 ft casing length rather than FWSAP 8 ft.

Although deviations were identified, the objectives of the characterization activities planned for the landfill were achieved.

4.0 NATURE OF CONTAMINATION AT THE LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS

This section summarizes the soil, sediment, surface water, and groundwater analytical results obtained from the environmental sampling conducted at the LNW. The results are organized by media: surface soil (0-1 ft), sediment, subsurface soil (Geoprobe®), surface water, and groundwater. The number of samples collected and the number of analytical results that exceeded either the RVAAP background criteria or Region 9 residential Preliminary Remediation Goals are listed in each subsection. The evaluation completed in this section is a preliminary comparison and is not intended to be used alone for making risk management decisions. The risk screening, presented later in this report, further discusses and evaluates the contaminants detected during this AOC characterization. The following sections summarize the results of the initial screening of the analytical data for samples collected during the AOC characterization.

4.1 MI SURFACE SOIL (0-1 FT)

Eighteen MI surface soil (0-1 ft) (15 regular and three QC) samples were collected from various locations throughout the area surrounding the landfill. Additionally, two discrete surface soil (0-1ft) samples were collected for VOC analysis. All positive detections were compared to RVAAP background and Region 9 residential PRG values as previously discussed.

Surface soil (0-1 ft) results at or above detection limits are presented in Table LNW-2. All surface soil (0-1 ft) analytical results are presented in Table LNW-7. The locations where surface soil (0-1 ft) analytes were detected at or above background levels and Region 9 residential PRGs are illustrated in Figures LNW-8A, LNW-8B and LNW-9. Laboratory analytical reports are provided in Appendix F.

The surface soil (0-1 ft) analytical results are summarized as follows:

- **Aluminum** exceeded the Region 9 residential PRG in 18 samples with a **maximum concentration of 12000 mg/kg.**
- **Arsenic** exceeded the Region 9 residential PRG in 18 samples with a **maximum concentration of 14 mg/kg.**
- **Barium** exceeded background in two samples with a **maximum concentration of 120 mg/kg.**
- **Beryllium** exceeded background in one sample with a **maximum concentration of 1.4 mg/kg.**
- **Cadmium** exceeded background in three samples with a **maximum concentration of 1.1 mg/kg.**
- **Calcium** exceeded background in one sample with a **maximum concentration of 21000 mg/kg.**
- **Chromium** exceeded background in 14 samples with a **maximum concentration of 26 mg/kg.**
- **Copper** exceeded background in one sample, and exceeded background and the Region 9 residential PRGs in one sample with a **maximum concentration of 430 mg/kg.**
- **Iron** exceeded the Region 9 residential PRG in 17 samples and exceeded background and the Region 9 residential PRGs in one sample with a **maximum concentration of 24000 mg/kg.**

- **Lead** exceeded background in three samples with a **maximum concentration of 140 mg/kg.**
- **Magnesium** exceeded background in one sample with a **maximum concentration of 4300 mg/kg**.
- **Manganese** exceeded the Region 9 residential PRG in 18 samples with a **maximum concentration of 1300 mg/kg.**
- **Nickel** exceeded background in two samples with a **maximum concentration of 24 mg/kg.**
- **Potassium** exceeded background in four samples with a **maximum concentration of 2300 mg/kg.**
- **Silver** exceeded background in one sample with a **maximum concentration of 22 mg/kg.**
- **Sodium** exceeded background in eighteen samples with a **maximum concentration of 690 mg/kg.**
- **Vanadium** exceeded the Region 9 residential PRG in 18 samples with a **maximum concentration of 22 mg/kg.**
- **Zinc** exceeded background in eight samples with a **maximum concentration of 1400 mg/kg.**
- **Mercury** exceeded background in nine samples with a **maximum concentration of 0.092 mg/kg.**
- **Thallium** exceeded background in six samples with a **maximum concentration of 0.3 mg/kg.**
- **2-Methylnaphthalene** exceeded the laboratory detection limit in four samples with a **maximum concentration of 0.085 mg/kg.**
- **Acenaphthylene** exceeded the laboratory detection limit in two samples with a **maximum concentration of 0.018 J mg/kg.** J value indicates an estimated result.
- **Benzo(a)pyrene** exceeded the Region 9 residential PRG in two samples with a **maximum concentration of 0.14 mg/kg.**
- **Benzo(g,h,i)perylene** exceeded the laboratory detection limit in five samples with a **maximum concentration of 0.056 mg/kg.**
- **Phenanthrene** exceeded the laboratory detection limit in six samples with a **maximum concentration of 0.26 mg/kg.**
- **Nitrocellulose** exceeded the laboratory detection limit in two samples with a **maximum concentration of 1.3 mg/kg.**
- **VOCs, pesticides, PCBs and explosives** were below Region 9 residential PRGs and/or laboratory detection limits.

4.2 SUBSURFACE SOIL (GEOPROBE ®)

Nineteen subsurface soil samples (17 regular and two QC) were collected from various locations, at depths greater than 1 ft, during the AOC characterization activities conducted at LNW. All positive detections were compared to RVAAP background and Region 9 residential PRG values as previously discussed.

Subsurface soil results at or above detection limits are presented in Table LNW-3. All subsurface soil analytical results are presented in Table LNW-8. The locations where subsurface soil analytes were

detected at or above background levels and Region 9 residential PRGs are illustrated in Figure LNW-10. Laboratory analytical reports are provided in Appendix G.

The subsurface soil analytical results are summarized as follows:

- **Aluminum** exceeded the Region 9 residential PRG in 14 samples with a **maximum concentration of 12000 mg/kg.**
- **Arsenic** exceeded the Region 9 residential PRG in 19 samples with a **maximum concentration of 17 mg/kg.**
- **Beryllium** exceeded background in one sample with a **maximum concentration of 0.93 mg/kg.**
- **Cadmium** exceeded background in three samples with a **maximum concentration of 0.2 mg/kg.**
- **Iron** exceeded the Region 9 residential PRG in 19 samples with a **maximum concentration of 28000 mg/kg.**
- **Manganese** exceeded the Region 9 residential PRG in 17 samples with a **maximum concentration of 540 mg/kg.**
- **Sodium** exceeded background in 13 samples with a **maximum concentration of 410 mg/kg.**
- **Vanadium** exceeded the Region 9 residential PRG in 19 samples with a **maximum concentration of 18 mg/kg.**
- **VOCs, SVOCs, pesticides, PCBs, explosives and propellants** were below Region 9 residential PRGs and/or laboratory detection limits.

4.3 SEDIMENTS

Five MI sediment samples (four regular and one QC) were collected during the AOC characterization at the LNW. Additionally, one discrete sediment sample was collected for VOC analysis. Sediment sample results were compared to facility-wide background concentrations for sediments and/or Region 9 residential PRGs for soil.

Sediment results at or above detection limits are presented in Table LNW-4. All sediment analytical results are presented in Table LNW-9. Locations where sediment analytes were detected at or above background levels and Region 9 residential PRGs are illustrated in Figures LNW-8A, LNW-8B and LNW-9. Laboratory analytical reports are provided in Appendix R.

The sediment analytical results are summarized as follows:

- **Aluminum** exceeded the Region 9 residential PRG in four samples with a **maximum concentration of 10000 mg/kg.**
- **Arsenic** exceeded the Region 9 residential PRG in five samples with a **maximum concentration of 12 mg/kg.**
- **Beryllium** exceeded background in five samples with a **maximum concentration of 0.73 mg/kg**.
- **Cadmium** exceeded background in one sample with a **maximum concentration of 0.34 mg/kg.**
- **Iron** exceeded the Region 9 residential PRG in five samples with a **maximum concentration of 22000 mg/kg.**
- **Manganese** exceeded the Region 9 residential PRG in five samples with a **maximum concentration of 710 mg/kg.**
- **Nickel** exceeded background in three samples with a **maximum concentration of 19 mg/kg.**
- **Sodium** exceeded background in five samples with a **maximum concentration of 300 mg/kg.**

- **Vanadium** exceeded the Region 9 residential PRG in five samples with a **maximum concentration of 18 mg/kg.**
- **Mercury** exceeded background in two samples with a **maximum concentration of 0.068 mg/kg.**
- **Benzo(a)pyrene** exceeded the Region 9 residential PRG in one sample with a **maximum concentration of 0.064 J mg/kg.** J value indicates an estimated result.
- **Benzo(g,h,i)perylene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.043 J mg/kg.** J value indicates an estimated result.
- **Nitrocellulose** exceeded the laboratory detection limit in one sample with a **maximum concentration of 1.4 mg/kg.**
- **VOCs, pesticides, PCBs and explosives** were below Region 9 residential PRGs and/or laboratory detection limits.

4.4 SURFACE WATER

Seven surface water samples (six regular and one QC) were collected to characterize the surface water in this AOC. Results from analyses were compared to surface water background concentrations and/or USEPA Region 9 tap water PRGs.

Surface water results at or above detection limits are presented in Table LNW-5. All surface water analytical results are presented in Table LNW-10. Locations where surface water analytes were detected at or above background levels and Region 9 tap water PRGs are illustrated in Figure LNW-11. Laboratory analytical reports are provided in Appendix P.

The surface water analytical results are summarized as follows:

- **Barium** exceeded background in one sample with a **maximum concentration of 53 µg/L.**
- **Manganese** exceeded the background in four samples, and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 1700 J µg/L.** J value indicates an estimated result.
- **Potassium** exceeded background in one sample with a **maximum concentration of 3500 µg/L.**
- **Arsenic** exceeded the Region 9 tap water PRG in five samples with a **maximum concentration of 1.3 µg/L.**
- **Mercury** exceeded background in one sample with a **maximum concentration of 0.05 µg/L.**
- **Thallium** exceeded background in one sample with a **maximum concentration of 1.5 µg/L.**
- **Benzo(a)anthracene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 0.17 J µg/L.** J value indicates an estimated result.
- **Benzo(a)pyrene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 0.12 J µg/L.** J value indicates an estimated result.
- **Benzo(b)fluoranthene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 0.11 J µg/L.** J value indicates an estimated result.
- **Dibenzo(a,h)anthracene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 0.13 J µg/L.** J value indicates an estimated result.
- **Indeno(1,2,3-cd)pyrene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 0.13 J µg/L.** J value indicates an estimated result.
- **VOCs, pesticides, PCBs, explosives and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

4.5 GROUNDWATER

Five groundwater samples (four regular and one QC) were collected from four monitoring wells LNWmw-024 through LNWmw-027 installed during the characterization effort. Groundwater samples were collected to determine whether the shallow water table contains contaminants exceeding acceptable concentrations. The groundwater analytical results were compared to background values and USEPA Region 9 tap water PRGs.

Groundwater results at or above detection limits are presented in Table LNW-6. All groundwater analytical results are presented in Table LNW-11. Locations where groundwater analytes were detected at or above background levels and Region 9 tap water PRGs are illustrated in Figure LNW-12. Laboratory analytical reports are provided in Appendix L.

The groundwater analytical results are summarized as follows:

- **Barium** exceeded background in two samples with a **maximum concentration of 110 µg/L.**
- **Cadmium** exceeded background in one sample with a **maximum concentration of 0.26 µg/L.**
- **Calcium** exceeded background in two samples with a **maximum concentration of 85000 µg/L.**
- **Cobalt** exceeded background in one sample with a **maximum concentration of 0.81 µg/L.**
- **Iron** exceeded background in two samples with a **maximum concentration of 3400 µg/L.**
- **Magnesium** exceeded background in two samples with a **maximum concentration of 32000 µg/L.**
- **Manganese** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 990 µg/L.**
- **Nickel** exceeded background in two samples with a **maximum concentration of 3.6 µg/L.**
- **Potassium** exceeded background in three samples with a **maximum concentration of 7000 µg/L.**
- **Vanadium** exceeded background in two samples with a **maximum concentration of 3.6 µg/L.**
- **Arsenic** exceeded the Region 9 tap water PRG in two samples, and exceeded background and the Region 9 tap water PRG in two samples with a **maximum concentration of 6.5 µg/L.**
- **Lead** exceeded background in two samples with a **maximum concentration of 1.6 µg/L.**
- **Thallium** exceeded background in one sample with a **maximum concentration of 2.0 µg/L.**
- **Bis(2-ethylhexyl)phthalate** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 15 µg/L.**
- **VOCs, pesticides, PCBs, explosives and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

4.6 GEOTECHNICAL

Geotechnical analysis was conducted during groundwater monitoring well installation. Two Shelby tubes were collected at monitoring well locations LNWmw-024 (4 to 6 ft) and LNWmw-025 (2 to 4 ft). The results of the geotechnical analysis are summarized in the following table.

Sample Number	Depth feet	Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index	Agg. %	C Sand %	M Sand %	F Sand %	Silt & Clay %	Soil Descr.	Class Sym.	pH	Specific Gravity
LNWmw-024 (4-6 ft.)	5.7	17.2	34	20	14	1.8	1.5	5.4	16.3	75.1	Brown lean clay with sand, trace gravel	CL	7.1	2.744
LNWmw-025 (2-4 ft.)	3.7	19.7	26	21	6	10.9	4.2	13.8	27.1	44.0	Brown silty, clayey sand, little gravel	SC-SM	7.6	2.740

4.7 IN SITU PERMEABILITY TESTING RESULTS

Following installation of the monitoring wells, a slug test was completed to determine the in-situ permeability of the aquifer underlying the LNW. The following table shows the results of the slug tests performed in January and February 2005.

Hydraulic Conductivities in Landfill N. of Winklepeck Burning Grounds Monitoring Wells

Monitoring Well ID	Screened Interval Depth (ft)	Total Borehole Depth (ft)	Geologic Material Adjacent to Screen	Hydraulic conductivity (cm/s)
MW-024	10-20	24	Shale, silty sand	1.26 E-4
MW-025	8-18	19	Shale, sandy silt	1.54 E-4
MW-026	14-23	24	Shale	8.20 E-5
MW-027	14-24	25	Shale	8.12 E-5

Based on the results of the slug tests, hydraulic conductivities arithmetic average 1.108×10^{-4} cm/s in the soil underlying this AOC. The field measurements and test data are provided in Appendix K along with the calculation worksheets for the tests. Previous slug tests performed at wells located at other sites within RVAAP indicate average hydraulic conductivities between 3.87×10^{-2} cm/s to 4.46×10^{-6} cm/s (USACE, 2001b).

Data from three rounds of well gauging were used to produce potentiometric surface maps for LNW (Figures LNW-12 through LNW-14). The water level data suggests that groundwater flows to the east / southeast at a gradient of approximately 0.015 ft/ft.

5.0 HUMAN HEALTH AND ECOLOGICAL RISK SCREENING FOR THE LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS

This section details both the human health and ecological risk screening performed at the LNW.

5.1 HUMAN HEALTH RISK SCREENING

Volume 1, Section 5.1 explains how LNW data were screened to determine human health contaminants of concern (COPCs). Total chromium analytical results were conservatively screened against 1/10th of the PRG value; therefore, a screening value of 21 mg/kg was used rather than 210 mg/kg.

5.1.1 Surface Soil (0-1 ft)

Table LNW-12 presents the human health screening data for surface soil (0-1 ft) in the LNW. A total of 48 constituents were detected including metals, volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs).

- Sixteen constituents had detections greater than background concentrations: barium, beryllium, cadmium, calcium, chromium, copper, iron, lead, magnesium, nickel, potassium, silver, sodium, zinc, mercury, and thallium.
- Seven constituents had detections above the adjusted Region 9 residential PRGs: aluminum, arsenic, copper, iron, manganese, vanadium, and benzo(a)pyrene.
- Two constituents, copper and iron, also had detected concentrations above both RVAAP background and the Region 9 residential PRG.
- Five constituents have no established background value or Region 9 residential PRG: 2-methylnaphthalene acenaphthylene, benzo(g,h,i)perylene, phenanthrene, and nitrocellulose.

Based on these comparisons, eight constituents were identified as chemicals of potential concern (COPC) in surface soil (0-1 ft) at the LNW: copper, iron, 2-methylnaphthalene, acenaphthylene, benzo(a)pyrene, benzo(g,h,i)perylene, phenanthrene, and nitrocellulose.

5.1.2 Subsurface Soil

Table LNW-13 presents the human health screening data for subsurface soil in the LNWs. A total of 25 constituents were detected including metals and SVOCs.

- Three constituents had detections greater than background concentrations: beryllium, cadmium, and sodium.
- Five constituents had detections above the adjusted Region 9 residential PRGs: aluminum, arsenic, iron, manganese, and vanadium.
- No constituents had detected concentrations above both background and the Region 9 residential PRG.

Based on these comparisons, no COPCs were identified for subsurface soil at the LNW.

5.1.3 Sediment

Table LNW-14 presents the human health screening data for sediment in the LNW. Twenty-eight constituents were detected in sediment. These constituents included metals and SVOCs.

- Five constituents had detected concentrations greater than background values: beryllium, cadmium, nickel, sodium, and mercury.
- Six constituents had detections above the adjusted Region 9 residential PRGs: aluminum, arsenic, iron, manganese, vanadium, and benzo(a)pyrene.
- No constituents also had detected concentrations above both background and Region 9 residential PRGs.
- Two constituents, benzo(g,h,i)perylene and nitrocellulose, have no established background value or Region 9 residential PRG.

Based on these comparisons, benzo(a)pyrene, benzo(g,h,i)perylene, and nitrocellulose were identified as COPCs.

5.1.4 Surface Water

Table LNW-15 presents the human health screening data for surface water in the LNW. Seven surface water samples were collected resulting in a total of 22 detected constituents.

- Five constituents had detections greater than background concentrations: barium, manganese, potassium, mercury, and thallium.
- Six constituents had detections above the Region 9 tap water PRGs: arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.
- Of these constituents, manganese had detected concentrations above both RVAAP background and its Region 9 tap water PRG.

Based on these comparisons, six COPCs were identified in surface water at the LNW: manganese, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

5.1.5 Groundwater

Table LNW-16 presents the human health screening data for groundwater in the LNW. A total of 19 constituents were detected, including 17 metals and two semivolatile organic compounds (SVOCs).

- Twelve constituents had detections greater than background concentrations: barium, cadmium, calcium, cobalt, iron, magnesium, nickel, potassium, vanadium, arsenic, lead, and thallium.
- Three constituents had detections above the Region 9 tap water PRGs: arsenic, manganese, and bis(2-ethylhexyl)phthalate.
- Of these constituents, arsenic had detected concentrations above both RVAAP background and the Region 9 tap water PRG.

Based on these comparisons, arsenic and bis(2-ethylhexyl)phthalate were identified as COPCs in groundwater at the LNW.

5.2 ECOLOGICAL RISK SCREENING

See Volume I, Section 5.2 for an explanation of the procedures used to conduct this ecological risk screen.

5.2.1 Surface Soil (0-1 ft)

Table LNW-17 presents the ecological screening data for surface soil (0-1ft) at the LNW. A total of 48 constituents were detected.

- Sixteen constituents had detections greater than background concentrations: barium, beryllium, cadmium, calcium, chromium, copper, iron, lead, magnesium, nickel, potassium, silver, sodium, zinc, mercury, and thallium.
- Twelve constituents had detections above ecological screening values: aluminum, arsenic, chromium, copper, iron, lead, manganese, selenium, silver, vanadium, zinc, mercury.
- Four constituents have no established screening values: benzoic acid, carbazole, dibenzofuran and nitrocellulose. Of the five, one constituent (magnesium) exceeds the background value established for RVAAP.

Based on these comparisons, 12 constituents were identified as chemicals of potential ecological concern (COPECs) in surface soil (0-1ft) at the LNW: chromium, copper, iron, lead, silver, zinc, mercury, beta-BHC, benzoic acid, carbazole, dibenzofuran, and nitrocellulose. Of these COPECs, benzoic acid, carbazole, dibenzofuran, and nitrocellulose were identified due to the lack of screening criteria. Beta-BHC was identified as a COPEC in surface soil (0-1ft) because it is considered persistent, bioaccumulative, and toxic.

5.2.2 Sediment

Table LNW-18 presents the ecological screening data for sediment at the LNW. Twenty-nine constituents were detected in sediment.

- Five constituents had detected concentrations greater than background values: beryllium, cadmium, nickel, sodium, and mercury.
- Only arsenic had detections above the ecological screening value.
- Seven constituents have no established screening values: aluminum, barium, beryllium, iron, manganese, and nitrocellulose. Of the eight, one constituent (beryllium) exceeds the background value established for RVAAP.
- No constituents exceed the Sediment Reference Value (SRV) (OEPA, 2003).

Based on these comparisons, only nitrocellulose was identified as a COPEC due to the lack of screening criteria, background value and SRV.

5.2.3 Surface Water

Table LNW-19 presents the ecological screening data for surface water at the LNW. Twenty-two constituents were detected in surface water.

- Five constituents had detections greater than background values: barium, manganese, potassium, mercury, and thallium.
- No constituents were detected above ecological screening values.
- Seven constituents have no established screening values: aluminum, iron, manganese, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. Of the eleven, one constituent (manganese) exceed the background value established for RVAAP.

Based on these comparisons, nine constituents were identified as COPECs in surface water at the LNW: manganese, mercury, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene. All COPECs, except mercury, were identified due to the lack of screening criteria. Mercury was identified as a COPEC in surface water because it is considered persistent, bioaccumulative, and toxic.

6.0 SUMMARY AND CONCLUSION FOR THE CHARACTERIZATION OF THE LANDFILL NORTH OF WINKLEPECK BURNING GROUNDS

This section briefly summarizes the existing conditions that were found during the AOC characterization at LNW and the risk screening tasks that were completed.

6.1 NATURE OF CONTAMINATION

The nature and extent of contamination is examined in all four media: soil [surface soil (0-1 ft) and subsurface (soil boring)], sediment, surface water and groundwater. Contaminants were detected above screening criteria in all environmental media sampled. Very few constituents other than inorganics were detected above screening criteria in the samples collected from the various media. Most of the contaminants (except for inorganics) were detected in very few samples. For example, SVOCs were detected above screening criteria in two surface soil (0-1 ft) and one groundwater sample locations. SVOCs were also detected above screening criteria (with a J qualifier) in one sediment and surface water sample. Therefore, no inferences can be made regarding contaminant distribution in any of the media because of the low frequency of detection.

- Contaminants detected in surface soil (0-1 ft) above background and/or Region 9 residential PRG screening values included metals and one SVOC (Benzo(a)pyrene).
- In sediment, several metals were detected above background and/or Region 9 residential PRG screening values as well as one SVOC with a J qualifier (Benzo(a)pyrene) .
- In surface water, several metals were detected above background and/or Region 9 tap water PRG screening values as well as SVOCs (with a J qualifier) in one sample LNWsw-047-SW.
- In groundwater, several metals were detected above background and/or Region 9 tap water PRG screening values as well as one SVOC (Bis(2-ethylhexyl) phthalate).
- In subsurface soil (soil boring), silty clay with sand was in soil boring north of the access road to the site while the soil conditions south of the access road changed to clayey silt with sand. Towards the southeast extent of the site, moist sand was predominantly encountered. Landfill materials were encountered only in boring LNWsb066 at the south end of the landfill. The materials were encountered a depth of 3.0 to 4.0 ft bgs. Based upon this the boring was moved 20 feet due south into the woods line. At this location additional debris and disturbed soils were encountered at 2.0 and 3.0 ft bgs. The boring location was moved an additional 20 feet du south and the boring encountered undisturbed soils. This location was selected as LNWsb066.

6.2 HUMAN HEALTH RISK SCREENING

A Human Health Risk Screening (HHRS) was conducted to compare the concentrations detected in LNW samples to RVAAP-specific background values and USEPA Region 9 PRGs. This preliminary screen was conducted to identify potential COPCs. The COPCs identified are:

Table LNW-21			
Chemical of Potential Concern – All Media			
Soils	**Sediment**	**Surface Water**	**Groundwater**
Copper	Benzo(a)pyrene	Manganese	Arsenic
Iron	Benzo(g,h,i)perylene	Benzo(a)anthracene	Bis(2-ethylhexyl)phthalate
2-Methylnapthalene	Nitrocellulose	Benzo(a)pyrene	
Acenaphthylene		Benzo(b)fluoranthene	
Benzo(a)pyrene		Dibenzo(a,h)anthracene	
Benzo(g,h,i)perylene		Indeno(1,2,3-cd)pyrene	
Phenanthrene			
Nitrocellulose			

6.3 ECOLOGICAL RISK SCREENING

An ecological risk screening was performed to compare contaminant concentrations detected in LNW to RVAAP-specific background values and ecological screening values. The ecological risk screening was conducted as outlined in Volume 1, Section 5.2. The ecological risk screening identified COPECs for LNW. The following table summarizes those COPECs by media.

Table LNW-22				
Chemical of Potential Ecological Concern – All Media				
Soils		**Sediment**	**Surface Water**	**Groundwater**
Chromium	Mercury	Nitrocellulose	Manganese	Groundwater not
Copper	Beta-BHC		Mercury	evaluated for ERS
Iron	Benzoic acid		Benzo(a)anthracene	
Lead	Carbazole		Benzo(a)pyrene	
Silver	Dibenzofuran		Benzo(b)fluoranthene	
Zinc	Nitrocellulose		Benzo(k)fluoranthene	
			Chrysene	
			Dibenzo(a,h)anthracene	
			Indeno(1,2,3-cd)pyrene	

6.4 CONCLUSION

Based on the COPCs presented in Section 6.2 and the COPECs presented in Section 6.3, a full risk evaluation should be considered in the overall risk management decisions that are made for the LNW.

B C

LNWmw-025

A

LNWmw-024

LNWmw-026

A'

C'

B'

LNWmw-027

Legend

- Monitoring Well Locations
- Geologic Cross Section
- Vegetation
- Streams/Ditches/Surface Water
- Road
- 10 ft Contour Line
- 2 ft Contour Line

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Ravenna, Ohio

Figure LNW-1

Landfill North of WBG

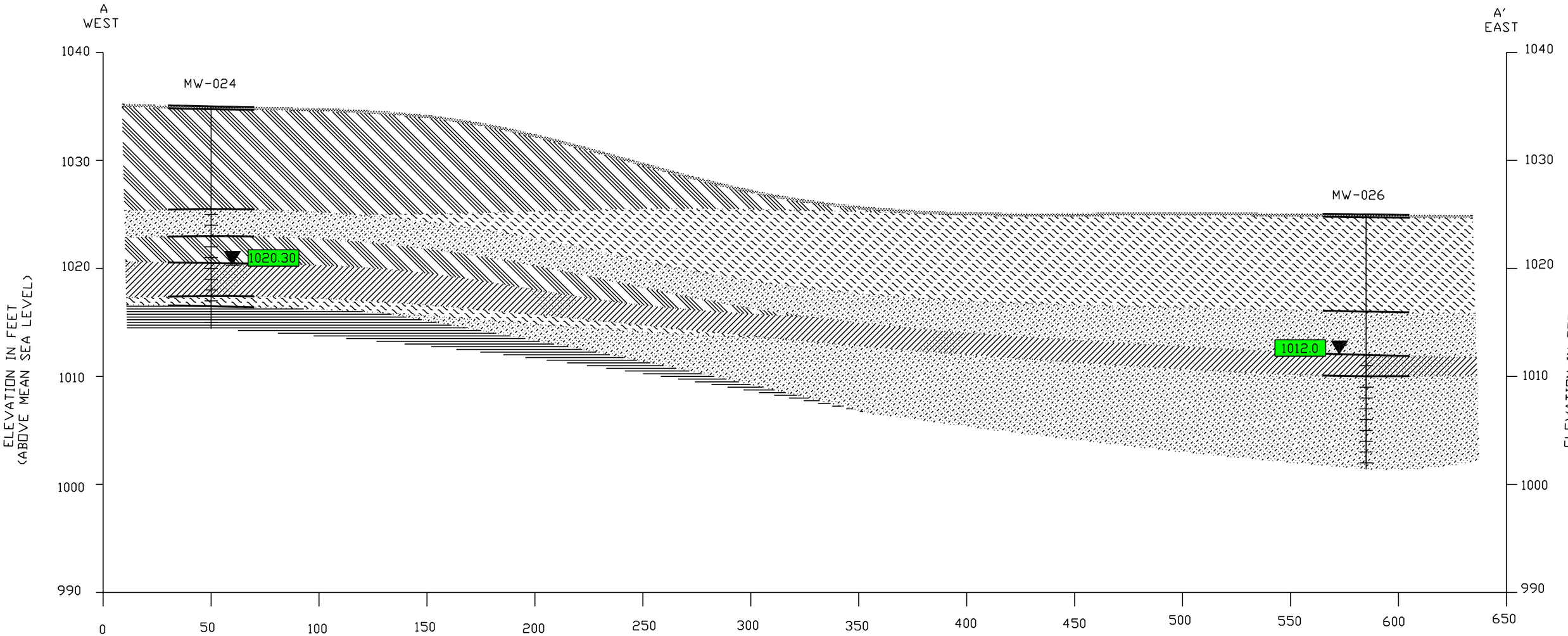
Geologic Cross Section

Characterization of 14 RVAAP AOCs

Drawn By:	Checked By:	Date Drawn:	Project No.:
ST	SL	03/30/05	04-02-0030

0 30 60 120 180 Feet

N W E S



CROSS SECTION A

HORIZONTAL 1"=50'
VERTICAL 1"=10'

VERTICAL EXAGGERATION = 10X

LEGEND

- TOP SOIL
- SANDY SILT
- SILTY CLAY
- DEPTH GROUNDWATER ENCOUNTERED
- SILTY SAND
- SAND STONE
- 1140.64 GROUNDWATER ELEVATION (ft)
- KNOWN SUBSURFACE SOIL CONDITIONS
- SHALE
- CLAYEY SILT
- SCREEN INTERVAL
- EXPECTED SUBSURFACE SOIL CONDITIONS

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
			05/25/06	MS

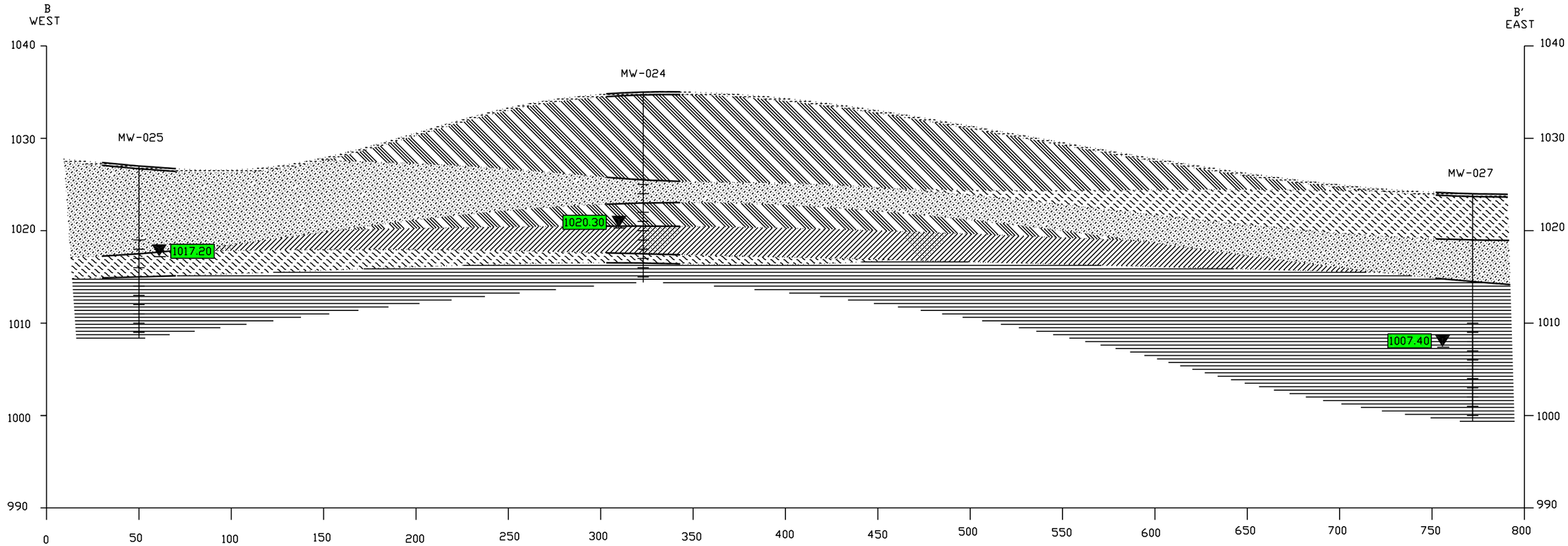
MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE LNW-2
LANDFILL NORTH OF WINKELPECK
GEOLOGIC CROSS SECTION A
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

SIZE	PROJECT NO.	DWG NO.	REV
D		LNW-2	

DRAWN BY	ST	APPR. BY	SRL



CROSS SECTION B

HORIZONTAL 1"=50'
VERTICAL 1"=10'

VERTICAL EXAGGERATION = 10X

LEGEND

- TOP SOIL
- SANDY SILT
- SILTY CLAY
- DEPTH GROUNDWATER ENCOUNTERED
- SILTY SAND
- SAND STONE
- 1140.64 GROUNDWATER ELEVATION (ft)
- KNOWN SUBSURFACE SOIL CONDITIONS
- SHALE
- CLAYEY SILT
- SCREEN INTERVAL
- EXPECTED SUBSURFACE SOIL CONDITIONS

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
			05/25/06	MS

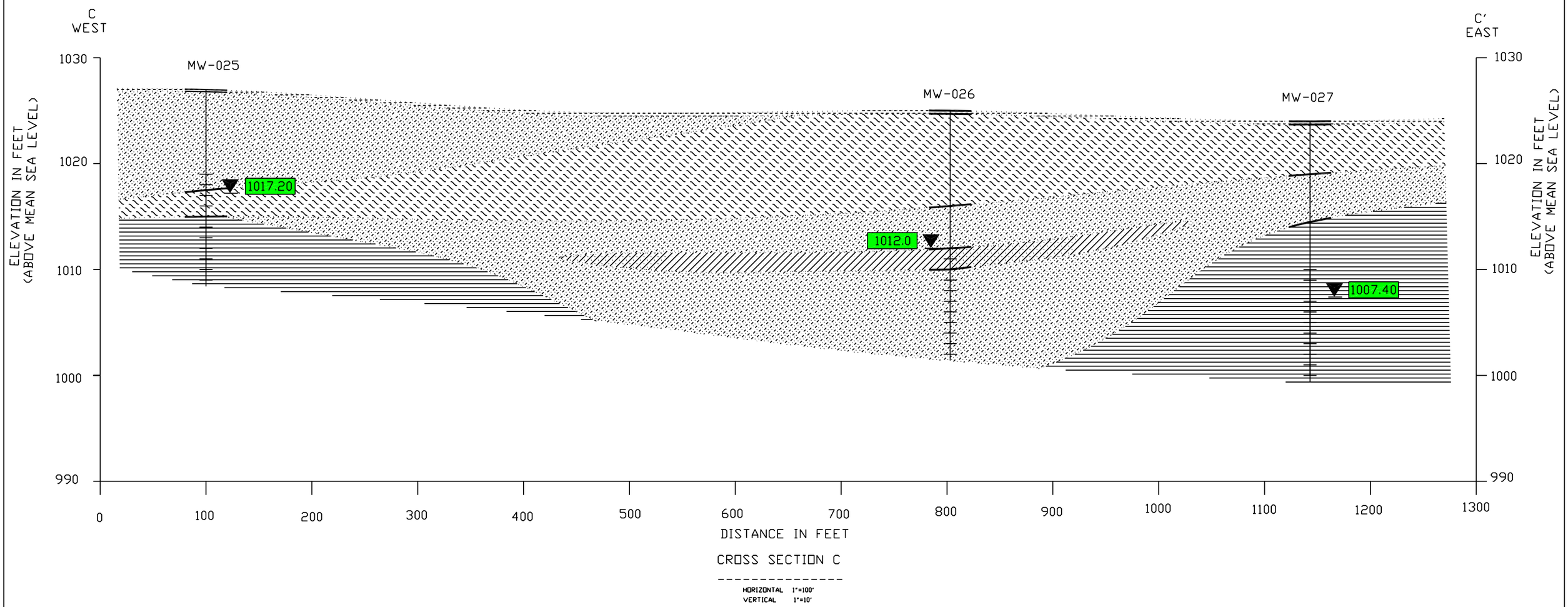
MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE LNW-3
LANDFILL NORTH OF WINKELPECK
GEOLOGIC CROSS SECTION B
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

SIZE	PROJECT NO.	DWG NO.	REV
D		LNW-3	

DRAWN BY	ST	APPR. BY	SRL



CROSS SECTION C

HORIZONTAL 1"=100'
VERTICAL 1"=10'

VERTICAL EXAGGERATION = 10X

LEGEND

- TOP SOIL
- SANDY SILT
- SILTY CLAY
- DEPTH GROUNDWATER ENCOUNTERED
- SILTY SAND
- SAND STONE
- 1140.64 GROUNDWATER ELEVATION (ft)
- KNOWN SUBSURFACE SOIL CONDITIONS
- SHALE
- CLAYEY SILT
- SCREEN INTERVAL
- EXPECTED SUBSURFACE SOIL CONDITIONS

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED
			05/25/06	MS

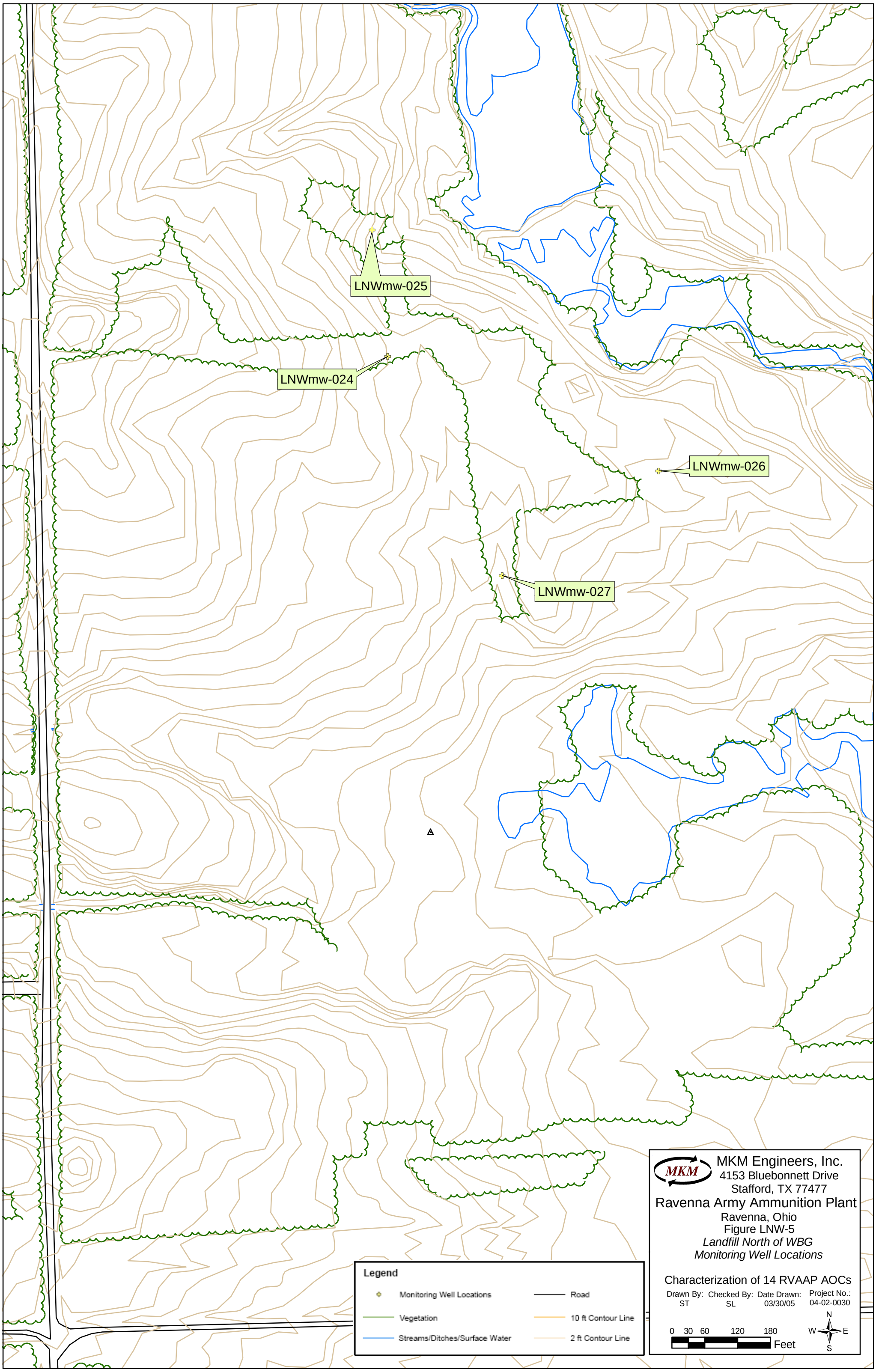
MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE LNW-4
LANDFILL NORTH OF WINKELPECK
GEOLOGIC CROSS SECTION C
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

SIZE	PROJECT NO.	DWG NO.	REV
D		LNW-4	

DRAWN BY	ST	APPR. BY	SRL


LNWmw-025
LNWmw-024
LNWmw-026
LNWmw-027
Legend
Monitoring Well Locations
Road
Vegetation
10 ft Contour Line
Streams/Ditches/Surface Water
2 ft Contour Line
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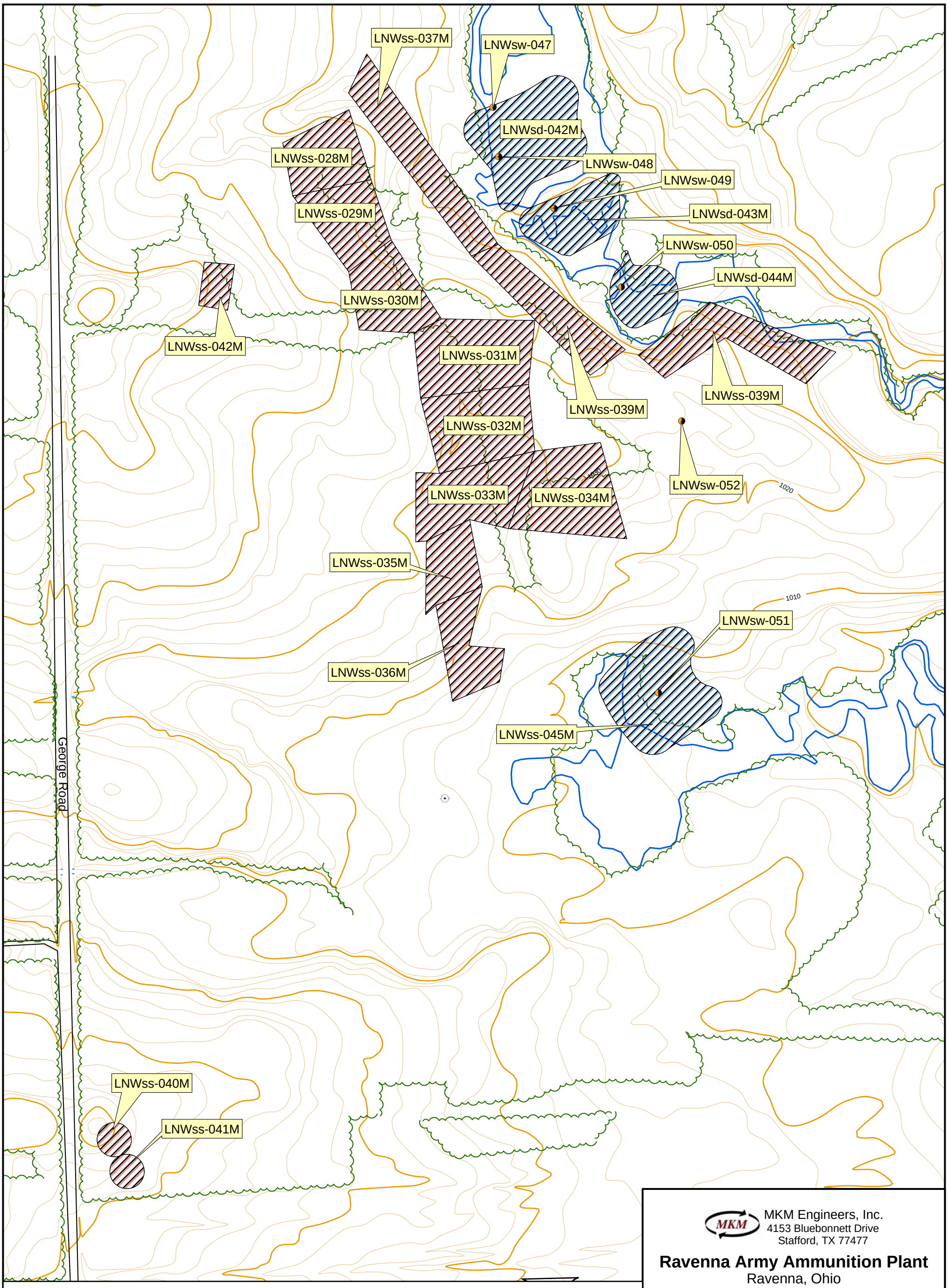
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure LNW-5
Landfill North of WBG
Monitoring Well Locations
Characterization of 14 RVAAP AOCs
Drawn By: ST
Checked By: SL
Date Drawn: 03/30/05
Project No.: 04-02-0030
0 30 60 120 180
Feet
N
W
E
S



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Ravenna, Ohio

Figure LNW-6

Landfill North of Winkelpeck Burning Grounds
Soil Sampling Locations

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

LNWsb-053
LNWsb-054
LNWsb-055
LNWsb-056
LNWsb-057
LNWsb-058
LNWsb-059
LNWsb-060
LNWsb-061
LNWsb-062
LNWsb-063
LNWsb-064
LNWsb-065
LNWsb-066
LNWsb-067
LNWsb-068
LNWsb-069
1030

Legend

- Vegetation
- Streams/Ditches Surface Water
- 10 ft Contour Lines
- 2 ft Contour Lines
- Steam Line Post
- Geoprobe Location

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Ravenna, Ohio

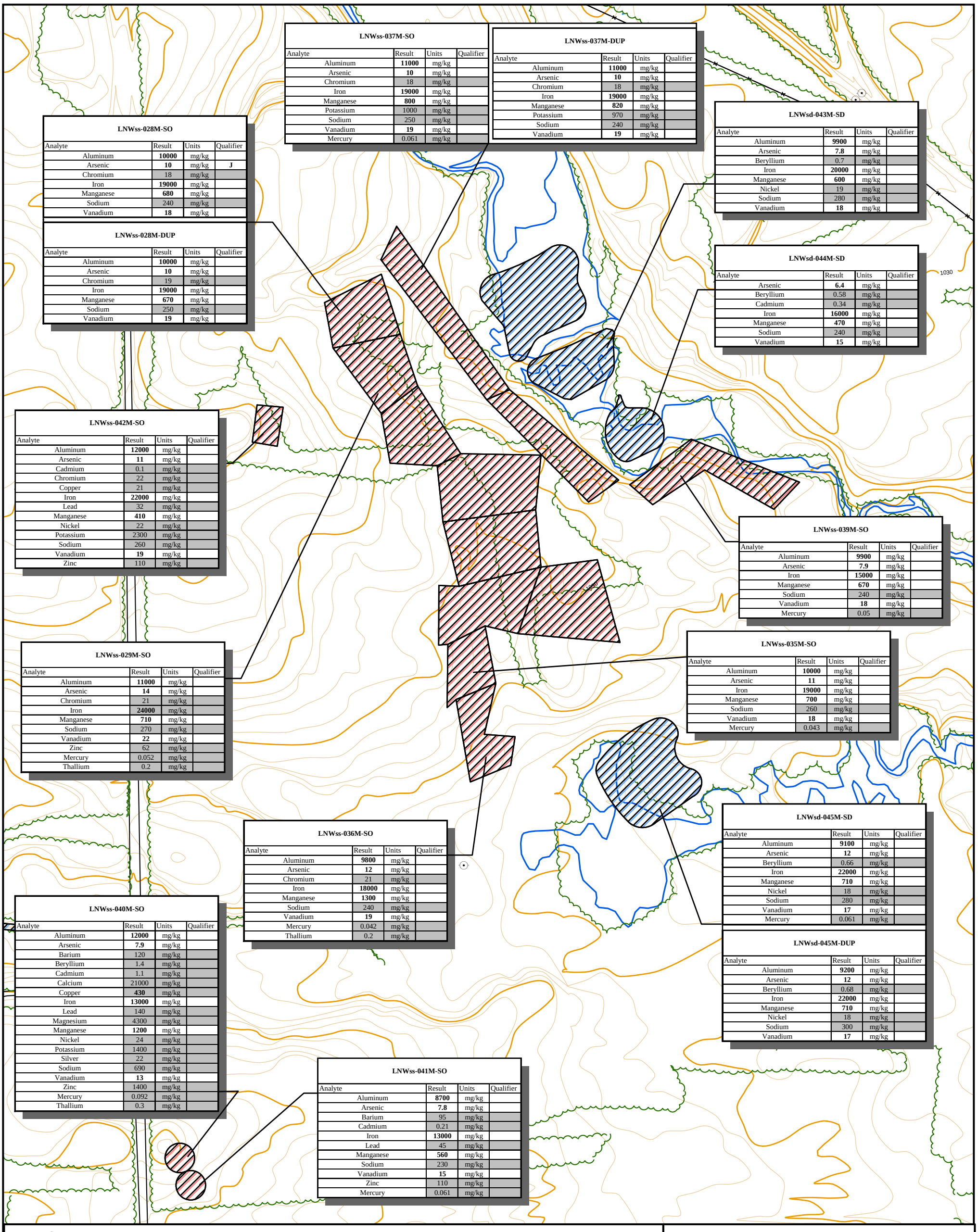
Figure LNW-7

Landfill North of Winkelpeck Burning Grounds
Geo-probe Sampling Locations

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 50 100 200 Feet

N W E S



LNWss-028M-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**10**	mg/kg	**J**
Chromium	18	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**680**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**18**	mg/kg	

LNWss-028M-DUP

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**10**	mg/kg	
Chromium	19	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**670**	mg/kg	
Sodium	250	mg/kg	
Vanadium	**19**	mg/kg	

LNWss-037M-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**10**	mg/kg	
Chromium	18	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**800**	mg/kg	
Potassium	1000	mg/kg	
Sodium	250	mg/kg	
Vanadium	**19**	mg/kg	
Mercury	0.061	mg/kg	

LNWss-037M-DUP

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**10**	mg/kg	
Chromium	18	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**820**	mg/kg	
Potassium	970	mg/kg	
Sodium	240	mg/kg	
Vanadium	**19**	mg/kg	

LNWsd-043M-SD

Analyte	Result	Units	Qualifier
Aluminum	**9900**	mg/kg	
Arsenic	**7.8**	mg/kg	
Beryllium	0.7	mg/kg	
Iron	**20000**	mg/kg	
Manganese	**600**	mg/kg	
Nickel	19	mg/kg	
Sodium	280	mg/kg	
Vanadium	**18**	mg/kg	

LNWsd-044M-SD

Analyte	Result	Units	Qualifier
Arsenic	**6.4**	mg/kg	
Beryllium	0.58	mg/kg	
Cadmium	0.34	mg/kg	
Iron	**16000**	mg/kg	
Manganese	**470**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**15**	mg/kg	

LNWss-042M-SO

Analyte	Result	Units	Qualifier
Aluminum	**12000**	mg/kg	
Arsenic	**11**	mg/kg	
Cadmium	0.1	mg/kg	
Chromium	22	mg/kg	
Copper	21	mg/kg	
Iron	**22000**	mg/kg	
Lead	32	mg/kg	
Manganese	**410**	mg/kg	
Nickel	22	mg/kg	
Potassium	2300	mg/kg	
Sodium	260	mg/kg	
Vanadium	**19**	mg/kg	
Zinc	110	mg/kg	

LNWss-039M-SO

Analyte	Result	Units	Qualifier
Aluminum	**9900**	mg/kg	
Arsenic	**7.9**	mg/kg	
Iron	**15000**	mg/kg	
Manganese	**670**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**18**	mg/kg	
Mercury	0.05	mg/kg	

LNWss-029M-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**14**	mg/kg	
Chromium	21	mg/kg	
Iron	**24000**	mg/kg	
Manganese	**710**	mg/kg	
Sodium	270	mg/kg	
Vanadium	**22**	mg/kg	
Zinc	62	mg/kg	
Mercury	0.052	mg/kg	
Thallium	0.2	mg/kg	

LNWss-035M-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**11**	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**700**	mg/kg	
Sodium	260	mg/kg	
Vanadium	**18**	mg/kg	
Mercury	0.043	mg/kg	

LNWss-036M-SO

Analyte	Result	Units	Qualifier
Aluminum	**9800**	mg/kg	
Arsenic	**12**	mg/kg	
Chromium	21	mg/kg	
Iron	**18000**	mg/kg	
Manganese	**1300**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**19**	mg/kg	
Mercury	0.042	mg/kg	
Thallium	0.2	mg/kg	

LNWsd-045M-SD

Analyte	Result	Units	Qualifier
Aluminum	**9100**	mg/kg	
Arsenic	**12**	mg/kg	
Beryllium	0.66	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**710**	mg/kg	
Nickel	18	mg/kg	
Sodium	280	mg/kg	
Vanadium	**17**	mg/kg	
Mercury	0.061	mg/kg	

LNWsd-045M-DUP

Analyte	Result	Units	Qualifier
Aluminum	**9200**	mg/kg	
Arsenic	**12**	mg/kg	
Beryllium	0.68	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**710**	mg/kg	
Nickel	18	mg/kg	
Sodium	300	mg/kg	
Vanadium	**17**	mg/kg	

LNWss-040M-SO

Analyte	Result	Units	Qualifier
Aluminum	**12000**	mg/kg	
Arsenic	**7.9**	mg/kg	
Barium	120	mg/kg	
Beryllium	1.4	mg/kg	
Cadmium	1.1	mg/kg	
Calcium	21000	mg/kg	
Copper	**430**	mg/kg	
Iron	**13000**	mg/kg	
Lead	140	mg/kg	
Magnesium	4300	mg/kg	
Manganese	**1200**	mg/kg	
Nickel	24	mg/kg	
Potassium	1400	mg/kg	
Silver	22	mg/kg	
Sodium	690	mg/kg	
Vanadium	**13**	mg/kg	
Zinc	1400	mg/kg	
Mercury	0.092	mg/kg	
Thallium	0.3	mg/kg	

LNWss-041M-SO

Analyte	Result	Units	Qualifier
Aluminum	**8700**	mg/kg	
Arsenic	**7.8**	mg/kg	
Barium	95	mg/kg	
Cadmium	0.21	mg/kg	
Iron	**13000**	mg/kg	
Lead	45	mg/kg	
Manganese	**560**	mg/kg	
Sodium	230	mg/kg	
Vanadium	**15**	mg/kg	
Zinc	110	mg/kg	
Mercury	0.061	mg/kg	

Legend

- Vegetation
- 10 ft Contour Lines
- Surface Soil (0-1 ft) Multi-increment Sample Location
- Streams/Ditches/ Surface Water
- 2 ft Contour Lines
- Sediment Multi-increment Sample Location
- Road
- Steam Line Post

Notes:

J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
mg / kg - Milligrams per Kilogram (parts per million - ppm)

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Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-8A

Landfill North of Winkelpeck Burning Grounds
Soil and Sediment Sample Location
Exceedences-Inorganics

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 100 200 400 Feet

N W E S

LNWss-030M-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**13**	mg/kg	
Chromium	23	mg/kg	
Iron	**23000**	mg/kg	
Manganese	**590**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**21**	mg/kg	
Mercury	0.052	mg/kg	

LNWss-031M-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**12**	mg/kg	
Chromium	21	mg/kg	
Iron	**21000**	mg/kg	
Manganese	**840**	mg/kg	
Sodium	270	mg/kg	
Vanadium	**19**	mg/kg	
Zinc	66	mg/kg	
Thallium	0.27	mg/kg	

LNWss-031M-QA

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**11**	mg/kg	
Chromium	20	mg/kg	
Iron	**21000**	mg/kg	
Manganese	**940**	mg/kg	
Sodium	270	mg/kg	
Vanadium	**20**	mg/kg	
Zinc	68	mg/kg	

LNWss-032M-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**11**	mg/kg	
Chromium	26	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**580**	mg/kg	
Sodium	250	mg/kg	
Vanadium	**21**	mg/kg	
Zinc	62	mg/kg	
Thallium	0.23	mg/kg	

LNWss-033M-SO

Analyte	Result	Units	Qualifier
Aluminum	**9900**	mg/kg	
Arsenic	**12**	mg/kg	
Chromium	25	mg/kg	
Iron	**21000**	mg/kg	
Manganese	**650**	mg/kg	
Sodium	200	mg/kg	
Vanadium	**20**	mg/kg	

LNWss-034M-SO

Analyte	Result	Units	Qualifier
Aluminum	**8500**	mg/kg	
Arsenic	**8.8**	mg/kg	
Chromium	18	mg/kg	
Iron	**16000**	mg/kg	
Manganese	**320**	mg/kg	
Sodium	200	mg/kg	
Vanadium	**15**	mg/kg	

LNWss-038M-SO

Analyte	Result	Units	Qualifier
Aluminum	**8100**	mg/kg	
Arsenic	**9.1**	mg/kg	
Chromium	18	mg/kg	
Iron	**17000**	mg/kg	
Manganese	**370**	mg/kg	
Sodium	210	mg/kg	
Vanadium	**14**	mg/kg	
Zinc	64	mg/kg	
Mercury	0.046	mg/kg	
Thallium	0.23	mg/kg	

1040
1030
1020
1010

Legend

- Vegetation
- Streams/Ditches/ Surface Water
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Steam Line Post
- Surface Soil (0-1 ft) Multi-increment Sample Location
- Sediment Multi-increment Sample Location

Notes:

If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
mg / kg - Milligrams per Kilogram (parts per million - ppm)

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Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-8B

Landfill North of Winkelpeck Burning Grounds
Soil and Sediment Sample Location
Exceedences-Inorganics

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 100 200 400 Feet

N W E S

LNWsd-044M-SD

Analyte	Result	Units	Qualifier
Benzo(a)pyrene	**0.064**	mg/kg	**J**

LNWss-040M-SO

Analyte	Result	Units	Qualifier
Benzo(a)pyrene	0.1	mg/kg	

Legend

- Vegetation
- Streams/Ditches/ Surface Water
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Steam Line Post
- Surface Soil (0-1 ft) Multi-increment Sample Location
- Sediment Multi-increment Sample Location

Notes:

J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
mg / kg - milligrams per kilogram (parts per million - ppm)

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Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-9

Landfill North of Winkelpeck Burning Grounds
Soil and Sediment Sample Location
Exceedences-Organics

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 100 200 400 Feet

N W E S

LNWsb-053-SO

Analyte	Result	Units	Qualifier
Aluminum	**12000**	mg/kg	
Arsenic	**13**	mg/kg	
Iron	**25000**	mg/kg	
Manganese	**490**	mg/kg	
Sodium	410	mg/kg	
Vanadium	**18**	mg/kg	

LNWsb-054-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**13**	mg/kg	
Iron	**26000**	mg/kg	
Manganese	**380**	mg/kg	
Vanadium	**18**	mg/kg	

LNWsb-055-SO

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**10**	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**300**	mg/kg	
Vanadium	**16**	mg/kg	

LNWsb-056-DUP

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**14**	mg/kg	
Beryllium	0.93	mg/kg	
Cadmium	0.2	mg/kg	
Iron	**26000**	mg/kg	
Manganese	**420**	mg/kg	
Vanadium	**17**	mg/kg	

LNWsb-056-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**13**	mg/kg	
Cadmium	0.11	mg/kg	
Iron	**25000**	mg/kg	
Manganese	**360**	mg/kg	
Vanadium	**17**	mg/kg	

LNWsb-057-SO

Analyte	Result	Units	Qualifier
Aluminum	**9800**	mg/kg	
Arsenic	**15**	mg/kg	
Cadmium	0.15	mg/kg	
Iron	**28000**	mg/kg	
Manganese	**390**	mg/kg	
Vanadium	**17**	mg/kg	

LNWsb-058-SO

Analyte	Result	Units	Qualifier
Aluminum	**8800**	mg/kg	
Arsenic	**11**	mg/kg	
Iron	**23000**	mg/kg	
Manganese	**280**	mg/kg	
Vanadium	**15**	mg/kg	

LNWsb-059-SO

Analyte	Result	Units	Qualifier
Arsenic	**12**	mg/kg	
Iron	**20000**	mg/kg	
Manganese	**320**	mg/kg	
Sodium	320	mg/kg	
Vanadium	**13**	mg/kg	

LNWsb-060-SO

Analyte	Result	Units	Qualifier
Aluminum	**9600**	mg/kg	
Arsenic	**12**	mg/kg	
Iron	**23000**	mg/kg	
Manganese	**220**	mg/kg	
Sodium	360	mg/kg	
Vanadium	**16**	mg/kg	

LNWsb-061-SO

Analyte	Result	Units	Qualifier
Aluminum	**8100**	mg/kg	
Arsenic	**12**	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**350**	mg/kg	
Sodium	320	mg/kg	
Vanadium	**14**	mg/kg	

LNWsb-062-SO

Analyte	Result	Units	Qualifier
Arsenic	**3.7**	mg/kg	
Iron	**14000**	mg/kg	
Sodium	280	mg/kg	
Vanadium	**10**	mg/kg	

LNWsb-063-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**13**	mg/kg	
Iron	**25000**	mg/kg	
Manganese	**520**	mg/kg	
Sodium	370	mg/kg	
Vanadium	**18**	mg/kg	

LNWsb-064-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**17**	mg/kg	
Iron	**26000**	mg/kg	
Manganese	**330**	mg/kg	
Sodium	370	mg/kg	
Vanadium	**18**	mg/kg	

LNWsb-064-DUP

Analyte	Result	Units	Qualifier
Aluminum	**11000**	mg/kg	
Arsenic	**11**	mg/kg	
Iron	**28000**	mg/kg	
Manganese	**540**	mg/kg	
Sodium	390	mg/kg	
Vanadium	**18**	mg/kg	

LNWsb-065-SO

Analyte	Result	Units	Qualifier
Aluminum	**9300**	mg/kg	
Arsenic	**10**	mg/kg	
Iron	**19000**	mg/kg	
Manganese	**400**	mg/kg	
Sodium	360	mg/kg	
Vanadium	**17**	mg/kg	

LNWsb-066-SO

Analyte	Result	Units	Qualifier
Aluminum	**10000**	mg/kg	
Arsenic	**14**	mg/kg	
Iron	**25000**	mg/kg	
Manganese	**400**	mg/kg	
Sodium	340	mg/kg	
Vanadium	**16**	mg/kg	

LNWsb-067-SO

Analyte	Result	Units	Qualifier
Arsenic	**9.6**	mg/kg	
Iron	**18000**	mg/kg	
Sodium	240	mg/kg	
Vanadium	**9.9**	mg/kg	

LNWsb-068-SO

Analyte	Result	Units	Qualifier
Arsenic	**10**	mg/kg	**J**
Iron	**17000**	mg/kg	**J**
Manganese	**380**	mg/kg	**J**
Sodium	250	mg/kg	
Vanadium	**13**	mg/kg	

LNWsb-069-SO

Analyte	Result	Units	Qualifier
Arsenic	**13**	mg/kg	
Iron	**22000**	mg/kg	
Manganese	**260**	mg/kg	
Sodium	350	mg/kg	
Vanadium	**11**	mg/kg	

1040

1030

1000

George Road

Legend

Vegetation

Road

10 ft Contour Lines

Subsurface Soil (>1 ft) Sample Location

Streams/Ditches/ Surface Water

Steam Line Post

2 ft Contour Lines

Notes:

J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
mg/kg - milligrams per Kilogram (parts per million - ppm)

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Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

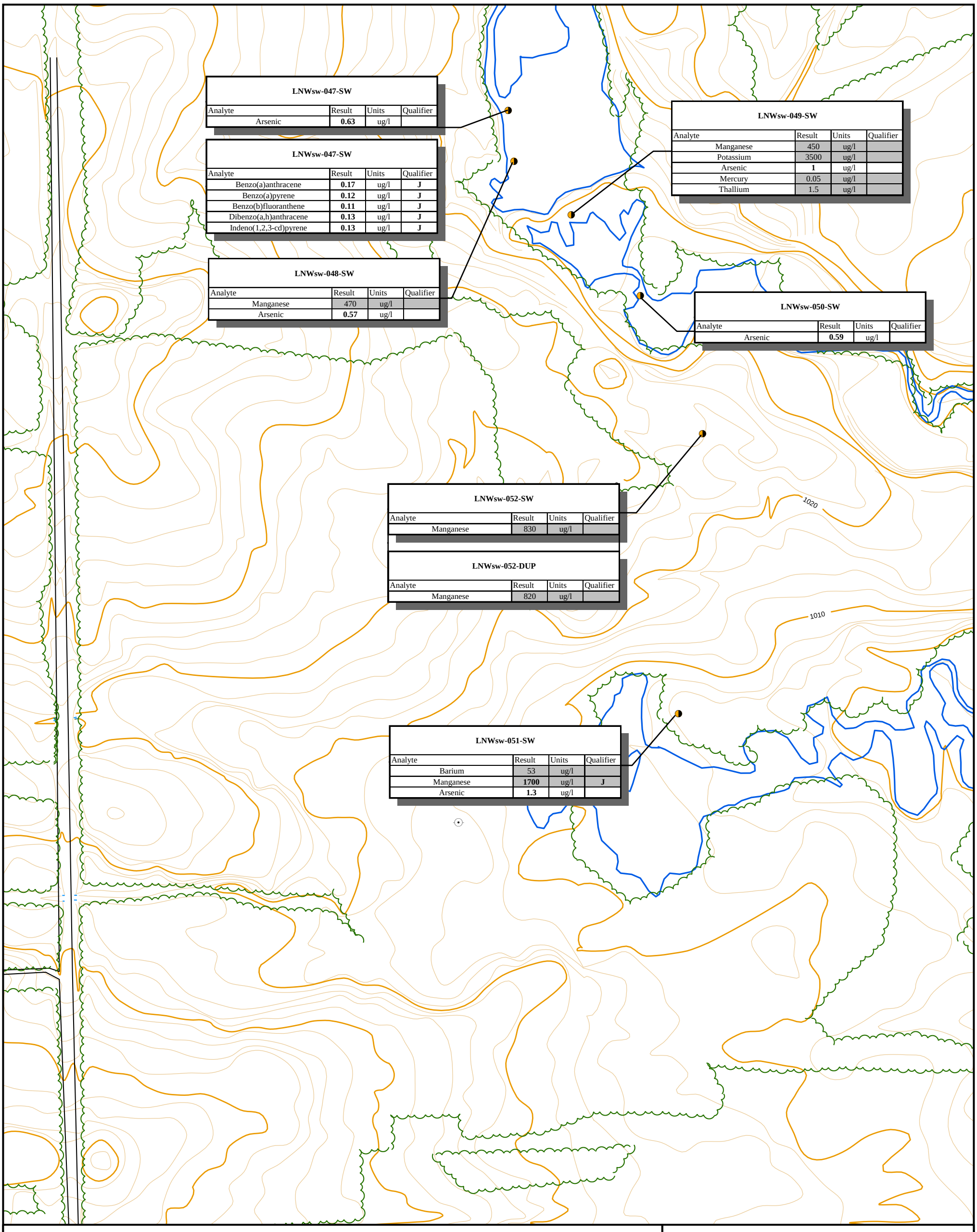
Figure LNW-10

Landfill North of Winkelpeck Burning Grounds Subsurface Soil (>1 ft) Sample Location Exceedences

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 100 200 400 Feet

N W E S



LNWsw-047-SW

Analyte	Result	Units	Qualifier
Arsenic	**0.63**	ug/l	

LNWsw-047-SW

Analyte	Result	Units	Qualifier
Benzo(a)anthracene	**0.17**	ug/l	**J**
Benzo(a)pyrene	**0.12**	ug/l	**J**
Benzo(b)fluoranthene	**0.11**	ug/l	**J**
Dibenzo(a,h)anthracene	**0.13**	ug/l	**J**
Indeno(1,2,3-cd)pyrene	**0.13**	ug/l	**J**

LNWsw-048-SW

Analyte	Result	Units	Qualifier
Manganese	470	ug/l	
Arsenic	**0.57**	ug/l	

LNWsw-049-SW

Analyte	Result	Units	Qualifier
Manganese	450	ug/l	
Potassium	3500	ug/l	
Arsenic	**1**	ug/l	
Mercury	0.05	ug/l	
Thallium	1.5	ug/l	

LNWsw-050-SW

Analyte	Result	Units	Qualifier
Arsenic	**0.59**	ug/l	

LNWsw-052-SW

Analyte	Result	Units	Qualifier
Manganese	830	ug/l	

LNWsw-052-DUP

Analyte	Result	Units	Qualifier
Manganese	820	ug/l	

LNWsw-051-SW

Analyte	Result	Units	Qualifier
Barium	53	ug/l	
Manganese	**1700**	ug/l	**J**
Arsenic	**1.3**	ug/l	

Legend

- Vegetation
- 10 ft Contour Lines
- Road
- Steam Line Post
- Stream/Ditches/ Surface Water
- 2 ft Contour Lines
- Surface Water Sampling Locations

Notes:

J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
Ug/L - Micrograms per Liter (parts per billion - ppb)

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Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-11
Landfill North of Winkelpeck Burning Grounds
Surface Water Sampling Location Exceedence

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-20-0030

0 75 150 300 Feet

N W E S

LNWmw-025-GW

Analyte	Result	Units	Qualifier
Manganese	**990**	ug/l	
Arsenic	**6.5**	ug/l	

LNWmw-025-GW

Analyte	Result	Units	Qualifier
Bis(2-ethylhexyl) phthalate	**15**	ug/l	

LNWmw-026-GW

Analyte	Result	Units	Qualifier
Barium	97	ug/l	
Cadmium	0.26	ug/l	
Iron	380	ug/l	
Nickel	1.4	ug/l	
Potassium	3600	ug/l	
Arsenic	**0.91**	ug/l	
Lead	1	ug/l	

LNWmw-026-DUP

Analyte	Result	Units	Qualifier
Barium	110	ug/l	
Cobalt	0.81	ug/l	
Iron	3400	ug/l	
Nickel	3.6	ug/l	
Potassium	3900	ug/l	
Vanadium	3.6	ug/l	
Arsenic	**1.5**	ug/l	
Lead	1.6	ug/l	

LNWmw-024-GW

Analyte	Result	Units	Qualifier
Calcium	85000	ug/l	
Magnesium	32000	ug/l	
Vanadium	1.6	ug/l	
Thallium	2	ug/l	

LNWmw-027-GW

Analyte	Result	Units	Qualifier
Calcium	63000	ug/l	
Magnesium	18000	ug/l	
Potassium	7000	ug/l	
Arsenic	**0.89**	ug/l	

1040
1030
1020
1010

Legend

- Vegetation
- Streams/Ditches/ Surface Water
- Road
- Steam Line Post
- 10 ft Contour Lines
- 2 ft Contour Lines
- Monitoring Well Locations
- Existing Monitoring Well Locations

Notes:

If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style.
Result < PRG & Background, then the value is presented with a normal style.
ug/L - Micrograms per Liter (parts per billion - ppb)

MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-12

Landfill North of Winkelpeck Burning Grounds Groundwater Sample Location Exceedences

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MGS	15 July 06	04-02-0030

0 75 150 300 Feet

N W E S

LNWmw-025
1024.92

LNWmw-024
1027.32

LNWmw-026
1023.93

LNWmw-027
1020.58

1040
1030
1020
1010

1025
1024
1026
1027
1023
1022
1021
1020

Legend

- Monitoring Well Locations
- Potentiometric Surface
- Potentiometric Surface (Inferred)
- Direction of GW Flow
- Streams/Ditches/Surface Water
- Vegetation
- Road
- 10 ft Contour Line
- 2 ft Contour Line

Mapping Provided By: ARCADIS

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4153 Bluebonnett Drive
Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-13

Landfill North of Winkelpeck Burning Grounds

Potentiometric Suface Map A
(February 2005)

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MAL	30 June 05	04-09-0020

0 75 150 300 Feet

N W E S

LNWmw-025
1025.38

LNWmw-024
1028.20

LNWmw-026
1024.40

LNWmw-027
1021.68

1040
1030
1020
1010
1025
1026
1027
1028
1028
1027
1026
1025
1024
1023
1022
1024
1023
1022

Legend

- Monitoring Well Locations
- Potentiometric Surface
- Direction of GW Flow
- Streams/Ditches/Surface Water
- Vegetation
- Road
- 10 ft Contour Line
- 2 ft Contour Line

Mapping Provided By: ARCADIS

MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477

Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure LNW-14

Landfill North of Winkelpeck Burning Grounds

Potentiometric Suface Map B
(March 2005)

Drawn By:	Checked By:	Date Drawn:	Project No.:
R. Haverkos	MAL	30 June 05	04-09-0020

0 75 150 300 Feet

N W E S

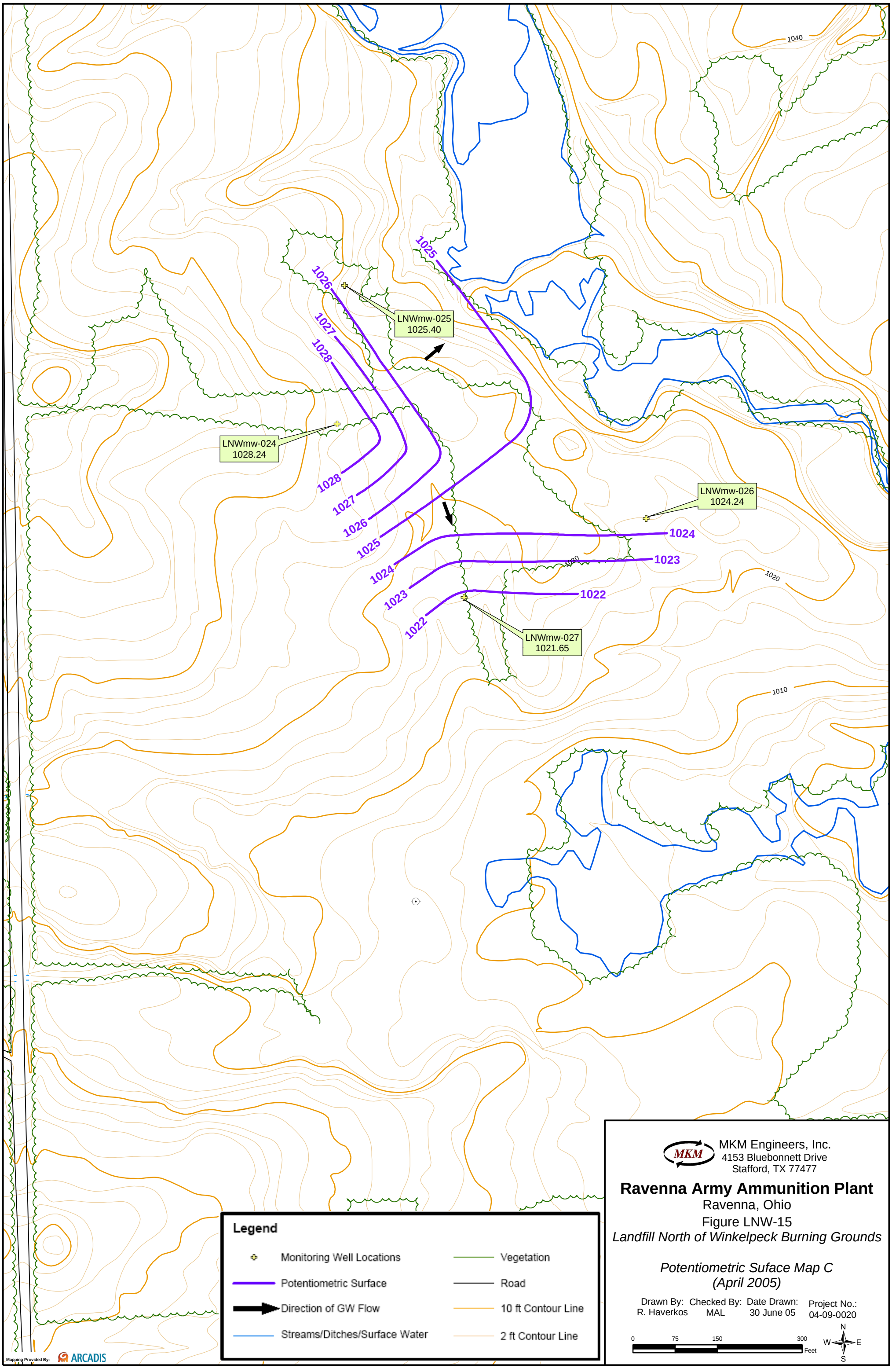
1040
1025
1026
1027
1028
LNWmw-025
1025.40
LNWmw-024
1028.24
1028
1027
1026
1025
1024
1023
1022
LNWmw-026
1024.24
1024
1023
1090
1020
1022
LNWmw-027
1021.65
1010
Legend
Monitoring Well Locations
Potentiometric Surface
Direction of GW Flow
Streams/Ditches/Surface Water
Vegetation
Road
10 ft Contour Line
2 ft Contour Line
Mapping Provided By:
ARCADIS
MKM
MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure LNW-15
Landfill North of Winkelpeck Burning Grounds
Potentiometric Suface Map C
(April 2005)
Drawn By: R. Haverkos
Checked By: MAL
Date Drawn: 30 June 05
Project No.: 04-09-0020
0
75
150
300
Feet
N
W
E
S

Table LNW-1
Landfill North of Winklepeck Summary of Sampling and Analysis
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

SAMPLE PREFIX																FIELD QA/QC SAMPLES					
LNW	SAMPLE ID	VOC 8260B	SVOC 8270C	Explosives 8330	Propellants 3532/8330	TAL Metals 6010/7000	Chrome +6 7196A	Pesticides 8081A	PCB 8082B	Cyanides 9010A/9012A	Nitrate EPA 353.2	TOC EPA 415.1	Geo-Tech Analysis (Various)	Grain Size ASTM D422	Multi-Incremental QA	Duplicate Sample	Equipment Blank	Trip Blank	MS/MSD	USACE Split
MULTI-INCREMENTAL SOILS																				
Surface Soils	SS-028M		1	1		1										1			1	1
	SS-029M		1	1		1														
	SS-030M	1 - same jar	1	1		1														
	SS-031M		1	1		1									1					
	SS-032M		1	1		1														
	SS-033M		1	1		1														
	SS-034M	1	1	1	1	1		1	1											
	SS-035M		1	1		1														
	SS-036M		1	1		1														
Creek Bank	SS-037M		1	1		1										1				1
	SS-038M		1	1		1														
	SS-039M	1	1	1	1	1		1	1											
Tracer Burn Furnace	SS-040M		1	1		1														
	SS-041M		1	1		1														
Old Barn	SS-042M		1	1		1														
		2	15	15	2	15	0	2	2	0	0	0	0	0	1	2	0	0	1	2
GEO-PROBE																				
25' - Outside LF	SB-053		1	1		1														
	SB-054		1	1		1														
	SB-055		1	1		1														
	SB-056		1	1		1										1				1
	SB-057		1	1		1														
	SB-058		1	1		1														
	SB-059		1	1		1														
	SB-060		1	1		1														
	SB-061		1	1		1														
	SB-062		1	1		1														
	SB-063		1	1		1														
	SB-064		1	1		1										1				1
	SB-065		1	1		1														
	SB-066		1	1		1														
	SB-067		1	1		1														
	SB-068		1	1		1														
	SB-069		1	1		1														
		0	17	17	0	17	0	0	0	0	0	0	0	0	0	1	0	0	0	0
GROUNDWATER	MW-024	1	1	1	1	1		1	1				1	1			1			
	MW-025	1	1	1	1	1		1	1				1	1						
	MW-026	1	1	1	1	1		1	1							1			1	1
	MW-027	1	1	1	1	1		1	1											
		4	4	4	4	4	0	4	4	0	0	0	2	2	0	1	1	0	1	1
SURFACE WATER	SW-047	1	1	1	1	1		1	1											
Pond/Wet Ditch/Spring	SW-048	1	1	1	1	1		1	1											
	SW-049	1	1	1	1	1		1	1											
	SW-050	1	1	1	1	1		1	1											
	SW-051	1	1	1	1	1		1	1											
Contingency	SW-052	1	1	1	1	1		1	1							1				1
		6	6	6	6	6	0	6	6	0	0	0	0	0	0	1	0	0	0	0
SEDIMENT	SD-043M		1	1		1						1		1						
Pond/Wet Ditch/Spring	SD-044M	1	1	1	1	1		1	1			1		1						
	SD-045M		1	1		1						1		1		1				1
	SD-046M		1	1		1						1		1						
		1	4	4	1	4	0	1	1	0	0	4	0	4	0	1	0	0	0	1

Notes:
Blank cell indicates that either the sample was not analyzed for that compound and/or the sample did not have a QC or Split sample associated with the regular sample.
Grainsize and TOC are taken at "all major drainageway" sediments
All shelby tubes taken during MW installatinons will have full geo-tech and grainsize analyses

Table LNW-2
Landfill North of Winklepeck Burning Grounds Summary of Surface Soil (0-1 ft) Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units															
Metals	6010B	Aluminum	7614 nc	17700	mg/kg	**10000**	**10000**	**11000**	**11000**	**10000**	**10000**	**11000**	**9900**		**8500**	**10000**	**9800**	**11000**	**11000**	**8100**
	6010B	Arsenic	0.39 ca	15.4	mg/kg	**10**	**10 J**	**14**	**13**	**11**	**12**	**11**	**12**		**8.8**	**11**	**12**	**10**	**10**	**9.1**
	6010B	Barium	538 nc	88.4	mg/kg	62	61	72	59	69	65	70	58		42	55	76	67	66	41
	6010B	Beryllium	15 nc	0.88	mg/kg	0.63	0.6	0.72	0.7	0.72	0.72	0.71	0.67		0.48	0.66	0.69	0.62	0.63	0.48
	6010B	Cadmium	3.7 nc	0.00	mg/kg															
	6010B	Calcium	--[n]	15800	mg/kg	410	400	1100	1700	1400	2000	1300	580		600	260	530	800	790	760
	6010B	Chromium	30 ca	17.4	mg/kg	19	18	21	23	20	21	26	25		18	17	21	18	18	18
	6010B	Cobalt	30 ca	10.4	mg/kg	8.9	8.9	10	9.2	9.9	9.7	8.5	9.2		6	9.3	9.3	9.2	10	6.5
	6010B	Copper	313 nc	17.7	mg/kg	11	11	16	14	16	17	17	13		14	12	10	14	14	17
	6010B	Iron	2346 nc	23100	mg/kg	**19000**	**19000**	**24000**	**23000**	**21000**	**21000**	**22000**	**21000**		**16000**	**19000**	**18000**	**19000**	**19000**	**17000**
	6010B	Lead	400 pbk	26.1	mg/kg	17	17	18	17	18	19	15	17		13	19	18	19	19	17
	6010B	Magnesium	--[n]	3030	mg/kg	1900	1900 J	2400	2400	2100	2300	2200	1900		1600	1700	1500	2100	2100	1800
	6010B	Manganese	176 nc	1450	mg/kg	**670**	**680**	**710**	**590**	**940**	**840**	**580**	**650**		**320**	**700**	**1300**	**820**	**800**	**370**
	6010B	Nickel	156 nc	21.1	mg/kg	16	15	20	19	18	19	19	19		16	14	17	17	17	16
	6010B	Potassium	--[n]	927	mg/kg	680	640 J	880	780	660	640	740	630		680	530	520	970	1000	690
	6010B	Selenium	39 nc	1.4	mg/kg	0.52	0.4		0.55	0.46	0.54	0.46	0.62			0.68	0.59			
	6010B	Silver	39 nc	0.00	mg/kg															
	6010B	Sodium	--[n]	123	mg/kg	250	240	270	240	270	270	250	200		200	260	240	240	250	210
	6010B	Vanadium	7.8 nc	31.1	mg/kg	**19**	**18**	**22**	**21**	**20**	**19**	**21**	**20**		**15**	**18**	**19**	**19**	**19**	**14**
	6010B	Zinc	2346 nc	61.8	mg/kg	57	54	62	55	68	66	62	51		56	55	53	57	57	64
	7471A	Mercury	2.3 nc	0.04	mg/kg	0.029	0.04	0.052	0.052	0.026	0.028	0.031	0.03		0.034	0.043	0.042	0.033	0.061	0.046
	7841	Thallium	0.52 nc	0.00	mg/kg			0.2			0.27	0.23					0.2			0.23
Pesticides	8081A	4,4'-DDE	1.7 ca	--	mg/kg										0.0027					
	8081A	beta-BHC	0.32 ca	--	mg/kg															
VOCs	8260B	Acetone	1412 nc	--	mg/kg															
SVOCs	8270C	2-Methylnaphthalene	--	--	mg/kg						0.011 J									
	8270C	Acenaphthylene	--	--	mg/kg															
	8270C	Anthracene	2189 nc	--	mg/kg															
	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg	0.029 J	0.045	0.014 J	0.011 J		0.01 J									
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg	0.021 J	0.033 J		0.011 J		0.013 J								0.011 J	0.012 J
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg	0.028 J	0.045	0.015 J	0.014 J		0.016 J				0.012 J	0.0094 J		0.015 J	0.016 J	0.018 J
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg	0.015 J	0.021 J													
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg	0.017 J	0.018 J				0.014 J									
	8270C	Benzoic acid	100000 max	--	mg/kg								0.24 J							
	8270C	Benzyl alcohol	1833 nc	--	mg/kg			0.35 J			0.6 J									
	8270C	Bis(2-ethylhexyl) phthalate	35 ca	--	mg/kg			0.037 J			0.12 J									0.045 J
	8270C	Carbazole	24 ca	--	mg/kg															
	8270C	Chrysene	62 ca	--	mg/kg	0.034	0.053	0.02 J	0.014 J		0.016 J				0.011 J	0.011 J	0.012 J	0.012 J	0.013 J	0.014 J
	8270C	Dibenzo(a,h)anthracene	0.062 ca	--	mg/kg															
	8270C	Dibenzofuran	15 nc	--	mg/kg			0.0093 J												
	8270C	Fluoranthene	229 nc	--	mg/kg	0.057	0.1	0.034	0.02 J	0.011 J	0.018 J		0.011 J		0.015 J	0.011 J	0.015 J	0.019 J	0.022 J	0.022 J
	8270C	Fluorene	275 nc	--	mg/kg															
	8270C	Indeno(1,2,3-cd)pyrene	0.62 ca	--	mg/kg	0.014 J	0.019 J													

Table LNW-2
Landfill North of Winklepeck Burning Grounds Summary of Surface Soil (0-1 ft) Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units															
	8270C	Naphthalene	5.6 nc	--	mg/kg			0.014 J			0.017 J									
	8270C	Phenanthrene	--	--	mg/kg	0.029 J	0.064	0.037 J												
	8270C	Phenol	1833 nc	--	mg/kg						0.031 J									
	8270C	Pyrene	232 nc	--	mg/kg	0.05 J	0.091	0.031 J	0.019 J		0.017 J								0.014 J	0.015 J
Propellants	353.2 Modified	Nitrocellulose	--	--	mg/kg										1.3					

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style

Table LNW-2
Landfill North of Winklepeck Burning Grounds Summary of Surface Soil (0-1 ft) Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
						Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
						Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units					
Metals	6010B	Aluminum	7614	nc	17700	mg/kg		**9900**	**12000**	**8700**	**12000**
	6010B	Arsenic	0.39	ca	15.4	mg/kg		**7.9**	**7.9**	**7.8**	**11**
	6010B	Barium	538	nc	88.4	mg/kg		65	120	95	74
	6010B	Beryllium	15	nc	0.88	mg/kg		0.56	1.4	0.68	0.7
	6010B	Cadmium	3.7	nc	0.00	mg/kg			1.1	0.21	0.1
	6010B	Calcium	--[n]		15800	mg/kg		560	21000	4400	4400
	6010B	Chromium	30	ca	17.4	mg/kg		16	15	17	22
	6010B	Cobalt	30	ca	10.4	mg/kg		7.6	6	6.6	8.6
	6010B	Copper	313	nc	17.7	mg/kg		11	**430**	12	21
	6010B	Iron	2346	nc	23100	mg/kg		**15000**	**13000**	**13000**	**22000**
	6010B	Lead	400	pbk	26.1	mg/kg		17	140	45	32
	6010B	Magnesium	--[n]		3030	mg/kg		1700	4300	1700	3000
	6010B	Manganese	176	nc	1450	mg/kg		**670**	**1200**	**560**	**410**
	6010B	Nickel	156	nc	21.1	mg/kg		14	24	13	22
	6010B	Potassium	--[n]		927	mg/kg		660	1400	860	2300
	6010B	Selenium	39	nc	1.4	mg/kg			0.73		
	6010B	Silver	39	nc	0.00	mg/kg			22		
	6010B	Sodium	--[n]		123	mg/kg		240	690	230	260
	6010B	Vanadium	7.8	nc	31.1	mg/kg		**18**	**13**	**15**	**19**
	6010B	Zinc	2346	nc	61.8	mg/kg		57	1400	110	110
	7471A	Mercury	2.3	nc	0.04	mg/kg		0.05	0.092	0.061	0.036
	7841	Thallium	0.52	nc	0.00	mg/kg			0.3		
Pesticides	8081A	4,4'-DDE	1.7	ca	--	mg/kg					
	8081A	beta-BHC	0.32	ca	--	mg/kg		0.0017 J			
VOCs	8260B	Acetone	1412	nc	--	mg/kg	0.088				
SVOCs	8270C	2-Methylnaphthalene	--		--	mg/kg			0.085	0.013 J	0.02 J
	8270C	Acenaphthylene	--		--	mg/kg			0.018 J		0.015 J
	8270C	Anthracene	2189	nc	--	mg/kg			0.015 J	0.012 J	0.031 J
	8270C	Benzo(a)anthracene	0.62	ca	--	mg/kg			0.083	0.044	0.14
	8270C	Benzo(a)pyrene	0.062	ca	--	mg/kg		0.017 J	**0.1**	0.053	**0.14**
	8270C	Benzo(b)fluoranthene	0.62	ca	--	mg/kg		0.029 J	0.15	0.069	0.21
	8270C	Benzo(g,h,i)perylene	--		--	mg/kg			0.044	0.025 J	0.056
	8270C	Benzo(k)fluoranthene	6.2	ca	--	mg/kg		0.012 J	0.079	0.032 J	0.12
	8270C	Benzoic acid	100000	max	--	mg/kg					
	8270C	Benzyl alcohol	1833	nc	--	mg/kg					
	8270C	Bis(2-ethylhexyl) phthalate	35	ca	--	mg/kg					
	8270C	Carbazole	24	ca	--	mg/kg					0.041 J
	8270C	Chrysene	62	ca	--	mg/kg		0.017 J	0.12	0.06	0.19
	8270C	Dibenzo(a,h)anthracene	0.062	ca	--	mg/kg			0.013 J		
	8270C	Dibenzofuran	15	nc	--	mg/kg			0.025 J		0.018 J
	8270C	Fluoranthene	229	nc	--	mg/kg		0.028 J	0.17	0.1	0.36
	8270C	Fluorene	275	nc	--	mg/kg					0.016 J
	8270C	Indeno(1,2,3-cd)pyrene	0.62	ca	--	mg/kg			0.048	0.026 J	0.06

Table LNW-2
Landfill North of Winklepeck Burning Grounds Summary of Surface Soil (0-1 ft) Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
					Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units					
	8270C	Naphthalene	5.6 nc	--	mg/kg			0.064	0.013 J	0.024 J
	8270C	Phenanthrene	--	--	mg/kg			0.089	0.052	0.26
	8270C	Phenol	1833 nc	--	mg/kg					
	8270C	Pyrene	232 nc	--	mg/kg		0.02 J	0.12	0.076	0.23
Propellants	353.2 Modified	Nitrocellulose	--	--	mg/kg		1			

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style

Table LNW-3
Landfill North of Winklepeck Burning Grounds Summary of Subsurface Soil (>1 ft) Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWsb-053-SO	LNWsb-054-SO	LNWsb-055-SO	LNWsb-056-DUP	LNWsb-056-SO	LNWsb-057-SO	LNWsb-058-SO	LNWsb-059-SO	LNWsb-060-SO	LNWsb-061-SO	LNWsb-062-SO	LNWsb-063-SO	LNWsb-064-DUP	LNWsb-064-SO	LNWsb-065-SO
						Sample Date:	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004
						Sample Depth:	2-4 ft	2-4 ft	2-4 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	6-8 ft	4-6 ft	6-8 ft	4-6 ft	2-4 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Deep Soil Background Criteria	Units															
Metals	6010B	Aluminum	7614	nc	19500	mg/kg	**12000**	**11000**	**11000**	**11000**	**10000**	**9800**	**8800**	7400	**9600**	**8100**	4900	**10000**	**11000**	**10000**	**9300**
	6010B	Arsenic	0.39	ca	19.8	mg/kg	**13**	**13**	**10**	**14**	**13**	**15**	**11**	**12**	**12**	**12**	**3.7**	**13**	**11**	**17**	**10**
	6010B	Barium	538	nc	124	mg/kg	67	79	57	87	57	47	49	23	46	47	23	56	57	49	59
	6010B	Beryllium	15	nc	0.88	mg/kg	0.75	0.77	0.66	0.93	0.71	0.68	0.65	0.47	0.65	0.53	0.37	0.73	0.83	0.74	0.56
	6010B	Cadmium	3.7	nc	0.00	mg/kg				0.2	0.11	0.15									
	6010B	Calcium	--[n]		35500	mg/kg	2100	4500	9300	3300	11000	11000	3400	490	15000	1500	1600	17000	4500	11000	1400
	6010B	Chromium	30	ca	27.2	mg/kg	18	17	16	16	16	16	15	9.9	15	12	8.4	16	18	17	13
	6010B	Cobalt	30	ca	23.2	mg/kg	13	12	9.8	12	12	10	9.6	8.8	8.2	8.5	6.5	13	13	13	8.1
	6010B	Copper	313	nc	32.3	mg/kg	21	19	16	18	18	18	20	20	20	22	17	21	27	24	17
	6010B	Iron	2346	nc	35200	mg/kg	**25000**	**26000**	**22000**	**26000**	**25000**	**28000**	**23000**	**20000**	**23000**	**22000**	**14000**	**25000**	**28000**	**26000**	**19000**
	6010B	Lead	400	pbk	19.1	mg/kg	12	15	9.7	10	11	12	9.8	11	10	11	9.8	12	12	15	13
	6010B	Magnesium	--[n]		8790	mg/kg	3900	4300	5700	3700	4900	4600	3500	1800	5400	2500	2000	4900	4500	5000	2200
	6010B	Manganese	176	nc	3030	mg/kg	**490**	**380**	**300**	**420**	**360**	**390**	**280**	**320**	**220**	**350**	150	**520**	**540**	**330**	**400**
	6010B	Nickel	156	nc	60.7	mg/kg	31	32	24	33	26	26	24	14	21	19	15	28	29	26	17
	6010B	Potassium	--[n]		3350	mg/kg	1800	1300	1400	1200	1400	1300	1500	730	1800	1000	830	1900	1800	1900	1100
	6010B	Selenium	39	nc	1.5	mg/kg	0.56			0.51	0.57	0.53	0.47	0.46	0.66		0.45	0.62	0.77	0.59	0.63
	6010B	Sodium	--[n]		145	mg/kg	410							320	360	320	280	370	390	370	360
	6010B	Vanadium	7.8	nc	37.6	mg/kg	**18**	**18**	**16**	**17**	**17**	**17**	**15**	**13**	**16**	**14**	**10**	**18**	**18**	**18**	**17**
	6010B	Zinc	2346	nc	93.3	mg/kg	61	61	58	62	60	60	55	51	57	63	51	61	65	66	56
	7471A	Mercury	2.3	nc	0.04	mg/kg		0.0092						0.015	0.021	0.031	0.022	0.03	0.034	0.027	
	7841	Thallium	0.52	nc	0.91	mg/kg	0.28	0.3	0.22											0.21	
SVOCs	8270C	Benzo(b)fluoranthene	0.62	ca	--	mg/kg															0.017 J
	8270C	Chrysene	62	ca	--	mg/kg															0.014 J
	8270C	Fluoranthene	229	nc	--	mg/kg															0.022 J

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-3
Landfill North of Winklepeck Burning Grounds Summary of Subsurface Soil (>1 ft) Detectio
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-066-SO	LNWsb-067-SO	LNWsb-068-SO	LNWsb-069-SO
					Sample Date:	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	4-6 ft	6-8 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units				
Metals	6010B	Aluminum	7614 nc	19500	mg/kg	**10000**	5600	6200	6800
	6010B	Arsenic	0.39 ca	19.8	mg/kg	**14**	**9.6**	**10 J**	**13**
	6010B	Barium	538 nc	124	mg/kg	61	16	34	24
	6010B	Beryllium	15 nc	0.88	mg/kg	0.69	0.38	0.42	0.42
	6010B	Cadmium	3.7 nc	0.00	mg/kg				
	6010B	Calcium	--[n]	35500	mg/kg	1800	870	600	810
	6010B	Chromium	30 ca	27.2	mg/kg	15	10	8.2	11
	6010B	Cobalt	30 ca	23.2	mg/kg	10	5.7	6.2 J	7.2
	6010B	Copper	313 nc	32.3	mg/kg	20	21	20 J	22
	6010B	Iron	2346 nc	35200	mg/kg	**25000**	**18000**	**17000 J**	**22000**
	6010B	Lead	400 pbk	19.1	mg/kg	12	9.8	10 J	9.9
	6010B	Magnesium	--[n]	8790	mg/kg	3400	2100	1700	2400
	6010B	Manganese	176 nc	3030	mg/kg	**400**	120	**380 J**	**260**
	6010B	Nickel	156 nc	60.7	mg/kg	25	15	15	18
	6010B	Potassium	--[n]	3350	mg/kg	1500	810	870 J	970
	6010B	Selenium	39 nc	1.5	mg/kg	0.54	0.78	0.69	0.68
	6010B	Sodium	--[n]	145	mg/kg	340	240	250	350
	6010B	Vanadium	7.8 nc	37.6	mg/kg	**16**	**9.9**	**13**	**11**
	6010B	Zinc	2346 nc	93.3	mg/kg	65	51	65 J	56
	7471A	Mercury	2.3 nc	0.04	mg/kg	0.036	0.022	0.018	
	7841	Thallium	0.52 nc	0.91	mg/kg				
SVOCs	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg				
	8270C	Chrysene	62 ca	--	mg/kg				
	8270C	Fluoranthene	229 nc	--	mg/kg				

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-4
Landfill North of Winklepeck Burning Grounds Summary of Sediment Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							
Metals	6010B	Aluminum	7614 nc	13900	mg/kg	**9900**		7400		**9200**	**9100**	**10000**
	6010B	Arsenic	0.39 ca	19.5	mg/kg	**7.8**		**6.4**		**12**	**12**	**7.8**
	6010B	Barium	538 nc	123	mg/kg	80		62		83	81	110
	6010B	Beryllium	15 nc	0.38	mg/kg	0.7		0.58		0.68	0.66	0.73
	6010B	Cadmium	3.7 nc	0.00	mg/kg			0.34				
	6010B	Calcium	--[n]	5510	mg/kg	2100		1900		2100	1900	1800
	6010B	Chromium	30 ca	18.1	mg/kg	13		10		13	12	13
	6010B	Cobalt	30 ca	9.1	mg/kg	8.6		6.9		8.8	8.5	7.5
	6010B	Copper	313 nc	27.6	mg/kg	15		12		16	18	16
	6010B	Iron	2346 nc	28200	mg/kg	**20000**		**16000**		**22000**	**22000**	**19000**
	6010B	Lead	400 pbk	27.4	mg/kg	15		15		17	16	19
	6010B	Magnesium	--[n]	2760	mg/kg	2400		1700		2200	2200	2200
	6010B	Manganese	176 nc	1950	mg/kg	**600**		**470**		**710**	**710**	**700**
	6010B	Nickel	156 nc	17.7	mg/kg	19		14		18	18	17
	6010B	Potassium	--[n]	1950	mg/kg	1300		930		1200	1200	810
	6010B	Sodium	--[n]	112	mg/kg	280		240		300	280	280
	6010B	Vanadium	7.8 nc	26.1	mg/kg	**18**		**15**		**17**	**17**	**18**
	6010B	Zinc	2346 nc	532	mg/kg	85		71		91	89	75
	7471A	Mercury	2.3 nc	0.06	mg/kg	0.038		0.038		0.035	0.061	0.068
SVOCs	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg	0.027 J		0.059 J		0.029 J	0.033 J	
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg	0.025 J		**0.064 J**		0.023 J	0.031 J	
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg	0.037 J		0.091			0.042 J	
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg			0.043 J				
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg	0.025 J		0.038 J				
	8270C	Chrysene	62 ca	--	mg/kg	0.041 J		0.079		0.03 J	0.033 J	
	8270C	Fluoranthene	229 nc	--	mg/kg	0.044 J		0.068 J		0.034 J	0.041 J	
	8270C	Pyrene	232 nc	--	mg/kg	0.043 J		0.071 J		0.037 J	0.043 J	
Propellants	353.2 Modified	Nitrocellulose	--	--	mg/kg				1.4			

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.

Table LNW-5
Landfill North of Winklepeck Burning Grounds Summary of Surface Water Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							
Metals	6010B	Aluminum	36499 nc	3370	ug/l	120	120	300	110	190	71	71
	6010B	Barium	2555 nc	47.5	ug/l	33	35	36	37	53	22	23
	6010B	Calcium	--[n]	41400	ug/l	38000	39000	38000	35000	32000 J	27000	28000
	6010B	Iron	10950 nc	2560	ug/l	890	1100	1600	1300	1800 J	1900	1900
	6010B	Magnesium	--[n]	10800	ug/l	8700	9000	8900	8100	8300 J	6400	6500
	6010B	Manganese	876 nc	391	ug/l	310	470	450	350	**1700 J**	820	830
	6010B	Potassium	--[n]	3170	ug/l	2800	2800	3500	2800	2300	1700	1700
	6010B	Sodium	--[n]	21300	ug/l	3000	3100	3100	3000	3200	2300	2300
	6010B	Zinc	10950 nc	42	ug/l						4.8	3.5
	7060A	Arsenic	0.045 ca	3.2	ug/l	**0.63**	**0.57**	**1**	**0.59**	**1.3**		
	7470A	Mercury	11 nc	0.00	ug/l			0.05 J				
	7841	Thallium	2.4 nc	0.00	ug/l			1.5 J				
SVOCs	8270C	Benzo(a)anthracene	0.092 ca	--	ug/l	**0.17 J**						
	8270C	Benzo(a)pyrene	0.0092 ca	--	ug/l	**0.12 J**						
	8270C	Benzo(b)fluoranthene	0.092 ca	--	ug/l	**0.11 J**						
	8270C	Benzo(k)fluoranthene	0.92 ca	--	ug/l	0.14 J						
	8270C	Chrysene	9.2 ca	--	ug/l	0.17 J						
	8270C	Dibenzo(a,h)anthracene	0.0092 ca	--	ug/l	**0.13 J**						
	8270C	Fluoranthene	1460 nc	--	ug/l	0.14 J						
	8270C	Indeno(1,2,3-cd)pyrene	0.092 ca	--	ug/l	**0.13 J**						
	8270C	Pyrene	182 nc	--	ug/l	0.16 J						
Explosives	8330	RDX	0.61 ca	--	ug/l			0.099 J				

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
ug/l - means micrograms per Liter (parts per billion - ppb)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style

Table LNW-6
Landfill North of Winklepeck Burning Grounds Summary of Groundwater Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
Metals	6010B	Aluminum	36499 nc	--	--	ug/l			2200	250	
	6010B	Barium	2555 nc	82.1	256	ug/l	46	57	110	97	53
	6010B	Cadmium	18 nc	0.00	0.00	ug/l				0.26	
	6010B	Calcium	--[n]	115000	53100	ug/l	85000	37000	45000	48000	63000
	6010B	Chromium	109 nc	7.3	0.00	ug/l			3.2		
	6010B	Cobalt	730 nc	0.00	0.00	ug/l			0.81		
	6010B	Iron	10950 nc	279	1430	ug/l		1300	3400	380	
	6010B	Magnesium	--[n]	43300	15000	ug/l	32000	10000	10000	11000	18000
	6010B	Manganese	876 nc	1020	1340	ug/l	310	**990**	75	52	180
	6010B	Nickel	730 nc	0.00	83.4	ug/l	2		3.6	1.4	5.4
	6010B	Potassium	--[n]	2890	5770	ug/l	3200	1200	3900	3600	7000
	6010B	Sodium	--[n]	45700	51400	ug/l	9400	8300	11000	13000	8500
	6010B	Vanadium	36 nc	0.00	0.00	ug/l	1.6		3.6		
	6010B	Zinc	10950 nc	60.9	52.3	ug/l		4.1			8.5
	7060A	Arsenic	0.045 ca	11.7	0.00	ug/l		**6.5**	**1.5**	**0.91**	**0.89**
	7421	Lead	15 mcl	0.00	0.00	ug/l			1.6	1	
	7841	Thallium	2.4 nc	0.00	0.00	ug/l	2				
SVOCs	8270C	Benzoic acid	145979 nc	--	--	ug/l					9.7 J
	8270C	Bis(2-ethylhexyl) phthalate	4.8 ca	--	--	ug/l		**15**			

Notes:
-- - no background/PRG value is available for this analyte
blank cell indicates that the analyte was a non-detect (with a "U" qualifier) or analysis was not performed
ug/l - means micrograms per Liter (parts per billion - ppb)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
UC/Filtered – GW sample was filtered for metals and taken from an unconsolidated MW
C/Filtered – GW sample was filtered for metals and taken from a consolidated (bedrock) MW
[n] - nutrient
U - analyte not detected
J - estimated value
If Result = or > Background, then the value is presented with a shaded/highlighted style

Table LNW-6
Landfill North of Winklepeck Burning Grounds Summary of Groundwater Detections
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units	LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW

If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units															
Metals	6010B	Aluminum	7614	nc	17700	mg/kg	**10000**	**10000**	**11000**	**11000**	**10000**	**10000**	**11000**	**9900**		**8500**	**10000**	**9800**	**11000**	**11000**	**8100**
	6010B	Arsenic	0.39	ca	15.4	mg/kg	**10**	**10 J**	**14**	**13**	**11**	**12**	**11**	**12**		**8.8**	**11**	**12**	**10**	**10**	**9.1**
	6010B	Barium	538	nc	88.4	mg/kg	62	61	72	59	69	65	70	58		42	55	76	67	66	41
	6010B	Beryllium	15	nc	0.88	mg/kg	0.63	0.6	0.72	0.7	0.72	0.72	0.71	0.67		0.48	0.66	0.69	0.62	0.63	0.48
	6010B	Cadmium	3.7	nc	0.00	mg/kg	0.245 U	0.24 U	0.24 U	0.26 U	0.25 U	0.125 U	0.25 U	0.25 U		0.12 U	0.13 U	0.13 U	0.135 U	0.14 U	0.12 U
	6010B	Calcium	--[n]		15800	mg/kg	410	400	1100	1700	1400	2000	1300	580		600	260	530	800	790	760
	6010B	Chromium	30	ca	17.4	mg/kg	19	18	21	23	20	21	26	25		18	17	21	18	18	18
	6010B	Cobalt	30	ca	10.4	mg/kg	8.9	8.9	10	9.2	9.9	9.7	8.5	9.2		6	9.3	9.3	9.2	10	6.5
	6010B	Copper	313	nc	17.7	mg/kg	11	11	16	14	16	17	17	13		14	12	10	14	14	17
	6010B	Iron	2346	nc	23100	mg/kg	**19000**	**19000**	**24000**	**23000**	**21000**	**21000**	**22000**	**21000**		**16000**	**19000**	**18000**	**19000**	**19000**	**17000**
	6010B	Lead	400	pbk	26.1	mg/kg	17	17	18	17	18	19	15	17		13	19	18	19	19	17
	6010B	Magnesium	--[n]		3030	mg/kg	1900	1900 J	2400	2400	2100	2300	2200	1900		1600	1700	1500	2100	2100	1800
	6010B	Manganese	176	nc	1450	mg/kg	**670**	**680**	**710**	**590**	**940**	**840**	**580**	**650**		**320**	**700**	**1300**	**820**	**800**	**370**
	6010B	Nickel	156	nc	21.1	mg/kg	16	15	20	19	18	19	19	19		16	14	17	17	17	16
	6010B	Potassium	--[n]		927	mg/kg	680	640 J	880	780	660	640	740	630		680	530	520	970	1000	690
	6010B	Selenium	39	nc	1.4	mg/kg	0.52	0.4	0.75 U	0.55	0.46	0.54	0.46	0.62		0.7 U	0.68	0.59	0.8 U	0.85 U	0.7 U
	6010B	Silver	39	nc	0.00	mg/kg	0.49 U	0.48 U	0.485 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.475 U	0.5 U	0.5 U	0.55 U	0.55 U	0.48 U
	6010B	Sodium	--[n]		123	mg/kg	250	240	270	240	270	270	250	200		200	260	240	240	250	210
	6010B	Vanadium	7.8	nc	31.1	mg/kg	**19**	**18**	**22**	**21**	**20**	**19**	**21**	**20**		**15**	**18**	**19**	**19**	**19**	**14**
	6010B	Zinc	2346	nc	61.8	mg/kg	57	54	62	55	68	66	62	51		56	55	53	57	57	64
	7041	Antimony	3.1	nc	0.96	mg/kg	0.75 U	- R	0.7 U	0.75 U	0.7 U	0.65 U	0.7 U	0.7 U		0.7 U	0.7 U	0.7 U	0.75 U	0.75 U	0.7 U
	7471A	Mercury	2.3	nc	0.04	mg/kg	0.029	0.04	0.052	0.052	0.026	0.028	0.031	0.03		0.034	0.043	0.042	0.033	0.061	0.046
	7841	Thallium	0.52	nc	0.00	mg/kg	0.31 U	0.32 U	0.2	0.32 U	0.29 U	0.27	0.23	0.3 U		0.29 U	0.3 U	0.2	0.315 U	0.315 U	0.23
Pesticides	8081A	4,4'-DDD	2.4	ca	--	mg/kg										0.00085 U					
	8081A	4,4'-DDE	1.7	ca	--	mg/kg										0.0027					
	8081A	4,4'-DDT	1.7	ca	--	mg/kg										0.00085 U					
	8081A	Aldrin	0.029	ca	--	mg/kg										0.00085 U					
	8081A	alpha-BHC	0.09	sat	--	mg/kg										0.00085 U					
	8081A	alpha-Chlordane	1.6	ca	--	mg/kg										0.00085 U					
	8081A	beta-BHC	0.32	ca	--	mg/kg										0.00085 U					
	8081A	delta-BHC	--		--	mg/kg										0.00085 U					
	8081A	Dieldrin	0.030	ca	--	mg/kg										0.00085 U					
	8081A	Endosulfan I	37	nc	--	mg/kg										0.00085 U					
	8081A	Endosulfan II	37	nc	--	mg/kg										0.00085 U					
	8081A	Endosulfan sulfate	37	nc	--	mg/kg										0.00085 U					
	8081A	Endrin	1.8	nc	--	mg/kg										0.00085 U					
	8081A	Endrin aldehyde	--		--	mg/kg										0.00085 U					
	8081A	Endrin ketone	--		--	mg/kg										0.00085 U					
	8081A	gamma-BHC	0.44	ca	--	mg/kg										0.00085 U					
	8081A	gamma-Chlordane	1.6	ca	--	mg/kg										0.00085 U					
	8081A	Heptachlor	0.11	ca	--	mg/kg										0.00085 U					
	8081A	Heptachlor epoxide	0.053	ca	--	mg/kg										0.00085 U					
	8081A	Methoxychlor	31	nc	--	mg/kg										0.0041 U					

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units															
	8081A	Toxaphene	0.44	ca	--	mg/kg										0.008 U					
PCBs	8082	Aroclor 1016	0.39	nc	--	mg/kg										0.016 U					
	8082	Aroclor 1221	0.22	ca	--	mg/kg										0.016 U					
	8082	Aroclor 1232	0.22	ca	--	mg/kg										0.008 U					
	8082	Aroclor 1242	0.22	ca	--	mg/kg										0.016 U					
	8082	Aroclor 1248	0.22	ca	--	mg/kg										0.008 U					
	8082	Aroclor 1254	0.22	ca	--	mg/kg										0.016 U					
	8082	Aroclor 1260	0.22	ca	--	mg/kg										0.016 U					
VOCs	8260B	1,1,1-Trichloroethane	1200	sat	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,1,2,2-Tetrachloroethane	0.41	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,1,2-Trichloroethane	0.73	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,1-Dichloroethane	51	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,1-Dichloroethene	12	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,2-Dibromoethane	0.032	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,2-Dichloroethane	0.28	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	1,2-Dichloroethene (total)	6.9	nc	--	mg/kg				0.0055 U					0.006 U						
	8260B	1,2-Dichloropropane	0.34	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	2-Butanone	2231	nc	--	mg/kg				0.008 U					0.009 U						
	8260B	2-Hexanone	530	nc	--	mg/kg				0.0055 U					0.006 U						
	8260B	4-Methyl-2-pentanone	528	nc	--	mg/kg				0.0055 U					0.006 U						
	8260B	Acetone	1412	nc	--	mg/kg				0.008 U					0.009 U						
	8260B	Benzene	0.64	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Bromochloromethane	--		--	mg/kg				0.00265 U					0.0029 U						
	8260B	Bromodichloromethane	0.82	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Bromoform	62	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Bromomethane	0.39	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Carbon disulfide	36	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Carbon tetrachloride	0.25	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Chlorobenzene	15	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Chloroethane	3.0	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Chloroform	0.22	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Chloromethane	4.7	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	cis-1,2-Dichloroethene	4.3	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	cis-1,3-Dichloropropene	0.78	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Dibromochloromethane	1.1	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Ethylbenzene	395	sat	--	mg/kg				0.00265 U					0.0029 U						
	8260B	m&p-Xylenes	27	nc	--	mg/kg				0.0055 U					0.006 U						
	8260B	Methylene chloride	9.1	ca	--	mg/kg				0.0055 U					0.006 U						
	8260B	o-Xylene	27	nc	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Styrene	1700	sat	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Tetrachloroethene	0.48	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Toluene	520	sat	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Total Xylenes	27	nc	--	mg/kg				0.0055 U					0.006 U						

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
						Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
						Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units															
	8260B	trans-1,2-Dichloroethene	6.9	nc	--	mg/kg				0.00265 UJ					0.0029 U						
	8260B	trans-1,3-Dichloropropene	0.78	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Trichloroethene	0.053	ca	--	mg/kg				0.00265 U					0.0029 U						
	8260B	Vinyl chloride	0.079	ca	--	mg/kg				0.00265 UJ					0.0029 U						
SVOCs	8270C	1,2,4-Trichlorobenzene	6.2	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	1,2-Dichlorobenzene	600	sat	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	1,3-Dichlorobenzene	53	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	1,4-Dichlorobenzene	3.4	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2,2-oxybis (1-chloropropane)	2.9	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2,4,5-Trichlorophenol	611	nc	--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	2,4,6-Trichlorophenol	0.61	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2,4-Dichlorophenol	18	nc	--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	2,4-Dimethylphenol	122	nc	--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	2,4-Dinitrophenol	12	nc	--	mg/kg	0.34 U	0.35 U	0.34 U	0.345 UJ	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	2,4-Dinitrotoluene	12	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	2,6-Dinitrotoluene	6.1	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	2-Chloronaphthalene	494	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2-Chlorophenol	6.3	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2-Methylnaphthalene	--		--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.011 J	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	2-Methylphenol	306	nc	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	2-Nitroaniline	18.3	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	2-Nitrophenol	--		--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	3,3'-Dichlorobenzidine	1.1	ca	--	mg/kg	0.085 U	0.085 UJ	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	3-Nitroaniline	1.8	nc	--	mg/kg	0.34 U	0.35 UJ	0.34 U	0.345 U	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	4,6-Dinitro-2-methylphenol	0.61	nc	--	mg/kg	0.34 U	0.35 U	0.34 U	0.345 U	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	4-Bromophenyl phenyl ether	--		--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	4-Chloro-3-methylphenol	--		--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	4-Chloroaniline	24	nc	--	mg/kg	0.34 U	0.35 UJ	0.34 U	0.345 U	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	4-Chlorophenyl phenyl ether	--		--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	4-Methylphenol	31	nc	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	4-Nitroaniline	23	ca	--	mg/kg	0.34 U	0.35 U	0.34 U	0.345 U	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	4-Nitrophenol	--		--	mg/kg	0.34 U	0.35 U	0.34 U	0.345 U	0.335 U	0.335 U	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	Acenaphthene	368	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Acenaphthylene	--		--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Anthracene	2189	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Benzo(a)anthracene	0.62	ca	--	mg/kg	0.029 J	0.045	0.014 J	0.011 J	0.0165 U	0.01 J	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Benzo(a)pyrene	0.062	ca	--	mg/kg	0.021 J	0.033 J	0.017 U	0.011 J	0.0165 U	0.013 J	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.011 J	0.012 J
	8270C	Benzo(b)fluoranthene	0.62	ca	--	mg/kg	0.028 J	0.045	0.015 J	0.014 J	0.0165 U	0.016 J	0.017 U	0.017 U		0.012 J	0.0094 J	0.017 U	0.015 J	0.016 J	0.018 J
	8270C	Benzo(g,h,i)perylene	--		--	mg/kg	0.015 J	0.021 J	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Benzo(k)fluoranthene	6.2	ca	--	mg/kg	0.017 J	0.018 J	0.017 U	0.017 U	0.0165 U	0.014 J	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Benzoic acid	100000	max	--	mg/kg	- R	- R	- R	- R	- R	- R	- R	0.24 J		- R	- R	- R	- R	- R	- R
	8270C	Benzyl alcohol	1833	nc	--	mg/kg	0.34 U	0.35 U	0.35 J	0.345 U	0.335 U	0.6 J	0.34 U	0.34 U		0.33 U	0.34 U	0.35 U	0.375 U	0.37 U	0.34 U
	8270C	Bis(2-chloroethoxy)methane	--		--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	Bis(2-chloroethyl) ether	0.22	ca	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units															
	8270C	Bis(2-ethylhexyl) phthalate	35	ca	--	mg/kg	0.085 U	0.085 U	0.037 J	0.085 U	0.085 U	0.12 J	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.045 J
	8270C	Butylbenzyl phthalate	1222	nc	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	Carbazole	24	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Chrysene	62	ca	--	mg/kg	0.034	0.053	0.02 J	0.014 J	0.0165 U	0.016 J	0.017 U	0.017 U		0.011 J	0.011 J	0.012 J	0.012 J	0.013 J	0.014 J
	8270C	Dibenzo(a,h)anthracene	0.062	ca	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Dibenzofuran	15	nc	--	mg/kg	0.034 U	0.035 U	0.0093 J	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	Diethyl phthalate	4888	nc	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	Dimethyl phthalate	100000	max	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	Di-n-butyl phthalate	611	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Di-n-octyl phthalate	244	nc	--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	Fluoranthene	229	nc	--	mg/kg	0.057	0.1	0.034	0.02 J	0.011 J	0.018 J	0.017 U	0.011 J		0.015 J	0.011 J	0.015 J	0.019 J	0.022 J	0.022 J
	8270C	Fluorene	275	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Hexachlorobenzene	0.30	ca	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Hexachlorobutadiene	6.2	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Hexachlorocyclopentadiene	37	nc	--	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U		0.495 U	0.5 U	0.5 U	0.55 U	0.55 U	0.5 U
	8270C	Hexachloroethane	35	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Indeno(1,2,3-cd)pyrene	0.62	ca	--	mg/kg	0.014 J	0.019 J	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Isophorone	512	ca	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Naphthalene	5.6	nc	--	mg/kg	0.0165 U	0.017 U	0.014 J	0.017 U	0.0165 U	0.017 J	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Nitrobenzene	2	nc	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	n-Nitroso-di-n-propylamine	0.069	ca	--	mg/kg	0.034 U	0.035 U	0.034 U	0.0345 U	0.0335 U	0.0335 U	0.034 U	0.034 U		0.033 U	0.034 U	0.035 U	0.0375 U	0.037 U	0.034 U
	8270C	n-Nitrosodiphenylamine	99	ca	--	mg/kg	0.0165 U	0.017 U	0.017 U	0.017 U	0.0165 U	0.0165 U	0.017 U	0.017 U		0.0165 U	0.017 U	0.017 U	0.0185 U	0.0185 U	0.0165 U
	8270C	Pentachlorophenol	3.0	ca	--	mg/kg	0.165 U	0.17 U	0.17 U	0.17 U	0.165 U	0.165 U	0.17 U	0.17 U		0.165 U	0.17 U	0.17 U	0.185 U	0.185 U	0.165 U
	8270C	Phenanthrene	--		--	mg/kg	0.029 J	0.064	0.037 J	0.026 U	0.025 U	0.025 U	0.0255 U	0.0255 U		0.0245 U	0.0255 U	0.026 U	0.028 U	0.0275 U	0.0255 U
	8270C	Phenol	1833	nc	--	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.031 J	0.085 U	0.085 U		0.085 U	0.085 U	0.085 U	0.095 U	0.095 U	0.085 U
	8270C	Pyrene	232	nc	--	mg/kg	0.05 J	0.091	0.031 J	0.019 J	0.025 U	0.017 J	0.0255 U	0.0255 U		0.0245 U	0.0255 U	0.026 U	0.028 U	0.014 J	0.015 J
Explosives	8330	1,3,5-Trinitrobenzene	183	nc	--	mg/kg	0.0495 U	0.0495 U	0.048 U	0.0485 U	0.049 U	0.0495 U	0.049 U	0.0495 U		0.0495 U	0.049 U	0.048 U	0.0495 U	0.05 U	0.05 U
	8330	1,3-Dinitrobenzene	0.61	nc	--	mg/kg	0.0495 U	0.0495 U	0.048 U	0.0485 U	0.049 U	0.0495 U	0.049 U	0.0495 U		0.0495 U	0.049 U	0.048 U	0.0495 U	0.05 U	0.05 U
	8330	2,4,6-TNT	16	ca	--	mg/kg	0.0495 U	0.0495 U	0.048 U	0.0485 U	0.049 U	0.0495 U	0.049 U	0.0495 U		0.0495 U	0.049 U	0.048 U	0.0495 U	0.05 U	0.05 U
	8330	2,4-Dinitrotoluene	12	nc	--	mg/kg	0.0495 U	0.0495 U	0.048 U	0.0485 U	0.049 U	0.0495 U	0.049 U	0.0495 U		0.0495 U	0.049 U	0.048 U	0.0495 U	0.05 U	0.05 U
	8330	2,6-Dinitrotoluene	6.1	nc	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	2-Amino-4,6-Dinitrotoluene	--		--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	2-Nitrotoluene	0.88	ca	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	3-Nitrotoluene	73	nc	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	4-Amino-2,6-Dinitrotoluene	--		--	mg/kg	0.15 U	0.15 U	0.145 U	0.145 U	0.145 U	0.15 U	0.145 U	0.15 U		0.15 U	0.145 U	0.145 U	0.15 U	0.15 U	0.15 U
	8330	4-Nitrotoluene	12	ca	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	HMX	306	nc	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	Nitrobenzene	2	nc	--	mg/kg	0.0495 U	0.0495 U	0.048 U	0.0485 U	0.049 U	0.0495 U	0.049 U	0.0495 U		0.0495 U	0.049 U	0.048 U	0.0495 U	0.05 U	0.05 U
	8330	RDX	4.4	ca	--	mg/kg	0.1 U	0.1 U	0.095 U	0.095 U	0.1 U	0.1 U	0.1 U	0.1 U		0.1 U	0.1 U	0.095 U	0.1 U	0.1 U	0.1 U
	8330	Tetryl	61	nc	--	mg/kg	0.195 U	0.2 U	0.19 U	0.195 U	0.195 U	0.195 U	0.195 U	0.2 U		0.2 U	0.195 U	0.19 U	0.2 U	0.2 U	0.2 U
Propellants	353.2 Modified	Nitrocellulose	--		--	mg/kg										1.3					
	8332	Nitroglycerine	35	ca	--	mg/kg										0.25 U					
	SW8330 Modified	Nitroguanidine	611	nc	--	mg/kg										0.125 U					

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-028M-DUP	LNWss-028M-SO	LNWss-029M-SO	LNWss-030M-SO	LNWss-031M-QA	LNWss-031M-SO	LNWss-032M-SO	LNWss-033M-SO	LNWss-034D-SO	LNWss-034M-SO	LNWss-035M-SO	LNWss-036M-SO	LNWss-037M-DUP	LNWss-037M-SO	LNWss-038M-SO
					Sample Date:	10/26/2004	10/26/2004	10/25/2004	10/25/2004	10/26/2004	10/26/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	10/26/2004	10/26/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units															

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
						Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
						Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units					
Metals	6010B	Aluminum	7614	nc	17700	mg/kg		**9900**	**12000**	**8700**	**12000**
	6010B	Arsenic	0.39	ca	15.4	mg/kg		**7.9**	**7.9**	**7.8**	**11**
	6010B	Barium	538	nc	88.4	mg/kg		65	120	95	74
	6010B	Beryllium	15	nc	0.88	mg/kg		0.56	1.4	0.68	0.7
	6010B	Cadmium	3.7	nc	0.00	mg/kg		0.135 U	1.1	0.21	0.1
	6010B	Calcium	--[n]		15800	mg/kg		560	21000	4400	4400
	6010B	Chromium	30	ca	17.4	mg/kg		16	15	17	22
	6010B	Cobalt	30	ca	10.4	mg/kg		7.6	6	6.6	8.6
	6010B	Copper	313	nc	17.7	mg/kg		11	**430**	12	21
	6010B	Iron	2346	nc	23100	mg/kg		**15000**	**13000**	**13000**	**22000**
	6010B	Lead	400	pbk	26.1	mg/kg		17	140	45	32
	6010B	Magnesium	--[n]		3030	mg/kg		1700	4300	1700	3000
	6010B	Manganese	176	nc	1450	mg/kg		**670**	**1200**	**560**	**410**
	6010B	Nickel	156	nc	21.1	mg/kg		14	24	13	22
	6010B	Potassium	--[n]		927	mg/kg		660	1400	860	2300
	6010B	Selenium	39	nc	1.4	mg/kg		0.8 U	0.73	0.7 U	0.75 U
	6010B	Silver	39	nc	0.00	mg/kg		0.55 U	22	0.465 U	0.5 U
	6010B	Sodium	--[n]		123	mg/kg		240	690	230	260
	6010B	Vanadium	7.8	nc	31.1	mg/kg		**18**	**13**	**15**	**19**
	6010B	Zinc	2346	nc	61.8	mg/kg		57	1400	110	110
	7041	Antimony	3.1	nc	0.96	mg/kg		0.8 U	0.7 U	0.65 U	0.7 U
	7471A	Mercury	2.3	nc	0.04	mg/kg		0.05	0.092	0.061	0.036
	7841	Thallium	0.52	nc	0.00	mg/kg		0.335 U	0.3	0.285 U	0.31 U
Pesticides	8081A	4,4'-DDD	2.4	ca	--	mg/kg		0.001 U			
	8081A	4,4'-DDE	1.7	ca	--	mg/kg		0.00115 U			
	8081A	4,4'-DDT	1.7	ca	--	mg/kg		0.001 U			
	8081A	Aldrin	0.029	ca	--	mg/kg		0.001 U			
	8081A	alpha-BHC	0.09	sat	--	mg/kg		0.001 U			
	8081A	alpha-Chlordane	1.6	ca	--	mg/kg		0.001 U			
	8081A	beta-BHC	0.32	ca	--	mg/kg		0.0017 J			
	8081A	delta-BHC	--		--	mg/kg		0.001 U			
	8081A	Dieldrin	0.030	ca	--	mg/kg		0.001 U			
	8081A	Endosulfan I	37	nc	--	mg/kg		0.001 U			
	8081A	Endosulfan II	37	nc	--	mg/kg		0.001 U			
	8081A	Endosulfan sulfate	37	nc	--	mg/kg		0.001 U			
	8081A	Endrin	1.8	nc	--	mg/kg		0.001 U			
	8081A	Endrin aldehyde	--		--	mg/kg		0.001 U			
	8081A	Endrin ketone	--		--	mg/kg		0.001 U			
	8081A	gamma-BHC	0.44	ca	--	mg/kg		0.001 U			
	8081A	gamma-Chlordane	1.6	ca	--	mg/kg		0.001 U			
	8081A	Heptachlor	0.11	ca	--	mg/kg		0.001 U			
	8081A	Heptachlor epoxide	0.053	ca	--	mg/kg		0.001 U			
	8081A	Methoxychlor	31	nc	--	mg/kg		0.00485 U			

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
					Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units					
	8081A	Toxaphene	0.44 ca	--	mg/kg		0.01 U			
PCBs	8082	Aroclor 1016	0.39 nc	--	mg/kg		0.0195 U			
	8082	Aroclor 1221	0.22 ca	--	mg/kg		0.0195 U			
	8082	Aroclor 1232	0.22 ca	--	mg/kg		0.01 U			
	8082	Aroclor 1242	0.22 ca	--	mg/kg		0.0195 U			
	8082	Aroclor 1248	0.22 ca	--	mg/kg		0.01 U			
	8082	Aroclor 1254	0.22 ca	--	mg/kg		0.0195 U			
	8082	Aroclor 1260	0.22 ca	--	mg/kg		0.0195 U			
VOCs	8260B	1,1,1-Trichloroethane	1200 sat	--	mg/kg	0.0042 U				
	8260B	1,1,2,2-Tetrachloroethane	0.41 ca	--	mg/kg	0.0042 U				
	8260B	1,1,2-Trichloroethane	0.73 ca	--	mg/kg	0.0042 U				
	8260B	1,1-Dichloroethane	51 nc	--	mg/kg	0.0042 U				
	8260B	1,1-Dichloroethene	12 nc	--	mg/kg	0.0042 U				
	8260B	1,2-Dibromoethane	0.032 ca	--	mg/kg	0.0042 U				
	8260B	1,2-Dichloroethane	0.28 ca	--	mg/kg	0.0042 U				
	8260B	1,2-Dichloroethene (total)	6.9 nc	--	mg/kg	0.0085 U				
	8260B	1,2-Dichloropropane	0.34 ca	--	mg/kg	0.0042 U				
	8260B	2-Butanone	2231 nc	--	mg/kg	0.0125 U				
	8260B	2-Hexanone	530 nc	--	mg/kg	0.0085 U				
	8260B	4-Methyl-2-pentanone	528 nc	--	mg/kg	0.0085 U				
	8260B	Acetone	1412 nc	--	mg/kg	0.088				
	8260B	Benzene	0.64 ca	--	mg/kg	0.0042 U				
	8260B	Bromochloromethane	--	--	mg/kg	0.0042 U				
	8260B	Bromodichloromethane	0.82 ca	--	mg/kg	0.0042 U				
	8260B	Bromoform	62 ca	--	mg/kg	0.0042 U				
	8260B	Bromomethane	0.39 nc	--	mg/kg	0.0042 U				
	8260B	Carbon disulfide	36 nc	--	mg/kg	0.0042 U				
	8260B	Carbon tetrachloride	0.25 ca	--	mg/kg	0.0042 U				
	8260B	Chlorobenzene	15 nc	--	mg/kg	0.0042 U				
	8260B	Chloroethane	3.0 ca	--	mg/kg	0.0042 U				
	8260B	Chloroform	0.22 ca	--	mg/kg	0.0042 U				
	8260B	Chloromethane	4.7 nc	--	mg/kg	0.0042 U				
	8260B	cis-1,2-Dichloroethene	4.3 nc	--	mg/kg	0.0042 U				
	8260B	cis-1,3-Dichloropropene	0.78 ca	--	mg/kg	0.0042 U				
	8260B	Dibromochloromethane	1.1 ca	--	mg/kg	0.0042 U				
	8260B	Ethylbenzene	395 sat	--	mg/kg	0.0042 U				
	8260B	m&p-Xylenes	27 nc	--	mg/kg	0.0085 U				
	8260B	Methylene chloride	9.1 ca	--	mg/kg	0.0085 U				
	8260B	o-Xylene	27 nc	--	mg/kg	0.0042 U				
	8260B	Styrene	1700 sat	--	mg/kg	0.0042 U				
	8260B	Tetrachloroethene	0.48 ca	--	mg/kg	0.0042 U				
	8260B	Toluene	520 sat	--	mg/kg	0.0042 U				
	8260B	Total Xylenes	27 nc	--	mg/kg	0.0085 U				

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
					Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units					
	8260B	trans-1,2-Dichloroethene	6.9 nc	--	mg/kg	0.0042 U				
	8260B	trans-1,3-Dichloropropene	0.78 ca	--	mg/kg	0.0042 U				
	8260B	Trichloroethene	0.053 ca	--	mg/kg	0.0042 U				
	8260B	Vinyl chloride	0.079 ca	--	mg/kg	0.0042 U				
SVOCs	8270C	1,2,4-Trichlorobenzene	6.2 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	1,2-Dichlorobenzene	600 sat	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	1,3-Dichlorobenzene	53 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	1,4-Dichlorobenzene	3.4 ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2,2-oxybis (1-chloropropane)	2.9 ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2,4,5-Trichlorophenol	611 nc	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	2,4,6-Trichlorophenol	0.61 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2,4-Dichlorophenol	18 nc	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	2,4-Dimethylphenol	122 nc	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	2,4-Dinitrophenol	12 nc	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	2,4-Dinitrotoluene	12 nc	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	2,6-Dinitrotoluene	6.1 nc	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	2-Chloronaphthalene	494 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2-Chlorophenol	6.3 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2-Methylnaphthalene	--	--	mg/kg		0.0195 U	0.085	0.013 J	0.02 J
	8270C	2-Methylphenol	306 nc	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	2-Nitroaniline	18.3 nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	2-Nitrophenol	--	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	3,3'-Dichlorobenzidine	1.1 ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	3-Nitroaniline	1.8 nc	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	4,6-Dinitro-2-methylphenol	0.61 nc	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	4-Bromophenyl phenyl ether	--	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	4-Chloro-3-methylphenol	--	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	4-Chloroaniline	24 nc	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	4-Chlorophenyl phenyl ether	--	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	4-Methylphenol	31 nc	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	4-Nitroaniline	23 ca	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	4-Nitrophenol	--	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	Acenaphthene	368 nc	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	Acenaphthylene	--	--	mg/kg		0.0195 U	0.018 J	0.0165 U	0.015 J
	8270C	Anthracene	2189 nc	--	mg/kg		0.0195 U	0.015 J	0.012 J	0.031 J
	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg		0.0195 U	0.083	0.044	0.14
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg		0.017 J	**0.1**	0.053	**0.14**
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg		0.029 J	0.15	0.069	0.21
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg		0.0195 U	0.044	0.025 J	0.056
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg		0.012 J	0.079	0.032 J	0.12
	8270C	Benzoic acid	100000 max	--	mg/kg		- R	- R	- R	- R
	8270C	Benzyl alcohol	1833 nc	--	mg/kg		0.395 U	0.34 U	0.335 U	0.35 U
	8270C	Bis(2-chloroethoxy)methane	--	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	Bis(2-chloroethyl) ether	0.22 ca	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
						Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
						Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Surface Soil Background Criteria	Units					
	8270C	Bis(2-ethylhexyl) phthalate	35	ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Butylbenzyl phthalate	1222	nc	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	Carbazole	24	ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.041 J
	8270C	Chrysene	62	ca	--	mg/kg		0.017 J	0.12	0.06	0.19
	8270C	Dibenzo(a,h)anthracene	0.062	ca	--	mg/kg		0.0195 U	0.013 J	0.0165 U	0.017 U
	8270C	Dibenzofuran	15	nc	--	mg/kg		0.0395 U	0.025 J	0.0335 U	0.018 J
	8270C	Diethyl phthalate	4888	nc	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	Dimethyl phthalate	100000	max	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	Di-n-butyl phthalate	611	nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Di-n-octyl phthalate	244	nc	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	Fluoranthene	229	nc	--	mg/kg		0.028 J	0.17	0.1	0.36
	8270C	Fluorene	275	nc	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.016 J
	8270C	Hexachlorobenzene	0.30	ca	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	Hexachlorobutadiene	6.2	ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Hexachlorocyclopentadiene	37	nc	--	mg/kg		0.6 U	0.5 U	0.5 U	0.5 U
	8270C	Hexachloroethane	35	ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Indeno(1,2,3-cd)pyrene	0.62	ca	--	mg/kg		0.0195 U	0.048	0.026 J	0.06
	8270C	Isophorone	512	ca	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Naphthalene	5.6	nc	--	mg/kg		0.0195 U	0.064	0.013 J	0.024 J
	8270C	Nitrobenzene	2	nc	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	n-Nitroso-di-n-propylamine	0.069	ca	--	mg/kg		0.0395 U	0.034 U	0.0335 U	0.035 U
	8270C	n-Nitrosodiphenylamine	99	ca	--	mg/kg		0.0195 U	0.017 U	0.0165 U	0.017 U
	8270C	Pentachlorophenol	3.0	ca	--	mg/kg		0.195 U	0.17 U	0.165 U	0.17 U
	8270C	Phenanthrene	--		--	mg/kg		0.0295 U	0.089	0.052	0.26
	8270C	Phenol	1833	nc	--	mg/kg		0.1 U	0.085 U	0.085 U	0.085 U
	8270C	Pyrene	232	nc	--	mg/kg		0.02 J	0.12	0.076	0.23
Explosives	8330	1,3,5-Trinitrobenzene	183	nc	--	mg/kg		0.05 U	0.0495 U	0.0495 U	0.0495 U
	8330	1,3-Dinitrobenzene	0.61	nc	--	mg/kg		0.05 U	0.0495 U	0.0495 U	0.0495 U
	8330	2,4,6-TNT	16	ca	--	mg/kg		0.05 U	0.0495 U	0.0495 U	0.0495 U
	8330	2,4-Dinitrotoluene	12	nc	--	mg/kg		0.05 U	0.0495 U	0.0495 U	0.0495 U
	8330	2,6-Dinitrotoluene	6.1	nc	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Amino-4,6-Dinitrotoluene	--		--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Nitrotoluene	0.88	ca	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	3-Nitrotoluene	73	nc	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	4-Amino-2,6-Dinitrotoluene	--		--	mg/kg		0.15 U	0.15 U	0.15 U	0.15 U
	8330	4-Nitrotoluene	12	ca	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	HMX	306	nc	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	Nitrobenzene	2	nc	--	mg/kg		0.05 U	0.0495 U	0.0495 U	0.0495 U
	8330	RDX	4.4	ca	--	mg/kg		0.1 U	0.1 U	0.1 U	0.1 U
	8330	Tetryl	61	nc	--	mg/kg		0.2 U	0.2 U	0.2 U	0.2 U
Propellants	353.2 Modified	Nitrocellulose	--		--	mg/kg		1			
	8332	Nitroglycerine	35	ca	--	mg/kg		0.25 U			
	SW8330 Modified	Nitroguanidine	611	nc	--	mg/kg		0.125 U			

Table LNW-7
Landfill North of Winklepeck Burning Grounds Summary of All Surface Soil (0-1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWss-039D-SO	LNWss-039M-SO	LNWss-040M-SO	LNWss-041M-SO	LNWss-042M-SO
					Sample Date:	11/1/2004	11/1/2004	11/1/2004	11/1/2004	11/1/2004
					Sample Depth:	0-1 ft	0-1 ft	0-1 ft	0-1 ft	0-1 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Surface Soil Background Criteria	Units					

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWsb-053-SO	LNWsb-054-SO	LNWsb-055-SO	LNWsb-056-DUP	LNWsb-056-SO	LNWsb-057-SO	LNWsb-058-SO	LNWsb-059-SO	LNWsb-060-SO	LNWsb-061-SO	LNWsb-062-SO	LNWsb-063-SO	LNWsb-064-DUP	LNWsb-064-SO	LNWsb-065-SO
						Sample Date:	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004
						Sample Depth:	2-4 ft	2-4 ft	2-4 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	6-8 ft	4-6 ft	6-8 ft	4-6 ft	2-4 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)		Deep Soil Background Criteria	Units															
Metals	6010B	Aluminum	7614	nc	19500	mg/kg	**12000**	**11000**	**11000**	**11000**	**10000**	**9800**	**8800**	7400	**9600**	**8100**	4900	**10000**	**11000**	**10000**	**9300**
	6010B	Arsenic	0.39	ca	19.8	mg/kg	**13**	**13**	**10**	**14**	**13**	**15**	**11**	**12**	**12**	**12**	**3.7**	**13**	**11**	**17**	**10**
	6010B	Barium	538	nc	124	mg/kg	67	79	57	87	57	47	49	23	46	47	23	56	57	49	59
	6010B	Beryllium	15	nc	0.88	mg/kg	0.75	0.77	0.66	0.93	0.71	0.68	0.65	0.47	0.65	0.53	0.37	0.73	0.83	0.74	0.56
	6010B	Cadmium	3.7	nc	0.00	mg/kg	0.13 U	0.14 U	0.125 U	0.2	0.11	0.15	0.14 U	0.145 U	0.135 U	0.14 U	0.135 U	0.135 U	0.14 U	0.14 U	0.145 U
	6010B	Calcium	--[n]		35500	mg/kg	2100	4500	9300	3300	11000	11000	3400	490	15000	1500	1600	17000	4500	11000	1400
	6010B	Chromium	30	ca	27.2	mg/kg	18	17	16	16	16	16	15	9.9	15	12	8.4	16	18	17	13
	6010B	Cobalt	30	ca	23.2	mg/kg	13	12	9.8	12	12	10	9.6	8.8	8.2	8.5	6.5	13	13	13	8.1
	6010B	Copper	313	nc	32.3	mg/kg	21	19	16	18	18	18	20	20	20	22	17	21	27	24	17
	6010B	Iron	2346	nc	35200	mg/kg	**25000**	**26000**	**22000**	**26000**	**25000**	**28000**	**23000**	**20000**	**23000**	**22000**	**14000**	**25000**	**28000**	**26000**	**19000**
	6010B	Lead	400	pbk	19.1	mg/kg	12	15	9.7	10	11	12	9.8	11	10	11	9.8	12	12	15	13
	6010B	Magnesium	--[n]		8790	mg/kg	3900	4300	5700	3700	4900	4600	3500	1800	5400	2500	2000	4900	4500	5000	2200
	6010B	Manganese	176	nc	3030	mg/kg	**490**	**380**	**300**	**420**	**360**	**390**	**280**	**320**	**220**	**350**	150	**520**	**540**	**330**	**400**
	6010B	Nickel	156	nc	60.7	mg/kg	31	32	24	33	26	26	24	14	21	19	15	28	29	26	17
	6010B	Potassium	--[n]		3350	mg/kg	1800	1300	1400	1200	1400	1300	1500	730	1800	1000	830	1900	1800	1900	1100
	6010B	Selenium	39	nc	1.5	mg/kg	0.56	0.85 U	0.75 U	0.51	0.57	0.53	0.47	0.46	0.66	0.85 U	0.45	0.62	0.77	0.59	0.63
	6010B	Silver	39	nc	0.00	mg/kg	0.5 U	0.55 U	0.5 U	0.55 U	0.55 U	0.55 U	0.55 U	0.6 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.6 U
	6010B	Sodium	--[n]		145	mg/kg	410	170 U	155 U	170 U	170 U	165 U	170 U	320	360	320	280	370	390	370	360
	6010B	Vanadium	7.8	nc	37.6	mg/kg	**18**	**18**	**16**	**17**	**17**	**17**	**15**	**13**	**16**	**14**	**10**	**18**	**18**	**18**	**17**
	6010B	Zinc	2346	nc	93.3	mg/kg	61	61	58	62	60	60	55	51	57	63	51	61	65	66	56
	7041	Antimony	3.1	nc	0.96	mg/kg	0.47	0.8 U	0.7 U	0.8 U	0.75 U	0.75 U	0.75 U	0.8 U	0.75 U	0.8 U	0.8 U	0.75 U	0.75 U	0.75 U	0.8 U
	7471A	Mercury	2.3	nc	0.04	mg/kg	0.0095 U	0.0092	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.015	0.021	0.031	0.022	0.03	0.034	0.027	0.01 U
	7841	Thallium	0.52	nc	0.91	mg/kg	0.28	0.3	0.22	0.35 U	0.315 U	0.31 U	0.325 U	0.345 U	0.33 U	0.335 U	0.35 U	0.325 U	0.33 U	0.21	0.33 U
SVOCs	8270C	1,2,4-Trichlorobenzene	6.2	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	1,2-Dichlorobenzene	600	sat	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	1,3-Dichlorobenzene	53	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	1,4-Dichlorobenzene	3.4	ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2,2-oxybis (1-chloropropane)	2.9	ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2,4,5-Trichlorophenol	611	nc	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	2,4,6-Trichlorophenol	0.61	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2,4-Dichlorophenol	18	nc	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	2,4-Dimethylphenol	122	nc	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	2,4-Dinitrophenol	12	nc	--	mg/kg	- R	- R	- R	- R	- R	- R	- R	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	2,4-Dinitrotoluene	12	nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	2,6-Dinitrotoluene	6.1	nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	2-Chloronaphthalene	494	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2-Chlorophenol	6.3	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2-Methylnaphthalene	--		--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	2-Methylphenol	306	nc	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	2-Nitroaniline	18.3	nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	2-Nitrophenol	--		--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	3,3'-Dichlorobenzidine	1.1	ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	3-Nitroaniline	1.8	nc	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	4,6-Dinitro-2-methylphenol	0.61	nc	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-053-SO	LNWsb-054-SO	LNWsb-055-SO	LNWsb-056-DUP	LNWsb-056-SO	LNWsb-057-SO	LNWsb-058-SO	LNWsb-059-SO	LNWsb-060-SO	LNWsb-061-SO	LNWsb-062-SO	LNWsb-063-SO	LNWsb-064-DUP	LNWsb-064-SO	LNWsb-065-SO
					Sample Date:	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	2-4 ft	2-4 ft	2-4 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	6-8 ft	4-6 ft	6-8 ft	4-6 ft	2-4 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units															
	8270C	4-Bromophenyl phenyl ether	--	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	4-Chloro-3-methylphenol	--	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	4-Chloroaniline	24 nc	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	4-Chlorophenyl phenyl ether	--	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	4-Methylphenol	31 nc	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	4-Nitroaniline	23 ca	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	4-Nitrophenol	--	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	Acenaphthene	368 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Acenaphthylene	--	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Anthracene	2189 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.017 J
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Benzoic acid	100000 max	--	mg/kg	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R	- R
	8270C	Benzyl alcohol	1833 nc	--	mg/kg	0.385 U	0.38 U	0.38 U	0.39 U	0.39 U	0.39 U	0.375 U	0.38 U	0.38 U	0.38 U	0.425 U	0.38 U	0.375 U	0.365 U	0.4 U
	8270C	Bis(2-chloroethoxy)methane	--	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Bis(2-chloroethyl) ether	0.22 ca	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Bis(2-ethylhexyl) phthalate	35 ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Butylbenzyl phthalate	1222 nc	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Carbazole	24 ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Chrysene	62 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.014 J
	8270C	Dibenzo(a,h)anthracene	0.062 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Dibenzofuran	15 nc	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Diethyl phthalate	4888 nc	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Dimethyl phthalate	100000 max	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	Di-n-butyl phthalate	611 nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Di-n-octyl phthalate	244 nc	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	Fluoranthene	229 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.022 J
	8270C	Fluorene	275 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Hexachlorobenzene	0.30 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Hexachlorobutadiene	6.2 ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Hexachlorocyclopentadiene	37 nc	--	mg/kg	0.55 U	0.55 U	0.55 U	0.6 U	0.6 U	0.6 U	0.55 U	0.55 U	0.55 U	0.55 U	0.65 U	0.55 U	0.55 U	0.55 U	0.6 U
	8270C	Hexachloroethane	35 ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Indeno(1,2,3-cd)pyrene	0.62 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Isophorone	512 ca	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U
	8270C	Naphthalene	5.6 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Nitrobenzene	2 nc	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	n-Nitroso-di-n-propylamine	0.069 ca	--	mg/kg	0.0385 U	0.038 U	0.038 U	0.039 U	0.039 U	0.039 U	0.0375 U	0.038 U	0.038 U	0.038 U	0.0425 U	0.038 U	0.0375 U	0.0365 U	0.04 U
	8270C	n-Nitrosodiphenylamine	99 ca	--	mg/kg	0.019 U	0.019 U	0.019 U	0.019 U	0.0195 U	0.019 U	0.0185 U	0.0185 U	0.019 U	0.0185 U	0.021 U	0.019 U	0.0185 U	0.018 U	0.0195 U
	8270C	Pentachlorophenol	3.0 ca	--	mg/kg	0.19 U	0.19 U	0.19 U	0.19 U	0.195 U	0.19 U	0.185 U	0.185 U	0.19 U	0.185 U	0.21 U	0.19 U	0.185 U	0.18 U	0.195 U
	8270C	Phenanthrene	--	--	mg/kg	0.0285 U	0.0285 U	0.0285 U	0.029 U	0.029 U	0.029 U	0.028 U	0.0285 U	0.0285 U	0.0285 U	0.0315 U	0.0285 U	0.028 U	0.027 U	0.03 U
	8270C	Phenol	1833 nc	--	mg/kg	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.095 U	0.105 U	0.095 U	0.095 U	0.09 U	0.1 U

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-053-SO	LNWsb-054-SO	LNWsb-055-SO	LNWsb-056-DUP	LNWsb-056-SO	LNWsb-057-SO	LNWsb-058-SO	LNWsb-059-SO	LNWsb-060-SO	LNWsb-061-SO	LNWsb-062-SO	LNWsb-063-SO	LNWsb-064-DUP	LNWsb-064-SO	LNWsb-065-SO
					Sample Date:	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/9/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	2-4 ft	2-4 ft	2-4 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	4-6 ft	6-8 ft	4-6 ft	6-8 ft	4-6 ft	2-4 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units															
	8270C	Pyrene	232 nc	--	mg/kg	0.0285 U	0.0285 U	0.0285 U	0.029 U	0.029 U	0.029 U	0.028 U	0.0285 U	0.0285 U	0.0285 U	0.0315 U	0.0285 U	0.028 U	0.027 U	0.03 U
Explosives	8330	1,3,5-Trinitrobenzene	183 nc	--	mg/kg	0.05 U	0.05 U	0.05 U	0.0495 U	0.0495 U	0.049 U	0.05 U	0.0495 U	0.049 U	0.05 U	0.049 U	0.049 U	0.049 U	0.05 U	0.05 U
	8330	1,3-Dinitrobenzene	0.61 nc	--	mg/kg	0.05 U	0.05 U	0.05 U	0.0495 U	0.0495 U	0.049 U	0.05 U	0.0495 U	0.049 U	0.05 U	0.049 U	0.049 U	0.049 U	0.05 U	0.05 U
	8330	2,4,6-TNT	16 ca	--	mg/kg	0.05 U	0.05 U	0.05 U	0.0495 U	0.0495 U	0.049 U	0.05 U	0.0495 U	0.049 U	0.05 U	0.049 U	0.049 U	0.049 U	0.05 U	0.05 U
	8330	2,4-Dinitrotoluene	12 nc	--	mg/kg	0.05 U	0.05 U	0.05 U	0.0495 U	0.0495 U	0.049 U	0.05 U	0.0495 U	0.049 U	0.05 U	0.049 U	0.049 U	0.049 U	0.05 U	0.05 U
	8330	2,6-Dinitrotoluene	6.1 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Amino-4,6-Dinitrotoluene	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Nitrotoluene	0.88 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	3-Nitrotoluene	73 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	4-Amino-2,6-Dinitrotoluene	--	--	mg/kg	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.145 U	0.15 U	0.15 U	0.145 U	0.15 U	0.145 U	0.145 U	0.145 U	0.15 U	0.15 U
	8330	4-Nitrotoluene	12 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	HMX	306 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	Nitrobenzene	2 nc	--	mg/kg	0.05 U	0.05 U	0.05 U	0.0495 U	0.0495 U	0.049 U	0.05 U	0.0495 U	0.049 U	0.05 U	0.049 U	0.049 U	0.049 U	0.05 U	0.05 U
	8330	RDX	4.4 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8330	Tetryl	61 nc	--	mg/kg	0.2 U	0.2 U	0.2 U	0.195 U	0.2 U	0.195 U	0.2 U	0.2 U	0.195 U	0.2 U	0.195 U	0.195 U	0.195 U	0.2 U	0.2 U

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Resu
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-066-SO	LNWsb-067-SO	LNWsb-068-SO	LNWsb-069-SO
					Sample Date:	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	4-6 ft	6-8 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units				
Metals	6010B	Aluminum	7614 nc	19500	mg/kg	**10000**	5600	6200	6800
	6010B	Arsenic	0.39 ca	19.8	mg/kg	**14**	**9.6**	**10 J**	**13**
	6010B	Barium	538 nc	124	mg/kg	61	16	34	24
	6010B	Beryllium	15 nc	0.88	mg/kg	0.69	0.38	0.42	0.42
	6010B	Cadmium	3.7 nc	0.00	mg/kg	0.14 U	0.135 U	0.14 U	0.15 U
	6010B	Calcium	--[n]	35500	mg/kg	1800	870	600	810
	6010B	Chromium	30 ca	27.2	mg/kg	15	10	8.2	11
	6010B	Cobalt	30 ca	23.2	mg/kg	10	5.7	6.2 J	7.2
	6010B	Copper	313 nc	32.3	mg/kg	20	21	20 J	22
	6010B	Iron	2346 nc	35200	mg/kg	**25000**	**18000**	**17000 J**	**22000**
	6010B	Lead	400 pbk	19.1	mg/kg	12	9.8	10 J	9.9
	6010B	Magnesium	--[n]	8790	mg/kg	3400	2100	1700	2400
	6010B	Manganese	176 nc	3030	mg/kg	**400**	120	**380 J**	**260**
	6010B	Nickel	156 nc	60.7	mg/kg	25	15	15	18
	6010B	Potassium	--[n]	3350	mg/kg	1500	810	870 J	970
	6010B	Selenium	39 nc	1.5	mg/kg	0.54	0.78	0.69	0.68
	6010B	Silver	39 nc	0.00	mg/kg	0.55 U	0.55 U	0.55 U	0.6 U
	6010B	Sodium	--[n]	145	mg/kg	340	240	250	350
	6010B	Vanadium	7.8 nc	37.6	mg/kg	**16**	**9.9**	**13**	**11**
	6010B	Zinc	2346 nc	93.3	mg/kg	65	51	65 J	56
	7041	Antimony	3.1 nc	0.96	mg/kg	0.8 U	0.8 U	- R	0.85 U
	7471A	Mercury	2.3 nc	0.04	mg/kg	0.036	0.022	0.018	0.0105 U
	7841	Thallium	0.52 nc	0.91	mg/kg	0.34 U	0.35 U	0.34 U	0.355 U
SVOCs	8270C	1,2,4-Trichlorobenzene	6.2 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	1,2-Dichlorobenzene	600 sat	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	1,3-Dichlorobenzene	53 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	1,4-Dichlorobenzene	3.4 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2,2-oxybis (1-chloropropane)	2.9 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2,4,5-Trichlorophenol	611 nc	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	2,4,6-Trichlorophenol	0.61 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2,4-Dichlorophenol	18 nc	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	2,4-Dimethylphenol	122 nc	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	2,4-Dinitrophenol	12 nc	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	2,4-Dinitrotoluene	12 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	2,6-Dinitrotoluene	6.1 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	2-Chloronaphthalene	494 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2-Chlorophenol	6.3 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2-Methylnaphthalene	--	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	2-Methylphenol	306 nc	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	2-Nitroaniline	18.3 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	2-Nitrophenol	--	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	3,3'-Dichlorobenzidine	1.1 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	3-Nitroaniline	1.8 nc	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	4,6-Dinitro-2-methylphenol	0.61 nc	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Resu
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-066-SO	LNWsb-067-SO	LNWsb-068-SO	LNWsb-069-SO
					Sample Date:	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	4-6 ft	6-8 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units				
	8270C	4-Bromophenyl phenyl ether	--	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	4-Chloro-3-methylphenol	--	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	4-Chloroaniline	24 nc	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	4-Chlorophenyl phenyl ether	--	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	4-Methylphenol	31 nc	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	4-Nitroaniline	23 ca	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	4-Nitrophenol	--	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	Acenaphthene	368 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Acenaphthylene	--	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Anthracene	2189 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Benzoic acid	100000 max	--	mg/kg	- R	- R	- R	- R
	8270C	Benzyl alcohol	1833 nc	--	mg/kg	0.395 U	0.43 U	0.395 U	0.415 U
	8270C	Bis(2-chloroethoxy)methane	--	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Bis(2-chloroethyl) ether	0.22 ca	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Bis(2-ethylhexyl) phthalate	35 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Butylbenzyl phthalate	1222 nc	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Carbazole	24 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Chrysene	62 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Dibenzo(a,h)anthracene	0.062 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Dibenzofuran	15 nc	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Diethyl phthalate	4888 nc	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Dimethyl phthalate	100000 max	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	Di-n-butyl phthalate	611 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Di-n-octyl phthalate	244 nc	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	Fluoranthene	229 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Fluorene	275 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Hexachlorobenzene	0.30 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Hexachlorobutadiene	6.2 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Hexachlorocyclopentadiene	37 nc	--	mg/kg	0.6 U	0.65 U	0.6 U	0.6 U
	8270C	Hexachloroethane	35 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Indeno(1,2,3-cd)pyrene	0.62 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Isophorone	512 ca	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U
	8270C	Naphthalene	5.6 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Nitrobenzene	2 nc	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	n-Nitroso-di-n-propylamine	0.069 ca	--	mg/kg	0.0395 U	0.043 U	0.0395 U	0.0415 U
	8270C	n-Nitrosodiphenylamine	99 ca	--	mg/kg	0.0195 U	0.021 U	0.0195 U	0.0205 U
	8270C	Pentachlorophenol	3.0 ca	--	mg/kg	0.195 U	0.21 U	0.195 U	0.205 U
	8270C	Phenanthrene	--	--	mg/kg	0.0295 U	0.032 U	0.0295 U	0.031 U
	8270C	Phenol	1833 nc	--	mg/kg	0.1 U	0.105 U	0.1 U	0.105 U

Table LNW-8
Landfill North of Winklepeck Burning Grounds Summary of All Subsurface Soil (>1 ft) Resu
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsb-066-SO	LNWsb-067-SO	LNWsb-068-SO	LNWsb-069-SO
					Sample Date:	11/10/2004	11/10/2004	11/10/2004	11/10/2004
					Sample Depth:	4-6 ft	6-8 ft	2-4 ft	2-4 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Deep Soil Background Criteria	Units				
	8270C	Pyrene	232 nc	--	mg/kg	0.0295 U	0.032 U	0.0295 U	0.031 U
Explosives	8330	1,3,5-Trinitrobenzene	183 nc	--	mg/kg	0.05 U	0.0495 U	0.05 U	0.049 U
	8330	1,3-Dinitrobenzene	0.61 nc	--	mg/kg	0.05 U	0.0495 U	0.05 U	0.049 U
	8330	2,4,6-TNT	16 ca	--	mg/kg	0.05 U	0.0495 U	0.05 U	0.049 U
	8330	2,4-Dinitrotoluene	12 nc	--	mg/kg	0.05 U	0.0495 U	0.05 U	0.049 U
	8330	2,6-Dinitrotoluene	6.1 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Amino-4,6-Dinitrotoluene	--	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	2-Nitrotoluene	0.88 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	3-Nitrotoluene	73 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	4-Amino-2,6-Dinitrotoluene	--	--	mg/kg	0.15 U	0.15 U	0.15 U	0.145 U
	8330	4-Nitrotoluene	12 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	HMX	306 nc	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	Nitrobenzene	2 nc	--	mg/kg	0.05 U	0.0495 U	0.05 U	0.049 U
	8330	RDX	4.4 ca	--	mg/kg	0.1 U	0.1 U	0.1 U	0.1 U
	8330	Tetryl	61 nc	--	mg/kg	0.2 U	0.2 U	0.2 U	0.195 U

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-9
Landfill North of Winklepeck Burning Grounds Summary of All Sediment Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							
Metals	6010B	Aluminum	7614 nc	13900	mg/kg	**9900**		7400		**9200**	**9100**	**10000**
	6010B	Arsenic	0.39 ca	19.5	mg/kg	**7.8**		**6.4**		**12**	**12**	**7.8**
	6010B	Barium	538 nc	123	mg/kg	80		62		83	81	110
	6010B	Beryllium	15 nc	0.38	mg/kg	0.7		0.53		0.68	0.66	0.73
	6010B	Cadmium	3.7 nc	0.00	mg/kg	0.27 U		0.34		0.275 U	0.265 U	0.24 U
	6010B	Calcium	--[n]	5510	mg/kg	2100		1900		2100	1900	1800
	6010B	Chromium	30 ca	18.1	mg/kg	13		10		13	12	13
	6010B	Cobalt	30 ca	9.1	mg/kg	8.6		6.9		8.8	8.5	7.5
	6010B	Copper	313 nc	27.6	mg/kg	15		12		16	18	16
	6010B	Iron	2346 nc	28200	mg/kg	**20000**		**16000**		**22000**	**22000**	**19000**
	6010B	Lead	400 pbk	27.4	mg/kg	15		15		17	16	19
	6010B	Magnesium	--[n]	2760	mg/kg	2400		1700		2200	2200	2200
	6010B	Manganese	176 nc	1950	mg/kg	**600**		**470**		**710**	**710**	**700**
	6010B	Nickel	156 nc	17.7	mg/kg	19		14		18	18	17
	6010B	Potassium	--[n]	1950	mg/kg	1300		930		1200	1200	810
	6010B	Selenium	39 nc	1.7	mg/kg	1.65 U		1.5 U		1.65 U	1.6 U	1.45 U
	6010B	Silver	39 nc	0.00	mg/kg	1.1 U		1 U		1.1 U	1.05 U	0.95 U
	6010B	Sodium	--[n]	112	mg/kg	280		240		300	280	280
	6010B	Vanadium	7.8 nc	26.1	mg/kg	**18**		**15**		**17**	**17**	**18**
	6010B	Zinc	2346 nc	532	mg/kg	85		71		91	89	75
	7041	Antimony	3.1 nc	0.00	mg/kg	1.25 U		1.15 U		1.15 U	1.55 U	1.15 U
	7471A	Mercury	2.3 nc	0.06	mg/kg	0.038		0.038		0.035	0.061	0.068
	7841	Thallium	0.52 nc	0.89	mg/kg	0.55 U		0.49 U		0.49 U	0.65 U	0.495 U
Pesticides	8081A	4,4'-DDD	2.4 ca	--	mg/kg			0.00185 U				
	8081A	4,4'-DDE	1.7 ca	--	mg/kg			0.0022 U				
	8081A	4,4'-DDT	1.7 ca	--	mg/kg			0.00185 U				
	8081A	Aldrin	0.029 ca	--	mg/kg			0.00185 U				
	8081A	alpha-BHC	0.09 sat	--	mg/kg			0.00185 U				
	8081A	alpha-Chlordane	1.6 ca	--	mg/kg			0.00185 U				
	8081A	beta-BHC	0.32 ca	--	mg/kg			0.00185 U				
	8081A	delta-BHC	--	--	mg/kg			0.00185 U				
	8081A	Dieldrin	0.030 ca	--	mg/kg			0.00185 U				
	8081A	Endosulfan I	37 nc	--	mg/kg			0.00185 U				
	8081A	Endosulfan II	37 nc	--	mg/kg			0.00185 U				
	8081A	Endosulfan sulfate	37 nc	--	mg/kg			0.00185 U				
	8081A	Endrin	1.8 nc	--	mg/kg			0.00185 U				
	8081A	Endrin aldehyde	--	--	mg/kg			0.00185 U				
	8081A	Endrin ketone	--	--	mg/kg			0.00185 U				
	8081A	gamma-BHC	0.44 ca	--	mg/kg			0.00185 U				
	8081A	gamma-Chlordane	1.6 ca	--	mg/kg			0.00185 U				
	8081A	Heptachlor	0.11 ca	--	mg/kg			0.00185 U				
	8081A	Heptachlor epoxide	0.053 ca	--	mg/kg			0.00185 U				
	8081A	Methoxychlor	31 nc	--	mg/kg			0.009 U				

Table LNW-9
Landfill North of Winklepeck Burning Grounds Summary of All Sediment Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							
	8081A	Toxaphene	0.44 ca	--	mg/kg			0.0185 U				
PCBs	8082	Aroclor 1016	0.39 nc	--	mg/kg			0.036 U				
	8082	Aroclor 1221	0.22 ca	--	mg/kg			0.036 U				
	8082	Aroclor 1232	0.22 ca	--	mg/kg			0.0185 U				
	8082	Aroclor 1242	0.22 ca	--	mg/kg			0.036 U				
	8082	Aroclor 1248	0.22 ca	--	mg/kg			0.0185 U				
	8082	Aroclor 1254	0.22 ca	--	mg/kg			0.036 U				
	8082	Aroclor 1260	0.22 ca	--	mg/kg			0.036 U				
VOCs	8260B	1,1,1-Trichloroethane	1200 sat	--	mg/kg		0.0034 U					
	8260B	1,1,2,2-Tetrachloroethane	0.41 ca	--	mg/kg		0.0034 UJ					
	8260B	1,1,2-Trichloroethane	0.73 ca	--	mg/kg		0.0034 UJ					
	8260B	1,1-Dichloroethane	51 nc	--	mg/kg		0.0034 U					
	8260B	1,1-Dichloroethene	12 nc	--	mg/kg		0.0034 UJ					
	8260B	1,2-Dibromoethane	0.032 ca	--	mg/kg		0.0034 UJ					
	8260B	1,2-Dichloroethane	0.28 ca	--	mg/kg		0.0034 UJ					
	8260B	1,2-Dichloroethene (total)	6.9 nc	--	mg/kg		0.007 U					
	8260B	1,2-Dichloropropane	0.34 ca	--	mg/kg		0.0034 U					
	8260B	2-Butanone	2231 nc	--	mg/kg		0.01 U					
	8260B	2-Hexanone	530 nc	--	mg/kg		0.007 U					
	8260B	4-Methyl-2-pentanone	528 nc	--	mg/kg		0.007 U					
	8260B	Acetone	1412 nc	--	mg/kg		0.01 U					
	8260B	Benzene	0.64 ca	--	mg/kg		0.0034 UJ					
	8260B	Bromochloromethane	--	--	mg/kg		0.0034 UJ					
	8260B	Bromodichloromethane	0.82 ca	--	mg/kg		0.0034 UJ					
	8260B	Bromoform	62 ca	--	mg/kg		0.0034 UJ					
	8260B	Bromomethane	0.39 nc	--	mg/kg		0.0034 U					
	8260B	Carbon disulfide	36 nc	--	mg/kg		0.0034 U					
	8260B	Carbon tetrachloride	0.25 ca	--	mg/kg		0.0034 UJ					
	8260B	Chlorobenzene	15 nc	--	mg/kg		0.0034 UJ					
	8260B	Chloroethane	3.0 ca	--	mg/kg		0.0034 UJ					
	8260B	Chloroform	0.22 ca	--	mg/kg		0.0034 U					
	8260B	Chloromethane	4.7 nc	--	mg/kg		0.0034 U					
	8260B	cis-1,2-Dichloroethene	4.3 nc	--	mg/kg		0.0034 U					
	8260B	cis-1,3-Dichloropropene	0.78 ca	--	mg/kg		0.0034 UJ					
	8260B	Dibromochloromethane	1.1 ca	--	mg/kg		0.0034 UJ					
	8260B	Ethylbenzene	395 sat	--	mg/kg		0.0034 UJ					
	8260B	m&p-Xylenes	27 nc	--	mg/kg		0.007 UJ					
	8260B	Methylene chloride	9.1 ca	--	mg/kg		0.007 U					
	8260B	o-Xylene	27 nc	--	mg/kg		0.0034 UJ					
	8260B	Styrene	1700 sat	--	mg/kg		0.0034 UJ					
	8260B	Tetrachloroethene	0.48 ca	--	mg/kg		0.0034 UJ					
	8260B	Toluene	520 sat	--	mg/kg		0.0034 UJ					
	8260B	Total Xylenes	27 nc	--	mg/kg		0.007 UJ					

Table LNW-9
Landfill North of Winklepeck Burning Grounds Summary of All Sediment Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							
	8260B	trans-1,2-Dichloroethene	6.9 nc	--	mg/kg		0.0034 UJ					
	8260B	trans-1,3-Dichloropropene	0.78 ca	--	mg/kg		0.0034 UJ					
	8260B	Trichloroethene	0.053 ca	--	mg/kg		0.0034 UJ					
	8260B	Vinyl chloride	0.079 ca	--	mg/kg		0.0034 UJ					
SVOCs	8270C	1,2,4-Trichlorobenzene	6.2 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	1,2-Dichlorobenzene	600 sat	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	1,3-Dichlorobenzene	53 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	1,4-Dichlorobenzene	3.4 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2,2-oxybis (1-chloropropane)	2.9 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2,4,5-Trichlorophenol	611 nc	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	2,4,6-Trichlorophenol	0.61 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2,4-Dichlorophenol	18 nc	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	2,4-Dimethylphenol	122 nc	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	2,4-Dinitrophenol	12 nc	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	2,4-Dinitrotoluene	12 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	2,6-Dinitrotoluene	6.1 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	2-Chloronaphthalene	494 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2-Chlorophenol	6.3 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2-Methylnaphthalene	--	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	2-Methylphenol	306 nc	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	2-Nitroaniline	18.3 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	2-Nitrophenol	--	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	3,3'-Dichlorobenzidine	1.1 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	3-Nitroaniline	1.8 nc	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	4,6-Dinitro-2-methylphenol	0.61 nc	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	4-Bromophenyl phenyl ether	--	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	4-Chloro-3-methylphenol	--	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	4-Chloroaniline	24 nc	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	4-Chlorophenyl phenyl ether	--	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	4-Methylphenol	31 nc	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	4-Nitroaniline	23 ca	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	4-Nitrophenol	--	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	Acenaphthene	368 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Acenaphthylene	--	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Anthracene	2189 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Benzo(a)anthracene	0.62 ca	--	mg/kg	0.027 J		0.059 J		0.029 J	0.033 J	0.18 U
	8270C	Benzo(a)pyrene	0.062 ca	--	mg/kg	0.025 J		**0.064 J**		0.023 J	0.031 J	0.18 U
	8270C	Benzo(b)fluoranthene	0.62 ca	--	mg/kg	0.037 J		0.091		0.0365 U	0.042 J	0.18 U
	8270C	Benzo(g,h,i)perylene	--	--	mg/kg	0.0375 U		0.043 J		0.0365 U	0.0375 U	0.18 U
	8270C	Benzo(k)fluoranthene	6.2 ca	--	mg/kg	0.025 J		0.038 J		0.0365 U	0.0375 U	0.18 U
	8270C	Benzoic acid	100000 max	--	mg/kg	- R		- R		- R	- R	- R
	8270C	Benzyl alcohol	1833 nc	--	mg/kg	0.75 U		0.7 U		0.75 U	0.75 U	3.65 U
	8270C	Bis(2-chloroethoxy)methane	--	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	Bis(2-chloroethyl) ether	0.22 ca	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U

Table LNW-9
Landfill North of Winklepeck Burning Grounds Summary of All Sediment Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							
	8270C	Bis(2-ethylhexyl) phthalate	35 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Butylbenzyl phthalate	1222 nc	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	Carbazole	24 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Chrysene	62 ca	--	mg/kg	0.041 J		0.079		0.03 J	0.033 J	0.18 U
	8270C	Dibenzo(a,h)anthracene	0.062 ca	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Dibenzofuran	15 nc	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	Diethyl phthalate	4888 nc	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	Dimethyl phthalate	100000 max	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	Di-n-butyl phthalate	611 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Di-n-octyl phthalate	244 nc	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	Fluoranthene	229 nc	--	mg/kg	0.044 J		0.068 J		0.034 J	0.041 J	0.18 U
	8270C	Fluorene	275 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Hexachlorobenzene	0.30 ca	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Hexachlorobutadiene	6.2 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Hexachlorocyclopentadiene	37 nc	--	mg/kg	1.15 U		1.05 U		1.1 U	1.15 U	5.5 U
	8270C	Hexachloroethane	35 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Indeno(1,2,3-cd)pyrene	0.62 ca	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Isophorone	512 ca	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Naphthalene	5.6 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Nitrobenzene	2 nc	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	n-Nitroso-di-n-propylamine	0.069 ca	--	mg/kg	0.075 U		0.07 U		0.075 U	0.075 U	0.365 U
	8270C	n-Nitrosodiphenylamine	99 ca	--	mg/kg	0.0375 U		0.0355 U		0.0365 U	0.0375 U	0.18 U
	8270C	Pentachlorophenol	3.0 ca	--	mg/kg	0.375 U		0.355 U		0.365 U	0.375 U	1.8 U
	8270C	Phenanthrene	--	--	mg/kg	0.055 U		0.055 U		0.055 U	0.055 U	0.275 U
	8270C	Phenol	1833 nc	--	mg/kg	0.19 U		0.18 U		0.185 U	0.19 U	0.9 U
	8270C	Pyrene	232 nc	--	mg/kg	0.043 J		0.071 J		0.037 J	0.043 J	0.275 U
Explosives	8330	1,3,5-Trinitrobenzene	183 nc	--	mg/kg	0.05 U		0.05 U		0.05 U	0.0495 U	0.49 U
	8330	1,3-Dinitrobenzene	0.61 nc	--	mg/kg	0.05 U		0.05 U		0.05 U	0.0495 U	0.49 U
	8330	2,4,6-TNT	16 ca	--	mg/kg	0.05 U		0.05 U		0.05 U	0.0495 U	0.49 U
	8330	2,4-Dinitrotoluene	12 nc	--	mg/kg	0.05 U		0.05 U		0.05 U	0.0495 U	0.49 U
	8330	2,6-Dinitrotoluene	6.1 nc	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	2-Amino-4,6-Dinitrotoluene	--	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	2-Nitrotoluene	0.88 ca	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	3-Nitrotoluene	73 nc	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	4-Amino-2,6-Dinitrotoluene	--	--	mg/kg	0.15 U		0.15 U		0.15 U	0.15 U	1.45 U
	8330	4-Nitrotoluene	12 ca	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	HMX	306 nc	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	Nitrobenzene	2 nc	--	mg/kg	0.05 U		0.05 U		0.05 U	0.0495 U	0.49 U
	8330	RDX	4.4 ca	--	mg/kg	0.1 U		0.1 U		0.1 U	0.1 U	1 U
	8330	Tetryl	61 nc	--	mg/kg	0.2 U		0.2 U		0.2 U	0.2 U	1.95 U
Propellants	353.2 Modified	Nitrocellulose	--	--	mg/kg				1.4			
	8332	Nitroglycerine	35 ca	--	mg/kg			0.25 U				
	SW8330 Modified	Nitroguanidine	611 nc	--	mg/kg				0.125 U			

Table LNW-9
Landfill North of Winklepeck Burning Grounds Summary of All Sediment Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsd-043M-SD	LNWsd-044D-SD	LNWsd-044M-SD	LNWsd-044-SD	LNWsd-045M-DUP	LNWsd-045M-SD	LNWsd-046M-SD
					Sample Date:	11/3/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004	11/2/2004
					Sample Depth:	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft	0-0.5 ft
Group	Method	Parameter	Region 9 PRG (Residential Soil)	Sediment Background Criteria	Units							

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
mg/kg - means milligrams per Kilogram (parts per million - ppm)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style.
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-10
Landfill North of Winklepeck Burning Grounds Summary of All Surface Water Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							
Metals	6010B	Aluminum	36499 nc	3370	ug/l	120	120	300	110	190	71	71
	6010B	Barium	2555 nc	47.5	ug/l	33	35	36	37	53	22	23
	6010B	Beryllium	73 nc	0.00	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	6010B	Cadmium	18 nc	0.00	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	6010B	Calcium	--[n]	41400	ug/l	38000	39000	38000	35000	32000 J	27000	28000
	6010B	Chromium	109 nc	0.00	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	6010B	Cobalt	730 nc	0.00	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
	6010B	Copper	1460 nc	7.9	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	6010B	Iron	10950 nc	2560	ug/l	890	1100	1600	1300	1800 J	1900	1900
	6010B	Magnesium	--[n]	10800	ug/l	8700	9000	8900	8100	8300 J	6400	6500
	6010B	Manganese	876 nc	391	ug/l	310	470	450	350	**1700 J**	820	830
	6010B	Nickel	730 nc	0.00	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	6010B	Potassium	--[n]	3170	ug/l	2800	2800	3500	2800	2300	1700	1700
	6010B	Selenium	182 nc	0.00	ug/l	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
	6010B	Silver	182 nc	0.00	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	6010B	Sodium	--[n]	21300	ug/l	3000	3100	3100	3000	3200	2300	2300
	6010B	Vanadium	36 nc	0.00	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	6010B	Zinc	10950 nc	42	ug/l	15 U	15 U	15 U	15 U	15 U	4.8	3.5
	7041	Antimony	15 nc	0.00	ug/l	3.75 U	3.75 U	3.75 U	3.75 U	3.75 U	3.75 U	3.75 U
	7060A	Arsenic	0.045 ca	3.2	ug/l	**0.63**	**0.57**	**1**	**0.59**	**1.3**	1 U	1 U
	7421	Lead	15 mcl	0.00	ug/l	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
	7470A	Mercury	11 nc	0.00	ug/l	0.1 U	0.1 U	0.05	0.1 U	0.1 U	0.1 U	0.1 U
	7841	Thallium	2.4 nc	0.00	ug/l	2 U	2 U	1.5	2 U	2 U	2 U	2 U
Pesticides	8081A	4,4'-DDD	0.28 ca	--	ug/l	0.05 U	0.055 U	0.055 U	0.055 U	0.055 U	0.05 U	0.05 U
	8081A	4,4'-DDE	0.20 ca	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	4,4'-DDT	0.20 ca	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Aldrin	0.0040 ca	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	alpha-BHC	0.011 nc	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	alpha-Chlordane	0.19 ca	--	ug/l	0.024 U	0.024 U	0.025 U	0.0245 U	0.0245 U	0.0235 U	0.024 U
	8081A	beta-BHC	0.037 ca	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	delta-BHC	--	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	Dieldrin	0.0042 ca	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	Endosulfan I	220 nc	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	Endosulfan II	220 nc	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Endosulfan sulfate	220 nc	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Endrin	11 nc	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	Endrin aldehyde	--	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Endrin ketone	--	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	gamma-BHC	0.052 ca	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	gamma-Chlordane	0.19 ca	--	ug/l	0.0475 U	0.048 U	0.05 U	0.0485 U	0.0485 U	0.0465 U	0.0475 U
	8081A	Heptachlor	0.015 ca	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Heptachlor epoxide	0.0074 ca	--	ug/l	0.07 U	0.07 U	0.075 U	0.075 U	0.075 U	0.07 U	0.07 U
	8081A	Methoxychlor	182 nc	--	ug/l	0.285 U	0.29 U	0.3 U	0.29 U	0.29 U	0.28 U	0.285 U
	8081A	Toxaphene	0.061 ca	--	ug/l	0.24 U	0.24 U	0.25 U	0.245 U	0.245 U	0.235 U	0.24 U

Table LNW-10
Landfill North of Winklepeck Burning Grounds Summary of All Surface Water Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							
PCBs	8082	Aroclor 1016	0.96 ca	--	ug/l	0.285 U	0.29 U	0.3 U	0.29 U	0.29 U	0.28 U	0.285 U
	8082	Aroclor 1221	0.034 ca	--	ug/l	0.6 U	0.6 U	0.65 U	0.65 U	0.65 U	0.6 U	0.6 U
	8082	Aroclor 1232	0.034 ca	--	ug/l	0.6 U	0.6 U	0.65 U	0.65 U	0.65 U	0.6 U	0.6 U
	8082	Aroclor 1242	0.034 ca	--	ug/l	0.6 U	0.6 U	0.65 U	0.65 U	0.65 U	0.6 U	0.6 U
	8082	Aroclor 1248	0.034 ca	--	ug/l	0.7 U	0.7 U	0.75 U	0.75 U	0.75 U	0.7 U	0.7 U
	8082	Aroclor 1254	0.034 ca	--	ug/l	0.6 U	0.6 U	0.65 U	0.65 U	0.65 U	0.6 U	0.6 U
	8082	Aroclor 1260	0.034 ca	--	ug/l	0.285 U	0.29 U	0.3 U	0.29 U	0.29 U	0.28 U	0.285 U
VOCs	8260B	1,1,1-Trichloroethane	3172 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1,2,2-Tetrachloroethane	0.055 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1,2-Trichloroethane	0.20 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1-Dichloroethane	811 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1-Dichloroethene	339 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dibromoethane	0.0056 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloroethane	0.12 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloroethene (total)	120 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloropropane	0.16 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	2-Butanone	6968 nc	--	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	8260B	2-Hexanone	2000 nc	--	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	8260B	4-Methyl-2-pentanone	1993 nc	--	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	8260B	Acetone	5475 nc	--	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
	8260B	Benzene	0.35 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromochloromethane	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromodichloromethane	0.18 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromoform	8.5 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromomethane	8.7 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Carbon disulfide	1043 nc	--	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
	8260B	Carbon tetrachloride	0.17 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chlorobenzene	106 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloroethane	4.6 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloroform	0.17 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloromethane	158 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	cis-1,2-Dichloroethene	61 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	cis-1,3-Dichloropropene	0.40 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Dibromochloromethane	0.13 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Ethylbenzene	1340 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	m&p-Xylenes	206 nc	--	ug/l	1 U	1 U	1 U	1 U	1 U	1 U	1 U
	8260B	Methylene chloride	4.3 ca	--	ug/l	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
	8260B	o-Xylene	206 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Styrene	1641 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Tetrachloroethene	0.10 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Toluene	723 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Total Xylenes	206 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	trans-1,2-Dichloroethene	122 nc	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	trans-1,3-Dichloropropene	0.40 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table LNW-10
Landfill North of Winklepeck Burning Grounds Summary of All Surface Water Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							
	8260B	Trichloroethene	0.028 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Vinyl chloride	0.020 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs	8270C	1,2,4-Trichlorobenzene	7.2 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	1,2-Dichlorobenzene	370 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	1,3-Dichlorobenzene	182 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	1,4-Dichlorobenzene	0.50 ca	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	2,2-oxybis (1-chloropropane)	0.27 ca	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	2,4,5-Trichlorophenol	3650 nc	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	2,4,6-Trichlorophenol	3.6 nc	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	2,4-Dichlorophenol	109 nc	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	2,4-Dimethylphenol	730 nc	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	2,4-Dinitrophenol	73 nc	--	ug/l	9.5 UJ	9.5 UJ	10.5 UJ	10 UJ	10 UJ	9.5 U	9.5 U
	8270C	2,4-Dinitrotoluene	73 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	2,6-Dinitrotoluene	36 nc	--	ug/l	0.245 U	0.245 U	0.26 U	0.245 U	0.25 U	0.235 U	0.235 U
	8270C	2-Chloronaphthalene	487 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	2-Chlorophenol	30 nc	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	2-Methylnaphthalene	--	--	ug/l	0.245 U	0.245 U	0.26 U	0.245 U	0.25 U	0.235 U	0.235 U
	8270C	2-Methylphenol	1825 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	2-Nitroaniline	109 nc	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	2-Nitrophenol	--	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	3,3'-Dichlorobenzidine	0.15 ca	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	3-Nitroaniline	3.2 ca	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	4,6-Dinitro-2-methylphenol	3.6 nc	--	ug/l	9.5 U	9.5 U	10.5 U	10 U	10 U	9.5 U	9.5 U
	8270C	4-Bromophenyl phenyl ether	--	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	4-Chloro-3-methylphenol	--	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	4-Chloroaniline	146 nc	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	4-Chlorophenyl phenyl ether	--	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	4-Methylphenol	182 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	4-Nitroaniline	3.2 ca	--	ug/l	4.85 UJ	4.85 UJ	5 UJ	4.9 UJ	5 UJ	4.65 U	4.7 U
	8270C	4-Nitrophenol	--	--	ug/l	9.5 U	9.5 U	10.5 U	10 U	10 U	9.5 U	9.5 U
	8270C	Acenaphthene	365 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Acenaphthylene	--	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Anthracene	1825 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Benzo(a)anthracene	0.092 ca	--	ug/l	**0.17 J**	0.095 U	0.105 U	0.1 U	0.1 U	0.095 U	0.095 U
	8270C	Benzo(a)pyrene	0.0092 ca	--	ug/l	**0.12 J**	0.195 U	0.205 U	0.195 U	0.2 U	0.185 U	0.19 U
	8270C	Benzo(b)fluoranthene	0.092 ca	--	ug/l	**0.11 J**	0.195 U	0.205 U	0.195 U	0.2 U	0.185 U	0.19 U
	8270C	Benzo(g,h,i)perylene	--	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Benzo(k)fluoranthene	0.92 ca	--	ug/l	0.14 J	0.195 U	0.205 U	0.195 U	0.2 U	0.185 U	0.19 U
	8270C	Benzoic acid	145979 nc	--	ug/l	9.5 U	9.5 U	10.5 U	10 U	10 U	9.5 U	9.5 U
	8270C	Benzyl alcohol	10950 nc	--	ug/l	9.5 U	9.5 U	10.5 U	10 U	10 U	9.5 U	9.5 U
	8270C	Bis(2-chloroethoxy)methane	--	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Bis(2-chloroethyl) ether	0.010 ca	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Bis(2-ethylhexyl) phthalate	4.8 ca	--	ug/l	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7 U	7 U
	8270C	Butylbenzyl phthalate	7300 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U

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						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							
	8270C	Carbazole	3.4 ca	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	Chrysene	9.2 ca	--	ug/l	0.17 J	0.245 U	0.26 U	0.245 U	0.25 U	0.235 U	0.235 U
	8270C	Dibenzo(a,h)anthracene	0.0092 ca	--	ug/l	**0.13 J**	0.195 UJ	0.205 UJ	0.195 UJ	0.2 UJ	0.185 U	0.19 U
	8270C	Dibenzofuran	12 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Diethyl phthalate	29199 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Dimethyl phthalate	364867 nc	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Di-n-butyl phthalate	3650 nc	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	Di-n-octyl phthalate	1460 nc	--	ug/l	4.85 UJ	4.85 UJ	5 UJ	4.9 UJ	5 UJ	4.65 U	4.7 U
	8270C	Fluoranthene	1460 nc	--	ug/l	0.14 J	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Fluorene	243 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Hexachlorobenzene	0.042 ca	--	ug/l	0.245 U	0.245 U	0.26 U	0.245 U	0.25 U	0.235 U	0.235 U
	8270C	Hexachlorobutadiene	0.86 ca	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	Hexachlorocyclopentadiene	219 nc	--	ug/l	- R	- R	- R	- R	- R	- R	- R
	8270C	Hexachloroethane	4.8 ca	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	Indeno(1,2,3-cd)pyrene	0.092 ca	--	ug/l	**0.13 J**	0.195 U	0.205 U	0.195 U	0.2 U	0.185 U	0.19 U
	8270C	Isophorone	71 ca	--	ug/l	0.95 U	0.95 U	1.05 U	1 U	1 U	0.95 U	0.95 U
	8270C	Naphthalene	6.2 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Nitrobenzene	3.4 nc	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	n-Nitroso-di-n-propylamine	0.0096 ca	--	ug/l	0.245 U	0.245 U	0.26 U	0.245 U	0.25 U	0.235 U	0.235 U
	8270C	n-Nitrosodiphenylamine	14 ca	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Pentachlorophenol	0.56 ca	--	ug/l	4.85 U	4.85 U	5 U	4.9 U	5 U	4.65 U	4.7 U
	8270C	Phenanthrene	--	--	ug/l	0.485 U	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
	8270C	Phenol	10950 nc	--	ug/l	2.45 U	2.45 U	2.6 U	2.45 U	2.5 U	2.35 U	2.35 U
	8270C	Pyrene	182 nc	--	ug/l	0.16 J	0.485 U	0.5 U	0.49 U	0.5 U	0.465 U	0.47 U
Explosives	8330	1,3,5-Trinitrobenzene	1095 nc	--	ug/l	0.1 U	0.1 U	0.1 U	0.145 U	0.165 U	0.185 U	0.195 U
	8330	1,3-Dinitrobenzene	3.6 nc	--	ug/l	0.1 U	0.1 U	0.1 U	0.145 U	0.165 U	0.185 U	0.195 U
	8330	2,4,6-TNT	2.2 ca	--	ug/l	0.125 U	0.125 U	0.125 U	0.18 U	0.21 U	0.235 U	0.245 U
	8330	2,4-Dinitrotoluene	73 nc	--	ug/l	0.18 U	0.185 U	0.18 U	0.26 U	0.3 U	0.335 U	0.355 U
	8330	2,6-Dinitrotoluene	36 nc	--	ug/l	0.215 U	0.22 U	0.215 U	0.31 U	0.36 U	0.4 U	0.425 U
	8330	2-Amino-4,6-Dinitrotoluene	--	--	ug/l	0.18 U	0.185 U	0.18 U	0.26 U	0.3 U	0.335 U	0.355 U
	8330	2-Nitrotoluene	0.049 ca	--	ug/l	0.155 U	0.16 U	0.155 U	0.225 U	0.26 U	0.29 U	0.305 U
	8330	3-Nitrotoluene	122 nc	--	ug/l	0.155 U	0.16 U	0.155 U	0.225 U	0.26 U	0.29 U	0.305 U
	8330	4-Amino-2,6-Dinitrotoluene	--	--	ug/l	0.165 U	0.17 U	0.165 U	0.24 U	0.275 U	0.31 U	0.325 U
	8330	4-Nitrotoluene	0.66 ca	--	ug/l	0.155 U	0.16 U	0.155 U	0.225 U	0.26 U	0.29 U	0.305 U
	8330	HMX	1825 nc	--	ug/l	0.155 U	0.16 U	0.155 U	0.225 U	0.26 U	0.29 U	0.305 U
	8330	Nitrobenzene	3.4 nc	--	ug/l	0.08 U	0.08 U	0.08 U	0.115 U	0.135 U	0.15 U	0.155 U
	8330	RDX	0.61 ca	--	ug/l	0.1 U	0.1 U	0.099 J	0.145 U	0.165 U	0.185 U	0.195 U
	8330	Tetryl	365 nc	--	ug/l	0.39 U	0.395 U	0.39 U	0.55 U	0.65 U	0.75 U	0.75 U
Propellants	353.2 Modified	Nitrocellulose	--	--	ug/l	250 U	250 U	250 U	250 U	250 U	250 U	250 U
	8332	Nitroglycerine	4.8 ca	--	ug/l	0.5 U	0.5 U	0.5 U	0.75 U	0.85 U	0.95 U	1 U
	SW8330 Modified	Nitroguanidine	3650 nc	--	ug/l	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Notes:

Table LNW-10
Landfill North of Winklepeck Burning Grounds Summary of All Surface Water Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

						LNWsw-047-SW	LNWsw-048-SW	LNWsw-049-SW	LNWsw-050-SW	LNWsw-051-SW	LNWsw-052-DUP	LNWsw-052-SW
					Sample Date:	11/3/2004	11/3/2004	11/2/2004	11/2/2004	11/2/2004	12/6/2004	12/6/2004
					Sample Depth:	surface	surface	surface	surface	surface	surface	surface
Group	Method	Parameter	Region 9 PRG (Tap Water)	Surface Water Background Criteria	Units							

-- - no value available
blank cell indicates that the analysis was not performed
ug/l - means micrograms per Liter (parts per billion - ppb)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-11
Landfill North of Winklepeck Burning Grounds Summary of All Groundwater Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
Metals	6010B	Aluminum	36499 nc	--	--	ug/l	75 U	75 U	2200	250	75 U
	6010B	Barium	2555 nc	82.1	256	ug/l	46	57	110	97	53
	6010B	Beryllium	73 nc	0.00	0.00	ug/l	1 U	1 U	1 U	1 U	1 U
	6010B	Cadmium	18 nc	0.00	0.00	ug/l	1 U	1 U	1 U	0.26	1 U
	6010B	Calcium	--[n]	115000	53100	ug/l	85000	37000	45000	48000	63000
	6010B	Chromium	109 nc	7.3	0.00	ug/l	5 U	5 U	3.2	5 U	5 U
	6010B	Cobalt	730 nc	0.00	0.00	ug/l	2.5 U	2.5 U	0.81	2.5 U	2.5 U
	6010B	Copper	1460 nc	0.00	0.00	ug/l	5 U	5 U	5 U	5 U	5 U
	6010B	Iron	10950 nc	279	1430	ug/l	60 U	1300	3400	380	60 U
	6010B	Magnesium	--[n]	43300	15000	ug/l	32000	10000	10000	11000	18000
	6010B	Manganese	876 nc	1020	1340	ug/l	310	**990**	75	52	180
	6010B	Nickel	730 nc	0.00	83.4	ug/l	2	5 U	3.6	1.4	5.4
	6010B	Potassium	--[n]	2890	5770	ug/l	3200	1200	3900	3600	7000
	6010B	Selenium	182 nc	0.00	0.00	ug/l	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
	6010B	Silver	182 nc	0.00	0.00	ug/l	5 U	5 U	5 U	5 U	5 U
	6010B	Sodium	--[n]	45700	51400	ug/l	9400	8300	11000	13000	8500
	6010B	Vanadium	36 nc	0.00	0.00	ug/l	1.6	5 U	3.6	5 U	5 U
	6010B	Zinc	10950 nc	60.9	52.3	ug/l	12.5 U	4.1	4 U	1.9 U	8.5
	7041	Antimony	15 nc	0.00	0.00	ug/l	3.75 U	3.75 U	3.75 U	3.75 U	3.75 U
	7060A	Arsenic	0.045 ca	11.7	0.00	ug/l	1 U	**6.5**	**1.5**	**0.91**	**0.89**
	7421	Lead	15 mcl	0.00	0.00	ug/l	0.65 U	1.5 U	1.6	1	1.5 U
	7470A	Mercury	11 nc	0.00	0.00	ug/l	0.1 U	0.1 U	0.1 U	0.1 UJ	0.1 U
	7841	Thallium	2.4 nc	0.00	0.00	ug/l	2	2 U	2 U	2 U	2 U
Pesticides	8081A	4,4'-DDD	0.28 ca	--	--	ug/l	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
	8081A	4,4'-DDE	0.20 ca	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	4,4'-DDT	0.20 ca	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	Aldrin	0.0040 ca	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	alpha-BHC	0.011 nc	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	alpha-Chlordane	0.19 ca	--	--	ug/l	0.024 U	0.025 U	0.025 U	0.025 U	0.0245 U
	8081A	beta-BHC	0.037 ca	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	delta-BHC	--	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	Dieldrin	0.0042 ca	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	Endosulfan I	220 nc	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	Endosulfan II	220 nc	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	Endosulfan sulfate	220 nc	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	Endrin	11 nc	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	Endrin aldehyde	--	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	Endrin ketone	--	--	--	ug/l	0.048 UJ	0.05 UJ	0.05 U	0.0495 U	0.0485 U
	8081A	gamma-BHC	0.052 ca	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	gamma-Chlordane	0.19 ca	--	--	ug/l	0.048 U	0.05 U	0.05 U	0.0495 U	0.0485 U
	8081A	Heptachlor	0.015 ca	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U
	8081A	Heptachlor epoxide	0.0074 ca	--	--	ug/l	0.07 U	0.075 U	0.075 U	0.075 U	0.075 U

Table LNW-11
Landfill North of Winklepeck Burning Grounds Summary of All Groundwater Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
	8081A	Methoxychlor	182 nc	--	--	ug/l	0.29 U	0.3 U	0.3 U	0.295 U	0.29 U
	8081A	Toxaphene	0.061 ca	--	--	ug/l	0.24 U	0.25 U	0.25 U	0.25 U	0.245 U
PCBs	8082	Aroclor 1016	0.96 ca	--	--	ug/l	0.29 U	0.3 U	0.3 U	0.295 U	0.29 U
	8082	Aroclor 1221	0.034 ca	--	--	ug/l	0.6 U	0.65 U	0.65 U	0.65 U	0.65 U
	8082	Aroclor 1232	0.034 ca	--	--	ug/l	0.6 U	0.65 U	0.65 U	0.65 U	0.65 U
	8082	Aroclor 1242	0.034 ca	--	--	ug/l	0.6 U	0.65 U	0.65 U	0.65 U	0.65 U
	8082	Aroclor 1248	0.034 ca	--	--	ug/l	0.7 U	0.75 U	0.75 U	0.75 U	0.75 U
	8082	Aroclor 1254	0.034 ca	--	--	ug/l	0.6 U	0.65 U	0.65 U	0.65 U	0.65 U
	8082	Aroclor 1260	0.034 ca	--	--	ug/l	0.29 U	0.3 U	0.3 U	0.295 U	0.29 U
VOCs	8260B	1,1,1-Trichloroethane	3172 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1,2,2-Tetrachloroethane	0.055 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1,2-Trichloroethane	0.20 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1-Dichloroethane	811 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,1-Dichloroethene	339 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dibromoethane	0.0056 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloroethane	0.12 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloroethene (total)	120 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	1,2-Dichloropropane	0.16 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	2-Butanone	6968 nc	--	--	ug/l	5 U	5 U	5 U	5 U	5 U
	8260B	2-Hexanone	2000 nc	--	--	ug/l	5 U	5 U	5 U	5 U	5 U
	8260B	4-Methyl-2-pentanone	1993 nc	--	--	ug/l	5 U	5 U	5 U	5 U	5 U
	8260B	Acetone	5475 nc	--	--	ug/l	5 U	5 U	5 U	5 U	5 U
	8260B	Benzene	0.35 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromochloromethane	--	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromodichloromethane	0.18 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromoform	8.5 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Bromomethane	8.7 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Carbon disulfide	1043 nc	--	--	ug/l	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
	8260B	Carbon tetrachloride	0.17 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chlorobenzene	106 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloroethane	4.6 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloroform	0.17 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Chloromethane	158 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	cis-1,2-Dichloroethene	61 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	cis-1,3-Dichloropropene	0.40 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Dibromochloromethane	0.13 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Ethylbenzene	1340 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	m&p-Xylenes	206 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8260B	Methylene chloride	4.3 ca	--	--	ug/l	1.2 U	0.75 U	0.75 U	0.75 U	0.75 U
	8260B	o-Xylene	206 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Styrene	1641 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table LNW-11
Landfill North of Winklepeck Burning Grounds Summary of All Groundwater Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
	8260B	Tetrachloroethene	0.10 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Toluene	723 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Total Xylenes	206 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	trans-1,2-Dichloroethene	122 nc	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	trans-1,3-Dichloropropene	0.40 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Trichloroethene	0.028 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	8260B	Vinyl chloride	0.020 ca	--	--	ug/l	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
SVOCs	8270C	1,2,4-Trichlorobenzene	7.2 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	1,2-Dichlorobenzene	370 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	1,3-Dichlorobenzene	182 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	1,4-Dichlorobenzene	0.50 ca	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	2,2-oxybis (1-chloropropane)	0.27 ca	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	2,4,5-Trichlorophenol	3650 nc	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	2,4,6-Trichlorophenol	3.6 nc	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	2,4-Dichlorophenol	109 nc	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	2,4-Dimethylphenol	730 nc	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	2,4-Dinitrophenol	73 nc	--	--	ug/l	10 U	10 U	10 U	10 U	10 U
	8270C	2,4-Dinitrotoluene	73 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	2,6-Dinitrotoluene	36 nc	--	--	ug/l	0.255 U	0.245 U	0.245 U	0.25 U	0.245 U
	8270C	2-Chloronaphthalene	487 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	2-Chlorophenol	30 nc	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	2-Methylnaphthalene	--	--	--	ug/l	0.255 U	0.245 U	0.245 U	0.25 U	0.245 U
	8270C	2-Methylphenol	1825 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	2-Nitroaniline	109 nc	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	2-Nitrophenol	--	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	3,3'-Dichlorobenzidine	0.15 ca	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	3-Nitroaniline	3.2 ca	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	4,6-Dinitro-2-methylphenol	3.6 nc	--	--	ug/l	10 U	10 U	10 U	10 U	10 U
	8270C	4-Bromophenyl phenyl ether	--	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	4-Chloro-3-methylphenol	--	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	4-Chloroaniline	146 nc	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	4-Chlorophenyl phenyl ether	--	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	4-Methylphenol	182 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	4-Nitroaniline	3.2 ca	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	4-Nitrophenol	--	--	--	ug/l	10 U	10 U	10 U	10 U	10 U
	8270C	Acenaphthene	365 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Acenaphthylene	--	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Anthracene	1825 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Benzo(a)anthracene	0.092 ca	--	--	ug/l	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	8270C	Benzo(a)pyrene	0.0092 ca	--	--	ug/l	0.205 U	0.195 U	0.195 U	0.2 U	0.195 U
	8270C	Benzo(b)fluoranthene	0.092 ca	--	--	ug/l	0.205 U	0.195 U	0.195 U	0.2 U	0.195 U
	8270C	Benzo(g,h,i)perylene	--	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U

Table LNW-11
Landfill North of Winklepeck Burning Grounds Summary of All Groundwater Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
	8270C	Benzo(k)fluoranthene	0.92 ca	--	--	ug/l	0.205 U	0.195 U	0.195 U	0.2 UJ	0.195 U
	8270C	Benzoic acid	145979 nc	--	--	ug/l	10 U	10 U	10 U	10 U	9.7 J
	8270C	Benzyl alcohol	10950 nc	--	--	ug/l	10 U	10 U	10 U	10 U	10 U
	8270C	Bis(2-chloroethoxy)methane	--	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Bis(2-chloroethyl) ether	0.010 ca	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Bis(2-ethylhexyl) phthalate	4.8 ca	--	--	ug/l	7.5 U	**15**	7.5 U	7.5 U	7.5 U
	8270C	Butylbenzyl phthalate	7300 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Carbazole	3.4 ca	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	Chrysene	9.2 ca	--	--	ug/l	0.255 U	0.245 U	0.245 U	0.25 U	0.245 U
	8270C	Dibenzo(a,h)anthracene	0.0092 ca	--	--	ug/l	0.205 U	0.195 U	0.195 U	0.2 U	0.195 U
	8270C	Dibenzofuran	12 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Diethyl phthalate	29199 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Dimethyl phthalate	364867 nc	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Di-n-butyl phthalate	3650 nc	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	Di-n-octyl phthalate	1460 nc	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	Fluoranthene	1460 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Fluorene	243 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Hexachlorobenzene	0.042 ca	--	--	ug/l	0.255 U	0.245 U	0.245 U	0.25 U	0.245 U
	8270C	Hexachlorobutadiene	0.86 ca	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	Hexachlorocyclopentadiene	219 nc	--	--	ug/l	10 U	10 U	- R	- R	10 U
	8270C	Hexachloroethane	4.8 ca	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	Indeno(1,2,3-cd)pyrene	0.092 ca	--	--	ug/l	0.205 U	0.195 U	0.195 U	0.2 U	0.195 U
	8270C	Isophorone	71 ca	--	--	ug/l	1 U	1 U	1 U	1 U	1 U
	8270C	Naphthalene	6.2 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Nitrobenzene	3.4 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	n-Nitroso-di-n-propylamine	0.0096 ca	--	--	ug/l	0.255 U	0.245 U	0.245 U	0.25 U	0.245 U
	8270C	n-Nitrosodiphenylamine	14 ca	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Pentachlorophenol	0.56 ca	--	--	ug/l	5 U	4.9 U	4.9 U	4.95 U	4.9 U
	8270C	Phenanthrene	--	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
	8270C	Phenol	10950 nc	--	--	ug/l	2.55 U	2.45 U	2.45 U	2.5 U	2.45 U
	8270C	Pyrene	182 nc	--	--	ug/l	0.5 U	0.49 U	0.49 U	0.495 U	0.49 U
Explosives	8330	1,3,5-Trinitrobenzene	1095 nc	--	--	ug/l	0.145 U	0.105 U	0.135 U	0.1 U	0.1 U
	8330	1,3-Dinitrobenzene	3.6 nc	--	--	ug/l	0.145 U	0.105 U	0.135 U	0.1 U	0.1 U
	8330	2,4,6-TNT	2.2 ca	--	--	ug/l	0.18 U	0.13 U	0.17 U	0.125 U	0.125 U
	8330	2,4-Dinitrotoluene	73 nc	--	--	ug/l	0.26 U	0.19 U	0.245 U	0.18 U	0.18 U
	8330	2,6-Dinitrotoluene	36 nc	--	--	ug/l	0.31 U	0.225 U	0.29 U	0.215 U	0.215 U
	8330	2-Amino-4,6-Dinitrotoluene	--	--	--	ug/l	0.26 U	0.19 U	0.245 U	0.18 U	0.18 U
	8330	2-Nitrotoluene	0.049 ca	--	--	ug/l	0.225 U	0.165 U	0.21 U	0.155 U	0.155 U
	8330	3-Nitrotoluene	122 nc	--	--	ug/l	0.225 U	0.165 U	0.21 U	0.155 U	0.155 U
	8330	4-Amino-2,6-Dinitrotoluene	--	--	--	ug/l	0.24 U	0.175 U	0.225 U	0.165 U	0.165 U
	8330	4-Nitrotoluene	0.66 ca	--	--	ug/l	0.225 U	0.165 U	0.21 U	0.155 U	0.155 U
	8330	HMX	1825 nc	--	--	ug/l	0.225 U	0.165 U	0.21 U	0.155 U	0.155 U

Table LNW-11
Landfill North of Winklepeck Burning Grounds Summary of All Groundwater Results
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

							LNWmw-024-GW	LNWmw-025-GW	LNWmw-026-DUP	LNWmw-026-GW	LNWmw-027-GW
						Sample Date:	1/12/2005	1/12/2005	1/26/2005	1/26/2005	1/21/2005
						Sample Depth:	15.5 ft	10.8 ft	20 ft	20 ft	20 ft
						Description	C/Filtered	C/Filtered	UC/Filtered	UC/Filtered	C/Filtered
Group	Method	Parameter	Region 9 PRG (Tap Water)	Unconsolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Units					
	8330	Nitrobenzene	3.4 nc	--	--	ug/l	0.115 U	0.085 U	0.11 U	0.08 U	0.08 U
	8330	RDX	0.61 ca	--	--	ug/l	0.145 U	0.105 U	0.135 U	0.1 U	0.1 U
	8330	Tetryl	365 nc	--	--	ug/l	0.55 U	0.41 U	0.55 U	0.39 U	0.39 U
Propellants	353.2 Modified	Nitrocellulose	--	--	--	ug/l	250 U	250 U	65 U	250 UJ	250 U
	8332	Nitroglycerine	4.8 ca	--	--	ug/l	0.75 U	0.55 U	0.6 U	0.5 UJ	0.5 U
	SW8330 Modified	Nitroguanidine	3650 nc	--	--	ug/l	10 U	10 U	10 U	10 U	10 U

Notes:
-- - no value available
blank cell indicates that the analysis was not performed
ug/l - means micrograms per Liter (parts per billion - ppb)
PRG - preliminary remediation goals
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
UC/Filtered – GW sample was filtered for metals and taken from an unconsolidated MW
C/Filtered – GW sample was filtered for metals and taken from a consolidated (bedrock) MW
[n] - nutrient
U - analyte not detected
J - estimated value
R - result rejected during ADR validation
If Result = or > Background, then the value is presented with a shaded/highlighted style
If Result = or > Background & PRG, then result is presented with a bold + shaded/highlighted style
If Result = or > PRG, then the value is presented with a bold style
If Result < PRG & Background, then the value is presented with a normal style

Table LNW-16
Landfill North of Winkelpeck Burning Grounds Human Health Risk Screening Tables for Groundwater
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Parameter	Region 9 PRG (Tap Water)		Un-consolidated Filtered Groundwater Background	Consolidated Filtered Groundwater Background	Maximum Detected UC/Filtered	Maximum Detected C/Filtered	Frequency of Detection	COPC
Aluminum	36499	nc	--	--	2200	--	2 / 5	No
Barium	2555	nc	82.1	256	110	57	5 / 5	No
Cadmium	18	nc	0.00	0.00	0.26	--	1 / 5	No
Calcium	--[n]		115000	53100	48000	85000	5 / 5	No
Chromium	109	nc	7.3	0.00	3.2	--	1 / 5	No
Cobalt	730	nc	0.00	0.00	0.81	--	1 / 5	No
Iron	10950	nc	279	1430	3400	1300	3 / 5	No
Magnesium	--[n]		43300	15000	11000	32000	5 / 5	No
Manganese	876	nc	1020	1340	75	990	5 / 5	No
Nickel	730	nc	0.00	83.4	3.6	5.4	4 / 5	No
Potassium	--[n]		2890	5770	3900	7000	5 / 5	No
Sodium	--[n]		45700	51400	13000	9400	5 / 5	No
Vanadium	36	nc	0.00	0.00	3.6	1.6	2 / 5	No
Zinc	10950	nc	60.9	52.3	--	8.5	2 / 5	No
Arsenic	0.045	ca	11.7	0.00	1.5	6.5	4 / 5	Yes, > BKG & PRG
Lead	15	mcl	0.00	0.00	1.6	--	2 / 5	No
Thallium	2.4	nc	0.00	0.00	--	2	1 / 5	No
Benzoic acid	145979	nc	--	--	--	9.7	1 / 5	No
Bis(2-ethylhexyl) phthalate	4.8	ca	--	--	--	15	1 / 5	Yes, > PRG

Notes:
-- - no value available
BKG - site specific background
PRG - USEPA Region 9 Preliminary Remediation Goals
NTX - no toxicity screening value available
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
[n] - nutrient
*Concentration Units ug/L

Table LNW-15

Landfill North of Winkelpeck Burning Grounds Human Health Risk Screening Tables for Surface Water

RVAAP 14 AOC Characterization

Ravenna Army Ammunition Plant, Ravenna, Ohio

Parameter	Region 9 PRG (Tap Water)		Surface Water Background	Maximum Detected	Frequency of Detection	COPC
Aluminum	36499	nc	3370	300	7 / 7	No
Barium	2555	nc	47.5	53	7 / 7	No
Calcium	--[n]		41400	39000	7 / 7	No
Iron	10950	nc	2560	1900	7 / 7	No
Magnesium	--[n]		10800	9000	7 / 7	No
Manganese	876	nc	391	1700	7 / 7	Yes, > BKG & PRG
Potassium	--[n]		3170	3500	7 / 7	No
Sodium	--[n]		21300	3200	7 / 7	No
Zinc	10950	nc	42	4.8	2 / 7	No
Arsenic	0.045	ca	3.2	1.3	5 / 7	No
Mercury	11	nc	0.00	0.05	1 / 7	No
Thallium	2.4	nc	0.00	1.5	1 / 7	No
Benzo(a)anthracene	0.092	ca	--	0.17	1 / 7	Yes, > PRG
Benzo(a)pyrene	0.0092	ca	--	0.12	1 / 7	Yes, > PRG
Benzo(b)fluoranthene	0.092	ca	--	0.11	1 / 7	Yes, > PRG
Benzo(k)fluoranthene	0.92	ca	--	0.14	1 / 7	No
Chrysene	9.2	ca	--	0.17	1 / 7	No
Dibenzo(a,h)anthracene	0.0092	ca	--	0.13	1 / 7	Yes, > PRG
Fluoranthene	1460	nc	--	0.14	1 / 7	No
Indeno(1,2,3-cd)pyrene	0.092	ca	--	0.13	1 / 7	Yes, > PRG
Pyrene	182	nc	--	0.16	1 / 7	No
RDX	0.61	ca	--	0.099	1 / 7	No

Notes:
-- - no value available
BKG - site specific background
PRG - USEPA Region 9 Preliminary Remediation Goals
NTX - no toxicity screening value available
nc - non-cancer basis
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
[n] - nutrient
*Concentration Units ug/L

Table LNW-14
Landfill North of Winkelpeck Burning Grounds Human Health Risk Screening Tables for Sediment
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Parameter	Region 9 PRG (Res Soil)		Sediment Background	Maximum Detected	Frequency of Detection	COPC
Aluminum	7614	nc	13900	10000	5 / 5	No
Arsenic	0.39	ca	19.5	12	5 / 5	No
Barium	538	nc	123	110	5 / 5	No
Beryllium	15	nc	0.38	0.73	5 / 5	No
Cadmium	3.7	nc	0.00	0.34	1 / 5	No
Calcium	--[n]		5510	2100	5 / 5	No
Chromium	30	ca	18.1	13	5 / 5	No
Cobalt	30	ca	9.1	8.8	5 / 5	No
Copper	313	nc	27.6	18	5 / 5	No
Iron	2346	nc	28200	22000	5 / 5	No
Lead	400	pbk	27.4	19	5 / 5	No
Magnesium	--[n]		2760	2400	5 / 5	No
Manganese	176	nc	1950	710	5 / 5	No
Nickel	156	nc	17.7	19	5 / 5	No
Potassium	--[n]		1950	1300	5 / 5	No
Sodium	--[n]		112	300	5 / 5	No
Vanadium	7.8	nc	26.1	18	5 / 5	No
Zinc	2346	nc	532	91	5 / 5	No
Mercury	2.3	nc	0.06	0.068	5 / 5	No
Benzo(a)anthracene	0.62	ca	--	0.059	4 / 5	No
Benzo(a)pyrene	0.062	ca	--	0.064	4 / 5	Yes, > PRG
Benzo(b)fluoranthene	0.62	ca	--	0.091	3 / 5	No
Benzo(g,h,i)perylene	--		--	0.043	1 / 5	Yes, NTX
Benzo(k)fluoranthene	6.2	ca	--	0.038	2 / 5	No
Chrysene	62	ca	--	0.079	4 / 5	No
Fluoranthene	229	nc	--	0.068	4 / 5	No
Pyrene	232	nc	--	0.071	4 / 5	No
Nitrocellulose	--		--	1.4	1 / 1	Yes, NTX

Notes:
-- - no value available
BKG - site specific background
PRG - USEPA Region 9 Preliminary Remediation Goals
NTX - no toxicity screening value available
nc - non-cancer basis, value is 1/10 the published PRG
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
*Concentration Units mg/kg

Table LNW-12
Landfill North of Winkelpeck Burning Grounds Human Health Risk Screening Tables for Surface Soil (0-1 ft)
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Parameter	Region 9 PRG (Res Soil)		Surface Soil Background	Maximum Detected	Frequency of Detection	COPC
Aluminum	7614	nc	17700	12000	18 / 18	No
Arsenic	0.39	ca	15.4	14	18 / 18	No
Barium	538	nc	88.4	120	18 / 18	No
Beryllium	15	nc	0.88	1.4	18 / 18	No
Cadmium	3.7	nc	0.00	1.1	3 / 18	No
Calcium	--[n]		15800	21000	18 / 18	No
Chromium	30	ca	17.4	26	18 / 18	No
Cobalt	30	ca	10.4	10	18 / 18	No
Copper	313	nc	17.7	430	18 / 18	Yes, > BKG & PRG
Iron	2346	nc	23100	24000	18 / 18	Yes, > BKG & PRG
Lead	400	pbk	26.1	140	18 / 18	No
Magnesium	--[n]		3030	4300	18 / 18	No
Manganese	176	nc	1450	1300	18 / 18	No
Nickel	156	nc	21.1	24	18 / 18	No
Potassium	--[n]		927	2300	18 / 18	No
Selenium	39	nc	1.4	0.73	10 / 18	No
Silver	39	nc	0.00	22	1 / 18	No
Sodium	--[n]		123	690	18 / 18	No
Vanadium	7.8	nc	31.1	22	18 / 18	No
Zinc	2346	nc	61.8	1400	18 / 18	No
Mercury	2.3	nc	0.04	0.092	18 / 18	No
Thallium	0.52	nc	0.00	0.3	6 / 18	No
4,4'-DDE	1.7	ca	--	0.0027	1 / 2	No
beta-BHC	0.32	ca	--	0.0017	1 / 2	No
Acetone	1412	nc	--	0.088	1 / 3	No
2-Methylnaphthalene	--		--	0.085	4 / 18	Yes, NTX
Acenaphthylene	--		--	0.018	2 / 18	Yes, NTX
Anthracene	2189	nc	--	0.031	3 / 18	No
Benzo(a)anthracene	0.62	ca	--	0.14	8 / 18	No
Benzo(a)pyrene	0.062	ca	--	0.14	10 / 18	Yes, > PRG
Benzo(b)fluoranthene	0.62	ca	--	0.21	14 / 18	No
Benzo(g,h,i)perylene	--		--	0.056	5 / 18	Yes, NTX
Benzo(k)fluoranthene	6.2	ca	--	0.12	7 / 18	No
Benzoic acid	100000	max	--	0.24	1 / 1	No
Benzyl alcohol	1833	nc	--	0.6	2 / 18	No
Bis(2-ethylhexyl) phthalate	35	ca	--	0.12	3 / 18	No
Carbazole	24	ca	--	0.041	1 / 18	No
Chrysene	62	ca	--	0.19	15 / 18	No
Dibenzo(a,h)anthracene	0.062	ca	--	0.013	1 / 18	No
Dibenzofuran	15	nc	--	0.025	3 / 18	No
Fluoranthene	229	nc	--	0.36	17 / 18	No
Fluorene	275	nc	--	0.016	1 / 18	No
Indeno(1,2,3-cd)pyrene	0.62	ca	--	0.06	5 / 18	No
Naphthalene	5.6	nc	--	0.064	5 / 18	No
Phenanthrene	--		--	0.26	6 / 18	Yes, NTX
Phenol	1833	nc	--	0.031	1 / 18	No
Pyrene	232	nc	--	0.23	11 / 18	No
Nitrocellulose	--		--	1.3	2 / 2	Yes, NTX

Notes:
-- - no value available
BKG - site specific background
PRG - USEPA Region 9 Preliminary Remediation Goals
NTX - no toxicity screening value available
nc - non-cancer basis, value is 1/10 the published PRG
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
*Concentration Units mg/kg

Table LNW-13
Landfill North of Winkelpeck Burning Grounds Human Health Risk Screening Tables for Subsurface Soil (>1 ft)
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Parameter	Region 9 PRG (Res Soil)		Soil Boring Background	Maximum Detected	Frequency of Detection	COPC
Aluminum	7614	nc	19500	12000	19 / 19	No
Arsenic	0.39	ca	19.8	17	19 / 19	No
Barium	538	nc	124	87	19 / 19	No
Beryllium	15	nc	0.88	0.93	19 / 19	No
Cadmium	3.7	nc	0.00	0.2	3 / 19	No
Calcium	--[n]		35500	17000	19 / 19	No
Chromium	30	ca	27.2	18	19 / 19	No
Cobalt	30	ca	23.2	13	19 / 19	No
Copper	313	nc	32.3	27	19 / 19	No
Iron	2346	nc	35200	28000	19 / 19	No
Lead	400	pbk	19.1	15	19 / 19	No
Magnesium	--[n]		8790	5700	19 / 19	No
Manganese	176	nc	3030	540	19 / 19	No
Nickel	156	nc	60.7	33	19 / 19	No
Potassium	--[n]		3350	1900	19 / 19	No
Selenium	39	nc	1.5	0.78	16 / 19	No
Sodium	--[n]		145	410	13 / 19	No
Vanadium	7.8	nc	37.6	18	19 / 19	No
Zinc	2346	nc	93.3	66	19 / 19	No
Antimony	3.1	nc	0.96	0.47	1 / 18	No
Mercury	2.3	nc	0.04	0.036	11 / 19	No
Thallium	0.52	nc	0.91	0.3	4 / 19	No
Benzo(b)fluoranthene	0.62	ca	--	0.017	1 / 19	No
Chrysene	62	ca	--	0.014	1 / 19	No
Fluoranthene	229	nc	--	0.022	1 / 19	No

Notes:
-- - no value available
BKG - site specific background
PRG - USEPA Region 9 Preliminary Remediation Goals
NTX - no toxicity screening value available
nc - non-cancer basis, value is 1/10 the published PRG
ca - cancer basis
pbk - based on PBK modeling
mcl - based on CWA maximum contaminant level
max - ceiling limit
sat - soil saturation
[n] - nutrient
*Concentration Units mg/kg

Table LNW-17
Landfill North of Winkelpeck Burning Grounds Ecological Risk Screening Tables for Surface Soil (0-1 ft)
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Group	Parameter	Frequency of Detection	Average Concentration	Maximum Detected Concentration	Units	Surface Soil Background Concentration	Maximum Concentration > Background	Screening Value	Maximum Concentration > Screening value	PBT	COPC	COPC Rationale
Metals	Aluminum	18 / 18	10217	12000	mg/kg	17700	No	600 ss2	Yes	No	No	BLBKG
	Arsenic	18 / 18	10	14	mg/kg	15.4	No	9.9 ss1	Yes	No	No	BLBKG
	Barium	18 / 18	68	120	mg/kg	88.4	Yes	283 ss1	No	No	No	BSL
	Beryllium	18 / 18	0.69	1.4	mg/kg	0.88	Yes	10 ss1	No	No	No	BSL
	Cadmium	3 / 18	0.23	1.1	mg/kg	0.00	Yes	4 ss1	No	No	No	BSL
	Calcium	18 / 18	2388	21000	mg/kg	15800	Yes	NUT	No	No	No	BSL
	Chromium	18 / 18	20	26	mg/kg	17.4	Yes	0.4 ss1	Yes	No	Yes	ASL
	Cobalt	18 / 18	8.5	10	mg/kg	10.4	No	20 ss1	No	No	No	BLBKG
	Copper	18 / 18	37	430	mg/kg	17.7	Yes	60 ss1	Yes	No	Yes	ASL
	Iron	18 / 18	18944	24000	mg/kg	23100	Yes	200 ss2	Yes	No	Yes	ASL
	Lead	18 / 18	26	140	mg/kg	26.1	Yes	40.5 ss1	Yes	No	Yes	ASL
	Magnesium	18 / 18	2144	4300	mg/kg	3030	Yes	NUT	No	No	No	BSL
	Manganese	18 / 18	712	1300	mg/kg	1450	No	100 ss2	Yes	No	No	BLBKG
	Nickel	18 / 18	18	24	mg/kg	21.1	Yes	30 ss1	No	No	No	BSL
	Potassium	18 / 18	848	2300	mg/kg	927	Yes	NUT	No	No	No	BSL
	Selenium	10 / 18	0.64	0.73	mg/kg	1.4	No	0.21 ss1	Yes	No	No	BLBKG
	Silver	1 / 18	1.7	22	mg/kg	0.00	Yes	2 ss1	Yes	No	Yes	ASL
	Sodium	18 / 18	267	690	mg/kg	123	Yes	NUT	No	No	No	BSL
	Vanadium	18 / 18	18	22	mg/kg	31.1	No	2 ss1	Yes	No	No	BLBKG
	Zinc	18 / 18	139	1400	mg/kg	61.8	Yes	8.5 ss1	Yes	No	Yes	ASL
	Mercury	18 / 18	0.044	0.092	mg/kg	0.04	Yes	0.00051 ss1	Yes	Yes	Yes	ASL
	Thallium	6 / 18	0.28	0.3	mg/kg	0.00	Yes	1 ss1	No	No	No	BSL
Pesticides	4,4'-DDE	1 / 2	0.0019	0.0027	mg/kg	--	NA	0.596 ss4	No	No	No	BSL
	beta-BHC	1 / 2	0.0013	0.0017	mg/kg	--	NA	0.00398 ss4	No	Yes	Yes	PBT
VOCs	Acetone	1 / 3	0.035	0.088	mg/kg	--	NA	2.5 ss4	No	No	No	BSL
SVOCs	2-Methylnaphthalene	4 / 18	0.021	0.085	mg/kg	--	NA	3.24 ss4	No	No	No	BSL
	Acenaphthylene	2 / 18	0.017	0.018	mg/kg	--	NA	628 ss4	No	No	No	BSL
	Anthracene	3 / 18	0.018	0.031	mg/kg	--	NA	148 ss4	No	No	No	BSL
	Benzo(a)anthracene	8 / 18	0.031	0.14	mg/kg	--	NA	5.21 ss4	No	No	No	BSL
	Benzo(a)pyrene	10 / 18	0.030	0.14	mg/kg	--	NA	1.52 ss4	No	No	No	BSL
	Benzo(b)fluoranthene	14 / 18	0.040	0.21	mg/kg	--	NA	59.8 ss4	No	No	No	BSL
	Benzo(g,h,i)perylene	5 / 18	0.021	0.056	mg/kg	--	NA	119 ss4	No	No	No	BSL
	Benzo(k)fluoranthene	7 / 18	0.027	0.12	mg/kg	--	NA	148 ss4	No	No	No	BSL
	Benzoic acid	1 / 1	0.24	0.24	mg/kg	--	NA	--	NSL	No	Yes	NSL
	Benzyl alcohol	2 / 18	0.36	0.6	mg/kg	--	NA	658 ss4	No	No	No	BSL
	Bis(2-ethylhexyl) phthalate	3 / 18	0.084	0.12	mg/kg	--	NA	0.925 ss4	No	No	No	BSL
	Carbazole	1 / 18	0.084	0.041	mg/kg	--	NA	--	NSL	No	Yes	NSL
	Chrysene	15 / 18	0.036	0.19	mg/kg	--	NA	4.73 ss4	No	No	No	BSL
	Dibenzo(a,h)anthracene	1 / 18	0.017	0.013	mg/kg	--	NA	18.4 ss4	No	No	No	BSL
	Dibenzofuran	3 / 18	0.032	0.025	mg/kg	--	NA	--	NSL	No	Yes	NSL
	Fluoranthene	17 / 18	0.057	0.36	mg/kg	--	NA	122 ss4	No	No	No	BSL
	Fluorene	1 / 18	0.017	0.016	mg/kg	--	NA	122 ss4	No	No	No	BSL
	Indeno(1,2,3-cd)pyrene	5 / 18	0.022	0.06	mg/kg	--	NA	109 ss4	No	No	No	BSL
	Naphthalene	5 / 18	0.020	0.064	mg/kg	--	NA	0.0994 ss4	No	No	No	BSL
	Phenanthrene	6 / 18	0.047	0.26	mg/kg	--	NA	45.7 ss4	No	No	No	BSL
	Phenol	1 / 18	0.084	0.031	mg/kg	--	NA	30 ss1	No	No	No	BSL
	Pyrene	11 / 18	0.048	0.23	mg/kg	--	NA	78.5 ss4	No	No	No	BSL
Propellants	Nitrocellulose	2 / 2	1.2	1.3	mg/kg	--	NA	--	NSL	No	Yes	NSL

Notes:
-- - no value available
mg/kg - means milligrams per Kilogram (parts per million - ppm
ss1 - Preliminary Remediation Goals (Efroymson et al , 1997a)
ss2 - Toxiclogolgical Benchmarks for Soil and Litter Invertebrates (Efrymonson et al. 1997b)
ss3 - Toxiclogolgical Benchmarks for Terrestrial Plants (Efrymonson et al. 1997c)
ss4- Ecological Data Quality Level (USEPA Region 5, 1999)
-- - no value available
NA - not applicable

NUT - nutrient
BLBKG - below background concentration
PBT- persistent, bioaccumulative and toxic
NSL - no screening level
ASL- above screening level
BSL - below screening level

Table LNW-18
Landfill North of Winkelpeck Burning Grounds Ecological Risk Screening Tables for Sediment
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Group	Parameter	Frequency of Detection	Average Concentration	Maximum Detected Concentration	Units	Sediment Background Concentration	Maximum Concentration > Background	SRV	Maximum Concentration > SRV	Screening Value	Maximum Concentration > Screening value	PBT	COPC	COPC Rationale
Metals	Aluminum	5 / 5	9120	10000	mg/kg	13900	No	29000	No	--	NSL	No	No	BLBKG
	Arsenic	5 / 5	9.2	12	mg/kg	19.5	No	25	No	9.79 sd1	Yes	No	No	BLBKG
	Barium	5 / 5	83	110	mg/kg	123	No	190	No	--	NSL	No	No	BLBKG
	Beryllium	5 / 5	0.67	0.73	mg/kg	0.38	Yes	0.8	No	--	NSL	No	No	BLSRV
	Cadmium	1 / 5	0.28	0.34	mg/kg	0.00	Yes	0.79	No	0.99 sd1	No	No	No	BLSRV
	Calcium	5 / 5	1960	2100	mg/kg	5510	No	21000	No	NUT	No	No	No	BLBKG
	Chromium	5 / 5	12	13	mg/kg	18.1	No	29	No	43.4 sd1	No	No	No	BLBKG
	Cobalt	5 / 5	8.1	8.8	mg/kg	9.1	No	12	No	50 sd2	No	No	No	BLBKG
	Copper	5 / 5	15	18	mg/kg	27.6	No	32	No	31.6 sd1	No	No	No	BLBKG
	Iron	5 / 5	19800	22000	mg/kg	28200	No	41000	No	--	NSL	No	No	BLBKG
	Lead	5 / 5	16	19	mg/kg	27.4	No	47	No	35.8 sd1	No	No	No	BLBKG
	Magnesium	5 / 5	2140	2400	mg/kg	2760	No	7100	No	NUT	No	No	No	BLBKG
	Manganese	5 / 5	638	710	mg/kg	1950	No	1500	No	--	NSL	No	No	BLBKG
	Nickel	5 / 5	17	19	mg/kg	17.7	Yes	33	No	22.7 sd1	No	No	No	BLSRV
	Potassium	5 / 5	1088	1300	mg/kg	1950	No	6800	No	NUT	No	No	No	BLBKG
	Sodium	5 / 5	276	300	mg/kg	112	Yes	--	NA	NUT	No	No	No	BLSRV
	Vanadium	5 / 5	17	18	mg/kg	26.1	No	40	No	--	NSL	No	No	BLBKG
	Zinc	5 / 5	82	91	mg/kg	532	No	160	No	121 sd1	No	No	No	BLBKG
	Mercury	5 / 5	0.048	0.068	mg/kg	0.06	Yes	0.12	No	0.18 sd1	No	Yes	No	BLSRV
SVOCs	Benzo(a)anthracene	4 / 5	0.066	0.059	mg/kg	--	NA	--	NA	0.108 sd1	No	No	No	BSL
	Benzo(a)pyrene	4 / 5	0.065	0.064	mg/kg	--	NA	--	NA	0.15 sd1	No	No	No	BSL
	Benzo(b)fluoranthene	3 / 5	0.077	0.091	mg/kg	--	NA	--	NA	10.4 sd2	No	No	No	BSL
	Benzo(g,h,i)perylene	1 / 5	0.067	0.043	mg/kg	--	NA	--	NA	0.17 sd2	No	No	No	BSL
	Benzo(k)fluoranthene	2 / 5	0.063	0.038	mg/kg	--	NA	--	NA	0.24 sd2	No	No	No	BSL
	Chrysene	4 / 5	0.073	0.079	mg/kg	--	NA	--	NA	0.166 sd1	No	No	No	BSL
	Fluoranthene	4 / 5	0.073	0.068	mg/kg	--	NA	--	NA	0.423 sd1	No	No	No	BSL
	Pyrene	4 / 5	0.094	0.071	mg/kg	--	NA	--	NA	0.195 sd1	No	No	No	BSL
	Total PAHs (1)	4 / 5	1.1	0.513	mg/kg	--	NA	--	NA	1.610 sd1	No	No	No	BSL
Propellants	Nitrocellulose	1 / 1	1.4	1.4	mg/kg	--	NA	--	NA	--	NSL	No	Yes	NSL

Notes:
-- - no value available
mg/kg - means milligrams per Kilogram (parts per million - ppm
sd1 - Threshold Effects Concentration from McDonald et al , (2000)
sd2 - Ecological Data Quality Level (USEPA Region 5, 1999)
-- - no value available
NUT - nutrient
NA - not applicable
BLBKG - below background concentration
PBT- persistent, bioaccumulative and toxic
NSL - no screening level
ASL- above screening level
BSL - below screening level
SRV-Sediment Reference Value (OEPA, 2003)
(1) - maximum detected concentration of total PAHs was calculated by summing positive detections

Table LNW-19
Landfill North of Winkelpeck Burning Grounds Ecological Risk Screening Tables for Surface Water
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Group	Parameter	Frequency of Detection	Average Concentration	Maximum Detected Concentration	Units	Surface Water Background Concentration	Maximum Concentration > Background	Screening Value	Maximum Concentration > Screening value	PBT	COPC	COPC Rationale
Metals	Aluminum	7 / 7	140	300	ug/l	3370	No	--	NSL	No	No	BLBKG
	Barium	7 / 7	34	53	ug/l	47.5	Yes	2000 sw1	No	No	No	BSL
	Calcium	7 / 7	33857	39000	ug/l	41400	No	NUT	No	No	No	BLBKG
	Iron	7 / 7	1499	1900	ug/l	2560	No	--	NSL	No	No	BLBKG
	Magnesium	7 / 7	7986	9000	ug/l	10800	No	NUT	No	No	No	BLBKG
	Manganese	7 / 7	704	1700	ug/l	391	Yes	--	NSL	No	Yes	NSL
	Potassium	7 / 7	2514	3500	ug/l	3170	Yes	NUT	No	No	No	BSL
	Sodium	7 / 7	2857	3200	ug/l	21300	No	NUT	No	No	No	BLBKG
	Zinc	2 / 7	12	4.8	ug/l	42	No	137 sw1[H]	No	No	No	BLBKG
	Arsenic	5 / 7	0.87	1.3	ug/l	3.2	No	340 sw1	No	No	No	BLBKG
	Mercury	1 / 7	0.093	0.05	ug/l	0.00	Yes	1.7 sw1	No	Yes	Yes	PBT
	Thallium	1 / 7	1.9	1.5	ug/l	0.00	Yes	79 sw1	No	No	No	BSL
SVOCs	Benzo(a)anthracene	1 / 7	0.11	0.17	ug/l	--	NA	--	NSL	No	Yes	NSL
	Benzo(a)pyrene	1 / 7	0.18	0.12	ug/l	--	NA	--	NSL	No	Yes	NSL
	Benzo(b)fluoranthene	1 / 7	0.18	0.11	ug/l	--	NA	--	NSL	No	Yes	NSL
	Benzo(k)fluoranthene	1 / 7	0.19	0.14	ug/l	--	NA	--	NSL	No	Yes	NSL
	Chrysene	1 / 7	0.23	0.17	ug/l	--	NA	--	NSL	No	Yes	NSL
	Dibenzo(a,h)anthracene	1 / 7	0.19	0.13	ug/l	--	NA	--	NSL	No	Yes	NSL
	Fluoranthene	1 / 7	0.44	0.14	ug/l	--	NA	3.7 sw1	No	No	No	BSL
	Indeno(1,2,3-cd)pyrene	1 / 7	0.19	0.13	ug/l	--	NA	--	NSL	No	Yes	NSL
	Pyrene	1 / 7	0.44	0.16	ug/l	--	NA	42 sw1	No	No	No	BSL
Explosives	RDX	1 / 7	0.14	0.099	ug/l	--	NA	520 sw1	No	No	No	BSL

Notes:
-- - no value available
ug/l - means micrograms per Liter (parts per billion - ppb)
sw1 - Ohio Water Quality Criteria (Reg 3745-1-07)
sw1[H] - Ohio Water Quality Criteria (Reg 3745-1-07) based on a site specific hardness of 117 (mg/l)
-- - no screening value listed
NA - not applicable
ID - insufficient data to calculate screening value
NUT - nutrient
BLBKG - below background concentration
PBT- persistent, bioaccumulative and toxic
NSL - no screening level
ASL- above screening level

Table LNW-20
Landfill North of Winkelpeck Burning Grounds Ecological Risk Summary of Quantitative and Qualitative COPECs for Environmental Media
RVAAP 14 AOC Characterization
Ravenna Army Ammunition Plant, Ravenna, Ohio

Group	Parameter	Shallow Soil	Sediment	Surface Water
Metals	Beryllium			
	Chromium	X		
	Copper	X		
	Iron	X		
	Lead	X		
	Magnesium			
	Manganese			Q
	Silver	X		
	Zinc	X		
	Lead	X		
	Mercury	X		X
Pesticides	beta-BHC	X		
SVOCs	Benzo(a)anthracene			Q
	Benzo(a)pyrene			Q
	Benzo(b)fluoranthene			Q
	Benzo(k)fluoranthene			Q
	Benzoic acid	Q		
	Carbazole	Q		
	Chrysene			Q
	Dibenzo(a,h)anthracene			Q
	Dibenzofuran	Q		
	Indeno(1,2,3-cd)pyrene			Q
Propellants	Nitrocellulose	Q		

Notes
COPEC - chemical of potential ecological concern
X - quantitative COPEC
Q - qualitatative COPEC
blank cell indicated that the analyte was not identified as a COPEC for the media