PART III

FINAL

SITE SAFETY AND HEALTH PLAN ADDENDUM

FOR THE

FACILITY-WIDE GROUNDWATER MONTORING PROGRAM

RAVENNA ARMY AMMUNITION PLANT, RAVENNA, OHIO

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APPROVALS

SITE SAFETY AND HEALTH PLAN ADDENDUM
FOR THE
FACILITY-WIDE GROUNDWATER MONITORING PROGRAM
AT THE
RAVENNA ARMY AMMUNITION PLANT
RAVENNA, OHIO

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ACRONYMS

AOC	Area of Concern
CHSO	contractor Health & Safety Officer
COC	contaminant of concern
DNT	dinitrotoluene
EOD	explosive ordnance disposal
FP	flash point
FWGWMP	Facility-Wide Groundwater Monitoring Program
GI	gastrointestinal
HCl	hydrochloric acid
H&S	Health and Safety
IDW	investigation derived waste
IP	ionization potential
JMC	Joint Munitions Command
MEC	Munitions and Explosives of Concern
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PPE	personal protective equipment
PVC	polyvinyl chloride
RDX	hexahydro-1,3,5-trinitro-1,3,5-triazine
RVAAP	Ravenna Army Ammunition Plant
SHP	Safety & Health Plan
SSHO	Site Safety and Health Officer
TNT	2,4,6-trinitrotoluene
USACE	U.S. Army Corps of Engineers
VP	vapor pressure

INTRODUCTION

This Safety and Health Plan (SHP) Addendum for the Facility-Wide Groundwater Monitoring Program (FWGWMP) sets forth the minimum requirements for protecting personnel involved in performing work under this program at the Ravenna Army Ammunition Plant (RVAAP). Standard procedures must be used to minimize the potential for personnel injury or illness. These will include on-site training, routine inspections, visual and instrument (as appropriate) surveillance for munitions and explosives of concern, and enforcement of the health and safety requirements by project management. This plan is organized to follow and address the requirements in Appendix B to ER 385-1-92, "Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste and Ordnance and Explosive Waste Activities." It is designed to comply with the requirements of Environmental Management (EM) 385-1-1, "U.S. Army Corps of Engineers (USACE) Safety and Health Requirements Manual," and relevant Occupational Safety and Health Administration (OSHA) regulations. This plan was prepared to provide guidance on health and safety hazards and controls. Nothing in this document relieves the contractor from the requirement to comply with all applicable portions of the EM 385-1-1 and OSHA regulations, and to provide a safe workplace.

This SHP Addendum is intended to serve as a lower tier document to the Facility-Wide Safety and Health Plan (FSHP) and is intended to address the hazards and controls expected to be unique to the anticipated on-site tasks involved in performance of work under the FWGWMP. A copy of the FSHP and this SHP addendum will be present and available for review at each work site.

Anticipated environmental investigation tasks expected to be performed during implementation of the FWGWMP include:

- site visits,
- groundwater monitoring well purging and sampling,
- vegetation clearing,
- investigation-derived waste handling, and
- sampling equipment decontamination.

Potential hazards posed by the planned tasks include injury from ordnance and explosives; noise and cut hazards associated with clearing vegetation; lifting, noise, and strain hazards associated with operating sampling equipment; fuel or decontamination solvent fires; chemical exposure; temperature extremes; stinging/biting insects; poisonous plants; and snakes. The potential for chemical overexposure appears to be minimal, given the nature of planned tasks. All of the potential contaminants have low vapor pressures, making overexposure through vapor inhalation highly unlikely. All of the planned tasks pose minimal potential for creating airborne particulates. There may be some potential for adverse effects due to dermal contact with contaminated soil or groundwater. Contractor personnel will use Level D personal protective equipment (PPE), plus protective gloves that are known to be resistant to the chemicals of concern (COCs) on site to handle potentially contaminated materials. If necessary, the

Contractor Site Safety and Health Officer (SSHO) will upgrade the required PPE to dermal contact with potentially contaminated materials. The Contractor SSHO will observe all site tasks during daily safety inspections and will use professional judgment and appropriate monitoring results to determine if upgrading PPE is required. A detailed analysis of these hazards and specific appropriate controls is presented in Chapter 2.0, Table 2-2.

1.0 SITE DESCRIPTION AND CHARACTERIZATION

1.1 SITE DESCRIPTION

The RVAAP is located in northeastern Ohio within Portage and Trumbull Counties, approximately 4.8 km (3 miles) northeast of the town of Ravenna. The facility consists of 8668.3 ha (21,419 acres) in a 17.7-km (11-mile)-long, 5.6-km (3.5-mile)-wide tract bordered by sparsely inhabited private residences. The installation is an inactive government-owned Joint Munitions Command (JMC) facility maintained by a contracted caretaker, Tol-Test, Inc.

The facility was active from 1941 to 1992. On-site activities included loading, assembling, storing and packing military ammunition, demilitarization of munitions, production of ammonium nitrate fertilizer, and disposal of "off-spec" munitions. Munitions handled on the installation included artillery rounds of 90 mm or more and 2000-pound bombs. A number of Areas of Concern (AOCs) have currently been identified. A description of each AOC is included in the installation Preliminary Assessment (December 1995), the RVAAP Installation Action Plan (2003), and the Relative Risk Site Evaluation (USACHPPM 1998).

1.2 CONTAMINANTS

The RVAAP AOCs were associated with the assembly, storage, shipment, and/or disposal of a variety of materials including munitions and wastes. The principal munitions assembled on the installation were artillery rounds of 90-mm or more and 2000-pound bombs. Contaminants of concern that are potentially present include explosive compounds (cyclonite, trinitrotoluene {TNT}, smokeless powder), propellants, polychlorinated biphenyls, petroleum hydrocarbons, and metals (aluminum, arsenic, barium, cadmium, chromium, lead, manganese, mercury, selenium, silver, and zinc). Contaminants that are potentially present at each AOC are discussed in an investigation-specific addendum prepared for each AOC.

2.0 HAZARD/RISK ANALYSIS

The purpose of the task hazard analysis is to identify and assess potential hazards that may be encountered by personnel and to prescribe required controls. Table 2-1 is a checklist of common hazards that may be posed during the implementation of the FWGWMP. It indicates whether a particular major type of hazard is present. The tasks to be performed as part of the FWGWMP are expected to consist of clearing vegetation; purging and sampling groundwater monitoring wells; and managing investigation-derived waste (IDW). In general, given these tasks, the potential for unacceptable exposure to contaminants appears to be low. The expected tasks present a variety of physical hazards including munitions and explosives of concern (MEC), contact with equipment, noise, and heat/cold stress.

Table 2-1. Hazards Inventory

Yes	No	Hazard
	X	Confined space entry [Not anticipated. Any confined space entry will require assessment in the SSHP Addendum and compliance with Section 9.4]
	X	Excavation entry [Not anticipated. Any excavation entry will require sloping or shoring excavation and compliance with all other applicable requirements]
	X	Heavy equipment (drill rigs, backhoes). [Not anticipated]
X		Potential dangerous tools (brush clearing with chainsaws, machetes, sling blades)
X		Heavy lifting (IDW handling)
X		Fire (fuels)
X		Explosion (munitions and explosives of concern)
X		Electrical shock (electrical equipment)
X		Exposure to chemicals (site contaminants and chemicals used during site work)
X		Temperature extremes
X		Biological hazards (poison ivy, Lyme disease, Histoplasmosis)
	X	Radiation or radioactive contamination
X		Noise (equipment)

Specific sampling tasks considered in this document are as follows:

- groundwater monitoring well purging and sampling,
- vegetation clearing,
- investigation-derived waste handling, and
- sampling equipment decontamination.

2.1 TASK-SPECIFIC HAZARD ANALYSIS

Table 2-2 presents task-specific hazards, minimum hazard controls, and required monitoring, if appropriate, for all of the planned tasks. This assessment is based on the U.S. Army expectations and some assumptions regarding the planned tasks. It is ultimately the Contractor's responsibility to ensure that the hazards of each task are adequately controlled. In cases where the following controls are not appropriate or sufficient for the specific task(s) to be performed by the Contractor, the Contractor must specify additional appropriate and sufficient controls.

2.2 POTENTIAL EXPOSURES

Information on the significant suspected contaminants and the chemical tools that may be used when performing work under the FWGWMP is provided in Table 2-3. Note that this list includes contaminants known or suspected to occur at any of the AOCs at concentrations sufficient to pose a risk of overexposure.

Table 2-2. Hazards Analysis

Safety and Health Hazards	Controls	Monitoring
Groundwater Monitoring Well Purging and Sampling		
General safety hazards (moving or heavy equipment, slips, falls)	Level D PPE Hazardous waste safety training.	Daily site safety inspections.
Noise	Hearing protection if monitoring indicates noise exposure of greater than 90 decibels.	Daily safety inspections.
Fire (vehicle fuels or subsurface contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with no smoking or open flames signs. Fire extinguishers in all fuel use areas.	Combustible gas indicator if buried organic material or other source of flammable gas is suspected.
Contact with munitions and explosives of concern	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Staying upwind of any dust-generating activities. Minimal contact. Hazard communication training. MSDSs for chemical tools on site. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work. Decontamination of potentially contaminated equipment prior to servicing.	Photoionization detector or other sampling as appropriate.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.

Safety and Health Hazards	Controls	Monitoring
Temperature extremes	Administrative controls. Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area. Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, Lyme disease, West Nile Virus, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellant, as necessary. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Inspect for ticks during the day and at the end of each work day. Avoidance of accumulations of bird or bat droppings.	Visual survey.
Vegetation Clearing with Chainsaws, Machetes, and Sling Blades		
General safety hazards (rotating machinery, contact with sharp edges, slips, falls)	Level D PPE plus hard hat. Only experienced operators. Personnel operating brush-clearing tools must maintain separation of at least 4.5 meters (15 feet). Tools must be inspected daily and taken out of service if damaged. Exclusion zone if there is a potential for entry of unauthorized personnel. Hazardous waste safety training.	Daily site safety inspections.
Chainsaw kickback and related hazards	Saws must have automatic chain brake or kickback device. Idle speed adjusted so chain does not move when idling. Saws must not be used to cut above shoulder height. Saws must be held with both hands when operating. Additional requirements at 385-1-1 Section 31.	Daily inspection.
Noise (chainsaw)	Hearing protection within 7.6 meters (25 feet) of operating chainsaw unless rig-specific monitoring indicates noise exposure of less than 90 decibels.	Daily safety inspections.

Safety and Health Hazards	Controls	Monitoring
Fire (fuels)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with No Smoking or Open Flames signs. Fire extinguishers in all fuel use areas. Gasoline powered equipment turned off and allowed to cool for at least five minutes prior to fueling.	Daily safety inspection.
Contact with munitions and explosives of concern	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Hazard communication training. Chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	Daily safety inspection.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Temperature extremes	Administrative controls. Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area. Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice per day. Pulse rates at the start of each break if wearing impermeable clothing.
Biological hazards (bees, ticks, Lyme disease, West Nile Virus, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellant, as necessary. Pant legs tucked into boots or otherwise closed to minimize potential for tick entry. Inspect for ticks during the day and at the end of each work day. Avoidance of accumulations of bird or bat droppings.	Visual survey.

Safety and Health Hazards	Controls	Monitoring
Electric shock	Electrical tools must be double insulated or connected through heavy duty power cord to GFCI.	Daily safety inspection.
Investigation-Derived Waste Handling		
General hazards (lifting equipment, manual lifting, slips)	Level D PPE including heavy duty gloves for materials handling. Unnecessary personnel will stay well clear of operating equipment. Functional back-up alarm on fork trucks, bobcats, trucks, etc. Documented forklift training for forklift operators. Only experienced operators will be allowed to operate equipment. No personnel allowed under lifted loads. Lifts of over 50 pounds will be made with two or more personnel or with lifting equipment. Hazardous waste safety training. Compliance with EM 385-1-1 Sections 14 and 16.	Daily safety inspections of operations. Daily inspection of equipment to verify brakes and operating systems are in proper working condition.
Contact with munitions and explosives of concern	On-site training in ordnance recognition for all field personnel. Clearance of sites by EOD personnel for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Medical clearance for hazardous waste work.	Daily safety inspections.
Gunfire (deer hunting with shotguns loaded with slugs allowed on Friday and Saturday during season)	No contractors permitted on site on hunt days.	None.
Fire (vehicle fuels and flammable contaminants)	Fuels stored in safety cans with flame arrestors. Bonding and grounding during fuel transfers. Fuel storage areas marked with No Smoking or Open Flames signs. Fire extinguishers in all fuel use areas.	Daily safety inspection.

Safety and Health Hazards	Controls	Monitoring
Noise	Hearing protection within 7.6 meters (25 feet) of any noisy drum moving equipment unless equipment-specific monitoring indicates exposures less than 90 decibels.	Daily safety inspections.
Biological hazards (bees, ticks, Lyme disease, West Nile Virus, Histoplasmosis, wasps, snakes)	PPE (boots, work clothes). Insect repellant, as necessary. Pant legs tucked into boots or otherwise closed to minimize tick entry. Inspect for ticks during the day and at the end of each work day. Avoidance of accumulations of bird or bat droppings.	Visual survey.
Electric shock	Identification and clearance of overhead utilities.	Visual of all work areas.
Temperature extremes	Administrative controls. Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area. Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice daily. Pulse rates at the start of each break if wearing impermeable clothing.
Equipment Decontamination (Hot Water Washing, Soap and Water Washing, HCl, and Methanol Rinse)		
General equipment decontamination hazards (hot water, slips, falls, equipment handling)	Level D PPE plus nitrile or PVC gloves. Hazardous waste safety training.	Daily safety inspections.
Noise (spray washer)	Hearing protection when washer is operating unless equipment-specific monitoring indicates that exposure is less than 90 decibels.	None.
Fire (decontamination solvents and gasoline)	Flammable material stored in original containers or in safety cans with flame arrestors. Fire extinguisher kept near decon area.	Daily safety inspection.
Contact with munitions and explosives of concern	On-site training in ordnance recognition for all field personnel. Clearance of sites for intrusive work. Withdrawal of all non-EOD personnel if ordnance or suspected ordnance is discovered.	Visual surveys for ordnance. Instrument surveys by EOD technicians in munitions disposal areas.

Safety and Health Hazards	Controls	Monitoring
Exposure to chemicals	PPE (Level D) plus nitrile or equivalent gloves for contact with contaminated material. Washing face and hands prior to taking anything by mouth. Minimal contact. Hazard communication training for chemical tools. MSDS on site. All chemical containers labeled to indicate contents and hazard. Medical clearance for hazardous waste work.	None.
Temperature extremes	Administrative controls. Cooled (shaded) or warmed break area depending on the season. Routine breaks in established break area. Chilled drinks if temperature exceeds 70°F.	Temperature measurements at least twice a day. Pulse rates at the start of each break if wearing impermeable clothing.

EOD = explosive ordnance disposal.
GFCI = ground fault circuit interrupter.
MSDS = Material Safety Data Sheet.
PPE = personal protective equipment.
PVC = polyvinyl chloride.

Table 2-3. Potential Exposures

Chemical[a]	Health Effects/ Potential Hazards[b]	Chemical and Physical Properties[b]	Exposure Route(s)[b]
Chromium	Eye irritation, sensitization	Solid; properties vary depending upon specific compound	Inhalation Congestion Contact
Dinitrotoluene (DNT)	Suspected human carcinogen, anorexia, cyanosis, reproductive effects	Orange-yellow solid, VP: 1 mm; FP: 404°F	Inhalation Absorption Ingestion Contact
Gasoline (used for fuel)	Potential carcinogen per NIOSH, dizziness, eye irritation, dermatitis	Liquid with aromatic odor; FP: -45°F; VP: 38-300 mm	Inhalation Absorption Ingestion Contact
Hydrochloric acid (HCl)	Eye and skin irritation and/or destruction	Liquid with acrid odor; FP: NA; IP: NA	Inhalation Absorption Ingestion Contact
Lead	Weakness, anorexia, abdominal pain, anemia	Solid metal; VP: 0 mm; FP: NA; IP: NA	Inhalation Ingestion Contact
Liquinox (used for decontamination)	Inhalation of powder may cause local irritation of mucus membranes	White powder, odorless, nonflammable	Inhalation Ingestion Contact
Mercury	Irritation of eyes and skin; coughing, GI disturbance, anorexia	Silver liquid; FP: NA; VP: 0.0012 mm	Inhalation Absorption Ingestion Contact
Methanol (potentially used for equipment decontamination)	Eye and skin irritation, headache, cough; optic nerve damage	Liquid; VP: 96 mm; FP: 52°F; IP: 10.84 eV	Inhalation Absorption Ingestion Contact

Table 2-3. (continued)

Chemical[a]	Health Effects/ Potential Hazards[b]	Chemical and Physical Properties[b]	Exposure Route(s)[b]
Cyclonite (RDX)	Explosive; irritation of eyes and skin, dizziness, weakness	White powder; FP: explodes; VP: 0.0004 mm at 230°F	Inhalation Absorption Ingestion Contact
Smokeless powder (nitrocellulose)	Low toxicity	Amorphous solid; FP: 55°F	Not given
Trinitrotoluene (TNT)	Irritation of skin and mucus membranes, liver damage, kidney damage	Pale solid; FP: explodes; VP: 0.0002 mm	Inhalation Absorption Ingestion Contact
Arsenic	Dermatitis, nasal tissue damage, stomach upset, potential cancer	Solid; VP: 0 mm; FP: NA	Inhalation Indigestion Absorption Contact
Barium	Irritation of eyes, skin, lungs; muscle spasm	Solid; VP: Low; FP: NA	Inhalation Ingestion Contact
Cadmium	Breathing difficulty, cough, chest tightness, pain beneath the sternum, headache, chills, aches, vomiting	Solid; VP: 0 mm; FP: NA	Inhalation Ingestion Contact
Selenium	Irritation of eyes, skin, throat; liver and/or spleen damage	Solid; FP: NA; VP: 0 mm	Inhalation Ingestion Contact
Zinc	Irritant to eyes	Soft white metal with a bluish tinge	NA
Propellant (containing nitrocellulose and potentially nitroglycerin)	Faintness, rapid pulse, dizziness, muscle twitch, damage to blood cells, vomiting	Solid; VP: 0 mm; FP: NA May burn or explode if exposed to high temperatures or shock	Inhalation Ingestion Absorption Contact

[a] The potential chemicals were obtained from the Facility-Wide Safety & Health Plan for the Ravenna Army Ammunition Plant (USACE 2001).
[b] From 1997 NIOSH Pocket Guide to Chemical Hazards, the Condensed Chemical Dictionary, Tenth Edition.
FP=flash point; IP= ionization potential; NA=not available; NIOSH=National Institute for Occupational Safety and Health; VP=vapor pressure

3.0 STAFF ORGANIZATION, QUALIFICATIONS, AND RESPONSIBILITIES

This section presents the general lines of authority, responsibilities, and communication procedures concerning site safety and health and emergency response. It includes key Contractor positions.

3.1 CONTRACTOR PROGRAM MANAGER

The Program Manager is responsible for ensuring conformance with Corporate, and U.S. Army policies and procedures. Specific responsibilities of the Program Manager include:

- coordinating with U.S. Army personnel,
- ensuring that project managers satisfy U.S. Army health and safety requirements,
- ensuring that project staff implement this SHP Addendum,
- ensuring that projects have the necessary resources to operate safely, and
- ensuring that project personnel have the appropriate regard for safe job performance.

3.2 CONTRACTOR HEALTH & SAFETY OFFICER

The Contractor Health & Safety Officer manages the health and safety program. This includes establishing health and safety policies and procedures, supporting project and office activities, and verification of safe work practices and conditions. The specific responsibilities of the Contractor Health & Safety Officer include:

- coordinating with U.S. Army health and safety personnel,
- reviewing and approving SHPs,
- approving downgrades in PPE or protective procedures, and
- interfacing with project personnel through routine communications and audits of selected projects.

3.3 CONTRACT PROJECT MANAGER

The Project Manager is responsible for overall project execution. The responsibilities of the Project Manager include:

- coordinating with U.S. Army personnel, including reporting accidents and incidents to the U.S. Army Project Manager immediately and submitting written reports within 2 working days;

- ensuring implementation of the Facility-wide Safety and Health Plan (FSHP) and this SHP addendum;

- maintaining auditable project documentation of all required records;

- ensuring that a qualified SSHO is designated; and

- maintaining a current copy of the FSHP and this SHP addendum.

3.4 CONTRACTOR FIELD OPERATIONS MANAGER OR TASK LEADER

The Field Operations Manager or Task Leader will oversee the field activities associated with a project and will be responsible for site accessibility, safety, and quality assurance. He/she is responsible for enforcing the field requirements of the FSHP and its addendum. Specific responsibilities of the Field Operations Manager or Task Leader are:

- enforcing compliance with the FSHP and this SHP addendum;

- coordinating on-site operations, including subcontractor activities;

- ensuring that subcontractors follow the requirements of the FSHP and this SHP addendum;

- coordinating and controlling any emergency response actions;

- ensuring that at least two persons currently certified in first aid/cardiopulmonary resuscitation are on-site during site operations; and

- maintaining current copies of the FSHP and this SHP addendum, Environmental Management (EM) 385-1-1, "U.S. Army Corps of Engineers Safety and Health Requirements Manual" on-site.

3.5 SITE SAFETY AND HEALTH OFFICER

The Contractor SSHO is responsible for implementing the FSHP, making health and safety decisions for specific health and safety activities and for verifying the effectiveness of the health and safety program. The SSHO's qualifications include, at a minimum, experience with similar projects, knowledge of and understanding of the FSHP and this addendum, and the ability to use the required monitoring equipment. The SSHO has primary responsibility for the following:

- stopping work or upgrading protective measures (including protective clothing) if uncontrolled health and safety hazards are encountered. Indications of uncontrolled health and safety hazards include monitoring instrument readings in excess of the established action limits, heavy equipment without back-up alarms, exposed munitions and explosives of concern, unguarded moving/rotating equipment, exposed electrical connections, non-compliance with Health and Safety (H&S) requirements, encountering liquids other than water, soil staining suggestive of unexpectedly high concentrations of nonvolatile contaminants, etc. The

SSHO must also authorize resumption of work following correction of the adverse condition(s);

- implementing and verifying compliance with this FSHP and this addendum and reporting to the Field Operations Manager or Task Leader, Project Manager, and Health and Safety Manager any deviations from anticipated conditions;

- conducting daily safety inspections;

- documenting deficiencies identified in the daily inspections and responsible parties, procedures, and timetables for correction;

- ensuring that site personnel have access to this plan and are aware of its provisions;

- conducting a site-specific pre-entry health and safety briefing covering potential chemical and physical hazards, safe work practices, and emergency procedures;

- maintaining on-site auditable documentation of
  - — MSDS for applicable materials utilized at the site;
  - — training for site workers and visitors;
  - — calibration/maintenance of field instruments such as photoionization detectors, combustible gas indicators, etc.;
  - — environmental and personal exposure monitoring results;
  - — notification of accidents/incidents;
  - — reports of any overexposure or excessive levels;
  - — notification of employees of exposure data; and
  - — medical surveillance.

- confirming that all on-site personnel have received the training listed in the Training Requirements section (Section 4.0) of the FSHP;

- issuing respirators, as necessary, and ensuring that all respirator users have received medical clearance within the last year, have been properly trained, and have been successfully fitted for respiratory protection;

- verifying that the FSHP's emergency points of contact are correct and supplying correcting information as necessary;

- ensuring that all monitoring equipment is operating according to the manufacturer's specifications and performing field checks of instrument calibration;

- ensuring monitoring for potential on-site exposures is conducted in accordance with the FSHP and this addendum;

- investigating accidents and near accidents and reporting (in concert with Field Operations Manager or Task Leader) same to Project Manager and Contractor SHO;

- conducting daily "tailgate" safety briefings; and

- controlling visitor access to the exclusion zone.

4.0 TRAINING

Training requirements are outlined in the FSHP and in Table 2-2 of this SHP addendum. In addition, at least one American Red Cross 43-hr Emergency Response certified person will be present during sampling activities at the site. All on-site personnel shall be first aid/CPR trained. All field personnel will be familiarized with the types of ordnance known to have been disposed of at this site.

5.0 PERSONAL PROTECTIVE EQUIPMENT

General guidelines for selection and use of PPE are presented in the FSHP. Specific PPE requirements for this work are presented in the hazard/risk analysis section (Chapter 2.0).

6.0 MEDICAL SURVEILLANCE

Medical surveillance requirements are presented in the FSHP and in Table 2-2 of this SHP addendum.

7.0 EXPOSURE MONITORING PROGRAM

Assessment of airborne chemical concentrations will be performed, as appropriate, to ensure that exposures do not exceed acceptable levels. Action levels, with appropriate responses, have been established for this monitoring. In addition to the specified monitoring, the Contractor SSHO may perform or require additional monitoring, such as organic vapor monitoring, in the equipment decontamination area, or personnel exposure monitoring for specific chemicals. The deployment of monitoring equipment will depend on the activities being conducted and the potential exposures. All personal exposure monitoring records will be maintained in accordance with 29 CFR 1910.120. The minimum monitoring requirements and action levels are presented in Table 7-1.

Most of the FWGWMP fieldwork is not expected to pose airborne exposure hazards for the following reasons:

- Work will be performed in open areas or abandoned buildings with natural ventilation.
- Prior site sampling indicated that contaminants are unlikely to pose an airborne hazard.
- The most probable contaminants (metals, explosives) are materials with relatively low vapor pressures.

Air monitoring of the breathing zone using a photoionization detector or equivalent is planned during groundwater monitoring well sampling. The SSHO will examine site conditions and will contact the Health and Safety Manager and initiate additional monitoring if there is any indication of potential airborne exposure.

Table 7-1. Monitoring Requirements and Action Limits

Hazard or Measured Parameter	Area	Interval	Limit	Action	Tasks
Airborne organics with PID or equivalent	Breathing zone [0.9 meters (3 feet) from source or 0.36 meters (14 inches) in front of employee's shoulder]	From top of well riser pipe and if site conditions, such as chemical smells, indicate that monitoring is necessary	<5 ppm >5 ppm	Level D Withdraw and evaluate: Need for PPE upgrade Notify Project Manager and H&S Manager	Groundwater Sampling
Noise	All	Any area where there is some doubt about noise levels	90 dBA and any area perceived as noisy	Require the use of hearing protection	All
Visible contamination	All	Continuously	Visible contamination of skin or personal clothing	Upgrade PPE to preclulde contact; may include disposable coveralls, boot covers, etc.	All
Visible airborne dust	All	Continuously	Visible dust generation	Stop work; use dust suppression techniques such as wetting surface	All

H&S = Health & Safety
PID = Photoionization Detector
PPE = Personal Protective Equipment

8.0 HEAT/COLD STRESS MONITORING

General requirements for heat/cold stress monitoring are contained in Section 8.0 of the FSHP.

9.0 STANDARD OPERATING SAFETY PROCEDURES

Standard operating safety procedures are described in Section 9.0 of the FSHP.

10.0 SITE CONTROL MEASURES

Site control measures are described in Section 10.0 of the FSHP. No formal site control is expected to be necessary for this work, as the work areas are somewhat remote and fenced, and bystanders are not anticipated. The RVAAP installation is not open to the public, and only authorized personnel are allowed in the project areas. If the Contractor SSHO determines that a potential exists for unauthorized personnel to approach within 25 feet of a work zone or otherwise be at risk due to proximity, then exclusion zones will be established as described in the FSHP.

11.0 PERSONNEL HYGIENE AND DECONTAMINATION

Personal hygiene and decontamination requirements are described in Section 11.0 of the FSHP and in Chapter 2.0 of this addendum.

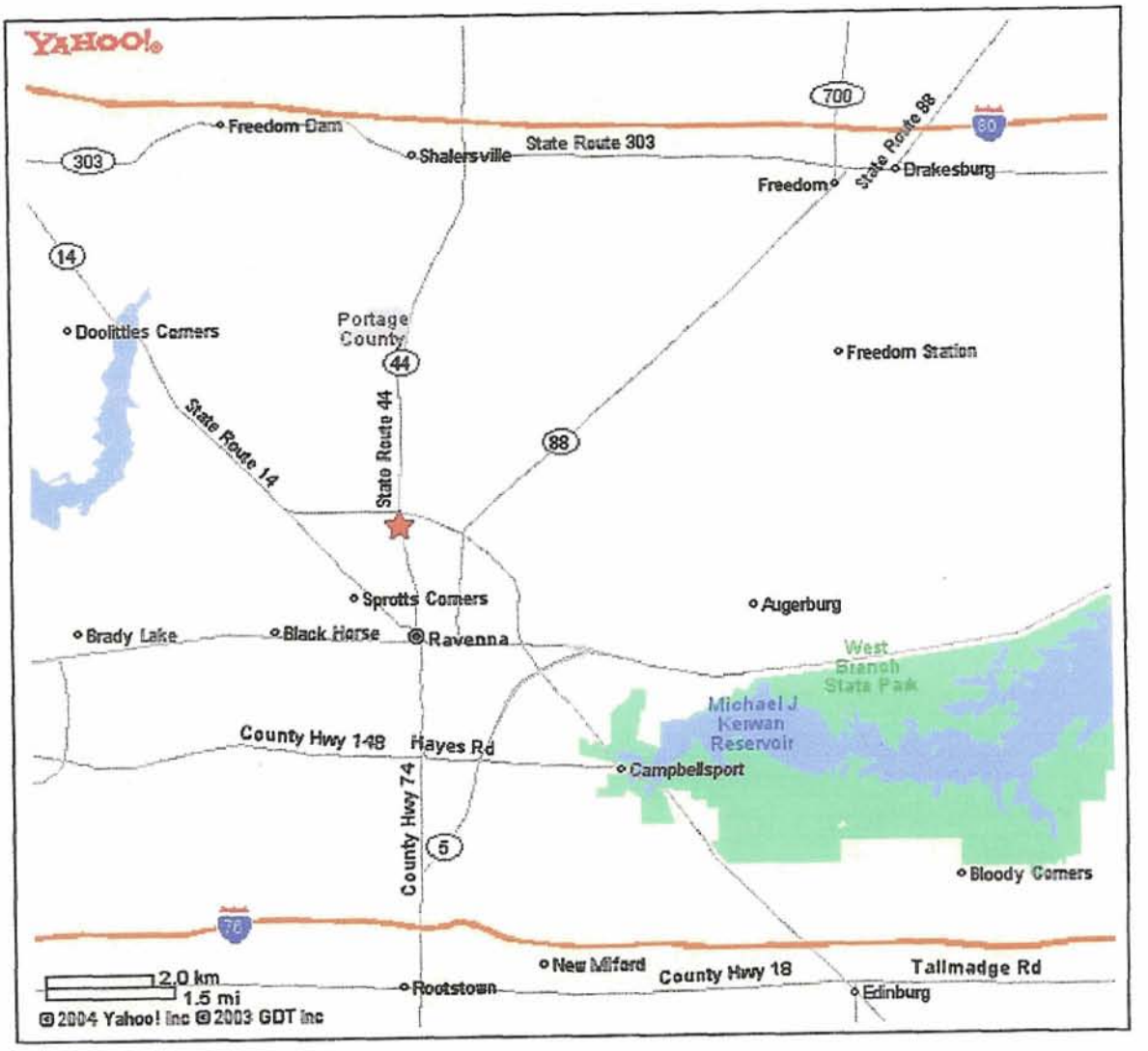
12.0 EMERGENCY PROCEDURES AND EQUIPMENT

Emergency contacts, telephone numbers, directions to the nearest medical facility, and general procedures can be found in Section 12.0 of the FSHP. The contractor field operations manager will remain in charge of all contractor and subcontractor personnel during emergency activities. The contractor field office will serve as the assembly point if it becomes necessary to evacuate one or more sampling locations. During mobilization, the SSHO will verify that the emergency information in the FSHP is correct; in addition, directions and a map to the nearest medical facility (Robinson Memorial Hospital, Figure 12-1) will be posted in conspicuous places that are readily available to all on-site workers in case of emergency. Each field team shall have a hand-held, two-way radio for communications purposes. During field operations under the FWGWMP, at least one American Red Cross 43-hour Emergency Response certified person shall be present, and all on-site personnel shall have CPR/first aid training.

13.0 LOGS, REPORTS, AND RECORD KEEPING

Logs, reports, and record keeping requirements are described in Section 13.0 of the FSHP.

★ Robinson Memorial Hospital, 6847 N Chestnut St Ravenna OH 44266 (330) 297-0811



Directions

1. Start at **8451 STATE ROUTE 5, RAVENNA** Turn (R) on **RAVENNA WARREN RD/STATE ROUTE 5** - go **6.3 mi**
2. **RAVENNA WARREN RD/STATE ROUTE 5** becomes **RAVENNA WARREN RD** - go **< 0.1 mi**
3. Continue on **RAVENNA WARREN RD/STATE ROUTE 59** - go **0.7 mi**
4. Turn (R) on **STATE ROUTE 14** - go **2.4 mi**
5. Turn (L) on **CHESTNUT ST/N CHESTNUT ST/RAVENNA PAINESVILLE RD** - go **0.1 mi**
6. Continue on **N CHESTNUT ST/RAVENNA PAINESVILLE RD** - go **0.1 mi**
7. Arrive at **6847 N CHESTNUT ST, RAVENNA**

Figure 12-1 Map to Robinson Memorial Hospital

14.0 REFERENCES

NIOSH (National Institute for Occupational Safety and Health) 1997. *NIOSH Pocket Guide to Chemical Hazards, the Condensed Chemical Dictionary,* 10th Edition.

USACE (U.S. Army Corps of Engineers) 1992. *Safety and Occupational Health Requirements for Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities*. ER-385-1-92.

USACE 1996. *Safety and Health Manual*. EM-385-1-1-13, September.

USACE 2001. *Facility-Wide Safety and Health Plan for Environmental Investigations at the Ravenna Army Ammunition Plant, Ravenna, Ohio*. DACA62-00-D-0001, D.O. CY02, March.

USJMC (U.S. Army Joint Munitions Command) 2003, *Installation Action Plan for Ravenna Army Ammunition Plant, Fiscal Year 2003*