



US Army Corps
of Engineers
Baltimore District

FINAL

Land Use Control Implementation Plan for Radford Army Ammunition Plant – New River Unit (RAAP-044)

Radford Army Ammunition Plant
Radford, Virginia



Infrastructure, environment, facilities

**Prepared for:
Radford Army Ammunition Plant**

August 2013



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

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Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

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

September 30, 2013

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

Re: Land Use Control Implementation Plan -NRU - Radford Army Ammunition Plant

Dear Mr. McKenna:

The Virginia Department of Environmental Quality (VDEQ) has reviewed the Land Use Control Implementation Work Plan (LUCIP) for the New River Unit (RAAP-044) dated August 2013 and approves the LUCIP as revised.

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

A handwritten signature in blue ink, appearing to read "JL Cutler".

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

cc: Jay Stewart, BAE
Aziz Farahmand, VDEQ-BRRO

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24143
Telephone (540) 639-7631
Fax (540) 639-8588

August 14, 2013

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

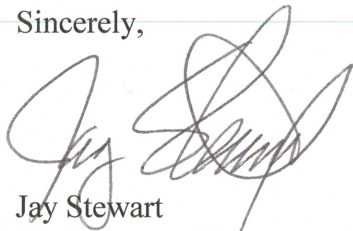
Subject: Transmittal Acknowledgement,
Final Land Use Control Implementation Plan for Radford Army Ammunition
Plant, New River Unit (RAAP-044) August 2013

Dear Mr. Cutler:

This letter is to acknowledge transmittal of the subject document that was sent to you August 12, 2013. Enclosed is a copy of the August 12, 2013 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-7785 or Mr. Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,



Jay Stewart
Environmental Manager
BAE Systems Inc, Ordnance Systems

Coordination with RFAAP Staff:


Jim McKenna

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

Rich Mendoza
US Army Environmental Command
Cleanup & Munitions Response Div
2450 Connell Rd, Bldg 2264, 1st Fl, Rm 126
San Antonio, TX 78234-7664

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

bc: Administrative File
J. McKenna, ACO Staff
Rob Davie-ACO Staff
Env. File

Alberts, Matt (US SSA)

From: McKenna, James J CIV (US) <james.j.mckenna16.civ@mail.mil>
Sent: Monday, August 12, 2013 2:54 PM
To: Cutler, Jim
Cc: Mendoza, Richard R Jr CIV (US); Meyer, Tom NAB02; Bressette, James W CIV USARMY MEDCOM PHC (US); Sismour, Karen; beth lohman (ealohman@deq.virginia.gov); Leahy, Timothy; Alberts, Matt (US SSA); Bogucki, MaryAnn (US SSA); Stewart, Jay (US SSA); Davie, Robert N.; Ortiz, Luis (RFAAP)
Subject: FW: Final LUCIP (UNCLASSIFIED)
Attachments: 2012 12 14 LUCIP_Cutler RTC.pdf

Classification: UNCLASSIFIED
Caveats: FOUO

All,

The contractor will ship the Final Land-Use Control Implementation Plan, New River Unit (RAAP044) to the VDEQ today (August 12, 2013). The Final Document was revised to include comments provided by VDEQ. Below are the POCs and their respective Fed Ex numbers.

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

Jim McKenna

Confidentiality Note: This e-mail is Official Correspondence and is For Official Use Only, it is intended only for the person or entity to which it is addressed, and may contain information that is privileged, confidential, sensitive, or otherwise protected from disclosure. If you receive this email in error please notify the sender immediately

James McKenna - tracking number (79642017-1909) Richard Mendoza - tracking number (7964-2019-3498) Jason Sherman - tracking number (7964-2022-0988) Tom Meyer - tracking number (7964-2023-2227) Jim Bressette - tracking number (7964-2028-6146) James Cutler - tracking number (7964-2074-7999) Karen Sismour - tracking number (7964-2031-4893) Elizabeth Lohman - tracking number (7964-2032-6990) Mark Bowen - tracking number (7964-2033-8802) Tim Leahy - tracking number (7964-2035-5390)

Classification: UNCLASSIFIED
Caveats: FOUO

Comments and Responses on the
Draft Land Use Control Implementation Plan
New River Unit RFAAP 044

Radford Army Ammunition Plant: Provided by Jim Cutler (VDEQ)
December 2012

Item No.	Report Reference	COMMENT	RESPONSE
Commenter: Jim Cutler (VDEQ) –Comments received via email 12/11/2012			
1	Page 3-1, Section 3.	The second bullet prohibits commercial use for building remnants at BLA and IAA. Residential use should also be prohibited (at least for IAA since BLA is already covered in first bullet).	Agreed. The second bullet has been revised as follows (with changes highlighted in yellow): Prohibit the occupation or use of buildings remnants within the BLA and IAA for residential, industrial or commercial purposes including storage and warehousing; and
2	Page 3-3.	Either here or somewhere in the LUCIP it should be stated that the LUCIP will be included as part of the "operating/procedural manual" (insert correct name) that governs procedures that must be followed when gaining access to the site. Also, is there a "master plan" covering future use at the NRU? I want to make sure that environmental concerns and/or restrictions are in the information loop.	Agreed. The text has been revised as follows: RFAAP and the operating contractor will be responsible for the care and maintenance of all land use restricted sites at RFAAP-NRU. This LUCIP and the restrictions identified herein will be incorporated in the Management Manual (or its equivalent) which maintains the access and use procedures for the NRU.
3	Page 3-5, Section 3.3.4.	It should also state that copies of the annual inspection reports will be submitted to VDEQ.	Agreed. The text has been revised as follows: Annual inspections will be performed to ensure that the BDDT and BLA are not used for residential purposes, that the building remnants at the BLA and IAA remain unused, and that all LUC information signs at RFAAP-NRU are properly maintained. Inspections will also be performed to ensure that the rip rap liner and downgradient vegetation at the BDDT remain in place to prevent erosion/migration of surface soils that contain COCs. Copies of the annual inspection reports will be provided to the VDEQ and documented in CERCLA 5-Year Reviews.

Comments and Responses on the
Draft Land Use Control Implementation Plan
New River Unit RFAAP 044

Radford Army Ammunition Plant: Provided by Jim Cutler (VDEQ)
December 2012

Item No.	Report Reference	COMMENT	RESPONSE
4	Page 3-6.	Please add the following sentence to the last bullet. "Confirmation sampling may be required after building materials are removed.	<p><i>Agreed. The last bullet has been revised as follows:</i></p> <p>Demolition and off-site disposal (in accordance with applicable regulations) of the remnant building materials at the BLA and IAA. Sampling may be performed after building demolition activities to confirm current conditions are consistent with planned use.</p>

-----Original Message-----

From: Cutler, Jim (DEQ) [<mailto:James.Cutler@deq.virginia.gov>]

Sent: Thursday, July 25, 2013 12:54 PM

To: McKenna, James J CIV (US)

Subject: NRU LUCIP RTC

Jim,

The VDEQ has reviewed Response to Comments for the Land Use Control Implementation Plan at the NRU (RFAAP-044) and concurs with the responses. The report can be finalized with the suggested revisions.

Thanks,

Jim

James L. Cutler Jr.

Federal Facilities Project Manager

Office of Remediation Programs

Virginia Dept. of Environmental Quality

804-698-4498

Classification: UNCLASSIFIED

Caveats: FOUO

From: McKenna, James J CIV (US) <james.j.mckenna16.civ@mail.mil>
Sent: Friday, May 17, 2013 8:12 AM
To: Cutler, Jim
Cc: Kalinowski, Chris; Wisbeck, Diane; Alberts, Matt (US SSA); Stewart, Jay (US SSA); MaryAnn Bogucki - Radford (maryann.bogucki@baesystems.com); Meyer, Tom NAB02; Mendoza, Richard R Jr CIV (US); Davie, Robert N III CIV (US); beth lohman (ealohman@deq.virginia.gov)
Subject: Acknowledgement letter for the NRU Decision Document and RTCs to DEQ comments on the draft NRU LUCIP (UNCLASSIFIED)
Attachments: 13-0900-071 NRU (RAAP-044) Decision Document.pdf

Classification: UNCLASSIFIED

Caveats: FOUO

Jim Cutler,

Please see attached file for the subject letter for the signed decision document and response to comments on the draft NRU LUCIP.

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

Jim McKenna

PS Diane, Chris, please retain this letter and email for the correspondence file.

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ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24143
Telephone (540) 639-7631
Fax (540) 639-8588

May 15, 2013

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

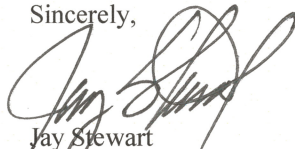
Subject: Transmittal Acknowledgement,
Final Decision Document for Radford Army Ammunition Plant, New River Unit (RAAP-044) November 2011

Dear Mr. Cutler:

This letter is to acknowledge transmittal of the subject document that was sent to you May 15, 2013. Enclosed is a copy of the 15 May 2013 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-7785 or Mr. Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,



Jay Stewart
Environmental Manager
BAE Systems, Ordnance Systems Inc.

cc: 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
2450 Connell Rd., Bldg. 2264, 1st Fl, Rm126
Attn: Richard Mendoza
San Antonio, TX 78234-7664

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

bc: BAE Administrative File
J. McKenna, ACO Staff
Rob Davie-ACO Staff
Environmental File

Coordination:


J. McKenna

Alberts, Matt (US SSA)

From: McKenna, James J CIV (US) <james.j.mckenna16.civ@mail.mil>
Sent: Wednesday, May 15, 2013 10:45 AM
To: Cutler, Jim
Cc: Kalinowski, Chris; diane.wisbeck@arcadis-us.com; Alberts, Matt (US SSA); Stewart, Jay (US SSA); Bogucki, MaryAnn (US SSA); Meyer, Tom NAB02; Mendoza, Richard R Jr CIV (US); Davie, Robert N.; beth lohman (ealohman@deq.virginia.gov)
Subject: FW: NRU Decision Document and RTCs to DEQ comments on the draft NRU LUCIP (UNCLASSIFIED)
Attachments: 20111111 NRU Decision Document - Rev20130513 signed.pdf; 2012 12 14 LUCIP_Cutler RTC.PDF

Classification: UNCLASSIFIED

Caveats: FOUO

Jim Cutler,

Please see attached files for the subject signed decision document and response to comments on the draft NRU LUCIP.

As a reminder, there is DEQ follow up action on documents that we have previously coordinated review and comment on and anticipated concurrence but were pending for the Decision Document to be signed by the Army. These actions are listed below.

1. the NRU Decision Document signed by the Army, attached to this email 2. the Response Action Completion and Closure Report for the BLA, IAA and WBG, NRU (RAAP-044) September 2011, originally sent via email 09/19/2011 3. the attached response to comments on the Land Use Control Implementation Plan, originally sent via email 12/14/2012

If you have questions or concerns, please do not hesitate to contact me.

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

Jim McKenna

PS Resending as I left Beth Lohman off of the earlier email that I sent.

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**Comments and Responses on the
Draft Land Use Control Implementation Plan
New River Unit RFAAP 044**

**Radford Army Ammunition Plant: Provided by Jim Cutler (VDEQ)
December 2012**

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**Comments and Responses on the
Draft Land Use Control Implementation Plan
New River Unit RFAAP 044**

**Radford Army Ammunition Plant: Provided by Jim Cutler (VDEQ)
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From: McKenna, James J CIV (US) <james.j.mckenna16.civ@mail.mil>
Sent: Friday, December 14, 2012 11:09 AM
To: Cutler, Jim
Cc: Kalinowski, Chris; Wisbeck, Diane; Alberts, Matt (US SSA); Stewart, Jay (US SSA); MaryAnn Bogucki (maryann.bogucki@baesystems.com); Meyer, Tom NAB02; Mendoza, Richard R Jr CIV (US); Ryan, Susan M CIV USARMY IMCOM AEC (US)
Subject: RTCs to DEQ comments on the draft NRU LUCIP (UNCLASSIFIED)
Attachments: 2012 12 14 LUCIP_Cutler RTC.PDF

Classification: UNCLASSIFIED
Caveats: FOUO

Jim Cutler,

Please see attached file for the subject responses. Note the yellow highlighting is provided to facilitate review of the specific change. If you concur with these responses then we can revise and resubmit the LUCIP.

Having said that, below is a brief summary of my understanding of the status of, and anticipated actions for the NRU and related documents.

1. NRU Decision Document, waiting for USAEC to approve.
2. Once USAEC approves the NRU Decision Document, then DEQ can concur with the following documents already (or soon to be) in their possession:
 - Response Action Completion and Closure Report for the BLA, IAA and WBG, NRU (RAAP-044) September 2011 -revised LUCIP
3. Once DEQ concurs with these documents, then RFAAP/ARCADIS can begin preparing and installing the signs at the BDDT, BLA and IAA areas.

Suggest that we all talk after the holiday break.

Thanks,
JJM

Classification: UNCLASSIFIED
Caveats: FOUO

**Comments and Responses on the
Draft Land Use Control Implementation Plan
New River Unit RFAAP 044**

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-----Original Message-----

From: Cutler, Jim (DEQ) [<mailto:James.Cutler@deq.virginia.gov>]

Sent: Tuesday, December 11, 2012 3:08 PM

To: McKenna, James J CIV (US)

Subject: RE: LUCIP Comments - AEC Legal Comments (UNCLASSIFIED)

Jim,

Overall the LUCIP looks good. I have a couple of comments to firm up some of the LUCIP details:

Page 3-1, Section 3. The second bullet prohibits commercial use for building remnants at BLA and IAA. Residential use should also be prohibited (at least for IAA since BLA is already covered in first bullet).

Page 3-3. Either here or somewhere in the LUCIP it should be stated that the LUCIP will be included as part of the "operating/ procedural manual" (insert correct name) that governs procedures that must be followed when gaining access to the site. Also, is there a "master plan" covering future use at the NRU? I want to make sure that environmental concerns and/or restrictions are in the information loop.

Page 3-5, Section 3.3.4. It should also state that copies of the annual inspection reports will be submitted to VDEQ.

Page 3-6. Please add the following sentence to the last bullet. "Confirmation sampling may be required after building materials are removed.

That's all for now. Let me know if you have any questions. Like the construction completion report I will not be able to give final approval until the DD is signed.

Thanks,

Jim C.

ORDNANCE SYSTEMS INC.
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford Virginia 24141

30 November, 2012

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

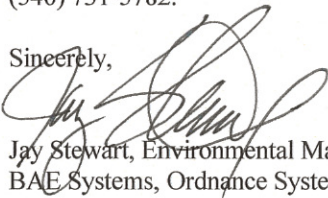
Subject: Transmittal Acknowledgement,
Draft Land Use Control Implementation Plan, New River Unit (RAAP-044) November 2012

Dear Mr. Cutler:

This letter is to acknowledge transmittal of the subject document that was sent to you on November 29, 2011. Enclosed is a copy of the 29 November 2012 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-7785 or Mr. Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,



Jay Stewart, Environmental Manager
BAE Systems, Ordnance Systems 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 Command
Cleanup & Munitions Response Div
2450 Connell Rd, Bldg 2264, 1st Fl, Rm 126
San Antonio, TX 78234-7664

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

bc: Administrative File
J. McKenna, ACO Staff
Rob Davie-ACO Staff
Env. File

Coordination:


J. McKenna

Alberts, Matt (US SSA)

From: McKenna, Jim
Sent: Thursday, November 29, 2012 8:04 AM
To: Cutler, Jim
Cc: Davie, Robert N.; Stewart, Jay (US SSA); Alberts, Matt (US SSA); Bogucki, MaryAnn (US SSA); Mendoza, Richard R Jr CIV (US); Ryan, Susan M CIV USARMY IMCOM AEC (US); Meyer, Tom NAB02; diane.wisbeck@arcadis-us.com; Kalinowski, Chris
Subject: FW: RAAP (UNCLASSIFIED)
Attachments: 2012 11 16 NRU LUCIP - Draft to VDEQ.pdf

Classification: UNCLASSIFIED

Caveats: FOUO

Jim,

Attached is the draft Land Use Control Plan for the New River Unit. If you need a hard copy let me know. I'm still waiting for the Decision Document. In the meantime I thought it would be helpful to get this plan out and reviewed.

Thanks,
JJM

Classification: UNCLASSIFIED

Caveats: FOUO

FINAL

**Land Use Control Implementation
Plan for Radford Army Ammunition
Plant – New River Unit (RFAAP-
044)**

Radford Army Ammunition Plant,
Radford, Virginia

August 2013

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- 1 RFAAP-NRU Facility Location
- 2 RFAAP-NRU Study Areas
- 3 Building Debris Disposal Trench Site Layout
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- 5 Igniter Assembly Area Site Layout

1. Introduction

Radford Army Ammunition Plant (RFAAP) is an active, government-owned, contractor operated propellant and explosives manufacturing facility located in the mountains of southwestern Virginia. RFAAP consists of two noncontiguous units: the Main Manufacturing Area (MMA) and the New River Unit (NRU). This Land Use Control Implementation Plan (LUCIP) has been prepared for RFAAP-NRU (CERCLIS ID # VASFN030555), which is located off of Bagging Plant Road, near the town of Dublin, in Pulaski County, Virginia (**Figure 1**). Specifically, this LUCIP addresses the land use controls (LUCs) that will be implemented at three separate sites located within the boundaries of RFAAP-NRU. These sites are defined as the Building Debris Disposal Trench (BDDT), Bag Loading Area (BLA), and the Igniter Assembly Area (IAA), and their locations within RFAAP-NRU are depicted in **Figure 2**.

The environmental investigation, characterization, remedial design, and cleanup activities for all Study Areas at RFAAP-NRU, including those discussed herein, have been managed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); although the site is not listed on the National Priorities List (NPL). The United States Department of the Army (Army) has served as the lead agency for all environmental investigation and cleanup activities at the facility and the Virginia Department of Environmental Quality (VDEQ) has served as the lead regulatory agency. Documents summarizing all phases of the investigation and cleanup process at the facility are contained in the Administrative Record File for RFAAP-NRU, which is maintained online at <http://www.radfordaapirp.org>.

As discussed in the Decision Document for RFAAP-NRU (ARCADIS 2011b), the final component of the remedial actions selected for the BDDT, BLA, and IAA Study Areas include the use of LUCs. LUCs are required for the BDDT and BLA Study Areas to restrict residential development because the selected remedies will leave contaminants in place in soil at concentrations that present potentially unacceptable health risks under hypothetical future residential land use scenarios. The LUCs for the IAA are only necessary to restrict the use of building remnants within the Study Area due to the presence of asbestos and lead based paint. The building use restrictions will also apply to building remnants at the BLA Study Area.

RFAAP recognizes that implementing and maintaining prescribed LUCs will be an integral part of assuring the protectiveness of the selected remedies over the long term. This LUCIP includes specific details of the LUCs that will be implemented for RFAAP-NRU and addresses the following general LUC provisions:

Introduction

LUCIP for Radford Army
Ammunition Plant – New
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1. The identification of the RFAAP point-of-contact that will be responsible for monitoring, maintaining, and enforcing the site specific LUCs.
2. A commitment to conduct field inspections periodically to assess the conditions and land use of the sites subject to LUCs.
3. A commitment to provide notification to VDEQ of any major changes in land use
4. A requirement for RFAAP to notify VDEQ immediately upon discovery of any unauthorized use of the sites subject to LUCs, and
5. A requirement for advance notification to VDEQ in the event of a pending real estate transfer.

2. Site Description and Land Use

Radford Army Ammunition Plant (RFAAP) is an active propellant and explosives manufacturing facility. The facility consists of two noncontiguous units, which are known as the Main Manufacturing Area (RFAAP-MMA) and the New River Unit (RFAAP-NRU). RFAAP-MMA is located in Montgomery County, near the City of Radford, while RFAAP-NRU is located in Pulaski County, near the town of Dublin (**Figure 1**). RFAAP-NRU was originally constructed during 1940 and served as powder bag loading plant for artillery, cannon, and mortar projectiles during World War II. Following WWII, RFAAP-NRU was consolidated with RFAAP-MMA and all active manufacturing operations at RFAAP-NRU were discontinued. RFAAP-NRU now only serves as a munitions storage facility for the on-going operations at RFAAP-MMA. These munitions storage operations are conducted in secured magazine buildings located throughout the eastern half of RFAAP-NRU. Although both RFAAP-MMA and RFAAP-NRU are owned by the Army, they are currently operated and maintained by an operating contractor.

In total, the RFAAP-NRU property encompasses approximately 3,000 acres. Access to the facility is controlled by perimeter fencing and permanently stationed security guards. Other than the on-going munitions storage operations, the only other current land uses within the secured boundaries of RFAAP-NRU include a few agricultural tracts located in the eastern portion of the facility. The majority of the land area consists of undeveloped grass lands and heavily forested areas. There are no residences and limited offices located within the RFAAP-NRU boundaries, and the only recreational activities at the facility consist of controlled game hunting and fishing. RFAAP-NRU is anticipated to remain an active military installation in the future with land use remaining unchanged or limited to military/industrial development.

2.1 Building Debris Disposal Trench

The BDDT Study Area is located within an approximately 5-acre area near the southern boundary of RFAAP-NRU (**Figure 2**). This area is characterized by rolling grass covered hills. The BDDT area includes what was formerly a natural drainage channel that had eroded into the clay soils between two hills. An approximately 700-ft long section of this channel is now lined with a geotextile membrane and filled with rip-rap to prevent erosion. This geotextile and rip-rap system was installed at the BDDT in 1998 as a component of the site investigation and restoration activities for the Study Area. The remainder of the BDDT Study Area is located at the downgradient extent of the riprap covered portion of the trench, where it widens into a gently sloping, delta

shaped depositional area that is covered with a thick grass groundcover. The downgradient edge of the BDDT area is marked by an unnamed stream that flows through the southwestern portion of RFAAP-NRU.

The environmental investigation and risk assessment activities for the BDDT determined that benzo(a)pyrene is present in surface soil underneath the rip-rap and in surface soil in the downgradient depositional area at concentrations that would present unacceptable risks under a residential land use scenario. There are no unacceptable risks associated with the current land use or with industrial/commercial development. The source of the benzo(a)pyrene was identified as building debris that had previously been located within the now rip-rap covered portion of the site. The building debris was all removed from the site as part of the 1998 site restoration activities. No constituents of concern (COCs) were identified for sediment or surface water in the unnamed stream downgradient of the BDDT.

The riprap/liner system in the former disposal area of the site, as long as it is kept in place, effectively prevents exposure to the soils as well as prevents erosion that would lead to potential migration of the soils containing benzo(a)pyrene. A grass groundcover and gentle land surface slope in the downgradient depositional area prevents the further migration of the benzo(a)pyrene impacted surface soils in this area. Considering these factors, and that there are no unacceptable risks associated with the current industrial/commercial land use scenario, the Decision Document for RFAAP-NRU concluded that no active remedies were required for the site. However, the Decision Document did specify that LUCs are to be utilized to prevent residential development of the area (e.g., housing, elementary and secondary schools, child-care facilities, and playgrounds) and to minimize the potential for the benzo(a)pyrene present in surface soils to migrate to other areas.

A map presenting the features of the BDDT Study Area, including the areas where LUCs are to be applied, is presented as **Figure 3**.

2.2 Bag Loading Area

The BLA is located within an approximately 25-acre area near the southern boundary of RFAAP-NRU (**Figure 2**). Two powder bag production lines were operated at the BLA during the period from 1941 through 1943. These bag loading operations and related materials handling activities were conducted in seven former buildings located throughout the BLA study area. Three additional buildings formerly located at the BLA were reportedly utilized for office/support activities related to BLA operations. The BLA

Site Description and Land Use

LUCIP for Radford Army
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buildings were all connected by a perimeter road and a series of elevated walkway platforms that ran across the site.

After the manufacturing operations were discontinued at RFAAP-NRU, the ten buildings at the BLA were dismantled. All of the wooden components of the BLA buildings (e.g., roofs, walls, stairs, etc.) and walkway platforms were taken down and removed from the site. The electrical transformers, utility lines, and process equipment were also removed from the site. All that remains of the former BLA operations are the concrete floors and a few concrete walls of the former buildings and the perimeter roads. There are also some residual lead-based paints and asbestos containing building materials left on some of the building remnants. Much of the site is now vegetated with grass groundcover and trees.

The environmental investigations and risk assessment activities for the BLA Study Area concluded that copper, lead, and asbestos were present in surface soil at concentrations that presented unacceptable risks or hazards to site workers and/or construction workers under the current and anticipated future industrial/commercial land use scenario. Copper, lead, asbestos, Aroclor 1254 and benzo(a)pyrene were also determined to present unacceptable risks and/or hazards under a hypothetical future residential land use scenario. The primary source of the copper, lead and asbestos in soil was identified as degrading conductive flooring material that was present in the seven former process buildings at the BLA.

As prescribed in the Decision Document for RFAAP-NRU (ARCADIS 2011b) and discussed in the Response Action Completion and Closure Report for the BLA, IAA, and WBG (ARCADIS 2011a), remedial activities were completed for the BLA Study Area in 2011. These actions included the removal of all conductive flooring material from the building remnants at the site and the excavation of soils containing copper, lead, and asbestos at concentrations that presented unacceptable risks for the site. The soil excavation activities were only conducted to target cleanup levels that eliminated unacceptable risks associated with the current and hypothetical future industrial/commercial land use scenario. Benzo(a)pyrene and Aroclor 1254 were left in place in surface soil at concentrations that could present unacceptable risks and/or hazards under a residential land use scenario.

The final component of the remedial action prescribed for the BLA Study Area is to implement LUCs to prevent residential development (e.g., housing, elementary and secondary schools, child-care facilities, and playgrounds) of the site. The LUCs for the BLA will also be used to restrict use of the former building remnants at the BLA due to

the presence of asbestos containing building materials and lead based paint. The restrictions would include preventing the use of the former buildings for storage or warehousing purposes.

A map presenting the features of the BLA Study Area, including the limits of the area where the LUCs will be applied is included as **Figure 4**.

2.3 Igniter Assembly Area

The IAA spreads across a 43-acre area in the western portion of RFAAP-NRU (**Figure 2**). The site was historically utilized for the assembly of igniter charges for artillery, cannon, and mortar projectiles, as well as shipping and handling of materials related to the IAA operations from 1941 through 1943. Approximately 36 buildings were located throughout the IAA, 29 of which contained a conductive flooring material similar to that located at the BLA. The IAA buildings were all connected by roads and a series of sidewalks that run across the site.

After the manufacturing operations were discontinued at RFAAP-NRU, the buildings at the IAA were dismantled in a similar fashion to the BLA. All of the wooden components of the IAA buildings (e.g., roofs, walls, stairs, etc.) and walkway platforms were taken down and removed from the site, as were the electrical transformers, utility lines, and process equipment. All that remains of the former IAA buildings are concrete floors, concrete walls, and sidewalks. Some residual lead-based paints and asbestos building materials also remain on some of the building remnants. The majority of the area is now heavily forested.

The environmental investigations and risk assessment for the IAA concluded that asbestos in surface soil was the only COC that presented unacceptable health risks under the current and anticipated future industrial/commercial land use scenario. Copper, lead, Aroclor 1254, and asbestos in surface soil were all found to present unacceptable risks under a residential land use scenario. The primary source of the copper, lead, and asbestos was identified as the conductive flooring material in the former site buildings. The source of the Aroclor 1254 appears to have been electrical transformers formerly located at the site.

As prescribed in the Decision Document for RFAAP-NRU (ARCADIS 2011b) and discussed in the Response Action Completion and Closure Report for the BLA, IAA, and WBG (ARCADIS 2011a), remedial activities were completed for the IAA Study Area in 2011. These actions included the removal of all conductive flooring material

Site Description and Land Use

LUCIP for Radford Army
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from the building remnants at the site and the excavation of soils containing copper, lead, asbestos, and Aroclor 1254 at concentrations that presented unacceptable risks for the site. The soil excavation activities were conducted to cleanup levels that eliminated unacceptable risks associated with residential use of the property; therefore, there is no requirement for LUCs due to COCs in soil. However, the LUCs were still selected as a component of the remedy for the IAA to restrict use of the former building remnants due to the presence of lead based paints and asbestos materials. The restrictions would include preventing the use of the former buildings for storage or warehousing purposes.

A map presenting the features of the IAA Study Area, including the former buildings to which LUCs will be applied is included as **Figure 5**.

3. Overview of Institutional Controls for RFAAP-NRU

Land Use Controls (LUCs) are generally non-engineered mechanisms such as administrative and/or legal controls that can be utilized to minimize the potential for human exposure to contamination and/or protect the integrity of a remedy already in place. The Army will often utilize LUCs for remediation scenarios that leave contaminants in place at concentrations that do not allow for unrestricted development or access of a property. At RFAAP-NRU, the Army will implement LUCs for the BDDT, BLA, and IAA to achieve the following performance objectives:

- Prohibit the development and use of the BDDT and BLA sites for residential housing, elementary and secondary schools, child-care facilities, and playgrounds;
- Prohibit the occupation or use of buildings remnants within the BLA and IAA for residential, industrial or commercial purposes including storage and warehousing; and
- Minimize the potential for COCs present in surface soils at the BDDT to migrate to other areas.

3.1 Summary of Land Use Control Mechanisms Currently in Place

The practice of applying LUCs or institutional controls to prevent residential land use at RFAAP-NRU provides an abundance of protection and caution as it is unlikely that the RFAAP-NRU site will be developed for residential purposes. RFAAP-NRU currently serves as a storage facility for energetic materials manufactured by the on-going operations at RFAAP-MMA. Accordingly the security afforded to both RFAAP-MMA and RFAAP-NRU by the Army and operating contractor is designed to prevent any unauthorized access to the facility. Specifically, a security force, physical control procedures and equipment access restrictions are utilized to secure RFAAP-MMA and RFAAP-NRU. RFAAP operates a personnel security clearance program to ensure that employees and subcontractors who are required to have a clearance to perform their duties are evaluated and cleared consistently with DoD-ID security policies.

Perimeter fencing, guarded gates, and uniformed guards with communication devices are already in place to restrict access to the RFAAP-NRU property. Construction, excavation and development of any kind are highly scrutinized by both the Army and RFAAP's commercial operator personnel. Several clearances, passes, permits and inspections are required before any equipment or personnel are allowed to operate on-

site. Therefore, it is highly unlikely that the BDDT, BLA, and IAA Study Areas would be utilized for anything other than the current state.

3.2 Implementation of Additional Land Use Controls Mechanisms

3.2.1 Building Debris Disposal Trench

The LUCs for the BDDT Study Area are intended to prevent the area from being used for residential housing, elementary and secondary schools, child-care facilities, and playgrounds due to benzo(a)pyrene in surface soils. The LUCs for the BDDT are also necessary to maintain the rip-rap liner system in the drainage channel and the grass groundcover in the depositional area to prevent erosion of impacted soils. These objectives are met by the control mechanisms that are already in place, as discussed in Section 3.1. There will be no further restrictions placed upon the area.

As an added precaution, RFAAP will post a sign at the BDDT Study Area that will read as follows:

“UNAUTHORIZED PERSONNEL KEEP OUT.
THIS SITE IS SUBJECT TO LAND USE CONTROLS.
MAINTAIN THIS SITE IN ITS CURRENT STATE,
AND PREVENT FUTURE RESIDENTIAL USE.
DO NOT REMOVE RIP-RAP OR VEGETATION FROM THIS AREA.
CONTACT THE ENVIRONMENTAL DEPARTMENT WITH QUESTIONS”

3.2.2 Bag Loading Area

The LUCs for the BLA Study Area are intended to prevent the area from being used for residential housing, elementary and secondary schools, child-care facilities, and playgrounds due to benzo(a)pyrene and Aroclor 1254 in surface soils. The LUCs for the BLA are also necessary to prevent the occupation or use of the building remnants at the site due to the presence of asbestos materials and lead based paint. These objectives are met by the control mechanisms that are already in place at RFAAP-NRU, as discussed in Section 3.1. There will be no further restrictions placed upon the area.

As an added precaution, RFAAP will post a sign at the BLA Study Area that will read as follows:

“UNAUTHORIZED PERSONNEL KEEP OUT.
THIS SITE IS SUBJECT TO LAND USE CONTROLS

**Overview of Institutional
Controls for RFAAP-
NRU**

LUCIP for Radford Army
Ammunition Plant – New
River Unit (RFAAP-044)

MAINTAIN THIS SITE IN ITS CURRENT STATE,
AND PREVENT FUTURE RESIDENTIAL USE.
CONTACT THE ENVIRONMENTAL DEPARTMENT WITH QUESTIONS”

and

“KEEP OUT OF BUILDING REMNANTS –
ASBESTOS AND LEAD BASED PAINTS.
CONTACT THE ENVIRONMENTAL DEPARTMENT WITH QUESTIONS”

3.2.3 Igniter Assembly Area

No restrictions to land use are required for the IAA because previously completed remedial actions have removed COCs that had contributed to unacceptable health risks. However, LUCs will still be implemented at the IAA for the purpose of restricting use of the building remnants at the site due to the presence of asbestos materials and lead based paint.

As an added precaution, RFAAP will post a sign at the IAA Study Area that will read as follows:

“KEEP OUT OF BUILDING REMNANTS –
ASBESTOS AND LEAD BASED PAINTS.
CONTACT THE ENVIRONMENTAL DEPARTMENT WITH QUESTIONS”

3.3 Maintenance and Inspection Procedures

3.3.1 RFAAP-NRU Land Use Control Coordinator and Point-of-Contact

RFAAP and the operating contractor will be responsible for the care and maintenance of all land use restricted sites at RFAAP-NRU. This LUCIP and the restrictions identified herein will be incorporated in the Management Manual (or its equivalent) which maintains the access and use procedures for the NRU.

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3.3.2 Distribution of Information

This LUCIP shall be provided to the following entities:

- RFAAP Operating Contractor
- Virginia Department of Environmental Quality

3.3.3 Notification of Changes in Land Use

In the event that RFAAP anticipates any “significant changes in land use” for the BDDT, BLA, or IAA, RFAAP will determine whether the contemplated changes will or will not necessitate the need for re-evaluation of the selected remedy or implementation of specific measures to ensure continued protection of human health and the environment. RFAAP will notify VDEQ in writing of such changes at least sixty (60) days prior to the initiation of such changes. Each notification shall include:

- a) an evaluation of whether the anticipated land use change will pose unacceptable risks to human health and the environment or negatively impact the effectiveness of the remedy;
- b) an evaluation of the need for any additional remedial action(s) resulting from the anticipated land use changes;
- c) a proposal for any necessary changes to the selected remedial action and identification of documentation requirements.
- d) Upon notification by RFAAP of an anticipated significant land use change, VDEQ will evaluate the information provided and will issue comments within sixty (60) days so as to minimize any potential adverse impacts to RFAAP activities or operations.

Any proposed land use change that the RFAAP determines would deem the LUCs not protective or would result in the selected remedy no longer meeting the remedial action objectives will not be implemented until a response and concurrence is obtained from VDEQ. The Parties agree that “significant changes in land use” are defined as:

- A change in land use that is inconsistent with the exposure assumptions in the risk assessment that was the basis for the LUCs.
- Any proposed land use change that would make the selected remedy not protective or no longer meet the remedial action objectives

- Any new construction proposed for the site.

3.3.4 Monitoring and Reporting

Annual inspections will be performed to ensure that the BDDT and BLA are not used for residential purposes, that the building remnants at the BLA and IAA remain unused, and that all LUC information signs at RFAAP-NRU are properly maintained. Inspections will also be performed to ensure that the rip rap liner and downgradient vegetation at the BDDT remain in place to prevent erosion/migration of surface soils that contain COCs. Copies of the annual inspection reports will be provided to the VDEQ and documented in CERCLA 5-Year Reviews.

If any unauthorized use of the BDDT, BLA, or IAA Study Areas is discovered during annual inspections, or during normal observation of the facility, RFAAP will notify VDEQ in writing within 60-days.

3.3.5 Maintenance

RFAAP will maintain and repair/update informational signs related to the LUC controls at the facility as necessary.

In the event the rip rap liner system or downgradient vegetation at the BDDT study area is damaged/compromised such that erosion of soils within the impacted portion of the site becomes a concern, RFAAP will make repairs to the rip rap and install silt fencing within downgradient areas until such time that the erosion potential is minimized.

3.3.6 Future Property Conveyance

In the event that there is a transfer of property that includes any portion of the BDDT, BLA, or IAA land area, RFAAP and/or the transferring agency will notify VDEQ of the transfer consistent with the laws and regulations governing such transfer. RFAAP and/or the transferring agency will also ensure that the land use restrictions are legally recorded, as appropriate, and incorporated into the provisions for the new land use.

3.4 Termination of Use Restrictions

The LUCs for the BDDT, BLA, and IAA at RFAAP-NRU will remain in place indefinitely. However, the following options are available with regulatory notification should the

Overview of Institutional Controls for RFAAP-NRU

LUCIP for Radford Army Ammunition Plant – New River Unit (RFAAP-044)

Army or future property owner decide that the use restrictions at a site need to be modified, though these options do not guarantee changes would be able to occur:

- A new evaluation of the contaminant concentrations present at the BDDT and BLA. The evaluation may include a comparison of historical data against new/revised standards. The evaluation could find that contamination levels are below the protective standards or risk assessment values.
- Performance of additional remediation such that land use restrictions would no longer be required.
- Demolition and off-site disposal (in accordance with applicable regulations) of the remnant building materials at the BLA and IAA. Sampling may be performed after building demolition activities to confirm current conditions are consistent with planned use.

REFERENCES

LUCIP for Radford Army
Ammunition Plant – New
River Unit (RFAAP-044)

4. References

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ARCADIS, 2011b. Decision Document for Radford Army Ammunition Plant – New River Unit (RFAAP-044), Radford Army Ammunition Plant, Radford, Virginia. November.

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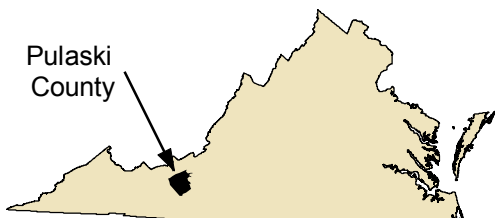
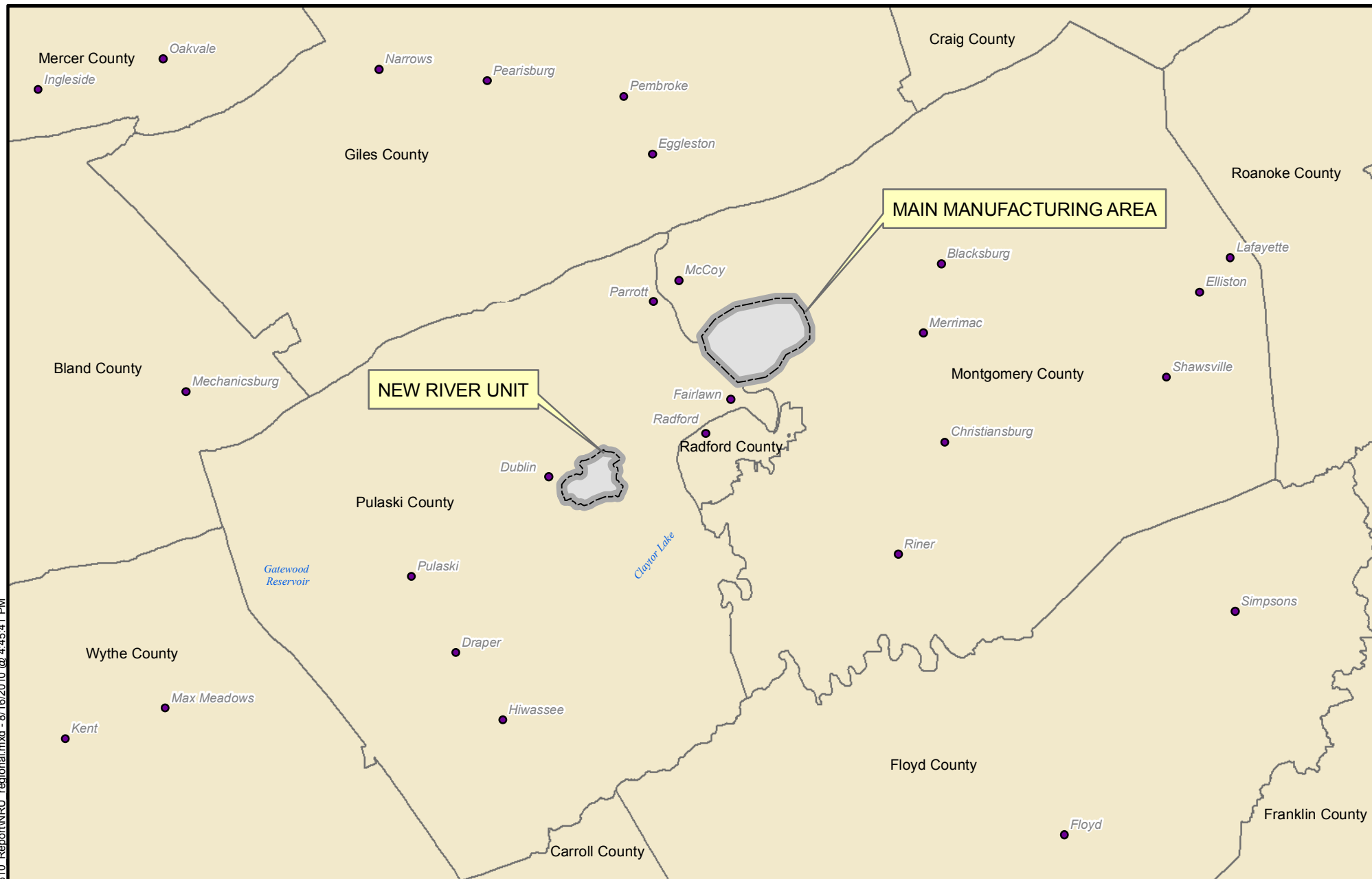
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OSWER No. 9355.7-03B-P

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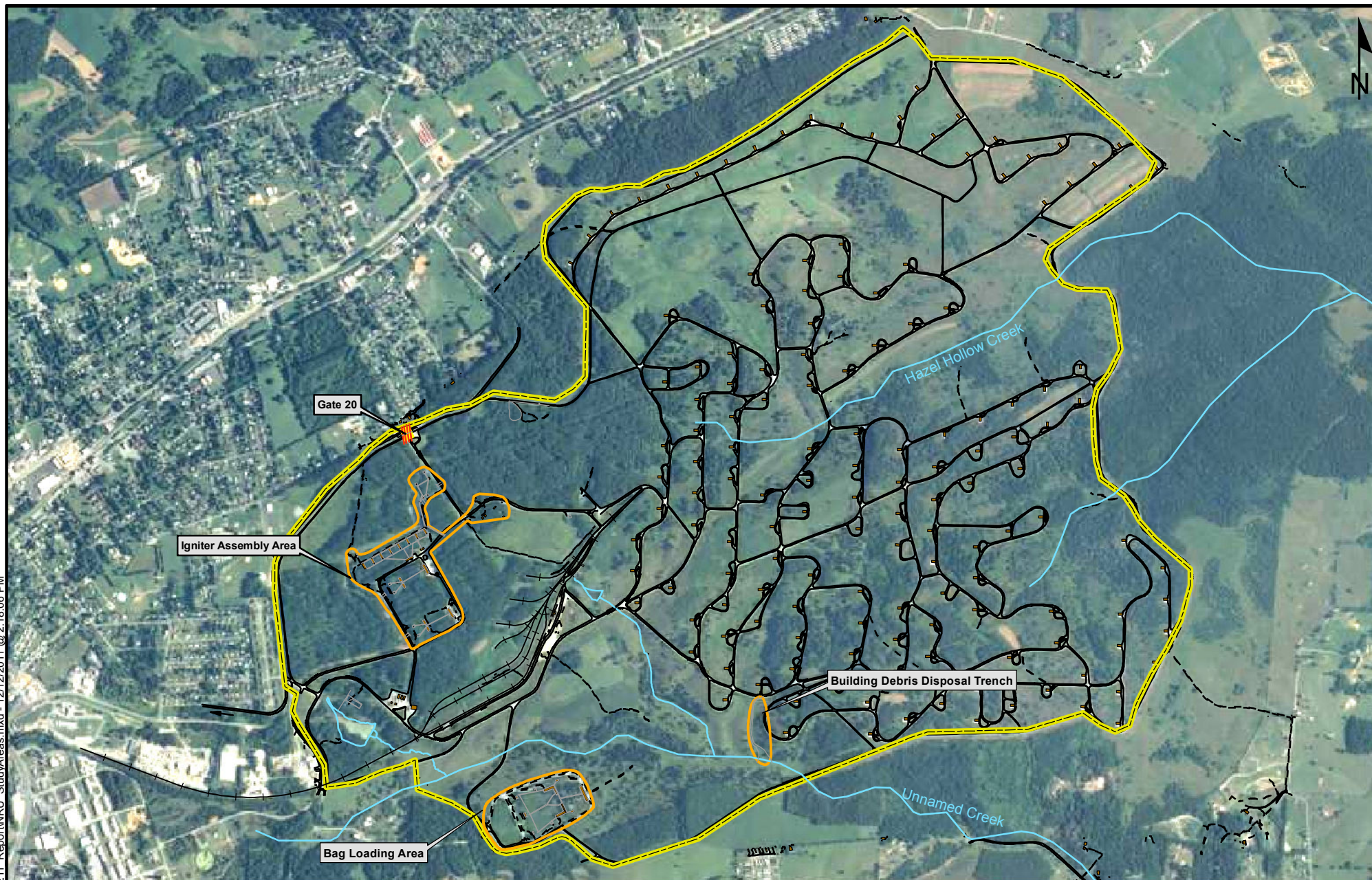


RADFORD ARMY AMMUNITION PLANT
RADFORD, VA

**RFAAP - NRU
FACILITY LOCATION**



FIGURE
1

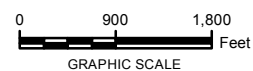


LEGEND

- | | |
|-----------------|------------------|
| — SITE FEATURES | - - - DIRT ROADS |
| + RAIL SPUR | □ STUDY AREA |
| — SURFACE WATER | □ NRU BOUNDARY |
| — PAVED ROADS | ■ 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.



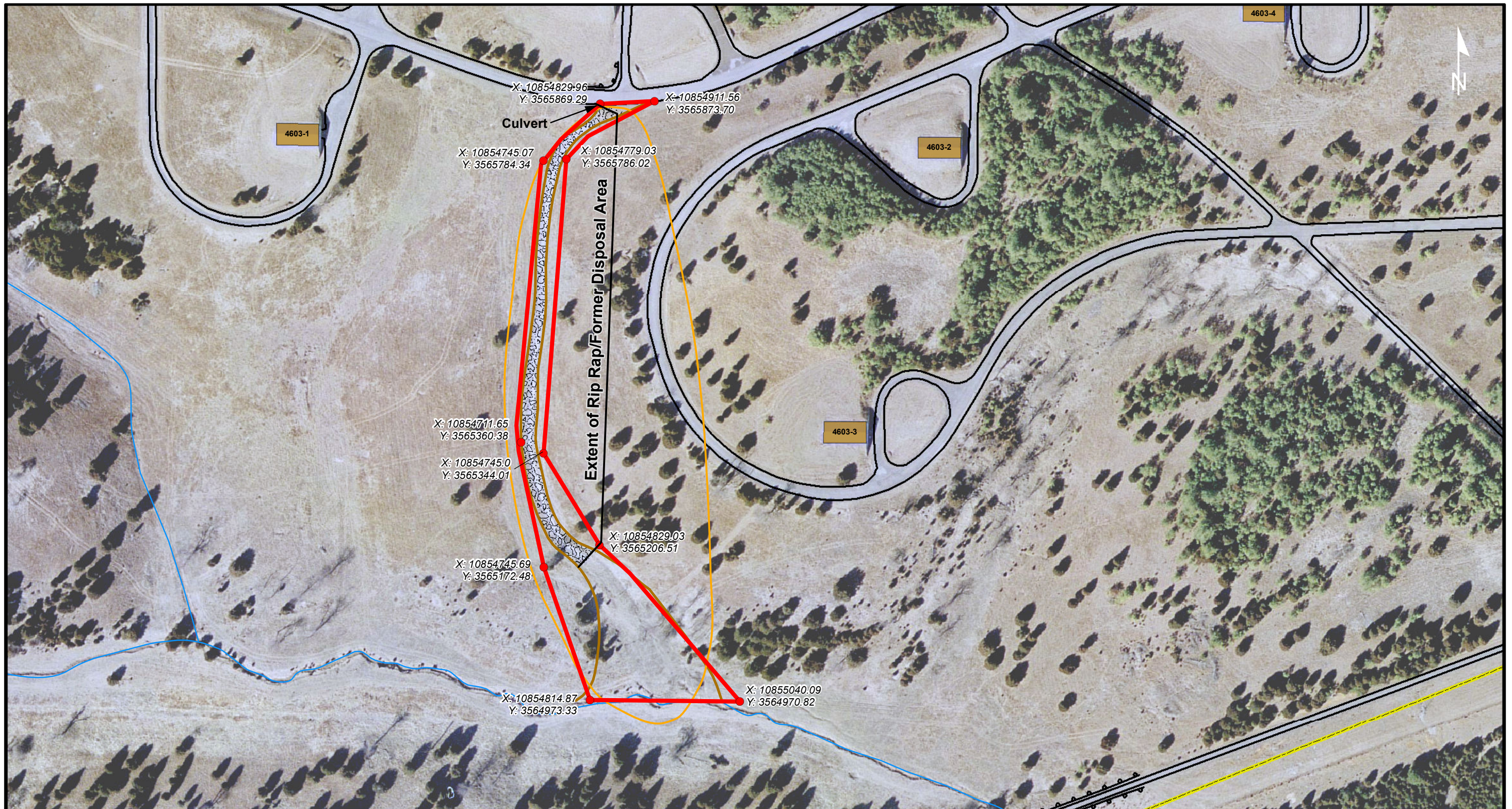
RADFORD ARMY AMMUNITION PLANT
NEW RIVER UNIT
PULASKI COUNTY, VIRGINIA

RFAAP - NRU STUDY AREAS













FIGURE
2

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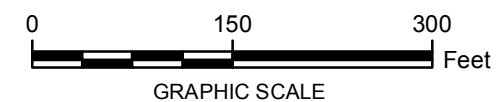


LEGEND

	LUC BOUNDARIES		PAVED ROADS		STUDY AREA
	SITE FEATURES		DIRT ROADS		BUILDINGS
	SURFACE WATER		RIPRAP		INSTALLATION BOUNDARY
	TRENCH				

NOTE:

- LUC AREA: AREA IS SUBJECT TO INSTITUTIONAL CONTROLS AND IS NOT TO BE UTILIZED FOR RESIDENTIAL PURPOSES.
- COORDINATES ARE REPORTED IN NAD 1983 STATE PLANE VIRGINIA, SOUTH (FEET).



RADFORD ARMY AMMUNITION PLANT
NEW RIVER UNIT
PULASKI COUNTY, VIRGINIA

BUILDING DEBRIS DISPOSAL TRENCH SITE LAYOUT












FIGURE
3

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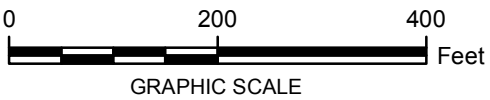


LEGEND

- | | | |
|--|---|---|
|  LUC BOUNDARIES |  SURFACE WATER |  INSTALLATION BOUNDARY |
|  PAVED ROADS |  FORMER RAISED WALKWAY PLATFORMS |  FORMER BUILDINGS |
|  DIRT ROADS |  STUDY AREA | |
|  SITE FEATURES | | |

NOTE:

- BUILDINGS 404 AND 405 WERE TWO STORY BUILDINGS.
- ACCESS WILL BE RESTRICTED TO ALL FORMER BUILDINGS AT BLA DUE TO LEAD BASED PAINT AND ASBESTOS.
- LUC AREA: AREA IS SUBJECT TO INSTITUTIONAL CONTROLS AND IS NOT TO BE UTILIZED FOR RESIDENTIAL PURPOSES.
- COORDINATES ARE REPORTED IN NAD 1983 STATE PLANE VIRGINIA, SOUTH (FEET).



RADFORD ARMY AMMUNITION PLANT
NEW RIVER UNIT
PULASKI COUNTY, VIRGINIA

**BAG LOADING AREA
SITE LAYOUT**



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LEGEND

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|-----|---------------|-----|---------------|-----------------|--|-----------------------|
| --- | SEWER LINE | — | SURFACE WATER | BUILDINGS | | STUDY AREA |
| --- | SITE FEATURES | --- | CULVERT | ACTIVE BUILDING | | INSTALLATION BOUNDARY |
| + | RAIL SPUR | --- | PAVED ROADS | FORMER BUILDING | | |
| --- | DIRT ROADS | | | | | |

NOTE:
ACCESS WILL BE RESTRICTED TO ALL FORMER BUILDINGS
AT IAA STUDY AREA DUE TO LEAD BASED PAINT AND
ASBESTOS.



RADFORD ARMY AMMUNITION PLANT
NEW RIVER UNIT
PULASKI COUNTY, VIRGINIA

IGNITER ASSEMBLY AREA SITE LAYOUT



FIGURE
5