



received  
9-27-11  
11-81

## COMMONWEALTH of VIRGINIA

### DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

TDD (804) 698-4021

[www.deq.virginia.gov](http://www.deq.virginia.gov)

September 22, 2011

Douglas W. Domenech  
Secretary of Natural Resources

David K. Paylor  
Director

(804) 698-4000  
1-800-592-5482

Mr. Jim McKenna  
Radford Army Ammunition Plant  
Route 114, P.O. Box 1  
Radford, Virginia 24143-0100

Re: Well Abandonment Plan- NRU - Radford Army Ammunition Plant

Dear Mr. McKenna:

Per my email of May 5, 2011, the Virginia Department of Environmental Quality (VDEQ) has reviewed the draft Monitoring Well Abandonment Plan for the New River Unit (RAAP-044) dated April 2011 and approves the work plan.

Please contact me at (804) 698-4498 if you have any questions or comments regarding the above site.

A handwritten signature in cursive script, appearing to read "JL Cutler Jr".

James L. Cutler, Jr., CPG  
Federal Facilities Project Manager

cc: Paige Holt, ATK  
Aziz Farahmand, VDEQ-BRRO



ATK Armament Systems  
Energetic Systems  
Radford Army Ammunition Plant  
Route 114, P.O. Box 1  
Radford, VA 24143-0100

www.atk.com

April 20, 2011

Mr. James L. Cutler, Jr.  
Virginia Department of Environmental Quality  
629 East Main Street  
Richmond, VA 23219

Subject: Transmittal Acknowledgement,  
Draft Monitoring Well Abandonment Work Plan,  
New River Unit (RAAP-044) April 2011

Dear Mr. Cutler:

This letter is to acknowledge transmittal of the subject document that was sent to you on April 18, 2011. Enclosed is a copy of the 18 April 2011 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder ATK staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,

  
P.W. Holt, Environmental Manager  
Alliant Techsystems Inc.

c: Karen Sismour  
Virginia Department of Environmental Quality  
P. O. Box 1105  
Richmond, VA 23218

E. A. Lohman  
Virginia Department of Environmental Quality  
Blue Ridge Regional Office  
3019 Peters Creek Road  
Roanoke, VA 24019

Rich Mendoza  
US Army Environmental Center  
11711 North IH 35, Suite 110  
Attn: Richard Mendoza (C-23)  
San Antonio, TX 78233

Tom Meyer  
Corps of Engineers, Baltimore District  
ATTN: CENAB-EN-HM  
10 South Howard Street  
Baltimore, MD 21201

11-815-62  
JMcKenna

bc: Rob Davie-ACO Staff  
J. McKenna, ACO Staff  
P.W. Holt  
J. J. Redder  
Env. File

Coordination:

  
J. McKenna

## Greene, Anne

---

**From:** McKenna, Jim  
**Sent:** Monday, April 18, 2011 9:59 AM  
**To:** Greene, Anne; Cutler, Jim; dennis.druck@us.army.mil; diane.wisbeck@arcadis-us.com; Redder, Jerome; Lohman, Elizabeth; Mendoza, Rich; Meyer, Tom NAB02; Sismour, Karen  
**Cc:** Davie, Robert; Holt, Paige; Flint, Jeremy  
**Subject:** Draft Monitoring Well Abandonment Plan for NRU. (UNCLASSIFIED)

**Importance:** High

**Classification:** UNCLASSIFIED  
**Caveats:** FOUO

All,

The contractor will ship the Draft Monitoring Well Abandonment Work Plan, New River Unit (RAAP044) will be submitted to the VDEQ today (April 18, 2011). Below are the POCs and their respective Fed Ex numbers.

Thank you for your support of the Radford AAP Installation Restoration Program

Jim McKenna

James McKenna, 7946-5654-7806 (2 copies +2CDs)

Richard Mendoza, 7969-9509-5732 (1 copy +1CD)

Susan Ryan, 7969-9510-0698 (1 CD)

Tom Meyers, 7946-5656-4978 (1 copy +1 CD)

Jeffrey G. Leach, 7946-5657-3148 (1copy)

James Cutler, 7969-9512-0748 (1 copy)

Karen Sismour, 7946-5658-6398 (1 copy)

Elizabeth Lohman, 7969-9513-3483 (1 CD)

**Classification:** UNCLASSIFIED  
**Caveats:** FOUO



DEPARTMENT OF THE ARMY  
US ARMY PUBLIC HEALTH COMMAND (PROVISIONAL)  
5158 BLACKHAWK ROAD  
ABERDEEN PROVING GROUND, MD 21010-5403

22 MAR 2011

MCHB-IP-REH

MEMORANDUM FOR Office of Environmental Quality, Radford Army Ammunition Plant  
(SJMRF-OP-EQ/Mr. Jim McKenna), P.O. Box 2, Radford, VA 24143-0002

SUBJECT: Internal Draft Monitoring Well Abandonment Work Plan for New River Unit  
(RAAP-044), Radford Army Ammunition Plant, Virginia, March 2011

1. The Army Institute of Public Health reviewed the subject document on behalf of the Office of The Surgeon General pursuant to Army Regulation 200-1 (Environmental Protection and Enhancement). We appreciate the opportunity to review the work plan.
2. We have no comments to provide on this document.
3. The document was reviewed by Mr. Dennis Druck, Environmental Health Risk Assessment Program. He can be reached at DSN 584-2953, commercial (410) 436-2953 or electronic mail, [dennis.druck@us.army.mil](mailto:dennis.druck@us.army.mil).

FOR THE DIRECTOR:

A handwritten signature in black ink, reading "Jeffrey S. Kirkpatrick", is positioned above the printed name.

JEFFREY S. KIRKPATRICK  
Portfolio Director, Health Risk Management

CF:

HQDA (DASG-PPM-NC)  
IMCOM-NE (IMNE-PWD-E)  
USACE (CEHNC-CX-ES)  
USAEC (IMAE-CD/Mr. Rich Mendoza)



US Army Corps  
of Engineers  
Baltimore District

DRAFT

**Monitoring Well Abandonment  
Work Plan  
New River Unit (RAAP-044)**

Radford Army Ammunition Plant  
Radford, Virginia

**Prepared for:  
Radford Army Ammunition Plant**

April 2011

**DRAFT**

**Monitoring Well Abandonment  
Work Plan, Radford Army  
Ammunition Plant**

**New River Unit**

Radford Army Ammunition Plant,  
Radford Virginia

April 2011

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Christopher Kalinowski  
Site Manager

---

Diane Wisbeck  
Project Manager

## **Monitoring Well Abandonment Work Plan**

Radford Army Ammunition Plant,  
Radford, Virginia

Prepared for:  
Radford Army Ammunition Plant

Prepared by:  
ARCADIS  
1114 Benfield Boulevard  
Suite A  
Millersville  
Maryland 21108  
Tel 410.987.0032  
Fax 410.987.4392

Our Ref.:

Date:  
April 2011



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### List of Acronyms and Abbreviations

AEC	Army Environmental Command
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ft	Feet
ft bgs	feet below ground surface
HASP	Health and Safety Plan
lbs	Pounds
IRP	Installation Restoration Program
MMA	Main Manufacturing Area
MWP	Master Work Plan
NBG	Northern Burning Ground
NROW	New River Ordinance Works
NRU	New River Unit
QAPA	Quality Assurance Plan Addendum
QA/QC	Quality Assurance/Quality Control
RFAAP	Radford Army Ammunition Plant
SOP	Standard Operating Procedure
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
VAC	Virginia Administrative Code
VDEQ	Virginia Department of Environmental Quality

## **1. Introduction**

ARCADIS U.S, Inc. (ARCADIS) has been retained by the United States Army Environmental Command (AEC) to perform Installation Restoration Program (IRP) activities at the Radford Army Ammunition Plant (RFAAP). The RFAAP facility is located in Montgomery and Pulaski Counties in southwestern Virginia and consists of two noncontiguous units: the New River Unit (NRU) and the Main Manufacturing Area (MMA). The RFAAP-MMA is located approximately 5 miles northeast of the City of Radford, Virginia. The RFAAP-NRU is located about six miles southwest of the RFAAP-MMA, near the town of Dublin, Virginia (Figure 1-1). IRP activities for both the RFAAP-MMA and the RFAAP-NRU are being conducted as part of a Performance Based Contract (PBC) awarded to ARCADIS under contract W91ZLK-05-D-0015: Task 0002. The RFAAP-NRU is managed under the Comprehensive Environmental Response and Compensation Liability Act (CERCLA).

This work plan summarizes the scope of work to abandon eleven groundwater monitoring wells located at the RFAAP-NRU. Approximately 1,100 linear feet will be abandoned. The health and safety requirements for fieldwork at the RFAAP-NRU are included in the Health and Safety Plan (HASP) addendum (ARCADIS, 2008a), which has been provided under separate cover. Additional activity specific health and safety requirements are also included as Appendix A. ARCADIS has also prepared a Quality Assurance Plan Addendum (QAPA) (ARCADIS, 2008b) to the Master Work Plan, which is also provided under a separate cover.

### **1.1 Site History**

The RFAAP-NRU was established in 1940, and was originally known as the New River Ordinance Works (NROW). The NROW was incorporated into RFAAP in 1945. The RFAAP-NRU facility operated as a bag manufacturing and loading plant for artillery, cannon, and mortar projectiles during World War II. Although active manufacturing activities at the RFAAP-NRU were reported to have ceased in the 1940's (after World War II), portions of the RFAAP-NRU are still utilized as storage facilities for operations at the MMA.

### **1.2 Site Description**

The RFAAP-NRU is composed of six study areas (Figure 1-2). However, this work plan only addresses the four study areas where the eleven monitoring wells proposed for abandonment are located within; they are as follows:

- Bag Loading Area (BLA) – The BLA is located along the southwestern boundary of the RFAAP-NRU and to the south of the Rail Yard (Figure 1-2). The BLA is located on a hilltop and is surrounded by a dirt road which forms the outer perimeter of the BLA. A site map depicting the layout of the BLA and the location of the monitoring wells is presented in Figure 1-3
- Igniter Assembly Area (IAA) – The IAA is located in the western portion of the RFAAP-NRU immediately south of Gate 20 (Figure 1-2). A site map depicting the layout of the IAA and the location of the monitoring wells is presented in Figure 1-4.
- Northern Burning Ground (NBG) – The NBG study area is located in the northwest portion of the RFAAP-NRU, east of Gate 20, along Guard Road (Figure 1-2). A dirt road follows the outer perimeter of the NBG and defines the outermost boundary of the site. A drainage ditch parallels Guard Road on the north side of the site. A site map depicting the layout of the NBG and the location of the monitoring wells is presented in Figure 1-5.
- Western Burning Ground (WBG) – the WBG is located in the southwestern portion of the RFAAP-NRU, south of the IAA (Figure 1-2). A site map depicting the layout of the WBG and the location of the monitoring wells is presented in Figure 1-6.

Table 1-1 presents a summary of the well construction details for each of the monitoring wells at RFAAP-NRU.

### **1.3 Reasoning for Well Abandonment**

Three historical groundwater sampling events (occurring during 2007, 2008, and 2010) have been conducted at RFAAP-NRU. Each of these events included the collection of samples from the eleven monitoring wells installed at the BLA, IAA, NBG, and WBG Study Areas. In addition to the collection of groundwater from the monitoring wells, two of the sampling events included the collection of spring water samples from four springs located throughout the facility. Full details of the historical groundwater sampling events are included within the Remedial Investigation (RI) Report for the New River Unit (ARCADIS, 2010).

The results of the monitoring well sampling events did not identify any localized groundwater quality problems in the investigated areas. Likewise, the spring water sampling events confirmed that there were no large scale groundwater quality issues

at RFAAP-NRU (ARCADIS, 2010). Furthermore, the subsequent groundwater risk assessments indicated that there were no unacceptable risks to current or hypothetical future receptors; therefore, No Action was recommended for groundwater in the RI Report. The VDEQ concurred with the findings of the RI Report recommendations in a letter dated 30 July 2010.

Groundwater quality at the RFAAP-NRU has been thoroughly investigated and characterized. Because there are no unacceptable risks to potential receptors, and no further action is necessary, the eleven groundwater monitoring wells located within the RFAAP-NRU are proposed for abandonment.

## **2. Scope of Work**

This section outlines the scope of work that will be completed for the monitoring well abandonment at the RFAAP-NRU.

### **2.1 Well Abandonment**

Monitoring well abandonment will be conducted by a Virginia certified well driller in accordance with Virginia Administrative Code (VAC) 5-630-450. Well abandonment is co-regulated by VDEQ and the Virginia Department of Health. Monitoring wells will be abandoned in place via the following procedure which is in compliance with State requirements.

- Prior to well abandonment, the depth-to-water and depth-to-bottom will be sounded at each monitoring well with an electronic water level indicator. The depth-to-bottom measurements will be compared to the well construction details presented in Table 1-1 to ensure that there are no obstructions that may interfere with the well abandonment.
- Surface completions shall be removed and disposed of in accordance with Section 2.3 of this work plan. Surface completions to be removed consist of the concrete pad, stickup cover, and protective bollards.
- The screened interval of the monitoring wells will be backfilled with clean sand to a depth of 2.0 ft above the screened interval (refer to Table 1-1 for a summary of the well screen intervals).
- Following placement of the sand interval, the remainder of the monitoring well casing shall be grouted with a hydrated cement mixture consisting of Type I Portland cement amended with 3 – 5 percent bentonite. The borehole will be filled utilizing a positive displacement method (e.g., tremie pipe) starting at the top of the sand pack and continue to 5.0 feet (ft) below ground surface (bgs). All downhole equipment inserted into the wells will be stem cleaned prior to introduction into each well.
- The top five ft (i.e., 0.0 – 5.0 ft bgs) of well casing shall be removed from the bore hole using an inside 2-inch PVC cutter; the remaining top five ft of the borehole will then be grouted to surface.
- A 6-ft diameter concrete cap will be constructed over each of the grouted boreholes. The concrete caps will be a minimum of 4-inches thick.

- If well abandonment activities are interrupted (i.e., due to inclement weather or night shut down) the monitoring well and any associated excavation shall be covered and then temporarily fenced to ensure site worker safety and protection of groundwater quality.
- The monitoring wells will not be chlorinated prior to abandonment.

## **2.2 Documentation and Quality Assurance**

The Virginia certified well driller shall keep daily logs of the well abandonment activities. The volume of fill/sealing material placed during the abandonment procedure shall be verified to ensure that it equals or exceeds the anticipated volume of fill required based upon the monitoring well dimensions. The actual volume of fill material placed within the monitoring well will be documented within the field log book. This will ensure that no jamming or bridging of the fill material has occurred.

## **2.3 Waste Management and Site Restoration**

Solid waste generated during the well abandonment activities shall be containerized on-site and disposed of in a permitted landfill facility. Waste materials generated from the well abandonment are expected to consist of bollards, stickup covers, and PVC casing.

Transportation of waste material will be conducted in accordance with the applicable regulations, including the requirements of the U.S. Department of Transportation (USDOT). Materials transporters will be appropriately licensed, permitted, and in compliance with all applicable regulations.

Portions of the Site affected by well abandonment shall be restored in-kind upon completion of the abandonment.

## **2.4 Health and Safety**

All phases of work for the well abandonment will be conducted in accordance with the requirements and procedures outlined in ARCADIS' Health and Safety Plan Addendum (HSPA) (ARCADIS, 2008a) to the Master Work Plan (URS 2003). Job Safety Analysis (JSA)/Job Loss Analysis (JLA) forms have been completed for each of the safety critical tasks that will be performed during the field work for well abandonment. The JSAs/JLAs identify specific hazards that could be encountered during an action as well as control methods to protect employees and property from hazards. The JSAs/JLAs

also list the type of personal protective equipment (PPE) required for the completion of the work. The following JSAs/JLAs are provided in Appendix A, along with a list of emergency contact information:

- Heavy Equipment Operation;
- Site Clearing; and
- Monitoring Well Abandonment.

In addition to the HSPA and the information provided in Appendix A, a copy of the ARCADIS Field Health and Safety Handbook will be available on-site. This handbook contains relevant general topics and is used as part of the overall health and safety process. To aid in the consistency of the process the handbook will be used as an informational source in conjunction with this HSPA. The following three (3) handbook sections are minimally required reading for this project:

- Section III-F. General Housekeeping, Personal Hygiene and Field Sanitation;
- Section III-G. Site Security, Work Zone and Decontamination for HAZWOPER Sites; and
- Section III-GG. HAZWOPER and HAZMAT Response.

All on-site personnel during the removal action will be fully trained and compliant with the OSHA HAZWOPER regulations. Health and Safety tailgate meetings will be performed at the beginning of each work day and when personnel return from any extended break. These meetings will ensure that all site personnel are fully aware of the specific conditions and hazards present at the site and the emergency response procedures. All Health and Safety meetings will be documented on *Site Activities Tailgate Health and Safety Briefing Form* provide in Appendix D of the HSPA.



### **3. Schedule and Reporting**

Monitoring well abandonment is anticipated to require approximately 3 days to complete, and is scheduled for March 2011. Well abandonment logs will be prepared for each of the eleven monitoring wells and provided to RFAAP for records retention. Virginia has no reporting requirement for the abandonment of monitoring wells.

#### **4. References**

URS, 2003. Master Work Plan, Radford Army Ammunition Plant, Radford, Virginia. August.

ARCADIS, 2008a. Health and Safety Plan Addendum, Radford Army Ammunition Plant, Radford, Virginia, April.

ARCADIS, 2008b. Quality Assurance Plan Addendum, Radford Army Ammunition Plant, Radford, Virginia, April.

ARCADIS, 2010. Remedial Investigation Report – New River Unit (RAAP 044), Radford Army Ammunition Plant, Radford, Virginia. June.

## Tables

Table 1-1  
Groundwater Monitoring Well Construction Details  
RFAAP-NRU  
Radford, Virginia

Monitor Well	General Well Location	Northing <sup>1</sup> (ft)	Easting <sup>1</sup> (ft)	Ground Elevation (ft amsl)	Total Depth (ft bls)	Well Bottom (ft amsl)	TOC Elevation (ft amsl)	Depth to Water <sup>2</sup> (ft btoc)	Grout (ft btoc)	Bentonite (ft btoc)	Sand (ft btoc)	Screened Interval (ft bls)
BLAMW01	Downgradient and proximal to buildings with conductive flooring	3564530.07	10851995.99	2088.35	223.5	1862.25	2090.92	123.85	NA	0.0 - 90	90 - 221	206 - 221
BLAMW02	Downgradient of BLA	3564814.00	10851807.48	2073.70	154.8	1915.53	2077.07	142.77	0.0 - 11	11 - 90	90 - 151	137 - 151
IAAMW01	Downgradient and proximal to buildings with conductive flooring	3568011.29	10850394.64	2116.17	36.2	2077.23	2118.90	35.33	0.0 - 16	NA	16 - 34	19 - 34
IAAMW02	Downgradient of IAA	3567399.30	10849464.83	2123.96	162.6	1958.69	2126.63	78.71		0.0 - 90	90 - 160	145 - 160
IAAMW03	Downgradient of IAA	3566913.67	10850758.28	2091.77	80.7	2008.36	2094.51	66.04	0.0 - 22	0.0 - 22	22 - 38	63 - 78
IAAMW04	Downgradient of IAA, near unnamed stream	3565504.32	10851159.66	2020.70	90.5	1927.31	2023.64	61.52	--	--	--	73.5 - 88.5
NBGMW01	Near the center of former burning area, in area with highest lead concentrations in soil	3569777.80	10851810.48	2115.79	98.0	2015.24	2118.34	89.09	0.0 - 75	NA	75 - 101	86 - 101
NBGMW02	North of former burning area, near NRU installation boundary	3569872.47	10851804.11	2110.05	103.4	2004.08	2112.67	92.23	NA	0.0 - 75	75 - 101	86 - 101
WBGMW01	Center of former burning area	3565783.83	10849309.86	2057.85	28.8	2026.52	2060.38	16.53	NA	0.0 - 9	9.0 - 27	11 - 27
WBGMW02	Between former burning area and pond	3565612.88	10849437.23	2060.85	52.0	2006.39	2063.35	27.57	NA	0.0 - 30	30 - 50	35 - 50
WBGMW03	Between former burning area and pond	3565596.35	10849266.40	2050.87	51.5	1997.04	2053.18	12.28	NA	0.0 - 29	29 - 49.5	34.5 - 49.5

1

Coordinates in NAD 1983, US State Plane (Virginia South).

2

Average depth to water obtained from the 2007, 2008, and 2010 groundwater sampling events

ft

Feet.

ft bls

Feet below land surface.

ft amsl

Feet above mean sea level.

ft btoc

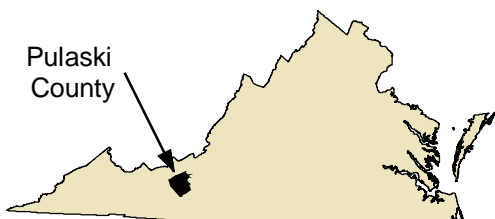
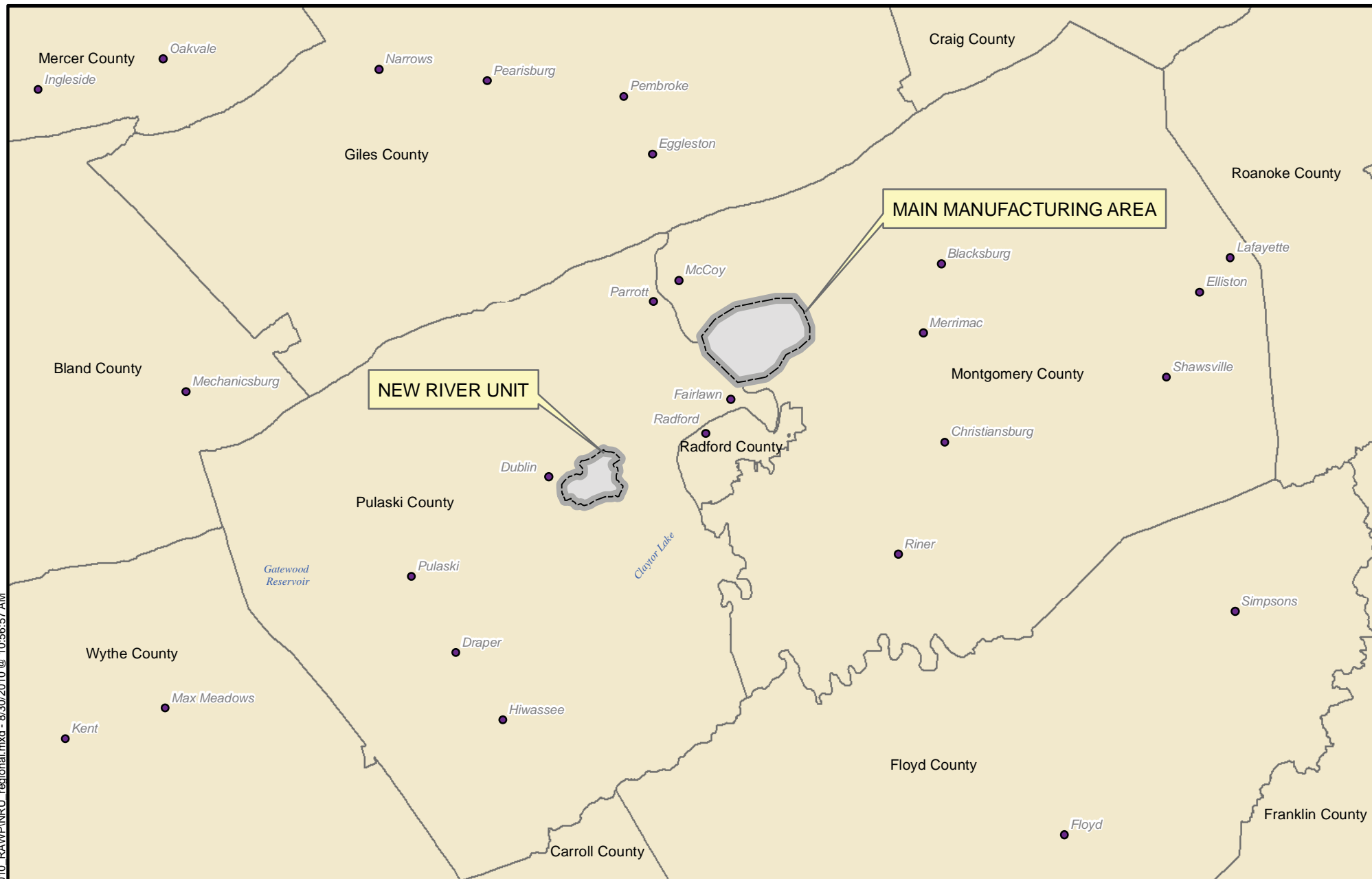
Feet below top of casing.

NA

Not Applicable; material not used

## Figures

I:\Radford\GIS\ArcMap\_MXD\083010\_RAWPNRU\_regional.mxd - 8/30/2010 @ 10:56:57 AM



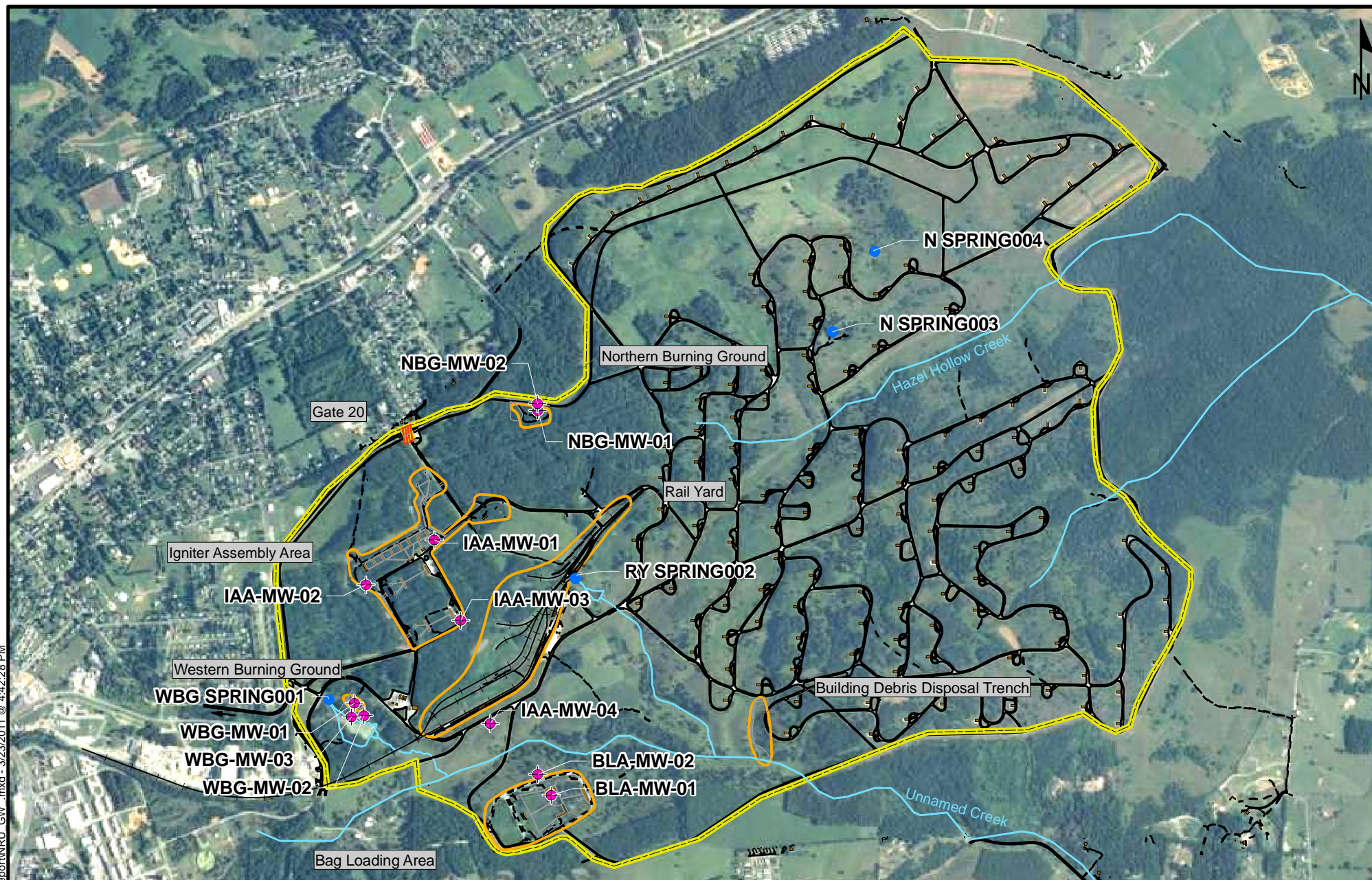
RADFORD ARMY AMMUNITION PLANT  
RADFORD, VA

**RFAAP - NRU  
FACILITY LOCATION**



FIGURE  
1-1



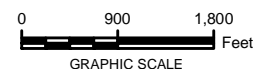


## LEGEND

- SPRINGS
- ◆ MONITORING WELLS
- SITE FEATURES
- RAIL SPUR
- SURFACE WATER
- PAVED ROADS
- DIRT ROADS
- STUDY AREA
- INSTALLATION BOUNDARY
- BUILDINGS

### NOTES:

1. GIS SPATIAL LAYERS OBTAINED FROM SHAW ENVIRONMENTAL, INC. AS REFERENCED IN THEIR REPORT TITLED NRU ADDITIONAL CHARACTERIZATION SAMPLING & GROUNDWATER INVESTIGATION DATA REPORT IN OCTOBER 2007.



RADFORD ARMY AMMUNITION PLANT  
RADFORD, VA

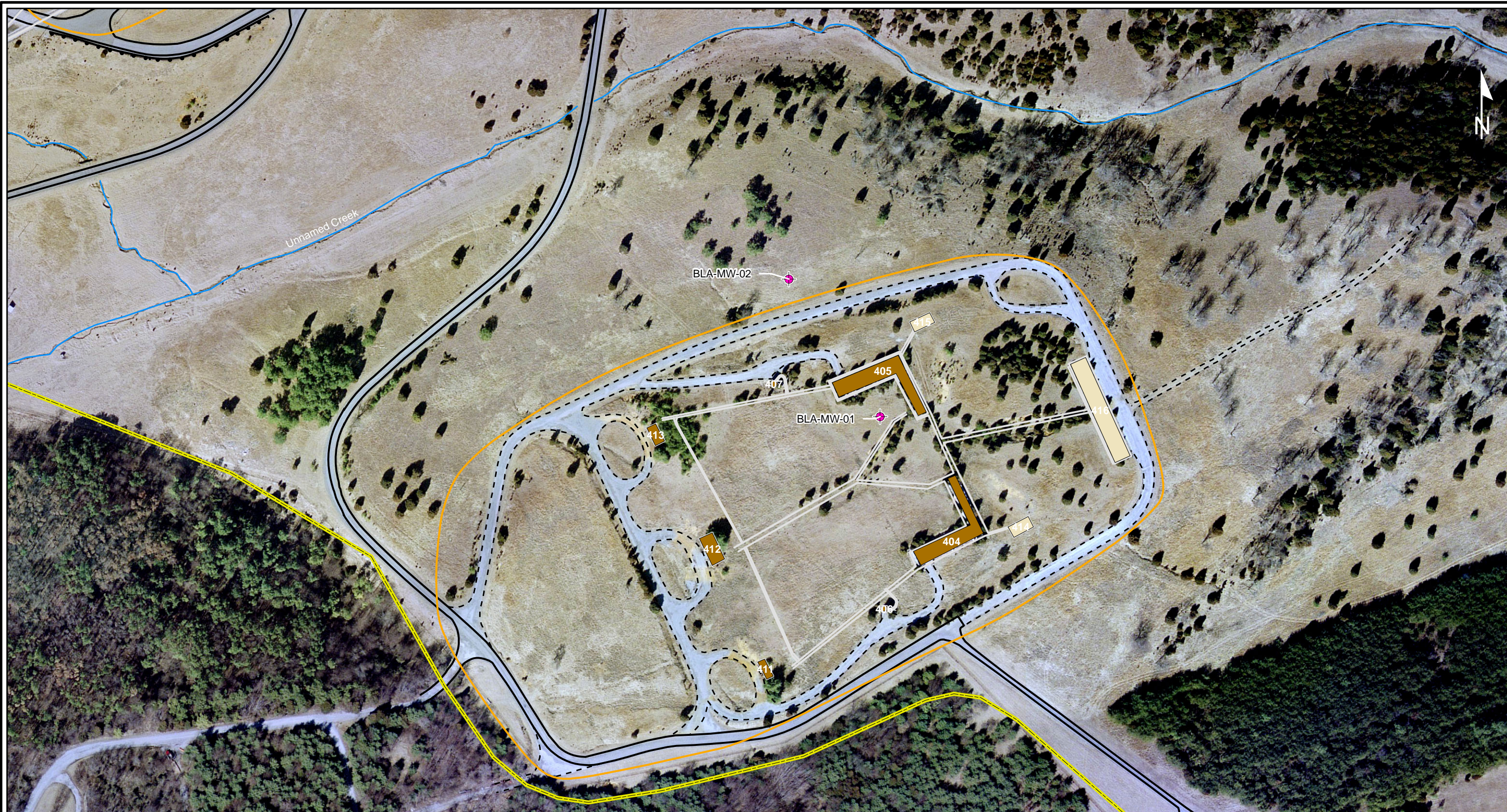
## GROUNDWATER MONITORING WELL AND SPRING SAMPLE LOCATIONS



FIGURE  
1-2



NYC: SER-4/AT: DB-TBR LD: TBR P/C: TL  
Radford (GP06RAAP-00PM)  
I:\Radford\GIS\ArcMap\_MXD\Report\BLA\_BaseMap.mxd - 3/25/2011 @ 1:40:39 PM



## Legend

- MONITORING WELL
- PAVED ROADS
- DIRT ROADS
- SITE FEATURES
- SURFACE WATER
- FORMER RAISED WALKWAY PLATFORMS

- STUDY AREA
- INSTALLATION BOUNDARY

### BUILDINGS

- NO CONDUCTIVE FLOORING
- YES CONDUCTIVE FLOORING

NOTE:  
BUILDINGS 404 AND 405 ARE TWO STORY BUILDINGS



RADFORD ARMY AMMUNITION PLANT  
RADFORD, VA

## BAG LOADING AREA SITE LAYOUT AND MONITORING WELL LOCATION



FIGURE  
1-3





LEGEND

- |                       |               |                         |
|-----------------------|---------------|-------------------------|
| MONITORING WELL       | SEWER LINE    | <b>BUILDINGS</b>        |
| STUDY AREA            | SITE FEATURES | NO CONDUCTIVE FLOORING  |
| INSTALLATION BOUNDARY | RAIL SPUR     | YES CONDUCTIVE FLOORING |
| PAVED ROADS           | SURFACE WATER |                         |
| DIRT ROADS            | CULVERT       |                         |

RADFORD ARMY AMMUNITION PLANT  
RADFORD, VA

IGNITER ASSEMBLY AREA  
SITE LAYOUT AND  
MONITORING WELL LOCATION



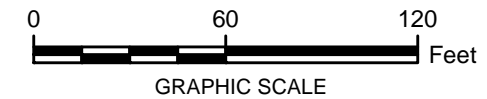
FIGURE  
1-4





## Legend

- |  |                 |  |                |  |              |
|--|-----------------|--|----------------|--|--------------|
|  | MONITORING WELL |  | LOW AREA       |  | STUDY AREA   |
|  | PAVED ROADS     |  | DRAINAGE DITCH |  | NRU BOUNDARY |
|  | DIRT ROADS      |  | CULVERT        |  |              |



THE NORTHERN BURNING GROUND AT THE NEW RIVER UNIT  
RADFORD ARMY AMMUNITION PLANT  
RADFORD, VA

### NORTHERN BURNING GROUND SITE LAYOUT AND MONITORING WELL LOCATION



FIGURE  
1-5



NYC: SER-4/ALT: DB-TBR LD: TBR P/C: TL  
Radford (GP06RAAP-00PM)  
I:\Radford\GIS\ArcMap\_MXD\Report\WBG\_Basemap.mxd - 3/25/2011 @ 1:32:48 PM





## **Appendix A**

Health and Safety Materials

Table 1: Emergency Contact List

Emergency Contact	Phone Number
Local Police - Dublin Police Department	540.674.5167
Local Ambulance	911 (if appropriate)
Radford Army Ammunition Plant Fire Department	540.639.7323
Local Fire Department	911 (from cell phone); 9911 (from plant phone)
New River Unit Security Post	540.674.4988
Local Hospital (Carilion New River Valley Medical Center)	540.731.2000
Poison Control	800.332.3073
National Response Center (all spills in reportable quantities)	800.424.8802
U.S Coast Guard (spills to water)	800.424.8802
ARCADIS Project Manager - Diane Wisbeck	410.923.7834 (office); 443.909.9059 (cell)
ARCADIS Site Manager - Chris Kalinowski	919.854.1282 (office); 919.656.7731 (cell)
ARCADIS H&S Manager - Chuck Webster	315.671.9297
Client Contact - James McKenna	540.731.5782
Client Contact - Jerry Redder	540.639.7536 (office); 540.239.2990 (cell)
Client Contact - Matt Alberts	540.639.8722 (office); 540.230.3294 (cell)
Emergency Coordinator - Diane Wisbeck	410.987.0032 (office); 410.963.0050 (cell)

**Emergency Notification Procedure for Project:**

**Step 1:** Field Personnel must contact Chuck Webster or Diane Wisbeck.

**Step 2:** Diane Wisbeck will contact Site Manager and Client Contacts

**Step 3:** If field personnel cannot locate Diane Wisbeck or Chuck Webster, then field personnel may contact client contacts

In the event of a medical emergency, field personnel will call 911 and then the RAAP Fire Department



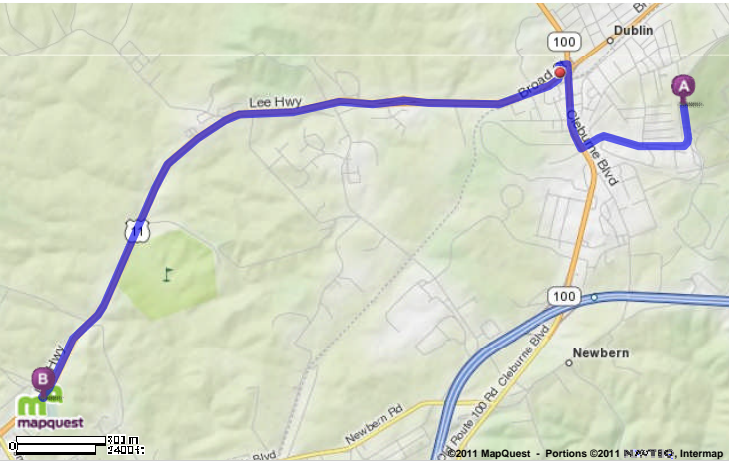
Trip to:  
2400 Lee Hwy  
Pulaski, VA 24301  
6.55 miles  
10 minutes

Notes

Route to Lewis-Gale Hospital in Pulaski, VA

	<b>[5508-5585] Bagging Plant Rd</b> Dublin, VA 24084	<b>Miles Per Section</b>
	1. Start out going WEST on BAGGING PLANT RD toward GREENWOOD DR.	<b>Go 1.0 Mi</b>
	2. Turn RIGHT onto CLEBURNE BLVD / VA-100 N. <i>CLEBURNE BLVD is just past ARMSTRONG ST</i>	<b>Go 0.6 Mi</b>
	3. Merge onto US-11 S via the ramp on the LEFT toward PULASKI. <i>If you are on CLEBURNE BLVD and reach 4TH ST you've gone about 0.2 miles too far</i>	<b>Go 4.9 Mi</b>
	4. Turn LEFT onto PLEASANT HILL DR. <i>PLEASANT HILL DR is 0.5 miles past MOREHEAD LN</i>	<b>Go 0.01 Mi</b>
	5. 2400 LEE HWY. <i>If you reach LEE HWY you've gone a little too far</i>	<b>Go 0.01 Mi</b>
	<b>2400 Lee Hwy</b> Pulaski, VA 24301	<b>6.5 mi</b>

Total Travel Estimate: 6.55 miles - about 10 minutes



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Directions and maps are informational only. We make no warranties on the accuracy of their content, road conditions or route usability or expeditiousness. You assume all risk of use. MapQuest and its suppliers shall not be liable to you for any loss or delay resulting from your use of MapQuest. Your use of MapQuest means you agree to our [Terms of Use](#)

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4538
Job Name	General Industry-Site clearing (tree/brush/vegetation) removal
Task Description	Site Clearing Prior to Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(1) Initial
Creation Date	2/17/2011 02:12:01 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011			Crone, Thomas	True

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Prepping equipment for clearing activities	1 Improperly maintained tools and equipment increase risk for injury to workers using tools/equipment	Maintain tools and equipment according to manufacturer recommendations, including proper oiling and inspection of tool/equipment. Ensure cutting blades are sharp.	
		2 Cuts to hands, fingers, forearms from sharpening tool/equipment blades	Wear protective gloves suitable for the tool/device being sharpened, use proper sharpening techniques and do not hurry through the sharpening process.	
		3 Falls accessing from egressing from large equipment like tractors or bulldozers	Always use 3 points of contact when access/egressing large heavy equipment. Never attempt to access/egress form moving equipment, wear footwear with good anti-slip tread and ankle support, keep mud off of stepping surfaces. Promptly affix seatbelt when sitting in seat.	
		4 Exposure to fuel during refueling activities	Wear protective gloves during refueling activities, avoid breathing fuel vapors by standing in up wind position when practical, promptly wash exposed skin or clothing.	
2	Clearing large brush/trees with heavy equipment	1 Struck by vegetation under tension during clearing	Stand at least 100 ft from clearing activity. Keep unnecessary workers away from clearing activity in all directions.	



		2 Trip fall hazards on uneven ground surfaces	Plan route and avoid walking over down trees and into vegetation where ground surface can not be seen. Wear footwear with good tread and ankle support, don't carry tools in a manner that can obstruct vision of ground	
		3 Slip or trip on muddy or sloped surfaces	Plan route, wear footwear as above, keep hands out of pockets to balance and brace falls,	
		4 Contact with poisonous or physically damaging plants	Identify and avoid contact, if brush containing poisonous plants being burned, do not stand down wind and inhale smoke, wear long pants and long sleeve shirt, in heavy briar infested areas requiring walking, wear briar chaps.	
		5 Contact with poisonous or biting insects	Watch for and avoid hazardous insects, keep cab doors closed, if equipped, to reduce exposure potential.	
		6 Struck by falling trees or large brush	Keep clear of planned fall direction, assume tree can fall in any direction and keep clear in all fall directions	
3	Clearing large brush/trees with hand tools/chainsaws	1 Cuts to arms, legs, hands from cutting tools or chainsaw	Wear protective gloves. When using chainsaw, using chainsaw chaps and helmet equipped with face shield. When using manual tools cut away from body, maintain large distance between workers using hand tools or chainsaw. When using chainsaws, don't reach over running saw, saw over head height, use saw in low visibility situations, use chainsaws on ladders or use one handed.	
		2 Physical stresses from repetitive motion or excessive push/pulling during clearing	Use job or task rotation or frequent rest breaks. Don't use excessive force pulling or pushing on vegetation.	
		3 Scrapes, cuts to skin from vegetation	Wear protective gloves, long pants and long sleeve shirt. Wear briar chaps in thorny vegetation.	
		4 Noise from chainsaws	Wear hearing protection, keep unnecessary workers away from sawing activity	
4	Clearing small brush/tall grass with mowers/bush hogs	1 Struck by flying debris from mowing activity	Keep unnecessary worker 100 ft from mowing activities	
		2 Foot hazards from slipping into cutting blades using walk behind mowers	Do not remove and promptly repair guards that reduce potential for foot entry into blade housing of mowers. Plan mowing to reduce situations that increase risk of foot slippage towards mower housing, wear steel toe boots with good tread	

		3	Noise from mowing activities	Wear hearing protection	
5	Using wood chippers	1	Struck by debris being chipped or chips emanating from the chipper	Stand clear of material being drawn into the chipper, stand to the side of the chipper table during vegetation entry. Maintain swinging baffles that prevent throwback of material.	
		2	Cuts/amputation of hands/arm inserting brush into chipper	Only use chippers with a 36 inch or more feed throw at from the cutting knives. Never place hand, feet on top the feed table of the chipper wear protective gloves.	
		3	Noise from chipping activity.	Wear hearing protection	
		4	Injury caused from unplanned movement of chipper.	Chock tires of chipper when operating.	
6	Using herbicides	1	Worker exposure to herbicide during mixing or application.	Follow manufacturer mixing and application instructions, review product MSDS for additional hazards or PPE requirements, wear impermeable gloves and clothing during mixing and application, promptly wash any skin exposed to herbicide, wear safety goggles and face shield during mixing and application	
		2	Fatigue and physical stresses from carrying hand applicator for prolonged period of time.	Use job or task rotation to reduce fatigue. For applicators carried by hand, switch hands periodically, opt for backpack versions of applicators when possible.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	coveralls	when using herbicides	Required
Eye Protection	faceshield	when using herbicides	Required
Eye Protection	safety glasses		Required
Eye Protection	safety goggles	when using herbicides	Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	other	chainsaw chaps	Required

#### Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4537
Job Name	Environmental-Other
Task Description	Ground Water Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(2) Review
Creation Date	2/17/2011 12:16:54 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011	2/17/2011		Crone, Thomas	True
Developer (Primary Contact)	Kalinowski, Christopher	3/10/2011	2/17/2011		Bertz, Charles	True
HASP Reviewer	Powell, Jace'que	3/3/2011			Mosher, Tyler	True
Reviewer	Wisbeck, Diane	3/3/2011	2/18/2011	True	Smith, Lee	True

### Reviewer Comments

Role	Employee	Approval Status	Completed Date	Comments
HASP Reviewer	Powell, Jace'que			
Reviewer	Wisbeck, Diane	Approve	02/18/2011	

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Locate/Setup Equipment and Work Area	1 Vehicle traffic for monitoring wells located next to or on roads	(1) Setup traffic cones and /or high visibility barriers (2) if possible, use field vehicle to shield work crew from oncoming traffic (only if this doesn't create additional hazards)	
		2 Slip/Trip/Falls	Locate and remove hazard if feasible. If removal is not feasible, then mark hazard to provide warning. Maintain a clean work area.	
2	Remove Existing well pad and materials	1 Heavy lifting/Back Strain	Use proper lifting technique: keep back straight and lift with your legs. Use buddy system for objects that weigh greater than 50 pounds.	
		2 Concrete dust generation	wet concrete if dust generation is excessive  stand cross wind to minimize dust generation	

		3 Hand injury	Use work gloves when breaking concrete and cutting materials. Use appropriate tools for task. Take frequent breaks to prevent overuse/ergonomic injuries.	
		4 Flying debris	Wear appropriate PPE during jackhammer activities (safety glasses, long sleeve shirts and pants, hard hats). Keep unnecessary personnel at least 15 feet from jackhammer to avoid being struck by flying debris.	
		5 Noise	Use hearing protection when operating equipment	
3	Abandon Monitoring Wells	1 Heavy Lifting - Concrete bags	Use proper lifting technique: keep back straight and lift with the legs. Use buddy system for bags weighing greater than 50 pounds.	
		2 Cement Dust	Wear appropriate PPE (dust mask) to prevent nuisance irritation. Stand up wind of mixer when adding cement.	
		3 Pressure Grouting	Maintain awareness of pressurized equipment while in use. Wear appropriate PPE while operating equipment. Keep hoses pointed away from self or other individuals.	
4	Restore Site and Cleanup	1 Heavy Equipment Operation	Remain aware of location and position of heavy equipment.	
		2 Chemical exposure	Use chemical resistant gloves when handling cement/asphalt patching compound.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants	during jackhammer activities	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)		Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	during heavy equipment operation	Recommended
Miscellaneous PPE	traffic vest--Class II or III		Required
Respiratory Protection	dust mask	during concrete breaking and cement mixing	Recommended

#### Supplies

Type	Supply	Description	Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required
Miscellaneous	flashlight		Recommended
Personal	eye wash (specify type)	Portable eye wash bottles	Required
Personal	insect repellent		Recommended
Personal	sunscreen		Recommended

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4540
Job Name	Construction-Heavy equipment operation
Task Description	Heavy Equipment Operation for Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(3) Completed
Creation Date	2/17/2011 02:26:22 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011	2/17/2011		Crone, Thomas	True

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Loading and Unloading Equipment from transport vehicles	1 Stake or impact hazards from moving equipment	Stand clear of equipment loading or unloading from transport vehicles	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		2 Equipment damage from improper removal or placement on vehicle	Ensure any ramps used are rated for weight and properly placed and secured prior to moving equipment across, ensure trailers being loaded or unloaded are properly secured against movement.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		3 Overhead utility contact for equipment with booms or extensions	Plan position of transport vehicle to maintain safe distance (>20 ft) from all overhead lines and structures. Use spotters since operator focus may be on vehicle alignment with ramps or other ground level distractions.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		4 Ascending/Descending equipment cab.	Do not hurry through task, wear footwear with good tread and ankle support, maintain 3 points of contact while accessing or egress equipment, no jumping off trailers or truck beds.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
2	Pre-operation inspection	1 Pinch hazards to hands	Wear gloves appropriate for hazard while maintaining dexterity. Keep hand in field of vision and watch for and keep hands clear of obvious hazards like door or cover closures. Do not hurry during the removal or placement of covers or equipment components.	
		2 Head injury from striking equipment covers or components	Wear hard hat, stay focused on surroundings, avoid standing or raising up suddenly especially if door cover is overhead.	

		3	Exposure to engine fluids or lubricants	Wear protective gloves, ensure MSDS is available for engine fluids and lubricants, promptly wash exposed skin, contact WorkCare immediately for any situation where diesel is injected under the skin.	
		4	Awkward body positions and twisting	Plan inspection activity and do not hurry through task, stretch before crawling or squatting. Avoid overreaching.	
		5	Entanglement in equipment components.	Do not circumvent protective guards or shields, ensure equipment is not operational (LOTO if necessary) when accessing engine compartment if intrusion required.	
3	Equipment operation	1	Strike or impact hazards with other workers, equipment or structures.	Keep eyes moving and watch for unanticipated worker movement. Keep workers 15 ft from any extendable area of the equipment, Maintain 360 degrees of awareness and ensure adequate communication method with other workers. All workers to know emergency STOP hand signals. all back up alarms to be functional.	
		2	Utility contact (subsurface or above ground)	Follow utility clearance procedure prior to any intrusive work with equipment. Immediately stop work if any unusual or unanticipated condition encountered.	
		3	Rollovers on slopes or from improper usage	Follow equipment manufacturer instructions for use on slopes or load capacities, wear seatbelt at all times, Ensure all outriggers, if equipped are properly deployed on stable surface.	
		4	Noise from engine or work activity	Wear hearing protection as required, keep equipment well maintained.	
		5	Slips and falls from accessing or egress from equipment	Maintain 3 points of contact when access or egress equipment, keep any ladder or steps on equipment clean and dry to extent practical, ensure equipment doors, if present, are in good working order.	
		6	Exposure to tools and metal edges and damaged metal resulting in cuts lacerations to hands during maintenance	Wear protective gloves that allow for good dexterity. Mitigate sharp surfaces to extent practical.	
		7	Pinch/crush hazards to hands from doors or covers	wear gloves appropriate for hazard while maintaining dexterity, Watch for and keep hands clear of obvious hazards like door or cover closures. Do not hurry during the removal or placement of covers or equipment components.	
		8	Contact stress to knees and hands	Use padding or knee pads if kneeling on hard surfaces for an extended period of time. Avoid placing weight on hands for extended periods of time.	

4	Maintenance	1	Awkward body positions and twisting	Plan inspection activity and do not hurry through task, stretch before crawling or squatting. Avoid overreaching.	
		2	Excessive force turning bolts or lifting heavy components, decontamination activities.	Use automated methods to loosen tight bolts, do not use excessive force or torque when using hand tools. Do not use "cheater bars"	
		3	Contact with engine fluids or lubricants	Wear protective gloves, ensure MSDS is available for engine fluids and lubricants, promptly wash exposed skin, contact WorkCare immediately for any situation where diesel is injected under the skin.	
		4	Flying debris during gross decontamination or cleaning activities	Wear adequate eye and face protection when removing soils or solid media from tracks, buckets, or other component of equipment using pressure washer.	
		5	Entanglement in equipment components.	Do not circumvent protective guards or shields, ensure equipment is not operational (LOTO if necessary) when accessing engine compartment if intrusion required.	
		6	Exposure of hands and arms to hot engine components	Take the time to allow the engine to cool, wear protective gloves and forearm protection.	
		7	Struck by moving equipment or boom extensions	Keep at least 15 ft from any extendable area of the equipment, if entering within 15 ft, establish and maintain contact with equipment operator, wear high visibility clothing or work vest.	
5	Working in proximity to heavy equipment	1	Equipment damage from moving equipment	Keep other equipment not required for work outside of heavy equipment work area in all directions. Flag or mark with high visibility markings, cones, etc., any required equipment near the ground	
		2	Noise hazards from equipment operation	Wear hearing protection and increase distance if work activity permits.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)		Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	as needed	Recommended

#### Supplies

Type	Supply	Description	Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required
Personal	eye wash (specify type)		Required

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4538
Job Name	General Industry-Site clearing (tree/brush/vegetation) removal
Task Description	Site Clearing Prior to Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(1) Initial
Creation Date	2/17/2011 02:12:01 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011			Crone, Thomas	True

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Prepping equipment for clearing activities	1 Improperly maintained tools and equipment increase risk for injury to workers using tools/equipment	Maintain tools and equipment according to manufacturer recommendations, including proper oiling and inspection of tool/equipment. Ensure cutting blades are sharp.	
		2 Cuts to hands, fingers, forearms from sharpening tool/equipment blades	Wear protective gloves suitable for the tool/device being sharpened, use proper sharpening techniques and do not hurry through the sharpening process.	
		3 Falls accessing from egressing from large equipment like tractors or bulldozers	Always use 3 points of contact when access/egressing large heavy equipment. Never attempt to access/egress form moving equipment, wear footwear with good anti-slip tread and ankle support, keep mud off of stepping surfaces. Promptly affix seatbelt when sitting in seat.	
		4 Exposure to fuel during refueling activities	Wear protective gloves during refueling activities, avoid breathing fuel vapors by standing in up wind position when practical, promptly wash exposed skin or clothing.	
2	Clearing large brush/trees with heavy equipment	1 Struck by vegetation under tension during clearing	Stand at least 100 ft from clearing activity. Keep unnecessary workers away from clearing activity in all directions.	



		2 Trip fall hazards on uneven ground surfaces	Plan route and avoid walking over down trees and into vegetation where ground surface can not be seen. Wear footwear with good tread and ankle support, don't carry tools in a manner that can obstruct vision of ground	
		3 Slip or trip on muddy or sloped surfaces	Plan route, wear footwear as above, keep hands out of pockets to balance and brace falls,	
		4 Contact with poisonous or physically damaging plants	Identify and avoid contact, if brush containing poisonous plants being burned, do not stand down wind and inhale smoke, wear long pants and long sleeve shirt, in heavy briar infested areas requiring walking, wear briar chaps.	
		5 Contact with poisonous or biting insects	Watch for and avoid hazardous insects, keep cab doors closed, if equipped, to reduce exposure potential.	
		6 Struck by falling trees or large brush	Keep clear of planned fall direction, assume tree can fall in any direction and keep clear in all fall directions	
3	Clearing large brush/trees with hand tools/chainsaws	1 Cuts to arms, legs, hands from cutting tools or chainsaw	Wear protective gloves. When using chainsaw, using chainsaw chaps and helmet equipped with face shield. When using manual tools cut away from body, maintain large distance between workers using hand tools or chainsaw. When using chainsaws, don't reach over running saw, saw over head height, use saw in low visibility situations, use chainsaws on ladders or use one handed.	
		2 Physical stresses from repetitive motion or excessive push/pulling during clearing	Use job or task rotation or frequent rest breaks. Don't use excessive force pulling or pushing on vegetation.	
		3 Scrapes, cuts to skin from vegetation	Wear protective gloves, long pants and long sleeve shirt. Wear briar chaps in thorny vegetation.	
		4 Noise from chainsaws	Wear hearing protection, keep unnecessary workers away from sawing activity	
4	Clearing small brush/tall grass with mowers/bush hogs	1 Struck by flying debris from mowing activity	Keep unnecessary worker 100 ft from mowing activities	
		2 Foot hazards from slipping into cutting blades using walk behind mowers	Do not remove and promptly repair guards that reduce potential for foot entry into blade housing of mowers. Plan mowing to reduce situations that increase risk of foot slippage towards mower housing, wear steel toe boots with good tread	

		3	Noise from mowing activities	Wear hearing protection	
5	Using wood chippers	1	Struck by debris being chipped or chips emanating from the chipper	Stand clear of material being drawn into the chipper, stand to the side of the chipper table during vegetation entry. Maintain swinging baffles that prevent throwback of material.	
		2	Cuts/amputation of hands/arm inserting brush into chipper	Only use chippers with a 36 inch or more feed throw at from the cutting knives. Never place hand, feet on top the feed table of the chipper wear protective gloves.	
		3	Noise from chipping activity.	Wear hearing protection	
		4	Injury caused from unplanned movement of chipper.	Chock tires of chipper when operating.	
6	Using herbicides	1	Worker exposure to herbicide during mixing or application.	Follow manufacturer mixing and application instructions, review product MSDS for additional hazards or PPE requirements, wear impermeable gloves and clothing during mixing and application, promptly wash any skin exposed to herbicide, wear safety goggles and face shield during mixing and application	
		2	Fatigue and physical stresses from carrying hand applicator for prolonged period of time.	Use job or task rotation to reduce fatigue. For applicators carried by hand, switch hands periodically, opt for backpack versions of applicators when possible.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	coveralls	when using herbicides	Required
Eye Protection	faceshield	when using herbicides	Required
Eye Protection	safety glasses		Required
Eye Protection	safety goggles	when using herbicides	Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)	leather	Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs		Required
Miscellaneous PPE	other	chainsaw chaps	Required

#### Supplies

Type	Supply	Description	Required
Communication Devices	mobile phone		Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4537
Job Name	Environmental-Other
Task Description	Ground Water Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(2) Review
Creation Date	2/17/2011 12:16:54 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011	2/17/2011		Crone, Thomas	True
Developer (Primary Contact)	Kalinowski, Christopher	3/10/2011	2/17/2011		Bertz, Charles	True
HASP Reviewer	Powell, Jace'que	3/3/2011			Mosher, Tyler	True
Reviewer	Wisbeck, Diane	3/3/2011	2/18/2011	True	Smith, Lee	True

### Reviewer Comments

Role	Employee	Approval Status	Completed Date	Comments
HASP Reviewer	Powell, Jace'que			
Reviewer	Wisbeck, Diane	Approve	02/18/2011	

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Locate/Setup Equipment and Work Area	1 Vehicle traffic for monitoring wells located next to or on roads	(1) Setup traffic cones and /or high visibility barriers (2) if possible, use field vehicle to shield work crew from oncoming traffic (only if this doesn't create additional hazards)	
		2 Slip/Trip/Falls	Locate and remove hazard if feasible. If removal is not feasible, then mark hazard to provide warning. Maintain a clean work area.	
2	Remove Existing well pad and materials	1 Heavy lifting/Back Strain	Use proper lifting technique: keep back straight and lift with your legs. Use buddy system for objects that weigh greater than 50 pounds.	
		2 Concrete dust generation	wet concrete if dust generation is excessive  stand cross wind to minimize dust generation	

		3 Hand injury	Use work gloves when breaking concrete and cutting materials. Use appropriate tools for task. Take frequent breaks to prevent overuse/ergonomic injuries.	
		4 Flying debris	Wear appropriate PPE during jackhammer activities (safety glasses, long sleeve shirts and pants, hard hats). Keep unnecessary personnel at least 15 feet from jackhammer to avoid being struck by flying debris.	
		5 Noise	Use hearing protection when operating equipment	
3	Abandon Monitoring Wells	1 Heavy Lifting - Concrete bags	Use proper lifting technique: keep back straight and lift with the legs. Use buddy system for bags weighing greater than 50 pounds.	
		2 Cement Dust	Wear appropriate PPE (dust mask) to prevent nuisance irritation. Stand up wind of mixer when adding cement.	
		3 Pressure Grouting	Maintain awareness of pressurized equipment while in use. Wear appropriate PPE while operating equipment. Keep hoses pointed away from self or other individuals.	
4	Restore Site and Cleanup	1 Heavy Equipment Operation	Remain aware of location and position of heavy equipment.	
		2 Chemical exposure	Use chemical resistant gloves when handling cement/asphalt patching compound.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Dermal Protection	long sleeve shirt/pants	during jackhammer activities	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)		Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	during heavy equipment operation	Recommended
Miscellaneous PPE	traffic vest--Class II or III		Required
Respiratory Protection	dust mask	during concrete breaking and cement mixing	Recommended

#### Supplies

Type	Supply	Description	Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required
Miscellaneous	flashlight		Recommended
Personal	eye wash (specify type)	Portable eye wash bottles	Required
Personal	insect repellent		Recommended
Personal	sunscreen		Recommended

## Job Loss Analysis

### General

Client Name	U.S. ARMY ENVIRONMENTAL CENTER
JSA ID	4540
Job Name	Construction-Heavy equipment operation
Task Description	Heavy Equipment Operation for Monitoring Well Abandonment
Project Number	GP08RAAP4WBG
Project Name	WBG Response Action
PIC Name	TALELE, TUSHAR
Project Manager	WISBECK, DIANE
Status	(3) Completed
Creation Date	2/17/2011 02:26:22 PM
Auto Closed	False

### User Roles

Role	Employee	Due Date	Completed	Approve	Supervisor	Active
Created By	White, Robert	3/10/2011	2/17/2011		Crone, Thomas	True

### Job Steps

Job Step	Job Step Description	Potential Hazard	Critical Action	HSP Reference
1	Loading and Unloading Equipment from transport vehicles	1 Stake or impact hazards from moving equipment	Stand clear of equipment loading or unloading from transport vehicles	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		2 Equipment damage from improper removal or placement on vehicle	Ensure any ramps used are rated for weight and properly placed and secured prior to moving equipment across, ensure trailers being loaded or unloaded are properly secured against movement.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		3 Overhead utility contact for equipment with booms or extensions	Plan position of transport vehicle to maintain safe distance (>20 ft) from all overhead lines and structures. Use spotters since operator focus may be on vehicle alignment with ramps or other ground level distractions.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
		4 Ascending/Descending equipment cab.	Do not hurry through task, wear footwear with good tread and ankle support, maintain 3 points of contact while accessing or egress equipment, no jumping off trailers or truck beds.	FHSB Section IV (E); ARCHSF019, FHSB Section III(MM)
2	Pre-operation inspection	1 Pinch hazards to hands	Wear gloves appropriate for hazard while maintaining dexterity. Keep hand in field of vision and watch for and keep hands clear of obvious hazards like door or cover closures. Do not hurry during the removal or placement of covers or equipment components.	
		2 Head injury from striking equipment covers or components	Wear hard hat, stay focused on surroundings, avoid standing or raising up suddenly especially if door cover is overhead.	

		3	Exposure to engine fluids or lubricants	Wear protective gloves, ensure MSDS is available for engine fluids and lubricants, promptly wash exposed skin, contact WorkCare immediately for any situation where diesel is injected under the skin.	
		4	Awkward body positions and twisting	Plan inspection activity and do not hurry through task, stretch before crawling or squatting. Avoid overreaching.	
		5	Entanglement in equipment components.	Do not circumvent protective guards or shields, ensure equipment is not operational (LOTO if necessary) when accessing engine compartment if intrusion required.	
3	Equipment operation	1	Strike or impact hazards with other workers, equipment or structures.	Keep eyes moving and watch for unanticipated worker movement. Keep workers 15 ft from any extendable area of the equipment, Maintain 360 degrees of awareness and ensure adequate communication method with other workers. All workers to know emergency STOP hand signals. all back up alarms to be functional.	
		2	Utility contact (subsurface or above ground)	Follow utility clearance procedure prior to any intrusive work with equipment. Immediately stop work if any unusual or unanticipated condition encountered.	
		3	Rollovers on slopes or from improper usage	Follow equipment manufacturer instructions for use on slopes or load capacities, wear seatbelt at all times, Ensure all outriggers, if equipped are properly deployed on stable surface.	
		4	Noise from engine or work activity	Wear hearing protection as required, keep equipment well maintained.	
		5	Slips and falls from accessing or egress from equipment	Maintain 3 points of contact when access or egress equipment, keep any ladder or steps on equipment clean and dry to extent practical, ensure equipment doors, if present, are in good working order.	
		6	Exposure to tools and metal edges and damaged metal resulting in cuts lacerations to hands during maintenance	Wear protective gloves that allow for good dexterity. Mitigate sharp surfaces to extent practical.	
		7	Pinch/crush hazards to hands from doors or covers	wear gloves appropriate for hazard while maintaining dexterity, Watch for and keep hands clear of obvious hazards like door or cover closures. Do not hurry during the removal or placement of covers or equipment components.	
		8	Contact stress to knees and hands	Use padding or knee pads if kneeling on hard surfaces for an extended period of time. Avoid placing weight on hands for extended periods of time.	

4	Maintenance	1	Awkward body positions and twisting	Plan inspection activity and do not hurry through task, stretch before crawling or squatting. Avoid overreaching.	
		2	Excessive force turning bolts or lifting heavy components, decontamination activities.	Use automated methods to loosen tight bolts, do not use excessive force or torque when using hand tools. Do not use "cheater bars"	
		3	Contact with engine fluids or lubricants	Wear protective gloves, ensure MSDS is available for engine fluids and lubricants, promptly wash exposed skin, contact WorkCare immediately for any situation where diesel is injected under the skin.	
		4	Flying debris during gross decontamination or cleaning activities	Wear adequate eye and face protection when removing soils or solid media from tracks, buckets, or other component of equipment using pressure washer.	
		5	Entanglement in equipment components.	Do not circumvent protective guards or shields, ensure equipment is not operational (LOTO if necessary) when accessing engine compartment if intrusion required.	
		6	Exposure of hands and arms to hot engine components	Take the time to allow the engine to cool, wear protective gloves and forearm protection.	
		7	Struck by moving equipment or boom extensions	Keep at least 15 ft from any extendable area of the equipment, if entering within 15 ft, establish and maintain contact with equipment operator, wear high visibility clothing or work vest.	
5	Working in proximity to heavy equipment	1	Equipment damage from moving equipment	Keep other equipment not required for work outside of heavy equipment work area in all directions. Flag or mark with high visibility markings, cones, etc., any required equipment near the ground	
		2	Noise hazards from equipment operation	Wear hearing protection and increase distance if work activity permits.	

#### Personal Protective Equipment

Type	Personal Protective Equipment	Description	Required
Eye Protection	safety glasses		Required
Foot Protection	steel-toe boots		Required
Hand Protection	work gloves (specify type)		Required
Head Protection	hard hat		Required
Hearing Protection	ear plugs	as needed	Recommended

#### Supplies

Type	Supply	Description	Required
Miscellaneous	fire extinguisher		Required
Miscellaneous	first aid kit		Required
Personal	eye wash (specify type)		Required