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# 1.0 INTRODUCTION

This report documents the results of Load Line 10 (LL10) (AOC-43) sampling efforts which were completed as part of the characterization of the 14 Ravenna Army Ammunition Plant (RVAAP) Areas of Concern (AOC's). This document summarizes the results of the field activities conducted from October 2004 to May 2005.

## 1.1 PURPOSE AND SCOPE

Characterization activities were conducted at LL10 to collect sufficient data for all applicable media to allow efficient planning and execution of future environmental actions.

The characterization effort for the LL10 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 LL10 involved a combination of field and laboratory activities to characterize the site. Field investigation techniques included surface soil (0-1 ft) samples (multi-increment (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 the LL10 site and previous inspections. In addition assessments and evaluations conducted at LL10 are summarized.

### 1.2.1 AOC Description and History

LL10 is located in an area known as Fuze and Booster Hill, which includes Load Lines 5 through 11, collectively. Fuze and Booster Hill is located in the south central part of RVAAP. LL10 is a 17.4 ha (43 acre) AOC located on Fuze and Booster Road west of Load Line 9 and east of Load Line 5. LL10

consists of 29 process buildings ranging in size between 36 sq ft and 13, 413 sq ft. Figure 1-2, Volume I shows the location of LL10 in relation to the RVAAP facility.

LL10, also known as the Percussion Element Manufacturing Line, was an initiator blending and loading line that was operated from 1941 to 1945. Operations were discontinued at the end of WWII, and the process equipment and production line was placed on standby status. The line was reactivated in 1951 and operated until 1956, when it was again placed on standby. The 1951 to 1956 production mimicked the 1941 to 1945 era production. The line was activated a third time in 1969 and operated until 1971, when the line was finally deactivated permanently, and the production equipment removed. There is no indication or information that indicates that LL10 was used for any process other than percussion element/primer manufacturing. LL10 is overgrown by trees, bushes and weeds.

Contrary to a previous USATHEMA document (USATEHMA 1978), there is no historical evidence that bulk handling or utilization of lead azide or lead styphnate, which are both primary explosives, took place within the boundaries of this load line. The two primer mixes that were utilized were FA 70 and FA 90A. Secondary explosives used were trinitrotoluene (TNT) and pentaerythritol tetranitrate (PETN).

A summary of building utilization is provided:

**1941 to 1945 and 1951 to 1956 Production Eras**

Buildings PE-12 and PE-18 – Initiator Processing
Buildings. PE-17, PE-19 and PE-13 – Primer Component Processing
Buildings PE-28 and PE-29 – PETN Processing
Buildings PE-20 – Solvent Storage
Buildings PE-1, PE-4, PE-5, PE-6, PE-7, PE-9, PE-14, PE-15, PE-21 and PE-22 – Primer Mix Processing

**1969 to 1971 Production Era**

Buildings PE-18 and PE-28 – Initiator Processing
Buildings PE-12, PE-13, PE-19, PE-19, PE-29A and PE-29B – Fuel Compound Blending and Storage
Buildings PE-20 – Solvent Storage
Buildings PE-1, PE-14, PE-5, PE-6, PE-4, PE-9 and PE-10 – Mix and Percussion Element Processing and Packing
Buildings PE-16 – Binder Blending

### 1.2.2 Previous Investigation

The following assessments and evaluations have been conducted at Load Line 10:

#### *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 were 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 during the development of the Preliminary Draft.

*1.2.2.3 Preliminary Assessment Screening of the Boundary Load Line Areas (USAEHA 1994)*

This document could not be located during the development of the Preliminary Draft.

*1.2.2.4 Relative Risk Site Evaluation for Newly Added Sites at the Ravenna Army Ammunition Plant (USACHPPM 1998)*

L10 was scored with a moderate (3.96) CHF for groundwater, and a potential migration pathway factor and receptor pathway factor. The AOC also was scored with a moderate (33.8) CHF for surface soil with a potential migration pathway factor and receptor pathway factor. The final RRSE score for the AOC was "Medium."

### 1.2.3 Regulatory Authorities

Volume I, Section 1.2.3 identifies the regulatory authorities which oversee remedial activities for these AOCs.

### 1.2.4 Regulatory Status of Load Line 10

Volume I, Section 1.2.4 identifies the regulatory status for these AOCs.

# 2.0 ENVIRONMENTAL SETTING AT LOAD LINE 10

This section describes the physical characteristics of Load Line 10 (LL10) 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 LL10 is a combination of forested and open areas of former operations. An unnamed stream is located approximately 750 feet southwest of the AOC that flows to the West Branch of the Mahoning River. This AOC is approximately 1000 feet northeast of LL 5 and 700 feet southwest of the LL9 AOC. The AOC surface water flows to the northeast and southwest. Fuze and Booster Road is located approximately 500 to the northeast. The AOC has very little topographic relief.

## 2.1 SURFACE FEATURES

Features at LL10 consist of a slightly oval one-lane asphalt paved road encircling the existing buildings. There are three large and approximately 15 smaller structures from the remaining operations. LL10 is bounded by Fuze and Booster Road to the west, north, and east. Load Line 5 is adjacent to the southwest with undeveloped property to the southeast (Figure 1-2).

The LL10 topography gently slopes from the northwest to the southeast. Ground elevations adjacent to the six monitoring wells at this site ranged from 1119 to 1130 ft amsl (Figure L10-6).

## 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 site and drains toward the south. Intermittent surface water flows in several drainage ditches located on site (Figure L10-5). These ditches are fed by surface runoff from precipitation events. The ditches tend to hold water for extended periods of time due to the low permeability of soils. One significant drainage ditch drains southwest toward Load Line 5.

## 2.4 GEOLOGY

Lithologic logs from six borings, advanced during the characterization activities and completed as monitoring wells, were used to characterize the surface and subsurface geology at LL10. The boring logs, which detail the vertical lithologic sequences, are found in Appendix H.

### 2.4.1 Glacial Deposits

LL10 subsurface lithology at LL10 consists mostly of silts and silty clay with interbedded sands. These deposits are generally firm with low to moderately plasticity. Cross-sections of the subsurface at LL10 illustrate the lateral distribution and variation of these discontinuous glaciated sediments (Figures L10-1 to L10-4). Groundwater was encountered at depths of 14 to 24 ft bgs during drilling of the six groundwater monitoring wells.

### 2.4.2 Sedimentary Rocks

Bedrock was encountered during drilling in five of the six monitoring wells. A fine to medium-grained sandstone with thin interbedded shale layers was found at depths ranging from 12 to 18 ft bgs to a total depth of approximately 32 ft bgs. No bedrock was encountered during the drilling of monitoring well L10mw-006.

## 2.5 SOIL

Only one soil type was found to cover LL10, the Mahoning Silt Loam (2 to 6 percent slopes). The Mahoning series consists of deep, somewhat poorly drained, nearly level to gently sloping soils that formed in silty clay loam or clay loam glacial till. The Mahoning Silt Loam (2 to 6 percent slopes) is characterized by gently sloped land with medium to rapid runoff. Erosion is a hazard with this soil type. Low areas with the Mahoning Silt Loam soil type are slow to dry out in spring. Seasonal wetness and slow permeability characterize this type of soil.

## 2.6 HYDROGEOLOGY

Volume 1, Section 2.6 describes the unconsolidated sediments and bedrock which influence the hydrogeological characteristics at RVAAP.

## 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 LOAD LINE 10

This section describes the field and analytical methods identified during the Load Line 10 (LL10) characterization activities. The field and analytical programs were conducted in accordance with the RVAAP Facility Wide Sampling and Analysis Plan (FWSAP) (USACE, 2001a) and the RVAAP 14 AOC FWSAP Addendum (MKM, 2004). Investigation objectives, rationale for sampling locations, and sampling methods are briefly discussed in this section.

## 3.1 FIELD ACTIVITIES

AOC specific field activities conducted from October 2004 thru May 2005 at LL10 included:

- Collecting MI surface soil (0-1 ft) samples (11-16-04 – 11-19-04),
- Collecting discrete surface soil (0-1 ft) samples (11-16-04 – 11-19-04),
- Excavating of four test trenches (10-07-04 – 10-08-04),
- Installing six groundwater monitoring wells (12-16-05 – 01-17-05),
- Collecting geotechnical samples from the borings (Shelby Tubes) (12-16-04 – 01-07-05),
- Conducting well slug tests (01-26-05),
- Collecting groundwater samples from monitoring wells (01-10-05 – 01-19-05),
- Collecting surface water samples (sewers/sumps/basins/basements) (11-19-04 – 12-15-04),
- Collecting sediment samples (sewers/sumps/basins) (11-23-04 – 12-15-04), and
- Conducting a sampling location and monitoring well survey (12-13-04 – 01-28-05).

Sampling points were located to assess the impact that the LL10 operations may have had on soil, sediment, surface water and groundwater. The following sections describe the rationales for, and sampling methods employed during, the investigation. Information from previous assessments, evaluations and investigations, plus institutional knowledge about the operations that occurred at Load Line 10, were used to determine the number of samples, sampling locations, type of media collected and analyses conducted. Table L10-1 summarizes the type and number of samples that were collected and the analyses performed. A photo log of the investigation activities is provided in Appendix C. Figure L10-5 shows the monitoring well locations, Figure L10-6 shows the sanitary sewer locations and Figure L10-7 shows the sample locations for all other media collected at this AOC.

### 3.1.1 Trenching Activities

Prior to the start of drilling operations, four test trenches were excavated near the proposed monitoring well locations. The trenching activities provided information about the soil stratification profile, depth to groundwater and depth to bedrock.

Trenching was halted upon encountering saturation. Saturation was encountered in Trench L10tr-001 at 12 ft bgs, Trench L10tr-002 at 12 ft bgs, Trench L10tr-003 at 13 ft bgs and Trench L10tr-004 at 14 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

MI surface soil (0-1 ft) samples were collected at this AOC to:

- Assess the potential impact of LL10 operations on the soils within the AOC,
- Characterize soil surrounding process buildings or found in dry drainage ditches within the AOC, and
- Determine the nature of contamination at this load line.

LL10 was divided into 37 MI grids located around process buildings or within dry drainage ditch locations. One MI surface soil (0-1 ft) sample was collected from each grid. Multi-increment samples were collected as described in Volume I, Section 3.1.10.1. Three split samples were collected and submitted for analysis to an independent, USACE-approved laboratory.

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. Field sampling forms documenting the surface soil (0-1 ft) sampling activities are presented in Appendix E.

### 3.1.3 Discrete Surface Soil (0-1 ft) Sampling (VOC)

Discrete surface soil (0-1 ft) samples were collected at this AOC to determine whether VOC contaminants are present. A VOC sample was collected outside two buildings formerly used as the solvent storage buildings (PE-2 and PE-20) and outside a building formerly used for fuel blending. The discrete surface soil (0-1 ft) samples were collected as stipulated in Section 3.1.10.3 of Volume I.

One split sample was collected and submitted for analysis to an independent, USACE-approved laboratory. Analysis of MI surface soils (0-1 ft) for L10 included the following parameters: TAL Metals, Explosives and Cyanide. Field sampling forms documenting the sampling activities are presented in Appendix E.

### 3.1.4 Surface Water Sampling (Sewers/Sumps/Basins/Basements)

Surface water samples were collected at this AOC to:

- Evaluate whether sewer, basement, sump, and/or basin water is being impacted by runoff from LL10, and
- Identify the migration pathways for contaminated runoff from Load Line 10.

Twenty-five surface water sample locations were stipulated in the SOW to evaluate whether contaminants are impacting surface water within the AOC boundary. Six of the ten sewer locations listed in the SOW contained enough water for sample collection. No water was present in the remaining four sewer locations, therefore no samples were collected. If possible, sewer water samples were collected as described in Volume I, Section 3.1.10.6, where applicable. If the depth to the surface water was too great, a peristaltic pump and silicone tubing were used to collect the sewer water sample.

Twelve of the 14 sumps/basins were located and contained enough water for a sample collection. However, two of the sumps/basins could not be located. A surface water sample was collected from one basement location. Water quality measurements (pH, conductivity, dissolved oxygen content, and temperature) were recorded just prior to sample collection. Surface water samples were collected as described in Volume I, Section 3.1.10.6.

Three split samples were collected and submitted for analysis to an independent USACE approved laboratory. Analysis of surface water at L10 included the following parameters: TAL Metals, Explosives, VOCs, SVOCs, Cyanide, Pesticides and PCBs. Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. Field sampling forms for the surface water are presented in Appendix O.

### 3.1.5 Sediment (Sewers/Sumps/Basins) Sampling

Sediment samples (sewer/sump/basin) were collected at this AOC to:

- Evaluate whether sewer/sump/basin sediments are being impacted via LL10 surface water runoff, and
- Evaluate whether contaminants in sewer/sump/basin sediments may have migrated beyond the AOC boundaries.

Sewer/sump/basin sediment samples (if present) were co-located with the sewer/sump/basin water samples. Six of the 24 sewers/sumps/basins contained enough sediment for a viable sample. Two sediment sampling locations could not be located during the sampling effort. All sewer/sump/basin sediment samples were collected using a long handled scoop or telescopic pole with Teflon swivel cup as specified in Volume I, Section 3.1.10.7. One split sample was collected and submitted for analysis to an independent, USACE-approved laboratory. Analysis of sediment for L10 included the following parameters: TAL Metals, Explosives and Cyanide. Samples were prepared, packaged and shipped per Volume I, Section 3.1.14. Field sampling forms are presented in Appendix Q.

### 3.1.6 Groundwater Investigation Activities

The groundwater activities were conducted at this AOC to:

- Determine whether contaminants from LL10 operations had adversely impacted groundwater quality underlying the AOC,
- Evaluate the quality of groundwater upgradient of LL10, and
- Collect data pertaining to the groundwater flow regime at LL10.

At Load Line 10, six boreholes were advanced into bedrock with borehole termination depth ranging from 24.0 ft. to 31.5 ft bgs. Monitoring wells were constructed in the boreholes. Monitoring well locations were selected to maximize the information collected about the aquifer underlying LL10.

- Monitoring Well LLmw-001 is located upgradient of the explosives handling area. It provides information for stratigraphic correlation.

- Monitoring Well LLmw-002 is located downgradient of a solvent storage building.
- Monitoring Well LLmw-003 is located within the explosives handling area near a different solvent storage building. This well also provides information for stratigraphic correlation.
- Monitoring Well LLmw-004 is located downgradient of the explosives handling area.
- Monitoring Well LLmw-005 is located downgradient of the explosives handling area and provides downgradient stratigraphic correlation information.
- Monitoring Well LLmw-006 is located downgradient of the Load Line 10 AOC.
- 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. Upon encountering bedrock, a 6 in. OD air rotary hammer with 3.95 in. core barrel was used to advance the boring. The total average borehole depth was 8.38 m (27.48 ft) bgs. Bedrock was encountered in all six boring locations at depths of 15.0 ft bgs (L10mw-001 cored from 15.0' to 20.0' bgs), 15.0 ft bgs (L10mw-002 cored from 16.0' to 28.0' bgs), 12.5 ft bgs (L10mw-003 cored from 14.3' to 25.8' bgs), 18.0 ft bgs (L10mw-004 cored from 29.2' to 30.5' bgs), 12.5 ft bgs (L10mw-005 cored from 15.2' to 25.4' bgs) and 23.0 ft bgs (L10mw-006).

Monitoring well installation and development at LL10 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 samples were collected in three Shelby Tubes from monitoring well locations L10mw-001 (6 to 8 ft), L10mw-004 (8 to 10 ft) and L10mw-005 (4 to 6 ft), and sent to the laboratory for analysis. Geotechnical sample collection was conducted per Section 4.4.2.4.1 of the FWSAP. Geotechnical analytical data is found in Appendix J.

### *3.1.6.3 Groundwater Sampling*

All groundwater sampling was conducted as outlined in Section 3.1.10.11, Volume I of this characterization report. No detections were observed in the PID readings for the wells at Load Line 10. 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 L10 included the following parameters: TAL Metals, Explosives, VOCs, SVOCs, Cyanide, 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 six LL10 monitoring wells as discussed in Volume I, Section 3.1.10.12. Slug test data records are provided at Appendix K. The testing results are located in Section 4.5.

*3.1.6.5 Water Level Measurements*

Water level measurements were performed at the six LL10 monitoring wells as discussed in Volume I, Section 3.1.10.13. Groundwater elevation data are included in Appendix M.

### 3.1.7 Sampling Location and Monitoring Well Survey

The sample location and monitoring well survey at LL10 were 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 sample location survey data is located in Appendix S.

## 3.2 DEVIATIONS FROM THE WORK PLAN

Every effort was made to complete the field activities as specified 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 LL10 investigation are noted below.

In five LL10 wells, the amount of sand placed above the screen was modified to ensure the soil/rock interfaced was sealed adequately.

- Monitoring Wells LL10mw-001, LL10mw-002, and LL10mw-004 were constructed with 2 ft of sand above the screen rather than the 3 ft stipulated by the FWSAP.
- Monitoring Well LL10mw-005 was constructed with 3.5 ft of sand above the screen.
- Monitoring Well LL10mw-006 was constructed with 2.5 ft of sand above the screen.
- The FWSAP stipulates that well development will begin no earlier than 24 hours, and no later than seven days, after grout has been set. Due to the Christmas holiday, development of Wells LL10mw-001 and LL10mw-002 began 12 days after the grout was set.
- Four of the ten sewer locations contained no water for sample collection.
- Seven of the ten sewer sediment locations did not contain enough recoverable sediment to constitute a viable sample.

Nine of the 14 sump/basin sediment locations did not contain enough recoverable sediment to constitute a viable sample. Two of the 14 sumps/basins could not be located.

The SOW stipulated that a wet ditch sample be collected at Location L10sd-025M-SD. At the time samples were being collected, neither water nor sediments were present at that location. Therefore, a soil sample (L10ss-040M-SO) was collected instead.

Water was not present at sampling point L10sw-025-SW (wet ditch) during field work. Consequently, L10sw-025-SW was re-assigned and collected as a basement water sample at Building PE-3.

L10mw-001-GW was dry to the top of bedrock and was subsequently cored to a depth of 28 ft bgs. Heavy petroleum stains were observed in the core at an approximate depth of 22 ft bgs. A headspace did not indicate the presence of lighter end volatiles. It was decided to include TPH 8015 DRO/GRO analysis in the analytical suite for all LL10 monitoring wells.

VOCs and SVOCs were added to the analytical suite for L10sd-022-SD.

Although deviations were identified, the objectives of the LL10 AOC characterization were still achieved.

# 4.0 NATURE OF CONTAMINATION AT LOAD LINE 10

This section summarizes the surface soil (0-1 ft), groundwater, surface water and sediment analytical results obtained from the environmental sampling conducted at the LL10. The results are organized by media: surface soil (0-1 ft), groundwater, surface water, and sediment. 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 present a summary of the results and initial screening of the analytical data for MI surface soil (0-1 ft) samples collected during the AOC characterization.

## 4.1 MI SURFACE SOIL (0-1 FT)

Forty-two MI surface soil (0-1 ft) (37 regular samples and five QC samples) were collected during the LL10 AOC characterization activities. Additionally, nine (seven regular samples and two QC samples) discrete surface soil (0-1 ft) samples were collected for VOC analysis. All positive detections were compared to RVAAP background and PRG values.

A summary of surface soil (0-1 ft) results at or above detection limits is presented in Table L10-2. A summary of all surface soil (0-1 ft) analytical results is presented in Table L10-6. Surface soil (0-1 ft) analytes detected at or above background concentrations and/or PRGs are illustrated in Figures L10-8 and L10-9. Laboratory analytical reports are provided in Appendix F.

Other details pertinent to the surface soil (0-1 ft) analytical results:

- **Aluminum** exceeded the Region 9 tap water PRG in 40 samples, and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 22000 mg/kg.**
- **Arsenic** exceeded the Region 9 tap water PRG in 39 samples, and exceeded background and the Region 9 tap water PRG in three samples with a **maximum concentration of 18 mg/kg.**
- **Barium** exceeded background in ten samples with a **maximum concentration of 190 mg/kg.**
- **Beryllium** exceeded background in 11 samples with a **maximum concentration of 5.3 mg/kg.**
- **Cadmium** exceeded background in 24 samples with a **maximum concentration of 0.89 mg/kg.**
- **Calcium** exceeded background in six samples with a **maximum concentration of 100000 mg/kg.**
- **Chromium** exceeded background in thirty-four samples and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 33 mg/kg.**
- **Cobalt** exceeded background in six samples with a **maximum concentration of 13 mg/kg.**
- **Copper** exceeded background in 25 samples with a **maximum concentration of 42 mg/kg.**
- **Iron** exceeded the Region 9 tap water PRG in 32 samples, and exceeded background and the Region 9 PRG in ten samples with a **maximum concentration of 28000 mg/kg.**
- **Lead** exceeded background in 25 samples, and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 430 mg/kg.**

- **Magnesium** exceeded background in 15 samples with a **maximum concentration of 23000 mg/kg.**
- **Manganese** exceeded the Region 9 tap water PRG in 42 samples with a **maximum concentration of 1400 mg/kg.**
- **Nickel** exceeded background in eight samples with a **maximum concentration of 31 mg/kg.**
- **Potassium** exceeded background in 33 samples with a **maximum concentration of 1900 mg/kg.**
- **Selenium** exceeded background in one sample with a **maximum concentration of 1.8 mg/kg.**
- **Sodium** exceeded background in 42 samples with a **maximum concentration of 960 mg/kg.**
- **Vanadium** exceeded the Region 9 tap water PRG in 42 samples with a **maximum concentration of 24 mg/kg.**
- **Zinc** exceeded background in 37 samples with a **maximum concentration of 220 mg/kg.**
- **Antimony** exceeded background in four samples with a **maximum concentration of 2.5 mg/kg.**
- **Mercury** exceeded background in 19 samples with a **maximum concentration of 0.082 mg/kg.**
- **Thallium** exceeded background in six samples with a **maximum concentration of 0.23 mg/kg**.
- **2-Methylnaphthalene** exceeded the laboratory detection limit in three samples with a **maximum concentration of 0.019 mg/kg.**
- **Benzo(g,h,i)perylene** exceeded the laboratory detection limit in four samples with a **maximum concentration of 0.023 J mg/kg.** J value indicates an estimated result.
- **Phenanthrene** exceeded the laboratory detection limit in four samples with a **maximum concentration of 0.056 mg/kg.**
- **Cyanide** exceeded background in 14 samples with a **maximum concentration of 1.3 J mg/kg.** J value indicates an estimated result.
- **VOCs, pesticides, PCBs, explosives and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

## 4.2 SEDIMENTS

Six sediment samples were collected during the LL10 AOC characterization activities. Results from the sediment samples were compared to facility-wide background concentrations for sediments and/or PRGs for residential soil.

Sediment results at or above detection limits are presented in Table L10-3. A summary of all sediment analytical results is presented in Table L10-7. Sediment analytes detected at or above background levels and/or PRGs are illustrated in Figure L10-10. Laboratory analytical reports are provided in Appendix R.

Sediment analytical results are summarized as follows:

- **Aluminum** exceeded the Region 9 tap water PRG in one sample, and exceeded background and the Region 9 tap water PRG in two samples with a **maximum concentration of 19000 mg/kg.**
- **Arsenic** exceeded the Region 9 tap water PRG in two samples, and exceeded background and the Region 9 tap water PRG in four samples with a **maximum concentration of 270 mg/kg.**
- **Barium** exceeded the Region 9 tap water PRG in one sample, and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 4600 mg/kg.**
- **Beryllium** exceeded background in six samples with a **maximum concentration of 1.8 mg/kg.**

- **Cadmium** exceeded the Region 9 tap water PRG in two samples with a **maximum concentration of 7.1 mg/kg.**
- **Calcium** exceeded background in two samples with a **maximum concentration of 90000 mg/kg.**
- **Chromium** exceeded background in two samples, and exceeded background and the Region 9 tap water PRG in three samples with a **maximum concentration of 270 mg/kg.**
- **Cobalt** exceeded background in two samples with a **maximum concentration of 10 mg/kg.**
- **Copper** exceeded background in three samples, and exceeded background and the Region 9 tap water PRG in two samples with a **maximum concentration of 980 mg/kg.**
- **Iron** exceeded the Region 9 PRG in two samples, and exceeded background and the Region 9 tap water PRG in four samples with a **maximum concentration of 71000 mg/kg.**
- **Lead** exceeded background in three samples, and exceeded background and the Region 9 tap water PRG in three samples with a **maximum concentration of 39000 mg/kg.**
- **Magnesium** exceeded background in two samples with a **maximum concentration of 6500 mg/kg.**
- **Manganese** exceeded the Region 9 tap water PRG in six samples with a **maximum concentration of 970 mg/kg.**
- **Nickel** exceeded background in five samples with a **maximum concentration of 41 mg/kg.**
- **Potassium** exceeded background in one sample with a **maximum concentration of 2600 mg/kg.**
- **Selenium** exceeded background in two samples with a **maximum concentration of 6.6 mg/kg.**
- **Silver** exceeded background in two samples with a **maximum concentration of 1.2 mg/kg.**
- **Sodium** exceeded background in five samples with a **maximum concentration of 1300 mg/kg.**
- **Vanadium** exceeded the Region 9 tap water PRG in three samples, and exceeded background and the Region 9 tap water PRG in three samples with a **maximum concentration of 34 mg/kg.**
- **Zinc** exceeded background in two samples with a **maximum concentration of 2000 mg/kg.**
- **Mercury** exceeded background in four samples with a **maximum concentration of 1.2 mg/kg.**
- **Antimony** exceeded the Region 9 tap water PRG in one sample, and exceeded background and the Region 9 tap water PRG in one sample with a **maximum concentration of 300 mg/kg.**
- **2-Methylnaphthalene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 28 mg/kg.**
- **Acenaphthylene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.74 mg/kg.**
- **Benzo(a)anthracene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 25 mg/kg.**
- **Benzo(a)pyrene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 11 mg/kg.**
- **Benzo(b)fluoranthene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 18 mg/kg.**
- **Benzo(g,h,i)perylene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 4.2 mg/kg.**
- **Benzo(k)fluoranthene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 11 mg/kg.**

- **Dibenzo(a,h)anthracene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 2.4 mg/kg.**
- **Dibenzofuran** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 37 mg/kg.**
- **Indeno(1,2,3-cd)pyrene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 4.9 mg/kg.**
- **Naphthalene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 18 mg/kg.**
- **Phenanthrene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 130 mg/kg.**
- **2,6-Dinitrotoluene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 11 mg/kg.**
- **2-Amino-4,6-Dinitrotoluene** exceeded the laboratory detection limit in two samples with a **maximum concentration of 1.7 mg/kg.**
- **4-Amino-2,6-Dinitrotoluene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.86 mg/kg.**
- **VOCs, pesticides, PCBs, and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

### 4.3 SURFACE WATER

Twenty-one surface water samples (19 regular samples and two QC samples) were collected during the AOC characterization activities at LL10. Results from analyses were compared to surface water background concentrations (USACE, 2001) and/or USEPA Region 9 tap water PRGs.

Surface water results at or above detection limits are presented in Table L10-4. A summary of all surface water analytical results is presented in Table L10-8. Surface water analytes detected at or above background levels and/or PRGs are shown in Figure L10-10. Laboratory analytical reports are provided in Appendix P.

Surface water analytical results are summarized as follows:

- **Aluminum** exceeded background in three samples with a **maximum concentration of 12000 µg/L.**
- **Barium** exceeded background in four samples with a **maximum concentration of 270 µg/L.**
- **Beryllium** exceeded background in three samples with a **maximum concentration of 1.1 µg/L.**
- **Cadmium** exceeded background in 11 samples with a **maximum concentration of 4.7 µg/L.**
- **Calcium** exceeded background in five samples with a **maximum concentration of 74000 µg/L.**
- **Chromium** exceeded background in ten samples, and exceeded background and the Region 9 PRG in two samples with a **maximum concentration of 200 µg/L.**
- **Cobalt** exceeded background in three samples with a **maximum concentration of 4.0 µg/L.**
- **Copper** exceeded background in six samples with a **maximum concentration of 400 µg/L.**
- **Iron** exceeded background in two samples, and exceeded background and the Region 9 PRG in one sample with a **maximum concentration of 14000 µg/L.**

- **Lead** exceeded background and the Region 9 tap water PRG in eight samples with a **maximum concentration of 14000 µg/L.**
- **Nickel** exceeded background in three samples with a **maximum concentration of 50 µg/L.**
- **Potassium** exceeded background in 14 samples with a **maximum concentration of 15000 µg/L.**
- **Selenium** exceeded background in two samples with a **maximum concentration of 3.2 µg/L.**
- **Silver** exceeded background in two samples with a **maximum concentration of 1.0 µg/L.**
- **Vanadium** exceeded background in four samples with a **maximum concentration of 24 µg/L.**
- **Zinc** exceeded background in seven samples with a **maximum concentration of 850 µg/L.**
- **Antimony** exceeded background in five samples, and exceeded background and the Region 9 tap water PRG in five samples with a **maximum concentration of 880 µg/L.**
- **Arsenic** exceeded the Region 9 tap water PRG in three samples, and exceeded background and the Region 9 tap water PRG in five samples with a **maximum concentration of 770 µg/L.**
- **Lead** exceeded background in eight samples, and exceeded background and the Region 9 tap water PRG in five samples with a **maximum concentration of 1300 µg/L.**
- **Mercury** exceeded background in three samples with a **maximum concentration of 0.77 µg/L.**
- **Acenaphthylene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.94 J µg/L.** J value indicates an estimated result.
- **Benzo(a)anthracene** exceeded the Region 9 tap water PRG in five samples with a **maximum concentration of 5.3 µg/L.**
- **Benzo(a)pyrene** exceeded the Region 9 tap water PRG in six samples with a **maximum concentration of 3.5 µg/L.**
- **Benzo(b)fluoranthene** exceeded the Region 9 tap water PRG in six samples with a **maximum concentration of 16 µg/L.**
- **Benzo(g,h,i)perylene** exceeded the laboratory detection limit in six samples with a **maximum concentration of 3.7 µg/L.**
- **Benzo(k)fluoranthene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 5.7 µg/L.**
- **Bis(2-ethylhexyl)phthalate** exceeded the Region 9 tap water PRG in four samples with a **maximum concentration of 30 µg/L.**
- **Chrysene** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 25 µg/L.**
- **Dibenzo(a,h)anthracene** exceeded the Region 9 tap water PRG in four samples with a **maximum concentration of 0.82 µg/L.**
- **Indeno(1,2,3-cd)pyrene** exceeded the Region 9 tap water PRG in six samples with a **maximum concentration of 3.8 µg/L.**
- **Pentachlorophenol** exceeded the Region 9 tap water PRG in one sample with a **maximum concentration of 4.8 J µg/L.** J value indicates an estimated result.
- **Phenanthrene** exceeded the laboratory detection limit in five samples with a **maximum concentration of 12 µg/L.**
- **2-Amino-4,6-Dinitrotoluene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.23 J µg/L.** J value indicates an estimated result.

- **4-Amino-2,6-Dinitrotoluene** exceeded the laboratory detection limit in two samples with a **maximum concentration of 0.46 µg/L.**
- **VOCs, pesticides, PCBs and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

## 4.4 GROUNDWATER

Seven groundwater samples (six regular samples and one QC sample) were collected from monitoring wells (L10mw-001 through L10mw-006) installed during the AOC characterization at LL10. 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 L10-5. A summary of all groundwater analytical results is presented in Table L10-9. Groundwater analytes detected at or above background levels and/or PRGs are shown in Figure L10-11. Laboratory analytical reports are provided in Appendix L.

Groundwater analytical results are summarized as follows:

- **Cadmium** exceeded background in one sample with a **maximum concentration of 0.41 µg/L.**
- **Calcium** exceeded background in five samples with a **maximum concentration of 71000 µg/L.**
- **Chromium** exceeded background in one sample with a **maximum concentration of 3.2 µg/L.**
- **Copper** exceeded background in one sample with a **maximum concentration of 2.8 µg/L.**
- **Magnesium** exceeded background in three samples with a **maximum concentration of 23000 µg/L.**
- **Antimony** exceeded background in one sample with a **maximum concentration of 4.4 µg/L.**
- **Thallium** exceeded background in one sample with a **maximum concentration of 1.5 µg/L.**
- **Carbon Tetrachloride** exceeded the Region 9 tap water PRG in two samples with a **maximum concentration of 1.6 µg/L.**
- **Phenanthrene** exceeded the laboratory detection limit in one sample with a **maximum concentration of 0.18 J µg/L.** J value indicates an estimated result.
- **Pesticides, PCBs, explosives and propellants** were below Region 9 tap water PRGs and/or laboratory detection limits.

## 4.5 GEOTECHNICAL

Geotechnical analysis was conducted during groundwater monitoring well installation. Three Shelby Tubes were collected at monitoring well locations L10mw-001 (6 to 8 ft), L10mw-004 (8 to 10 ft) and L10mw-005 (4 to 6 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 Description | Class Sym. | pH | Specific Gravity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L10mw-001 (6-8 ft.) | 7.7 | 15.7 | 23 | 20 | 3 | 4.3 | 2.8 | 6.6 | 16.0 | 70.2 | Brown silt with sand, trace gravel | ML | 10.07 | 2.725 |
| L10mw-004 (8-10 ft.) | 9.7 | 14.2 | 20 | 17 | 3 | 2.2 | 2.6 | 11.0 | 27.1 | 57.2 | Brown sandy silt, trace gravel | ML | 8.1 | 2.656 |
| L10mw-005 (4-6 ft.) | 5.7 | 15.2 | 28 | 18 | 9 | 5.1 | 2.6 | 7.2 | 19.1 | 66.0 | Brown sandy lean clay, trace gravel | CL | 8.2 | 2.801 |

## 4.6 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 LL10. The following table shows the results of the slug tests performed in January and February 2005.

**Hydraulic Conductivities in Load Line 10 Monitoring Wells**

| Monitoring Well ID | Screened Interval Depth (ft) | Total Borehole Depth (ft) | Geologic Material Adjacent to Screen | Hydraulic conductivity (cm/s) |
|---|---|---|---|---|
| MW-001 | 17-27 | 28 | Sandstone | 1.76 E-4 |
| MW-002 | 17-27 | 28 | Sandstone | 3.04 E-4 |
| MW-003 | 16-26 | 26.4 | Sandstone | 2.60 E-4 |
| MW-004 | 21-31 | 31.2 | Sandstone | 3.17 E-4 |
| MW-005 | 16.5-26.5 | 27 | Sandstone | 2.76 E-4 |
| MW-006 | 13.5-23.5 | 24 | Sand, Sandy Silt, Silty Sand | 1.97 E-4 |

Based on the results of the slug tests, hydraulic conductivities arithmetic average is $2.55 \times 10^{-4}$ cm/s in the soil underlying LL10. The field measurements, test data and calculations are provided in Appendix K. Previous slug tests performed at wells located at other sites within RVAAP indicate average hydraulic conductivities between $3.87 \times 10^{-2}$ cm/s to $4.46 \times 10^{-6}$ cm/s (USACE, 1999).

Data from the three rounds of well gauging were used to produce potentiometric surface maps for LL10 (Figures L10-12 through L10-14). The water level data suggest that groundwater flow is generally to the north-northwest at a gradient of approximately 0.003 ft/ft.

# 5.0 HUMAN HEALTH AND ECOLOGICAL RISK SCREENING FOR LOAD LINE 10

This section details both the human health and ecological risk screening performed at Load Line 10 (LL10).

## 5.1 HUMAN HEALTH RISK SCREENING

Volume 1, Section 5.1 explains how LL10 data were screened to determine human health contaminants of concern (COPCs). Total chromium analytical results were conservatively screened against 1/10$^{th}$ 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 L10-10 presents the human health screening data for surface soil (0-1 ft) at LL10. A total of 41 constituents were detected including metals and semi-volatile organic compounds (SVOCs).

- Twenty-one constituents had detections greater than background concentrations: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, potassium, selenium, sodium, zinc, antimony, mercury, thallium, and cyanide.
- Seven constituents had detections above the adjusted Region 9 residential PRGs: aluminum, arsenic, chromium, iron, lead, manganese, and vanadium.
- Concentrations of five constituents, aluminum, arsenic, chromium, iron, and lead, exceeded both RVAAP-specific background concentrations and the Region 9 residential PRG.
- Three constituents have no established background value or Region 9 residential PRG: 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene.

Based on these comparisons, eight constituents were identified as chemicals of potential concern (COPC) in surface soil (0-1 ft) at LL10: aluminum, arsenic, chromium, iron, lead, 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene. Of these COPC, 2-methylnaphthalene, benzo(g,h,i)perylene, and phenanthrene were identified due to the lack of screening criteria.

### 5.1.2 Sediment

Table L10-11 presents the human health screening data for sediment at LL10. Fifty-three constituents were detected in sediment. These constituents included metals, pesticides, and SVOCs.

- Twenty-one constituents had detected concentrations greater than background values: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, potassium, selenium, silver, sodium, vanadium, zinc, antimony, and mercury.
- Twenty constituents had detections above the adjusted Region 9 residential PRGs: arsenic, aluminum, barium, cadmium, chromium, copper, iron, lead, manganese, vanadium, zinc, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, naphthalene, and 2,6-dinitrotoluene.

- Ten constituents had detected concentrations above both background and PRGs: arsenic, aluminum, barium, cadmium, chromium, copper, iron, lead, antimony, and vanadium.
- Six constituents have no established background value or Region 9 residential PRG: 2-methylnaphthalene, acenaphthylene, benzo(g,h,i)perylene, phenanthrene, 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene.

Based on these comparisons, 25 constituents were identified as COPC: arsenic, aluminum, barium, cadmium, chromium, copper, iron, lead, vanadium, antimony, 2-methylnaphthalene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(ghi)perylene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, dibenzofuran, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene. Of these COPC, 2-methylnaphthalene, acenaphthylene, benzo(g,h,i)perylene, phenanthrene, 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene were identified due to the lack of screening criteria.

### 5.1.3 Surface Water

Table L10-12 presents the human health screening data for surface water at LL10. Twenty-one surface water samples were collected resulting in a total of 50 detected constituents.

- Nineteen constituents had detections greater than background values: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, nickel, potassium, selenium, silver, vanadium, zinc, antimony, and mercury.
- Fourteen constituents had detections above the Region 9 residential PRGs: chromium, iron, lead, arsenic, antimony, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenzo(ah)anthracene, indeno(1,2,3-cd)pyrene, and pentachlorophenol.
- Five constituents also had detected concentrations greater than both background and the PRG: chromium, iron, lead, antimony, and arsenic.
- Five constituents have no established background value or Region 9 PRG: acenaphthylene, benzo(g,h,i)perylene, phenanthrene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene.

Based on these comparisons, 19 constituents were identified as COPC in surface water: chromium, iron, lead, antimony, arsenic, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, phenanthrene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene. Of these COPC, acenaphthylene, benzo(g,h,i)perylene, phenanthrene, 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene were identified due to the lack of screening criteria.

### 5.1.4 Groundwater

Table L10-13 presents the human health screening data for groundwater at LL10. A total of 21 constituents were detected including metals and SVOCs.

- Seven constituents had detections greater than background concentrations: cadmium, calcium, chromium, copper, magnesium, antimony, and thallium.

- Carbon tetrachloride had detected concentrations above the Region 9 tap water PRG.
- No constituents were detected above both background and the PRG.
- One constituent, phenanthrene, has no established background value or Region 9 tap water PRG.

Based on these comparisons, carbon tetrachloride and phenanthrene were identified as COPC in groundwater at LL10. Phenanthrene was identified as COPC due to the lack of screening criteria.

## 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 L10-14 presents the ecological screening data for surface soil (0-1 ft) at Load Line 10. A total of 41 constituents were detected.

- Twenty-one constituents had detections greater than background concentrations: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, potassium, selenium, sodium, zinc, antimony, mercury, thallium, and cyanide.
- Twelve constituents had detections above ecological screening values: aluminum, chromium, iron, lead, manganese, nickel, selenium, vanadium, zinc, mercury, and 2, 6-dinitrotoluene.
- One constituent, dibenzofuran, has no established screening values.

Based on these comparisons, twelve constituents were identified as chemicals of potential ecological concern (COPECs) in surface soil (0-1 ft) at LL10: aluminum, arsenic, chromium, iron, lead, nickel, selenium, zinc, mercury, dibenzofuran, and 2, 6-dinitrotoluene. Of these COPECs, dibenzofuran was identified due to the lack of screening criteria.

### 5.2.2 Sediment

Table L10-15 presents the ecological screening data for sediment at LL10. Fifty-four constituents were detected in sediment.

- Twenty-one constituents had detected concentrations greater than background values: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, nickel, potassium, selenium, silver, sodium, vanadium, zinc, antimony, and mercury.
- Thirty-three constituents had detections above ecological screening values: arsenic, cadmium, chromium, copper, lead, nickel, silver, zinc, mercury, 4,4-DDD, 4,4-DDE, 4,4-DDT, gamma-chlordane, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, total PAHs, and 2,6-dinitrotoluene.

- Fifteen constituents exceeded the Sediment Reference Value (SRV) (Ohio EPA, 2003): arsenic, barium, beryllium, cadmium, calcium, chromium, copper, iron, lead, nickel, selenium, silver, zinc, antimony, and mercury.
- Thirteen constituents have no established screening values: aluminum, barium, beryllium, iron, manganese, selenium, vanadium, antimony, carbazole, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, tetryl, and nitroguanidine. Of the thirteen, seven constituents (aluminum, barium, beryllium, iron, selenium, vanadium, antimony) exceed the background value established for RVAAP and five (barium, beryllium, iron, selenium and antimony) exceed the SRV.

Based on these comparisons, 46 constituents were identified as COPECs: arsenic, barium, beryllium, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, zinc, antimony, mercury, 4,4-DDD, 4,4-DDE, 4,4-DDT, alpha-chlordane, dieldrin, endosulfan I, gamma-chlordane, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene, total PAHs, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, tetryl, and nitroguanidine. Of these COPECs, barium, beryllium, iron, selenium, antimony, carbazole, 2-amino-4, 6-dinitrotoluene, 4-amino-2, 6-dinitrotoluene, tetryl, and nitroguanidine were identified due to lack of screening criteria. Alpha-chlordane, dieldrin and endosulfan I were identified as a COPECs in sediment because they are considered persistent, bioaccumulative, and toxic and no RVAAP-specific background value or SRV is available.

### 5.2.3 Surface Water

Table L10-16 presents the ecological screening data for surface water at LL10. Fourty-nine constituents were detected in surface water.

- Nineteen constituents had detections greater than background values: aluminum, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, nickel, potassium, selenium, silver, vanadium, zinc, antimony, arsenic, lead, and mercury.
- Eight constituents were detected above ecological screening values: cadmium, copper, zinc, arsenic, lead, anthracene, fluoranthene, and pyrene.
- Seventeen constituents have no established screening values: aluminum, iron, manganese, selenium, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, dibenzo(a,h)anthracene, di-n-butyl phthalate, indeno(1,2,3-cd)pyrene, n-nitrosodiphenylamine, and pentachlorophenol. Of the fifteen, aluminum, iron and selenium also exceed the background value established for RVAAP

Based on these comparisons, 25 constituents were identified as COPECs in surface water at LL10: aluminum, cadmium, copper, iron, selenium, zinc, arsenic, lead, mercury, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, dibenzo(a,h)anthracene, di-n-butyl phthalate, fluoranthene, indeno(1,2,3-cd)pyrene, n-nitrosodiphenylamine, pentachlorophenol, and pyrene. Of these COPECs, aluminum, iron, selenium, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, carbazole, chrysene, dibenzo(a,h)anthracene, di-n-butyl phthalate, indeno(1,2,3-

cd)pyrene, n-nitrosodiphenylamine, and pentachlorophenol 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 LOAD LINE 10

This section briefly summarizes the existing conditions that were found during the AOC characterization at Load Line 10 (LL10) and the risk screening tasks that were completed.

## 6.1 NATURE OF CONTAMINATION

Contaminants were detected above screening criteria in four media: surface soil (0-1 ft), sediment, surface water and groundwater. Thirteen constituents other than inorganics were detected above screening criteria in the samples collected from the various media. SVOCs were detected above screening criteria in one of two sediment samples and eight of 21 surface water samples. VOCs were detected above screening criteria in two of seven groundwater samples.

Twenty-two metals and cyanide were detected in soil above background and/or PRG screening values.

Twenty-two metals and nine SVOCs were detected at concentrations above background and/or PRG screening values in sediments.

Nineteen metals and nine SVOCs were detected above background and/or PRG screening values in surface water.

Seven metals and one VOC were detected above background and/or PRG screening values in groundwater.

## 6.2 HUMAN HEALTH RISK SCREENING

An HHRS was conducted to compare the concentrations detected in LL10 samples to RVAAP-specific background values and U.S. EPA Region 9 PRGs. This preliminary screening was conducted to identify potential COPCs. The following table lists the COPCs by media.

| Table L10-18 | | | |
|---|---|---|---|
| **Chemical of Potential Concern – All Media** | | | |
| **Soils** | **Sediment** | **Surface Water** | **Groundwater** |
| Arsenic | Arsenic | Chromium | Carbon Tetrachloride |
| Aluminum | Aluminum | Arsenic | Phenanthrene |
| Benzo(g,h,i)perylene | Barium | Benzo(b)fluoranthene | |
| Lead | Cadmium | Chrysene | |
| Chromium | Chromium | Phenanthrene | |
| Iron | Copper | Iron | |
| 2-methylnaphthalene | Iron | Acenaphthylene | |
| Phenanthrene | Lead | Benzo(ghi)perylene | |
| | Vanadium | Dibenzo(a,h)anthracene | |
| | Antimony | 2-Amino-4,6-dinitrotoluene | |
| | 2-Methylnaphthalene | Lead | |
| | Acenaphthylene | Benzo(a)anthracene | |
| | Benzo(a)anthracene | Benzo(k)fluoranthene | |
| | Benzo(a)pyrene | Indeno(1,2,3-cd)pyrene | |
| | Benzo(b)fluoranthene | 4-Amino-2,6-dinitrotoluene | |
| | Benzo(ghi)perylene | Antimony | |
| | Benzo(k)fluoranthene | Benzo(a)pyrene | |
| | Dibenzo(a,h)anthracene | Bis(2-ethylhexyl)phthalate | |
| | Dibenzofuran | Pentachlorophenol | |
| | Indeno(1,2,3-cd)pyrene | | |
| | Naphthalene | | |
| | Phenanthrene | | |
| | 2,6-Dinitrotoluene | | |
| | 2-Amino-4,6-dinitrotoluene | | |
| | 4-Amino-2,6-dinitrotoluene | | |

## 6.3 ECOLOGICAL RISK SCREENING

An ERS was performed to compare contaminant concentrations detected in LL10 to RVAAP-specific background values and ecological screening values. The ERS was conducted as outlined in Volume 1, Section 5.2. The ERS identified COPECs for LL10. The following table summarizes those COPECs by media.

| Table L10-19 | | | | |
|---|---|---|---|---|
| **Chemical of Potential Ecological Concern – All Media** | | | | |
| **Soils** | **Sediment** | | **Surface Water** | **Groundwater** |
| Aluminum | Arsenic | Benzo(a)anthracene | Aluminum | Groundwater not |
| Arsenic | Barium | Benzo(a)pyrene | Cadmium | not evaluated |
| Iron | Beryllium | Benzo(b)fluoranthene | Copper | for ERS |
| Lead | Cadmium | Benzo(ghi)perylene | Iron | |
| Nickel | Chromium | Benzo(k)fluoranthene | Selenium | |
| Selenium | Copper | Carbazole | Zinc | |
| Zinc | Iron | Chrysene | Lead | |
| Mercury | Lead | Dibenzo(a,h)anthracene | Arsenic | |
| Chromium | Nickel | Dibenzofuran | Mercury | |
| Dibenzofuran | Selenium | Fluoranthene | Acenaphthylene | |
| 2,6-Dinitrotoluene | Silver | Fluorene | Anthracene | |
| | Zinc | Indeno(1,2,3-cd)pyrene | Benzo(a)anthracene | |
| | Antimony | Naphthalene | Benzo(a)pyrene | |
| | Mercury | Phenanthrene | Benzo(b)fluoranthene | |
| | 4,4-DDD | Pyrene | Benzo(ghi)perylene | |
| | 4,4-DDE | Total PAHs | Benzo(k)fluoranthene | |
| | 4,4-DDT | 2,6-Dinitrotoluene | Carbazole | |
| | Alpha-chlordane | 2-Amino-4,6-dinitrotoluene | Chrysene | |
| | Dieldrin | 4-Amino-2,6-dinitrotoluene | Dibenzo(a,h)anthracene | |
| | Endosulfan I | Tetryl | Di-n-butyl Phthalate | |
| | Gamma-chlordane | Nitroguanidine | Fluoranthene | |
| | 2-Methylnaphthalene | | Indeno(1,2,3-cd)pyrene | |
| | Acenaphthene | | n-Nitrosodiphenylamine | |
| | Acenaphthylene | | Pentachlorophenol | |
| | Anthracene | | 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 LL10.

LL-9 MW001

L10mw-001

B

A

L10mw-002

D'

L10mw-003

L10mw-005

A'

C'

L10mw-004

D

L10mw-006

B'

C

A

**Legend**

- Monitoring Well Locations
- Existing Monitoring Wells at RVAAP
- Geologic Cross Section
- Vegetation
- Piping
- Steam Line Post
- Road
- Building
- Walkway
- Fence
- 10 ft Contour Line
- 2 ft Contour Line

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Stafford, TX 77477

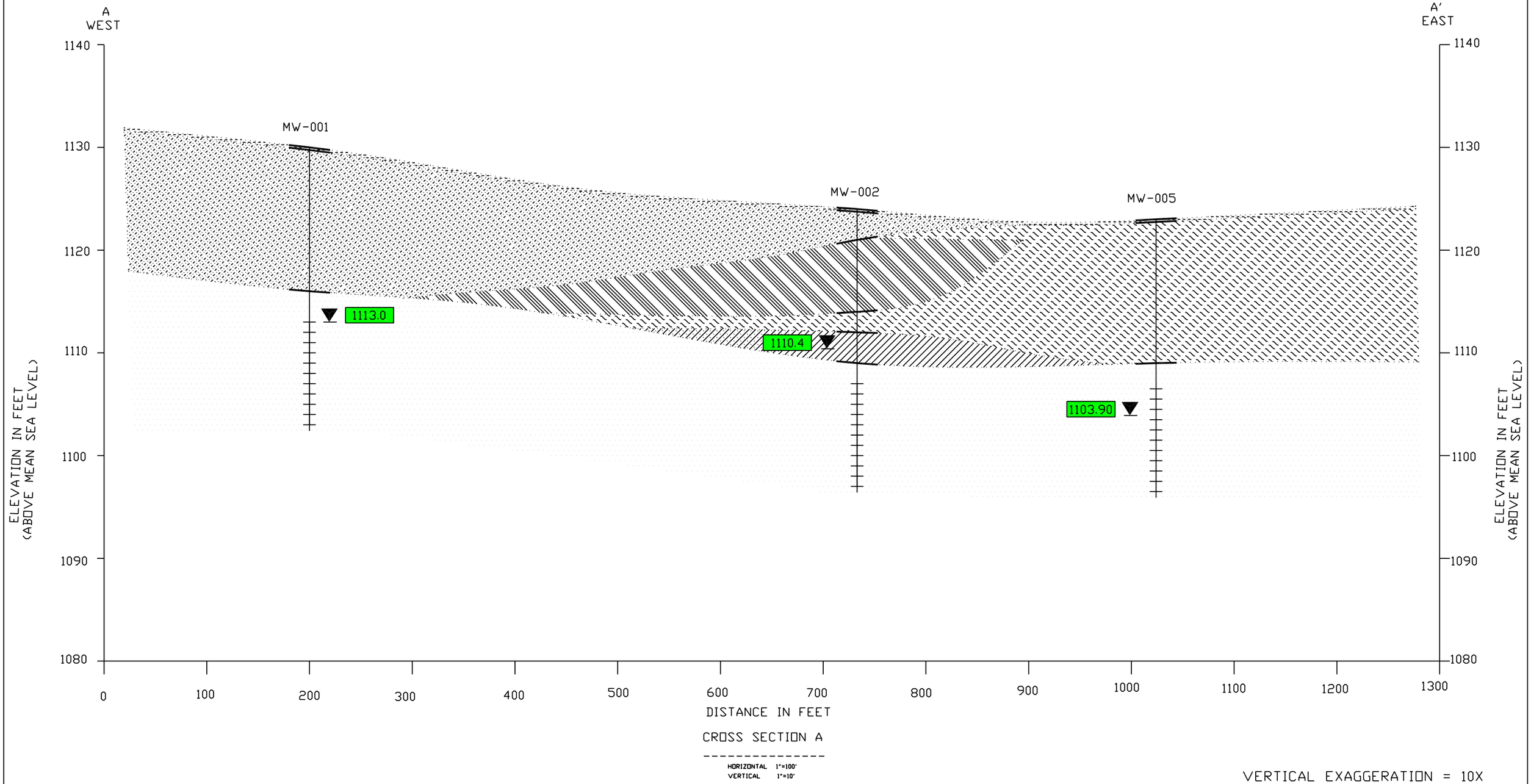
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-1
*Load Line 10*
*Geologic Cross Section*

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"=100'
VERTICAL 1"=10'

VERTICAL EXAGGERATION = 10X

**LEGEND**

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

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

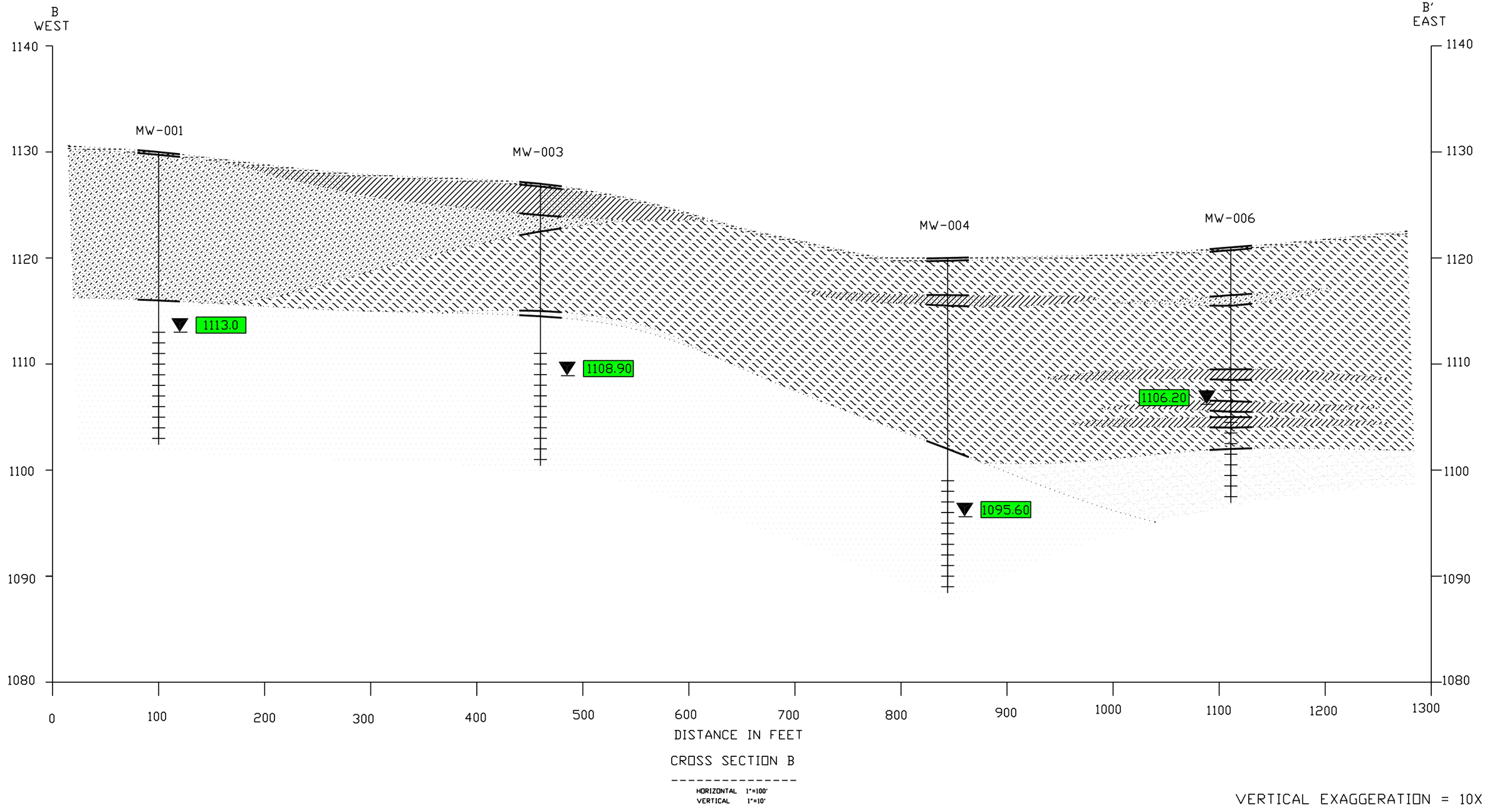
MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE L10-2
LOAD LINE 10
GEOLOGIC CROSS SECTION A
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

| SIZE | PROJECT NO. | DWG NO. | REV |
|---|---|---|---|
| D | | L10-2 | |

| DRAWN BY | ST | APPR. BY | SRL |
|---|---|---|---|




CROSS SECTION B

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

VERTICAL EXAGGERATION = 10X

**LEGEND**

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

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

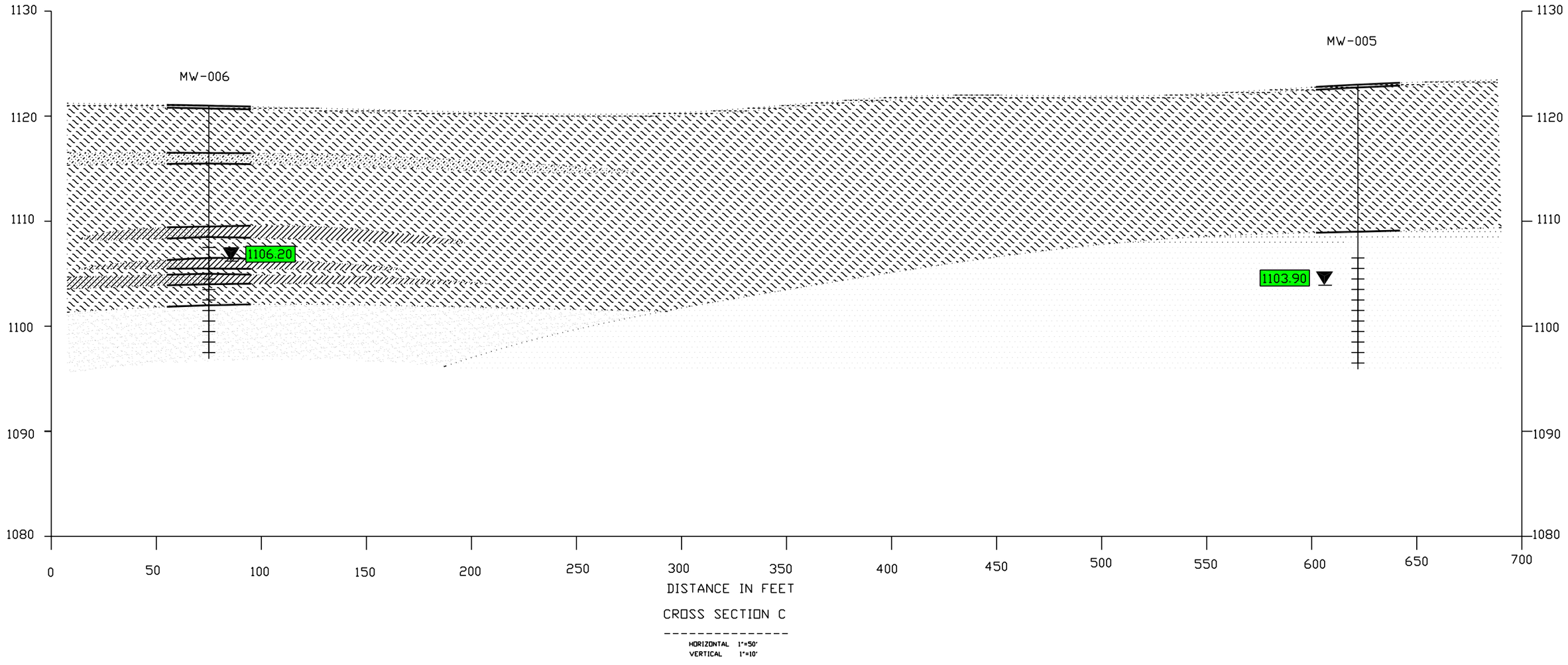
MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE L10-3
LOAD LINE 10
GEOLOGIC CROSS SECTION B
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

| SIZE | PROJECT NO. | DWG NO. | REV |
|---|---|---|---|
| D | | L10-3 | |

| DRAWN BY | ST | APPR. BY | SRL |
|---|---|---|---|




CROSS SECTION C

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

VERTICAL EXAGGERATION = 10X

**LEGEND**

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

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

MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

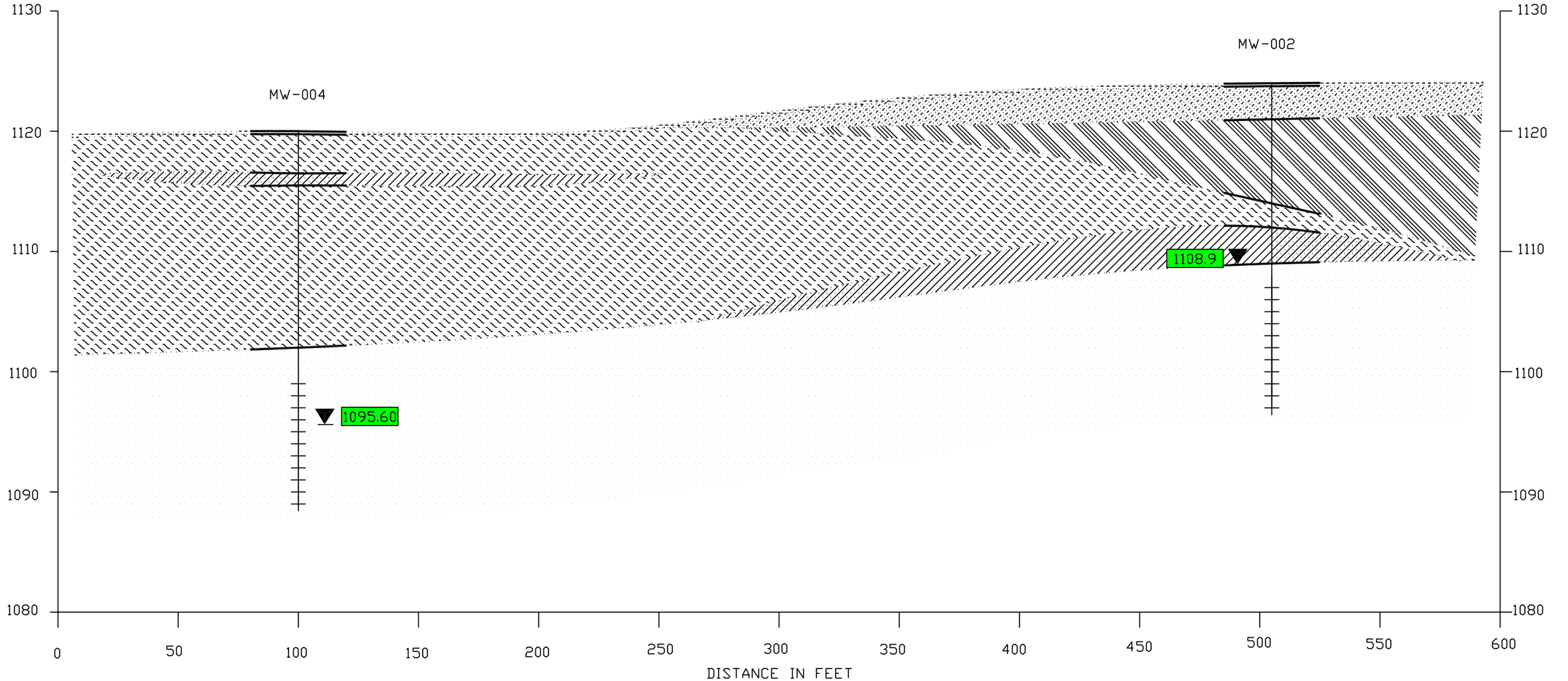
FIGURE L10-4
LOAD LINE 10
GEOLOGIC CROSS SECTION C
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

| SIZE | PROJECT NO. | DWG NO. | REV |
|---|---|---|---|
| D | | L10-4 | |

| DRAWN BY | ST | APPR. BY | SRL |
|---|---|---|---|

D
SOUTHWEST

D'
NORTHEAST




CROSS SECTION D

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

VERTICAL EXAGGERATION = 10X

**LEGEND**

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

REVISIONS

| ZONE | REV | DESCRIPTION | DATE | APPROVED |
|---|---|---|---|---|
| | | | 05/25/06 | MS |

MKM ENGINEERS, INC.

DATE DRAWN 04/18/05

FIGURE L10-5
LOAD LINE 10
GEOLOGIC CROSS SECTION D
RAVENNA ARMY AMMUNITION PLANT, RAVENNA OHIO

| SIZE | PROJECT NO. | DWG NO. | REV |
|---|---|---|---|
| D | | L10-5 | |

| DRAWN BY | ST | APPR. BY | SRL |
|---|---|---|---|

LL-9 MW001

L10mw-001

L10mw-002

L10mw-003

L10mw-004

L10mw-005

L10mw-006

**Legend**

- Monitoring Well Locations
- Existing Monitoring Wells at RVAAP
- Vegetation
- Piping
- Steam Line Post
- Road
- Building
- Walkway
- Fence
- 10 ft Contour Line
- 2 ft Contour Line

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Stafford, TX 77477

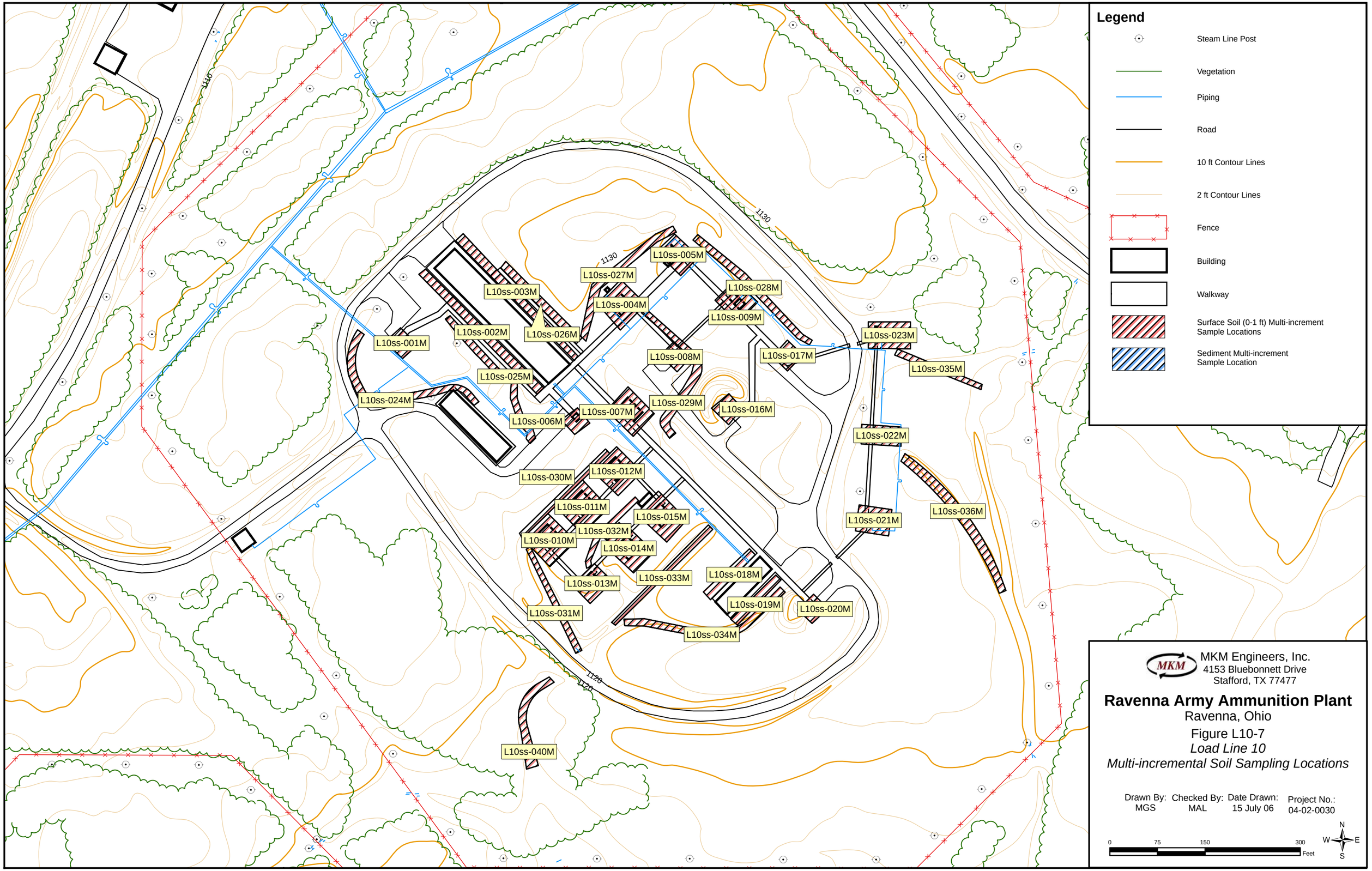
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-6
*Load Line 10*
*Monitoring Well Locations*

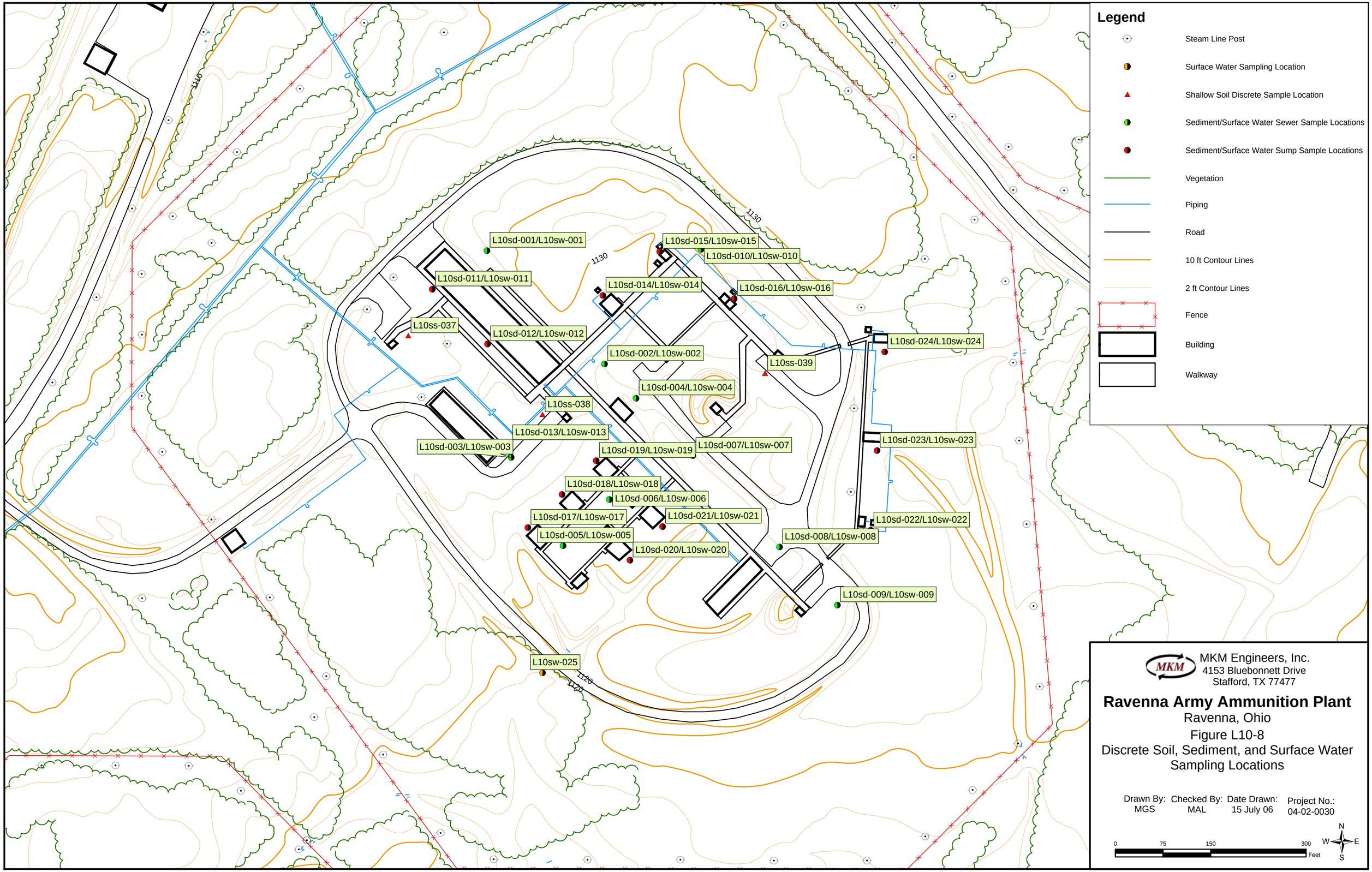
Characterization of 14 RVAAP AOCs

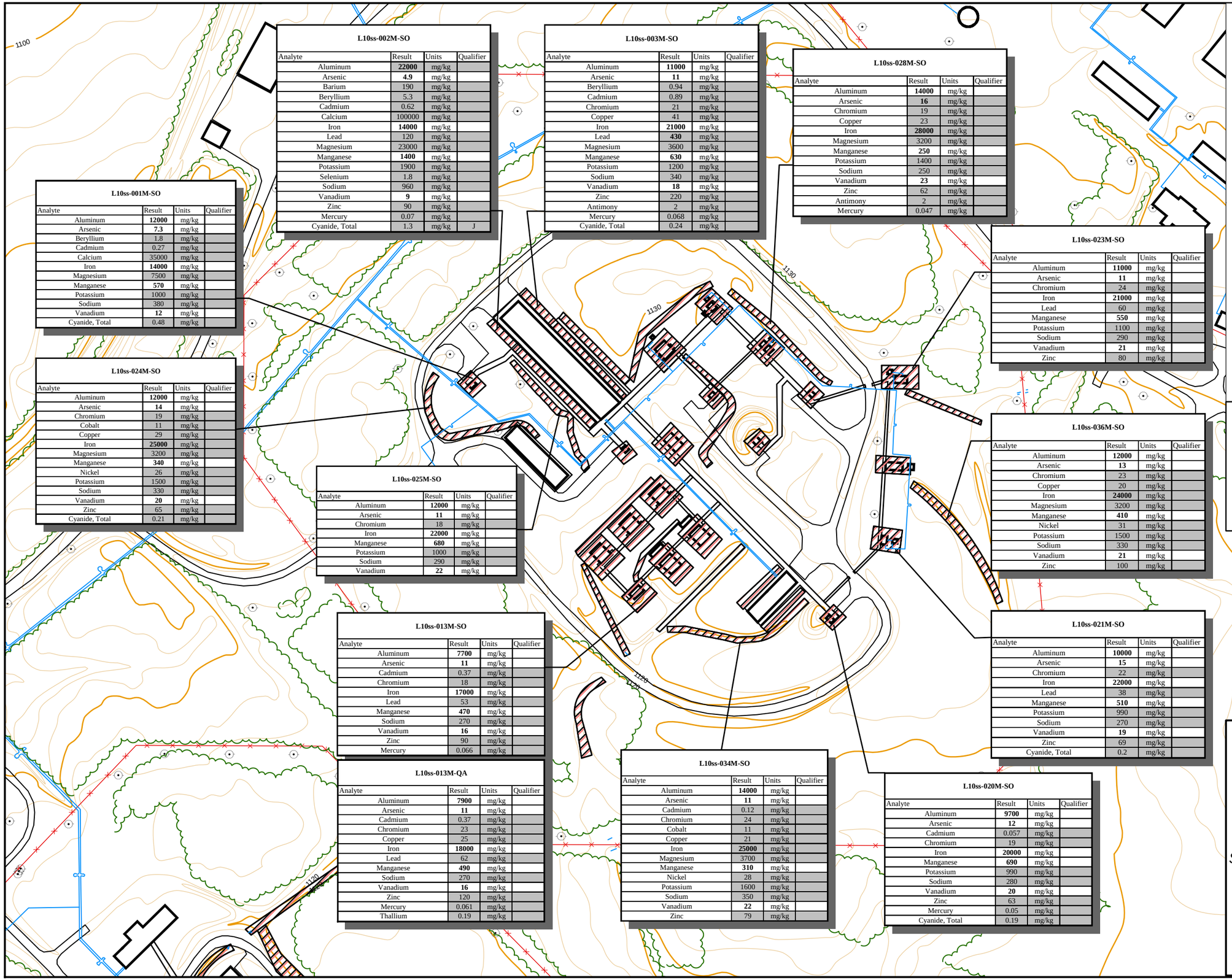
| Drawn By: | Checked By: | Date Drawn: | Project No.: |
|---|---|---|---|
| ST | SL | 03/30/05 | 04-02-0030 |

0 30 60 120 180 Feet

N W E S


1140
1130
1130
1120
L10ss-001M
L10ss-002M
L10ss-003M
L10ss-004M
L10ss-005M
L10ss-006M
L10ss-007M
L10ss-008M
L10ss-009M
L10ss-010M
L10ss-011M
L10ss-012M
L10ss-013M
L10ss-014M
L10ss-015M
L10ss-016M
L10ss-017M
L10ss-018M
L10ss-019M
L10ss-020M
L10ss-021M
L10ss-022M
L10ss-023M
L10ss-024M
L10ss-025M
L10ss-026M
L10ss-027M
L10ss-028M
L10ss-029M
L10ss-030M
L10ss-031M
L10ss-032M
L10ss-033M
L10ss-034M
L10ss-035M
L10ss-036M
L10ss-040M
Legend
Steam Line Post
Vegetation
Piping
Road
10 ft Contour Lines
2 ft Contour Lines
Fence
Building
Walkway
Surface Soil (0-1 ft) Multi-increment Sample Locations
Sediment Multi-increment Sample Location
MKM
MKM Engineers, Inc.
4153 Bluebonnet Drive
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-7
Load Line 10
Multi-incremental Soil Sampling Locations
Drawn By: MGS
Checked By: MAL
Date Drawn: 15 July 06
Project No.: 04-02-0030
0
75
150
300
Feet
N
W
E
S


1110
1130
1130
1120
L10sd-001/L10sw-001
L10sd-011/L10sw-011
L10ss-037
L10sd-012/L10sw-012
L10sd-015/L10sw-015
L10sd-010/L10sw-010
L10sd-014/L10sw-014
L10sd-016/L10sw-016
L10sd-002/L10sw-002
L10ss-039
L10sd-024/L10sw-024
L10sd-004/L10sw-004
L10ss-038
L10sd-013/L10sw-013
L10sd-003/L10sw-003
L10sd-019/L10sw-019
L10sd-007/L10sw-007
L10sd-023/L10sw-023
L10sd-018/L10sw-018
L10sd-006/L10sw-006
L10sd-017/L10sw-017
L10sd-021/L10sw-021
L10sd-022/L10sw-022
L10sd-005/L10sw-005
L10sd-020/L10sw-020
L10sd-008/L10sw-008
L10sd-009/L10sw-009
L10sw-025
Legend
Steam Line Post
Surface Water Sampling Location
Shallow Soil Discrete Sample Location
Sediment/Surface Water Sewer Sample Locations
Sediment/Surface Water Sump Sample Locations
Vegetation
Piping
Road
10 ft Contour Lines
2 ft Contour Lines
Fence
Building
Walkway
MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-8
Discrete Soil, Sediment, and Surface Water Sampling Locations
Drawn By: MGS
Checked By: MAL
Date Drawn: 15 July 06
Project No.: 04-02-0030
0
75
150
300
Feet
N
W
E
S




**L10ss-001M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **7.3** | mg/kg | |
| Beryllium | 1.8 | mg/kg | |
| Cadmium | 0.27 | mg/kg | |
| Calcium | 35000 | mg/kg | |
| Iron | **14000** | mg/kg | |
| Magnesium | 7500 | mg/kg | |
| Manganese | **570** | mg/kg | |
| Potassium | 1000 | mg/kg | |
| Sodium | 380 | mg/kg | |
| Vanadium | **12** | mg/kg | |
| Cyanide, Total | 0.48 | mg/kg | |

**L10ss-002M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **22000** | mg/kg | |
| Arsenic | **4.9** | mg/kg | |
| Barium | 190 | mg/kg | |
| Beryllium | 5.3 | mg/kg | |
| Cadmium | 0.62 | mg/kg | |
| Calcium | 100000 | mg/kg | |
| Iron | **14000** | mg/kg | |
| Lead | 120 | mg/kg | |
| Magnesium | 23000 | mg/kg | |
| Manganese | **1400** | mg/kg | |
| Potassium | 1900 | mg/kg | |
| Selenium | 1.8 | mg/kg | |
| Sodium | 960 | mg/kg | |
| Vanadium | **9** | mg/kg | |
| Zinc | 90 | mg/kg | |
| Mercury | 0.07 | mg/kg | |
| Cyanide, Total | 1.3 | mg/kg | J |

**L10ss-003M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Beryllium | 0.94 | mg/kg | |
| Cadmium | 0.89 | mg/kg | |
| Chromium | 21 | mg/kg | |
| Copper | 41 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | **430** | mg/kg | |
| Magnesium | 3600 | mg/kg | |
| Manganese | **630** | mg/kg | |
| Potassium | 1200 | mg/kg | |
| Sodium | 340 | mg/kg | |
| Vanadium | **18** | mg/kg | |
| Zinc | 220 | mg/kg | |
| Antimony | 2 | mg/kg | |
| Mercury | 0.068 | mg/kg | |
| Cyanide, Total | 0.24 | mg/kg | |

**L10ss-028M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **14000** | mg/kg | |
| Arsenic | **16** | mg/kg | |
| Chromium | 19 | mg/kg | |
| Copper | 23 | mg/kg | |
| Iron | **28000** | mg/kg | |
| Magnesium | 3200 | mg/kg | |
| Manganese | **250** | mg/kg | |
| Potassium | 1400 | mg/kg | |
| Sodium | 250 | mg/kg | |
| Vanadium | **23** | mg/kg | |
| Zinc | 62 | mg/kg | |
| Antimony | 2 | mg/kg | |
| Mercury | 0.047 | mg/kg | |

**L10ss-023M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Chromium | 24 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | 60 | mg/kg | |
| Manganese | **550** | mg/kg | |
| Potassium | 1100 | mg/kg | |
| Sodium | 290 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 80 | mg/kg | |

**L10ss-024M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **14** | mg/kg | |
| Chromium | 19 | mg/kg | |
| Cobalt | 11 | mg/kg | |
| Copper | 29 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Magnesium | 3200 | mg/kg | |
| Manganese | **340** | mg/kg | |
| Nickel | 26 | mg/kg | |
| Potassium | 1500 | mg/kg | |
| Sodium | 330 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 65 | mg/kg | |
| Cyanide, Total | 0.21 | mg/kg | |

**L10ss-025M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Chromium | 18 | mg/kg | |
| Iron | **22000** | mg/kg | |
| Manganese | **680** | mg/kg | |
| Potassium | 1000 | mg/kg | |
| Sodium | 290 | mg/kg | |
| Vanadium | **22** | mg/kg | |

**L10ss-036M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **13** | mg/kg | |
| Chromium | 23 | mg/kg | |
| Copper | 20 | mg/kg | |
| Iron | **24000** | mg/kg | |
| Magnesium | 3200 | mg/kg | |
| Manganese | **410** | mg/kg | |
| Nickel | 31 | mg/kg | |
| Potassium | 1500 | mg/kg | |
| Sodium | 330 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 100 | mg/kg | |

**L10ss-013M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **7700** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Cadmium | 0.37 | mg/kg | |
| Chromium | 18 | mg/kg | |
| Iron | **17000** | mg/kg | |
| Lead | 53 | mg/kg | |
| Manganese | **470** | mg/kg | |
| Sodium | 270 | mg/kg | |
| Vanadium | **16** | mg/kg | |
| Zinc | 90 | mg/kg | |
| Mercury | 0.066 | mg/kg | |

**L10ss-021M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **10000** | mg/kg | |
| Arsenic | **15** | mg/kg | |
| Chromium | 22 | mg/kg | |
| Iron | **22000** | mg/kg | |
| Lead | 38 | mg/kg | |
| Manganese | **510** | mg/kg | |
| Potassium | 990 | mg/kg | |
| Sodium | 270 | mg/kg | |
| Vanadium | **19** | mg/kg | |
| Zinc | 69 | mg/kg | |
| Cyanide, Total | 0.2 | mg/kg | |

**L10ss-013M-QA**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **7900** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Cadmium | 0.37 | mg/kg | |
| Chromium | 23 | mg/kg | |
| Copper | 25 | mg/kg | |
| Iron | **18000** | mg/kg | |
| Lead | 62 | mg/kg | |
| Manganese | **490** | mg/kg | |
| Sodium | 270 | mg/kg | |
| Vanadium | **16** | mg/kg | |
| Zinc | 120 | mg/kg | |
| Mercury | 0.061 | mg/kg | |
| Thallium | 0.19 | mg/kg | |

**L10ss-034M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **14000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Cadmium | 0.12 | mg/kg | |
| Chromium | 24 | mg/kg | |
| Cobalt | 11 | mg/kg | |
| Copper | 21 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Magnesium | 3700 | mg/kg | |
| Manganese | **310** | mg/kg | |
| Nickel | 28 | mg/kg | |
| Potassium | 1600 | mg/kg | |
| Sodium | 350 | mg/kg | |
| Vanadium | **22** | mg/kg | |
| Zinc | 79 | mg/kg | |

**L10ss-020M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **9700** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Cadmium | 0.057 | mg/kg | |
| Chromium | 19 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Manganese | **690** | mg/kg | |
| Potassium | 990 | mg/kg | |
| Sodium | 280 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 63 | mg/kg | |
| Mercury | 0.05 | mg/kg | |
| Cyanide, Total | 0.19 | mg/kg | |

## Legend

- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway
- 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)

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-9A

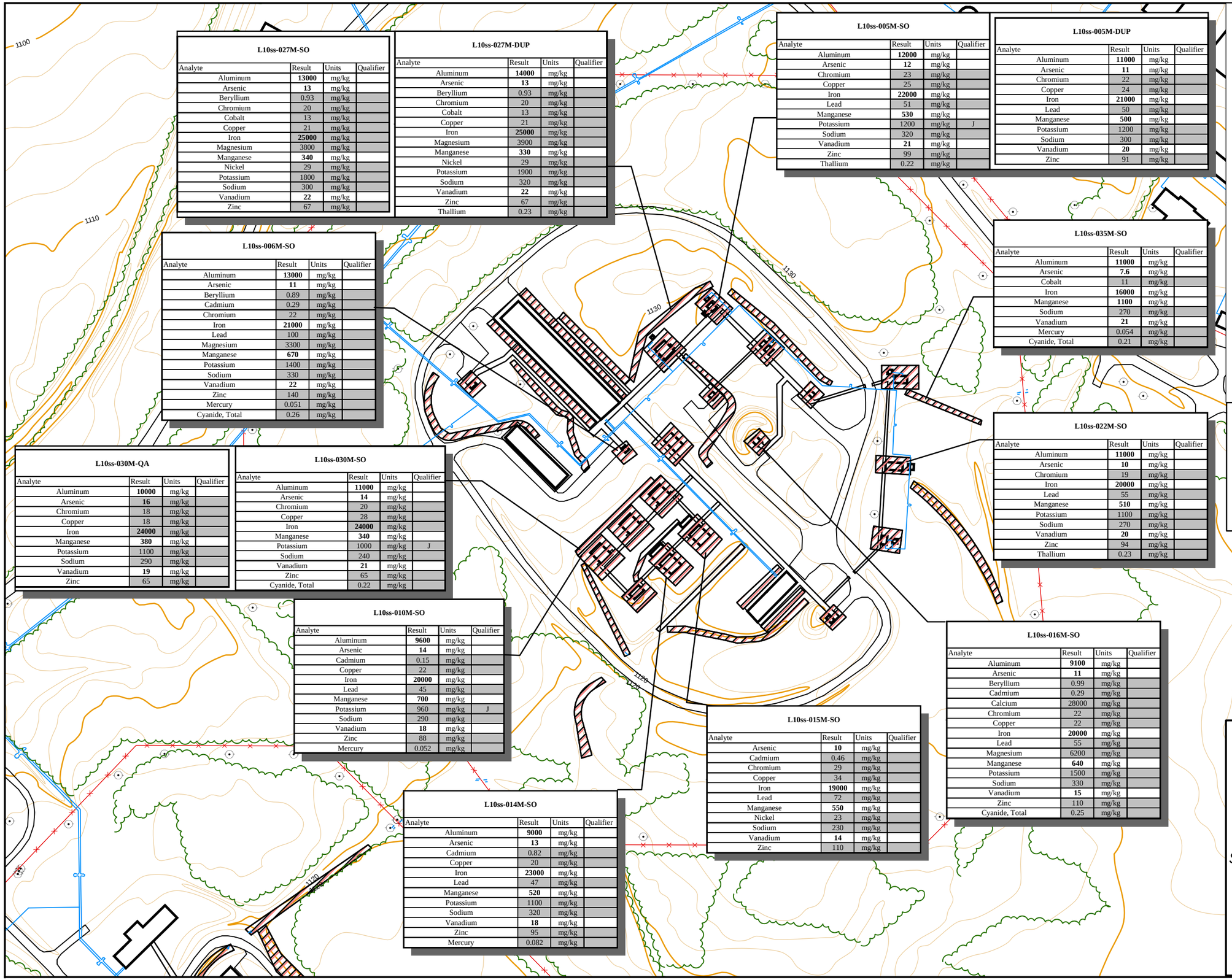
*Load Line 10*

*Soil Sample Location Exceedences-Inorganics*

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

0 65 130 260 Feet

N W E S




**L10ss-027M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **13000** | mg/kg | |
| Arsenic | **13** | mg/kg | |
| Beryllium | 0.93 | mg/kg | |
| Chromium | 20 | mg/kg | |
| Cobalt | 13 | mg/kg | |
| Copper | 21 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Magnesium | 3800 | mg/kg | |
| Manganese | **340** | mg/kg | |
| Nickel | 29 | mg/kg | |
| Potassium | 1800 | mg/kg | |
| Sodium | 300 | mg/kg | |
| Vanadium | **22** | mg/kg | |
| Zinc | 67 | mg/kg | |

**L10ss-027M-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **14000** | mg/kg | |
| Arsenic | **13** | mg/kg | |
| Beryllium | 0.93 | mg/kg | |
| Chromium | 20 | mg/kg | |
| Cobalt | 13 | mg/kg | |
| Copper | 21 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Magnesium | 3900 | mg/kg | |
| Manganese | **330** | mg/kg | |
| Nickel | 29 | mg/kg | |
| Potassium | 1900 | mg/kg | |
| Sodium | 320 | mg/kg | |
| Vanadium | **22** | mg/kg | |
| Zinc | 67 | mg/kg | |
| Thallium | 0.23 | mg/kg | |

**L10ss-005M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Chromium | 23 | mg/kg | |
| Copper | 25 | mg/kg | |
| Iron | **22000** | mg/kg | |
| Lead | 51 | mg/kg | |
| Manganese | **530** | mg/kg | |
| Potassium | 1200 | mg/kg | J |
| Sodium | 320 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 99 | mg/kg | |
| Thallium | 0.22 | mg/kg | |

**L10ss-005M-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Chromium | 22 | mg/kg | |
| Copper | 24 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | 50 | mg/kg | |
| Manganese | **500** | mg/kg | |
| Potassium | 1200 | mg/kg | |
| Sodium | 300 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 91 | mg/kg | |

**L10ss-006M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **13000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Beryllium | 0.89 | mg/kg | |
| Cadmium | 0.29 | mg/kg | |
| Chromium | 22 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | 100 | mg/kg | |
| Magnesium | 3300 | mg/kg | |
| Manganese | **670** | mg/kg | |
| Potassium | 1400 | mg/kg | |
| Sodium | 330 | mg/kg | |
| Vanadium | **22** | mg/kg | |
| Zinc | 140 | mg/kg | |
| Mercury | 0.051 | mg/kg | |
| Cyanide, Total | 0.26 | mg/kg | |

**L10ss-035M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **7.6** | mg/kg | |
| Cobalt | 11 | mg/kg | |
| Iron | **16000** | mg/kg | |
| Manganese | **1100** | mg/kg | |
| Sodium | 270 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Mercury | 0.054 | mg/kg | |
| Cyanide, Total | 0.21 | mg/kg | |

**L10ss-030M-QA**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **10000** | mg/kg | |
| Arsenic | **16** | mg/kg | |
| Chromium | 18 | mg/kg | |
| Copper | 18 | mg/kg | |
| Iron | **24000** | mg/kg | |
| Manganese | **380** | mg/kg | |
| Potassium | 1100 | mg/kg | |
| Sodium | 290 | mg/kg | |
| Vanadium | **19** | mg/kg | |
| Zinc | 65 | mg/kg | |

**L10ss-030M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **14** | mg/kg | |
| Chromium | 20 | mg/kg | |
| Copper | 28 | mg/kg | |
| Iron | **24000** | mg/kg | |
| Manganese | **340** | mg/kg | |
| Potassium | 1000 | mg/kg | J |
| Sodium | 240 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 65 | mg/kg | |
| Cyanide, Total | 0.22 | mg/kg | |

**L10ss-022M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **10** | mg/kg | |
| Chromium | 19 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 55 | mg/kg | |
| Manganese | **510** | mg/kg | |
| Potassium | 1100 | mg/kg | |
| Sodium | 270 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 94 | mg/kg | |
| Thallium | 0.23 | mg/kg | |

**L10ss-010M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **9600** | mg/kg | |
| Arsenic | **14** | mg/kg | |
| Cadmium | 0.15 | mg/kg | |
| Copper | 22 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 45 | mg/kg | |
| Manganese | **700** | mg/kg | |
| Potassium | 960 | mg/kg | J |
| Sodium | 290 | mg/kg | |
| Vanadium | **18** | mg/kg | |
| Zinc | 88 | mg/kg | |
| Mercury | 0.052 | mg/kg | |

**L10ss-015M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Arsenic | **10** | mg/kg | |
| Cadmium | 0.46 | mg/kg | |
| Chromium | 29 | mg/kg | |
| Copper | 34 | mg/kg | |
| Iron | **19000** | mg/kg | |
| Lead | 72 | mg/kg | |
| Manganese | **550** | mg/kg | |
| Nickel | 23 | mg/kg | |
| Sodium | 230 | mg/kg | |
| Vanadium | **14** | mg/kg | |
| Zinc | 110 | mg/kg | |

**L10ss-016M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **9100** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Beryllium | 0.99 | mg/kg | |
| Cadmium | 0.29 | mg/kg | |
| Calcium | 28000 | mg/kg | |
| Chromium | 22 | mg/kg | |
| Copper | 22 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 55 | mg/kg | |
| Magnesium | 6200 | mg/kg | |
| Manganese | **640** | mg/kg | |
| Potassium | 1500 | mg/kg | |
| Sodium | 330 | mg/kg | |
| Vanadium | **15** | mg/kg | |
| Zinc | 110 | mg/kg | |
| Cyanide, Total | 0.25 | mg/kg | |

**L10ss-014M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **9000** | mg/kg | |
| Arsenic | **13** | mg/kg | |
| Cadmium | 0.82 | mg/kg | |
| Copper | 20 | mg/kg | |
| Iron | **23000** | mg/kg | |
| Lead | 47 | mg/kg | |
| Manganese | **520** | mg/kg | |
| Potassium | 1100 | mg/kg | |
| Sodium | 320 | mg/kg | |
| Vanadium | **18** | mg/kg | |
| Zinc | 95 | mg/kg | |
| Mercury | 0.082 | mg/kg | |

## Legend

- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway
- Surface Soil (0-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)

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-9B

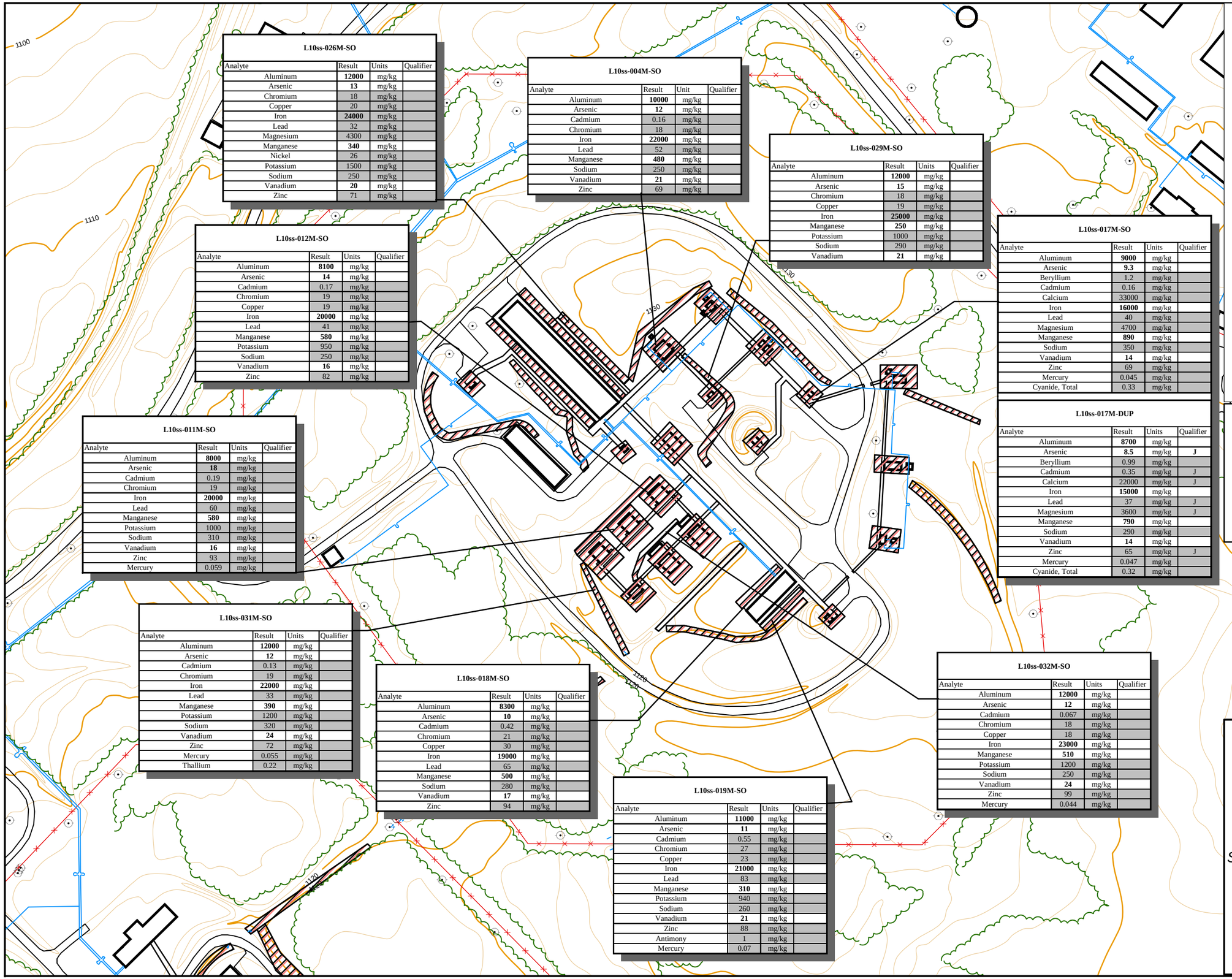
*Load Line 10*

*Soil Sample Location Exceedences-Inorganics*

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

0 65 130 260 Feet

N W E S




**L10ss-026M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **13** | mg/kg | |
| Chromium | 18 | mg/kg | |
| Copper | 20 | mg/kg | |
| Iron | **24000** | mg/kg | |
| Lead | 32 | mg/kg | |
| Magnesium | 4300 | mg/kg | |
| Manganese | **340** | mg/kg | |
| Nickel | 26 | mg/kg | |
| Potassium | 1500 | mg/kg | |
| Sodium | 250 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 71 | mg/kg | |

**L10ss-004M-SO**

| Analyte | Result | Unit | Qualifier |
|---|---|---|---|
| Aluminum | **10000** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Cadmium | 0.16 | mg/kg | |
| Chromium | 18 | mg/kg | |
| Iron | **22000** | mg/kg | |
| Lead | 52 | mg/kg | |
| Manganese | **480** | mg/kg | |
| Sodium | 250 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 69 | mg/kg | |

**L10ss-029M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **15** | mg/kg | |
| Chromium | 18 | mg/kg | |
| Copper | 19 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Manganese | **250** | mg/kg | |
| Potassium | 1000 | mg/kg | |
| Sodium | 290 | mg/kg | |
| Vanadium | **21** | mg/kg | |

**L10ss-012M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **8100** | mg/kg | |
| Arsenic | **14** | mg/kg | |
| Cadmium | 0.17 | mg/kg | |
| Chromium | 19 | mg/kg | |
| Copper | 19 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 41 | mg/kg | |
| Manganese | **580** | mg/kg | |
| Potassium | 950 | mg/kg | |
| Sodium | 250 | mg/kg | |
| Vanadium | **16** | mg/kg | |
| Zinc | 82 | mg/kg | |

**L10ss-017M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **9000** | mg/kg | |
| Arsenic | **9.3** | mg/kg | |
| Beryllium | 1.2 | mg/kg | |
| Cadmium | 0.16 | mg/kg | |
| Calcium | 33000 | mg/kg | |
| Iron | **16000** | mg/kg | |
| Lead | 40 | mg/kg | |
| Magnesium | 4700 | mg/kg | |
| Manganese | **890** | mg/kg | |
| Sodium | 350 | mg/kg | |
| Vanadium | **14** | mg/kg | |
| Zinc | 69 | mg/kg | |
| Mercury | 0.045 | mg/kg | |
| Cyanide, Total | 0.33 | mg/kg | |

**L10ss-017M-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **8700** | mg/kg | |
| Arsenic | **8.5** | mg/kg | **J** |
| Beryllium | 0.99 | mg/kg | |
| Cadmium | 0.35 | mg/kg | J |
| Calcium | 22000 | mg/kg | J |
| Iron | **15000** | mg/kg | |
| Lead | 37 | mg/kg | J |
| Magnesium | 3600 | mg/kg | J |
| Manganese | **790** | mg/kg | |
| Sodium | 290 | mg/kg | |
| Vanadium | **14** | mg/kg | |
| Zinc | 65 | mg/kg | J |
| Mercury | 0.047 | mg/kg | |
| Cyanide, Total | 0.32 | mg/kg | |

**L10ss-011M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **8000** | mg/kg | |
| Arsenic | **18** | mg/kg | |
| Cadmium | 0.19 | mg/kg | |
| Chromium | 19 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 60 | mg/kg | |
| Manganese | **580** | mg/kg | |
| Potassium | 1000 | mg/kg | |
| Sodium | 310 | mg/kg | |
| Vanadium | **16** | mg/kg | |
| Zinc | 93 | mg/kg | |
| Mercury | 0.059 | mg/kg | |

**L10ss-031M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Cadmium | 0.13 | mg/kg | |
| Chromium | 19 | mg/kg | |
| Iron | **22000** | mg/kg | |
| Lead | 33 | mg/kg | |
| Manganese | **390** | mg/kg | |
| Potassium | 1200 | mg/kg | |
| Sodium | 320 | mg/kg | |
| Vanadium | **24** | mg/kg | |
| Zinc | 72 | mg/kg | |
| Mercury | 0.055 | mg/kg | |
| Thallium | 0.22 | mg/kg | |

**L10ss-018M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **8300** | mg/kg | |
| Arsenic | **10** | mg/kg | |
| Cadmium | 0.42 | mg/kg | |
| Chromium | 21 | mg/kg | |
| Copper | 30 | mg/kg | |
| Iron | **19000** | mg/kg | |
| Lead | 65 | mg/kg | |
| Manganese | **500** | mg/kg | |
| Sodium | 280 | mg/kg | |
| Vanadium | **17** | mg/kg | |
| Zinc | 94 | mg/kg | |

**L10ss-019M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Cadmium | 0.55 | mg/kg | |
| Chromium | 27 | mg/kg | |
| Copper | 23 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | 83 | mg/kg | |
| Manganese | **310** | mg/kg | |
| Potassium | 940 | mg/kg | |
| Sodium | 260 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Zinc | 88 | mg/kg | |
| Antimony | 1 | mg/kg | |
| Mercury | 0.07 | mg/kg | |

**L10ss-032M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Cadmium | 0.067 | mg/kg | |
| Chromium | 18 | mg/kg | |
| Copper | 18 | mg/kg | |
| Iron | **23000** | mg/kg | |
| Manganese | **510** | mg/kg | |
| Potassium | 1200 | mg/kg | |
| Sodium | 250 | mg/kg | |
| Vanadium | **24** | mg/kg | |
| Zinc | 99 | mg/kg | |
| Mercury | 0.044 | mg/kg | |

## Legend

- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway
- 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)

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-9C

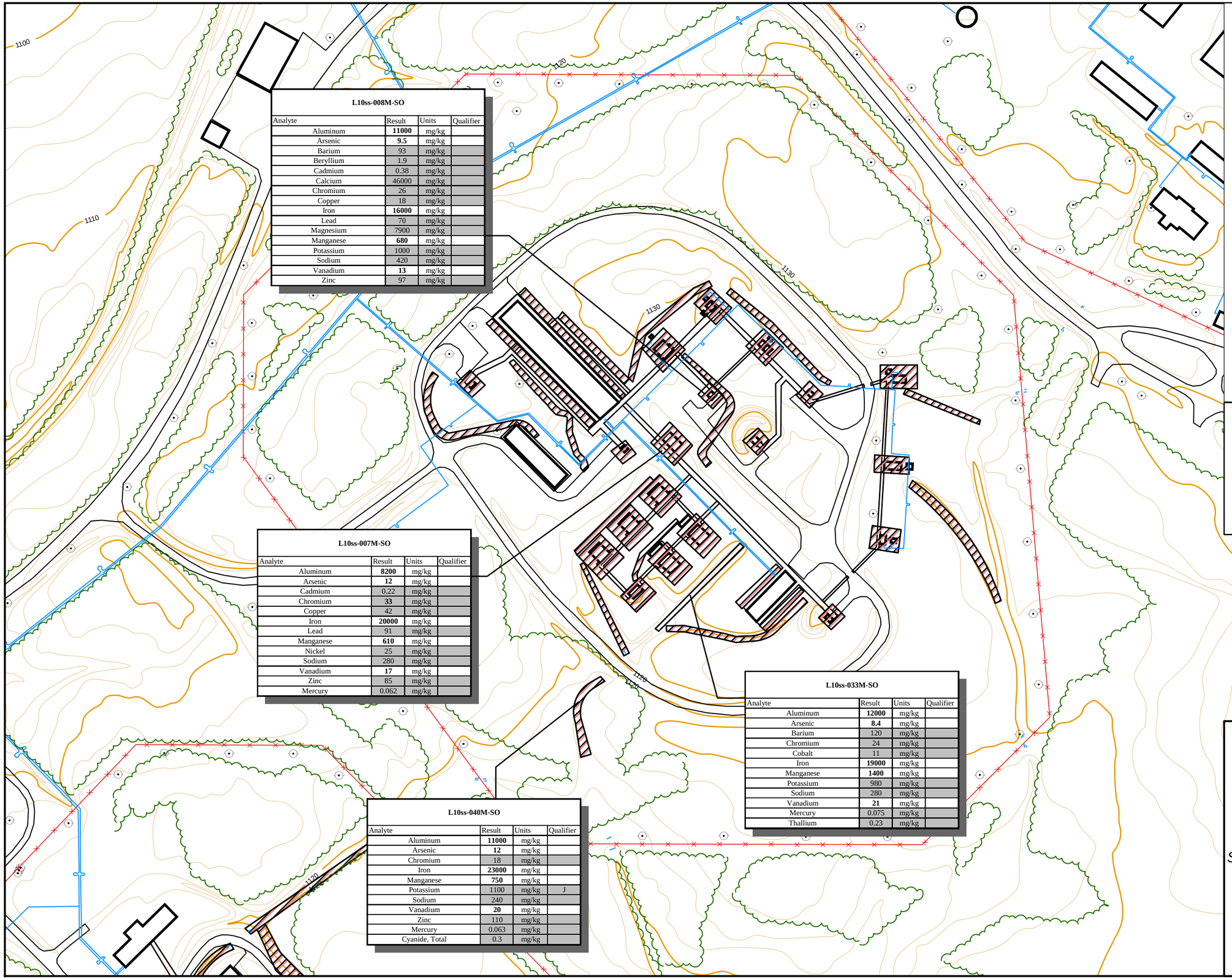
*Load Line 10*

*Soil Sample Location Exceedences-Inorganics*

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

0 65 130 260 Feet

N W E S




**L10ss-008M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **9.5** | mg/kg | |
| Barium | 93 | mg/kg | |
| Beryllium | 1.9 | mg/kg | |
| Cadmium | 0.38 | mg/kg | |
| Calcium | 46000 | mg/kg | |
| Chromium | 26 | mg/kg | |
| Copper | 18 | mg/kg | |
| Iron | **16000** | mg/kg | |
| Lead | 70 | mg/kg | |
| Magnesium | 7900 | mg/kg | |
| Manganese | **680** | mg/kg | |
| Potassium | 1000 | mg/kg | |
| Sodium | 420 | mg/kg | |
| Vanadium | **13** | mg/kg | |
| Zinc | 97 | mg/kg | |

**L10ss-007M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **8200** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Cadmium | 0.22 | mg/kg | |
| Chromium | **33** | mg/kg | |
| Copper | 42 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | 91 | mg/kg | |
| Manganese | **610** | mg/kg | |
| Nickel | 25 | mg/kg | |
| Sodium | 280 | mg/kg | |
| Vanadium | **17** | mg/kg | |
| Zinc | 85 | mg/kg | |
| Mercury | 0.062 | mg/kg | |

**L10ss-040M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **11000** | mg/kg | |
| Arsenic | **12** | mg/kg | |
| Chromium | 18 | mg/kg | |
| Iron | **23000** | mg/kg | |
| Manganese | **750** | mg/kg | |
| Potassium | 1100 | mg/kg | J |
| Sodium | 240 | mg/kg | |
| Vanadium | **20** | mg/kg | |
| Zinc | 110 | mg/kg | |
| Mercury | 0.063 | mg/kg | |
| Cyanide, Total | 0.3 | mg/kg | |

**L10ss-033M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **12000** | mg/kg | |
| Arsenic | **8.4** | mg/kg | |
| Barium | 120 | mg/kg | |
| Chromium | 24 | mg/kg | |
| Cobalt | 11 | mg/kg | |
| Iron | **19000** | mg/kg | |
| Manganese | **1400** | mg/kg | |
| Potassium | 980 | mg/kg | |
| Sodium | 280 | mg/kg | |
| Vanadium | **21** | mg/kg | |
| Mercury | 0.075 | mg/kg | |
| Thallium | 0.23 | mg/kg | |

## Legend

- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway
- Surface Soil (0-1 ft) Multi-increment Sample Location
- Sediment Multi-incremental 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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4153 Bluebonnett Drive
Stafford, TX 77477

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-9D

*Load Line 10*

*Soil Sample Location Exceedences-Inorganics*

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

0 65 130 260 Feet

N W E S

## Legend

- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway
- 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)

**L10ss-034M-SO**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **14000** | mg/kg | |
| Arsenic | **11** | mg/kg | |
| Cadmium | 0.12 | mg/kg | |
| Chromium | 24 | mg/kg | |
| Cobalt | 11 | mg/kg | |
| Copper | 21 | mg/kg | |
| Iron | **25000** | mg/kg | |
| Magnesium | 3700 | mg/kg | |
| Manganese | **310** | mg/kg | |
| Nickel | 28 | mg/kg | |
| Potassium | 1600 | mg/kg | |
| Sodium | 350 | mg/kg | |
| Vanadium | **22** | mg/kg | |
| Zinc | 79 | mg/kg | |

MKM Engineers, Inc.
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Stafford, TX 77477

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-10

*Load Line 10*

*Soil Sample Location Exceedences-Organics*

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

0 65 130 260 Feet

N W E S

**L10sw-011-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | **0.17** | ug/l | **J** |
| Benzo(a)pyrene | **0.28** | ug/l | **J** |
| Benzo(b)fluoranthene | **0.32** | ug/l | **J** |
| Bis(2-ethylhexyl) phthalate | **5.8** | ug/l | **J** |
| Dibenzo(a,h)anthracene | **0.21** | ug/l | **J** |
| Indeno(1,2,3-cd)pyrene | **0.36** | ug/l | **J** |

**L10sw-011-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | 12000 | ug/l | |
| Barium | 270 | ug/l | |
| Beryllium | 1.1 | ug/l | |
| Cadmium | 0.91 | ug/l | |
| Calcium | 52000 | ug/l | |
| Chromium | **200** | ug/l | |
| Cobalt | 4 | ug/l | |
| Copper | 400 | ug/l | |
| Iron | **14000** | ug/l | |
| Lead | **10000** | ug/l | |
| Nickel | 29 | ug/l | |
| Potassium | 5800 | ug/l | |
| Selenium | 3 | ug/l | |
| Vanadium | 24 | ug/l | |
| Zinc | 500 | ug/l | |
| Antimony | **53** | ug/l | |
| Arsenic | **89** | ug/l | |
| Mercury | 0.77 | ug/l | |

**L10sd-004-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Arsenic | **12** | mg/kg | |
| Beryllium | 0.44 | mg/kg | |
| Iron | **20000** | mg/kg | |
| Lead | **640** | mg/kg | |
| Manganese | **520** | mg/kg | |
| Sodium | 200 | mg/kg | |
| Vanadium | **15** | mg/kg | |
| Antimony | 1.9 | mg/kg | |
| Mercury | 0.13 | mg/kg | |

**L10sw-004-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Antimony | 4 | ug/l | |
| Lead | 9.7 | ug/l | |

**L10sd-005-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Arsenic | **20** | mg/kg | |
| Beryllium | 0.55 | mg/kg | |
| Chromium | 28 | mg/kg | |
| Cobalt | 10 | mg/kg | |
| Copper | 94 | mg/kg | |
| Iron | **71000** | mg/kg | |
| Lead | 350 | mg/kg | |
| Manganese | **970** | mg/kg | |
| Nickel | 24 | mg/kg | |
| Sodium | 340 | mg/kg | |
| Vanadium | **28** | mg/kg | |
| Mercury | 0.074 | mg/kg | |

**L10sw-002-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Antimony | 4 | ug/l | |
| Lead | 2.2 | ug/l | |

**L10sw-002-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Chromium | 1.2 | ug/l | |
| Antimony | 3.2 | ug/l | |
| Lead | 2.2 | ug/l | |

**L10sw-015-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.25 | ug/l | |
| Chromium | 4.7 | ug/l | |
| Lead | **220** | ug/l | |
| Potassium | 7400 | ug/l | |
| Silver | 1 | ug/l | |
| Antimony | **49** | ug/l | |
| Arsenic | **40** | ug/l | |

**L10sd-006-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Arsenic | **18** | mg/kg | |
| Beryllium | 0.49 | mg/kg | |
| Chromium | **54** | mg/kg | |
| Copper | 130 | mg/kg | |
| Iron | **31000** | mg/kg | |
| Lead | 310 | mg/kg | |
| Manganese | **520** | mg/kg | |
| Nickel | 20 | mg/kg | |
| Sodium | 230 | mg/kg | |
| Vanadium | **20** | mg/kg | |

**L10sw-006-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Chromium | 1.1 | ug/l | |
| Lead | 1.1 | ug/l | |

**L10sw-006-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | **0.4** | ug/l | |
| Benzo(a)pyrene | **0.45** | ug/l | |
| Benzo(b)fluoranthene | **0.64** | ug/l | |
| Indeno(1,2,3-cd)pyrene | **0.32** | ug/l | **J** |

**L10sw-007-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Vanadium | 1.1 | ug/l | |
| Antimony | 2.5 | ug/l | |
| Lead | 5.1 | ug/l | |

**L10sw-008-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Lead | 4.3 | ug/l | |

**L10sw-009-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Lead | 4.4 | ug/l | |

**L10sd-024-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **7800** | mg/kg | |
| Arsenic | **35** | mg/kg | |
| Beryllium | 0.58 | mg/kg | |
| Chromium | 19 | mg/kg | |
| Copper | 35 | mg/kg | |
| Iron | **21000** | mg/kg | |
| Lead | 77 | mg/kg | |
| Manganese | **240** | mg/kg | |
| Nickel | 19 | mg/kg | |
| Sodium | 330 | mg/kg | |
| Vanadium | **16** | mg/kg | |

**L10sw-024-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Calcium | 48000 | ug/l | |
| Chromium | 16 | ug/l | |
| Copper | 35 | ug/l | |
| Potassium | 3500 | ug/l | |
| Arsenic | **220** | ug/l | |
| Lead | **20** | ug/l | |

1130

1130

## Legend

- Vegetation
- Streams / Ditches
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Steam Line Post
- Surface Soil (0-1 ft) Discrete Sample Location
- Sediment/Surface Water Sewer Sample Location
- Sediment/Surface Water Sump Sample Location
- Walkway
- Building
- Fence

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)
Ug/L - Microgram per Liter (parts per billion - ppb)

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-11A

*Load Line 10*

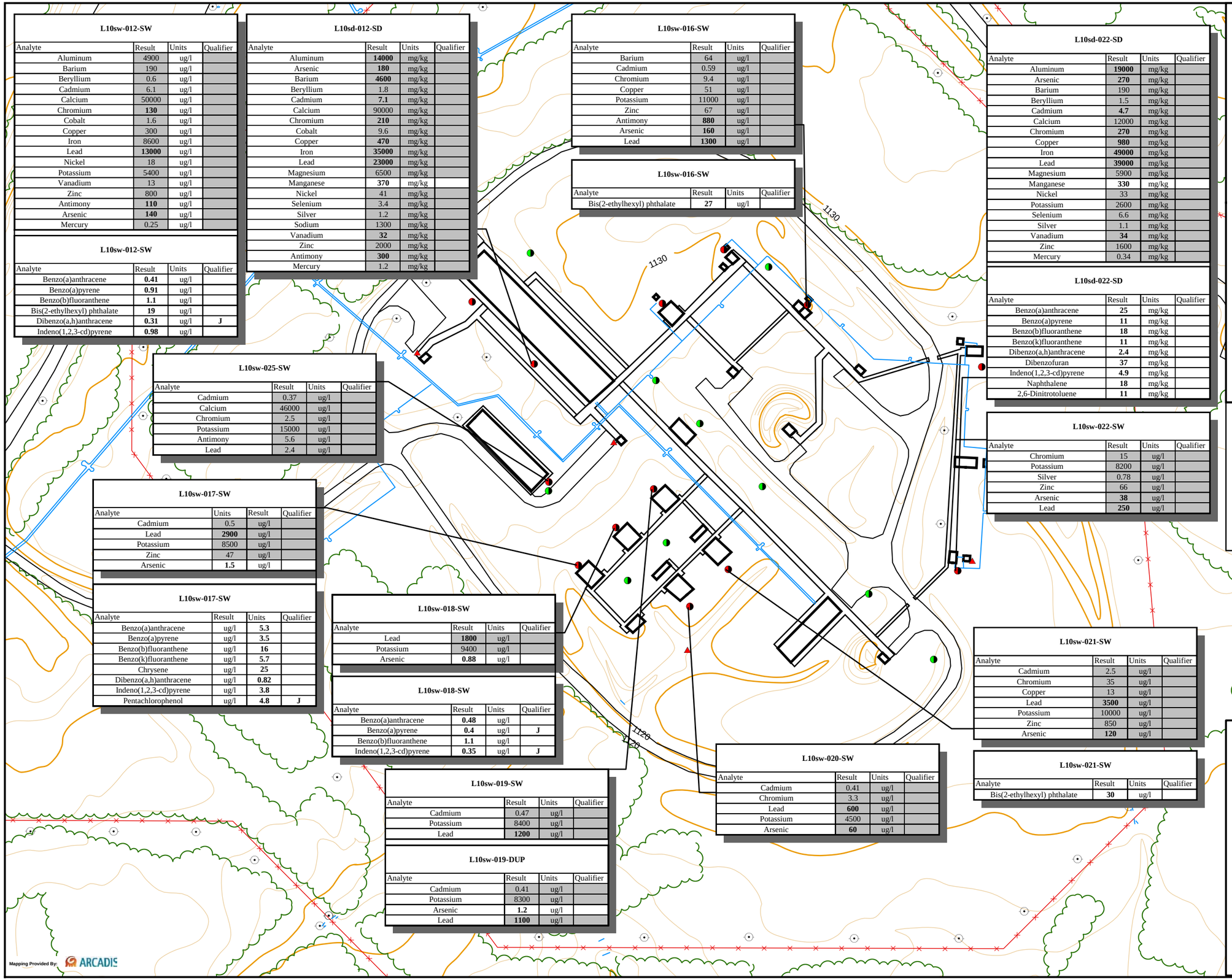
*Surface Water and Sediment*

*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




**L10sw-012-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | 4900 | ug/l | |
| Barium | 190 | ug/l | |
| Beryllium | 0.6 | ug/l | |
| Cadmium | 6.1 | ug/l | |
| Calcium | 50000 | ug/l | |
| Chromium | **130** | ug/l | |
| Cobalt | 1.6 | ug/l | |
| Copper | 300 | ug/l | |
| Iron | 8600 | ug/l | |
| Lead | **13000** | ug/l | |
| Nickel | 18 | ug/l | |
| Potassium | 5400 | ug/l | |
| Vanadium | 13 | ug/l | |
| Zinc | 800 | ug/l | |
| Antimony | **110** | ug/l | |
| Arsenic | **140** | ug/l | |
| Mercury | 0.25 | ug/l | |

**L10sw-012-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | **0.41** | ug/l | |
| Benzo(a)pyrene | **0.91** | ug/l | |
| Benzo(b)fluoranthene | **1.1** | ug/l | |
| Bis(2-ethylhexyl) phthalate | **19** | ug/l | |
| Dibenzo(a,h)anthracene | **0.31** | ug/l | J |
| Indeno(1,2,3-cd)pyrene | **0.98** | ug/l | |

**L10sd-012-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **14000** | mg/kg | |
| Arsenic | **180** | mg/kg | |
| Barium | **4600** | mg/kg | |
| Beryllium | 1.8 | mg/kg | |
| Cadmium | **7.1** | mg/kg | |
| Calcium | 90000 | mg/kg | |
| Chromium | **210** | mg/kg | |
| Cobalt | 9.6 | mg/kg | |
| Copper | **470** | mg/kg | |
| Iron | **35000** | mg/kg | |
| Lead | **23000** | mg/kg | |
| Magnesium | 6500 | mg/kg | |
| Manganese | **370** | mg/kg | |
| Nickel | 41 | mg/kg | |
| Selenium | 3.4 | mg/kg | |
| Silver | 1.2 | mg/kg | |
| Sodium | 1300 | mg/kg | |
| Vanadium | **32** | mg/kg | |
| Zinc | 2000 | mg/kg | |
| Antimony | **300** | mg/kg | |
| Mercury | 1.2 | mg/kg | |

**L10sw-016-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Barium | 64 | ug/l | |
| Cadmium | 0.59 | ug/l | |
| Chromium | 9.4 | ug/l | |
| Copper | 51 | ug/l | |
| Potassium | 11000 | ug/l | |
| Zinc | 67 | ug/l | |
| Antimony | **880** | ug/l | |
| Arsenic | **160** | ug/l | |
| Lead | **1300** | ug/l | |

**L10sw-016-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Bis(2-ethylhexyl) phthalate | **27** | ug/l | |

**L10sd-022-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Aluminum | **19000** | mg/kg | |
| Arsenic | **270** | mg/kg | |
| Barium | 190 | mg/kg | |
| Beryllium | 1.5 | mg/kg | |
| Cadmium | **4.7** | mg/kg | |
| Calcium | 12000 | mg/kg | |
| Chromium | **270** | mg/kg | |
| Copper | **980** | mg/kg | |
| Iron | **49000** | mg/kg | |
| Lead | **39000** | mg/kg | |
| Magnesium | 5900 | mg/kg | |
| Manganese | **330** | mg/kg | |
| Nickel | 33 | mg/kg | |
| Potassium | 2600 | mg/kg | |
| Selenium | 6.6 | mg/kg | |
| Silver | 1.1 | mg/kg | |
| Vanadium | **34** | mg/kg | |
| Zinc | 1600 | mg/kg | |
| Mercury | 0.34 | mg/kg | |

**L10sd-022-SD**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | **25** | mg/kg | |
| Benzo(a)pyrene | **11** | mg/kg | |
| Benzo(b)fluoranthene | **18** | mg/kg | |
| Benzo(k)fluoranthene | **11** | mg/kg | |
| Dibenzo(a,h)anthracene | **2.4** | mg/kg | |
| Dibenzofuran | **37** | mg/kg | |
| Indeno(1,2,3-cd)pyrene | **4.9** | mg/kg | |
| Naphthalene | **18** | mg/kg | |
| 2,6-Dinitrotoluene | **11** | mg/kg | |

**L10sw-022-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Chromium | 15 | ug/l | |
| Potassium | 8200 | ug/l | |
| Silver | 0.78 | ug/l | |
| Zinc | 66 | ug/l | |
| Arsenic | **38** | ug/l | |
| Lead | **250** | ug/l | |

**L10sw-025-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.37 | ug/l | |
| Calcium | 46000 | ug/l | |
| Chromium | 2.5 | ug/l | |
| Potassium | 15000 | ug/l | |
| Antimony | 5.6 | ug/l | |
| Lead | 2.4 | ug/l | |

**L10sw-017-SW**

| Analyte | Units | Result | Qualifier |
|---|---|---|---|
| Cadmium | 0.5 | ug/l | |
| Lead | **2900** | ug/l | |
| Potassium | 8500 | ug/l | |
| Zinc | 47 | ug/l | |
| Arsenic | **1.5** | ug/l | |

**L10sw-017-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | ug/l | **5.3** | |
| Benzo(a)pyrene | ug/l | **3.5** | |
| Benzo(b)fluoranthene | ug/l | **16** | |
| Benzo(k)fluoranthene | ug/l | **5.7** | |
| Chrysene | ug/l | **25** | |
| Dibenzo(a,h)anthracene | ug/l | **0.82** | |
| Indeno(1,2,3-cd)pyrene | ug/l | **3.8** | |
| Pentachlorophenol | ug/l | **4.8** | J |

**L10sw-018-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Lead | **1800** | ug/l | |
| Potassium | 9400 | ug/l | |
| Arsenic | **0.88** | ug/l | |

**L10sw-018-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Benzo(a)anthracene | **0.48** | ug/l | |
| Benzo(a)pyrene | **0.4** | ug/l | J |
| Benzo(b)fluoranthene | **1.1** | ug/l | |
| Indeno(1,2,3-cd)pyrene | **0.35** | ug/l | J |

**L10sw-019-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.47 | ug/l | |
| Potassium | 8400 | ug/l | |
| Lead | **1200** | ug/l | |

**L10sw-019-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.41 | ug/l | |
| Potassium | 8300 | ug/l | |
| Arsenic | **1.2** | ug/l | |
| Lead | **1100** | ug/l | |

**L10sw-020-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.41 | ug/l | |
| Chromium | 3.3 | ug/l | |
| Lead | **600** | ug/l | |
| Potassium | 4500 | ug/l | |
| Arsenic | **60** | ug/l | |

**L10sw-021-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 2.5 | ug/l | |
| Chromium | 35 | ug/l | |
| Copper | 13 | ug/l | |
| Lead | **3500** | ug/l | |
| Potassium | 10000 | ug/l | |
| Zinc | 850 | ug/l | |
| Arsenic | **120** | ug/l | |

**L10sw-021-SW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Bis(2-ethylhexyl) phthalate | **30** | ug/l | |

## Legend

- Vegetation
- Piping
- Road
- 10 ft Contour Line
- 2 ft Contour Line
- Steam Line Post
- Surface Soil (0-1 ft) Discrete Sample Location
- Sediment/Surface Water Sewer Sample Location
- Sediment/Surface Water Sump Sample Location
- Walkway
- Building
- Fence

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 = milligram per kilogram (parts per million)
ug/kg = microgram per kilogram (parts per billion)

Mapping Provided By: ARCADIS

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-11B

*Load Line 10*

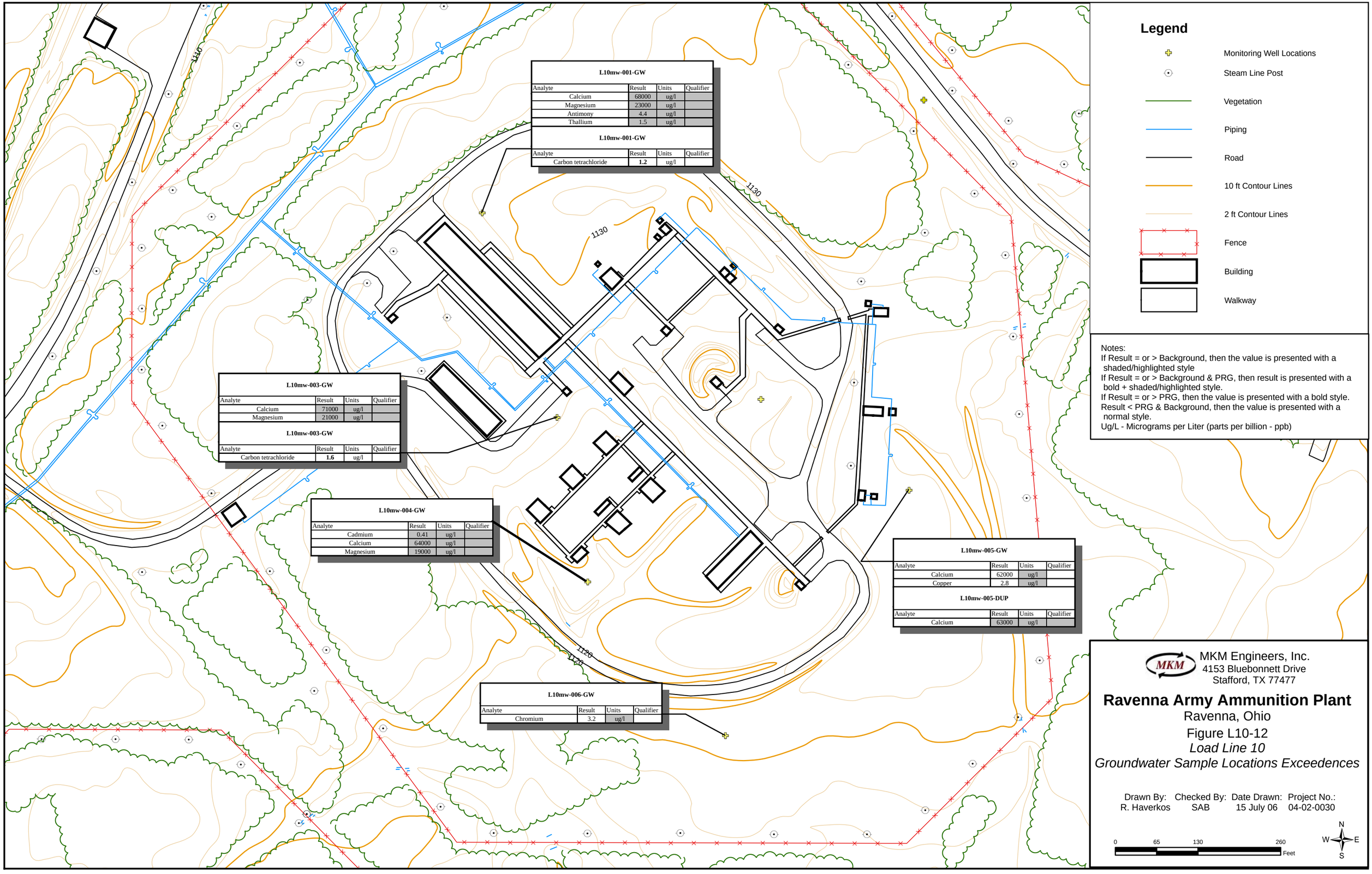
*Surface Water and Sediment*

*Sample Location Exceedences*

| Drawn By: | Checked By: | Date Drawn: | Project No.: |
|---|---|---|---|
| R. Haverkos | MGS | 30 June 05 | 04-02-0030 |

0 75 150 300 Feet

N W E S




**L10mw-001-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Calcium | 68000 | ug/l | |
| Magnesium | 23000 | ug/l | |
| Antimony | 4.4 | ug/l | |
| Thallium | 1.5 | ug/l | |

**L10mw-001-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Carbon tetrachloride | **1.2** | ug/l | |

**L10mw-003-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Calcium | 71000 | ug/l | |
| Magnesium | 21000 | ug/l | |

**L10mw-003-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Carbon tetrachloride | **1.6** | ug/l | |

**L10mw-004-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Cadmium | 0.41 | ug/l | |
| Calcium | 64000 | ug/l | |
| Magnesium | 19000 | ug/l | |

**L10mw-005-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Calcium | 62000 | ug/l | |
| Copper | 2.8 | ug/l | |

**L10mw-005-DUP**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Calcium | 63000 | ug/l | |

**L10mw-006-GW**

| Analyte | Result | Units | Qualifier |
|---|---|---|---|
| Chromium | 3.2 | ug/l | |

## Legend

- Monitoring Well Locations
- Steam Line Post
- Vegetation
- Piping
- Road
- 10 ft Contour Lines
- 2 ft Contour Lines
- Fence
- Building
- Walkway

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 L10-12

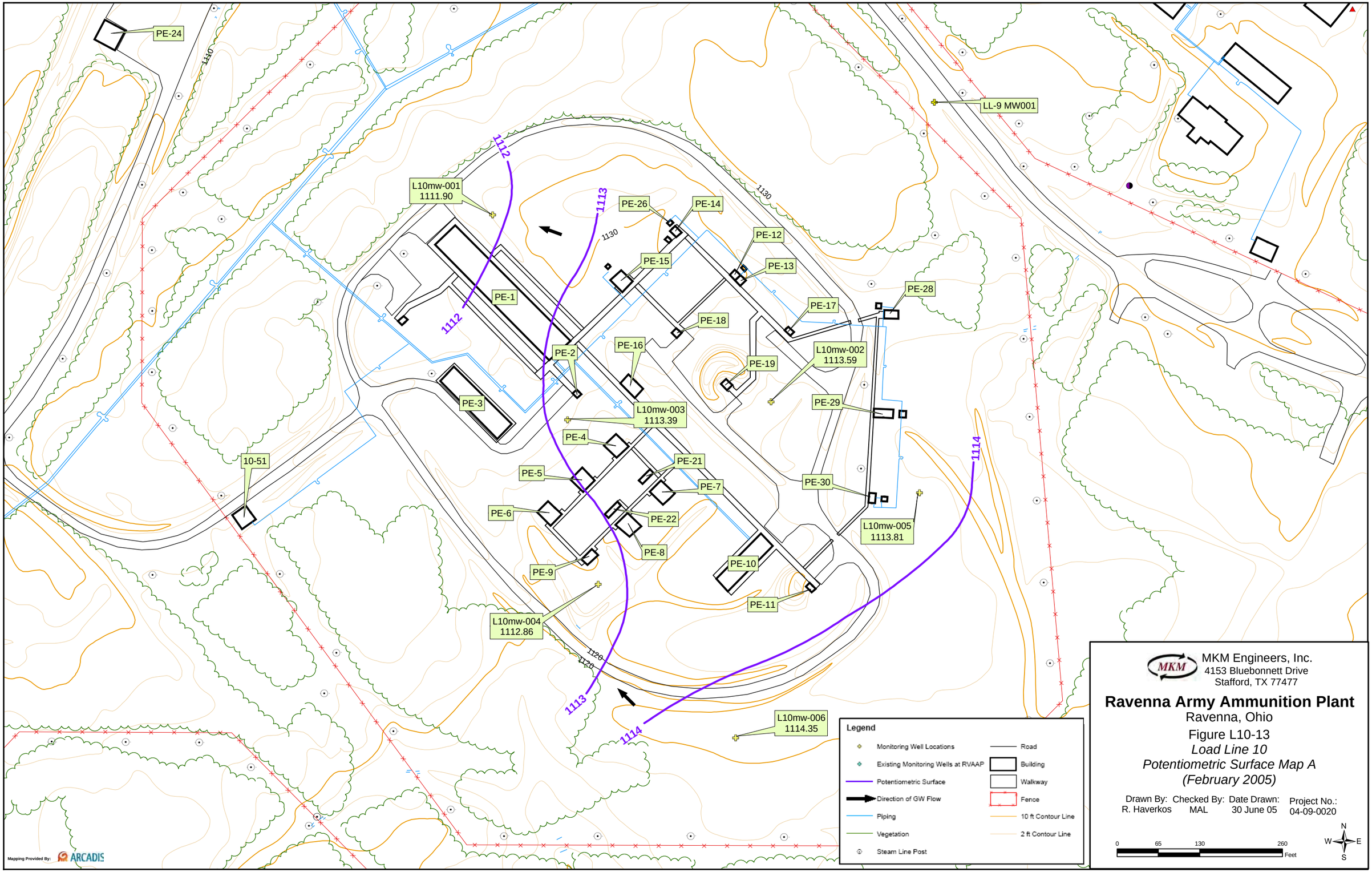
*Load Line 10*

*Groundwater Sample Locations Exceedences*

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

0 65 130 260 Feet

N W E S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PE-13
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PE-28
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PE-9
PE-11
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L10mw-006
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1114
LL-9 MW001
10-51
Mapping Provided By: ARCADIS
Legend
Monitoring Well Locations
Existing Monitoring Wells at RVAAP
Potentiometric Surface
Direction of GW Flow
Piping
Vegetation
Steam Line Post
Road
Building
Walkway
Fence
10 ft Contour Line
2 ft Contour Line
MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-13
Load Line 10
Potentiometric Surface Map A
(February 2005)
Drawn By: R. Haverkos
Checked By: MAL
Date Drawn: 30 June 05
Project No.: 04-09-0020
0
65
130
260
Feet
N
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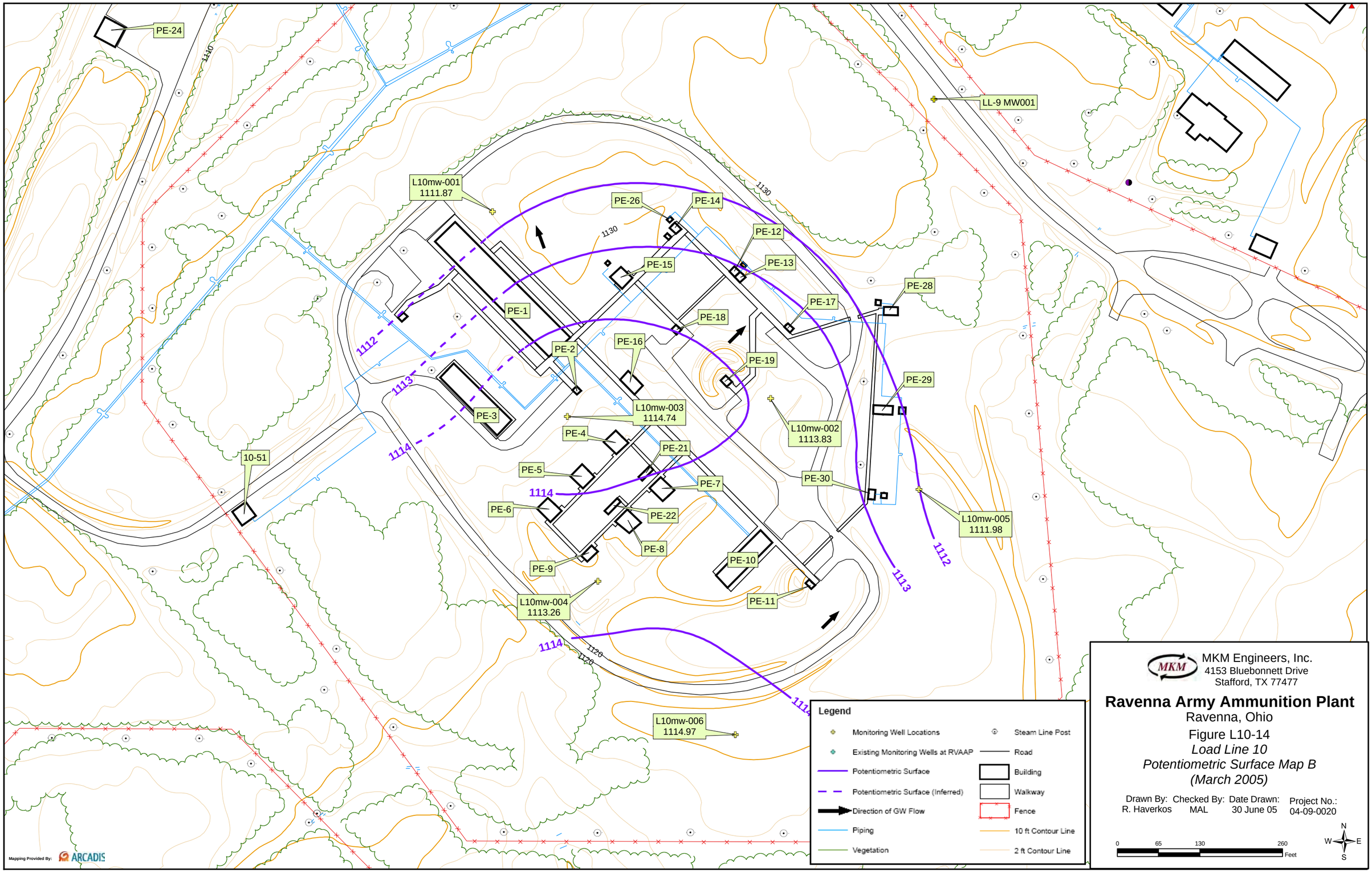
S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1114.74
PE-4
PE-21
PE-5
PE-7
PE-6
PE-22
PE-8
PE-9
PE-10
PE-11
L10mw-004
1113.26
L10mw-006
1114.97
10-51
1112
1113
1114
LL-9 MW001
PE-28
PE-17
PE-29
L10mw-002
1113.83
PE-30
L10mw-005
1111.98
Mapping Provided By: ARCADIS
Legend
Monitoring Well Locations
Existing Monitoring Wells at RVAAP
Potentiometric Surface
Potentiometric Surface (Inferred)
Direction of GW Flow
Piping
Vegetation
Steam Line Post
Road
Building
Walkway
Fence
10 ft Contour Line
2 ft Contour Line
MKM Engineers, Inc.
4153 Bluebonnett Drive
Stafford, TX 77477
Ravenna Army Ammunition Plant
Ravenna, Ohio
Figure L10-14
Load Line 10
Potentiometric Surface Map B
(March 2005)
Drawn By: R. Haverkos
Checked By: MAL
Date Drawn: 30 June 05
Project No.: 04-09-0020
0 65 130 260
Feet
N
W
E
S

PE-24
1110
L10mw-001
1111.85
PE-26
PE-14
PE-12
PE-13
PE-15
PE-1
PE-18
PE-16
PE-2
PE-3
L10mw-003
1113.57
PE-5
PE-4
PE-21
PE-7
PE-6
PE-22
PE-8
PE-9
PE-10
PE-11
L10mw-004
1113.00
10-51
1130
1120
1112
1113
1114
LL-9 MW001
PE-28
PE-17
PE-19
PE-29
L10mw-002
1113.58
PE-30
L10mw-005
1113.75
L10mw-006
1114.83
Mapping Provided By: ARCADIS

**Legend**

- Monitoring Well Locations
- Existing Monitoring Wells at RVAAP
- Potentiometric Surface
- Potentiometric Surface (Inferred)
- Direction of GW Flow
- Piping
- Vegetation
- Steam Line Post
- Road
- Building
- Walkway
- Fence
- 10 ft Contour Line
- 2 ft Contour Line

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

# Ravenna Army Ammunition Plant

Ravenna, Ohio

Figure L10-15

*Load Line 10*

*Potentiometric Surface Map C*

*(April 2005)*

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

0 65 130 260 Feet

N W E S

**Table L10-1**
**Load Line 10 Summary of Sampling and Analysis**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| SAMPLE PREFIX | | VOC | SVOC | Explosives | Propellants | TAL Metals | Chrome +6 | Pesticides | PCB | Cyanides | TPH GRO/ DRO | TOC | Geo-Tech Analysis | Grain Size | FIELD QA/QC SAMPLES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***L10*** | SAMPLE ID | 8260B | 8270C | 8330 | 3532/8330 | 6010/7000 | 7196A | 8081A | 8082B | 9010A/9012A | 8015 | EPA 415.1 | (Various) | ASTM D422 | Multi-Incremental QA | Duplicate Sample | Equipment Blank | Trip Blank | MS/MSD | USACE Split |
| **MULTI-INCREMENTAL SOILS** | | | | | | | | | | | | | | | | | | | | |
| *Surface Soils* | SS-001M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-002M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-003M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-004M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-005M | | | 1 | | 1 | | | | 1 | | | | | | 1 | | | | 1 |
| | SS-006M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-007M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-008M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-009M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-010M | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | 1 | |
| | SS-011M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-012M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-013M | | | 1 | | 1 | | | | 1 | | | | | 1 | | | | | |
| | SS-014M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-015M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-016M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-017M | | | 1 | | 1 | | | | 1 | | | | | | 1 | | | | 1 |
| | SS-018M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-019M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-020M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-021M | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SS-022M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-023M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| *Dry-Ditch Soils* | SS-024M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-025M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-026M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-027M | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | 1 | 1 | | | NT |
| | SS-028M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-029M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-030M | | | 1 | | 1 | | | | 1 | | | | | 1 | | | | | |
| | SS-031M | | | 1 | | 1 | | | | 1 | | | | | | | | | 1 | |
| | SS-032M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-033M | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SS-034M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-035M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-036M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SS-040M | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| **DISCRETE SOILS** | SS-037 | 1 | | | | | | | | | | | | | | 1 | | | | 1 |
| | SS-038 | 1 | | | | | | | | | | | | | | | | | | |
| | SS-039 | 1 | | | | | | | | | | | | | | | | | | |
| | | 7 | 4 | 37 | 4 | 37 | 0 | 4 | 4 | 37 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 2 | 3 |
| **GROUNDWATER** | MW-001 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | |
| | MW-002 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | | | | | | | | |
| | MW-003 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | | | | | | | | |
| | MW-004 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | | |
| | MW-005 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | | | | 1 |
| | MW-006 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | | | | | 1 | | | |
| | | 6 | 6 | 6 | 1 | 6 | 0 | 6 | 6 | 6 | 0 | 0 | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 1 |

**Table L10-1**
**Load Line 10 Summary of Sampling and Analysis**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| SAMPLE PREFIX | | VOC | SVOC | Explosives | Propellants | TAL Metals | Chrome +6 | Pesticides | PCB | Cyanides | TPH GRO/ DRO | TOC | Geo-Tech Analysis | Grain Size | FIELD QA/QC SAMPLES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***L10*** | SAMPLE ID | 8260B | 8270C | 8330 | 3532/8330 | 6010/7000 | 7196A | 8081A | 8082B | 9010A/9012A | 8015 | EPA 415.1 | (Various) | ASTM D422 | Multi-Incremental QA | Duplicate Sample | Equipment Blank | Trip Blank | MS/MSD | USACE Split |
| **SURFACE WATER** | SW-001 | *No sample (no water)* | | | | | | | | | | | | | | | | | | |
| Sanitary Sewers | SW-002 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | 1 | | | 1 | 1 |
| | SW-003 | *No sample (no water)* | | | | | | | | | | | | | | | | | | |
| | SW-004 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-005 | *No sample (no water)* | | | | | | | | | | | | | | | | | | |
| | SW-006 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-007 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-008 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-009 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-010 | *No sample (no water)* | | | | | | | | | | | | | | | | | | |
| Sumps/Basins | SW-011 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-012 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-013 | *Cannot locate* | | | | | | | | | | | | | | | | | | |
| | SW-014 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-015 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-016 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-017 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-018 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-019 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | 1 | | | | 1 |
| | SW-020 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-021 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-022 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SW-023 | *Cannot locate* | | | | | | | | | | | | | | | | | | |
| | SW-024 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| Basement | SW-025 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | | 19 | 19 | 19 | 2 | 19 | 0 | 19 | 19 | 19 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 2 |
| **SEDIMENT** | SD-001 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| Sanitary Sewers | SD-002 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-003 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-004 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | | | | | | | | | | |
| | SD-005 | | | 1 | | 1 | | | | 1 | | | | | | | 1 | | | |
| | SD-006 | | | 1 | | 1 | | | | 1 | | | | | | *not enough* | | | | 1 |
| | SD-007 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-008 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-009 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-010 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| Sumps/Basins | SD-011 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-012 | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SD-013 | *Cannot locate* | | | | | | | | | | | | | | | | | | |
| | SD-014 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-015 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-016 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-017 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-018 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-019 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-020 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-021 | *No sample (no sediment)* | | | | | | | | | | | | | | | | | | |
| | SD-022 | 1 | 1 | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | SD-023 | *Cannot locate* | | | | | | | | | | | | | | | | | | |
| | SD-024 | | | 1 | | 1 | | | | 1 | | | | | | | | | | |
| | | 2 | 2 | 6 | 1 | 6 | 0 | 1 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 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.
Discrete Sample is taken for VOCs only from Bldgs PE2, PE17 & PE20 and doorway
Geo-tech analysis consists of Moisture Content (ASTM D2216), Atterburg Limits (ASTM D4318), UCS (ASTM D2487), pH (EPA 150.1) & Specific Gravity (ASTM D854)
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 L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO | L10ss-013M-QA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/16/2004 |
| | | | | | | 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 (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **12000** | **22000** | **11000** | **10000** | **11000** | **12000** | **13000** | **8200** | **11000** | **9500** | | **9600** | **8000** | **8100** | **7900** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **7.3** | **4.9** | **11** | **12** | **11** | **12** | **11** | **12** | **9.5** | **13** | | **14** | **18** | **14** | **11** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 82 | 190 | 88 | 59 | 66 | 69 | 84 | 53 | 93 | 55 | | 60 | 46 | 51 | 53 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 1.8 | 5.3 | 0.94 | 0.68 | 0.61 | 0.66 | 0.89 | 0.61 | 1.9 | 0.6 | | 0.65 | 0.58 | 0.58 | 0.56 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.27 | 0.62 | 0.89 | 0.16 | | | 0.29 | 0.22 | 0.38 | 0.14 | | 0.15 | 0.19 | 0.17 | 0.37 |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 35000 | 100000 | 8800 | 1500 | 1900 | 2000 | 12000 | 2500 | 46000 | 2000 | | 1900 J | 2200 | 1600 | 2200 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 14 | 12 | 21 | 18 | 22 | 23 | 22 | **33** | 26 | 19 | | 17 | 19 | 19 | 23 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 4.4 | 2.9 | 8.9 | 8.1 | 8 | 8.6 | 8.3 | 8.2 | 5.2 | 8.8 | | 9.2 | 7.6 | 8 | 6.7 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 16 | 12 | 41 | 17 | 24 | 25 | 16 | 42 | 18 | 19 | | 22 | 17 | 19 | 25 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **14000** | **14000** | **21000** | **22000** | **21000** | **22000** | **21000** | **20000** | **16000** | **20000** | | **20000** | **20000** | **20000** | **18000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 22 | 120 | **430** | 52 | 50 | 51 | 100 | 91 | 70 | 74 | | 45 | 60 | 41 | 62 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 7500 | 23000 | 3600 | 2100 | 2400 | 2600 J | 3300 | 2200 | 7900 | 2200 | | 2200 | 1900 | 2000 | 1700 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **570** | **1400** | **630** | **480** | **500** | **530** | **670** | **610** | **680** | **620** | | **700** | **580** | **580** | **490** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 13 | 10 | 21 | 17 | 20 | 20 | 19 | 25 | 18 | 19 | | 20 | 19 | 20 | 21 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1000 | 1900 | 1200 | 860 | 1200 | 1200 J | 1400 | 890 | 1000 | 1000 | | 960 J | 1000 | 950 | 790 |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.71 | 1.8 | 0.59 | 0.54 | 0.77 | 0.72 | 0.74 | 0.65 | 1.2 | 0.66 | | 0.76 | 0.68 | 0.51 | 0.72 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | | | | | | | | | | | | | | | |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 380 | 960 | 340 | 250 | 300 | 320 | 330 | 280 | 420 | 280 | | 290 | 310 | 250 | 270 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **12** | **9** | **18** | **21** | **20** | **21** | **22** | **17** | **13** | **18** | | **18** | **16** | **16** | **16** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 53 | 90 | 220 | 69 | 91 | 99 | 140 | 85 | 97 | 89 | | 88 | 93 | 82 | 120 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | | | 2 | 0.67 | | | | | | 2.5 | | | | 0.47 | |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | | 0.07 | 0.068 | 0.036 | | | 0.051 | 0.062 | 0.032 | | | 0.052 | 0.059 | 0.032 | 0.061 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | | | | | | 0.22 | | | | | | | | | 0.19 |
| SVOCs | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | | | | | 0.012 J | | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.04 | | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | | 0.047 | | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.063 | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | | | | | 0.02 J | | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | 0.035 J | | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | | | | | | | | | 0.054 | | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | | | | | | | | | 0.11 | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.022 J | | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | | | | | | | | 0.054 | | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | | | | | | | | | 0.074 | | | |

**Table L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO | L10ss-013M-QA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/16/2004 |
| | | | | | 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 (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | | |
| Explosives | 8330 | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | | | | | 0.14 J | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 | nc | 0.00 | mg/kg | 0.48 | 1.3 J | 0.24 | | | | 0.26 | | 0.56 | | | | | | |

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, 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
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 L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO | L10ss-024M-SO | L10ss-025M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 |
| | | | | | | 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 (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **7700** | **9000** | 7000 | **9100** | **8700** | **9000** | **8300** | **11000** | **9700** | | **10000** | **11000** | **11000** | **12000** | **12000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **11** | **13** | **10** | **11** | **8.5 J** | **9.3** | **10** | **11** | **12** | | **15** | **10** | **11** | **14** | **11** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 48 | 49 | 47 | 69 | 81 | 88 | 60 | 58 | 65 | | 57 | 66 | 61 | 78 | 71 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.56 | 0.64 | 0.54 | 0.89 | 0.99 | 1.2 | 0.59 | 0.59 | 0.72 | | 0.63 | 0.61 | 0.66 | 0.79 | 0.74 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.37 | 0.82 | 0.46 | 0.29 | 0.35 J | 0.16 | 0.42 | 0.55 | 0.057 | | | | | | |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 3700 | 2600 | 2500 | 28000 | 22000 J | 33000 | 2000 | 2200 | 2700 | | 1600 | 1500 | 1300 | 2400 | 2600 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 18 | 17 | 29 | 22 | 14 | 15 | 21 | 27 | 19 | | 22 | 19 | 24 | 19 | 18 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 6.1 | 8.8 | 6.6 | 6.8 | 6.7 J | 6.8 | 8.3 | 7 | 7.9 | | 8.8 | 7.4 | 8.8 | 11 | 10 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 17 | 20 | 34 | 22 | 12 | 13 | 30 | 23 | 14 | | 15 | 15 | 15 | 29 | 16 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **17000** | **23000** | **19000** | **20000** | **15000** | **16000** | **19000** | **21000** | **20000** | | **22000** | **20000** | **21000** | **25000** | **22000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 53 | 47 | 72 | 55 | 37 J | 40 | 65 | 83 | 26 | | 38 | 55 | 60 | 17 | 25 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 1700 | 2400 | 1900 | 6200 | 3600 J | 4700 | 2200 | 2500 | 2200 | | 2200 | 2000 | 2200 | 3200 | 2400 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **470** | **520** | **550** | **640** | **790** | **890** | **500** | **310** | **690** | | **510** | **510** | **550** | **340** | **680** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 15 | 18 | 23 | 19 | 13 | 14 | 18 | 19 | 16 | | 20 | 16 | 19 | 26 | 17 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 880 | 1100 | 900 | 1500 | 890 J | 880 | 760 | 940 | 990 | | 990 | 1100 | 1100 | 1500 | 1000 |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.74 | 0.66 | 0.45 | 0.85 | 0.54 | 1.1 | 0.76 | 0.49 | 0.73 | | 0.52 | 0.65 | 0.71 | 0.46 | 0.56 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | | | | | | | | | | | | | | | |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 270 | 320 | 230 | 330 | 290 | 350 | 280 | 260 | 280 | | 270 | 270 | 290 | 330 | 290 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **16** | **18** | **14** | **15** | **14** | **14** | **17** | **21** | **20** | | **19** | **20** | **21** | **20** | **22** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 90 | 95 | 110 | 110 | 65 J | 69 | 94 | 88 | 63 | | 69 | 94 | 80 | 65 | 56 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | | | | | 0.53 J | 0.49 | | 1 | | | | | | | 0.53 |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.066 | 0.082 | 0.035 | | 0.047 | 0.045 | 0.034 | 0.07 | 0.05 | | | | | | 0.04 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | | | | | | | | | | | | 0.23 | | | |
| SVOCs | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | | | | 0.011 J | | | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | 0.018 J | | | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | 0.022 J | | | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | 0.033 J | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | | | | 0.015 J | | | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | | | | | | | | 0.03 J | | | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | | | | | | | | 0.046 | | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | 0.014 J | | | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | | | | | | | 0.0092 J | | | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | | | | | | | 0.028 J | | | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | | | | | | | | 0.036 J | | | | |

**Table L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO | L10ss-024M-SO | L10ss-025M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 |
| | | | | | 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 (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | | |
| Explosives | 8330 | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | | | | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 | nc | 0.00 | mg/kg | | | | 0.25 | 0.32 | 0.33 | | | 0.19 | | 0.2 | | | 0.21 | |

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, 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
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 L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **12000** | | **14000** | **13000** | **14000** | **12000** | **10000** | **11000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **13** | | **13** | **13** | 16 | **15** | 16 | **14** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 68 | | 88 | 88 | 46 | 48 | 53 | 56 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.75 | | 0.93 | 0.93 | 0.69 | 0.68 | 0.65 | 0.68 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | | | | | | | | |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 8700 | | 2800 | 2600 | 970 | 1300 | 1900 | 1800 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 18 | | 20 | 20 | 19 | 18 | 18 | 20 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 10 | | 13 | 13 | 8.9 | 8 | 8.7 | 8.3 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 20 | | 21 | 21 | 23 | 19 | 18 | 28 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **24000** | | **25000** | **25000** | **28000** | **25000** | **24000** | **24000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 32 | | 21 | 21 | 23 | 26 | 24 | 25 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 4300 | | 3900 | 3800 | 3200 | 2600 | 2400 | 2500 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **340** | | **330** | **340** | **250** | **250** | **380** | **340** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 26 | | 29 | 29 | 21 | 19 | 19 | 20 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1500 | | 1900 | 1800 | 1400 | 1000 | 1100 | 1000 J |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | | | | | | 0.62 | | 0.55 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | | | | | | | | |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 250 | | 320 | 300 | 250 | 290 | 290 | 240 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **20** | | **22** | **22** | **23** | **21** | **19** | **21** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 71 | | 67 | 67 | 62 | 61 | 65 | 65 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | | | | | 2 | 0.53 | 0.52 | |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | | | 0.039 | 0.039 | 0.047 | 0.033 | 0.025 | |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | | | 0.23 | | | | | |
| SVOCs | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | 0.018 J | 0.019 J | | | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | 0.029 J | 0.032 | | | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | 0.036 | 0.038 | | | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | 0.044 | 0.047 | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | 0.022 J | 0.023 J | | | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | 0.028 J | 0.027 J | | | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | 1.9 | 2.1 | | | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | 0.037 | 0.04 | | | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | 0.015 J | 0.018 J | | | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | 0.077 | 0.088 | | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | 0.021 J | 0.022 J | | | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | 0.01 J | 0.012 J | | | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | 0.019 J | 0.021 J | | | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | 0.047 J | 0.056 | | | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | 0 056 | 0 059 | | | | |

**Table L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | |
| Explosives | 8330 | 2,6-Dinitrotoluene | 6.1 nc | -- | mg/kg | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | | | | | | | | 0.22 |

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, 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
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 L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **12000** | **12000** | | **12000** | **14000** | **11000** | **12000** | | | | | **11000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **12** | **12** | | **8.4** | **11** | **7.6** | **13** | | | | | **12** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 57 | 56 | | 120 | 85 | 83 | 77 | | | | | 62 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.71 | 0.64 | | 0.77 | 0.87 | 0.8 | 0.75 | | | | | 0.7 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.13 | 0.067 | | | 0.12 | | | | | | | |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 1800 | 1300 | | 730 | 2000 | 290 | 3400 | | | | | 1500 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 19 | 18 | | 24 | 24 | 15 | 23 | | | | | 18 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 7.6 | 8.3 | | 11 | 11 | 11 | 10 | | | | | 9.9 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 15 | 18 | | 11 | 21 | 9.1 | 20 | | | | | 16 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **22000** | **23000** | | **19000** | **25000** | **16000** | **24000** | | | | | **23000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 33 | 25 | | 21 | 15 | 21 | 19 | | | | | 22 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 2400 | 2400 | | 2200 | 3700 | 1800 | 3200 | | | | | 2000 J |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **390** | **510** | | **1400** | **310** | **1100** | **410** | | | | | **750** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 17 | 16 | | 20 | 28 | 15 | 31 | | | | | 18 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1200 | 1200 | | 980 | 1600 | 680 | 1500 | | | | | 1100 J |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.91 | 0.54 | | 0.87 | | 0.84 | | | | | | 0.75 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | | | | | | | | | | | | |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 320 | 250 | | 280 | 350 | 270 | 330 | | | | | 240 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **24** | **24** | | **21** | **22** | **21** | **21** | | | | | **20** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 72 | 99 | | 57 | 79 | 53 | 100 | | | | | 110 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | | | | | 0.6 | | | | | | | |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.055 | 0.044 | | 0.075 | 0.031 | 0.054 | | | | | | 0.063 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | 0.22 | | | 0.23 | | | | | | | | |
| SVOCs | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | 0.012 J | | | | | | | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | 0.02 J | | | | | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | 0.016 J | | | | | | | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | 0.022 J | | | | | | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | | | | | | | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | 0.017 J | | | | | | | | |

**Table L10-2**
**Load Line 10 Summary of Surface Soil (0-1 ft) Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | | | | | |
| Explosives | 8330 | 2,6-Dinitrotoluene | 6.1 nc | -- | mg/kg | | | | | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | | | | | | 0.21 | | | | | | 0.3 |

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, 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
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 L10-3**
**Load Line 10 Summary of Sediment Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
| | | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Sediment Background Criteria | Units | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 13900 | mg/kg | 5500 | 6300 | 6100 | **14000** | **19000** | **7800** |
| | 6010B | Arsenic | 0.39 | ca | 19.5 | mg/kg | **12** | **20** | **18** | **180** | **270** | **35** |
| | 6010B | Barium | 538 | nc | 123 | mg/kg | 46 | 71 | 50 | **4600** | 190 | 47 |
| | 6010B | Beryllium | 15 | nc | 0.38 | mg/kg | 0.44 | 0.55 | 0.49 | 1.8 | 1.5 | 0.58 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | | | | **7.1** | **4.7** | |
| | 6010B | Calcium | --[n] | | 5510 | mg/kg | 4200 | 3000 | 2300 | 90000 | 12000 | 1700 |
| | 6010B | Chromium | 30 | ca | 18.1 | mg/kg | 13 | 28 | **54** | **210** | **270** | 19 |
| | 6010B | Cobalt | 30 | ca | 9.1 | mg/kg | 8.8 | 10 | 8.3 | 9.6 | 8.4 | 8.5 |
| | 6010B | Copper | 313 | nc | 27.6 | mg/kg | 23 | 94 | 130 | **470** | **980** | 35 |
| | 6010B | Iron | 2346 | nc | 28200 | mg/kg | **20000** | **71000** | **31000** | **35000** | **49000** | **21000** |
| | 6010B | Lead | 400 | pbk | 27.4 | mg/kg | **640** | 350 | 310 | **23000** | **39000** | 77 |
| | 6010B | Magnesium | --[n] | | 2760 | mg/kg | 1800 | 1600 | 1700 | 6500 | 5900 | 2200 |
| | 6010B | Manganese | 176 | nc | 1950 | mg/kg | **520** | **970** | **520** | **370** | **330** | **240** |
| | 6010B | Nickel | 156 | nc | 17.7 | mg/kg | 17 | 24 | 20 | 41 | 33 | 19 |
| | 6010B | Potassium | --[n] | | 1950 | mg/kg | 760 | 930 | 850 | 1700 | 2600 | 1300 |
| | 6010B | Selenium | 39 | nc | 1.7 | mg/kg | | | | 3.4 | 6.6 | 1.1 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | | | | 1.2 | 1.1 | |
| | 6010B | Sodium | --[n] | | 112 | mg/kg | 200 | 340 | 230 | 1300 | | 330 |
| | 6010B | Vanadium | 7.8 | nc | 26.1 | mg/kg | **15** | **28** | **20** | **32** | **34** | **16** |
| | 6010B | Zinc | 2346 | nc | 532 | mg/kg | 99 | 230 | 160 | 2000 | 1600 | 150 |
| | 7471A | Mercury | 2.3 | nc | 0.06 | mg/kg | 0.13 | 0.074 | 0.049 | 1.2 | 0.34 | |
| | 7041 | Antimony | 3.1 | nc | 0.00 | mg/kg | 1.9 | | | **300** | | |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | 0.017 | | | | | |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | 0.045 | | | | | |
| | 8081A | 4,4'-DDT | 1.7 | ca | -- | mg/kg | 0.055 J | | | | | |
| | 8081A | alpha-Chlordane | 1.6 | ca | -- | mg/kg | 0.0018 J | | | | | |
| | 8081A | Dieldrin | 0.030 | ca | -- | mg/kg | 0.0016 J | | | | | |
| | 8081A | Endosulfan I | 37 | nc | -- | mg/kg | 0.0011 J | | | | | |
| | 8081A | gamma-Chlordane | 1.6 | ca | -- | mg/kg | 0.0053 | | | | | |
| SVOCs | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | 28 | |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | | | | | 39 | |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | | | | | 0.74 | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | 27 | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | 0.031 J | | | | **25** | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | 0.048 | | | | **11** | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | 0.091 | | | | **18** | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | 0.068 | | | | 4.2 | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | 0.04 J | | | | **11** | |
| | 8270C | Carbazole | 24 | ca | -- | mg/kg | | | | | 9.6 | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | 0.042 | | | | 24 | |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 | ca | -- | mg/kg | | | | | **2.4** | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | **37** | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | 0.045 | | | | 74 | |

**Table L10-3**
**Load Line 10 Summary of Sediment Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
| | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Sediment Background Criteria | Units | | | | | | |
| | 8270C | Fluorene | 275 nc | -- | mg/kg | | | | | 44 | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 ca | -- | mg/kg | 0.054 | | | | **4.9** | |
| | 8270C | Naphthalene | 5.6 nc | -- | mg/kg | | | | | **18** | |
| | 8270C | Phenanthrene | -- | -- | mg/kg | | | | | 130 | |
| | 8270C | Pyrene | 232 nc | -- | mg/kg | 0.027 J | | | | 51 | |
| Explosives | 8330 | 2,6-Dinitrotoluene | 6.1 nc | -- | mg/kg | | | 4.7 | | **11** | |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | mg/kg | | | | 0.054 J | 1.7 | |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | mg/kg | | | | | 0.86 | |
| | 8330 | Tetryl | 61 nc | -- | mg/kg | | | 0.87 J | | | |
| Propellants | SW8330 Modified | Nitroguanidine | 611 nc | -- | mg/kg | 0.056 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, 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
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 L10-4**
**Load Line 10 Summary of Surface Water Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 |
| | | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | | Surface Water Background Criteria | Units | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW | L10sw-018-SW |
| Metals | 6010B | Aluminum | 36499 | nc | 3370 | ug/l | 460 | 390 | 430 | 470 | 360 | 380 | 300 | 12000 | 4900 | 3600 | | 43 | 410 | 48 |
| | 6010B | Barium | 2555 | nc | 47.5 | ug/l | 18 | 17 | 22 | 19 | 20 | 19 | 19 | 270 | 190 | 160 | 40 | 64 | 22 | 22 |
| | 6010B | Beryllium | 73 | nc | 0.00 | ug/l | | | | | | | | 1.1 | 0.6 | 0.28 | | | | |
| | 6010B | Cadmium | 18 | nc | 0.00 | ug/l | | | | | | | | 0.91 | 6.1 | 4.7 | 0.25 | 0.59 | 0.5 | |
| | 6010B | Calcium | --[n] | | 41400 | ug/l | 28000 | 27000 | 29000 | 24000 | 25000 | 28000 | 31000 | 52000 | 50000 | 74000 | 25000 | 18000 | 10000 | 13000 |
| | 6010B | Chromium | 109 | nc | 0.00 | ug/l | 1.2 | | | 1.1 | | | | **200** | **130** | 71 | 4.7 | 9.4 | | |
| | 6010B | Cobalt | 730 | nc | 0.00 | ug/l | | | | | | | | 4 | 1.6 | 2.7 | | | | |
| | 6010B | Copper | 1460 | nc | 7.9 | ug/l | | | | | | | | 400 | 300 | 400 | 5 | 51 | 6.8 | 5 |
| | 6010B | Iron | 10950 | nc | 2560 | ug/l | 590 | 560 | 560 | 490 | 440 | 470 | 400 | **14000** | 8600 | 9400 | 300 | 410 | 930 | 320 |
| | 6010B | Lead | 15 | mcl | 0.00 | ug/l | | | | | | | | **10000** | **13000** | **14000** | **220** | | **2900** | **1800** |
| | 6010B | Magnesium | --[n] | | 10800 | ug/l | 4900 | 4700 | 5000 | 4800 | 4600 | 5000 | 5400 | 8300 | 5100 | 6700 | 2300 | 1400 | 1400 | 690 |
| | 6010B | Manganese | 876 | nc | 391 | ug/l | 13 | 13 | 18 | 4 | 11 | 10 | 7.7 | 120 | 100 | 210 | 56 | 49 | 48 | 38 |
| | 6010B | Nickel | 730 | nc | 0.00 | ug/l | | | | | | | | 29 | 18 | 50 | | | | |
| | 6010B | Potassium | --[n] | | 3170 | ug/l | 1400 | 1400 | 1200 | 1100 | 1200 | 1100 | 1100 | 5800 | 5400 | 6800 | 7400 | 11000 | 8500 | 9400 |
| | 6010B | Selenium | 182 | nc | 0.00 | ug/l | | | | | | | | 3 | | 3.2 | | | | |
| | 6010B | Silver | 182 | nc | 0.00 | ug/l | | | | | | | | | | | 1 | | | |
| | 6010B | Sodium | --[n] | | 21300 | ug/l | 930 | 880 | 1200 | 1600 | 1600 | 1500 | 1500 | 1400 | 1700 | 1700 | 2100 | 600 | 910 | 610 |
| | 6010B | Vanadium | 36 | nc | 0.00 | ug/l | | | | | 1.1 | | | 24 | 13 | 6.2 | | | | |
| | 6010B | Zinc | 10950 | nc | 42 | ug/l | | | | | | | | 500 | 800 | 700 | 31 | 67 | 47 | 38 |
| | 7041 | Antimony | 15 | nc | 0.00 | ug/l | 3.2 | 4 | 4 | | 2.5 | | | **53** | **110** | **110** | **49** | **880** | | |
| | 7060A | Arsenic | 0.045 | ca | 3.2 | ug/l | | | | | | | | **89** | **140** | **770** | **40** | **160** | **1.5** | **0.88** |
| | 7421 | Lead | 15 | mcl | 0.00 | ug/l | 2.2 | 2.2 | 9.7 | 1.1 | 5.1 | 4.3 | 4.4 | | | | | **1300** | | |
| | 7470A | Mercury | 11 | nc | 0.00 | ug/l | | | | | | | | 0.77 | 0.25 | 0.58 | | | | |
| SVOCs | 8270C | Acenaphthene | 365 | nc | -- | ug/l | | | | | | | | | | | | | 0.61 J | |
| | 8270C | Acenaphthylene | -- | | -- | ug/l | | | | | | | | | | | | | 0.94 J | |
| | 8270C | Anthracene | 1825 | nc | -- | ug/l | | | | | | | | | | | | | 2.7 | 0.7 J |
| | 8270C | Benzo(a)anthracene | 0.092 | ca | -- | ug/l | | | | **0.4** | | | | **0.17 J** | **0.41** | | | | **5.3** | **0.48** |
| | 8270C | Benzo(a)pyrene | 0.0092 | ca | -- | ug/l | | | | **0.45** | | | | **0.28 J** | **0.91** | **0.1 J** | | | **3.5** | **0.4 J** |
| | 8270C | Benzo(b)fluoranthene | 0.092 | ca | -- | ug/l | | | | **0.64** | | | | **0.32 J** | **1.1** | **0.11 J** | | | **16** | **1.1** |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | ug/l | | | | 0.38 J | | | | 0.36 J | 0.87 J | 0.19 J | | | 3.7 | 0.34 J |
| | 8270C | Benzo(k)fluoranthene | 0.92 | ca | -- | ug/l | | | | 0.25 J | | | | 0.2 J | 0.4 | | | | **5.7** | 0.35 J |
| | 8270C | Bis(2-ethylhexyl) phthalate | 4.8 | ca | -- | ug/l | | | | | | | | **5.8 J** | **19** | | | **27** | | |
| | 8270C | Carbazole | 3.4 | ca | -- | ug/l | | | | | | | | | | | | | 3.4 J | |

**Table L10-4**
**Load Line 10 Summary of Surface Water Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW | L10sw-018-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 |
| | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | | | | | | | |
| | 8270C | Chrysene | 9.2 ca | -- | ug/l | | | | 0.48 J | | | | 0.22 J | 1.1 | 0.1 J | | | **25** | 1.3 |
| | 8270C | Dibenzo(a,h)anthracene | 0.0092 ca | -- | ug/l | | | | | | | | **0.21 J** | **0.31 J** | **0.13 J** | | | **0.82** | |
| | 8270C | Dibenzofuran | 12 nc | -- | ug/l | | | | | | | | | | | | | 0.49 J | |
| | 8270C | Di-n-butyl phthalate | 3650 nc | -- | ug/l | | | | | | | | | 3 J | | | | | |
| | 8270C | Fluoranthene | 1460 nc | -- | ug/l | | | | 0.83 J | | | | 0.37 J | 0.72 J | 0.13 J | | | 59 | 3.2 |
| | 8270C | Fluorene | 243 nc | -- | ug/l | | | | | | | | | | | | | 0.63 J | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.092 ca | -- | ug/l | | | | **0.32 J** | | | | **0.36 J** | **0.98** | **0.14 J** | | | **3.8** | **0.35 J** |
| | 8270C | n-Nitrosodiphenylamine | . 14 ca | -- | ug/l | | | | | | | | | 0.21 J | | | | | |
| | 8270C | Pentachlorophenol | 0.56 ca | -- | ug/l | | | | | | | | | | | | | **4.8 J** | |
| | 8270C | Phenanthrene | -- | -- | ug/l | | | | 0.41 J | | | | 0.15 J | 0.31 J | | | | 12 | 0.38 J |
| | 8270C | Pyrene | 182 nc | -- | ug/l | | | | 0.64 J | | | | 0.29 J | 0.91 J | 0.15 J | | | 46 | 2.6 |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 1095 nc | -- | ug/l | | | | | | | | | | | | | 0.19 J | 0.067 J |
| | 8330 | 2,4,6-TNT | 2.2 ca | -- | ug/l | | | | | | | | | | | | 0.29 J | | |
| | 8330 | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | | | | | | | | | | | | | 0.37 J | |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | ug/l | | | | | | | | | | | | 0.23 J | | |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | ug/l | | | | | | | | | | 0.32 J | | 0.46 | | |
| Propellants | 8332 | Nitroglycerine | 4.8 ca | -- | ug/l | | | | | | | | | | | | 0.21 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
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
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 L10-4**
**Load Line 10 Summary of Surface Water Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
| | | | | | Sample Date: | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | |
| Metals | 6010B | Aluminum | 36499 nc | 3370 | ug/l | 42 | 75 | | 340 | | 170 | |
| | 6010B | Barium | 2555 nc | 47.5 | ug/l | 21 | 18 | 18 | 14 | 30 | 38 | 24 |
| | 6010B | Beryllium | 73 nc | 0.00 | ug/l | | | | | | | |
| | 6010B | Cadmium | 18 nc | 0.00 | ug/l | 0.41 | 0.47 | 0.41 | 2.5 | | | 0.37 |
| | 6010B | Calcium | --[n] | 41400 | ug/l | 9800 | 10000 | 14000 | 12000 | 31000 | 48000 | 46000 |
| | 6010B | Chromium | 109 nc | 0.00 | ug/l | | | 3.3 | 35 | 15 | 16 | 2.5 |
| | 6010B | Cobalt | 730 nc | 0.00 | ug/l | | | | | | | |
| | 6010B | Copper | 1460 nc | 7.9 | ug/l | 5.2 | 5 | 7.2 | 13 | 4.9 | 35 | 3.8 |
| | 6010B | Iron | 10950 nc | 2560 | ug/l | 450 | 480 | 280 | 1800 | 1000 | 870 | 100 |
| | 6010B | Lead | 15 mcl | 0.00 | ug/l | | | **600** | **3500** | | | |
| | 6010B | Magnesium | --[n] | 10800 | ug/l | 930 | 950 | 910 | 1000 | 3500 | 1000 | 8000 |
| | 6010B | Manganese | 876 nc | 391 | ug/l | 23 | 26 | 91 | 110 | 41 | 24 | 1.1 |
| | 6010B | Nickel | 730 nc | 0.00 | ug/l | | | | | | | |
| | 6010B | Potassium | --[n] | 3170 | ug/l | 8300 | 8400 | 4500 | 10000 | 8200 | 3500 | 15000 |
| | 6010B | Selenium | 182 nc | 0.00 | ug/l | | | | | | | |
| | 6010B | Silver | 182 nc | 0.00 | ug/l | | | | | 0.78 | | |
| | 6010B | Sodium | --[n] | 21300 | ug/l | 930 | 840 | 690 | 2000 | 2500 | 1200 | 5900 |
| | 6010B | Vanadium | 36 nc | 0.00 | ug/l | | | | | | | |
| | 6010B | Zinc | 10950 nc | 42 | ug/l | 17 | 20 | 22 | 850 | 66 | 20 | 39 |
| | 7041 | Antimony | 15 nc | 0.00 | ug/l | | | | | | | 5.6 |
| | 7060A | Arsenic | 0.045 ca | 3.2 | ug/l | **1.2** | | **60** | **120** | **38** | **220** | |
| | 7421 | Lead | 15 mcl | 0.00 | ug/l | **1100** | **1200** | | | **250** | **20** | 2.4 |
| | 7470A | Mercury | 11 nc | 0.00 | ug/l | | | | | | | |
| SVOCs | 8270C | Acenaphthene | 365 nc | -- | ug/l | | | | | | | |
| | 8270C | Acenaphthylene | -- | -- | ug/l | | | | | | | |
| | 8270C | Anthracene | 1825 nc | -- | ug/l | 0.28 J | 0.17 J | | | | | |
| | 8270C | Benzo(a)anthracene | 0.092 ca | -- | ug/l | | | | | | | |
| | 8270C | Benzo(a)pyrene | 0.0092 ca | -- | ug/l | | | | | | | |
| | 8270C | Benzo(b)fluoranthene | 0.092 ca | -- | ug/l | | | | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | -- | ug/l | | | | | | | |
| | 8270C | Benzo(k)fluoranthene | 0.92 ca | -- | ug/l | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 4.8 ca | -- | ug/l | | | | **30** | | | |
| | 8270C | Carbazole | 3.4 ca | -- | ug/l | | | | | | | |

**Table L10-4**
**Load Line 10 Summary of Surface Water Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | |
| | 8270C | Chrysene | 9.2 ca | -- | ug/l | 0.17 J | 0.2 J | | | | | |
| | 8270C | Dibenzo(a,h)anthracene | 0.0092 ca | -- | ug/l | | | | | | | |
| | 8270C | Dibenzofuran | 12 nc | -- | ug/l | | | | | | | |
| | 8270C | Di-n-butyl phthalate | 3650 nc | -- | ug/l | | | | | | | |
| | 8270C | Fluoranthene | 1460 nc | -- | ug/l | 0.28 J | 0.23 J | | | | | |
| | 8270C | Fluorene | 243 nc | -- | ug/l | | | | | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.092 ca | -- | ug/l | | | | | | | |
| | 8270C | n-Nitrosodiphenylamine | 14 ca | -- | ug/l | | | | | | | |
| | 8270C | Pentachlorophenol | 0.56 ca | -- | ug/l | | | | | | | |
| | 8270C | Phenanthrene | -- | -- | ug/l | | | | | | | |
| | 8270C | Pyrene | 182 nc | -- | ug/l | 0.21 J | 0.24 J | | | | | |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 1095 nc | -- | ug/l | | | | | | | |
| | 8330 | 2,4,6-TNT | 2.2 ca | -- | ug/l | | | | | | | |
| | 8330 | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | | | | | | | |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | ug/l | | | | | | | |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | ug/l | | | | | | | |
| Propellants | 8332 | Nitroglycerine | 4.8 ca | -- | ug/l | | | | | | | |

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
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 L10-5**
**Load Line 10 Summary of Groundwater Detections**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| Metals | 6010B | Aluminum | 36499 nc | -- | ug/l | | | | | | 25 | |
| | 6010B | Barium | 2555 nc | 256 | ug/l | 14 | 17 | 7.8 | 5.3 | 6.8 | 7 | 17 |
| | 6010B | Cadmium | 18 nc | 0.00 | ug/l | | | | 0.41 | | | |
| | 6010B | Calcium | --[n] | 53100 | ug/l | 68000 | 28000 | 71000 | 64000 | 63000 | 62000 | 23000 J |
| | 6010B | Chromium | 109 nc | 0.00 | ug/l | | | | | | | 3.2 |
| | 6010B | Copper | 1460 nc | 0.00 | ug/l | | | | | | 2.8 | |
| | 6010B | Iron | 10950 nc | 1430 | ug/l | | | | | | | 63 |
| | 6010B | Magnesium | --[n] | 15000 | ug/l | 23000 | 7700 | 21000 | 19000 | 14000 | 14000 | 9400 |
| | 6010B | Manganese | 876 nc | 1340 | ug/l | 63 | 2.1 | 45 | 9.7 | 49 | 49 | 65 |
| | 6010B | Nickel | 730 nc | 83.4 | ug/l | 1.9 | 2.3 | | 1.6 | | 2 | |
| | 6010B | Potassium | --[n] | 5770 | ug/l | 1400 | 1000 | 1000 | 890 | 870 | 940 | 1300 |
| | 6010B | Sodium | --[n] | 51400 | ug/l | 7500 | 5600 | 6100 | 4700 | 3300 | 3300 | 3100 |
| | 6010B | Zinc | 10950 nc | 52.3 | ug/l | 2.6 | 6.7 | 17 | 2.3 | 8.9 | 10 | 4.7 |
| | 7041 | Antimony | 15 nc | 0.00 | ug/l | 4.4 | | | | | | |
| | 7841 | Thallium | 2.4 nc | 0.00 | ug/l | 1.5 | | | | | | |
| VOCs | 8260B | Carbon tetrachloride | 0.17 ca | -- | ug/l | **1.2** | | **1.6** | | | | |
| | 8260B | Methylene chloride | 4.3 ca | -- | ug/l | | | | | | | 1.8 |
| SVOCs | 8270C | Fluoranthene | 1460 nc | -- | ug/l | | | | 0.23 J | | | |
| | 8270C | Phenanthrene | -- | -- | ug/l | | | | 0.18 J | | | |
| | 8270C | Pyrene | 182 nc | -- | ug/l | | | | 0.16 J | | | |
| Explosives | 8330 | 2,4,6-TNT | 2.2 ca | -- | ug/l | 1.2 | 0.17 J | | | | | |
| Other Analytes | 8015B DRO | Diesel Range Organics | NA | -- | ug/l | | | | 61 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
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
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 L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **12000** | 22000 | **11000** | **10000** | **11000** | **12000** | **13000** | **8200** | **11000** | **9500** | | **9600** | **8000** | **8100** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **7.3** | **4.9** | **11** | **12** | **11** | **12** | **11** | **12** | **9.5** | **13** | | **14** | 18 | **14** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 82 | 190 | 88 | 59 | 66 | 69 | 84 | 53 | 93 | 55 | | 60 | 46 | 51 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 1.8 | 5.3 | 0.94 | 0.68 | 0.61 | 0.66 | 0.89 | 0.61 | 1.9 | 0.6 | | 0.65 | 0.58 | 0.58 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.27 | 0.62 | 0.89 | 0.16 | 0.12 U | 0.125 U | 0.29 | 0.22 | 0.38 | 0.14 | | 0.15 | 0.19 | 0.17 |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 35000 | 100000 | 8800 | 1500 | 1900 | 2000 | 12000 | 2500 | 46000 | 2000 | | 1900 J | 2200 | 1600 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 14 | 12 | 21 | 18 | 22 | 23 | 22 | **33** | 26 | 19 | | 17 | 19 | 19 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 4.4 | 2.9 | 8.9 | 8.1 | 8 | 8.6 | 8.3 | 8.2 | 5.2 | 8.8 | | 9.2 | 7.6 | 8 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 16 | 12 | 41 | 17 | 24 | 25 | 16 | 42 | 18 | 19 | | 22 | 17 | 19 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **14000** | **14000** | **21000** | **22000** | **21000** | **22000** | **21000** | **20000** | **16000** | **20000** | | **20000** | **20000** | **20000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 22 | 120 | **430** | 52 | 50 | 51 | 100 | 91 | 70 | 74 | | 45 | 60 | 41 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 7500 | 23000 | 3600 | 2100 | 2400 | 2600 J | 3300 | 2200 | 7900 | 2200 | | 2200 | 1900 | 2000 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **570** | **1400** | **630** | **480** | **500** | **530** | **670** | **610** | **680** | **620** | | **700** | **580** | **580** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 13 | 10 | 21 | 17 | 20 | 20 | 19 | 25 | 18 | 19 | | 20 | 19 | 20 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1000 | 1900 | 1200 | 860 | 1200 | 1200 J | 1400 | 890 | 1000 | 1000 | | 960 J | 1000 | 950 |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.71 | 1.8 | 0.59 | 0.54 | 0.77 | 0.72 | 0.74 | 0.65 | 1.2 | 0.66 | | 0.76 | 0.68 | 0.51 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | 0.5 U | 0.5 U | 0.49 U | 0.5 U | 0.48 U | 0.495 U | 0.495 U | 0.55 U | 0.5 U | 0.46 U | | 0.5 U | 0.47 U | 0.485 U |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 380 | 960 | 340 | 250 | 300 | 320 | 330 | 280 | 420 | 280 | | 290 | 310 | 250 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **12** | **9** | **18** | **21** | **20** | **21** | **22** | **17** | **13** | **18** | | **18** | **16** | **16** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 53 | 90 | 220 | 69 | 91 | 99 | 140 | 85 | 97 | 89 | | 88 | 93 | 82 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | 0.7 U | 0.7 U | 2 | 0.67 | 0.7 U | - R | 0.75 U | 0.75 U | 0.7 U | 2.5 | | - R | 0.65 U | 0.47 |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.0165 U | 0.07 | 0.068 | 0.036 | 0.013 U | 0.0145 U | 0.051 | 0.062 | 0.032 | 0.014 U | | 0.052 | 0.059 | 0.032 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | 0.3 U | 0.31 U | 0.29 U | 0.315 U | 0.305 U | 0.22 | 0.32 U | 0.315 U | 0.31 U | 0.3 U | | 0.32 U | 0.285 U | 0.3 U |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | | | | | | | | | | | | 0.00105 U | | |
| | 8081A | 4,4'-DDT | 1.7 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Aldrin | 0.029 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | alpha-BHC | 0.09 | sat | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | alpha-Chlordane | 1.6 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | beta-BHC | 0.32 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | delta-BHC | -- | | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Dieldrin | 0.030 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endosulfan I | 37 | nc | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endosulfan II | 37 | nc | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endosulfan sulfate | 37 | nc | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endrin | 1.8 | nc | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endrin aldehyde | -- | | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Endrin ketone | -- | | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | gamma-BHC | 0.44 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | gamma-Chlordane | 1.6 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Heptachlor | 0.11 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 UJ | | |
| | 8081A | Heptachlor epoxide | 0.053 | ca | -- | mg/kg | | | | | | | | | | | | 0.0009 U | | |
| | 8081A | Methoxychlor | 31 | nc | -- | mg/kg | | | | | | | | | | | | 0.00435 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO |
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8081A | Toxaphene | 0.44 | ca | -- | mg/kg | | | | | | | | | | | | 0.009 U | | |
| PCBs | 8082 | Aroclor 1016 | 0.39 | nc | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8082 | Aroclor 1221 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8082 | Aroclor 1232 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.009 U | | |
| | 8082 | Aroclor 1242 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8082 | Aroclor 1248 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.009 U | | |
| | 8082 | Aroclor 1254 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8082 | Aroclor 1260 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| VOCs | 8260B | 1,1,1-Trichloroethane | 1200 | sat | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,1,2,2-Tetrachloroethane | 0.41 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,1,2-Trichloroethane | 0.73 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,1-Dichloroethane | 51 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,1-Dichloroethene | 12 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,2-Dibromoethane | 0.032 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,2-Dichloroethane | 0.28 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 1,2-Dichloroethene (total) | 6.9 | nc | -- | mg/kg | | | | | | | | | | | 0.006 U | | | |
| | 8260B | 1,2-Dichloropropane | 0.34 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | 2-Butanone | 2231 | nc | -- | mg/kg | | | | | | | | | | | 0.009 U | | | |
| | 8260B | 2-Hexanone | 530 | nc | -- | mg/kg | | | | | | | | | | | 0.006 U | | | |
| | 8260B | 4-Methyl-2-pentanone | 528 | nc | -- | mg/kg | | | | | | | | | | | 0.006 U | | | |
| | 8260B | Acetone | 1412 | nc | -- | mg/kg | | | | | | | | | | | 0.009 U | | | |
| | 8260B | Benzene | 0.64 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Bromochloromethane | -- | | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Bromodichloromethane | 0.82 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Bromoform | 62 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Bromomethane | 0.39 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Carbon disulfide | 36 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Carbon tetrachloride | 0.25 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Chlorobenzene | 15 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 UJ | | | |
| | 8260B | Chloroethane | 3.0 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Chloroform | 0.22 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Chloromethane | 4.7 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | cis-1,2-Dichloroethene | 4.3 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | cis-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Dibromochloromethane | 1.1 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Ethylbenzene | 395 | sat | -- | mg/kg | | | | | | | | | | | 0.00295 UJ | | | |
| | 8260B | m&p-Xylenes | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.006 UJ | | | |
| | 8260B | Methylene chloride | 9.1 | ca | -- | mg/kg | | | | | | | | | | | 0.006 U | | | |
| | 8260B | o-Xylene | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.00295 UJ | | | |
| | 8260B | Styrene | 1700 | sat | -- | mg/kg | | | | | | | | | | | 0.00295 UJ | | | |
| | 8260B | Tetrachloroethene | 0.48 | ca | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Toluene | 520 | sat | -- | mg/kg | | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Total Xylenes | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.006 UJ | | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | |
| | 8260B | trans-1,2-Dichloroethene | 6.9 | nc | -- | mg/kg | | | | | | | | | | 0.00295 U | | | |
| | 8260B | trans-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Trichloroethene | 0.053 | ca | -- | mg/kg | | | | | | | | | | 0.00295 U | | | |
| | 8260B | Vinyl chloride | 0.079 | ca | -- | mg/kg | | | | | | | | | | 0.00295 U | | | |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 6.2 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 1,2-Dichlorobenzene | 600 | sat | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 1,3-Dichlorobenzene | 53 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 1,4-Dichlorobenzene | 3.4 | ca | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2,2-oxybis (1-chloropropane) | 2.9 | ca | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2,4,5-Trichlorophenol | 611 | nc | -- | mg/kg | | | | | | | | | | | 0.175 U | | |
| | 8270C | 2,4,6-Trichlorophenol | 0.61 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2,4-Dichlorophenol | 18 | nc | -- | mg/kg | | | | | | | | | | | 0.175 U | | |
| | 8270C | 2,4-Dimethylphenol | 122 | nc | -- | mg/kg | | | | | | | | | | | 0.175 U | | |
| | 8270C | 2,4-Dinitrophenol | 12 | nc | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | | | | | | | | | | | 0.0175 U | | |
| | 8270C | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | | | | | | | 0.0175 U | | |
| | 8270C | 2-Chloronaphthalene | 494 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2-Chlorophenol | 6.3 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | | | | 0.0175 U | | |
| | 8270C | 2-Methylphenol | 306 | nc | -- | mg/kg | | | | | | | | | | | 0.0355 U | | |
| | 8270C | 2-Nitroaniline | 18.3 | nc | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 2-Nitrophenol | -- | | -- | mg/kg | | | | | | | | | | | 0.175 U | | |
| | 8270C | 3,3'-Dichlorobenzidine | 1.1 | ca | -- | mg/kg | | | | | | | | | | | 0.09 UJ | | |
| | 8270C | 3-Nitroaniline | 1.8 | nc | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | 4,6-Dinitro-2-methylphenol | 0.61 | nc | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | mg/kg | | | | | | | | | | | 0.175 U | | |
| | 8270C | 4-Chloroaniline | 24 | nc | -- | mg/kg | | | | | | | | | | | 0.355 UJ | | |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | | | | 0.09 U | | |
| | 8270C | 4-Methylphenol | 31 | nc | -- | mg/kg | | | | | | | | | | | 0.0355 U | | |
| | 8270C | 4-Nitroaniline | 23 | ca | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | 4-Nitrophenol | -- | | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | | | | 0.012 J | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | 0.04 | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | 0.047 | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | 0.063 | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | | | | 0.02 J | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | 0.035 J | | |
| | 8270C | Benzoic acid | 100000 | max | -- | mg/kg | | | | | | | | | | | - R | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | | | | 0.355 U | | |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | mg/kg | | | | | | | | | | | 0.0355 U | | |
| | 8270C | Bis(2-chloroethyl) ether | 0.22 | ca | -- | mg/kg | | | | | | | | | | | 0.0355 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO |
| | | | | | Sample Date: | | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Butylbenzyl phthalate | 1222 | nc | -- | mg/kg | | | | | | | | | | | | 0.0355 U | | |
| | 8270C | Carbazole | 24 | ca | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | | | | | | | | | 0.054 | | |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | | | | | | | | 0.0355 U | | |
| | 8270C | Diethyl phthalate | 4888 | nc | -- | mg/kg | | | | | | | | | | | | 0.0355 U | | |
| | 8270C | Dimethyl phthalate | 100000 | max | -- | mg/kg | | | | | | | | | | | | 0.0355 U | | |
| | 8270C | Di-n-butyl phthalate | 611 | nc | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Di-n-octyl phthalate | 244 | nc | -- | mg/kg | | | | | | | | | | | | 0.175 U | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | | | | | | | | | 0.11 | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Hexachlorobenzene | 0.30 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Hexachlorobutadiene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Hexachlorocyclopentadiene | 37 | nc | -- | mg/kg | | | | | | | | | | | | 0.55 UJ | | |
| | 8270C | Hexachloroethane | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.022 J | | |
| | 8270C | Isophorone | 512 | ca | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Nitrobenzene | 2 | nc | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | n-Nitroso-di-n-propylamine | 0.069 | ca | -- | mg/kg | | | | | | | | | | | | 0.0355 U | | |
| | 8270C | n-Nitrosodiphenylamine | 99 | ca | -- | mg/kg | | | | | | | | | | | | 0.0175 U | | |
| | 8270C | Pentachlorophenol | 3.0 | ca | -- | mg/kg | | | | | | | | | | | | 0.175 U | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | | | | | | | | 0.054 | | |
| | 8270C | Phenol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | 0.09 U | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | | | | | | | | | 0.074 | | |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 183 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.0495 U | 0.0485 U | 0.048 U | 0.05 U | 0.05 U | 0.0495 U | 0.049 U | | 0.05 U | 0.05 U | 0.0495 U |
| | 8330 | 1,3-Dinitrobenzene | 0.61 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.0495 U | 0.0485 U | 0.048 U | 0.05 U | 0.05 U | 0.0495 U | 0.049 U | | 0.05 U | 0.05 U | 0.0495 U |
| | 8330 | 2,4,6-TNT | 16 | ca | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.0495 U | 0.0485 U | 0.048 U | 0.05 U | 0.05 U | 0.0495 U | 0.049 U | | 0.05 U | 0.05 U | 0.0495 U |
| | 8330 | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.0495 U | 0.0485 U | 0.048 U | 0.05 U | 0.05 U | 0.0495 U | 0.049 U | | 0.05 U | 0.05 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 | 0.095 U | 0.095 U | 0.1 U | 0.1 U | 0.14 J | 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 | 0.095 U | 0.095 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 | 0.095 U | 0.095 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 | 0.095 U | 0.095 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 | 0.145 U | 0.145 U | 0.15 U | 0.15 U | 0.15 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 | 0.1 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 | 0.1 U |
| | 8330 | HMX | 306 | nc | -- | mg/kg | 0.1 U | 0.1 U | 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 | 0.1 U |
| | 8330 | Nitrobenzene | 2 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.0495 U | 0.0485 U | 0.048 U | 0.05 U | 0.05 U | 0.0495 U | 0.049 U | | 0.05 U | 0.05 U | 0.0495 U |
| | 8330 | RDX | 4.4 | ca | -- | mg/kg | 0.1 U | 0.1 U | 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 | 0.1 U |
| | 8330 | Tetryl | 61 | nc | -- | mg/kg | 0.2 U | 0.2 U | 0.2 U | 0.195 U | 0.195 U | 0.19 U | 0.2 U | 0.2 U | 0.2 U | 0.195 U | | 0.2 U | 0.2 U | 0.195 U |
| Propellants | 353.2 Modified | Nitrocellulose | -- | | -- | mg/kg | | | | | | | | | | | | 0.65 U | | |
| | 8332 | Nitroglycerine | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.25 U | | |
| | SW8330 Modified | Nitroguanidine | 611 | nc | -- | mg/kg | | | | | | | | | | | | 0 125 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-001M-SO | L10ss-002M-SO | L10ss-003M-SO | L10ss-004M-SO | L10ss-005M-DUP | L10ss-005M-SO | L10ss-006M-SO | L10ss-007M-SO | L10ss-008M-SO | L10ss-009M-SO | L10ss-010D-SO | L10ss-010M-SO | L10ss-011M-SO | L10ss-012M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | 0.48 | 1.3 J | 0.24 | 0.265 U | 0.31 U | 0.34 U | 0.26 | 0.305 U | 0.56 | 0.26 U | | 0.295 U | 0.215 U | 0.205 U |

Notes:
-- - no background/PRG value is available for this analyte
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, 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
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 L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | L10ss-013M-QA | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **7900** | **7700** | **9000** | 7000 | **9100** | **8700** | **9000** | **8300** | **11000** | **9700** | | **10000** | **11000** | **11000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **11** | **11** | **13** | **10** | **11** | **8.5 J** | **9.3** | **10** | **11** | **12** | | **15** | **10** | **11** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 53 | 48 | 49 | 47 | 69 | 81 | 88 | 60 | 58 | 65 | | 57 | 66 | 61 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.56 | 0.56 | 0.64 | 0.54 | 0.99 | 0.99 | 1.2 | 0.59 | 0.59 | 0.72 | | 0.63 | 0.61 | 0.66 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.37 | 0.37 | 0.82 | 0.46 | 0.29 | 0.35 J | 0.16 | 0.42 | 0.55 | 0.057 | | 0.12 U | 0.12 U | 0.125 U |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 2200 | 3700 | 2600 | 2500 | 28000 | 22000 J | 33000 | 2000 | 2200 | 2700 | | 1600 | 1500 | 1300 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 23 | 18 | 17 | 29 | 22 | 14 | 15 | 21 | 27 | 19 | | 22 | 19 | 24 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 6.7 | 6.1 | 8.8 | 6.6 | 6.8 | 6.7 J | 6.8 | 8.3 | 7 | 7.9 | | 8.8 | 7.4 | 8.8 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 25 | 17 | 20 | 34 | 22 | 12 | 13 | 30 | 23 | 14 | | 15 | 15 | 15 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **18000** | **17000** | **23000** | **19000** | **20000** | **15000** | **16000** | **19000** | **21000** | **20000** | | **22000** | **20000** | **21000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 62 | 53 | 47 | 72 | 55 | 37 J | 40 | 65 | 83 | 26 | | 38 | 55 | 60 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 1700 | 1700 | 2400 | 1900 | 6200 | 3600 J | 4700 | 2200 | 2500 | 2200 | | 2200 | 2000 | 2200 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **490** | **470** | **520** | **550** | **640** | **790** | **890** | **500** | **310** | **690** | | **510** | **510** | **550** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 21 | 15 | 18 | 23 | 19 | 13 | 14 | 18 | 19 | 16 | | 20 | 16 | 19 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 790 | 880 | 1100 | 900 | 1500 | 890 J | 880 | 760 | 940 | 990 | | 990 | 1100 | 1100 |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.72 | 0.74 | 0.66 | 0.45 | 0.85 | 0.54 | 1.1 | 0.76 | 0.49 | 0.73 | | 0.52 | 0.65 | 0.71 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | 0.5 U | 0.49 U | 0.55 U | 0.485 U | 0.55 U | 0.495 U | 0.5 U | 0.5 U | 0.55 U | 0.55 U | | 0.485 U | 0.47 U | 0.5 U |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 270 | 270 | 320 | 230 | 330 | 290 | 350 | 280 | 260 | 280 | | 270 | 270 | 290 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **16** | **16** | **18** | **14** | **15** | **14** | **14** | **17** | **21** | **20** | | **19** | **20** | **21** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 120 | 90 | 95 | 110 | 110 | 65 J | 69 | 94 | 88 | 63 | | 69 | 94 | 80 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | 0.7 U | - R | 0.7 U | 0.7 U | 0.75 U | 0.53 J | 0.49 | 0.7 U | 1 | 0.7 U | | 0.7 U | 0.7 U | 0.7 U |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.061 | 0.066 | 0.082 | 0.035 | 0.0165 U | 0.047 | 0.045 | 0.034 | 0.07 | 0.05 | | 0.015 U | 0.016 U | 0.0165 U |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | 0.19 | 0.285 U | 0.31 U | 0.305 U | 0.325 U | 0.29 U | 0.29 U | 0.295 U | 0.315 U | 0.3 U | | 0.3 U | 0.23 | 0.305 U |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | | | | | | | | | | | | 0.00085 U | | |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | | | | | | | | | | | | 0.001 U | | |
| | 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 UJ | | |
| | 8081A | Heptachlor epoxide | 0.053 | ca | -- | mg/kg | | | | | | | | | | | | 0.00085 U | | |
| | 8081A | Methoxychlor | 31 | nc | -- | mg/kg | | | | | | | | | | | | 0.00415 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-013M-QA | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO |
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8081A | Toxaphene | 0.44 | ca | -- | mg/kg | | | | | | | | | | | | 0.0085 U | | |
| PCBs | 8082 | Aroclor 1016 | 0.39 | nc | -- | mg/kg | | | | | | | | | | | | 0.0165 U | | |
| | 8082 | Aroclor 1221 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0165 U | | |
| | 8082 | Aroclor 1232 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0085 U | | |
| | 8082 | Aroclor 1242 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0165 U | | |
| | 8082 | Aroclor 1248 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0085 U | | |
| | 8082 | Aroclor 1254 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0165 U | | |
| | 8082 | Aroclor 1260 | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.0165 U | | |
| VOCs | 8260B | 1,1,1-Trichloroethane | 1200 | sat | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,1,2,2-Tetrachloroethane | 0.41 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,1,2-Trichloroethane | 0.73 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,1-Dichloroethane | 51 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,1-Dichloroethene | 12 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,2-Dibromoethane | 0.032 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,2-Dichloroethane | 0.28 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 1,2-Dichloroethene (total) | 6.9 | nc | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |
| | 8260B | 1,2-Dichloropropane | 0.34 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | 2-Butanone | 2231 | nc | -- | mg/kg | | | | | | | | | | | 0.0095 U | | | |
| | 8260B | 2-Hexanone | 530 | nc | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |
| | 8260B | 4-Methyl-2-pentanone | 528 | nc | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |
| | 8260B | Acetone | 1412 | nc | -- | mg/kg | | | | | | | | | | | 0.0095 U | | | |
| | 8260B | Benzene | 0.64 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Bromochloromethane | -- | | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Bromodichloromethane | 0.82 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Bromoform | 62 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Bromomethane | 0.39 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Carbon disulfide | 36 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Carbon tetrachloride | 0.25 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Chlorobenzene | 15 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Chloroethane | 3.0 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Chloroform | 0.22 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Chloromethane | 4.7 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | cis-1,2-Dichloroethene | 4.3 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | cis-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Dibromochloromethane | 1.1 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Ethylbenzene | 395 | sat | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | m&p-Xylenes | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |
| | 8260B | Methylene chloride | 9.1 | ca | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |
| | 8260B | o-Xylene | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Styrene | 1700 | sat | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Tetrachloroethene | 0.48 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Toluene | 520 | sat | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Total Xylenes | 27 | nc | -- | mg/kg | | | | | | | | | | | 0.0065 U | | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-013M-QA | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO |
| | | | | | Sample Date: | | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8260B | trans-1,2-Dichloroethene | 6.9 | nc | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | trans-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Trichloroethene | 0.053 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| | 8260B | Vinyl chloride | 0.079 | ca | -- | mg/kg | | | | | | | | | | | 0.0032 U | | | |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 6.2 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 1,2-Dichlorobenzene | 600 | sat | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 1,3-Dichlorobenzene | 53 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 1,4-Dichlorobenzene | 3.4 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2,2-oxybis (1-chloropropane) | 2.9 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2,4,5-Trichlorophenol | 611 | nc | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | 2,4,6-Trichlorophenol | 0.61 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2,4-Dichlorophenol | 18 | nc | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | 2,4-Dimethylphenol | 122 | nc | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | 2,4-Dinitrophenol | 12 | nc | -- | mg/kg | | | | | | | | | | | | - R | | |
| | 8270C | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | 2-Chloronaphthalene | 494 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2-Chlorophenol | 6.3 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | | | | | 0.011 J | | |
| | 8270C | 2-Methylphenol | 306 | nc | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | 2-Nitroaniline | 18.3 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 2-Nitrophenol | -- | | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | 3,3'-Dichlorobenzidine | 1.1 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 3-Nitroaniline | 1.8 | nc | -- | mg/kg | | | | | | | | | | | | 0.34 U | | |
| | 8270C | 4,6-Dinitro-2-methylphenol | 0.61 | nc | -- | mg/kg | | | | | | | | | | | | - R | | |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | 4-Chloroaniline | 24 | nc | -- | mg/kg | | | | | | | | | | | | 0.34 U | | |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | 4-Methylphenol | 31 | nc | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | 4-Nitroaniline | 23 | ca | -- | mg/kg | | | | | | | | | | | | 0.34 U | | |
| | 8270C | 4-Nitrophenol | -- | | -- | mg/kg | | | | | | | | | | | | 0.34 U | | |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.018 J | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | | 0.022 J | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.033 J | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | | | | | 0.015 J | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Benzoic acid | 100000 | max | -- | mg/kg | | | | | | | | | | | | - R | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | 0.34 U | | |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | Bis(2-chloroethyl) ether | 0.22 | ca | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-013M-QA | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO |
| | | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Butylbenzyl phthalate | 1222 | nc | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | Carbazole | 24 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | | | | | | | | | 0.03 J | | |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 | ca | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | Diethyl phthalate | 4888 | nc | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | Dimethyl phthalate | 100000 | max | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | Di-n-butyl phthalate | 611 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Di-n-octyl phthalate | 244 | nc | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | | | | | | | | | 0.046 | | |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Hexachlorobenzene | 0.30 | ca | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | Hexachlorobutadiene | 6.2 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Hexachlorocyclopentadiene | 37 | nc | -- | mg/kg | | | | | | | | | | | | 0.5 U | | |
| | 8270C | Hexachloroethane | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | | | | | | | | 0.014 J | | |
| | 8270C | Isophorone | 512 | ca | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | | | | | | | | 0.0092 J | | |
| | 8270C | Nitrobenzene | 2 | nc | -- | mg/kg | | | | | | | | | | | | 0.017 U | | |
| | 8270C | n-Nitroso-di-n-propylamine | 0.069 | ca | -- | mg/kg | | | | | | | | | | | | 0.034 U | | |
| | 8270C | n-Nitrosodiphenylamine | 99 | ca | -- | mg/kg | | | | | | | | | | | | 0.017 UJ | | |
| | 8270C | Pentachlorophenol | 3.0 | ca | -- | mg/kg | | | | | | | | | | | | 0.17 U | | |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | | | | | | | | 0.028 J | | |
| | 8270C | Phenol | 1833 | nc | -- | mg/kg | | | | | | | | | | | | 0.085 U | | |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | | | | | | | | | 0.036 J | | |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 183 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.05 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | | 0.049 U | 0.0485 U | 0.0495 U |
| | 8330 | 1,3-Dinitrobenzene | 0.61 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.05 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | | 0.049 U | 0.0485 U | 0.0495 U |
| | 8330 | 2,4,6-TNT | 16 | ca | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.05 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | | 0.049 U | 0.0485 U | 0.0495 U |
| | 8330 | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.05 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | | 0.049 U | 0.0485 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 | 0.1 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 |
| | 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 | 0.095 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 | 0.095 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 | 0.095 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 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | | 0.145 U | 0.145 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 | 0.095 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 | 0.095 U | 0.1 U |
| | 8330 | Nitrobenzene | 2 | nc | -- | mg/kg | 0.0495 U | 0.05 U | 0.05 U | 0.05 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | 0.0495 U | | 0.049 U | 0.0485 U | 0.0495 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 | 0.095 U | 0.1 U |
| | 8330 | Tetryl | 61 | nc | -- | mg/kg | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.195 U | 0.2 U | 0.195 U | 0.2 U | | 0.195 U | 0.195 U | 0.2 U |
| Propellants | 353.2 Modified | Nitrocellulose | -- | | -- | mg/kg | | | | | | | | | | | | 0.65 U | | |
| | 8332 | Nitroglycerine | 35 | ca | -- | mg/kg | | | | | | | | | | | | 0.245 U | | |
| | SW8330 Modified | Nitroguanidine | 611 | nc | -- | mg/kg | | | | | | | | | | | | 0.125 U | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-013M-QA | L10ss-013M-SO | L10ss-014M-SO | L10ss-015M-SO | L10ss-016M-SO | L10ss-017M-DUP | L10ss-017M-SO | L10ss-018M-SO | L10ss-019M-SO | L10ss-020M-SO | L10ss-021D-SO | L10ss-021M-SO | L10ss-022M-SO | L10ss-023M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/17/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | 0.33 U | 0.325 U | 0.33 U | 0.285 U | 0.25 | 0.32 | 0.33 | 0.345 U | 0.31 U | 0.19 | | 0.2 | 0.26 U | 0.255 U |

Notes:
-- - no background/PRG value is available for this analyte
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, 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
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 L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-024M-SO | L10ss-025M-SO | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO |
| | | | | | | Sample Date: | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **12000** | **12000** | **12000** | | **14000** | **13000** | **14000** | **12000** | **10000** | **11000** | **12000** | **12000** | | **12000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **14** | **11** | **13** | | **13** | **13** | **16** | **15** | **16** | **14** | **12** | **12** | | **8.4** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 78 | 71 | 68 | | 88 | 88 | 46 | 48 | 53 | 56 | 57 | 56 | | 120 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.79 | 0.74 | 0.75 | | 0.93 | 0.93 | 0.69 | 0.68 | 0.65 | 0.68 | 0.71 | 0.64 | | 0.77 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.125 U | 0.12 U | 0.12 U | | 0.12 U | 0.12 U | 0.125 U | 0.12 U | 0.125 U | 0.125 U | 0.13 | 0.067 | | 0.135 U |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 2400 | 2600 | 8700 | | 2800 | 2600 | 970 | 1300 | 1900 | 1800 | 1800 | 1300 | | 730 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 19 | 18 | 18 | | 20 | 20 | 19 | 18 | 18 | 20 | 19 | 18 | | 24 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 11 | 10 | 10 | | 13 | 13 | 8.9 | 8 | 8.7 | 8.3 | 7.6 | 8.3 | | 11 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 29 | 16 | 20 | | 21 | 21 | 23 | 19 | 18 | 28 | 15 | 18 | | 11 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **25000** | **22000** | **24000** | | **25000** | **25000** | **28000** | **25000** | **24000** | **24000** | **22000** | **23000** | | **19000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 17 | 25 | 32 | | 21 | 21 | 23 | 26 | 24 | 25 | 33 | 25 | | 21 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 3200 | 2400 | 4300 | | 3900 | 3800 | 3200 | 2600 | 2400 | 2500 | 2400 | 2400 | | 2200 |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **340** | **680** | **340** | | **330** | **340** | **250** | **250** | **380** | **340** | **390** | **510** | | **1400** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 26 | 17 | 26 | | 29 | 29 | 21 | 19 | 19 | 20 | 17 | 16 | | 20 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1500 | 1000 | 1500 | | 1900 | 1800 | 1400 | 1000 | 1100 | 1000 J | 1200 | 1200 | | 980 |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.46 | 0.56 | 0.75 U | | 0.7 U | 0.7 U | 0.75 U | 0.62 | 0.75 U | 0.55 | 0.91 | 0.54 | | 0.87 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | 0.495 U | 0.48 U | 0.485 U | | 0.48 U | 0.475 U | 0.49 U | 0.475 U | 0.495 U | 0.5 U | 0.5 U | 0.485 U | | 0.55 U |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 330 | 290 | 250 | | 320 | 300 | 250 | 290 | 290 | 240 | 320 | 250 | | 280 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **20** | **22** | **20** | | **22** | **22** | **23** | **21** | **19** | **21** | **24** | **24** | | **21** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 65 | 56 | 71 | | 67 | 67 | 62 | 61 | 65 | 65 | 72 | 99 | | 57 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | 0.7 U | 0.53 | 0.7 U | | 0.65 U | 0.7 U | 2 | 0.53 | 0.52 | - R | 0.75 U | 0.7 U | | 0.75 U |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.013 U | 0.04 | 0.0135 U | | 0.039 | 0.039 | 0.047 | 0.033 | 0.025 | 0.0155 UJ | 0.055 | 0.044 | | 0.075 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | 0.305 U | 0.3 U | 0.3 U | | 0.23 | 0.295 U | 0.29 U | 0.28 U | 0.29 U | 0.29 UJ | 0.22 | 0.29 U | | 0.23 |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | | | | | 0.001 U | 0.001 U | | | | | | | | 0.00115 U |
| | 8081A | 4,4'-DDT | 1.7 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Aldrin | 0.029 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | alpha-BHC | 0.09 | sat | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | alpha-Chlordane | 1.6 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | beta-BHC | 0.32 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | delta-BHC | -- | | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Dieldrin | 0.030 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endosulfan I | 37 | nc | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endosulfan II | 37 | nc | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endosulfan sulfate | 37 | nc | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endrin | 1.8 | nc | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endrin aldehyde | -- | | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Endrin ketone | -- | | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | gamma-BHC | 0.44 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | gamma-Chlordane | 1.6 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Heptachlor | 0.11 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 UJ |
| | 8081A | Heptachlor epoxide | 0.053 | ca | -- | mg/kg | | | | | 0.00085 U | 0.00085 U | | | | | | | | 0.00095 U |
| | 8081A | Methoxychlor | 31 | nc | -- | mg/kg | | | | | 0.0041 U | 0.0042 U | | | | | | | | 0.0047 U |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-024M-SO | L10ss-025M-SO | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8081A | Toxaphene | 0.44 ca | -- | mg/kg | | | | | 0.008 U | 0.0085 U | | | | | | | | 0.0095 U |
| PCBs | 8082 | Aroclor 1016 | 0.39 nc | -- | mg/kg | | | | | 0.0165 U | 0.0165 U | | | | | | | | 0.019 U |
| | 8082 | Aroclor 1221 | 0.22 ca | -- | mg/kg | | | | | 0.0165 U | 0.0165 U | | | | | | | | 0.019 U |
| | 8082 | Aroclor 1232 | 0.22 ca | -- | mg/kg | | | | | 0.008 U | 0.0085 U | | | | | | | | 0.0095 U |
| | 8082 | Aroclor 1242 | 0.22 ca | -- | mg/kg | | | | | 0.0165 U | 0.0165 U | | | | | | | | 0.019 U |
| | 8082 | Aroclor 1248 | 0.22 ca | -- | mg/kg | | | | | 0.008 U | 0.0085 U | | | | | | | | 0.0095 U |
| | 8082 | Aroclor 1254 | 0.22 ca | -- | mg/kg | | | | | 0.0165 U | 0.0165 U | | | | | | | | 0.019 U |
| | 8082 | Aroclor 1260 | 0.22 ca | -- | mg/kg | | | | | 0.0165 U | 0.0165 U | | | | | | | | 0.019 U |
| VOCs | 8260B | 1,1,1-Trichloroethane | 1200 sat | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,1,2,2-Tetrachloroethane | 0.41 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,1,2-Trichloroethane | 0.73 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,1-Dichloroethane | 51 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,1-Dichloroethene | 12 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,2-Dibromoethane | 0.032 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,2-Dichloroethane | 0.28 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 1,2-Dichloroethene (total) | 6.9 nc | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |
| | 8260B | 1,2-Dichloropropane | 0.34 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | 2-Butanone | 2231 nc | -- | mg/kg | | | | 0.0095 U | | | | | | | | | 0.0095 U | |
| | 8260B | 2-Hexanone | 530 nc | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |
| | 8260B | 4-Methyl-2-pentanone | 528 nc | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |
| | 8260B | Acetone | 1412 nc | -- | mg/kg | | | | 0.0095 U | | | | | | | | | 0.0095 U | |
| | 8260B | Benzene | 0.64 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Bromochloromethane | -- | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Bromodichloromethane | 0.82 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Bromoform | 62 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Bromomethane | 0.39 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Carbon disulfide | 36 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Carbon tetrachloride | 0.25 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Chlorobenzene | 15 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Chloroethane | 3.0 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Chloroform | 0.22 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Chloromethane | 4.7 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | cis-1,2-Dichloroethene | 4.3 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | cis-1,3-Dichloropropene | 0.78 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Dibromochloromethane | 1.1 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Ethylbenzene | 395 sat | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | m&p-Xylenes | 27 nc | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |
| | 8260B | Methylene chloride | 9.1 ca | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |
| | 8260B | o-Xylene | 27 nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Styrene | 1700 sat | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Tetrachloroethene | 0.48 ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Toluene | 520 sat | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Total Xylenes | 27 nc | -- | mg/kg | | | | 0.0065 U | | | | | | | | | 0.0065 U | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-024M-SO | L10ss-025M-SO | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO |
| | | | | | Sample Date: | | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8260B | trans-1,2-Dichloroethene | 6.9 | nc | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | trans-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Trichloroethene | 0.053 | ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| | 8260B | Vinyl chloride | 0.079 | ca | -- | mg/kg | | | | 0.00315 U | | | | | | | | | 0.00325 U | |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 6.2 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 1,2-Dichlorobenzene | 600 | sat | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 1,3-Dichlorobenzene | 53 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 1,4-Dichlorobenzene | 3.4 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2,2-oxybis (1-chloropropane) | 2.9 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2,4,5-Trichlorophenol | 611 | nc | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | 2,4,6-Trichlorophenol | 0.61 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2,4-Dichlorophenol | 18 | nc | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | 2,4-Dimethylphenol | 122 | nc | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | 2,4-Dinitrophenol | 12 | nc | -- | mg/kg | | | | | - R | - R | | | | | | | | - R |
| | 8270C | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | 2-Chloronaphthalene | 494 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2-Chlorophenol | 6.3 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | 0.018 J | 0.019 J | | | | | | | | 0.0185 U |
| | 8270C | 2-Methylphenol | 306 | nc | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | 2-Nitroaniline | 18.3 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 2-Nitrophenol | -- | | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | 3,3'-Dichlorobenzidine | 1.1 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 3-Nitroaniline | 1.8 | nc | -- | mg/kg | | | | | 0.33 U | 0.325 U | | | | | | | | 0.38 U |
| | 8270C | 4,6-Dinitro-2-methylphenol | 0.61 | nc | -- | mg/kg | | | | | - R | - R | | | | | | | | - R |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | 4-Chloroaniline | 24 | nc | -- | mg/kg | | | | | 0.33 U | 0.325 U | | | | | | | | 0.38 U |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | 4-Methylphenol | 31 | nc | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | 4-Nitroaniline | 23 | ca | -- | mg/kg | | | | | 0.33 U | 0.325 U | | | | | | | | 0.38 U |
| | 8270C | 4-Nitrophenol | -- | | -- | mg/kg | | | | | 0.33 U | 0.325 U | | | | | | | | 0.38 U |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | 0.029 J | 0.032 | | | | | | | | 0.0185 U |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | 0.036 | 0.038 | | | | | | | | 0.012 J |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | 0.044 | 0.047 | | | | | | | | 0.02 J |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | 0.022 J | 0.023 J | | | | | | | | 0.0185 U |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | 0.028 J | 0.027 J | | | | | | | | 0.0185 U |
| | 8270C | Benzoic acid | 100000 | max | -- | mg/kg | | | | | - R | - R | | | | | | | | - R |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | 1.9 | 2.1 | | | | | | | | 0.38 U |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | Bis(2-chloroethyl) ether | 0.22 | ca | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-024M-SO | L10ss-025M-SO | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO |
| | | | | | | Sample Date: | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 35 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Butylbenzyl phthalate | 1222 | nc | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | Carbazole | 24 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Chrysene | 62 | ca | -- | mg/kg | | | | | 0.037 | 0.04 | | | | | | | | 0.016 J |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 | ca | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | Dibenzofuran | 15 | nc | -- | mg/kg | | | | | 0.015 J | 0.018 J | | | | | | | | 0.038 U |
| | 8270C | Diethyl phthalate | 4888 | nc | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | Dimethyl phthalate | 100000 | max | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | Di-n-butyl phthalate | 611 | nc | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Di-n-octyl phthalate | 244 | nc | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | Fluoranthene | 229 | nc | -- | mg/kg | | | | | 0.077 | 0.088 | | | | | | | | 0.022 J |
| | 8270C | Fluorene | 275 | nc | -- | mg/kg | | | | | 0.01 J | 0.012 J | | | | | | | | 0.0185 U |
| | 8270C | Hexachlorobenzene | 0.30 | ca | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | Hexachlorobutadiene | 6.2 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Hexachlorocyclopentadiene | 37 | nc | -- | mg/kg | | | | | 0.49 U | 0.48 U | | | | | | | | 0.55 U |
| | 8270C | Hexachloroethane | 35 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | mg/kg | | | | | 0.021 J | 0.022 J | | | | | | | | 0.0185 U |
| | 8270C | Isophorone | 512 | ca | -- | mg/kg | | | | | 0.08 U | 0.08 U | | | | | | | | 0.095 U |
| | 8270C | Naphthalene | 5.6 | nc | -- | mg/kg | | | | | 0.019 J | 0.021 J | | | | | | | | 0.0185 U |
| | 8270C | Nitrobenzene | 2 | nc | -- | mg/kg | | | | | 0.016 U | 0.016 U | | | | | | | | 0.0185 U |
| | 8270C | n-Nitroso-di-n-propylamine | 0.069 | ca | -- | mg/kg | | | | | 0.033 U | 0.0325 U | | | | | | | | 0.038 U |
| | 8270C | n-Nitrosodiphenylamine | 99 | ca | -- | mg/kg | | | | | 0.016 UJ | 0.016 UJ | | | | | | | | 0.0185 UJ |
| | 8270C | Pentachlorophenol | 3.0 | ca | -- | mg/kg | | | | | 0.16 U | 0.16 U | | | | | | | | 0.185 U |
| | 8270C | Phenanthrene | -- | | -- | mg/kg | | | | | 0.047 J | 0.056 | | | | | | | | 0.028 U |
| | 8270C | Phenol | 1833 | nc | -- | mg/kg | | | | | 0.18 | 0.18 | | | | | | | | 0.095 U |
| | 8270C | Pyrene | 232 | nc | -- | mg/kg | | | | | 0.056 | 0.059 | | | | | | | | 0.017 J |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 183 | nc | -- | mg/kg | 0.05 U | 0.0495 U | 0.049 U | | 0.0495 U | 0.0495 U | 0.05 U | 0.049 U | 0.05 U | 0.0495 U | 0.05 U | 0.0485 U | | 0.049 U |
| | 8330 | 1,3-Dinitrobenzene | 0.61 | nc | -- | mg/kg | 0.05 U | 0.0495 U | 0.049 U | | 0.0495 U | 0.0495 U | 0.05 U | 0.049 U | 0.05 U | 0.0495 U | 0.05 U | 0.0485 U | | 0.049 U |
| | 8330 | 2,4,6-TNT | 16 | ca | -- | mg/kg | 0.05 U | 0.0495 U | 0.049 U | | 0.0495 U | 0.0495 U | 0.05 U | 0.049 U | 0.05 U | 0.0495 U | 0.05 U | 0.0485 U | | 0.049 U |
| | 8330 | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | 0.05 U | 0.0495 U | 0.049 U | | 0.0495 U | 0.0495 U | 0.05 U | 0.049 U | 0.05 U | 0.0495 U | 0.05 U | 0.0485 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 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.095 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 | 0.095 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 | 0.095 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 | 0.095 U | | 0.1 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | | -- | mg/kg | 0.15 U | 0.15 U | 0.145 U | | 0.15 U | 0.15 U | 0.15 U | 0.145 U | 0.15 U | 0.15 U | 0.15 U | 0.145 U | | 0.145 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 | 0.095 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 | 0.095 U | | 0.1 U |
| | 8330 | Nitrobenzene | 2 | nc | -- | mg/kg | 0.05 U | 0.0495 U | 0.049 U | | 0.0495 U | 0.0495 U | 0.05 U | 0.049 U | 0.05 U | 0.0495 U | 0.05 U | 0.0485 U | | 0.049 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 | 0.095 U | | 0.1 U |
| | 8330 | Tetryl | 61 | nc | -- | mg/kg | 0.2 U | 0.2 U | 0.195 U | | 0.195 U | 0.195 U | 0.2 U | 0.195 U | 0.2 U | 0.195 U | 0.2 U | 0.195 U | | 0.195 U |
| Propellants | 353.2 Modified | Nitrocellulose | -- | | -- | mg/kg | | | | | 0.6 U | 0.9 U | | | | | | | | 0.6 U |
| | 8332 | Nitroglycerine | 35 | ca | -- | mg/kg | | | | | 0.25 U | 0.25 U | | | | | | | | 0.25 U |
| | SW8330 Modified | Nitroguanidine | 611 | nc | -- | mg/kg | | | | | 0 125 U | 0 125 U | | | | | | | | 0 125 U |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-024M-SO | L10ss-025M-SO | L10ss-026M-SO | L10ss-027D-SO | L10ss-027M-DUP | L10ss-027M-SO | L10ss-028M-SO | L10ss-029M-SO | L10ss-030M-QA | L10ss-030M-SO | L10ss-031M-SO | L10ss-032M-SO | L10ss-033D-SO | L10ss-033M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/18/2004 | 11/17/2004 | 11/16/2004 | 11/16/2004 | 11/16/2004 | 11/18/2004 | 11/18/2004 | 11/18/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | 0.21 | 0.265 U | 0.22 U | | 0.235 U | 0.205 U | 0.335 U | 0.245 U | 0.23 U | 0.22 | 0.295 U | 0.285 U | | 0.295 U |

Notes:
-- - no background/PRG value is available for this analyte
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, 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
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 L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
| | | | | | | Sample Date: | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 17700 | mg/kg | **14000** | **11000** | **12000** | | | | | **11000** |
| | 6010B | Arsenic | 0.39 | ca | 15.4 | mg/kg | **11** | **7.6** | **13** | | | | | **12** |
| | 6010B | Barium | 538 | nc | 88.4 | mg/kg | 85 | 83 | 77 | | | | | 62 |
| | 6010B | Beryllium | 15 | nc | 0.88 | mg/kg | 0.87 | 0.8 | 0.75 | | | | | 0.7 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.12 | 0.13 U | 0.125 U | | | | | 0.125 U |
| | 6010B | Calcium | --[n] | | 15800 | mg/kg | 2000 | 290 | 3400 | | | | | 1500 |
| | 6010B | Chromium | 30 | ca | 17.4 | mg/kg | 24 | 15 | 23 | | | | | 18 |
| | 6010B | Cobalt | 30 | ca | 10.4 | mg/kg | 11 | 11 | 10 | | | | | 9.9 |
| | 6010B | Copper | 313 | nc | 17.7 | mg/kg | 21 | 9.1 | 20 | | | | | 16 |
| | 6010B | Iron | 2346 | nc | 23100 | mg/kg | **25000** | **16000** | **24000** | | | | | **23000** |
| | 6010B | Lead | 400 | pbk | 26.1 | mg/kg | 15 | 21 | 19 | | | | | 22 |
| | 6010B | Magnesium | --[n] | | 3030 | mg/kg | 3700 | 1800 | 3200 | | | | | 2000 J |
| | 6010B | Manganese | 176 | nc | 1450 | mg/kg | **310** | **1100** | **410** | | | | | **750** |
| | 6010B | Nickel | 156 | nc | 21.1 | mg/kg | 28 | 15 | 31 | | | | | 18 |
| | 6010B | Potassium | --[n] | | 927 | mg/kg | 1600 | 680 | 1500 | | | | | 1100 J |
| | 6010B | Selenium | 39 | nc | 1.4 | mg/kg | 0.8 U | 0.84 | 0.75 U | | | | | 0.75 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | 0.5 U | 0.5 U | 0.495 U | | | | | 0.5 U |
| | 6010B | Sodium | --[n] | | 123 | mg/kg | 350 | 270 | 330 | | | | | 240 |
| | 6010B | Vanadium | 7.8 | nc | 31.1 | mg/kg | **22** | **21** | **21** | | | | | **20** |
| | 6010B | Zinc | 2346 | nc | 61.8 | mg/kg | 79 | 53 | 100 | | | | | 110 |
| | 7041 | Antimony | 3.1 | nc | 0.96 | mg/kg | 0.6 | 0.7 U | 0.7 U | | | | | - R |
| | 7471A | Mercury | 2.3 | nc | 0.04 | mg/kg | 0.031 | 0.054 | 0.0145 U | | | | | 0.063 |
| | 7841 | Thallium | 0.52 | nc | 0.00 | mg/kg | 0.315 U | 0.305 U | 0.31 U | | | | | 0.295 U |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | 4,4'-DDT | 1.7 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | Aldrin | 0.029 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | alpha-BHC | 0.09 | sat | -- | mg/kg | | | | | | | | |
| | 8081A | alpha-Chlordane | 1.6 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | beta-BHC | 0.32 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | delta-BHC | -- | | -- | mg/kg | | | | | | | | |
| | 8081A | Dieldrin | 0.030 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | Endosulfan I | 37 | nc | -- | mg/kg | | | | | | | | |
| | 8081A | Endosulfan II | 37 | nc | -- | mg/kg | | | | | | | | |
| | 8081A | Endosulfan sulfate | 37 | nc | -- | mg/kg | | | | | | | | |
| | 8081A | Endrin | 1.8 | nc | -- | mg/kg | | | | | | | | |
| | 8081A | Endrin aldehyde | -- | | -- | mg/kg | | | | | | | | |
| | 8081A | Endrin ketone | -- | | -- | mg/kg | | | | | | | | |
| | 8081A | gamma-BHC | 0.44 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | gamma-Chlordane | 1.6 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | Heptachlor | 0.11 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | Heptachlor epoxide | 0.053 | ca | -- | mg/kg | | | | | | | | |
| | 8081A | Methoxychlor | 31 | nc | -- | mg/kg | | | | | | | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
| | | | | | | Sample Date: | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | |
| | 8081A | Toxaphene | 0.44 | ca | -- | mg/kg | | | | | | | | |
| PCBs | 8082 | Aroclor 1016 | 0.39 | nc | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1221 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1232 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1242 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1248 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1254 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| | 8082 | Aroclor 1260 | 0.22 | ca | -- | mg/kg | | | | | | | | |
| VOCs | 8260B | 1,1,1-Trichloroethane | 1200 | sat | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,1,2,2-Tetrachloroethane | 0.41 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,1,2-Trichloroethane | 0.73 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,1-Dichloroethane | 51 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,1-Dichloroethene | 12 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,2-Dibromoethane | 0.032 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,2-Dichloroethane | 0.28 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 1,2-Dichloroethene (total) | 6.9 | nc | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |
| | 8260B | 1,2-Dichloropropane | 0.34 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | 2-Butanone | 2231 | nc | -- | mg/kg | | | | 0.0085 U | 0.0085 U | 0.0085 U | 0.0085 U | |
| | 8260B | 2-Hexanone | 530 | nc | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |
| | 8260B | 4-Methyl-2-pentanone | 528 | nc | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |
| | 8260B | Acetone | 1412 | nc | -- | mg/kg | | | | 0.0085 U | 0.0085 U | 0.0085 U | 0.0085 U | |
| | 8260B | Benzene | 0.64 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Bromochloromethane | -- | | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Bromodichloromethane | 0.82 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Bromoform | 62 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Bromomethane | 0.39 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Carbon disulfide | 36 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Carbon tetrachloride | 0.25 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Chlorobenzene | 15 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Chloroethane | 3.0 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Chloroform | 0.22 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Chloromethane | 4.7 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | cis-1,2-Dichloroethene | 4.3 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | cis-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Dibromochloromethane | 1.1 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Ethylbenzene | 395 | sat | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | m&p-Xylenes | 27 | nc | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |
| | 8260B | Methylene chloride | 9.1 | ca | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |
| | 8260B | o-Xylene | 27 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Styrene | 1700 | sat | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Tetrachloroethene | 0.48 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Toluene | 520 | sat | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Total Xylenes | 27 | nc | -- | mg/kg | | | | 0.0055 U | 0.0055 U | 0.0055 U | 0.0055 U | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
| | | | | | | Sample Date: | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Surface Soil Background Criteria | Units | | | | | | | | |
| | 8260B | trans-1,2-Dichloroethene | 6.9 | nc | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | trans-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Trichloroethene | 0.053 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| | 8260B | Vinyl chloride | 0.079 | ca | -- | mg/kg | | | | 0.0028 U | 0.0028 U | 0.0028 U | 0.00275 U | |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 6.2 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 1,2-Dichlorobenzene | 600 | sat | -- | mg/kg | | | | | | | | |
| | 8270C | 1,3-Dichlorobenzene | 53 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 1,4-Dichlorobenzene | 3.4 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | 2,2-oxybis (1-chloropropane) | 2.9 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4,5-Trichlorophenol | 611 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4,6-Trichlorophenol | 0.61 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4-Dichlorophenol | 18 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4-Dimethylphenol | 122 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4-Dinitrophenol | 12 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Chloronaphthalene | 494 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Chlorophenol | 6.3 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Methylphenol | 306 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Nitroaniline | 18.3 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 2-Nitrophenol | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | 3,3'-Dichlorobenzidine | 1.1 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | 3-Nitroaniline | 1.8 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 4,6-Dinitro-2-methylphenol | 0.61 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Chloroaniline | 24 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Methylphenol | 31 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Nitroaniline | 23 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | 4-Nitrophenol | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | | | | | | | | |
| | 8270C | Benzoic acid | 100000 | max | -- | mg/kg | | | | | | | | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | | | | | | | | |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | mg/kg | | | | | | | | |
| | 8270C | Bis(2-chloroethyl) ether | 0.22 | ca | -- | mg/kg | | | | | | | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 35 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Butylbenzyl phthalate | 1222 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Carbazole | 24 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Chrysene | 62 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Dibenzofuran | 15 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Diethyl phthalate | 4888 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Dimethyl phthalate | 100000 max | -- | mg/kg | | | | | | | | |
| | 8270C | Di-n-butyl phthalate | 611 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Di-n-octyl phthalate | 244 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Fluoranthene | 229 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Fluorene | 275 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Hexachlorobenzene | 0.30 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Hexachlorobutadiene | 6.2 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Hexachlorocyclopentadiene | 37 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Hexachloroethane | 35 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Isophorone | 512 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Naphthalene | 5.6 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Nitrobenzene | 2 nc | -- | mg/kg | | | | | | | | |
| | 8270C | n-Nitroso-di-n-propylamine | 0.069 ca | -- | mg/kg | | | | | | | | |
| | 8270C | n-Nitrosodiphenylamine | 99 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Pentachlorophenol | 3.0 ca | -- | mg/kg | | | | | | | | |
| | 8270C | Phenanthrene | -- | -- | mg/kg | | | | | | | | |
| | 8270C | Phenol | 1833 nc | -- | mg/kg | | | | | | | | |
| | 8270C | Pyrene | 232 nc | -- | mg/kg | | | | | | | | |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 183 nc | -- | mg/kg | 0.05 U | 0.05 U | 0.048 U | | | | | 0.049 U |
| | 8330 | 1,3-Dinitrobenzene | 0.61 nc | -- | mg/kg | 0.05 U | 0.05 U | 0.048 U | | | | | 0.049 U |
| | 8330 | 2,4,6-TNT | 16 ca | -- | mg/kg | 0.05 U | 0.05 U | 0.048 U | | | | | 0.049 U |
| | 8330 | 2,4-Dinitrotoluene | 12 nc | -- | mg/kg | 0.05 U | 0.05 U | 0.048 U | | | | | 0.049 U |
| | 8330 | 2,6-Dinitrotoluene | 6.1 nc | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | 2-Nitrotoluene | 0.88 ca | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | 3-Nitrotoluene | 73 nc | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | mg/kg | 0.15 U | 0.15 U | 0.145 U | | | | | 0.145 U |
| | 8330 | 4-Nitrotoluene | 12 ca | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | HMX | 306 nc | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | Nitrobenzene | 2 nc | -- | mg/kg | 0.05 U | 0.05 U | 0.048 U | | | | | 0.049 U |
| | 8330 | RDX | 4.4 ca | -- | mg/kg | 0.1 U | 0.1 U | 0.095 U | | | | | 0.1 U |
| | 8330 | Tetryl | 61 nc | -- | mg/kg | 0.2 U | 0.2 U | 0.19 U | | | | | 0.195 U |
| Propellants | 353.2 Modified | Nitrocellulose | -- | -- | mg/kg | | | | | | | | |
| | 8332 | Nitroglycerine | 35 ca | -- | mg/kg | | | | | | | | |
| | SW8330 Modified | Nitroguanidine | 611 nc | -- | mg/kg | | | | | | | | |

**Table L10-6**
**Load Line 10 Summary of All Surface Soil (0-1 ft) Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10ss-034M-SO | L10ss-035M-SO | L10ss-036M-SO | L10ss-037-DUP | L10ss-037-SO | L10ss-038-SO | L10ss-039-SO | L10ss-040M-SO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/17/2004 | 11/18/2004 | 11/17/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 | 11/19/2004 |
| | | | | | 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 |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Surface Soil Background Criteria | Units | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | 0.28 U | 0.21 | 0.29 U | | | | | 0.3 |

Notes:
-- - no background/PRG value is available for this analyte
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, 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
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 L10-7**
**Load Line 10 Summary of All Sediment Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
| | | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Sediment Background Criteria | Units | | | | | | |
| Metals | 6010B | Aluminum | 7614 | nc | 13900 | mg/kg | 5500 | 6300 | 6100 | **14000** | **19000** | **7800** |
| | 6010B | Arsenic | 0.39 | ca | 19.5 | mg/kg | **12** | **20** | **18** | **180** | **270** | **35** |
| | 6010B | Barium | 538 | nc | 123 | mg/kg | 46 | 71 | 50 | **4600** | 190 | 47 |
| | 6010B | Beryllium | 15 | nc | 0.38 | mg/kg | 0.44 | 0.55 | 0.49 | 1.8 | 1.5 | 0.58 |
| | 6010B | Cadmium | 3.7 | nc | 0.00 | mg/kg | 0.16 U | 0.415 U | 0.145 U | 7.1 | **4.7** | 0.24 U |
| | 6010B | Calcium | --[n] | | 5510 | mg/kg | 4200 | 3000 | 2300 | 90000 | 12000 | 1700 |
| | 6010B | Chromium | 30 | ca | 18.1 | mg/kg | 13 | 28 | **54** | **210** | **270** | 19 |
| | 6010B | Cobalt | 30 | ca | 9.1 | mg/kg | 8.8 | 10 | 8.3 | 9.6 | 8.4 | 8.5 |
| | 6010B | Copper | 313 | nc | 27.6 | mg/kg | 23 | 94 | 130 | **470** | **980** | 35 |
| | 6010B | Iron | 2346 | nc | 28200 | mg/kg | **20000** | **71000** | **31000** | **35000** | **49000** | **21000** |
| | 6010B | Lead | 400 | pbk | 27.4 | mg/kg | **640** | 350 | 310 | **23000** | **39000** | 77 |
| | 6010B | Magnesium | --[n] | | 2760 | mg/kg | 1800 | 1600 | 1700 | 6500 | 5900 | 2200 |
| | 6010B | Manganese | 176 | nc | 1950 | mg/kg | **520** | **970** | **520** | **370** | **330** | **240** |
| | 6010B | Nickel | 156 | nc | 17.7 | mg/kg | 17 | 24 | 20 | 41 | 33 | 19 |
| | 6010B | Potassium | --[n] | | 1950 | mg/kg | 760 | 930 | 850 | 1700 | 2600 | 1300 |
| | 6010B | Selenium | 39 | nc | 1.7 | mg/kg | 0.95 U | 1.25 U | 0.85 U | 3.4 | 6.6 | 1.1 |
| | 6010B | Silver | 39 | nc | 0.00 | mg/kg | 0.65 U | 0.85 U | 0.6 U | 1.2 | 1.1 | 0.95 U |
| | 6010B | Sodium | --[n] | | 112 | mg/kg | 200 | 340 | 230 | 1300 | 1050 U | 330 |
| | 6010B | Vanadium | 7.8 | nc | 26.1 | mg/kg | **15** | **28** | **20** | **32** | **34** | **16** |
| | 6010B | Zinc | 2346 | nc | 532 | mg/kg | 99 | 230 | 160 | 2000 | 1600 | 150 |
| | 7041 | Antimony | 3.1 | nc | 0.00 | mg/kg | 1.9 | 1.1 U | 0.8 U | **300** | 3.65 U | 0.9 UJ |
| | 7471A | Mercury | 2.3 | nc | 0.06 | mg/kg | 0.13 | 0.074 | 0.049 | 1.2 | 0.34 | 0.012 U |
| | 7841 | Thallium | 0.52 | nc | 0.89 | mg/kg | 0.355 U | 2.3 U | 0.35 U | 1.35 U | 1.55 U | 0.38 U |
| Pesticides | 8081A | 4,4'-DDD | 2.4 | ca | -- | mg/kg | 0.017 | | | | | |
| | 8081A | 4,4'-DDE | 1.7 | ca | -- | mg/kg | 0.045 | | | | | |
| | 8081A | 4,4'-DDT | 1.7 | ca | -- | mg/kg | 0.055 J | | | | | |
| | 8081A | Aldrin | 0.029 | ca | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | alpha-BHC | 0.09 | sat | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | alpha-Chlordane | 1.6 | ca | -- | mg/kg | 0.0018 J | | | | | |
| | 8081A | beta-BHC | 0.32 | ca | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | delta-BHC | -- | | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Dieldrin | 0.030 | ca | -- | mg/kg | 0.0016 J | | | | | |
| | 8081A | Endosulfan I | 37 | nc | -- | mg/kg | 0.0011 J | | | | | |
| | 8081A | Endosulfan II | 37 | nc | -- | mg/kg | 0.0011 UJ | | | | | |
| | 8081A | Endosulfan sulfate | 37 | nc | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Endrin | 1.8 | nc | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Endrin aldehyde | -- | | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Endrin ketone | -- | | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | gamma-BHC | 0.44 | ca | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | gamma-Chlordane | 1.6 | ca | -- | mg/kg | 0.0053 | | | | | |
| | 8081A | Heptachlor | 0.11 | ca | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Heptachlor epoxide | 0.053 | ca | -- | mg/kg | 0.0011 U | | | | | |
| | 8081A | Methoxychlor | 31 | nc | -- | mg/kg | 0.0055 U | | | | | |

**Table L10-7**
**Load Line 10 Summary of All Sediment Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
| | | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Sediment Background Criteria | Units | | | | | | |
| | 8081A | Toxaphene | 0.44 | ca | -- | mg/kg | 0.0105 UJ | | | | | |
| PCBs | 8082 | Aroclor 1016 | 0.39 | nc | -- | mg/kg | 0.0215 U | | | | | |
| | 8082 | Aroclor 1221 | 0.22 | ca | -- | mg/kg | 0.0215 U | | | | | |
| | 8082 | Aroclor 1232 | 0.22 | ca | -- | mg/kg | 0.011 U | | | | | |
| | 8082 | Aroclor 1242 | 0.22 | ca | -- | mg/kg | 0.0215 U | | | | | |
| | 8082 | Aroclor 1248 | 0.22 | ca | -- | mg/kg | 0.011 U | | | | | |
| | 8082 | Aroclor 1254 | 0.22 | ca | -- | mg/kg | 0.0215 U | | | | | |
| | 8082 | Aroclor 1260 | 0.22 | ca | -- | mg/kg | 0.0215 U | | | | | |
| VOCs | 8260B | 1,1,1-Trichloroethane | 1200 | sat | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,1,2,2-Tetrachloroethane | 0.41 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,1,2-Trichloroethane | 0.73 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,1-Dichloroethane | 51 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,1-Dichloroethene | 12 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,2-Dibromoethane | 0.032 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,2-Dichloroethane | 0.28 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 1,2-Dichloroethene (total) | 6.9 | nc | -- | mg/kg | 0.0065 U | | | | 0.375 U | |
| | 8260B | 1,2-Dichloropropane | 0.34 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | 2-Butanone | 2231 | nc | -- | mg/kg | 0.0095 U | | | | 0.55 U | |
| | 8260B | 2-Hexanone | 530 | nc | -- | mg/kg | 0.0065 U | | | | 0.375 U | |
| | 8260B | 4-Methyl-2-pentanone | 528 | nc | -- | mg/kg | 0.0065 U | | | | 0.375 U | |
| | 8260B | Acetone | 1412 | nc | -- | mg/kg | 0.0095 U | | | | 0.55 U | |
| | 8260B | Benzene | 0.64 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Bromochloromethane | -- | | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Bromodichloromethane | 0.82 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Bromoform | 62 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Bromomethane | 0.39 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Carbon disulfide | 36 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Carbon tetrachloride | 0.25 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Chlorobenzene | 15 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Chloroethane | 3.0 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Chloroform | 0.22 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Chloromethane | 4.7 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | cis-1,2-Dichloroethene | 4.3 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | cis-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Dibromochloromethane | 1.1 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Ethylbenzene | 395 | sat | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | m&p-Xylenes | 27 | nc | -- | mg/kg | 0.0065 U | | | | 0.375 U | |
| | 8260B | Methylene chloride | 9.1 | ca | -- | mg/kg | 0.0065 U | | | | 0.375 U | |
| | 8260B | o-Xylene | 27 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Styrene | 1700 | sat | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Tetrachloroethene | 0.48 | ca | -- | mg/kg | 0.00325 UJ | | | | 0.19 U | |
| | 8260B | Toluene | 520 | sat | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Total Xylenes | 27 | nc | -- | mg/kg | 0.0065 U | | | | 0.375 U | |

**Table L10-7**
**Load Line 10 Summary of All Sediment Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Sample ID: | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
| | | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | | Sediment Background Criteria | Units | | | | | | |
| | 8260B | trans-1,2-Dichloroethene | 6.9 | nc | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | trans-1,3-Dichloropropene | 0.78 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Trichloroethene | 0.053 | ca | -- | mg/kg | 0.00325 U | | | | 0.19 U | |
| | 8260B | Vinyl chloride | 0.079 | ca | -- | mg/kg | 0.00325 UJ | | | | 0.19 U | |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 6.2 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 1,2-Dichlorobenzene | 600 | sat | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 1,3-Dichlorobenzene | 53 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 1,4-Dichlorobenzene | 3.4 | ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2,2-oxybis (1-chloropropane) | 2.9 | ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2,4,5-Trichlorophenol | 611 | nc | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | 2,4,6-Trichlorophenol | 0.61 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2,4-Dichlorophenol | 18 | nc | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | 2,4-Dimethylphenol | 122 | nc | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | 2,4-Dinitrophenol | 12 | nc | -- | mg/kg | - R | | | | - R | |
| | 8270C | 2,4-Dinitrotoluene | 12 | nc | -- | mg/kg | 0.0205 U | | | | 0.125 U | |
| | 8270C | 2,6-Dinitrotoluene | 6.1 | nc | -- | mg/kg | 0.0205 U | | | | 0.125 U | |
| | 8270C | 2-Chloronaphthalene | 494 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2-Chlorophenol | 6.3 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2-Methylnaphthalene | -- | | -- | mg/kg | 0.0205 U | | | | 28 | |
| | 8270C | 2-Methylphenol | 306 | nc | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | 2-Nitroaniline | 18.3 | nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 2-Nitrophenol | -- | | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | 3,3'-Dichlorobenzidine | 1.1 | ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 3-Nitroaniline | 1.8 | nc | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | 4,6-Dinitro-2-methylphenol | 0.61 | nc | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | 4-Chloroaniline | 24 | nc | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | 4-Methylphenol | 31 | nc | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | 4-Nitroaniline | 23 | ca | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | 4-Nitrophenol | -- | | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | Acenaphthene | 368 | nc | -- | mg/kg | 0.0205 U | | | | 39 | |
| | 8270C | Acenaphthylene | -- | | -- | mg/kg | 0.0205 U | | | | 0.74 | |
| | 8270C | Anthracene | 2189 | nc | -- | mg/kg | 0.0205 U | | | | 27 | |
| | 8270C | Benzo(a)anthracene | 0.62 | ca | -- | mg/kg | 0.031 J | | | | **25** | |
| | 8270C | Benzo(a)pyrene | 0.062 | ca | -- | mg/kg | 0.048 | | | | **11** | |
| | 8270C | Benzo(b)fluoranthene | 0.62 | ca | -- | mg/kg | 0.091 | | | | **18** | |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | mg/kg | 0.068 | | | | 4.2 | |
| | 8270C | Benzo(k)fluoranthene | 6.2 | ca | -- | mg/kg | 0.04 J | | | | **11** | |
| | 8270C | Benzoic acid | 100000 | max | -- | mg/kg | - R | | | | 2.5 U | |
| | 8270C | Benzyl alcohol | 1833 | nc | -- | mg/kg | 0.415 U | | | | 2.5 U | |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | Bis(2-chloroethyl) ether | 0.22 | ca | -- | mg/kg | 0.0415 U | | | | 0.25 U | |

**Table L10-7**
**Load Line 10 Summary of All Sediment Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Sediment Background Criteria | Units | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 35 ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Butylbenzyl phthalate | 1222 nc | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | Carbazole | 24 ca | -- | mg/kg | 0.105 U | | | | 9.6 | |
| | 8270C | Chrysene | 62 ca | -- | mg/kg | 0.042 | | | | 24 | |
| | 8270C | Dibenzo(a,h)anthracene | 0.062 ca | -- | mg/kg | 0.0205 U | | | | **2.4** | |
| | 8270C | Dibenzofuran | 15 nc | -- | mg/kg | 0.0415 U | | | | **37** | |
| | 8270C | Diethyl phthalate | 4888 nc | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | Dimethyl phthalate | 100000 max | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | Di-n-butyl phthalate | 611 nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Di-n-octyl phthalate | 244 nc | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | Fluoranthene | 229 nc | -- | mg/kg | 0.045 | | | | 74 | |
| | 8270C | Fluorene | 275 nc | -- | mg/kg | 0.0205 U | | | | 44 | |
| | 8270C | Hexachlorobenzene | 0.30 ca | -- | mg/kg | 0.0205 U | | | | 0.125 U | |
| | 8270C | Hexachlorobutadiene | 6.2 ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Hexachlorocyclopentadiene | 37 nc | -- | mg/kg | 0.6 U | | | | 3.75 U | |
| | 8270C | Hexachloroethane | 35 ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.62 ca | -- | mg/kg | 0.054 | | | | **4.9** | |
| | 8270C | Isophorone | 512 ca | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Naphthalene | 5.6 nc | -- | mg/kg | 0.0205 U | | | | **18** | |
| | 8270C | Nitrobenzene | 2 nc | -- | mg/kg | 0.0205 U | | | | 0.125 U | |
| | 8270C | n-Nitroso-di-n-propylamine | 0.069 ca | -- | mg/kg | 0.0415 U | | | | 0.25 U | |
| | 8270C | n-Nitrosodiphenylamine | 99 ca | -- | mg/kg | 0.0205 U | | | | 0.125 U | |
| | 8270C | Pentachlorophenol | 3.0 ca | -- | mg/kg | 0.205 U | | | | 1.25 U | |
| | 8270C | Phenanthrene | -- | -- | mg/kg | 0.031 U | | | | 130 | |
| | 8270C | Phenol | 1833 nc | -- | mg/kg | 0.105 U | | | | 0.6 U | |
| | 8270C | Pyrene | 232 nc | -- | mg/kg | 0.027 J | | | | 51 | |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 183 nc | -- | mg/kg | 0.0495 U | 0.5 U | 0.245 U | 0.0495 U | 0.1 U | 0.05 U |
| | 8330 | 1,3-Dinitrobenzene | 0.61 nc | -- | mg/kg | 0.0495 U | 0.5 U | 0.245 U | 0.0495 U | 0.1 U | 0.05 U |
| | 8330 | 2,4,6-TNT | 16 ca | -- | mg/kg | 0.0495 U | 0.5 U | 0.245 U | 0.0495 U | 0.1 U | 0.05 U |
| | 8330 | 2,4-Dinitrotoluene | 12 nc | -- | mg/kg | 0.0495 U | 0.5 U | 0.245 U | 0.0495 U | 0.1 U | 0.05 U |
| | 8330 | 2,6-Dinitrotoluene | 6.1 nc | -- | mg/kg | 0.1 U | 1 U | 4.7 | 0.1 U | **11** | 0.1 U |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.054 J | 1.7 | 0.1 U |
| | 8330 | 2-Nitrotoluene | 0.88 ca | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.1 U | 0.195 U | 0.1 U |
| | 8330 | 3-Nitrotoluene | 73 nc | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.1 U | 0.195 U | 0.1 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | mg/kg | 0.15 U | 1.5 U | 0.75 U | 0.15 U | 0.86 | 0.15 U |
| | 8330 | 4-Nitrotoluene | 12 ca | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.1 U | 0.195 U | 0.1 U |
| | 8330 | HMX | 306 nc | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.1 U | 0.195 U | 0.1 U |
| | 8330 | Nitrobenzene | 2 nc | -- | mg/kg | 0.0495 U | 0.5 U | 0.245 U | 0.0495 U | 0.1 U | 0.05 U |
| | 8330 | RDX | 4.4 ca | -- | mg/kg | 0.1 U | 1 U | 0.49 U | 0.1 U | 0.195 U | 0.1 U |
| | 8330 | Tetryl | 61 nc | -- | mg/kg | 0.2 U | 2 U | 0.87 J | 0.2 U | 0.395 U | 0.2 U |

**Table L10-7**
**Load Line 10 Summary of All Sediment Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sd-004-SD | L10sd-005-SD | L10sd-006-SD | L10sd-012-SD | L10sd-022-SD | L10sd-024-SD |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/14/2004 | 12/14/2004 | 12/15/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 |
| | | | | | Sample Depth: | 9.83 ft | 6.5 ft | 7.09 ft | 5 ft | 6 ft | 4.5 ft |
| Group | Method | Parameter | Region 9 PRG (Res Soil) | Sediment Background Criteria | Units | | | | | | |
| Propellants | 353.2 Modified | Nitrocellulose | -- | -- | mg/kg | 0.55 U | | | | | |
| | 8332 | Nitroglycerine | 35 ca | -- | mg/kg | 0.25 U | | | | | |
| | SW8330 Modified | Nitroguanidine | 611 nc | -- | mg/kg | 0.056 J | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 122 nc | 0.00 | mg/kg | 0.415 U | 0.325 U | 0.325 U | 2.3 U | 2.15 U | 0.5 U |

Notes:
-- - no background/PRG value is available for this analyte
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, 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
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 L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 |
| | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | | | | | | |
| Metals | 6010B | Aluminum | 36499 nc | 3370 | ug/l | 460 | 390 | 430 | 470 | 360 | 380 | 300 | 12000 | 4900 | 3600 | 75 U | 43 | 410 |
| | 6010B | Barium | 2555 nc | 47.5 | ug/l | 18 | 17 | 22 | 19 | 20 | 19 | 19 | 270 | 190 | 160 | 40 | 64 | 22 |
| | 6010B | Beryllium | 73 nc | 0.00 | ug/l | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.1 | 0.6 | 0.28 | 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 | 0.91 | 6.1 | 4.7 | 0.25 | 0.59 | 0.5 |
| | 6010B | Calcium | --[n] | 41400 | ug/l | 28000 | 27000 | 29000 | 24000 | 25000 | 28000 | 31000 | 52000 | 50000 | 74000 | 25000 | 18000 | 10000 |
| | 6010B | Chromium | 109 nc | 0.00 | ug/l | 1.2 | 5 U | 5 U | 1.1 | 5 U | 5 U | 5 U | **200** | **130** | 71 | 4.7 | 9.4 | 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 | 4 | 1.6 | 2.7 | 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 | 400 | 300 | 400 | 5 | 51 | 6.8 |
| | 6010B | Iron | 10950 nc | 2560 | ug/l | 590 | 560 | 560 | 490 | 440 | 470 | 400 | **14000** | 8600 | 9400 | 300 | 410 | 930 |
| | 6010B | Lead | 15 mcl | 0.00 | ug/l | | | | | | | | **10000** | **13000** | **14000** | **220** | | **2900** |
| | 6010B | Magnesium | --[n] | 10800 | ug/l | 4900 | 4700 | 5000 | 4800 | 4600 | 5000 | 5400 | 8300 | 5100 | 6700 | 2300 | 1400 | 1400 |
| | 6010B | Manganese | 876 nc | 391 | ug/l | 13 | 13 | 18 | 4 | 11 | 10 | 7.7 | 120 | 100 | 210 | 56 | 49 | 48 |
| | 6010B | Nickel | 730 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 29 | 18 | 50 | 5 U | 5 U | 5 U |
| | 6010B | Potassium | --[n] | 3170 | ug/l | 1400 | 1400 | 1200 | 1100 | 1200 | 1100 | 1100 | 5800 | 5400 | 6800 | 7400 | 11000 | 8500 |
| | 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 | 3 | 7.5 U | 3.2 | 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 | 5 U | 5 U | 5 U | 1 | 5 U | 5 U |
| | 6010B | Sodium | --[n] | 21300 | ug/l | 930 | 880 | 1200 | 1600 | 1600 | 1500 | 1500 | 1400 | 1700 | 1700 | 2100 | 600 | 910 |
| | 6010B | Vanadium | 36 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 1.1 | 5 U | 5 U | 24 | 13 | 6.2 | 5 U | 5 U | 5 U |
| | 6010B | Zinc | 10950 nc | 42 | ug/l | 3.65 U | 3.2 U | 3 U | 4.3 U | 2.85 U | 2.95 U | 2.25 U | 500 | 800 | 700 | 31 | 67 | 47 |
| | 7041 | Antimony | 15 nc | 0.00 | ug/l | 3.2 | 4 | 4 | 3.75 U | 2.5 | 3.75 U | 3.75 U | **53** | **110** | **110** | **49** | **880** | 3.75 U |
| | 7060A | Arsenic | 0.045 ca | 3.2 | ug/l | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | **89** | **140** | **770** | **40** | **160** | **1.5** |
| | 7421 | Lead | 15 mcl | 0.00 | ug/l | 2.2 | 2.2 | 9.7 | 1.1 | 5.1 | 4.3 | 4.4 | | | | | **1300** | |
| | 7470A | Mercury | 11 nc | 0.00 | ug/l | 0.1 U | 0.1 UJ | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.77 | 0.25 | 0.58 | 0.1 U | 0.1 U | 0.1 U |
| | 7841 | Thallium | 2.4 nc | 0.00 | ug/l | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 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 | 0.05 UJ | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.055 U | 0.05 U | 0.055 U | 0.055 U | 0.055 U |
| | 8081A | 4,4'-DDE | 0.20 ca | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | 4,4'-DDT | 0.20 ca | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Aldrin | 0.0040 ca | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | alpha-BHC | 0.011 nc | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | alpha-Chlordane | 0.19 ca | -- | ug/l | 0.024 U | 0.024 U | 0.024 U | 0.024 UJ | 0.024 U | 0.0235 U | 0.024 U | 0.0235 U | 0.0245 U | 0.0235 U | 0.0245 U | 0.024 U | 0.0245 U |
| | 8081A | beta-BHC | 0.037 ca | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | delta-BHC | -- | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | Dieldrin | 0.0042 ca | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | Endosulfan I | 220 nc | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | Endosulfan II | 220 nc | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Endosulfan sulfate | 220 nc | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Endrin | 11 nc | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | Endrin aldehyde | -- | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Endrin ketone | -- | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | gamma-BHC | 0.052 ca | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | gamma-Chlordane | 0.19 ca | -- | ug/l | 0.048 U | 0.048 U | 0.048 U | 0.0475 UJ | 0.0475 U | 0.047 U | 0.0475 U | 0.0465 U | 0.049 U | 0.0465 U | 0.049 U | 0.048 U | 0.0485 U |
| | 8081A | Heptachlor | 0.015 ca | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Heptachlor epoxide | 0.0074 ca | -- | ug/l | 0.07 U | 0.07 U | 0.07 U | 0.07 UJ | 0.07 U | 0.07 U | 0.07 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U | 0.075 U |
| | 8081A | Methoxychlor | 182 nc | -- | ug/l | 0.29 U | 0.29 U | 0.29 U | 0.285 UJ | 0.285 U | 0.285 U | 0.285 U | 0.28 U | 0.295 U | 0.28 U | 0.295 U | 0.29 U | 0.29 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 |
| | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | | | | | | |
| | 8081A | Toxaphene | 0.061 ca | -- | ug/l | 0.24 U | 0.24 U | 0.24 U | 0.24 UJ | 0.24 U | 0.235 U | 0.24 U | 0.235 U | 0.245 U | 0.235 U | 0.245 U | 0.24 U | 0.245 U |
| PCBs | 8082 | Aroclor 1016 | 0.96 ca | -- | ug/l | 0.29 U | 0.29 U | 0.29 U | 0.285 U | 0.285 U | 0.285 U | 0.285 U | 0.28 U | 0.295 U | 0.28 U | 0.295 U | 0.29 U | 0.29 U |
| | 8082 | Aroclor 1221 | 0.034 ca | -- | ug/l | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U |
| | 8082 | Aroclor 1232 | 0.034 ca | -- | ug/l | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U |
| | 8082 | Aroclor 1242 | 0.034 ca | -- | ug/l | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U |
| | 8082 | Aroclor 1248 | 0.034 ca | -- | ug/l | 0.7 U | 0.7 U | 0.7 U | 0.7 U | 0.7 U | 0.7 U | 0.7 U | 0.7 U | 0.75 U | 0.7 U | 0.75 U | 0.7 U | 0.75 U |
| | 8082 | Aroclor 1254 | 0.034 ca | -- | ug/l | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U | 0.65 U |
| | 8082 | Aroclor 1260 | 0.034 ca | -- | ug/l | 0.29 U | 0.29 U | 0.29 U | 0.285 U | 0.285 U | 0.285 U | 0.285 U | 0.28 U | 0.295 U | 0.28 U | 0.295 U | 0.29 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 | 0.5 U | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ |
| | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW |
| | | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 |
| | | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | | Surface Water Background Criteria | Units | | | | | | | | | | | | | |
| | 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 | 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 | 0.5 U | 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 | 0.5 U | 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 | 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 | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 1,2-Dichlorobenzene | 370 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 1,3-Dichlorobenzene | 182 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 1,4-Dichlorobenzene | 0.50 | ca | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 2,2-oxybis (1-chloropropane) | 0.27 | ca | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 2,4,5-Trichlorophenol | 3650 | nc | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 2,4,6-Trichlorophenol | 3.6 | nc | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 2,4-Dichlorophenol | 109 | nc | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 2,4-Dimethylphenol | 730 | nc | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 2,4-Dinitrophenol | 73 | nc | -- | ug/l | 10 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 10 U | 10 U | 9.5 U | 10 U | 10 U | 9.5 U |
| | 8270C | 2,4-Dinitrotoluene | 73 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.485 U |
| | 8270C | 2,6-Dinitrotoluene | 36 | nc | -- | ug/l | 0.245 U | 0.245 U | 0.24 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.235 U | 0.245 U | 0.245 U | 0.245 U |
| | 8270C | 2-Chloronaphthalene | 487 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 2-Chlorophenol | 30 | nc | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 2-Methylnaphthalene | -- | | -- | ug/l | 0.245 U | 0.245 U | 0.24 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.235 U | 0.245 U | 0.245 U | 0.245 U |
| | 8270C | 2-Methylphenol | 1825 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 2-Nitroaniline | 109 | nc | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 2-Nitrophenol | -- | | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 3,3'-Dichlorobenzidine | 0.15 | ca | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 3-Nitroaniline | 3.2 | ca | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 4,6-Dinitro-2-methylphenol | 3.6 | nc | -- | ug/l | 10 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 10 U | 10 U | 9.5 U | 10 U | 10 U | 9.5 U |
| | 8270C | 4-Bromophenyl phenyl ether | -- | | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 4-Chloro-3-methylphenol | -- | | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 4-Chloroaniline | 146 | nc | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | 4-Methylphenol | 182 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | 4-Nitroaniline | 3.2 | ca | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | 4-Nitrophenol | -- | | -- | ug/l | 10 U | 9.5 UJ | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 10 U | 10 U | 9.5 U | 10 U | 10 U | 9.5 U |
| | 8270C | Acenaphthene | 365 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.61 J |
| | 8270C | Acenaphthylene | -- | | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.94 J |
| | 8270C | Anthracene | 1825 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 2.7 |
| | 8270C | Benzo(a)anthracene | 0.092 | ca | -- | ug/l | 0.1 U | 0.095 U | 0.095 U | **0.4** | 0.095 U | 0.095 U | 0.095 U | **0.17 J** | **0.41** | 0.095 U | 0.1 U | 0.1 U | **5.3** |
| | 8270C | Benzo(a)pyrene | 0.0092 | ca | -- | ug/l | 0.195 U | 0.195 U | 0.19 U | **0.45** | 0.195 U | 0.195 U | 0.195 U | **0.28 J** | **0.91** | **0.1 J** | 0.195 U | 0.195 U | **3.5** |
| | 8270C | Benzo(b)fluoranthene | 0.092 | ca | -- | ug/l | 0.195 U | 0.195 U | 0.19 U | **0.64** | 0.195 U | 0.195 U | 0.195 U | **0.32 J** | **1.1** | **0.11 J** | 0.195 U | 0.195 U | **16** |
| | 8270C | Benzo(g,h,i)perylene | -- | | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.38 J | 0.485 U | 0.485 U | 0.485 U | 0.36 J | 0.87 J | 0.19 J | 0.49 U | 0.49 U | 3.7 |
| | 8270C | Benzo(k)fluoranthene | 0.92 | ca | -- | ug/l | 0.195 U | 0.195 U | 0.19 U | 0.25 J | 0.195 U | 0.195 U | 0.195 U | 0.2 J | 0.4 | 0.19 U | 0.195 U | 0.195 U | **5.7** |
| | 8270C | Benzoic acid | 145979 | nc | -- | ug/l | 10 U | 9.5 UJ | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 10 U | 10 U | 9.5 U | 10 U | 10 U | 9.5 U |
| | 8270C | Benzyl alcohol | 10950 | nc | -- | ug/l | 10 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 10 U | 10 U | 9.5 U | 10 U | 10 U | 9.5 U |
| | 8270C | Bis(2-chloroethoxy)methane | -- | | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | Bis(2-chloroethyl) ether | 0.010 | ca | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW |
| | | | | | Sample Date: | | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 |
| | | | | | Sample Depth: | | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | | Surface Water Background Criteria | Units | | | | | | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 4.8 | ca | -- | ug/l | 7.5 U | 7.5 U | 7 U | 7.5 U | 7.5 U | 7.5 U | 7.5 U | **5.8 J** | **19** | 7 U | 7.5 U | **27** | 7.5 U |
| | 8270C | Butylbenzyl phthalate | 7300 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | Carbazole | 3.4 | ca | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 3.4 J |
| | 8270C | Chrysene | 9.2 | ca | -- | ug/l | 0.245 U | 0.245 U | 0.24 U | 0.48 J | 0.245 U | 0.245 U | 0.245 U | 0.22 J | 1.1 | 0.1 J | 0.245 U | 0.245 U | **25** |
| | 8270C | Dibenzo(a,h)anthracene | 0.0092 | ca | -- | ug/l | 0.195 U | 0.195 U | 0.19 U | 0.195 U | 0.195 U | 0.195 U | 0.195 U | **0.21 J** | **0.31 J** | **0.13 J** | 0.195 U | 0.195 U | **0.82** |
| | 8270C | Dibenzofuran | 12 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.49 J |
| | 8270C | Diethyl phthalate | 29199 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | Dimethyl phthalate | 364867 | nc | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | Di-n-butyl phthalate | 3650 | nc | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 3 J | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | Di-n-octyl phthalate | 1460 | nc | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | 4.85 U |
| | 8270C | Fluoranthene | 1460 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.83 J | 0.485 U | 0.485 U | 0.485 U | 0.37 J | 0.72 J | 0.13 J | 0.49 U | 0.49 U | 59 |
| | 8270C | Fluorene | 243 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.63 J |
| | 8270C | Hexachlorobenzene | 0.042 | ca | -- | ug/l | 0.245 U | 0.245 U | 0.24 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.235 U | 0.245 U | 0.245 U | 0.245 U |
| | 8270C | Hexachlorobutadiene | 0.86 | ca | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | Hexachlorocyclopentadiene | 219 | nc | -- | ug/l | 10 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | 9.5 U | - R | - R | - R | - R | - R | - R |
| | 8270C | Hexachloroethane | 4.8 | ca | -- | ug/l | 2.45 U | 2.45 U | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 UJ | 2.45 UJ | 2.35 UJ | 2.45 UJ | 2.45 U | 2.45 UJ |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.092 | ca | -- | ug/l | 0.195 U | 0.195 U | 0.19 U | **0.32 J** | 0.195 U | 0.195 U | 0.195 U | **0.36 J** | **0.98** | **0.14 J** | 0.195 U | 0.195 U | **3.8** |
| | 8270C | Isophorone | 71 | ca | -- | ug/l | 1 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 0.95 U | 1 U | 1 U | 0.95 U | 1 U | 1 U | 0.95 U |
| | 8270C | Naphthalene | 6.2 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.485 U |
| | 8270C | Nitrobenzene | 3.4 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.49 U | 0.47 U | 0.49 U | 0.49 U | 0.485 U |
| | 8270C | n-Nitroso-di-n-propylamine | 0.0096 | ca | -- | ug/l | 0.245 U | 0.245 U | 0.24 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.245 U | 0.235 U | 0.245 U | 0.245 U | 0.245 U |
| | 8270C | n-Nitrosodiphenylamine | 14 | ca | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.485 U | 0.485 U | 0.485 U | 0.485 U | 0.49 U | 0.21 J | 0.47 U | 0.49 U | 0.49 U | 0.485 U |
| | 8270C | Pentachlorophenol | 0.56 | ca | -- | ug/l | 4.9 U | 4.85 U | 4.8 U | 4.85 U | 4.85 U | 4.85 U | 4.85 U | 4.9 U | 4.9 U | 4.7 U | 4.9 U | 4.9 U | **4.8 J** |
| | 8270C | Phenanthrene | -- | | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.41 J | 0.485 U | 0.485 U | 0.485 U | 0.15 J | 0.31 J | 0.47 U | 0.49 U | 0.49 U | 12 |
| | 8270C | Phenol | 10950 | nc | -- | ug/l | 2.45 U | 2.45 UJ | 2.4 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U | 2.45 U | 2.45 U | 2.45 U |
| | 8270C | Pyrene | 182 | nc | -- | ug/l | 0.49 U | 0.485 U | 0.48 U | 0.64 J | 0.485 U | 0.485 U | 0.485 U | 0.29 J | 0.91 J | 0.15 J | 0.49 U | 0.49 U | 46 |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 1095 | nc | -- | ug/l | 0.14 U | 0.11 U | 0.1 U | 0.1 U | 0.125 U | 0.125 U | 0.15 U | 0.105 U | 0.16 U | 0.18 U | 0.1 U | 0.12 U | 0.19 J |
| | 8330 | 1,3-Dinitrobenzene | 3.6 | nc | -- | ug/l | 0.14 U | 0.11 U | 0.1 U | 0.1 U | 0.125 U | 0.125 U | 0.15 U | 0.105 U | 0.16 U | 0.18 U | 0.1 U | 0.12 U | 0.13 U |
| | 8330 | 2,4,6-TNT | 2.2 | ca | -- | ug/l | 0.175 U | 0.135 U | 0.125 U | 0.125 U | 0.155 U | 0.155 U | 0.185 U | 0.13 U | 0.2 U | 0.225 U | 0.125 U | 0.29 J | 0.165 U |
| | 8330 | 2,4-Dinitrotoluene | 73 | nc | -- | ug/l | 0.255 U | 0.195 U | 0.18 U | 0.18 U | 0.22 U | 0.22 U | 0.265 U | 0.185 U | 0.29 U | 0.325 U | 0.18 U | 0.22 U | 0.235 U |
| | 8330 | 2,6-Dinitrotoluene | 36 | nc | -- | ug/l | 0.305 U | 0.235 U | 0.215 U | 0.215 U | 0.265 U | 0.265 U | 0.32 U | 0.22 U | 0.35 U | 0.39 U | 0.215 U | 0.26 U | 0.37 J |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | | -- | ug/l | 0.255 U | 0.195 U | 0.18 U | 0.18 U | 0.22 U | 0.22 U | 0.265 U | 0.185 U | 0.29 U | 0.325 U | 0.18 U | 0.23 J | 0.235 U |
| | 8330 | 2-Nitrotoluene | 0.049 | ca | -- | ug/l | 0.22 U | 0.17 U | 0.155 U | 0.155 U | 0.19 U | 0.19 U | 0.23 U | 0.16 U | 0.25 U | 0.28 U | 0.155 U | 0.19 U | 0.205 U |
| | 8330 | 3-Nitrotoluene | 122 | nc | -- | ug/l | 0.22 U | 0.17 U | 0.155 U | 0.155 U | 0.19 U | 0.19 U | 0.23 U | 0.16 U | 0.25 U | 0.28 U | 0.155 U | 0.19 U | 0.205 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | | -- | ug/l | 0.235 U | 0.18 U | 0.165 U | 0.165 U | 0.205 U | 0.205 U | 0.245 U | 0.17 U | 0.265 U | 0.32 J | 0.165 U | 0.46 | 0.215 U |
| | 8330 | 4-Nitrotoluene | 0.66 | ca | -- | ug/l | 0.22 U | 0.17 U | 0.155 U | 0.155 U | 0.19 U | 0.19 U | 0.23 U | 0.16 U | 0.25 U | 0.28 U | 0.155 U | 0.19 U | 0.205 U |
| | 8330 | HMX | 1825 | nc | -- | ug/l | 0.22 U | 0.17 U | 0.155 U | 0.155 U | 0.19 U | 0.19 U | 0.23 U | 0.16 U | 0.25 U | 0.28 U | 0.155 U | 0.19 U | 0.205 U |
| | 8330 | Nitrobenzene | 3.4 | nc | -- | ug/l | 0.115 U | 0.085 U | 0.08 U | 0.08 U | 0.1 U | 0.1 U | 0.12 U | 0.085 U | 0.13 U | 0.145 U | 0.08 U | 0.095 U | 0.105 U |
| | 8330 | RDX | 0.61 | ca | -- | ug/l | 0.14 U | 0.11 U | 0.1 U | 0.1 U | 0.125 U | 0.125 U | 0.15 U | 0.105 U | 0.16 U | 0.18 U | 0.1 U | 0.12 U | 0.13 U |
| | 8330 | Tetryl | 365 | nc | -- | ug/l | 0.55 U | 0.425 U | 0.39 U | 0.39 U | 0.48 U | 0.48 U | 0.6 U | 0.405 U | 0.65 U | 0.7 U | 0.39 U | 0.475 U | 0.5 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-002-DUP | L10sw-002-SW | L10sw-004-SW | L10sw-006-SW | L10sw-007-SW | L10sw-008-SW | L10sw-009-SW | L10sw-011-SW | L10sw-012-SW | L10sw-014-SW | L10sw-015-SW | L10sw-016-SW | L10sw-017-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 12/15/2004 | 12/15/2004 | 12/14/2004 | 12/15/2004 | 12/14/2004 | 12/14/2004 | 12/14/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 11/23/2004 | 12/1/2004 | 11/23/2004 |
| | | | | | Sample Depth: | 9.07 ft | 9.07 ft | 9.10 ft | 7.09 ft | 6.04 ft | 10.04 ft | 13 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3.5 ft | 4 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | | | | | | |
| Propellants | 353.2 Modified | Nitrocellulose | -- | -- | ug/l | | | | | 250 U | | | | | | | 250 U | |
| | 8332 | Nitroglycerine | 4.8 ca | -- | ug/l | | | | | 0.6 U | | | | | | | 0.21 J | |
| | SW8330 Modified | Nitroguanidine | 3650 nc | -- | ug/l | | | | | 10 U | | | | | | | 10 U | |
| Other Analytes | 9014 | Cyanide, Total | 730 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

Notes:
-- - no background/PRG value is available for this analyte
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 L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L10sw-018-SW | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
| | | | | | Sample Date: | 11/23/2004 | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | |
| Metals | 6010B | Aluminum | 36499 nc | 3370 | ug/l | 48 | 42 | 75 | 75 U | 340 | 75 U | 170 | 75 U |
| | 6010B | Barium | 2555 nc | 47.5 | ug/l | 22 | 21 | 18 | 18 | 14 | 30 | 38 | 24 |
| | 6010B | Beryllium | 73 nc | 0.00 | ug/l | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| | 6010B | Cadmium | 18 nc | 0.00 | ug/l | 1 U | 0.41 | 0.47 | 0.41 | 2.5 | 1 U | 1 U | 0.37 |
| | 6010B | Calcium | --[n] | 41400 | ug/l | 13000 | 9800 | 10000 | 14000 | 12000 | 31000 | 48000 | 46000 |
| | 6010B | Chromium | 109 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 3.3 | 35 | 15 | 16 | 2.5 |
| | 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 | 2.5 U |
| | 6010B | Copper | 1460 nc | 7.9 | ug/l | 5 | 5.2 | 5 | 7.2 | 13 | 4.9 | 35 | 3.8 |
| | 6010B | Iron | 10950 nc | 2560 | ug/l | 320 | 450 | 480 | 280 | 1800 | 1000 | 870 | 100 |
| | 6010B | Lead | 15 mcl | 0.00 | ug/l | **1800** | | | **600** | **3500** | | | |
| | 6010B | Magnesium | --[n] | 10800 | ug/l | 690 | 930 | 950 | 910 | 1000 | 3500 | 1000 | 8000 |
| | 6010B | Manganese | 876 nc | 391 | ug/l | 38 | 23 | 26 | 91 | 110 | 41 | 24 | 1.1 |
| | 6010B | Nickel | 730 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| | 6010B | Potassium | --[n] | 3170 | ug/l | 9400 | 8300 | 8400 | 4500 | 10000 | 8200 | 3500 | 15000 |
| | 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 | 7.5 U |
| | 6010B | Silver | 182 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 0.78 | 5 U | 5 U |
| | 6010B | Sodium | --[n] | 21300 | ug/l | 610 | 930 | 840 | 690 | 2000 | 2500 | 1200 | 5900 |
| | 6010B | Vanadium | 36 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| | 6010B | Zinc | 10950 nc | 42 | ug/l | 38 | 17 | 20 | 22 | 850 | 66 | 20 | 39 |
| | 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 | 5.6 |
| | 7060A | Arsenic | 0.045 ca | 3.2 | ug/l | **0.88** | **1.2** | 1 U | **60** | **120** | **38** | **220** | 1 U |
| | 7421 | Lead | 15 mcl | 0.00 | ug/l | | **1100** | **1200** | | | **250** | **20** | 2.4 |
| | 7470A | Mercury | 11 nc | 0.00 | ug/l | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 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 | 2 U | 2 U | 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 | 0.05 U | 0.055 U | 0.05 U |
| | 8081A | 4,4'-DDE | 0.20 ca | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | 4,4'-DDT | 0.20 ca | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Aldrin | 0.0040 ca | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | alpha-BHC | 0.011 nc | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | alpha-Chlordane | 0.19 ca | -- | ug/l | 0.0245 U | 0.025 U | 0.025 U | 0.0245 U | 0.0245 U | 0.0235 U | 0.0245 U | 0.0235 U |
| | 8081A | beta-BHC | 0.037 ca | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | delta-BHC | -- | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | Dieldrin | 0.0042 ca | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | Endosulfan I | 220 nc | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | Endosulfan II | 220 nc | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Endosulfan sulfate | 220 nc | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Endrin | 11 nc | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | Endrin aldehyde | -- | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Endrin ketone | -- | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | gamma-BHC | 0.052 ca | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | gamma-Chlordane | 0.19 ca | -- | ug/l | 0.049 U | 0.0495 U | 0.0495 U | 0.049 U | 0.0485 U | 0.047 U | 0.049 U | 0.0465 U |
| | 8081A | Heptachlor | 0.015 ca | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Heptachlor epoxide | 0.0074 ca | -- | ug/l | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.07 U | 0.075 U | 0.07 U |
| | 8081A | Methoxychlor | 182 nc | -- | ug/l | 0.295 U | 0.295 U | 0.295 U | 0.295 U | 0.29 U | 0.285 U | 0.295 U | 0.28 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-018-SW | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/23/2004 | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | |
| | 8081A | Toxaphene | 0.061 ca | -- | ug/l | 0.245 U | 0.25 U | 0.25 U | 0.245 U | 0.245 U | 0.235 U | 0.245 U | 0.235 U |
| PCBs | 8082 | Aroclor 1016 | 0.96 ca | -- | ug/l | 0.295 U | 0.295 U | 0.295 U | 0.295 U | 0.29 U | 0.285 U | 0.295 U | 0.28 U |
| | 8082 | Aroclor 1221 | 0.034 ca | -- | ug/l | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U |
| | 8082 | Aroclor 1232 | 0.034 ca | -- | ug/l | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U |
| | 8082 | Aroclor 1242 | 0.034 ca | -- | ug/l | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U |
| | 8082 | Aroclor 1248 | 0.034 ca | -- | ug/l | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.7 U | 0.75 U | 0.7 U |
| | 8082 | Aroclor 1254 | 0.034 ca | -- | ug/l | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.65 U | 0.6 U | 0.65 U | 0.6 U |
| | 8082 | Aroclor 1260 | 0.034 ca | -- | ug/l | 0.295 U | 0.295 U | 0.295 U | 0.295 U | 0.29 U | 0.285 U | 0.295 U | 0.28 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 0.5 U |
| | 8260B | 2-Butanone | 6968 nc | -- | ug/l | 5 U | 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 | 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 | 5 U |
| | 8260B | Acetone | 5475 nc | -- | ug/l | 5 U | 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 | 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 | 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 | 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 | 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 | 0.5 U |
| | 8260B | Carbon disulfide | 1043 nc | -- | ug/l | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ | 2.5 UJ |
| | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | 0.5 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | L10sw-018-SW | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
| | | | | | Sample Date: | 11/23/2004 | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | |
| | 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 | 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 | 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 | 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 | 0.5 U |
| SVOCs | 8270C | 1,2,4-Trichlorobenzene | 7.2 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 1,2-Dichlorobenzene | 370 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 1,3-Dichlorobenzene | 182 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 1,4-Dichlorobenzene | 0.50 ca | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 2,2-oxybis (1-chloropropane) | 0.27 ca | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.1 U | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 2,4,5-Trichlorophenol | 3650 nc | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 2,4,6-Trichlorophenol | 3.6 nc | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 2,4-Dichlorophenol | 109 nc | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 2,4-Dimethylphenol | 730 nc | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 2,4-Dinitrophenol | 73 nc | -- | ug/l | 11 U | 9.5 U | 10 U | 10.5 UJ | 9.5 U | 9.5 U | 10 U | 9.5 U |
| | 8270C | 2,4-Dinitrotoluene | 73 nc | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | 0.28 U | 0.245 U | 0.245 U | 0.26 UJ | 0.245 U | 0.245 U | 0.245 U | 0.235 U |
| | 8270C | 2-Chloronaphthalene | 487 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 2-Chlorophenol | 30 nc | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 2-Methylnaphthalene | -- | -- | ug/l | 0.28 U | 0.245 U | 0.245 U | 0.26 UJ | 0.245 U | 0.245 U | 0.245 U | 0.235 U |
| | 8270C | 2-Methylphenol | 1825 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 2-Nitroaniline | 109 nc | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 2-Nitrophenol | -- | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 3,3'-Dichlorobenzidine | 0.15 ca | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 3-Nitroaniline | 3.2 ca | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 4,6-Dinitro-2-methylphenol | 3.6 nc | -- | ug/l | 11 U | 9.5 U | 10 U | 10.5 UJ | 9.5 U | 9.5 U | 10 U | 9.5 U |
| | 8270C | 4-Bromophenyl phenyl ether | -- | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 4-Chloro-3-methylphenol | -- | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 4-Chloroaniline | 146 nc | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | 4-Methylphenol | 182 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | 4-Nitroaniline | 3.2 ca | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | 4-Nitrophenol | -- | -- | ug/l | 11 U | 9.5 U | 10 U | 10.5 UJ | 9.5 U | 9.5 U | 10 U | 9.5 U |
| | 8270C | Acenaphthene | 365 nc | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Acenaphthylene | -- | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Anthracene | 1825 nc | -- | ug/l | 0.7 J | 0.28 J | 0.17 J | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Benzo(a)anthracene | 0.092 ca | -- | ug/l | **0.48** | 0.095 U | 0.1 U | 0.105 UJ | 0.095 U | 0.095 U | 0.1 U | 0.095 U |
| | 8270C | Benzo(a)pyrene | 0.0092 ca | -- | ug/l | **0.4 J** | 0.195 U | 0.195 U | 0.21 UJ | 0.195 U | 0.195 U | 0.195 U | 0.185 U |
| | 8270C | Benzo(b)fluoranthene | 0.092 ca | -- | ug/l | **1.1** | 0.195 U | 0.195 U | 0.21 UJ | 0.195 U | 0.195 U | 0.195 U | 0.185 U |
| | 8270C | Benzo(g,h,i)perylene | -- | -- | ug/l | 0.34 J | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Benzo(k)fluoranthene | 0.92 ca | -- | ug/l | 0.35 J | 0.195 U | 0.195 U | 0.21 UJ | 0.195 U | 0.195 U | 0.195 U | 0.185 U |
| | 8270C | Benzoic acid | 145979 nc | -- | ug/l | 11 U | 9.5 U | 10 U | 10.5 UJ | 9.5 U | 9.5 U | 10 U | 9.5 U |
| | 8270C | Benzyl alcohol | 10950 nc | -- | ug/l | 11 U | 9.5 U | 10 U | 10.5 UJ | 9.5 U | 9.5 U | 10 U | 9.5 U |
| | 8270C | Bis(2-chloroethoxy)methane | -- | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Bis(2-chloroethyl) ether | 0.010 ca | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-018-SW | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/23/2004 | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | |
| | 8270C | Bis(2-ethylhexyl) phthalate | 4.8 ca | -- | ug/l | 8.5 U | 7.5 U | 7.5 U | 8 UJ | **30** | 7.5 U | 7.5 U | 7 U |
| | 8270C | Butylbenzyl phthalate | 7300 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Carbazole | 3.4 ca | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.8 U | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | Chrysene | 9.2 ca | -- | ug/l | 1.3 | 0.17 J | 0.2 J | 0.26 UJ | 0.245 U | 0.245 U | 0.245 U | 0.235 U |
| | 8270C | Dibenzo(a,h)anthracene | 0.0092 ca | -- | ug/l | 0.22 U | 0.195 U | 0.195 U | 0.21 UJ | 0.195 U | 0.195 U | 0.195 U | 0.185 U |
| | 8270C | Dibenzofuran | 12 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Diethyl phthalate | 29199 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Dimethyl phthalate | 364867 nc | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Di-n-butyl phthalate | 3650 nc | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | Di-n-octyl phthalate | 1460 nc | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 UJ |
| | 8270C | Fluoranthene | 1460 nc | -- | ug/l | 3.2 | 0.28 J | 0.23 J | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Fluorene | 243 nc | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Hexachlorobenzene | 0.042 ca | -- | ug/l | 0.28 U | 0.245 U | 0.245 U | 0.26 UJ | 0.245 U | 0.245 U | 0.245 U | 0.235 U |
| | 8270C | Hexachlorobutadiene | 0.86 ca | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | Hexachlorocyclopentadiene | 219 nc | -- | ug/l | - R | - R | - R | - R | - R | - R | - R | - R |
| | 8270C | Hexachloroethane | 4.8 ca | -- | ug/l | 2.8 UJ | 2.45 U | 2.45 U | 2.6 UJ | 2.45 UJ | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.092 ca | -- | ug/l | **0.35 J** | 0.195 U | 0.195 U | 0.21 UJ | 0.195 U | 0.195 U | 0.195 U | 0.185 U |
| | 8270C | Isophorone | 71 ca | -- | ug/l | 1.1 U | 0.95 U | 1 U | 1.05 UJ | 0.95 U | 0.95 U | 1 U | 0.95 U |
| | 8270C | Naphthalene | 6.2 nc | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Nitrobenzene | 3.4 nc | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | n-Nitroso-di-n-propylamine | 0.0096 ca | -- | ug/l | 0.28 U | 0.245 U | 0.245 U | 0.26 UJ | 0.245 U | 0.245 U | 0.245 U | 0.235 U |
| | 8270C | n-Nitrosodiphenylamine | 14 ca | -- | ug/l | 0.55 U | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Pentachlorophenol | 0.56 ca | -- | ug/l | 5.5 U | 4.85 U | 4.9 U | 5 UJ | 4.85 U | 4.85 U | 4.9 U | 4.65 U |
| | 8270C | Phenanthrene | -- | -- | ug/l | 0.38 J | 0.485 U | 0.49 U | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| | 8270C | Phenol | 10950 nc | -- | ug/l | 2.8 U | 2.45 U | 2.45 U | 2.6 UJ | 2.45 U | 2.45 U | 2.45 U | 2.35 U |
| | 8270C | Pyrene | 182 nc | -- | ug/l | 2.6 | 0.21 J | 0.24 J | 0.5 UJ | 0.485 U | 0.485 U | 0.49 U | 0.465 U |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 1095 nc | -- | ug/l | 0.067 J | 0.15 U | 0.145 U | 0.1 U | 0.1 U | 0.19 U | 0.135 U | 0.1 U |
| | 8330 | 1,3-Dinitrobenzene | 3.6 nc | -- | ug/l | 0.1 U | 0.15 U | 0.145 U | 0.1 U | 0.1 U | 0.19 U | 0.135 U | 0.1 U |
| | 8330 | 2,4,6-TNT | 2.2 ca | -- | ug/l | 0.125 U | 0.185 U | 0.18 U | 0.125 U | 0.125 U | 0.24 U | 0.165 U | 0.125 U |
| | 8330 | 2,4-Dinitrotoluene | 73 nc | -- | ug/l | 0.18 U | 0.265 U | 0.26 U | 0.18 U | 0.18 U | 0.34 U | 0.24 U | 0.18 U |
| | 8330 | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | 0.215 U | 0.32 U | 0.31 U | 0.215 U | 0.215 U | 0.41 U | 0.285 U | 0.215 U |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | ug/l | 0.18 U | 0.265 U | 0.26 U | 0.18 U | 0.18 U | 0.34 U | 0.24 U | 0.18 U |
| | 8330 | 2-Nitrotoluene | 0.049 ca | -- | ug/l | 0.155 U | 0.23 U | 0.22 U | 0.155 U | 0.155 U | 0.295 U | 0.205 U | 0.155 U |
| | 8330 | 3-Nitrotoluene | 122 nc | -- | ug/l | 0.155 U | 0.23 U | 0.22 U | 0.155 U | 0.155 U | 0.295 U | 0.205 U | 0.155 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | ug/l | 0.165 U | 0.245 U | 0.235 U | 0.165 U | 0.165 U | 0.315 U | 0.22 U | 0.165 U |
| | 8330 | 4-Nitrotoluene | 0.66 ca | -- | ug/l | 0.155 U | 0.23 U | 0.22 U | 0.155 U | 0.155 U | 0.295 U | 0.205 U | 0.155 U |
| | 8330 | HMX | 1825 nc | -- | ug/l | 0.155 U | 0.23 U | 0.22 U | 0.155 U | 0.155 U | 0.295 U | 0.205 U | 0.155 U |
| | 8330 | Nitrobenzene | 3.4 nc | -- | ug/l | 0.08 U | 0.12 U | 0.115 U | 0.08 U | 0.08 U | 0.15 U | 0.105 U | 0.08 U |
| | 8330 | RDX | 0.61 ca | -- | ug/l | 0.1 U | 0.15 U | 0.145 U | 0.1 U | 0.1 U | 0.19 U | 0.135 U | 0.1 U |
| | 8330 | Tetryl | 365 nc | -- | ug/l | 0.39 U | 0.6 U | 0.55 U | 0.39 U | 0.39 U | 0.75 U | 0.5 U | 0.39 U |

**Table L10-8**
**Load Line 10 Summary of All Surface Water Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10sw-018-SW | L10sw-019-DUP | L10sw-019-SW | L10sw-020-SW | L10sw-021-SW | L10sw-022-SW | L10sw-024-SW | L10sw-025-SW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 11/23/2004 | 12/1/2004 | 12/1/2004 | 11/23/2004 | 11/23/2004 | 11/30/2004 | 11/30/2004 | 11/19/2004 |
| | | | | | Sample Depth: | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 4 ft | 3 ft | 3 ft |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Surface Water Background Criteria | Units | | | | | | | | |
| Propellants | 353.2 Modified | Nitrocellulose | -- | -- | ug/l | | | | | | | | |
| | 8332 | Nitroglycerine | 4.8 ca | -- | ug/l | | | | | | | | |
| | SW8330 Modified | Nitroguanidine | 3650 nc | -- | ug/l | | | | | | | | |
| Other Analytes | 9014 | Cyanide, Total | 730 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |

Notes:
-- - no background/PRG value is available for this analyte
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 L10-9**
**Load Line 10 Summary of All Groundwater Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| Metals | 6010B | Aluminum | 36499 nc | -- | ug/l | 75 U | 75 U | 75 U | 75 U | 75 U | 25 | 75 U |
| | 6010B | Barium | 2555 nc | 256 | ug/l | 14 | 17 | 7.8 | 5.3 | 6.8 | 7 | 17 |
| | 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 | 0.41 | 1 U | 1 U | 1 U |
| | 6010B | Calcium | --[n] | 53100 | ug/l | 68000 | 28000 | 71000 | 64000 | 63000 | 62000 | 23000 J |
| | 6010B | Chromium | 109 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 3.2 |
| | 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 | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 2.8 | 5 U |
| | 6010B | Iron | 10950 nc | 1430 | ug/l | 60 U | 60 U | 60 U | 60 U | 60 U | 60 U | 63 |
| | 6010B | Magnesium | --[n] | 15000 | ug/l | 23000 | 7700 | 21000 | 19000 | 14000 | 14000 | 9400 |
| | 6010B | Manganese | 876 nc | 1340 | ug/l | 63 | 2.1 | 45 | 9.7 | 49 | 49 | 65 |
| | 6010B | Nickel | 730 nc | 83.4 | ug/l | 1.9 | 2.3 | 1.05 U | 1.6 | 5 U | 2 | 1.85 U |
| | 6010B | Potassium | --[n] | 5770 | ug/l | 1400 | 1000 | 1000 | 890 | 870 | 940 | 1300 |
| | 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] | 51400 | ug/l | 7500 | 5600 | 6100 | 4700 | 3300 | 3300 | 3100 |
| | 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 | 52.3 | ug/l | 2.6 | 6.7 | 17 | 2.3 | 8.9 | 10 | 4.7 |
| | 7041 | Antimony | 15 nc | 0.00 | ug/l | 4.4 | 3.75 U | 3.75 U | 3.75 U | 3.75 U | 3.75 U | 3.75 U |
| | 7060A | Arsenic | 0.045 ca | 0.00 | ug/l | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| | 7196A | Hexavalent Chromium | 109 nc | 0.00 | ug/l | | | | | | | |
| | 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 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U |
| | 7841 | Thallium | 2.4 nc | 0.00 | ug/l | 1.5 | 2 U | 2 U | 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 | 0.055 U | 0.055 U |
| | 8081A | 4,4'-DDE | 0.20 ca | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | 4,4'-DDT | 0.20 ca | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | Aldrin | 0.0040 ca | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | alpha-BHC | 0.011 nc | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | alpha-Chlordane | 0.19 ca | -- | ug/l | 0.0235 U | 0.0245 U | 0.026 U | 0.0245 U | 0.025 U | 0.0255 U | 0.026 U |
| | 8081A | beta-BHC | 0.037 ca | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | delta-BHC | -- | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | Dieldrin | 0.0042 ca | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | Endosulfan I | 220 nc | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | Endosulfan II | 220 nc | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | Endosulfan sulfate | 220 nc | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | Endrin | 11 nc | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | Endrin aldehyde | -- | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | Endrin ketone | -- | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | gamma-BHC | 0.052 ca | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | gamma-Chlordane | 0.19 ca | -- | ug/l | 0.047 U | 0.0485 U | 0.05 U | 0.0485 U | 0.0495 U | 0.05 U | 0.05 U |
| | 8081A | Heptachlor | 0.015 ca | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |

**Table L10-9**
**Load Line 10 Summary of All Groundwater Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| | 8081A | Heptachlor epoxide | 0.0074 ca | -- | ug/l | 0.07 U | 0.075 U | 0.08 U | 0.075 U | 0.075 U | 0.075 U | 0.08 U |
| | 8081A | Methoxychlor | 182 nc | -- | ug/l | 0.285 U | 0.29 U | 0.315 U | 0.29 U | 0.295 U | 0.305 U | 0.315 U |
| | 8081A | Toxaphene | 0.061 ca | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.245 U | 0.25 U | 0.255 U | 0.26 U |
| PCBs | 8082 | Aroclor 1016 | 0.96 ca | -- | ug/l | 0.285 U | 0.29 U | 0.315 U | 0.29 U | 0.295 U | 0.305 U | 0.315 U |
| | 8082 | Aroclor 1221 | 0.034 ca | -- | ug/l | 0.6 U | 0.65 U | 0.7 U | 0.65 U | 0.65 U | 0.65 U | 0.7 U |
| | 8082 | Aroclor 1232 | 0.034 ca | -- | ug/l | 0.6 U | 0.65 U | 0.7 U | 0.65 U | 0.65 U | 0.65 U | 0.7 U |
| | 8082 | Aroclor 1242 | 0.034 ca | -- | ug/l | 0.6 U | 0.65 U | 0.7 U | 0.65 U | 0.65 U | 0.65 U | 0.7 U |
| | 8082 | Aroclor 1248 | 0.034 ca | -- | ug/l | 0.7 U | 0.75 U | 0.8 U | 0.75 U | 0.75 U | 0.75 U | 0.8 U |
| | 8082 | Aroclor 1254 | 0.034 ca | -- | ug/l | 0.6 U | 0.65 U | 0.7 U | 0.65 U | 0.65 U | 0.65 U | 0.7 U |
| | 8082 | Aroclor 1260 | 0.034 ca | -- | ug/l | 0.285 U | 0.29 U | 0.315 U | 0.29 U | 0.295 U | 0.305 U | 0.315 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 | **1.2** | 0.5 U | **1.6** | 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 | 1.8 |
| | 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 |

**Table L10-9**
**Load Line 10 Summary of All Groundwater Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| | 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 |
| | 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 | 1 U | 1.05 U |
| | 8270C | 1,2-Dichlorobenzene | 370 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | 1,3-Dichlorobenzene | 182 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | 1,4-Dichlorobenzene | 0.50 ca | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 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 | 1 U | 1.05 U |
| | 8270C | 2,4,5-Trichlorophenol | 3650 nc | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 2,4,6-Trichlorophenol | 3.6 nc | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 2,4-Dichlorophenol | 109 nc | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 2,4-Dimethylphenol | 730 nc | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 2,4-Dinitrophenol | 73 nc | -- | ug/l | 9.5 U | 9.5 U | 10.5 U | 10 U | 10 U | 10 U | 10.5 U |
| | 8270C | 2,4-Dinitrotoluene | 73 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.255 U | 0.25 U | 0.245 U | 0.26 U |
| | 8270C | 2-Chloronaphthalene | 487 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | 2-Chlorophenol | 30 nc | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 2-Methylnaphthalene | -- | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.255 U | 0.25 U | 0.245 U | 0.26 U |
| | 8270C | 2-Methylphenol | 1825 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | 2-Nitroaniline | 109 nc | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 2-Nitrophenol | -- | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 3,3'-Dichlorobenzidine | 0.15 ca | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 3-Nitroaniline | 3.2 ca | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 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 | 10 U | 10.5 U |
| | 8270C | 4-Bromophenyl phenyl ether | -- | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 4-Chloro-3-methylphenol | -- | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 4-Chloroaniline | 146 nc | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 4-Chlorophenyl phenyl ether | -- | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | 4-Methylphenol | 182 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | 4-Nitroaniline | 3.2 ca | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | 4-Nitrophenol | -- | -- | ug/l | 9.5 U | 9.5 U | 10.5 U | 10 U | 10 U | 10 U | 10.5 U |
| | 8270C | Acenaphthene | 365 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Acenaphthylene | -- | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Anthracene | 1825 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Benzo(a)anthracene | 0.092 ca | -- | ug/l | 0.095 U | 0.095 U | 0.105 U | 0.1 U | 0.1 U | 0.1 U | 0.105 U |
| | 8270C | Benzo(a)pyrene | 0.0092 ca | -- | ug/l | 0.185 U | 0.195 U | 0.21 U | 0.205 U | 0.2 U | 0.195 U | 0.21 U |
| | 8270C | Benzo(b)fluoranthene | 0.092 ca | -- | ug/l | 0.185 U | 0.195 U | 0.21 U | 0.205 U | 0.2 U | 0.195 U | 0.21 U |

**Table L10-9**
**Load Line 10 Summary of All Groundwater Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| | 8270C | Benzo(g,h,i)perylene | -- | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Benzo(k)fluoranthene | 0.92 ca | -- | ug/l | 0.185 U | 0.195 U | 0.21 U | 0.205 U | 0.2 U | 0.195 U | 0.21 U |
| | 8270C | Benzoic acid | 145979 nc | -- | ug/l | 9.5 U | 9.5 U | 10.5 U | 10 U | 10 U | 10 U | 10.5 U |
| | 8270C | Benzyl alcohol | 10950 nc | -- | ug/l | 9.5 U | 9.5 U | 10.5 U | 10 U | 10 U | 10 U | 10.5 U |
| | 8270C | Bis(2-chloroethoxy)methane | -- | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Bis(2-chloroethyl) ether | 0.010 ca | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Bis(2-ethylhexyl) phthalate | 4.8 ca | -- | ug/l | 7 U | 7.5 U | 8 U | 7.5 U | 7.5 U | 7.5 U | 8 U |
| | 8270C | Butylbenzyl phthalate | 7300 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Carbazole | 3.4 ca | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | Chrysene | 9.2 ca | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.255 U | 0.25 U | 0.245 U | 0.26 U |
| | 8270C | Dibenzo(a,h)anthracene | 0.0092 ca | -- | ug/l | 0.185 U | 0.195 U | 0.21 U | 0.205 U | 0.2 U | 0.195 U | 0.21 U |
| | 8270C | Dibenzofuran | 12 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Diethyl phthalate | 29199 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Dimethyl phthalate | 364867 nc | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Di-n-butyl phthalate | 3650 nc | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | Di-n-octyl phthalate | 1460 nc | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | Fluoranthene | 1460 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.23 J | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Fluorene | 243 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Hexachlorobenzene | 0.042 ca | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.255 U | 0.25 U | 0.245 U | 0.26 U |
| | 8270C | Hexachlorobutadiene | 0.86 ca | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | Hexachlorocyclopentadiene | 219 nc | -- | ug/l | 9.5 U | 9.5 U | 10.5 U | 10 U | 10 U | 10 U | 10.5 U |
| | 8270C | Hexachloroethane | 4.8 ca | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | Indeno(1,2,3-cd)pyrene | 0.092 ca | -- | ug/l | 0.185 U | 0.195 U | 0.21 U | 0.205 U | 0.2 U | 0.195 U | 0.21 U |
| | 8270C | Isophorone | 71 ca | -- | ug/l | 0.95 U | 0.95 U | 1.05 U | 1 U | 1 U | 1 U | 1.05 U |
| | 8270C | Naphthalene | 6.2 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Nitrobenzene | 3.4 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | n-Nitroso-di-n-propylamine | 0.0096 ca | -- | ug/l | 0.235 U | 0.245 U | 0.26 U | 0.255 U | 0.25 U | 0.245 U | 0.26 U |
| | 8270C | n-Nitrosodiphenylamine | 14 ca | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.5 U | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Pentachlorophenol | 0.56 ca | -- | ug/l | 4.65 U | 4.85 U | 5 U | 5 U | 4.95 U | 4.9 U | 5 U |
| | 8270C | Phenanthrene | -- | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.18 J | 0.495 U | 0.49 U | 0.5 U |
| | 8270C | Phenol | 10950 nc | -- | ug/l | 2.35 U | 2.45 U | 2.6 U | 2.55 U | 2.5 U | 2.45 U | 2.6 U |
| | 8270C | Pyrene | 182 nc | -- | ug/l | 0.465 U | 0.485 U | 0.5 U | 0.16 J | 0.495 U | 0.49 U | 0.5 U |
| Explosives | 8330 | 1,3,5-Trinitrobenzene | 1095 nc | -- | ug/l | 0.13 U | 0.1 U | 0.16 U | 0.17 U | 0.19 U | 0.145 U | 0.1 U |
| | 8330 | 1,3-Dinitrobenzene | 3.6 nc | -- | ug/l | 0.13 U | 0.1 U | 0.16 U | 0.17 U | 0.19 U | 0.145 U | 0.1 U |
| | 8330 | 2,4,6-TNT | 2.2 ca | -- | ug/l | 1.2 | 0.17 J | 0.2 U | 0.215 U | 0.24 U | 0.18 U | 0.125 U |
| | 8330 | 2,4-Dinitrotoluene | 73 nc | -- | ug/l | 0.235 U | 0.18 U | 0.29 U | 0.31 U | 0.34 U | 0.26 U | 0.18 U |
| | 8330 | 2,6-Dinitrotoluene | 36 nc | -- | ug/l | 0.285 U | 0.215 U | 0.345 U | 0.37 U | 0.41 U | 0.31 U | 0.215 U |
| | 8330 | 2-Amino-4,6-Dinitrotoluene | -- | -- | ug/l | 0.235 U | 0.18 U | 0.29 U | 0.31 U | 0.34 U | 0.26 U | 0.18 U |
| | 8330 | 2-Nitrotoluene | 0.049 ca | -- | ug/l | 0.205 U | 0.155 U | 0.25 U | 0.265 U | 0.295 U | 0.22 U | 0.155 U |
| | 8330 | 3-Nitrotoluene | 122 nc | -- | ug/l | 0.205 U | 0.155 U | 0.25 U | 0.265 U | 0.295 U | 0.22 U | 0.155 U |
| | 8330 | 4-Amino-2,6-Dinitrotoluene | -- | -- | ug/l | 0.215 U | 0.165 U | 0.265 U | 0.285 U | 0.315 U | 0.235 U | 0.165 U |
| | 8330 | 4-Nitrotoluene | 0.66 ca | -- | ug/l | 0.205 U | 0.155 U | 0.25 U | 0.265 U | 0.295 U | 0.22 U | 0.155 U |

**Table L10-9**
**Load Line 10 Summary of All Groundwater Results**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| | | | | | | L10mw-001-GW | L10mw-002-GW | L10mw-003-GW | L10mw-004-GW | L10mw-005-DUP | L10mw-005-GW | L10mw-006-GW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sample Date: | 1/10/2005 | 1/10/2005 | 1/17/2005 | 1/19/2005 | 1/19/2005 | 1/19/2005 | 1/17/2005 |
| | | | | | Sample Depth: | 25 ft | 20 ft | 23 ft | 20 ft | 25 ft | 25 ft | 21 ft |
| | | | | | Description | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered | C/Filtered |
| Group | Method | Parameter | Region 9 PRG (Tap Water) | Consolidated Filtered Groundwater Background | Units | | | | | | | |
| | 8330 | HMX | 1825 nc | -- | ug/l | 0.205 U | 0.155 U | 0.25 U | 0.265 U | 0.295 U | 0.22 U | 0.155 U |
| | 8330 | Nitrobenzene | 3.4 nc | -- | ug/l | 0.105 U | 0.08 U | 0.13 U | 0.135 U | 0.15 U | 0.115 U | 0.08 U |
| | 8330 | RDX | 0.61 ca | -- | ug/l | 0.13 U | 0.1 U | 0.16 U | 0.17 U | 0.19 U | 0.145 U | 0.1 U |
| | 8330 | Tetryl | 365 nc | -- | ug/l | 0.5 U | 0.39 U | 0.6 U | 0.65 U | 0.75 U | 0.55 U | 0.39 U |
| Propellants | 353.2 Modified | Nitrocellulose | -- | -- | ug/l | | | 65 U | | | | |
| | 8332 | Nitroglycerine | 4.8 ca | -- | ug/l | 0.65 U | 0.5 U | 0.8 U | | | | |
| | SW8330 Modified | Nitroguanidine | 3650 nc | -- | ug/l | | | 10 U | | | | |
| Other Analytes | 9014 | Cyanide, Total | 730 nc | 0.00 | ug/l | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| | 8015B DRO | Diesel Range Organics | NA | -- | ug/l | 60 U | 60 U | 65 U | 61 J | 60 U | 60 U | 65 U |
| | 8015B GRO | Gasoline Range Organics | NA | -- | ug/l | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U | 25 U |

Notes:
-- - no background/PRG value is available for this analyte
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 L10-13**
**Load Line 10 Human Health Risk Screening Tables for Groundwater**
**RVAAP 14 AOC Characterization**
**Ravenna Army Ammunition Plant, Ravenna, Ohio**

| Parameter | Region 9 PRG (Tap Water) | | Consolidated Filtered Groundwater Background | Maximum Detected C/Filtered | Frequency of Detection | COPC |
|---|---|---|---|---|---|---|
| Aluminum | 36499 | nc | -- | 25 | 1 / 7 | No |
| Barium | 2555 | nc | 256 | 17 | 7 / 7 | No |
| Cadmium | 18 | nc | 0.00 | 0.41 | 1 / 7 | No |
| Calcium | --[n] | | 53100 | 71000 | 7 / 7 | No |
| Chromium | 109 | nc | 0.00 | 3.2 | 1 / 7 | No |
| Copper | 1460 | nc | 0.00 | 2.8 | 1 / 7 | No |
| Iron | 10950 | nc | 1430 | 63 | 1 / 7 | No |
| Magnesium | --[n] | | 15000 | 23000 | 7 / 7 | No |
| Manganese | 876 | nc | 1340 | 65 | 7 / 7 | No |
| Nickel | 730 | nc | 83.4 | 2.3 | 4 / 7 | No |
| Potassium | --[n] | | 5770 | 1400 | 7 / 7 | No |
| Sodium | --[n] | | 51400 | 7500 | 7 / 7 | No |
| Zinc | 10950 | nc | 52.3 | 17 | 7 / 7 | No |
| Antimony | 15 | nc | 0.00 | 4.4 | 1 / 7 | No |
| Thallium | 2.4 | nc | 0.00 | 1.5 | 1 / 7 | No |
| Carbon tetrachloride | 0.17 | ca | -- | 1.6 | 2 / 7 | Yes, > PRG |
| Methylene chloride | 4.3 | ca | -- | 1.8 | 1 / 7 | No |
| Fluoranthene | 1460 | nc | -- | 0.23 | 1 / 7 | No |
| Phenanthrene | -- | | -- | 0.18 | 1 / 7 | Yes, NTX |
| Pyrene | 182 | nc | -- | 0.16 | 1 / 7 | No |
| 2,4,6-TNT | 2.2 | ca | -- | 1.2 | 2 / 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 L10-12**
**Load Line 10 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 | 12000 | 17 / 21 | No |
| Barium | 2555 | nc | 47.5 | 270 | 21 / 21 | No |
| Beryllium | 73 | nc | 0.00 | 1.1 | 3 / 21 | No |
| Cadmium | 18 | nc | 0.00 | 6.1 | 11 / 21 | No |
| Calcium | --[n] | | 41400 | 74000 | 21 / 21 | No |
| Chromium | 109 | nc | 0.00 | 200 | 12 / 21 | Yes, > BKG & PRG |
| Cobalt | 730 | nc | 0.00 | 4 | 3 / 21 | No |
| Copper | 1460 | nc | 7.9 | 400 | 14 / 21 | No |
| Iron | 10950 | nc | 2560 | 14000 | 21 / 21 | Yes, > BKG & PRG |
| Magnesium | --[n] | | 10800 | 8300 | 21 / 21 | No |
| Manganese | 876 | nc | 391 | 210 | 21 / 21 | No |
| Nickel | 730 | nc | 0.00 | 50 | 3 / 21 | No |
| Potassium | --[n] | | 3170 | 15000 | 21 / 21 | No |
| Selenium | 182 | nc | 0.00 | 3.2 | 2 / 21 | No |
| Silver | 182 | nc | 0.00 | 1 | 2 / 21 | No |
| Sodium | --[n] | | 21300 | 5900 | 21 / 21 | No |
| Vanadium | 36 | nc | 0.00 | 24 | 4 / 21 | No |
| Zinc | 10950 | nc | 42 | 850 | 14 / 21 | No |
| Antimony | 15 | nc | 0.00 | 880 | 10 / 21 | Yes, > BKG & PRG |
| Arsenic | 0.045 | ca | 3.2 | 770 | 12 / 21 | Yes, > BKG & PRG |
| Lead | 15 | mcl | 0.00 | 14000 | 21 / 21 | Yes, > BKG & PRG |
| Mercury | 11 | nc | 0.00 | 0.77 | 3 / 21 | No |
| Acenaphthene | 365 | nc | -- | 0.61 | 1 / 21 | No |
| Acenaphthylene | -- | | -- | 0.94 | 1 / 21 | Yes, NTX |
| Anthracene | 1825 | nc | -- | 2.7 | 4 / 21 | No |
| Benzo(a)anthracene | 0.092 | ca | -- | 5.3 | 5 / 21 | Yes, > PRG |
| Benzo(a)pyrene | 0.0092 | ca | -- | 3.5 | 6 / 21 | Yes, > PRG |
| Benzo(b)fluoranthene | 0.092 | ca | -- | 16 | 6 / 21 | Yes, > PRG |
| Benzo(g,h,i)perylene | -- | | -- | 3.7 | 6 / 21 | Yes, NTX |
| Benzo(k)fluoranthene | 0.92 | ca | -- | 5.7 | 5 / 21 | Yes, > PRG |
| Bis(2-ethylhexyl) phthalate | 4.8 | ca | -- | 30 | 4 / 21 | Yes, > PRG |
| Carbazole | 3.4 | ca | -- | 3.4 | 1 / 21 | No |
| Chrysene | 9.2 | ca | -- | 25 | 8 / 21 | Yes, > PRG |
| Dibenzo(a,h)anthracene | 0.0092 | ca | -- | 0.82 | 4 / 21 | Yes, > PRG |
| Dibenzofuran | 12 | nc | -- | 0.49 | 1 / 21 | No |
| Di-n-butyl phthalate | 3650 | nc | -- | 3 | 1 / 21 | No |
| Fluoranthene | 1460 | nc | -- | 59 | 8 / 21 | No |
| Fluorene | 243 | nc | -- | 0.63 | 1 / 21 | No |
| Indeno(1,2,3-cd)pyrene | 0.092 | ca | -- | 3.8 | 6 / 21 | Yes, > PRG |
| n-Nitrosodiphenylamine | 14 | ca | -- | 0.21 | 1 / 21 | No |
| Pentachlorophenol | 0.56 | ca | -- | 4.8 | 1 / 21 | Yes, > PRG |
| Phenanthrene | -- | | -- | 12 | 5 / 21 | Yes, NTX |
| Pyrene | 182 | nc | -- | 46 | 8 / 21 | No |
| 1,3,5-Trinitrobenzene | 1095 | nc | -- | 0.19 | 2 / 21 | No |
| 2,4,6-TNT | 2.2 | ca | -- | 0.29 | 1 / 21 | No |
| 2,6-Dinitrotoluene | 36 | nc | -- | 0.37 | 1 / 21 | No |
| 2-Amino-4,6-Dinitrotoluene | -- | | -- | 0.23 | 1 / 21 | Yes, NTX |
| 4-Amino-2,6-Dinitrotoluene | -- | | -- | 0.46 | 2 / 21 | Yes, NTX |
| Nitroglycerine | 4.8 | ca | -- | 0.21 | 1 / 2 | 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 L10-11**
**Load Line 10 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 | 19000 | 6 / 6 | Yes, > BKG & PRG |
| Arsenic | 0.39 | ca | 19.5 | 270 | 6 / 6 | Yes, > BKG & PRG |
| Barium | 538 | nc | 123 | 4600 | 6 / 6 | Yes, > BKG & PRG |
| Beryllium | 15 | nc | 0.38 | 1.8 | 6 / 6 | No |
| Cadmium | 3.7 | nc | 0.00 | 7.1 | 2 / 6 | Yes, > BKG & PRG |
| Calcium | --[n] | | 5510 | 90000 | 6 / 6 | No |
| Chromium | 30 | ca | 18.1 | 270 | 6 / 6 | Yes, > BKG & PRG |
| Cobalt | 30 | ca | 9.1 | 10 | 6 / 6 | No |
| Copper | 313 | nc | 27.6 | 980 | 6 / 6 | Yes, > BKG & PRG |
| Iron | 2346 | nc | 28200 | 71000 | 6 / 6 | Yes, > BKG & PRG |
| Lead | 400 | pbk | 27.4 | 39000 | 6 / 6 | Yes, > BKG & PRG |
| Magnesium | --[n] | | 2760 | 6500 | 6 / 6 | No |
| Manganese | 176 | nc | 1950 | 970 | 6 / 6 | No |
| Nickel | 156 | nc | 17.7 | 41 | 6 / 6 | No |
| Potassium | --[n] | | 1950 | 2600 | 6 / 6 | No |
| Selenium | 39 | nc | 1.7 | 6.6 | 3 / 6 | No |
| Silver | 39 | nc | 0.00 | 1.2 | 2 / 6 | No |
| Sodium | --[n] | | 112 | 1300 | 5 / 6 | No |
| Vanadium | 7.8 | nc | 26.1 | 34 | 6 / 6 | Yes, > BKG & PRG |
| Zinc | 2346 | nc | 532 | 2000 | 6 / 6 | No |
| Antimony | 3.1 | nc | 0.00 | 300 | 2 / 6 | Yes, > BKG & PRG |
| Mercury | 2.3 | nc | 0.06 | 1.2 | 5 / 6 | No |
| 4,4'-DDD | 2.4 | ca | -- | 0.017 | 1 / 1 | No |
| 4,4'-DDE | 1.7 | ca | -- | 0.045 | 1 / 1 | No |
| 4,4'-DDT | 1.7 | ca | -- | 0.055 | 1 / 1 | No |
| alpha-Chlordane | 1.6 | ca | -- | 0.0018 | 1 / 1 | No |
| Dieldrin | 0.030 | ca | -- | 0.0016 | 1 / 1 | No |
| Endosulfan I | 37 | nc | -- | 0.0011 | 1 / 1 | No |
| gamma-Chlordane | 1.6 | ca | -- | 0.0053 | 1 / 1 | No |
| 2-Methylnaphthalene | -- | | -- | 28 | 1 / 2 | Yes, NTX |
| Acenaphthene | 368 | nc | -- | 39 | 1 / 2 | No |
| Acenaphthylene | -- | | -- | 0.74 | 1 / 2 | Yes, NTX |
| Anthracene | 2189 | nc | -- | 27 | 1 / 2 | No |
| Benzo(a)anthracene | 0.62 | ca | -- | 25 | 2 / 2 | Yes, > PRG |
| Benzo(a)pyrene | 0.062 | ca | -- | 11 | 2 / 2 | Yes, > PRG |
| Benzo(b)fluoranthene | 0.62 | ca | -- | 18 | 2 / 2 | Yes, > PRG |
| Benzo(g,h,i)perylene | -- | | -- | 4.2 | 2 / 2 | Yes, NTX |
| Benzo(k)fluoranthene | 6.2 | ca | -- | 11 | 2 / 2 | Yes, > PRG |
| Carbazole | 24 | ca | -- | 9.6 | 1 / 2 | No |
| Chrysene | 62 | ca | -- | 24 | 2 / 2 | No |
| Dibenzo(a,h)anthracene | 0.062 | ca | -- | 2.4 | 1 / 2 | Yes, > PRG |
| Dibenzofuran | 15 | nc | -- | 37 | 1 / 2 | Yes, > PRG |
| Fluoranthene | 229 | nc | -- | 74 | 2 / 2 | No |
| Fluorene | 275 | nc | -- | 44 | 1 / 2 | No |
| Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | 4.9 | 2 / 2 | Yes, > PRG |
| Naphthalene | 5.6 | nc | -- | 18 | 1 / 2 | Yes, > PRG |
| Phenanthrene | -- | | -- | 130 | 1 / 2 | Yes, NTX |
| Pyrene | 232 | nc | -- | 51 | 2 / 2 | No |
| 2,6-Dinitrotoluene | 6.1 | nc | -- | 11 | 2 / 6 | Yes, > PRG |
| 2-Amino-4,6-Dinitrotoluene | -- | | -- | 1.7 | 2 / 6 | Yes, NTX |
| 4-Amino-2,6-Dinitrotoluene | -- | | -- | 0.86 | 1 / 6 | Yes, NTX |

| Parameter | Region 9 PRG (Res Soil) | | Sediment Background | Maximum Detected | Frequency of Detection | COPC |
|---|---|---|---|---|---|---|
| Tetryl | 61 | nc | -- | 0.87 | 1 / 6 | No |
| Nitroguanidine | 611 | nc | -- | 0.056 | 1 / 1 | 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 L10-10**
**Load Line 10 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 | 22000 | 42 / 42 | Yes, > BKG & PRG |
| Arsenic | 0.39 | ca | 15.4 | 18 | 42 / 42 | Yes, > BKG & PRG |
| Barium | 538 | nc | 88.4 | 190 | 42 / 42 | No |
| Beryllium | 15 | nc | 0.88 | 5.3 | 42 / 42 | No |
| Cadmium | 3.7 | nc | 0.00 | 0.89 | 24 / 42 | No |
| Calcium | --[n] | | 15800 | 100000 | 42 / 42 | No |
| Chromium | 30 | ca | 17.4 | 33 | 42 / 42 | Yes, > BKG & PRG |
| Cobalt | 30 | ca | 10.4 | 13 | 42 / 42 | No |
| Copper | 313 | nc | 17.7 | 42 | 42 / 42 | No |
| Iron | 2346 | nc | 23100 | 28000 | 42 / 42 | Yes, > BKG & PRG |
| Lead | 400 | pbk | 26.1 | 430 | 42 / 42 | Yes, > BKG & PRG |
| Magnesium | --[n] | | 3030 | 23000 | 42 / 42 | No |
| Manganese | 176 | nc | 1450 | 1400 | 42 / 42 | No |
| Nickel | 156 | nc | 21.1 | 31 | 42 / 42 | No |
| Potassium | --[n] | | 927 | 1900 | 42 / 42 | No |
| Selenium | 39 | nc | 1.4 | 1.8 | 35 / 42 | No |
| Sodium | --[n] | | 123 | 960 | 42 / 42 | No |
| Vanadium | 7.8 | nc | 31.1 | 24 | 42 / 42 | No |
| Zinc | 2346 | nc | 61.8 | 220 | 42 / 42 | No |
| Antimony | 3.1 | nc | 0.96 | 2.5 | 12 / 37 | No |
| Mercury | 2.3 | nc | 0.04 | 0.082 | 30 / 42 | No |
| Thallium | 0.52 | nc | 0.00 | 0.23 | 6 / 42 | No |
| 2-Methylnaphthalene | -- | | -- | 0.019 | 3 / 5 | Yes, NTX |
| Anthracene | 2189 | nc | -- | 0.012 | 1 / 5 | No |
| Benzo(a)anthracene | 0.62 | ca | -- | 0.04 | 4 / 5 | No |
| Benzo(a)pyrene | 0.062 | ca | -- | 0.047 | 5 / 5 | No |
| Benzo(b)fluoranthene | 0.62 | ca | -- | 0.063 | 5 / 5 | No |
| Benzo(g,h,i)perylene | -- | | -- | 0.023 | 4 / 5 | Yes, NTX |
| Benzo(k)fluoranthene | 6.2 | ca | -- | 0.035 | 3 / 5 | No |
| Benzyl alcohol | 1833 | nc | -- | 2.1 | 2 / 5 | No |
| Chrysene | 62 | ca | -- | 0.054 | 5 / 5 | No |
| Dibenzofuran | 15 | nc | -- | 0.018 | 2 / 5 | No |
| Fluoranthene | 229 | nc | -- | 0.11 | 5 / 5 | No |
| Fluorene | 275 | nc | -- | 0.012 | 2 / 5 | No |
| Indeno(1,2,3-cd)pyrene | 0.62 | ca | -- | 0.022 | 4 / 5 | No |
| Naphthalene | 5.6 | nc | -- | 0.021 | 3 / 5 | No |
| Phenanthrene | -- | | -- | 0.056 | 4 / 5 | Yes, NTX |
| Phenol | 1833 | nc | -- | 0.18 | 2 / 5 | No |
| Pyrene | 232 | nc | -- | 0.074 | 5 / 5 | No |
| 2,6-Dinitrotoluene | 6.1 | nc | -- | 0.14 | 1 / 42 | No |
| Cyanide, Total | 122 | nc | 0.00 | 1.3 | 14 / 42 | 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 L10-14**
**Load Line 10 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 | 42 / 42 | 10924 | 22000 | mg/kg | 17700 | Yes | 600 ss2 | Yes | No | Yes | ASL |
| | Arsenic | 42 / 42 | 12 | 18 | mg/kg | 15.4 | Yes | 9.9 ss1 | Yes | No | Yes | ASL |
| | Barium | 42 / 42 | 70 | 190 | mg/kg | 88.4 | Yes | 283 ss1 | No | No | No | BSL |
| | Beryllium | 42 / 42 | 0.88 | 5.3 | mg/kg | 0.88 | Yes | 10 ss1 | No | No | No | BSL |
| | Cadmium | 24 / 42 | 0.23 | 0.89 | mg/kg | 0.00 | Yes | 4 ss1 | No | No | No | BSL |
| | Calcium | 42 / 42 | 8543 | 100000 | mg/kg | 15800 | Yes | NUT | No | No | No | BSL |
| | Chromium | 42 / 42 | 20 | 33 | mg/kg | 17.4 | Yes | 0.4 ss1 | Yes | No | Yes | ASL |
| | Cobalt | 42 / 42 | 8.4 | 13 | mg/kg | 10.4 | Yes | 20 ss1 | No | No | No | BSL |
| | Copper | 42 / 42 | 20 | 42 | mg/kg | 17.7 | Yes | 60 ss1 | No | No | No | BSL |
| | Iron | 42 / 42 | 20857 | 28000 | mg/kg | 23100 | Yes | 200 ss2 | Yes | No | Yes | ASL |
| | Lead | 42 / 42 | 54 | 430 | mg/kg | 26.1 | Yes | 40.5 ss1 | Yes | No | Yes | ASL |
| | Magnesium | 42 / 42 | 3438 | 23000 | mg/kg | 3030 | Yes | NUT | No | No | No | BSL |
| | Manganese | 42 / 42 | 574 | 1400 | mg/kg | 1450 | No | 100 ss2 | Yes | No | No | BLBKG |
| | Nickel | 42 / 42 | 20 | 31 | mg/kg | 21.1 | Yes | 30 ss1 | Yes | No | Yes | ASL |
| | Potassium | 42 / 42 | 1139 | 1900 | mg/kg | 927 | Yes | NUT | No | No | No | BSL |
| | Selenium | 35 / 42 | 0.73 | 1.8 | mg/kg | 1.4 | Yes | 0.21 ss1 | Yes | No | Yes | ASL |
| | Sodium | 42 / 42 | 310 | 960 | mg/kg | 123 | Yes | NUT | No | No | No | BSL |
| | Vanadium | 42 / 42 | 19 | 24 | mg/kg | 31.1 | No | 2 ss1 | Yes | No | No | BLBKG |
| | Zinc | 42 / 42 | 86 | 220 | mg/kg | 61.8 | Yes | 8.5 ss1 | Yes | No | Yes | ASL |
| | Antimony | 12 / 37 | 0.80 | 2.5 | mg/kg | 0.96 | Yes | 5 ss1 | No | No | No | BSL |
| | Mercury | 30 / 42 | 0.040 | 0.082 | mg/kg | 0.04 | Yes | 0.00051 ss1 | Yes | Yes | Yes | ASL |
| | Thallium | 6 / 42 | 0.29 | 0.23 | mg/kg | 0.00 | Yes | 1 ss1 | No | No | No | BSL |
| SVOCs | 2-Methylnaphthalene | 3 / 5 | 0.017 | 0.019 | mg/kg | -- | NA | 3.24 ss4 | No | No | No | BSL |
| | Anthracene | 1 / 5 | 0.016 | 0.012 | mg/kg | -- | NA | 148 ss4 | No | No | No | BSL |
| | Benzo(a)anthracene | 4 / 5 | 0.028 | 0.04 | mg/kg | -- | NA | 5.21 ss4 | No | No | No | BSL |
| | Benzo(a)pyrene | 5 / 5 | 0.031 | 0.047 | mg/kg | -- | NA | 1.52 ss4 | No | No | No | BSL |
| | Benzo(b)fluoranthene | 5 / 5 | 0.041 | 0.063 | mg/kg | -- | NA | 59.8 ss4 | No | No | No | BSL |
| | Benzo(g,h,i)perylene | 4 / 5 | 0.020 | 0.023 | mg/kg | -- | NA | 119 ss4 | No | No | No | BSL |
| | Benzo(k)fluoranthene | 3 / 5 | 0.025 | 0.035 | mg/kg | -- | NA | 148 ss4 | No | No | No | BSL |
| | Benzyl alcohol | 2 / 5 | 1.0 | 2.1 | mg/kg | -- | NA | 658 ss4 | No | No | No | BSL |
| | Chrysene | 5 / 5 | 0.035 | 0.054 | mg/kg | -- | NA | 4.73 ss4 | No | No | No | BSL |
| | Dibenzofuran | 2 / 5 | 0.028 | 0.018 | mg/kg | -- | NA | -- | NSL | No | Yes | NSL |
| | Fluoranthene | 5 / 5 | 0.069 | 0.11 | mg/kg | -- | NA | 122 ss4 | No | No | No | BSL |
| | Fluorene | 2 / 5 | 0.015 | 0.012 | mg/kg | -- | NA | 122 ss4 | No | No | No | BSL |
| | Indeno(1,2,3-cd)pyrene | 4 / 5 | 0.019 | 0.022 | mg/kg | -- | NA | 109 ss4 | No | No | No | BSL |
| | Naphthalene | 3 / 5 | 0.017 | 0.021 | mg/kg | -- | NA | 0.0994 ss4 | No | No | No | BSL |
| | Phenanthrene | 4 / 5 | 0.043 | 0.056 | mg/kg | -- | NA | 45.7 ss4 | No | No | No | BSL |
| | Phenol | 2 / 5 | 0.13 | 0.18 | mg/kg | -- | NA | 30 ss1 | No | No | No | BSL |
| | Pyrene | 5 / 5 | 0.048 | 0.074 | mg/kg | -- | NA | 78.5 ss4 | No | No | No | BSL |
| Explosives | 2,6-Dinitrotoluene | 1 / 42 | 0.10 | 0.14 | mg/kg | -- | NA | 0.0328 ss4 | Yes | No | Yes | ASL |
| Other Analytes | Cyanide, Total | 14 / 42 | 0.31 | 1.3 | mg/kg | 0.00 | Yes | 1.33 ss4 | No | No | No | BSL |

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)
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 L10-15**
**Load Line 10 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 | 6 / 6 | 9783 | 19000 | mg/kg | 13900 | Yes | 29000 | No | -- | NSL | No | No | BLSRV |
| | Arsenic | 6 / 6 | 89 | 270 | mg/kg | 19.5 | Yes | 25 | Yes | 9.79 sd1 | Yes | No | Yes | ASL |
| | Barium | 6 / 6 | 834 | 4600 | mg/kg | 123 | Yes | 190 | Yes | -- | NSL | No | Yes | NSL |
| | Beryllium | 6 / 6 | 0.89 | 1.8 | mg/kg | 0.38 | Yes | 0.8 | Yes | -- | NSL | No | Yes | NSL |
| | Cadmium | 2 / 6 | 2.1 | 7.1 | mg/kg | 0.00 | Yes | 0.79 | Yes | 0.99 sd1 | Yes | No | Yes | ASL |
| | Calcium | 6 / 6 | 18867 | 90000 | mg/kg | 5510 | Yes | 21000 | Yes | NUT | No | No | No | BSL |
| | Chromium | 6 / 6 | 99 | 270 | mg/kg | 18.1 | Yes | 29 | Yes | 43.4 sd1 | Yes | No | Yes | ASL |
| | Cobalt | 6 / 6 | 8.9 | 10 | mg/kg | 9.1 | Yes | 12 | No | 50 sd2 | No | No | No | BLSRV |
| | Copper | 6 / 6 | 289 | 980 | mg/kg | 27.6 | Yes | 32 | Yes | 31.6 sd1 | Yes | No | Yes | ASL |
| | Iron | 6 / 6 | 37833 | 71000 | mg/kg | 28200 | Yes | 41000 | Yes | -- | NSL | No | Yes | NSL |
| | Lead | 6 / 6 | 10563 | 39000 | mg/kg | 27.4 | Yes | 47 | Yes | 35.8 sd1 | Yes | No | Yes | ASL |
| | Magnesium | 6 / 6 | 3283 | 6500 | mg/kg | 2760 | Yes | 7100 | No | NUT | No | No | No | BLSRV |
| | Manganese | 6 / 6 | 492 | 970 | mg/kg | 1950 | No | 1500 | No | -- | NSL | No | No | BLBKG |
| | Nickel | 6 / 6 | 26 | 41 | mg/kg | 17.7 | Yes | 33 | Yes | 22.7 sd1 | Yes | No | Yes | ASL |
| | Potassium | 6 / 6 | 1357 | 2600 | mg/kg | 1950 | Yes | 6800 | No | NUT | No | No | No | BLSRV |
| | Selenium | 3 / 6 | 2.4 | 6.6 | mg/kg | 1.7 | Yes | 1.7 | Yes | -- | NSL | No | Yes | NSL |
| | Silver | 2 / 6 | 0.89 | 1.2 | mg/kg | 0.00 | Yes | 0.43 | Yes | 0.5 sd2 | Yes | No | Yes | ASL |
| | Sodium | 5 / 6 | 575 | 1300 | mg/kg | 112 | Yes | -- | NA | NUT | No | No | No | BSL |
| | Vanadium | 6 / 6 | 24 | 34 | mg/kg | 26.1 | Yes | 40 | No | -- | NSL | No | No | BLSRV |
| | Zinc | 6 / 6 | 706 | 2000 | mg/kg | 532 | Yes | 160 | Yes | 121 sd1 | Yes | No | Yes | ASL |
| | Antimony | 2 / 6 | 51 | 300 | mg/kg | 0.00 | Yes | 1.3 | Yes | -- | NSL | No | Yes | NSL |
| | Mercury | 5 / 6 | 0.30 | 1.2 | mg/kg | 0.06 | Yes | 0.12 | Yes | 0.18 sd1 | Yes | Yes | Yes | ASL |
| Pesticides | 4,4'-DDD | 1 / 1 | 0.017 | 0.017 | mg/kg | -- | NA | -- | NA | 0.00488 sd2 | Yes | Yes | Yes | ASL |
| | 4,4'-DDE | 1 / 1 | 0.045 | 0.045 | mg/kg | -- | NA | -- | NA | 0.00316 sd2 | Yes | Yes | Yes | ASL |
| | 4,4'-DDT | 1 / 1 | 0.055 | 0.055 | mg/kg | -- | NA | -- | NA | 0.00416 sd2 | Yes | Yes | Yes | ASL |
| | alpha-Chlordane | 1 / 1 | 0.0018 | 0.0018 | mg/kg | -- | NA | -- | NA | 0.00324 sd2 | No | Yes | Yes | PBT |
| | Dieldrin | 1 / 1 | 0.0016 | 0.0016 | mg/kg | -- | NA | -- | NA | 0.0019 sd2 | No | Yes | Yes | PBT |
| | Endosulfan I | 1 / 1 | 0.0011 | 0.0011 | mg/kg | -- | NA | -- | NA | 0.00326 sd2 | No | Yes | Yes | PBT |
| | gamma-Chlordane | 1 / 1 | 0.0053 | 0.0053 | mg/kg | -- | NA | -- | NA | 0.00324 sd2 | Yes | Yes | Yes | ASL |
| SVOCs | 2-Methylnaphthalene | 1 / 2 | 14 | 28 | mg/kg | -- | NA | -- | NA | 0.0202 sd2 | Yes | No | Yes | ASL |
| | Acenaphthene | 1 / 2 | 20 | 39 | mg/kg | -- | NA | -- | NA | 0.00671 sd2 | Yes | No | Yes | ASL |
| | Acenaphthylene | 1 / 2 | 0.38 | 0.74 | mg/kg | -- | NA | -- | NA | 0.00587 sd2 | Yes | No | Yes | ASL |
| | Anthracene | 1 / 2 | 14 | 27 | mg/kg | -- | NA | -- | NA | 0.0572 sd1 | Yes | No | Yes | ASL |
| | Benzo(a)anthracene | 2 / 2 | 13 | 25 | mg/kg | -- | NA | -- | NA | 0.108 sd1 | Yes | No | Yes | ASL |
| | Benzo(a)pyrene | 2 / 2 | 5.5 | 11 | mg/kg | -- | NA | -- | NA | 0.15 sd1 | Yes | No | Yes | ASL |
| | Benzo(b)fluoranthene | 2 / 2 | 9.0 | 18 | mg/kg | -- | NA | -- | NA | 10.4 sd2 | Yes | No | Yes | ASL |
| | Benzo(g,h,i)perylene | 2 / 2 | 2.1 | 4.2 | mg/kg | -- | NA | -- | NA | 0.17 sd2 | Yes | No | Yes | ASL |
| | Benzo(k)fluoranthene | 2 / 2 | 5.5 | 11 | mg/kg | -- | NA | -- | NA | 0.24 sd2 | Yes | No | Yes | ASL |
| | Carbazole | 1 / 2 | 4.9 | 9.6 | mg/kg | -- | NA | -- | NA | -- | NSL | No | Yes | NSL |
| | Chrysene | 2 / 2 | 12 | 24 | mg/kg | -- | NA | -- | NA | 0.166 sd1 | Yes | No | Yes | ASL |
| | Dibenzo(a,h)anthracene | 1 / 2 | 1.2 | 2.4 | mg/kg | -- | NA | -- | NA | 0.033 sd1 | Yes | No | Yes | ASL |
| | Dibenzofuran | 1 / 2 | 19 | 37 | mg/kg | -- | NA | -- | NA | 0.449 sd2 | Yes | No | Yes | ASL |
| | Fluoranthene | 2 / 2 | 37 | 74 | mg/kg | -- | NA | -- | NA | 0.423 sd1 | Yes | No | Yes | ASL |
| | Fluorene | 1 / 2 | 22 | 44 | mg/kg | -- | NA | -- | NA | 0.0774 sd1 | Yes | No | Yes | ASL |
| | Indeno(1,2,3-cd)pyrene | 2 / 2 | 2.5 | 4.9 | mg/kg | -- | NA | -- | NA | 0.2 sd2 | Yes | No | Yes | ASL |
| | Naphthalene | 1 / 2 | 9.0 | 18 | mg/kg | -- | NA | -- | NA | 0.176 sd1 | Yes | No | Yes | ASL |
| | Phenanthrene | 1 / 2 | 65 | 130 | mg/kg | -- | NA | -- | NA | 0.204 sd1 | Yes | No | Yes | ASL |
| | Pyrene | 2 / 2 | 26 | 51 | mg/kg | -- | NA | -- | NA | 0.195 sd1 | Yes | No | Yes | ASL |
| | Total PAHs (1) | 2 / 2 | 242 | 512.24 | mg/kg | -- | NA | -- | NA | 1.610 sd1 | Yes | No | Yes | ASL |
| Explosives | 2,6-Dinitrotoluene | 2 / 6 | 2.8 | 11 | mg/kg | -- | NA | -- | NA | 0.00398 sd2 | Yes | No | Yes | ASL |
| | 2-Amino-4,6-Dinitrotoluene | 2 / 6 | 0.57 | 1.7 | mg/kg | -- | NA | -- | NA | -- | NSL | No | Yes | NSL |
| | 4-Amino-2,6-Dinitrotoluene | 1 / 6 | 0.59 | 0.86 | mg/kg | -- | NA | -- | NA | -- | NSL | No | Yes | NSL |
| | Tetryl | 1 / 6 | 0.64 | 0.87 | mg/kg | -- | NA | -- | NA | -- | NSL | No | Yes | NSL |
| Propellants | Nitroguanidine | 1 / 1 | 0.056 | 0.056 | 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)
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)
BLSRV-Below Sediment Reference Value
(1) - maximum detected concentration of total PAHs was calculated by summing positive detections

**Table L10-16**
**Load Line 10 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 | 17 / 21 | 1177 | 12000 | ug/l | 3370 | Yes | -- | NSL | No | Yes | NSL |
| | Barium | 21 / 21 | 51 | 270 | ug/l | 47.5 | Yes | 2000 sw1 | No | No | No | BSL |
| | Beryllium | 3 / 21 | 0.95 | 1.1 | ug/l | 0.00 | Yes | 75 sw1[H] | No | No | No | BSL |
| | Cadmium | 11 / 21 | 1.3 | 6.1 | ug/l | 0.00 | Yes | 3.9 sw1[H] | Yes | No | Yes | ASL |
| | Calcium | 21 / 21 | 28800 | 74000 | ug/l | 41400 | Yes | NUT | No | No | No | BSL |
| | Chromium | 12 / 21 | 25 | 200 | ug/l | 0.00 | Yes | 1609 sw1[H] | No | No | No | BSL |
| | Cobalt | 3 / 21 | 2.5 | 4 | ug/l | 0.00 | Yes | 220 sw1 | No | No | No | BSL |
| | Copper | 14 / 21 | 61 | 400 | ug/l | 7.9 | Yes | 12 sw1[H] | Yes | No | Yes | ASL |
| | Iron | 21 / 21 | 2021 | 14000 | ug/l | 2560 | Yes | -- | NSL | No | Yes | NSL |
| | Magnesium | 21 / 21 | 3647 | 8300 | ug/l | 10800 | No | NUT | No | No | No | BLBKG |
| | Manganese | 21 / 21 | 48 | 210 | ug/l | 391 | No | -- | NSL | No | No | BLBKG |
| | Nickel | 3 / 21 | 8.9 | 50 | ug/l | 0.00 | Yes | 417 sw1[H] | No | No | No | BSL |
| | Potassium | 21 / 21 | 5748 | 15000 | ug/l | 3170 | Yes | NUT | No | No | No | BSL |
| | Selenium | 2 / 21 | 7.1 | 3.2 | ug/l | 0.00 | Yes | -- | NSL | No | Yes | NSL |
| | Silver | 2 / 21 | 4.6 | 1 | ug/l | 0.00 | Yes | 1.1 sw1[H] | No | No | No | BSL |
| | Sodium | 21 / 21 | 1538 | 5900 | ug/l | 21300 | No | NUT | No | No | No | BLBKG |
| | Vanadium | 4 / 21 | 6.2 | 24 | ug/l | 0.00 | Yes | 150 sw1 | No | No | No | BSL |
| | Zinc | 14 / 21 | 154 | 850 | ug/l | 42 | Yes | 106 sw1[H] | Yes | No | Yes | ASL |
| | Antimony | 10 / 21 | 60 | 880 | ug/l | 0.00 | Yes | 900 sw1 | No | No | No | BSL |
| | Arsenic | 12 / 21 | 79 | 770 | ug/l | 3.2 | Yes | 340 sw1 | Yes | No | Yes | ASL |
| | Lead | 21 / 21 | 2377 | 14000 | ug/l | 0.00 | Yes | 103 sw1[H] | Yes | No | Yes | ASL |
| | Mercury | 3 / 21 | 0.16 | 0.77 | ug/l | 0.00 | Yes | 1.7 sw1 | No | Yes | Yes | PBT |
| SVOCs | Acenaphthene | 1 / 21 | 0.49 | 0.61 | ug/l | -- | NA | 19 sw1 | No | No | No | BSL |
| | Acenaphthylene | 1 / 21 | 0.51 | 0.94 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Anthracene | 4 / 21 | 0.58 | 2.7 | ug/l | -- | NA | 0.18 sw1 | Yes | No | Yes | ASL |
| | Benzo(a)anthracene | 5 / 21 | 0.40 | 5.3 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Benzo(a)pyrene | 6 / 21 | 0.41 | 3.5 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Benzo(b)fluoranthene | 6 / 21 | 1.1 | 16 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Benzo(g,h,i)perylene | 6 / 21 | 0.63 | 3.7 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Benzo(k)fluoranthene | 5 / 21 | 0.48 | 5.7 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Bis(2-ethylhexyl) phthalate | 4 / 21 | 10.0 | 30 | ug/l | -- | NA | 1100 sw1 | No | No | No | BSL |
| | Carbazole | 1 / 21 | 2.5 | 3.4 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Chrysene | 8 / 21 | 1.5 | 25 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Dibenzo(a,h)anthracene | 4 / 21 | 0.23 | 0.82 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Dibenzofuran | 1 / 21 | 0.96 | 0.49 | ug/l | -- | NA | 36 sw1 | No | No | No | BSL |
| | Di-n-butyl phthalate | 1 / 21 | 2.5 | 3 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Fluoranthene | 8 / 21 | 3.4 | 59 | ug/l | -- | NA | 3.7 sw1 | Yes | No | Yes | ASL |
| | Fluorene | 1 / 21 | 0.50 | 0.63 | ug/l | -- | NA | 110 sw1 | No | No | No | BSL |
| | Indeno(1,2,3-cd)pyrene | 6 / 21 | 0.42 | 3.8 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | n-Nitrosodiphenylamine | 1 / 21 | 0.48 | 0.21 | ug/l | -- | NA | -- | NSL | No | Yes | NSL |
| | Pentachlorophenol | 1 / 21 | 4.9 | 4.8 | ug/l | -- | NA | nv | NSL | No | Yes | NSL |
| | Phenanthrene | 5 / 21 | 1.0 | 12 | ug/l | -- | NA | 31 sw1 | No | No | No | BSL |
| | Pyrene | 8 / 21 | 2.7 | 46 | ug/l | -- | NA | 42 sw1 | Yes | No | Yes | ASL |
| Explosives | 1,3,5-Trinitrobenzene | 2 / 21 | 0.13 | 0.19 | ug/l | -- | NA | 27 sw1 | No | No | No | BSL |
| | 2,4,6-TNT | 1 / 21 | 0.16 | 0.29 | ug/l | -- | NA | 120 sw1 | No | No | No | BSL |
| | 2,6-Dinitrotoluene | 1 / 21 | 0.28 | 0.37 | ug/l | -- | NA | 730 sw1 | No | No | No | BSL |
| | 2-Amino-4,6-Dinitrotoluene | 1 / 21 | 0.23 | 0.23 | ug/l | -- | NA | 160 sw1 | No | No | No | BSL |
| | 4-Amino-2,6-Dinitrotoluene | 2 / 21 | 0.22 | 0.46 | ug/l | -- | NA | 98 sw1 | No | No | No | BSL |
| Propellants | Nitroglycerine | 1 / 2 | 0.40 | 0.21 | ug/l | -- | NA | 160 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 87 (mg/l)
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 L10-17**
**Load Line 10 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 | Arsenic | X | | X |
| | Beryllium | | | |
| | Cadmium | | | X |
| | Chromium | X | | |
| | Copper | | | X |
| | Iron | X | | Q |
| | Lead | X | | X |
| | Magnesium | | | |
| | Nickel | X | | |
| | Selenium | X | | Q |
| | Silver | | | |
| | Vanadium | | | |
| | Zinc | X | | X |
| | Antimony | | | |
| | Arsenic | X | | X |
| | Lead | X | | X |
| | Mercury | X | | X |
| Pesticides | 4,4'-DDD | | | |
| | 4,4'-DDE | | | |
| | 4,4'-DDT | | | |
| | Dieldrin | | | |
| | gamma-Chlordane | | | |
| SVOCs | 2,6-Dinitrotoluene | X | | |
| | 2-Methylnaphthalene | | | |
| | Acenaphthene | | | |
| | Acenaphthylene | | | Q |
| | Anthracene | | | X |
| | Benzo(a)anthracene | | | Q |
| | Benzo(a)pyrene | | | Q |
| | Benzo(b)fluoranthene | | | Q |
| | Benzo(g,h,i)perylene | | | Q |
| | Benzo(k)fluoranthene | | | Q |
| | Carbazole | | | Q |
| | Chrysene | | | Q |
| | Dibenzo(a,h)anthracene | | | Q |
| | Dibenzofuran | Q | | |
| | Di-n-butyl phthalate | | | Q |
| | Fluoranthene | | | X |
| | Fluorene | | | |
| | Indeno(1,2,3-cd)pyrene | | | Q |
| | Naphthalene | | | |
| | n-Nitrosodiphenylamine | | | Q |
| | Pentachlorophenol | | | Q |
| | Phenanthrene | | | |
| | Pyrene | | | X |
| | Total PAHs | | | |
| Explosives | 2,6-Dinitrotoluene | X | | |
| | 2-Amino-4,6-Dinitrotoluene | | | |
| | 4-Amino-2,6-Dinitrotoluene | | | |
| | Tetryl | | | |
| Propellants | Nitroguanidine | | | |

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

Total PAHs are only applicable to sediments For soil and surface water, only the individual PAHs are screened