



Alabama Department of Environmental Management
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July 19, 2021

CERTIFIED MAIL # 9489 0090 0027 6295 4238 27

Mr. A. Keith Cook, Chief
Environmental Management Division
U.S. Army Garrison - Redstone Arsenal
4488 Martin Road Room A-336
Redstone Arsenal, AL 35898

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Mr. Jeffrey L. Langhout, Executive Director
U.S. Army Combat Capabilities Development Command Aviation and Missile Center
(DEVCOM AvMC)
5400 Fowler Road
Redstone Arsenal, AL 35898

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Mr. Donald R. Benton, Director
U.S. Army Recovered Chemical Materiel Directorate (RCMD)
E4585 Hoadley Road, Building E4524
Aberdeen Proving Ground, MD 21010-5424

RE: Final Permit Determination
Redstone Arsenal
Redstone Arsenal, AL 35898
USEPA I.D. Number: AL7 210 020 742

Dear Mr. Cook, Mr. Langhout, Mr. Benton:

The Department has made a final determination to renew the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) Hazardous Waste Storage/SWMU Corrective Action/Subpart X Permit for the Redstone Arsenal (RSA).

A public comment period was held from April 30, 2021 to June 14, 2021. The permit application and the draft Hazardous Waste Storage/SWMU Corrective Action/Subpart X Permit were available for public review at the Department's main office in Montgomery and electronically via <http://www.adem.alabama.gov/newsEvents/PublicNotices.cnt> during the comment period.



Comments were received during the public comment period. All comments were carefully considered and appropriate responses have been prepared. A copy of the comments received and the Department's responses to those comments are attached. Also attached is a copy of the issued permit. This permit is effective immediately.

A permit issuance may be appealed as provided in §22-22-A-7 of the Code of Alabama. The procedures for hearing appeals are outlined in ADEM Admin. Code Rule 335-2-1, "Rules of Procedures for Hearing Appeals of Administrative Actions of the Alabama Department of Environmental Management."

Regarding the issued permit, please note that the permit application documents have been incorporated into the permit by reference and, as such, must be maintained together with the permit document. The Permittee should be aware of the permit conditions containing compliance schedules. Failure to comply with compliance schedules will constitute a permit violation and may result in enforcement actions by the Department.

If questions and comments should arise concerning this matter, please contact Mr. Krishna Morrisette of the Governmental Hazardous Waste Branch at (334) 394-4335 or via email at kmorrisette@adem.alabama.gov.

Sincerely,



Stephen A. Cobb, Chief
Land Division

Attachments

cc/via email: Director, Land, Chemical and Redevelopment Division, US EPA Region 4
Kevin Greaney, US EPA Region IV
Jason T. Wilson, ADEM
Kelley Hartley, ADEM
Jason Braxton, Redstone Arsenal
Steven Harris, Redstone Arsenal

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The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the Redstone Arsenal's (RSA or the Army) comments on the subject Draft Permit Renewal. The Department's responses to the Army's comments are shown below.

General Comments – Cover Letter

RSA Comment No. 1: Operational Ranges –

Comment (as summarized by the Department): ADEM lacks absolute authority to regulate operational ranges. Military munitions are not solid wastes and are not a hazardous wastes or hazardous constituents subject to RCRA permitting or corrective action.

Request (as summarized by the Department): ADEM must delete Part V of the draft permit in its entirety (entitled "SWMUs and AOCs on Operational Ranges") from Part V.A through Part V.D.2.

ADEM Response No. 1: The Department has reviewed the comment and does not concur with the Army's request. Part V of the permit does not regulate operational ranges, rather this Part addresses any "RCRA regulated activities" which may be present on Army operational ranges. Activities excluded from hazardous waste regulation pursuant to the Military Munitions Rule are not addressed here. Therefore, if there are no SWMUs or AOCs on Redstone's ranges, then there are no requirements imposed on the facility by this section of the permit. Based on this information, Part V will remain in the AHWMMMA Permit. Although the Department does not concur with the Army's general request as stated above, changes to the AHWMMMA Permit have been made to remove the following SWMUs from the Table VI.2 (requiring a RFI): RSA-046, RSA-071, RSA-072, RSA-073, RSA-074, RSA-129, RSA-254, and RSA-260. These SWMUs will remain on Table VI.1 (the master list of SWMUs at RSA) with the following note – **** Denotes SWMUs/AOCs that are included in this table as a historical reference because they have been identified as SWMUs/AOCs in the permit as a part of previously approved RFAs. However, pursuant to the military munitions rule (MMR) and ADEM Admin. Code r. 335-14-7-.13, a military munition is not considered a solid waste when used for its intended purpose. Therefore, these locations are not considered Solid Waste Management Units under the MMR.*"

RSA Comment No. 2: Notice of Environmental Use Restrictions as an Alternative to Environmental Covenants –

Comment (as summarized by the Department): The Army notes that it is legally unable to execute and record an environmental covenant for any sites on federally owned property to include Redstone Arsenal.

Request (as summarized by the Department): Any reference to ADEM Admin. Code r.335-5, including the entirety of Part VIII.B.6., must be deleted. ADEM must delete various references in the draft permit to ADEM policy Memorandum #304. ADEM must change the term "environmental use restrictions" to "land use controls".

ADEM Response No. 2: The Department has reviewed the comment and does not concur with the Army's general request. ADEM Admin Code r. 335-5 requires sites that are not returned to

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unrestricted reuse to execute an Environmental Covenant (EC). ADEM Admin Code r. 335-5 appropriately addresses properties or sites owned by the federal government which are legally unable to execute an environmental covenant during the period of federal ownership. These regulations provide requirements in lieu of an environmental covenant during the period of federal ownership. In addition, it should be noted that requirements of ADEM Admin. Code r. 335-5 only apply to properties that are undergoing a response action that does not return the property to unrestricted reuse. Therefore, the Army may select remedies that result in unrestricted reuse.

With respect to Memo 304, it is acknowledged that Memo 304 has been superseded with updates to ADEM Admin. Code r. 335-5 to address federally owned properties. However, the references included in the permit are found in the Area Specific Conditions where site specific information/requirements for past remedies have been incorporated into the permit (while Memo 304 was still valid). Since those references were drawn from the information in the approved CMI Plans, to remove the references now would create inconsistent language from what was in the CMI Plan which was approved. In an effort to address the historical references to Memo 304 in the Area Specific Conditions section of the permit, a statement under the “documents incorporated by reference” section below the table of contents was added. Although the Department does not concur with all of the requested edits in the Army’s general comment as stated above, changes to the AHWMMMA Permit have been made to replace the term “environmental use restrictions” with “land use restrictions” in five specific locations within Part VIII Corrective Measures Implementation for consistency.

RSA Comment No. 3: Per- and Polyfluoroalkyl Substances (PFAS) –

Comment (as summarized by the Department): PFAS, PFOS, and PFOA are neither RCRA hazardous wastes/constituents, nor CERCLA hazardous substances. While they are not federally regulated, Army may address both as “pollutants and contaminants,” as the term is defined in CERCLA 101(33).

Request (as summarized by the Department): Because these contaminants are not federally regulated and recognizing the Army’s current CERCLA efforts, references to PFAS within the hazardous waste draft permit is inappropriate, unnecessary, and outside of the scope of ADEM’s authority. Accordingly, footnote ** to Table VI.3 should be deleted.

ADEM Response No. 3: The Department does not concur with the Army’s request. The footnote “**” in Table VI.3 does not require the Army to take any actions. It is an informational footnote to assist the Department. No change to the AHWMMMA Permit to address this comment is warranted at this time.

Specific Comments

RSA Comment No. 1: General Statement – The “technical comments” provided herein are a component of and are incorporated in full into the Army comments and requests submitted in the Army’s comment letter.

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ADEM Response No. 1: The comment was duly noted. No change to the AHWMMMA Permit to address this comment is warranted at this time.

RSA Comment No. 2: ADEM Transmittal Letter to the Army –

Comment: Dr. Juanita M. Christensen is no longer the director of the U.S. Army Combat Capabilities Development Command Aviation and Missile Center (DEVCOM AvMC).

Request: Please ensure that Jeffery L. Langhout, Director, Aviation and Missile Center, replaces Dr. Juanita M. Christensen for future correspondence.

ADEM Response No. 2: The Department has revised the AHWMMMA Permit to address the comment.

RSA Comment No. 3: Part II General Facility Conditions –

Comment: Figures C-2 and C-4 in the permit renewal application do not apply to the EDS. These forms are prepared by the generator of the waste to be stored in one of the Hazardous Waste Storage Units (HWSUs) and/or treated at the Open Burn/Open Detonation (OB/OD) as stated in permit renewal application Sections C-1 Introduction for the Hazardous Waste Storage Area, C-1 g-5 Waste Qualification and Acceptance Process (for OB/OD), and C-2a Parameters and Rationale (for HWSUs).

Request: Revise first sentence to state: “Before treatment of waste by OB or OD, the Permittee shall ensure that waste sent for treatment corresponds with the applicable Waste Profile Form, Figures C-2 and C-4, of the permit application, for that waste.”

ADEM Response No. 3: The Department has reviewed the Army's comment. After multiple discussions between the Army and ADEM, the Department has determined (and the Army agreed) that no change to the AHWMMMA Permit is required to address this comment at this time.

RSA Comment No. 4: Part II General Facility Conditions –

Comment: The second sentence states: “The signs shall read ‘Danger - Unauthorized Personnel Keep Out’. Warning Signs are posted and convey a similar warning to requested wording. However, they are not all phrased specifically as noted in this portion of the draft permit.”

Request: Revise the second sentence to state: “‘Danger - Unauthorized Personnel Keep Out’ or equivalent consistent with ADEM Admin. Code r. 335-14-5-.02(5)(c).”

ADEM Response No. 4: The Department has reviewed the comment and does not concur with the Army's request. Permit Condition II.D.3 complies with ADEM Admin. Code r. 335-14-5-.02(5)(c), which limits the verbiage that can be used on signs. The verbiage for new signs are required to comply with Permit Condition II.D.3. No change to the AHWMMMA Permit to address this comment is warranted at this time.

RSA Comment No. 5: Part III Management in Containers –

Comment: The Army's system for providing containment including secondary containment for containers with liquid is supported by ADEM regulations. RSA will

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continue to have igloos out of operations while repairs are made to the floors resulting from forklift damage to the coating. Storage areas for containers include manufactured secondary containment that meets the storage requirement specified in ADEM Admin. Code r. 335-14-5-.09(6)(b).

Request: Request paragraph 2 be deleted and the text in the first sentence of the current paragraph 3 be revised to state: “For all hazardous waste storage igloos listed in Table III.1 used for container storage, the Permittee shall provide secondary containment for any container containing free liquids.”

ADEM Response No. 5: The Department has reviewed the Army's comment and has revised the AHWMMMA Permit to address the comment.

RSA Comment No. 6: Part VI Solid Waste Management Unit (SWMU) Identification and Evaluation –

Comment: Draft permit states that the Army must submit two (2) copies of all submittals to the Department in accordance with Permit Condition 1.K. The Army understands that the Department is working with the Army to be flexible on these submittals.

Request: In lieu of the text NOT specifically stating that two copies must be in hard/printed copy, the Army understands this to mean that submittals may consist of copies of the submittals on compact disks and not in hard/printed copy. No change if this is correct. If not correct, request language be modified to allow Army to submit electronic copies.

ADEM Response No. 6: The Department has reviewed the Army's comment and has revised the AHWMMMA Permit to address the comment.

RSA Comment No. 7: Part VI SWMU Identification and Evaluation –

Comment: Five sites located on ranges are not noted on Table VI.2 with a ** denoting sites where the RFI is deferred until the range is closed and the land has been removed from the Army's range inventory. Based on investigation results, RSA requests that 8 sites be removed from Table VI.5 (MSFC-035, RSA-110, 188, 051, 063, 064, 257, 264).

Request: RSA-051, 063, 064, 257, 264 be denoted on Table VI.2 with a ** denoting sites where RFI is deferred until range is closed and land is removed from range inventory. RSA-051, 063 be noted on Table VI.5 with a *** denoting sites where the IM is deferred until range is closed and land is removed from the range inventory. MSFC-035, RSA-110, 188, 064, 257, 264 be removed from Table VI.5 to proceed with the RFI.

ADEM Response No. 7: The Department has reviewed the comment and does not concur with the Army's request. The Department notes that the Army provided limited information to justify the proposed changes. These sites listed in the Army's comment are sites that have been determined to potentially need Interim Measures (IM). The Department understands that several of the IM investigations have been completed, and the Army should submit the results of the IM investigations and their proposed path forward for each site to the Department for review. The Department must receive and review the data/information prior to either adding the suggested note or moving these IM SWMUs from one table to another. Since this recommended change is not

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appropriate as a part of the permit renewal at this time, no change to the AHWMMMA Permit to address this comment is warranted.

RSA Comment No. 8: Part VI SWMU Identification and Evaluation –

Comment: The RFI report for RSA-217 was approved in a letter from ADEM dated May 21, 2021. The RFI report for RSA-116 was approved in a letter from ADEM dated May 26, 2021.

Request: As per ADEM concurrence letter, Army requests that ADEM move RSA-217 from Table VI.2 to Table VI.6 requiring action for soils and groundwater to be remediated as part of RSA-146. And for RSA-116 to be moved from Table VI.2 to Table VI.6 requiring an action for groundwater as part of 116 and NFA for soils.

ADEM Response No. 8: The Department has reviewed the Army's comment and has revised the AHWMMMA Permit to address the comment.

RSA Comment No. 9: Part VII Groundwater Monitoring and Corrective Action –

Comment: For RSA-252 and other sites with a soil or groundwater action based on the objective of groundwater protection and restoration, groundwater monitoring does not commence until the soil and/or groundwater action is complete and should not be dictated to begin 120 days after the permit is issued. It is also unclear what is meant by “120 days after the permit is issued”.

Request: For RSA-252 and other sites groundwater sampling as part of the monitoring requirements should not begin before the soil and/or groundwater action is complete and approved. Request that the required groundwater monitoring start within 120 days following ADEM approval of the CMR for these sites.

ADEM Response No. 9: The Department has reviewed the comment and does not concur with the Army's request. The permit condition indicates that the identified monitoring requirements shall commence within 120 calendar days of the effective date of the permit. To clarify, the effective date of the permit is the date of the permit renewal (for corrective actions approved as part of this permit renewal), or the date of the permit modification approving a Corrective Measures Implementation Plan (CMIP) (for corrective actions approved as part of future permit modifications). For instances where the required monitoring has already been initiated prior to the effective date of the permit renewal, the requirement to commence within 120 calendar days has already been satisfied and the monitoring shall continue in accordance with the required schedule/frequency. For instances where monitoring has not been initiated prior to the effective date of the renewal permit, and RSA will not be able to initiate the sampling within 120 calendar days of the effective date of the permit renewal, the Army may submit an extension request containing an alternative schedule for the Department's approval. It should be noted that monitoring schedules included in Corrective Measures Implementation (CMI) plans, and approved as a part thereof, supersede the requirement to commence within 120 calendar days of the effective date of the renewed permit or the effective date of the modification in which the CMI plan was approved. Therefore, no change to the AHWMMMA Permit to address this comment is warranted at this time.

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RSA Comment No. 10: Part VII Groundwater Monitoring and Corrective Action –

Comment: The draft permit says: “These reports shall be submitted to the Department within 60 days of each annual anniversary of this permit after corrective action is initiated and continue until corrective action is completed.” Is this the date the permit is renewed, or the current permit modification, or the date of the permit modification for the corrective action? The statement is vague and puts the Army at risk of permit violation based on any one regulator's interpretation of what this sentence means.

Request: The Army requests that the text be revised to state: “These reports shall be submitted to the Department annually and continue until corrective action is completed. The first report will be due to the Department within 14 months of the date of the permit modification for the specific corrective action and continue to be submitted annually on or before that date until the corrective action is completed.”

ADEM Response No. 10: The Department has reviewed the comment and does not concur with the Army's request. The permit condition indicates that these reports are to be submitted within 60 calendar days of each annual anniversary of this permit after the corrective action has been initiated. This condition establishes an annual schedule for the submittal of Corrective Action Effectiveness Reporting. For instances where an annual Corrective Action Effectiveness Reporting schedule has already been established prior to the effective date of this permit renewal, this condition will be deemed to have been satisfied and the reporting shall continue in accordance with the approved schedule. For instances where an annual Corrective Action Effectiveness Reporting schedule has not been established prior to the effective date of the renewal permit (i.e. Corrective Actions not yet initiated), the reporting shall begin within 60 calendar days following the annual anniversary of the renewal permit. It should also be noted that RSA may submit an extension request containing an alternative schedule for the Department's approval to receive the report for a specific SWMU annually at a different start date. In addition, RSA may consolidate reports for multiple sites under one report and reporting frequency. Therefore, as new corrective actions are subsequently approved, the effectiveness reports may be incorporated into the consolidated report beginning with the next annual report following the date of the modification approving the Corrective Action. Therefore, no change to the AHWMMMA Permit to address this comment is warranted at this time.

RSA Comment No. 11: Part VII Groundwater Monitoring and Corrective Action –

Comment: The Army had originally sought a revised/reduced analyte list for the RSA-054/055 monitoring in Tables E-3 and E-4 in the permit renewal application. It is understood that the request for reduction in the analyte list is to be made during a permit modification (or in this case, a permit renewal application). However, no changes were made in the draft permit issued for public comment.

Request: While data collected to date justifies the Army's position that certain analytes should be removed from monitoring, to accommodate potential ADEM concerns, the Army requests that the current analyte list be run every two years and a more limited analyte list be run in the other three semiannual rounds.

ADEM Response No. 11: The Department has reviewed the comment and does not concur with the Army's request. The Army's recommendation to remove constituents from the sampling list within the GW monitoring reports for the RSA-054/-055 area is not appropriate at this time due to

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the unknown nature of all waste disposed of in the landfill. Once these proposed changes have been agreed upon by the Department within the GW monitoring report for the RSA-054/-055 area, the Army may request that the AHWMMMA permit at Redstone be modified to reflect that change. Until then the Army should continue to monitor for all constituents as described in Part VII of the facility's AHWMMMA Permit. No change to the AHWMMMA Permit to address this comment is warranted at this time.

RSA Comment No. 12: Part VII Groundwater Monitoring and Corrective Action –

Comment: The Army had originally sought a revised/reduced analyte list for the OB/OD monitoring in Tables E-1 and E-2 in the permit renewal application. It is understood that the request for reduction in the analyte list is to be made during a permit modification (or in this case, a permit renewal application). However, no changes were made in the draft permit issued for public comment.

Request: While data collected to date justifies the Army's position that certain analytes should be removed from monitoring, to accommodate potential ADEM concerns, the Army requests that the current analyte list be run every three years and a more limited analyte list be run in the other two annual rounds (spaced to capture alternating spring and fall seasons).

ADEM Response No. 12: The Department has reviewed the comment and does not concur with the Army's request. The Army's recommendation to remove constituents from the sampling list within the GW monitoring reports for the OBOD area is not appropriate at this time due to the widespread use of various chemicals and chemical processes, limited site history, and multiple ongoing groundwater investigations. Once these proposed changes have been agreed upon by the Department within the GW monitoring report for the OBOD area, the Army may request that the AHWMMMA permit at Redstone be modified to reflect that change. Until then the Army should continue to monitor for all constituents as described in Part VII of the facility's AHWMMMA Permit. No change to the AHWMMMA Permit to address this comment is warranted at this time.

RSA Comment No. 13: Part VII Groundwater Monitoring and Corrective Action –

Comment: The Army had originally sought a revised/reduced analyte list for the facility-wide and facility-wide bedrock monitoring in Tables E-5 and E-6 in the permit renewal application. It is understood that the request for reduction in the analyte list is to be made during a permit modification (or in this case, a permit renewal application). However, no changes were made in the draft permit issued for public comment.

Request: While data collected to date justifies the Army's position that certain analytes should be removed from monitoring, to accommodate potential ADEM concerns, the Army requests that the current analyte list be run every three years and a more limited analyte list be run in the other two annual rounds.

ADEM Response No. 13: The Department has reviewed the comment and does not concur with the Army's request. The Army's recommendation to remove constituents from the sampling list within the GW monitoring reports for the IW GW monitoring is not appropriate at this time due to the widespread use of various chemicals and chemical processes, and multiple ongoing groundwater investigations. Once these proposed changes have been agreed upon by the Department within the GW monitoring report for the IW GW, then the Army may request that the

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AHWMMA permit at Redstone be modified to reflect that change. Until then the Army should continue to monitor for all constituents as described in Part VII of the facility's AHWMMA Permit. No change to the AHWMMA Permit to address this comment is warranted at this time.

RSA Comment No. 14: Part VI SWMU Identification and Evaluation –

Comment: The Army notes that Tables VI.1 and VI.2 contain a listing of IOUs as SWMUs or AOCs. These sites are locations where non-Army entities are wholly or partially responsible for the contamination associated with the sites, including Olin, Cities of Huntsville and Madison, and NASA. Where others are or may be responsible for contamination, then these areas are not appropriate to include as the Army's SWMUs or AOCs within the hazardous waste permit.

Request: Either remove these sites in their entirety or note that these sites are the responsibility of third parties.

ADEM Response No. 14: The Department has reviewed the comment and does not concur with the Army's request. The Army's recommendation to remove the list of IOUs from Tables VI.1 and VI.2 as SWMUs or AOCs is not appropriate as a part of the permit renewal at this time. The IOUs were identified as AOCs by the Army within the Final Redstone Arsenal Integrator Operable Unit Protocol Report of Findings dated June 2010, which was approved by the Department in a letter dated March 30, 2012. These IOUs were incorporated into the permit as AOCs a part of Permit Modification #1 in October 2012. No change to the AHWMMA Permit to address this comment is warranted at this time.

HAZARDOUS WASTE FACILITY PERMIT

PERMITTEE: U.S. Army, Garrison Redstone
U.S. Army Combat Capabilities Development Command Aviation and
Missile Center (DEVCOM AvMC)
U.S. Army Recovered Chemical Materiel Directorate (RCMD)

ADDRESS: Huntsville, Madison County

PERMIT NUMBER: AL7 210 020 742

UNITS PERMITTED: 33 Hazardous Waste Storage Units
2 Thermal Treatment Units (Subpart X OB Unit and Subpart X OD Unit)
Up to 2 Container Treatment Units (Phase 2 Explosive Destruction System
(EDS) Units)
Solid Waste Management Unit (SWMU) Corrective Action

ISSUANCE DATE: JULY 19, 2021

EXPIRATION DATE: JULY 18, 2031

This Permit is issued pursuant with the Code of Alabama 1975, §§ 22-30-1-et. seq., as amended, and regulations adopted thereunder and the Hazardous Wastes Management and Minimization Act and in accordance with the plans and specifications and applications filed with the Department subject to the conditions appended hereto, all of which are considered a part of this Permit. This Permit shall be subject to all applicable laws of the State of Alabama, rules and regulations and orders of the Department of Environmental Management and shall be effective from the date of issuance.



Alabama Department of Environmental Management

**ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
HAZARDOUS WASTE PERMIT**

Permittee: U.S. Army, Garrison Redstone (IMSE-RED-PWE)
U.S. Army Combat Capabilities Development Command Aviation and Missile
Center (DEVCOM AvMC)
U.S. Army Recovered Chemical Materiel Directorate (RCMD)

Permit No.: AL7 210 020 742

Identification No.: AL7 210 020 742

Permit Modification:

Pursuant to the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA), Code of Ala. 1975, Section 22-30-1, et. seq., as amended, and attendant regulations promulgated thereunder by the Alabama Department of Environmental Management (ADEM or the Department), a permit is issued to U.S. Army Garrison – Redstone (Facility Owner, Facility Co-Permittee, Facility Operator), the U.S. Army Combat Capabilities Development Command Aviation and Missile Center (DEVCOM AvMC) (Facility Co-Permittee, Facility Co-Operator (OB/OD Units)) and the U.S. Army Recovered Chemical Materiel Directorate (RCMD) (Facility Co-Permittee, Facility Co-Operator (EDS Units)) to operate a hazardous waste treatment and storage facility located in Madison County, Alabama, at latitude N34° 37' 00" and longitude W86° 39' 00".

For purpose of clarification, the designations Facility Owner, Facility Co-Permittee, Facility Operator, and Facility Co-Operator hereinafter shall be referred to as Owner, Permittee, and Operator respectively. The use of referring to Co-Permittee as Permittee and Co-Operator as Operator shall not change legal obligations and/or responsibilities.

To ensure the proper execution of this Permit, the Permittee agrees to the following division of operation responsibility:

- The U.S. Army Garrison – Redstone, as Facility Owner, a Permittee and Operator, acknowledges its responsibility for hazardous waste management activities at the RSA Facility. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions, and closure or post-closure activities.
- The U.S. Army Combat Capabilities Development Command Aviation and Missile Center (DEVCOM AvMC), as Permittee and Operator, acknowledges its responsibility for hazardous waste management activities under the control of DEVCOM AvMC. These responsibilities include funding, policy, capital expenditures, design, programmatic and scheduling decisions, general oversight of contractor activities, interim or corrective actions and closure or post-closure activities. The areas under DEVCOM AvMC control include the energetic treatment of waste munitions by open burning and open detonation and the associated storage of waste within permitted igloos for these operations.
- The U.S. Army Recovered Chemical Materiel Directorate (RCMD), as Permittee and Operator, acknowledges its responsibility for hazardous waste management activities under the control of RCMD. The areas under RCMD control include the treatment of recovered munitions or other items that contain chemical agent or industrial chemical fills in the EDS units. RCMD also

controls the storage of wastes associated with the EDS treatment at the permitted igloos. The RCMD responsibilities include the operation of EDS units and personnel training for the safe operation of the EDS units, hazardous waste management, contingency plan implementation and emergency procedures. The training responsibility includes new procedures and refreshers as well as training new personnel. The RCMD will maintain training records in accordance with ADEM Admin. Code r. 335-14-5-.02(7)d.

The hazardous waste treatment and storage facility consists of a hazardous waste storage area, a Subpart X Open Burning (OB) treatment unit, a Subpart X Open Detonation (OD) treatment unit, and up to two Phase 2 explosive destruction system (EDS) units, as well as multiple solid waste management units (SWMUs) and areas of concern (AOCs).

The hazardous waste storage area consists of 33 container storage igloos. The maximum storage capacity of each hazardous waste storage igloo is 240 fifty-five gallon containers (13,200 gallons) and the maximum storage capacity of all 33 units is not to exceed 7920 fifty-five gallon drums or 435,600 total gallons. All 33 igloos are being managed and inspected by the Environmental Management Division (EMD) of U.S. Army Garrison - Redstone.

The OB and OD units are used to burn and detonate hazardous energetic waste having the characteristic of reactivity. The open burning area consists of five metal burn pans that are each 9 by 20 feet, elevated on support steel and placed on top of concrete pads. The open detonation takes place in an area inside the designated OB and OD Units. The OD area is elevated on an earthen mound and each detonation is completed in a newly excavated pit.

The EDS units are used to process recovered munitions or other items that contain chemical agent or industrial chemical fills. Items to be treated may or may not have an explosive component. The EDS units are operated in environmental enclosures.

The facility also includes current and former solid waste management units (SWMUs). This permit sets forth SWMU corrective action requirements and associated activities that must be conducted by the Permittee.

The Permittee must comply with all terms and conditions of this permit, which consists of the conditions set forth herein (including those in any attachments), and the regulations applicable to the Permittee's facility contained in Chapters 335-14-1, 335-14-2, 335-14-5, 335-14-8, and 335-14-9 of the ADEM Administrative Code of Regulations (hereinafter referred to as the "ADEM Admin. Code Rule" or "ADEM Admin. Code R."). Applicable regulations are those which are in effect on the date of issuance of this permit.

This permit is based on the assumption that the information submitted in the permit application attached to the Permittee's letter dated February 6, 2020 as modified by subsequent amendments dated September 21, 2020 and September 24, 2020 (hereby incorporated by reference and hereafter referred to as the Application) is accurate and that the facility will be constructed and operated as specified in the Application. Any inaccuracies found in this information could lead to the termination or modification of this permit in accordance with ADEM Admin. Code Rules 335-14-8-.04(2), 335-14-8-.04(3), and 335-14-

8-.04(4) and could lead to potential enforcement action. The Permittee must inform ADEM of any deviation from or changes in the information provided in the Application that would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

This permit is effective as of July 19, 2021 and shall remain in effect until July 18, 2031 unless revoked and reissued, or terminated under ADEM Admin. Code Rules 335-14-8-.04(2) and 335-14-8-.04(4) or continued in accordance with ADEM Admin. Code Rule 335-14-8-.05(2).



Alabama Department of Environmental Management

7/19/2021

Date Signed

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Documents Incorporated By Reference:

Part A and Part B Permit Application submitted on February 6, 2020, as modified by subsequent amendments dated September 21, 2020 and September 24, 2020.

Final ROD for Surface Media at RSA-057 (September 10, 2007)
 Final Remedial Action Work Plan for RSA-057 (March 31, 2008)
 Land Use Control Remedial Design (LUC RD) for RSA-049 (July 2, 2009)
 Installation-Wide Groundwater LUC RD (August 18, 2009)
 Revision 4, Remedial Action Phase 1 Completion Report for RSA-057 (August 7, 2012)

CMI Plan for Surface Media and Groundwater at RSA-053 (September 10, 2012)
 Revision 2 CMI Work Plan, RSA-054/RSA-055 (December 10, 2012)
 Revision 1 CMI Work Plan, RSA-095 and RSA-142 (September 6, 2013, Revised May 18, 2016)
 Installation-Wide Groundwater Monitoring Plan (Revised June 23, 2014)

Revision 2 CMI Work Plan, RSA-058 (November 14, 2014)
 CMI Work Plan, RSA-250 (July 20, 2016)
 Revision 2 CMI Work Plan, RSA-204 (September 23, 2016)
 Revision 1 CMI Work Plan, RSA-060 (August 8, 2017)
 Revision 1 CMI Work Plan for the OB/OD Area (September 8, 2017)
 CMI Report, RSA-250 (September 14, 2017)
 Revision 2 CMI Work Plan for RSA-255 (December 12, 2017)

Phase II CMI Work Plan for RSA-058 (May 18, 2018)
 CMI Work Plan, MSFC-033A (May 30, 2018)
 CMI Work Plan, RSA-140 (June 26, 2018)
 Revision 1 CMI Work Plan, RSA-009 (August 8, 2018)
 Revision 1 CMI Work Plan, RSA-003 (October 1, 2018) Revision 1 Addendum to the Revision 1 CMI Work Plan, RSA-095 and RSA-142 (July 26, 2018, Revised October 24, 2018)
 CMI Work Plan, RSA-201, RSA-242, and RSA-247 (December 17, 2018)
 CMI Work Plan, RSA-056 and RSA-139 (March 13, 2019)
 Revision 1 CMI Work Plan for RSA-083 (April 11, 2019)

CMI Work Plan, RSA-294-R-01 (June 20, 2019)
CMI Work Plan, RSA-072-R-01 (RSA-282) (July 26, 2019)
Revision 1 CMI Work Plan, RSA-275 (October 15, 2019)
Revision 1 CMI Work Plan, RSA-209 (April 22, 2020)
Slip Pages to Rev 1 CMI WP, RSA-280-R-01 (May 29, 2020)

Revision 1 CMI Work Plan, RSA-315 (July 30, 2020)
Revision 1 CMI Work Plan, RSA-045 (September 25, 2020)
Revision 1 CMI Work Plan, RSA-225 (October 21, 2020)
Revision 2 CMI Work Plan, RSA-252 (November 13, 2020)
Revision 1 CMI Work Plan, RSA-206 (November 19, 2020)
Revision 2 CMI Work Plan, RSA-269 (December 8, 2020)

Redstone Arsenal Installation Restoration Site Access Control Program (Redstone Regulation 200-7), as enacted May 27, 2003 and revised September 19, 2012.

Alabama Department of Environmental Management (ADEM) Memorandum #304 – Subject: Compliance with Land Use Control Requirements for Federally – Owned Property, as enacted September 3, 2010. (Note: Mention of Policy Memo 304 is for reference purposes only as the contents of this memo have been subsequently incorporated into and superseded by ADEM Admin. Code r. 335-5-1-.02(3).)

PART I

STANDARD FACILITY CONDITIONS

I.A. EFFECT OF PERMIT

The Permittee is allowed to store hazardous waste in designated storage units; and perform hazardous waste treatment, specifically EDS, OB and OD actions, in designated treatment units. The above mentioned actions must be conducted in accordance with the conditions of the permit. The Permittee is also required to perform investigation and/or corrective action at the solid waste management units (SWMUs) identified herein.

Issuance of this permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local law or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under the AHWMMMA, or any other law governing protection of public health or the environment, for any imminent and substantial endangerment to human health, welfare, or the environment. (ADEM Admin. Code R. 335-14-8-.01(4)).

I.B. SEVERABILITY

The provisions of this permit are severable and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

I.C. DUTIES AND REQUIREMENTS

1. Duty to Comply

The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. The Permittee shall comply with document submittal dates and schedules of compliance established or approved by the Department for activities required by this permit. Any permit noncompliance, other than noncompliance authorized by an emergency permit, constitutes a violation of the AHWMMMA, and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

2. Duty to Reapply

a. Operating Units

If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must apply for and obtain a new permit. The application for a new permit must be submitted at least 180 days before the expiration of this permit, as required by ADEM Admin. Code R. 335-14-8-.03(1)(b)2.

b. SWMU Corrective Action Requirements

The Permittee must submit an application for a new permit for both post-closure and Solid Waste Management Unit (SWMU) corrective action at least 180 calendar days before the expiration of this permit. The Permittee must reapply in order to fulfill the 30-year post-closure care period required by ADEM Admin. Code Rule 335-14-5-.07(8)(a)1. The Department may shorten or extend the post-closure care period applicable to the hazardous waste facility in accordance with ADEM Admin. Code Rules 335-14-5-.07(8)(a)2. and 335-14-8-.03(1)(b).

3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate

In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

5. Proper Operation and Maintenance

The Permittee shall, at all times, properly operate and maintain all facilities and systems of storage, monitoring, and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance (O&M) includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause as specified in ADEM Admin. Code Rules 335-14-8-.04(2), (3) and (4). The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay the applicability or enforceability of any permit condition.

7. Property Rights

Issuance of this permit does not convey any property rights of any sort, nor any exclusive privilege.

8. Duty to Provide Information

The Permittee shall furnish to the Department, within a reasonable time as determined by the Department, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this

permit, or to determine compliance with this permit. The Permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

9. Inspection and Entry

The Permittee shall allow duly designated officers and employees of the Department or their authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
- d. Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the AHWMMMA, any substances or parameters at any location. The Permittee shall have the opportunity to split samples during sampling.

10. Monitoring and Records

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method from ADEM Admin. Code Rule 335-14-2-Appendix I or the methods specified in the Waste Analysis Plan, Section C-2, of the permit application. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846 (latest edition), Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020), Standard Methods for the Examination of Water and Wastewater (latest edition), the methods specified in the Waste Analysis Plan, Section C-2, of the permit application, or an alternative method approved by ADEM. [ADEM Admin. Code Rule 335-14-8-.03(1)(j)1.]
- b. The Permittee shall maintain at the facility records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, the certification required by 335-14-5-.05(4)(b)9, records of all data used to prepare documents required by this permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the certification, application, sample, measurement, report or record, or until corrective action is completed, whichever date is later. This period may be extended by the Department at any time and is automatically extended during the course of any unresolved enforcement action regarding this

facility. [ADEM Admin. Code Rules 335-14-5-.05(5)(b) and 335-14-8-.03(1)(j)2.]

- c. The Permittee shall maintain at the facility records of all groundwater monitoring wells, piezometers and associated groundwater surface elevations throughout the term of this Permit. These records shall include the surveyed location, surveyed elevation, surveyed elevation reference point, total depth, screened interval, construction details, well log, and all other pertinent information for each well and piezometer.
- d. Records for monitoring information shall include:
 - i. The date(s), exact place, and times of sampling or measurements;
 - ii. The names of individual(s) who performed the sampling or measurements;
 - iii. The date(s) analyses were performed;
 - iv. The names of individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and,
 - vi. The results of such analyses.
- e. The following documents and information shall be maintained throughout the term of this Permit at the facility:
 - i. Complete copy of this permit and the permit application.
 - ii. Operating record as required by ADEM Admin. Code Rule 335-14-5-.05(4) and this permit.
 - iii. Copies of all plans, reports, inspection schedules, inspection logs as required by ADEM Admin. Code Rule 335-14-5 and this permit.

11. Signatory Requirements

All applications, reports or information required by this permit and submitted to the Department shall be signed and certified in accordance with ADEM Admin. Code Rules 335-14-8-.02(2) and 335-14-8-.03(1)(k).

12. Reporting Requirements

a. Planned Changes

The Permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility and any solid waste management units identified under Part VI of this permit.

b. Anticipated Noncompliance

The Permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.

c. Transfer of Permits

This permit may be transferred to a new owner or operator only if it is modified or revoked and reissued pursuant to ADEM Admin. Code Rule 335-14-8-.04(1) or 335-14-8-.04(3)(a)1.(vii). Before transferring ownership or operation of the facility during the term of this Permit, the Permittee shall notify the new owner or operator, in writing, of the requirements of ADEM Admin. Code Rules 335-14-5 and 335-14-8 and this permit.

d. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

e. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Department no later than 14 calendar days following each schedule date.

f. Twenty-Four Hour Reporting

i. The Permittee shall report to the Department any noncompliance with this permit that may endanger human health or the environment. Any such information shall be reported orally within 24 hours from the time the Permittee becomes aware of the circumstances. This report shall include, but is not limited to, the following:

- (I) Information concerning the release of any hazardous waste which may endanger public drinking water supplies; and,
- (II) Information concerning the release or discharge of any hazardous waste, or hazardous waste constituents, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility.

ii. The description of the occurrence and its cause shall include:

- (I) Name, address, and telephone number of the owner or operator;
- (II) Name, address, telephone number, and EPA Identification Number of the facility;
- (III) Date, time, and type of incident;

- (IV) Name and quantity of material(s) involved;
- (V) The extent of injuries, if any;
- (VI) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and,
- (VII) Estimated quantity and disposition of recovered material that resulted from the accident.

iii. A written submission shall also be provided within 5 calendar days of the time that the Permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance (including exact dates and times); whether the noncompliance has been corrected, and if not, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

g. Other Noncompliance

The Permittee shall report to the Department all instances of noncompliance not otherwise required by Permit Conditions I.C.12.d., I.C.12.e., or I.C.12.f. at the time any other reports required by this permit are submitted. The reports shall contain the information required by Permit Condition I.C.12.f..

h. Other Information

When the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information. In addition, upon request, the Permittee shall furnish to the Department any information related to compliance with this permit.

13. Obligation for Corrective Action

Owners and operators of hazardous waste management units must have permits during the active life (including the closure and post-closure period) of the unit, and for any period necessary to comply with the SWMU corrective action requirements (Part VI) of this permit. Therefore, the Permittee must reapply in accordance with Condition I.C.2. of this permit until this obligation is fulfilled.

14. Certification of Construction

The Permittee may not commence treatment, storage or disposal of hazardous waste or contaminated media at any new or modified portion of the facility until the Permittee has submitted to the Department, by certified mail or hand-delivery, a letter (together with the certification by the Construction Quality Assurance (CQA) officer required by ADEM Admin. Code Rule 335-14-5-.02(10)(d) and any other certifications required by this permit or ADEM Admin. Code Rule 335-14) signed by the Permittee and a

registered Professional Engineer (State of Alabama) stating that the facility has been constructed or modified in compliance with this permit where appropriate; and,

- a. The Department has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of this permit; or
 - b. The Department has either waived the inspection or has not notified the Permittee, within 15 calendar days of the notification from the Permittee, of its intent to inspect. [ADEM Admin. Code Rule 335-14-8-.03(1)(1)2.]
15. The Permittee shall assure that all measures necessary to maintain and/or achieve compliance with all applicable requirements of ADEM Admin. Code Rules 335-14 are taken during the active life of the facility, post-closure care period, corrective action period, and throughout the term of this permit.
 16. In the event that circumstances beyond the Permittee's control arise to prevent achievement of any deadline set forth by this permit, the Permittee may immediately, upon the occurrence thereof, request an extension by sending a written request to the Department explaining the need for the extension. The Department may, after consideration of the circumstances, grant the extension. Requests for extensions may require a permit modification pursuant to ADEM Admin. Code Rule 335-14-8-.04(2) or (3).

I.D. CONFIDENTIAL INFORMATION

The Permittee may claim confidential any information required to be submitted by this permit if the information is protectable under Code of Alabama 1975, §22-30-18, as amended. The term “trade secret” as used in §22-30-18 is defined in Code of Alabama 1975, §22-30-3(12).

I.E. DEFINITIONS

For the purposes of this permit, terms used herein shall have the same meaning as those in ADEM Admin. Code Rules 335-14-1, 335-14-2, 335-14-5, and 335-14-8, unless this permit specifically provides otherwise. Where terms are not defined in the regulations or this permit, a standard dictionary reference or the generally accepted scientific or industrial meaning of the term shall define the meaning associated with such terms.

"Action levels" for the purposes of this permit are health-based concentrations of hazardous constituents determined to be indicators for the protection of human health and/or the environment.

An “alternate concentration limit” (ACL) for the purposes of this permit refers to a groundwater concentration limit which is established pursuant to ADEM Admin. Code R. 335-14-5-.06(5)(b).

"Area of concern" (AOC), for the purposes of this permit, includes any area having a probable release of a hazardous waste or hazardous constituent which is not from a solid waste management unit and is determined by the Department to pose a current or potential threat to human health or the environment. Such areas of concern may require investigations and remedial action as required under Section 3005(c)(3) of the Resource Conservation and Recovery Act and

ADEM Admin. Code Rule 335-14-8-.03(3)(b)2. in order to ensure adequate protection of human health and the environment.

"Contamination," for the purposes of this permit, refers to the presence of any hazardous constituent in a concentration that exceeds the naturally occurring concentration of that constituent in the immediate vicinity of the facility (i.e., areas not affected by the facility).

"Corrective action" for the purposes of this permit is the sum of all corrective measures, and may include all corrective measures necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required by ADEM Admin. Code R. 335-14-5-.06(11) and/or 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater.

"Corrective Action Management Unit" (CAMU) for the purposes of this permit, includes any area within a facility that is designated by the Department under ADEM Admin. Code 335-14-5-.19 for the purpose of implementing corrective action requirements under ADEM Admin Code Rule 335-14-5-.06(12), 22-30-19 et seq., Code of Alabama 1975, and/or RCRA section 3008(h). A CAMU shall only be used for the management of remediation waste pursuant to implementing such corrective actions requirements at the facility.

"Corrective measures" for the purposes of this permit, include all individual measures taken and/or necessary to remedy releases and to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit at the facility, regardless of the time at which waste was placed in the unit, as required under ADEM Admin. Code R. 335-14-5-.06(12). Corrective measures may address releases to air, soils, surface water, or groundwater. The sum of all individual corrective measures is known as corrective action.

"Extent of contamination," for the purposes of this permit, is defined as the horizontal and vertical areas in which the concentrations of hazardous constituents in the environmental media being investigated are above detection limits or background concentrations indicative of the region, whichever is appropriate as determined by the Department.

"Hazardous constituents," for the purposes of this permit, are those substances listed in ADEM Admin. Code Rule 335-14-2-Appendix VIII and/or ADEM Admin. Code Rule 335-14-5-Appendix IX and include hazardous constituents released from solid waste, hazardous waste, and hazardous waste constituents that are reaction by-products.

"Interim measures" for the purposes of this permit are actions necessary to minimize or prevent the further migration of contaminants and limit actual or potential human and environmental exposure to contaminants while long term corrective action remedies are evaluated and, if necessary, implemented.

"Land Disposal" for the purposes of this permit and ADEM Admin. Code R. 335-14-9 means placement in or on the land and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, underground mine or cave, or concrete vault or bunker intended for disposal purposes.

"Landfill" for the purposes of this permit, includes any disposal facility or part of a facility where hazardous waste is placed in or on the land and which is not a pile, a land treatment facility, a

surface impoundment, an underground injection well, a salt dome formation, a salt bed formation, an underground mine, a cave, or a corrective action management unit.

“Land Use Controls (LUC),” for the purposes of this permit, is as defined by ADEM Admin. Code Rule 335-15-1-.02.

A “maximum concentration limit” (MCL) for the purposes of this permit refers to a groundwater concentration limit listed in Table 1 of ADEM Admin. Code R. 335-14-5-.06(5), or which is listed in ADEM Admin. Code R. 335-7-2 (Primary Drinking Water Standards) or ADEM Admin. Code R. 335-7-3 (Secondary Drinking Water Standards) or analogous Federal safe drinking water regulations (40 CFR 141). In cases where a constituent is listed in multiple sources (ADEM Admin. Code R. 335-14 and/or ADEM Admin. Code R. 335-7, and/or 40 CFR 141), the most stringent standard shall apply.

“Method detection limit” (MDL), for the purposes of this permit, means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

“Mixed waste,” for the purposes of this permit, means a solid waste that is a mixture of hazardous waste (as defined in ADEM Admin. Code Rule 335-14-2-.01(3)) and radioactive waste (as defined in 10 CFR 61.2). The radioactive component of mixed waste is subject to regulation by the Atomic Energy Act (AEA)/Nuclear Regulatory Commission (NRC). The non-radioactive chemically hazardous component of mixed waste is subject to regulation by the AHWMA and ADEM Admin. Code Rule 335-14.

“Miscellaneous unit” means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under 40 CFR Part 146, containment building, corrective action management unit, unit eligible for a research, development and demonstration permit under 335-14-8-.06(4); or staging pile.

“Munitions Debris” for the purposes of this permit means remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

“Non-regulated waste” for the purposes of this permit means waste that is not otherwise regulated as RCRA listed and/or characteristic hazardous waste. In this case, non-regulated includes, but is not limited to, solid and universal waste, used oil, PCB, etc. Universal waste and used oil are subject to ADEM Admin. Code 335-14-11, Standards for Universal Waste Management and ADEM 335-14-17, Standards for the Management of Used Oil, respectively.

“Open burning” means the combustion of any material without the control of combustion air to maintain adequate temperature for efficient combustion, containment of the combustion-reaction in an enclosed device to provide sufficient residence time and mixing for complete combustion, and control of emission of the gaseous combustion products.

“Open detonation” means the explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level) and which produces the uncontrolled emission of the gaseous detonation products.

“Operating day,” for the purposes of this permit, means any day on which hazardous waste is treated, stored, or disposed of in a unit. For example, each day that a hazardous waste storage unit contains hazardous waste is an operating day; as is each day that a disposal unit contains or receives hazardous waste, or each day that hazardous waste is treated in a treatment unit.

“Operational range” for the purpose of this permit, as defined in Section 101(e) of the United States Code means a range that is under the jurisdiction, custody, or control of the Secretary of a military department and (a) that is used for range activities, or (b) although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities.

“Practical quantitation limits” (PQL) for the purposes of this permit, are the lowest concentrations of analytes in groundwater that can be reliably determined within specified limits of precision and accuracy by a given method under routine laboratory operating conditions, as listed in ADEM Admin. Code R. 335-14-5-Appendix IX.

"Release," for the purposes of this permit, includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, escaping, leaching, pumping, or disposing into the environment of any hazardous waste or hazardous constituent.

"Remediation waste" for the purposes of this permit includes all solid and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, which contain listed hazardous wastes or which themselves exhibit a hazardous waste characteristic, that are managed for the purpose of implementing corrective action requirements under ADEM Admin. Code R. 335-14-5-.06(12) and RCRA Section 3008(h). For a given facility, remediation wastes may originate only from within the facility boundary, but may include waste managed in implementing RCRA Sections 3004(v) or 3008(h) for releases beyond the facility boundary.

"Solid waste" for the purposes of this permit means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded materials, including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under Section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923).

"Solid waste management unit" (SWMU), for the purposes of this permit, includes any unit that has been used for the treatment, storage or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA-regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills).

“Storm event,” for the purposes of this permit, is defined as a 1-year, 24-hour storm event or rainfall that measures 1-inch or greater in 1 hour or less. Rainfall measurements may be taken at the site, or the closest official weather monitoring station may be used.

"Temporary Unit" (TU) for the purposes of this permit, includes any temporary tanks and/or container storage areas used solely for treatment or storage of hazardous remediation wastes during specific remediation activities. Designated by the Department, such units must conform to specific standards, and may only be in operation for a period of time as specified in this permit.

"Thermal treatment" for the purpose of this permit, includes open burning and open detonation of hazardous energetics and energetic contaminated waste.

A "unit" for the purposes of this permit includes any contiguous discernable area used for the management of hazardous waste (or non-hazardous waste in the case of a SWMU) and may include, but is not limited to, any landfill, surface impoundment, waste pile, land treatment unit, incinerator, injection well, tank, container storage area, septic tank, drain field, wastewater treatment unit, elementary neutralization unit, transfer station, recycling unit or the EDS, OB and OD units.

I.F. EXPIRATION AND CONTINUATION OF PERMIT

This permit and all conditions herein will remain in effect beyond this permit's expiration date if the Permittee has submitted a new application as required by Permit Condition I.C.2. and, through no fault of the Permittee, the Department has not issued a new permit (ADEM Admin. Code R. 335-14-8-.05(1) and 335-14-8.05(2)).

I.G. WASTE MINIMIZATION

1. Certification Requirements

Pursuant to ADEM Admin. Code Rule 335-14-5-.05(4)(b)9, the Permittee must certify, no less often than annually, that:

- a. The Permittee has a program in place to reduce the volume and toxicity of hazardous waste to the degree determined by the Permittee to be economically practicable; and,
- b. The proposed method of treatment, storage, or disposal is the most practicable method available to the Permittee and that it minimizes the present and future threat to human health and the environment.

2. Recording Requirements

- a. The Permittee shall maintain copies of this certification in the facility operating record as required by ADEM Admin. Code R. 335-14-5-.05(4)(b)9.
- b. The Waste Minimization Program required under I.G.1.a. and I.G.1.b. above should at a minimum address the following topics:
 - i. Identity of each hazardous waste stream and the source of generation.
 - ii. Types and amounts of hazardous waste that is generated at the facility.

- iii. Present and proposed method of treatment, storage or disposal that is available to the Permittee.
 - iv. Description of techniques implemented in the past for hazardous waste reduction and their effectiveness.
 - v. An evaluation of technically and economically feasible hazardous waste reduction techniques.
 - vi. A program and schedule for implementing the selected hazardous waste reduction technique.
3. Solid Waste Minimization Objectives
- a. If Condition I.G. of this permit is applicable, then the Waste Minimization program required under Condition I.G. above should address the objectives listed in Appendix A of this permit.

I.H. COST ESTIMATES

- 1. The Permittee shall maintain detailed written cost estimates, in current dollars, at the location specified in Permit Condition I.C.10.e. and on file with ADEM in accordance with ADEM Admin. Code Rules 335-14-5-.08(3), (5), and (10).
- 2. All cost estimates must be updated annually as required by ADEM Admin. Code Rules 335-14-5-.08(3)(b), 335-14-5-.08(5)(b), and 335-14-5-.08(10)(b).
- 3. The cost estimate shall be maintained and submitted in the form designated by the Department.
- 4. The Permittee must update the cost estimate no later than 30 calendar days after the Department has approved a modification to the Closure Plan, Post-Closure Plan, or Corrective Action Plan, or any other plan required or referenced by this permit, if the change in the plan results in an increase in the amount of the cost estimate.

I.I. FINANCIAL ASSURANCE (RESERVED)

I.J. PERMIT MODIFICATIONS

The Permittee shall request a permit modification whenever changes in operating plans or facility design affect any plan (e.g., closure, groundwater monitoring, post-closure, or corrective action) required or referenced by this permit. The Permittee must submit a written request for a permit modification pursuant to the requirements of ADEM Admin. Code Rule 335-14-8-.04(2) at least 60 calendar days prior to the proposed change in facility design or operation.

I.K. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

All reports, notifications, or other submissions that are required by this permit should be sent via certified mail, private courier service (which has package tracking/tracing), or hand delivered to:

Chief, Land Division
Alabama Department of Environmental Management
P.O. Box 301463 (Zip 36130-1463)
1400 Coliseum Boulevard (Zip 36110-2059)
Montgomery, Alabama

and

Director, Land, Chemicals and Redevelopment Division
US EPA Region 4
Atlanta Federal Center
61 Forsyth Street SW
Atlanta Georgia 30303-3104

PART II

GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF PERMITTED UNITS

The Permittee shall maintain and operate such units to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or constituents to air, soil, surface water, or groundwater which could threaten human health or the environment.

Stored hazardous waste may only be released to those who are authorized to handle and/or manage such hazardous waste. EDS, OB and OD operations may only be conducted by those who are authorized to handle the hazardous waste and conduct such operations.

II.B. HAZARDOUS WASTE FROM OFF-SITE SOURCE

The Permittee shall not receive hazardous waste from an off-site source for storage without prior approval of the Department. The Permittee shall only treat hazardous waste by EDS, OB and/or OD that is generated onsite or that is generated at the contiguous Marshall Space Flight Center (EPA ID AL1 800 013 863).

II.C. GENERAL WASTE ANALYSIS

1. The Permittee shall comply with all requirements set forth under ADEM Admin. Code R. 335 14-5-.02(4) and shall follow the procedures described in the Waste Analysis Plan, Section C-2, of the permit application.
2. The Permittee shall utilize the analytical methods specified in the Waste Analysis Plan, Section C-2, of the permit application. These laboratory methods will address the wastes listed in Section C-2, of the permit application. Modification of the Waste Analysis Plan shall require a modification of this permit pursuant to ADEM Admin. Code R. 335-14-8-.04(2).
3. The Permittee shall subject samples from incoming waste shipments to the fingerprint parameters identified in Section C-2 of the permit application.
4. The Permittee shall classify waste as non-conforming when the receiving analysis does not match the information contained in the accompanying manifest, profile, and/or equivalent information described in Section C-2 of the permit application.
5. Before treatment of waste by EDS, OB or OD, the Permittee shall ensure that waste sent for treatment corresponds with the applicable Waste Profile Form, Figures C-2 and C-4, of the permit application, for that waste. All waste that does not conform to the information contained in the applicable Waste Profile Form shall be classified as non-conforming and returned to the generator.

6. Before storing, treating, or disposing of a hazardous waste, the Permittee shall obtain a detailed chemical and physical analysis of a representative sample of the waste, as described in Section C-2 of the permit application.

II.D. SECURITY

1. The Permittee shall comply with the security provisions set forth under ADEM Admin. Code R. 335-14-5-.02(5) and as described in Section F-1 of the permit application.
2. In order to comply with ADEM Admin. Code R. 335-14-5-.02(5), the hazardous waste storage areas and the EDS, OB and OD areas of the facility shall remain fenced with at least a six-foot high chain link fence. The fence shall be kept in good repair. All entrances to the permitted hazardous waste management areas shall be closed and locked when security and/or operations personnel are not present.
3. The Permittee shall maintain signs along the perimeter fence of the permitted hazardous waste management areas and the EDS, OB and OD areas. The signs shall read "Danger - Unauthorized Personnel Keep Out". At least one sign must be legible from a distance of at least 25 feet from any approach to each area (ADEM Admin. Code R. 335-14-5-.02(5)(c)).

II.E. GENERAL INSPECTION REQUIREMENTS

1. The Permittee shall comply with all requirements of ADEM Admin. Code R. 335-14-5-.02(6), and 335-14-5-.09(5),
2. The Permittee shall follow the inspection procedures and schedules, as described in Section F-2 of the permit application.
3. The Permittee shall remedy any deterioration or malfunction (of equipment or structure(s)) discovered during any inspection as required by ADEM Admin. Code R. 335-14-5-.02(6)(c).
4. Records of inspections shall be maintained at the facility as required by ADEM Admin. Code R. 335-14-5-.02(6).

II.F. PERSONNEL TRAINING

The Permittee shall conduct personnel training as required by ADEM Admin. Code R. 335-14-5-.02(7). This training program shall follow the procedures and outline, described in Section H of the permit application. The Permittee shall maintain training documents and records as required by ADEM Admin. Code R. 335-14-5-.02(7)(d) and (e).

II.G. GENERAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

1. The Permittee shall comply with all requirements for ignitable, reactive or incompatible wastes set forth under ADEM Admin. Code R. 335-14-5-.02(8).
2. "No Smoking" signs must be conspicuously placed wherever there is a potential hazard from ignitable waste

II.H. LOCATION STANDARDS AND UNIT MAINTENANCE

1. The Permittee shall comply with all location standards set forth under ADEM Admin. Code R. 335-14-5-.02(9).
2. If changes are made to the design or operation of a hazardous waste management or treatment unit, these changes must receive approval by the Department before they are implemented, and may require permit modification pursuant to ADEM Admin. Code R. 335-14-8-.04(2).

II.I. PREPAREDNESS AND PREVENTION

1. Required Equipment

The Permittee shall comply with ADEM Admin. Code R. 335-14-5-.03(3) and at a minimum, shall equip the facility with the equipment set forth in the Contingency Plan, Section G of the permit application.

2. Testing and Maintenance of Equipment

The Permittee shall test and maintain the equipment specified in the Contingency Plan, Section G of the permit application, as necessary to assure its proper operation in time of emergency as required by ADEM Admin. Code R. 335-14-5-.03(4).

3. Access to Communication or Alarm System

The Permittee shall maintain access to the communications or alarm system as required by ADEM Admin. Code R. 335-14-5-.03(5).

4. Arrangements with Local Authorities

The Permittee shall maintain arrangements with state and local authorities as required by ADEM Admin. Code R. 335-14-5-.03(8). The Permittee shall develop and maintain a Preparedness and Prevention Plan providing information on the type, approximate quantities and locations of hazardous wastes within the facility. The Plan shall be provided to state and local authorities in both written paper format and in an appropriate electronic format that is most useful to emergency responders, and updated copies of the Plan shall be provided as needed to reflect significant changes in operations (e.g., significant changes in waste streams and/or volumes, facility design changes, etc.). A

copy of the Plan and documentation that the Plan has been submitted to all local police departments, fire departments, hospitals and local emergency response teams that may be called upon to provide emergency services, shall be submitted to the Department within 45 days from the effective date of this permit for review. If state or local officials refuse to enter into preparedness and prevention arrangements with the Permittee, the Permittee must document this refusal in the operating record.

5. Required Aisle Space

The Permittee must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency (ADEM Admin. Code R. 335-14-5-.03(6)).

II.J. CONTINGENCY PLAN

1. Implementation of Plan

The Permittee shall immediately carry out the provisions of the Contingency Plan, (Section G of the permit application) and follow the emergency procedures as required by ADEM Admin. Code R. 335-14-5-.04(2) whenever there is a fire, explosion, or release of hazardous waste or hazardous constituents which threatens or could threaten human health or the environment.

2. Copies of Plan

A copy of the Contingency Plan and all current revisions to the plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams that may be called upon to provide emergency services, as described in Section G of the permit application, and as required by ADEM Admin. Code R. 335-14-5-.04(4).

3. Amendments to Plan

The Permittee shall review and immediately amend, if necessary, the Contingency Plan, as required by ADEM Admin. Code R. 335-14-5-.04(5).

4. Emergency Coordinator

The Permittee shall comply with the requirements of ADEM Admin. Code R. 335-14-5-.04(6) concerning the emergency coordinator as specified in the Contingency Plan, (Section G of the permit application).

II.K. RECORDKEEPING AND REPORTING

1. Operating Record

The Permittee shall maintain a written operating record at the facility in accordance with ADEM Admin. Code R. 335-14-5-.05(4).

2. Availability, Retention, and Disposition of Records

The Permittee shall comply with the Availability, Retention, and Disposition of Records at the facility in accordance with ADEM Admin. Code R. 335-14-5-.05(5).

3. Biennial Report

The Permittee shall comply with the biennial report requirements of ADEM Admin. Code R. 335-14-5-.05(6).

II.L. CLOSURE

1. Performance Standard

The Permittee shall close the permitted hazardous waste management areas, as required by ADEM Admin. Code R. 335-14-5-.07(2), 335-14-5-.09(9), 335-14-5-.10(8), and in accordance with the Closure Plan, Section I-1 of the permit application.

2. Amendment to Closure Plan

The Permittee shall amend the Closure Plan as required by ADEM Admin. Code R. 335-14-5-.07(3)(c).

3. Notification of Closure

As required by ADEM Admin. Code R. 335-14-5-.07(3)(d), the Permittee shall notify the Department at least 60 days prior to the date closure activities are initiated at either unit.

4. Time Allowed for Closure

The Permittee shall comply with the requirements of ADEM Admin. Code R. 335-14-5-.07(4). After receiving or treating the final volume of hazardous waste, the Permittee shall complete closure activities in accordance with the schedule specified in the Closure Plan, Section I-1 of the permit application.

5. Disposal or Decontamination of Equipment

The Permittee shall decontaminate or dispose of all facility equipment as required by ADEM Admin. Code Rules 335-14-5-.07(5), 335-14-5-.09(9), 335-14-5-.10(8), 335-14-5-.11(9), and 335-14-5-.12(9) and as specified in the Closure Plan, Section I-1 of the permit application.

6. Certification of Closure

The Permittee shall certify that each individual unit has been closed in accordance with the specifications presented in the Closure Plan, (Section I-1 of the permit application), as required by ADEM Admin. Code R. 335-14-5-.07(6). The Permittee shall maintain copies of this closure certification in the facility operating record as required by ADEM Admin Code R. 335-14-5-.05(4).

II.M. POST-CLOSURE

If at closure, not all waste and contaminated structures and soils at a unit can be removed or decontaminated, the Permittee shall close the container storage or treatment unit as a landfill and perform post-closure care as specified in ADEM Admin. Code R. 335-14-5-.09(9)(b) and 335-14-5-.14(11).

1. Post-Closure Care Period

The Permittee shall begin post-closure care at all units where closure by removal is not achieved, after completion of unit closure and shall continue for the duration of the post-closure period. The post-closure care period shall continue for a period of 30 years after the closure of each hazardous waste management unit, unless shortened or extended Pursuant to ADEM Admin. Code Rule 335-14-5-.07(8). Each post-closure care period is initiated upon certification by a registered Professional Engineer (State of Alabama) and upon acceptance by the Department pursuant to ADEM Admin. Code R. 335-14-5-.07(6), that closure has been completed and waste has been left in place. The post-closure care period shall automatically extend through the end of the compliance period specified in Condition VII.B.4 of this permit.

2. Post-Closure Security

The Permittee shall maintain security at the facility during post-closure care in accordance with the post-closure plan included in the permit application.

3. Amendment to Post-Closure Plan

The Permittee shall amend the Post-Closure Plan in accordance with ADEM Admin. Code R. 335-14-5-.07(9), whenever necessary.

4. The Permittee shall maintain continuous compliance with the following:

- a. Post closure care of property. (ADEM Admin. Code R. 335-14-5-.07(8))
- b. Notice to local land authority and in deed to property. (ADEM Admin. Code R. 335-14-5-.07(10))

II.N. LAND DISPOSAL RESTRICTIONS**1. General Restrictions**

ADEM Admin. Code R. 335-14-9 identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances in which an otherwise prohibited waste may continue to be placed on or in a land treatment, storage or disposal unit. The Permittee shall maintain compliance with the requirements of ADEM Admin. Code R. 335-14-9. Where the Permittee has applied for an extension, waiver, or variance under ADEM Admin. Code R. 335-14-9 the Permittee shall comply with all restrictions on land disposal under this Part once the effective date for the waste has been reached pending final approval of such a land disposal permit application.

2. Land Disposal Prohibitions and Treatment Standards

- a. A restricted waste identified in ADEM Admin. Code R. 335-14-9-.03 may not be placed in a land disposal unit without further treatment unless the requirements of ADEM Admin. Code R. 335-14-9-.03 and/or .04 are met.
- b. The storage of hazardous wastes restricted from land disposal under ADEM Admin. Code R. 335-14-9 is prohibited unless the requirements of ADEM Admin. Code R. 335-14-9-.05 are met

II.O. ORGANIC AIR EMISSION REQUIREMENTS**1. General Introduction****a. Process Vents and Equipment**

Phase I Organic Air Emission Standards consist of ADEM Admin. Code R. 335-14-5-.27 and 335-14-5-.28 for hazardous waste treatment, storage, and disposal (TSD) facilities. ADEM Admin. Code R. 335-14-5-.27 contains emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that process hazardous waste with an annual average total organic concentration of at least ten (10) parts per million by weight (ppmw). ADEM Admin. Code R. 335-14-5-.28 contains emission standards that address leaks from specific equipment (i.e., pumps, valves, compressors, etc.) containing or contacting hazardous waste with a total organic concentration of at least ten-percent by weight.

b. Tanks, Containers, Surface Impoundments and Miscellaneous Units

The Phase II Organic Emission Standards consist of ADEM Admin. Code R. 335-14-5-.29 for hazardous waste treatment, storage, and disposal facilities, including certain hazardous waste generator standards for accumulating waste on-site in RCRA permit-exempt (90-day) tanks and containers. In general, under these standards air emission controls must be used for tanks, surface impoundments, containers, and miscellaneous units that contact hazardous waste containing an average organic concentration greater than 500 ppmw at the point

of origination determined by the procedures outlined in ADEM Admin. Code R. 335-14-5-.29(4), except as specifically exempted under ADEM Admin. Code R. 335-14-5-.29(1) and 335-14-5-.29(3).

2. Notification of New Units

a. Process Vents and Equipment

Prior to constructing any equipment with process vents subject to the requirements of ADEM Admin. Code R. 335-14-5-.27, or installing any additional equipment subject to the requirements of ADEM Admin. Code R. 335-14-5-.28, or prior to modifying the current process such that existing equipment previously not subject to the requirement of ADEM Admin. Code R. 335-14-5-.28 the Permittee shall supply the specific Part B information required pursuant to ADEM Admin. Code R. 335-14-8-.02(15) and 335-14-8-.02(16) as applicable, and shall obtain a permit modification in accordance with the requirements of ADEM Admin. Code R. 334-14-8-.04(3) and condition I.J. of this permit.

b. Tanks, Containers, Surface Impoundments, Miscellaneous Units

Prior to installing any tank, container, surface impoundment or miscellaneous unit subject to ADEM Admin. Code R. 335-14-5-.29, or modifying an existing process waste handling or tank or container such that the unit(s) will become subject to ADEM Admin. Code R. 335-14-5-.29, the Permittee shall obtain a permit modification under ADEM Admin. Code R. 335-14-8-.04(3), and provide specific Part B application information required under ADEM Admin. Code R. 335-14-8-.02(5) – (8) and 335-14-8-.02(18), as applicable, with the modification request.

II.P. MANIFEST SYSTEM

The Permittee shall comply with the requirements of ADEM Admin. Code Rules 335-14-5-.05(2), 335-14-5-.05(3), and 335-14-5-.05(7).

II.Q. WASTE REJECTION NOTIFICATION (RESERVED)

PART III

MANAGEMENT IN CONTAINERS

III.A. WASTE IDENTIFICATION

1. The Permittee may store the hazardous and PCB wastes listed in Part A of the permit application in containers at the facility, subject to the terms of this permit. The storage of any waste not listed in Part A of the permit application is prohibited.
2. The Permittee shall not store mixed waste in containers at the facility.
3. The maximum quantity of waste that can be stored at one time in the container storage area (33 storage igloos) is 7920 fifty-five gallon drums or 435,600 gallons. Individual igloo storage limits for hazardous waste storage buildings are specified in Table III.1. Note that some of the igloos listed in the table require upgrades prior to use.
4. The Permittee may treat the wastes identified in Condition III.C and Table III.2 of the permit at the Phase 2 explosive destruction system (EDS) unit(s). The treatment of any waste not listed or identified herein is prohibited.

III.B. STORAGE IN CONTAINERS

1. The container capacity is distributed throughout the container storage area as shown in Table III.1 of this permit, and as described in Section D-1 of the permit application. The maximum quantity of hazardous waste stored in each unit or containment area shall not exceed the capacity listed in Table III.1 of this permit.
2. The Permittee shall maintain and operate the container storage areas in accordance with the procedures specified in Section D-1 of the permit application.
3. The maximum combined quantity of hazardous and non-hazardous waste stored in a given area shall not exceed ten times the capacity of the containment system for that area. No individual container may be stored in a given area whose volume exceeds the capacity of the containment system for that area.
4. The sampling and staging of drums shall not exceed 72 hours. All containers that are to be fingerprinted or are awaiting analysis shall be segregated from other containers in the container storage area. Each container shall be marked with the date of receipt.

III.C. TREATMENT IN CONTAINERS

The Permittee shall not treat hazardous waste in containers at the storage facility except as prescribed in Condition III.C of this permit.

1. EDS Description
 - a. EDS units are container like, trailer-mounted, transportable treatment systems

comprised primarily of a Containment Vessel. Items are loaded into the Containment Vessel, shape charges are used to access the chemical fill and detonate the munition buster explosives if present, and the exposed chemical fill is treated with reagent. After the treatment level is confirmed, the neutralant is drained into a liquid waste container and the Containment Vessel is rinsed and purged. When the vapor concentration in the Containment Vessel is confirmed safe, the vessel door is opened and solid waste materials are removed to solid waste containers. Engineering descriptions of the EDS design and operation are located in Section D and Appendix D-4 of the permit application.

- b. Up to two EDS units shall be located within the 8200 block of igloos at approximately N 34° 34' and W 86° 39'. The EDS unit(s) location(s) is shown on Figure B-3 of the permit application.
- c. The Permittee may use the EDS unit(s) to process recovered munitions or other items that contain chemical agent or industrial chemical fills. Items to be treated may or may not have an explosive component.

2. Permitted and Prohibited Waste Identification

- a. The Permittee may use up to two Phase 2 EDS units at the facility to treat the hazardous wastes listed on Table III.2 of this permit, subject to the terms of this permit. Anticipated chemicals are listed in Appendix C-1 of the permit application and safety data sheets for these items will be made available for ADEM's inspection onsite or transmittal to ADEM while the EDS is operating as described in Section C-1 of the permit application.
- b. The Permittee shall not treat any hazardous waste that is not specified in Table III.2 in an EDS unit.
- c. The Permittee shall use process knowledge and information obtained from nondestructive tools (e.g., x-rays, physical appearance, portable isotopic neutron spectroscopy (PINS), etc.) and Materiel Assessment Review Board (MARB) review to identify the recovered items.
- d. The treatment of items containing depleted uranium, white phosphorous or red phosphorus is prohibited.
- e. Items that can be processed are limited to those recovered from on-site or from the contiguous facility, Marshall Space Flight Center.

3. Operation

- a. The EDS units shall be operated by properly trained personnel in accordance with the EDS Standard Operating Procedures (SOPs) provided in Appendix D-4 of the permit application.
- b. Each Phase 2 EDS unit will be housed and operated within an environmental enclosure as described in Appendix D-5 of Section D of the permit application.
 - i. The environmental enclosure shall include a ceiling, sides and flooring to

- protect the EDS from precipitation and reduce the potential for contaminated runoff.
 - ii. The environmental enclosure shall be equipped with multiple doors for entrance and egress.
 - iii. The environmental enclosure shall be maintained under negative pressure during ongoing operations to minimize the potential for airborne releases.
 - iv. Each enclosure shall be connected to at least one air filtration system (AFS) and shall have an induced draft fan to maintain a negative pressure within the enclosure relative to the outside air to capture any released vapors. The AFS shall include the components described in Appendix D-5 of the permit application.
 - v. The enclosure shall include impermeable flooring.
 - vi. Personnel shall don the protective clothing as shown on Table III.3 of the permit, prior to entering the environmental enclosure.
 - vii. Open flames, smoking, cutting or welding hot surfaces, frictional heat and sparks are prohibited in the environmental enclosure when munitions are present.
- c. Each EDS unit shall be equipped with a power generating system capable of providing power for critical and essential loads in the event of a power outage.
- d. As described in Section D of the permit application, a minimum of two feet of aisle space will be maintained within the environmental enclosure between containers, and the EDS unit and the environmental enclosure sides to allow for unobstructed visual inspections, movement of waste handling equipment, personnel and fire protection, spill control, and decontamination equipment response to an emergency.
- e. The trailer supporting the EDS unit shall have a secondary containment pan to collect any spilled liquids.
- f. The work areas shall be monitored for the appropriate chemical vapors.
 - i. MINICAMS® shall be operated at all times that items are within the enclosure, as described in Section F-4e of the permit application.
 - ii. MINICAMS® alarms shall be confirmed by Depot Area Air Monitoring (DAAMS) tubes, colorimetric tubes, and/or dosimeter badges as specified in Section F-4e of the permit application.
 - iii. Monitoring personnel shall maintain documentation of all monitoring activities as specified in Section F-4e of the permit application.
- g. Each EDS unit may be operated to treat one to six recovered munitions or other items simultaneously, provided that the total net explosive weight (NEW) does not exceed the value established for the EDS unit.
- h. Each Phase 2 EDS unit may be used to detonate up to 4.8 pounds of trinitrotoluene (TNT) equivalent explosives (NEW), including the munitions and the donor charges per treatment event.
- i. Treatment shall be completed in accordance with the SOP included in Appendix

D-4 of the permit application to deactivate any explosive component, reduce the toxicity of the chemical fill and explosive residues and decontaminate the item or munition casing fragments before shipment to an offsite permitted treatment, storage, and disposal facility (TSDF).

- i. The items to be processed shall be placed in an expendable holder that will in turn be placed in a fragment suppression system (FSS) or an advanced fragment suppression system (AFSS), depending on the types and number of items being treated.
 - ii. Shape charges and detonators shall be placed on the munition holder.
 - iii. The FSS or AFSS shall be placed within the containment vessel and the containment vessel shall be closed and checked for leaks using a helium leak detector. If the leak test fails, the protocol in Annex H of the EDS SOPs shall be followed.
 - iv. The shape charges shall be detonated to expose the chemical/industrial fill and detonate the munition burster explosives if present. The appropriate reagent shall be added to the containment vessel to neutralize the chemical/industrial fill.
 - v. The containment vessel shall be rotated and heated as needed (up to 100°C [212°F]) until analysis of the liquid indicates that the treatment level specified in Table D-1 within Appendix D-4 of the permit application has been met.
 - vi. The liquid (neutralent) shall then be drained from the containment vessel to a liquid waste container and the containment vessel shall be rinsed with clean, heated water. The waste container shall have secondary containment to collect any spilled liquid.
 - vii. The rinse water shall be drained from the containment vessel into another suitable waste container. The waste container shall have secondary containment to collect any spilled liquid.
 - viii. The containment vessel shall then be purged with an inert gas and headspace samples shall be taken and analyzed.
 - ix. After sampling indicates that chemical agent vapor levels are safe as shown on Tables III.4 and III.5 of the permit, the containment vessel door shall be opened, the solid wastes shall be visually inspected for any unexploded energetic material, removed from the containment vessel and placed into a container for solid wastes. If any unexploded components are found, they will be segregated from other solid wastes, placed in a separate container and transferred to explosive ordnance disposal (EOD) personnel for disposition, or retreated in the EDS during a subsequent treatment event. The Permittee shall follow the procedures as specified in Section F-4e of the permit application.
 - x. The containment vessel shall be rinsed to remove any remaining debris. The resulting liquid and solid wastes shall be placed in suitable waste containers.
 - xi. All waste containers shall be placed in 90-day waste storage areas or a permitted storage igloo pending waste characterization and shipment offsite for further treatment or ultimate disposal in accordance with Table C-3 of the permit application. The waste containers shall be maintained as described in the following sections of this permit.
- j. Prior to treating subsequent chemical-filled items, the Containment Vessel

interior shall be cleaned. The interior vessel wall, sealing surface, and door shall be visually inspected for damage or other impairments to the proper operation of the unit. The Containment Vessel door metal seal and ethylene propylene diene monomer O-ring will be replaced after every fifth use (detonation) for the seal and after each detonation for the O-ring. The electrical connection fittings that connect the firing system to the detonators shall be replaced as necessary.

4. Inspection

- a. The Permittee shall inspect the EDS units prior to operation and each operating day, in accordance with Table F-2 and the Operational Inspection checklists included in Appendix F-1 of the permit application.
- b. The Permittee shall inspect the RSA EDS site monthly, in accordance with Table F-2 and following the checklist included in Appendix F-1 of the permit application.
- c. If the EDS containment vessel becomes unfit for continued use, the Permittee shall remove the EDS from service. The containment vessel shall be considered unfit for continued use if a major release or incident that results in impairment to the containment vessel integrity requiring repair beyond routinely expected maintenance occurs.
- d. The monitoring devices shall be inspected prior to use and each operating day as detailed in Section F-2 and Table F-2 of the permit application.
- e. Any leaking equipment, including hose lines and pumps, shall be repaired or replaced as soon as operationally feasible and prior to processing the next item.

5. Record Keeping

- a. The Permittee shall record leak test and worker safety monitoring results and include this information in the EDS operation record. The Permittee shall maintain the EDS operating record in accordance with Condition I.C.10 of this permit.
- b. The Permittee shall maintain inspection logs, including any corrective actions taken, at the RSA EDS site. The Permittee shall maintain all repair and maintenance records for all instruments and instrument systems as part of the operating record required by ADEM Admin. Code R. 335-14-5-.05(4).
- c. The Permittee shall maintain the training records of all personnel involved in EDS hazardous waste management operations and activities in accordance with Condition II.F of this permit.
- d. The Permittee shall maintain documentation on all samples collected, chain-of-custody, results, and reports received. All information will become part of the operating record and shall be kept until EDS site closure, in accordance with Condition II.K of this permit.

- e. A log of events that occur during a work shift, including all activities preceding, during, and following the destruction of recovered munitions or items, any near real-time (NRT) monitoring alarms, and historical monitoring confirmations shall be kept and made available to inspectors. This log shall be maintained as part of the operating record in accordance with Condition II.K of this permit.

6. Contingency

The contingency plan, as detailed in Section G of the permit application, shall be maintained at the RSA EDS command post location. A copy of the contingency plan and any and all revisions to the plan shall be submitted to all local law enforcement departments, fire departments, hospitals, and State and local emergency response teams [including the ADEM Field Operations Division] that may be called upon to provide emergency services, in accordance with Condition II.J. of this permit. Any incident that necessitates implementing the contingency plan shall be followed by a written report to the Department within five days, in accordance with Condition I.C.12 of this permit. The written report shall document the incident and follow-up actions.

7. Closure and Post Closure

- a. The Permittee shall service, clean, disassemble, and decontaminate (if necessary) EDS components in accordance with EDS SOPs (Appendix D-4 of the permit application) and Section I of the permit application so that the EDS may be reused for subsequent or future operations at the same RSA location, a new RSA location, or moved to an off-site location.
- b. When the EDS operation is no longer required at RSA, the unit(s) shall undergo closure in accordance with the closure plan provided in Section I of the permit application and Condition II.L of this permit.
- c. Within 60 days of completing closure, the Permittee shall submit to the Department a closure report describing the closure activities conducted. The closure report shall include, but not be limited to:
 - i. Confirmatory sampling results demonstrating clean closure of the EDS.
 - ii. Closure certification signed by the Permittee and a qualified, Alabama-licensed Professional Engineer.

III.D. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, upon discovery the Permittee shall immediately transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of ADEM Admin. Code R. 335-14-5-.09(2).

III.E. COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittee shall assure that the ability of the container to contain the waste is not impaired, as required by ADEM Admin. Code R. 335-14-5-.09(3).

III.F. MANAGEMENT OF CONTAINERS

1. The Permittee shall manage containers as required by ADEM Admin. Code R. 335-14-5-.09(4) and Section D-1 of the permit application.
2. A container holding hazardous waste must always be closed during storage, except when it is necessary to add, remove, sample, or inspect the waste.
3. A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.
4. At least 24 inches of aisle space will be maintained at all times, as discussed in Section D-1 of the storage permit application, and as necessary to provide adequate access for emergency equipment and inspection.
5. Containers having a capacity greater than or equal to 30 gallons shall not be stacked over two containers high at any time.

III.G. CONTAINMENT

1. The Permittee shall maintain the containment systems of the container storage in accordance with the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b), and as specified in Section D-1 of the permit application.
2. For all hazardous waste storage igloos listed in Table III.1 used for container storage, the Permittee shall provide secondary containment for any container containing free liquids. The secondary containment must meet the requirements of ADEM Admin. Code R. 335-14-5-.09(6)(b). Employments of drip pans or container overpacks are two of the methodologies that meet the secondary containment regulatory requirements.

III.H. INSPECTIONS

For hazardous waste storage igloos, the Permittee shall inspect areas where containers are stored or handled weekly unless empty. Inspections shall resume on a weekly basis when a previously empty hazardous waste storage igloo is returned to use. The purpose of this inspection is to detect leaking containers and deterioration of containers or containment systems and to ensure stacking is no more than two high as specified in Section III.F.5. of this permit and as required by ADEM Admin. Code R. 335-14-5-.09(5). The Permittee shall note the number and capacity of hazardous waste containers present.

III.I. SPECIAL REQUIREMENTS FOR IGNITABLE OR REACTIVE WASTES

1. The Permittee shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line as required by ADEM Admin. Code R. 335-14-5-.09 (7).

2. The Permittee shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste and follow the procedures specified in Section C-2g of the permit application and as required by ADEM Admin. Code R. 335-14-5-.02(8).

III.J. SPECIAL REQUIREMENTS FOR INCOMPATIBLE WASTE

The Permittee shall separate containers of incompatible wastes as specified in Section C-2g of the permit application.

1. Except as specifically addressed in Condition III.C of this permit, incompatible wastes, or incompatible wastes and materials, must not be placed in the same container unless the Permittee is in compliance with ADEM Admin. Code R. 335-14-5-.02(8)(b).
2. The Permittee shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material.
3. The Permittee must document compliance with Conditions III.J.1. and III.J.2. of this permit as required by ADEM Admin. Code R. 335-14-5-.05(4) and place this documentation in the operating record.
4. The Permittee shall separate containers of incompatible wastes as required by ADEM Admin. Code R. 335-14-5-.09(8)(c).

Table III.1

HAZARDOUS WASTE STORAGE IGLOOS

Igloo	Storage Dimensions	Max. Volume (gallons)**
Bldg 8205	26'5" x 81	13,200
Bldg 8208	26'5" x 81	13,200
Bldg 8209*	26'5" x 81	13,200
Bldg 8210*	26'5" x 81	13,200
Bldg 8211	26'5" x 81	13,200
Bldg 8212	26'5" x 81	13,200
Bldg 8213	26'5" x 81	13,200
Bldg 8214	26'5" x 81	13,200
Bldg 8216	26'5" x 81	13,200
Bldg 8217	26'5" x 81	13,200
Bldg 8218	26'5" x 81	13,200
Bldg 8219	26'5" x 81	13,200
Bldg 8220	26'5" x 81	13,200
Bldg 8221	26'5" x 81	13,200
Bldg 8222*	26'5" x 81	13,200
Bldg 8223*	26'5" x 81	13,200
Bldg 8224	26'5" x 81	13,200
Bldg 8225	26'5" x 81	13,200
Bldg 8226	26'5" x 81	13,200
Bldg 8227	26'5" x 81	13,200
Bldg 8228	26'5" x 81	13,200
Bldg 8229	26'5" x 81	13,200
Bldg 8230*	26'5" x 81	13,200
Bldg 8231	26'5" x 81	13,200
Bldg 8621	26'5" x 81	13,200
Bldg 8622	26'5" x 81	13,200
Bldg 8623	26'5" x 81	13,200
Bldg 8624	26'5" x 81	13,200
Bldg 8625	26'5" x 81	13,200
Bldg 8630	26'5" x 81	13,200
Bldg 8631	26'5" x 81	13,200
Bldg 8632	26'5" x 81	13,200
Bldg 8633	26'5" x 81	13,200

Notes: * Requires upgrades prior to use

** Max. Volume includes all waste (regulated and non-regulated) stored in the igloos.

Table III.2

Permitted Waste Codes for the Explosive Destruction System (EDS)

USEPA Hazardous Waste Number	Waste Description
D001	Ignitable waste
D002	Corrosive waste
D003	Reactive waste
D004	Arsenic
D005	Barium
D006	Cadmium
D007	Chromium
D008	Lead
D009	Mercury
D010	Selenium
D011	Silver
D018	Benzene
D019	Carbon tetrachloride
D022	Chloroform
D027	1,4-dichlorobenzene
D028	1,2-dichloroethane
D029	1,1-dichloroethylene
D030	2,4-dinitrotoluene
D032	Hexachlorobenzene
D034	Hexachloroethane
D039	Tetrachloroethylene
D040	Trichloroethylene
D043	Vinyl chloride
F001	Spent halogenated solvents used in degreasing, such as Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons
F002	Spent halogenated solvents, such as Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane
F003	Spent non-halogenated solvents, such as Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol
F004	Spent non-halogenated solvents, such as Cresols and cresylic acid, and nitrobenzene
F005	Spent non-halogenated solvents, Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane
P036	Dichlorophenylarsine
P095	Carbonic dichloride
U133	Hydrazine

Table III.3**Personal Protective Equipment (PPE) Levels for Processing Items within the EDS ^a**

Task	PPE Requirement
Emergency Operations or Response (work space is at or above action levels)	OSHA Level B PPE
Site Setup	OSHA Level D PPE
Monitoring	OSHA Level D PPE
Transferring Reagent Between Reagent Drums and EDS Tanks	OSHA Level C PPE
Decontamination Personnel	OSHA Level C PPE
Site Operations Support Personnel, Data Collection, Project Observers, Visitors, Nonchemical Workers	OSHA Level D PPE
Routine and Occasional Maintenance	OSHA Level D PPE
Handling Cleared Liquid Waste Containers ^b	OSHA Level D PPE
Handling Munitions/Chemical-Filled Cylinders Upon Initial Receipt and Assessment	OSHA Level C PPE
Collecting Liquid or Vapor Samples (if work space is below action levels)	OSHA Level C PPE
Collecting Liquid or Vapor Samples (if work space is at or above action levels)	OSHA Level B PPE
Opening EDS Containment Vessel Door	OSHA Level C PPE
Sampling Containment Vessel Solid Waste and Removal of Munition/AFSS or FSS Metal Parts	OSHA Level C PPE
Handling Uncleared Waste Materials and Containers ^c	OSHA Level C PPE
DAAMS Technicians Collecting Tubes (when work space is below action levels) ^d	OSHA Level D PPE ^e
DAAMS Technicians Collecting Tubes (when operations are in progress) ^d	OSHA Level C PPE
DAAMS Technicians Collecting Tubes (when work space is at or above action levels or operations are in progress) ^d	OSHA Level B PPE

Notes:

- a Protection levels may be downgraded or modified.
- b “Cleared” means that a liquid waste sample has been collected, analyzed for chemical agent, and found to meet treatment levels.
- c “Uncleared” means that a sample has not yet been collected, or results have not been reported yet, or the results indicate that the treatment level is not met.
- d Applicable for chemical agent operations only. In the event of a worker population limit (WPL) excursion, the site-specific WPL Excursion Plan will be put into effect.
- e PPE level/respiratory protection is dependent on monitoring results.

Acronyms:

AFSS	=	Advanced Fragment Suppression System
DAAMS	=	Depot Area Air Monitoring System
EDS	=	Explosive Destruction System
FSS	=	Fragment Suppression System
OSHA	=	Occupational Safety and Health Administration
PPE	=	Personal protective equipment

Table III.4**AELs for Mustard (HD, HS, HT, and HN-3) and Lewisite within the EDS ^b**

	WPL	STEL ^a
Mustard Exposure Level (mg/m ³)	0.0004	0.003
Lewisite Exposure Level (mg/m ³)	0.003	0.003
Averaging Time	8 hours	15 minutes / Time-independent
Required Monitoring Method	Historical or near real-time	Near real time

Notes:

- a The Centers for Disease Control and Prevention (CDC) may publish updated numbers for the exposures at the STEL.
- b Airborne exposure limits (AELs) are taken from the U.S. Army Chemical Materials Agency Programmatic Monitoring Concept Plan (MCP) (July 2018) and 69 Federal Register (FR) 24164-24168 (3 May 2004). All AELs are concentration and time values, not concentration only values. Administrative controls may be used to limit potential exposure to workers. However, because administrative controls cannot be used to limit the duration of potential public exposure, only the WPL protective action level is significantly affected by administrative controls, which limit the duration of potential exposure.

Acronyms:

EDS	=	Explosive Destruction System	HT	=	Mustard-T Mixture
HD	=	Distilled Sulfur Mustard	mg/m ³	=	Milligrams of Chemical per Cubic Meter of Air
HN-3	=	Nitrogen Mustard	STEL	=	Short-term Exposure Limit
HS	=	Sulfur Mustard	WPL	=	Worker Population Limit

OELs for Industrial Chemicals within the EDS ^e

Notes:

a Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) from 29 CFR 1910.1000 Z-1 Table (<https://www.osha.gov/annotated-pels/table-z-1>) [58 FR 35340, June 30, 1993; 58 FR 40191, July 27, 1993, as amended at 61 FR 56831, Nov. 4, 1996; 62 FR 1600, Jan 10, 1997; 62 FR 42018, Aug. 4, 1997; 71 FR 10373, Feb. 28, 2006; 71 FR 16673, Apr. 3, 2006; 71 FR 36008, June 23, 2006.] and 29 CFR 1910.1000 Z-2 Table (<https://www.osha.gov/annotated-pels/table-z-2>) [62 FR 42018, August 4, 1997] as amended [71 FR 36009, June 23, 2006]. PELs are 8-hour time weighted averages (TWAs) unless otherwise indicated

b U.S. National Institute for Occupational Safety and Health (NIOSH) Recommended Exposure Limits (RELs) from the NIOSH Pocket Guide to Chemical Hazards (<https://www.cdc.gov/niosh/npg>) (Web site last accessed on October 18, 2019). Adjusted value from the 8-hour TWA.

c American Conference of Governmental Industrial Hygienists (ACGIH®) Threshold Limit Value (TLVs®) for Chemical Substances are listed in the order of 8-hour TWAs, STELs (ST), and Ceilings (C), if available. The 2019 TLV® and Biological Exposure Indices (BEI®) Book and Documentation of the TLVs® on Chemical Substances, 7th Edition are available through the ACGIH® website at <http://www.acgih.org>.

d Parts of vapor or gas per million parts of contaminated air by volume at 25 degrees C and 760 torr.

e Monitoring for all industrial chemicals will be at the applicable occupational exposure limit (OEL). The Permittee will be required to comply with the most conservative value with respect to the OSHA PELs, NIOSH RELs, and ACGIH TLVs.

EDS	=	Explosive Destruction System	STEL	=	Short-term Exposure Limit
mg/m ³	=	Milligrams of Chemical per Cubic Meter of Air			

PART IV

THERMAL TREATMENT

IV.A. DESCRIPTION

1. The OB and OD Units occupy approximately 59 acres located in the southwestern portion of RSA at approximately N 34°34' and W 86°40'. The unit(s) locations are shown in Figures B-1, B-2, and B-41 of the permit application. Thermal treatment of hazardous waste by means other than as specifically authorized by this permit is prohibited. The following units are permitted for treatment of hazardous wastes:
 - a. Open Burning (OB) Units – SWMU 12
 - b. Open Detonation (OD) Unit – SWMU 131
2. The Permittee is allowed to thermally treat (via open burning and open detonation) hazardous energetic and energetic-contaminated waste that is generated on-site or at the contiguous facility, Marshall Space Flight Center (AL1 800 013 863). Structural dimensions and other details for the burn pans and OD area are found in Section D-8a and Appendix D-6 of the permit application.
3. Treatment by open burning (OB) may be conducted in the OB unit, consisting of five burn pans dedicated to the thermal destruction of propellants, explosives, energetic-contaminated waste and propellant and D003-contaminated solvents as depicted in Section D-8a(1) of the permit application. All burn pans shall be similarly constructed, as shown in Appendix D-6 of the permit application. One burn pan, pan No. 3, shall be exclusively used to thermally treat D003-contaminated solvents and shall have spill containment surrounding the base structure as shown in Appendix D-6 of the permit application. The OB of any waste not described in this section is prohibited without prior approval from the Department.
4. Treatment by open detonation (OD) may be conducted in the designated area for the detonation of energetic wastes in pits. The OD unit consists of seven detonation pit areas elevated on an earthen mound as described in Section D-8a(2) of the permit application. The OD of any waste not described in this section is prohibited without prior approval from the Department.

IV.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

This permit allows RSA to treat United Nations Organization (UNO) Class 1 materials at the OB and OD units, as noted in the permit application. Waste treated at the OB and OD units exhibits the RCRA hazardous characteristic of reactivity (i.e. D003). Such waste may consist of fired and unfired munitions items (rocket motors, warheads, shells, grenades, flares), munitions components (e.g., fuses, detonators, rocket motor igniters), bulk energetics (propellants and explosives), and energetic-contaminated materials. The wastes treated at the OB and OD units

shall not contain pesticides, herbicides, dioxins, or PCBs. Pentachlorophenol (PCP)-treated wood and beryllium and/or waste containing beryllium are prohibited from treatment at the OB and OD units. Waste types and waste characteristics are detailed in Sections B and C of the permit application.

Thermal treatment of hazardous waste by means other than as specifically authorized by this permit is prohibited. Treatment of recovered liquid-filled rounds, chemical warfare materiel or components thereof, liquid agent-contaminated explosive components, and items containing depleted uranium, either loaded or expended, are prohibited. Treatment of loaded munitions or components containing colored smokes, hexachloroethane, or riot control agents is prohibited.

Limited treatment of white phosphorus and other types of phosphorus within the OD pits, as shown below, may be allowed by ADEM on a case-by-case basis. The density and heat content of all types of phosphorus in munitions (i.e. yellow phosphorus, red phosphorus, also known as violet or black phosphorus) are similar; and therefore, the estimated acute inhalation hazards would be similar to white phosphorus. Based on air modeling and risk results, RSA may detonate similar types of phosphorus potentially contained in munitions. Prior to the treatment of white phosphorus or other types of phosphorus previously described above, written approval by the Department must be granted. The Permittee shall request written approval from the Department for each treatment event.

IV.C. OPERATION

1. Meteorological Restrictions

The listed meteorological restrictions are applicable to both open burning and open detonation treatment operations. Treatment is allowed subject to the requirements of this permit under the following weather conditions:

- a. Less than a 50 percent chance of precipitation (including thunderstorms or electrical storms),

2. Other Restrictions

- a. Operations are limited to the period between ½ hour after sunrise and ½ hour before sunset,
- b. Open burning will be conducted in each pan no more than once per day,
- c. Open detonation will be conducted in each pit no more than twice per day,
- d. Either OB or OD treatment events, but not both, may occur within a 1-hour period,
- e. OB and OD events may occur on the same day, but not during the same hour,
- f. Treatment of white phosphorus via OD shall be limited to no more than 26 events per year (no more than 1 event in a 14 day period), to ensure potential inhalation exposure via subchronic or chronic conditions does not occur (as these exposure

scenarios were not assessed in the human health risk assessment). As prescribed in Section IV.B, the Permittee must receive written approval by the Department prior to each treatment event of white phosphorus or other types of phosphorus.

3. Treatment Quantities Per Unit

The following quantity of material may be treated at the OB and/or OD units, expressed as net explosive weight (NEW). NEW is the total quantity of energetics (explosives, oxidizer propellant, and pyrotechnics). Explosive limits have also been established for the OB and OD units and these limits also cannot be exceeded at any time. The operating limits per day are as follows:

- a. 50 pounds NEW per open detonation pit (total of 350 pounds NEW per day for the seven detonation pits). Can be hazard class 1.1, 1.2, 1.3, 1.4, 1.5 or 1.6.
- b. 100 pounds NEW consisting of hazard class 1.1, 1.5 or 1.6 material per burn pan (total limit of 500 pounds NEW of hazard class 1.1, 1.5 or 1.6 material for the five open burn pans).
- c. 2000 pounds NEW consisting of hazard class 1.3 and 1.4 material per burn pan (total limit of 10,000 pounds NEW of hazard class 1.3 and 1.4 material for the five open burn pans)
- d. 1000 pounds NEW consisting of oxidizer material per burn pan (total limit of 5000 pounds oxidizer NEW for the five open burn pans)
- e. D003-contaminated solvents containing 900 pounds contaminated solvents at burn pan No. 3
- f. 50 pounds NEW consisting of dynamite per burn pan (total limit of 250 pounds dynamite NEW for the five open burn pans)
- g. 100 pounds NEW consisting of test rocket motors per burn pan, including ignition materials at the five open burn pans (total limit of 500 pounds NEW test rocket motors for the five open burn pans)
- h. Hazard class 1.1, 1.5 and 1.6 materials shall be burned separately from 1.3 and 1.4 materials.
- i. Hazard class 1.2 materials shall not be open burned.

4. Maximum Operating Rates

The daily and annual maximum treatment quantities are as follows:

- a. Daily Maximums Treatment Quantities:

OD - 1.1 through 1.6 hazard class materials

7 pits x 25 pounds NEW/pit x 2 operations/day = 350 pounds NEW/day or

7 pits x 50 pounds NEW/pit x 1 operation/day = 350 pounds NEW/day

OB - 1.1, 1.5 and 1.6 hazard class materials

5 burn pans x 100 pounds NEW/pan x 1 operation/day = 500 pounds
NEW/day

OB - 1.3 and 1.4 hazard class materials

5 burn pans x 2000 pounds NEW/pan x 1 operations/day = 10,000 pounds
NEW/day

Note: (Hazard class 1.2 materials shall not be open burned)

b. Annual Maximum Treatment Quantities:

OD - 1.1 through 1.6 hazard class materials = 35,000 pounds NEW/year

OD - White phosphorus* = a maximum of 84 pounds by weight/year

- For 21 pounds to 84 pounds of white phosphorus
 - At least 35.14 pounds of NEW shall be used
- For less than 21 pounds of white phosphorus
 - At least 8.8 pounds of NEW shall be used

OB - 1.1, 1.3, 1.4, 1.5 and 1.6 hazard class materials = 80,000 pounds NEW/year

* Prior to the treatment of white phosphorus or other types of phosphorus, written approval by the Department must be granted. The Permittee shall request written approval from the Department for each treatment event.

5. Residue Control

The open burning operation of waste materials results in the generation of ash and scrap metal. Ash residue and scrap metal residue shall be handled in the following manner:

Ash Residue:

- a. At the completion of each burn, the Permittee will allow a reasonable cooling period and then verify via visual inspection that all of the reactive material has been properly treated.
- b. Ash shall be removed from the burn pan. The ash is to be placed into DOT-approved 55-gallon drums with lids and closure rings. One drum shall be dedicated to each burn pan and ash from different pans shall not be co-mingled.
- c. The drums shall be properly labeled with the appropriate hazardous waste designation including the pan number, applicable RCRA waste codes, and the date the waste was first placed into the drum.
- d. The drums shall be removed to the satellite accumulation area and kept closed except to add more ash or to collect samples.

- e. When the drum is determined to be full, it shall be given a 90-day accumulation start date and moved to the 90-day area for sampling in accordance with Section C-2 (Waste Analysis Plan) of the permit application.
- f. All drums shall be managed in accordance with all state and Federal regulations governing hazardous waste handling and disposal. Wind dispersal of ash shall be controlled by limiting burns in accordance with Permit Condition IV.C. When ash is present, lids are to be placed on the burn pans. Lids shall be used to prevent precipitation from accumulating in the burn pans.

Scrap Metal:

- a. At the completion of each burn, the Permittee will allow a reasonable cooling period and then verify via visual inspection that all the reactive material has been properly treated.
- b. The scrap metal shall be collected, sorted according to type (light metal, heavy metal, aluminum, brass, etc.), loaded onto trucks, and transported to the Permittee's Logistics Agency (DLA) Disposition Services - Huntsville for recycling or disposal.
- c. The open detonation operation generates metal fragments, unexploded items, and non-metallic residuals ejected from the open detonation area.

- i. Metal Fragments (Shrapnel)

At the completion of each detonation series, the Permittee will visually inspect the active portion of the detonation area for the presence of shrapnel (metal fragments). Any fragments/shrapnel that are (1) observable on the soil and (2) measure 4 inches or greater in any dimension shall be collected and removed. Any shrapnel found shall be visually inspected to verify that the energetic component of the waste munition has been successfully treated. If shrapnel is observed or suspected to contain unreacted energetics, it shall be retreated with the next available detonation. If shrapnel is found to be free of energetics, it will be certified as explosive-free and removed as scrap metal.

- ii. Other residuals

At the completion of each operating day the immediate area surrounding the active portion of the detonation pits shall be visually inspected for the presence of unexploded items or ejected items including munitions or components thereof. All items found shall be re-treated in the next available detonation. At least monthly the inspection area shall include a boundary designated by the facility which shall encompass all potential areas where ejected material may fall beyond the immediate area of the active portion of the unit.

IV.D. INSPECTION

The Permittee is required to conduct routine inspections at the OB and OD units, as established in Section F-2 of the permit application. During such inspections, the Permittee will check for malfunction and/or deterioration, operator error, and evidence of discharge, that may cause or lead to the release of hazardous constituents or that may have caused or lead to a potential threat to human health or the environment. These inspections shall be conducted at frequencies specified in Table F-1 of the permit application to correct non-compliances before they can harm human health or the environment.

Any equipment or structure deterioration or malfunction (i.e., non-compliance) identified in the inspection must be promptly remedied to ensure the non-compliance does not cause environmental or human health hazard. If a hazard is determined to be imminent, or has already occurred, remedial action must be taken immediately. No further OB or OD operations are allowed to commence if the non-compliance has the potential to cause imminent hazard. If a non-compliance cannot be remediated within 48 hours, the Permittee shall notify the Department within 3 working days and submit a written report to the Department within 14 days of discovering the non-compliance.

Inspections shall be performed in accordance with Section F-2 of the permit application. Documentation of the required inspections shall be documented in accordance with Table F-1, Inspection Items and Schedule, of the permit application. All areas subject to spills (loading and unloading areas, and burn pans) are required to be inspected daily when in use.

IV.E. GROUNDWATER MONITORING PROGRAM

A groundwater monitoring program shall be established for the OB and OD units in accordance with the requirements in Section VII of this permit.

Groundwater underlying the OB and OD units is required to be monitored throughout the operating life of the OB and OD units per Permit Condition IV.E. and Section E of the permit application. If at the time of closure the current and historical groundwater monitoring results indicate no evidence of contamination from the OB and OD units, then the groundwater will be considered un-impacted by OB and OD operations. If groundwater contamination is present from OB and OD operations, then the Permittee must address continued groundwater monitoring and corrective action in the post-closure plan.

IV.F. AIR MONITORING

Operating limits presented in Section D-8a and Table D-10 of the permit application are established by this permit to minimize the potential for impacts from OB and OD Units air releases at RSA and to ensure protection of human health and the environment.

IV.G. CLOSURE AND POST-CLOSURE PLAN

The Permittee shall close the OB and OD Units in accordance with ADEM Admin. Code R. 335-14-5-.07 and Section I of the permit application. If clean closure according to ADEM Admin.

Code R. 335-14-5-.07(2) cannot be obtained, then the Permittee will submit a post-closure plan as part of a permit modification per Permit Condition I.J.

1. Closure Procedures

- a. All untreated reactive hazardous wastes, contaminated ash residue, unexploded ordnance (UXO), contaminated concrete pads, and contaminated soils shall be removed from the OB and OD units as described in Section I of the permit application and disposed in accordance with all state and Federal regulations governing hazardous waste handling and disposal.
- b. All burn pans and lids shall be decontaminated or disposed as required by ADEM Admin. Code R. 335-14-5-.07(5) and as described in Section I of the permit application. Burn pans and lids may be removed from the OB and OD units and disposed as scrap metal or may be put to other use at RSA.
- c. The concrete pan supports and concrete pads shall be decontaminated and/or cleaned to remove untreated waste and/or ashes as required by ADEM Admin. Code R. 335-14-5-.07 and as described in Section I of the permit application. The supports and pads may be left in place if decontaminated to acceptance criteria or disposed of as a non-hazardous waste. If concrete cannot be cleaned and properly decontaminated, it shall be disposed per Permit Condition IV.G.1.a.
- d. All soil in the area of the OB and OD units will be sampled for contamination per the ADEM approved closure plan (as described in Section I of the permit application) required by Permit Condition IV.G. If decontamination of soil cannot be attained during approved closure activities, the OB and OD unit will be closed in accordance with ADEM Admin. Code R. 335-14-5-.07 and an approved post-closure plan.
- e. If the OB and OD units cannot be clean-closed and certified for unrestricted use pursuant to the Uniform Environmental Covenant Act (UECA)[ADEM Admin. Code R. 335-5 and ADEM Policy Memorandum #304], then a Land Use Control Plan must be developed and submitted in the post-closure plan.

PART V

SWMUs and AOCs ON OPERATIONAL RANGES

V.A. APPLICABILITY

The conditions of this Part apply to the management, investigation and remediation of SWMUs and AOCs located on operational ranges identified in Section J-1 (Tables J-2 and J-3) of the permit application and which are defined in Condition I.E of this permit and ranges listed on the Department of Defense Operational Range Inventory.

V.B. IDENTIFICATION AND ASSESSMENT OF SWMUs and AOCs ON OPERATIONAL RANGES (RESERVED)

V.C. INVESTIGATION AND REMEDIATION OF SWMUs and AOCs LOCATED ON OPERATIONAL RANGES

1. RESERVED

2. The Permittee shall coordinate with range personnel in order to determine the scheduled use of the operational ranges and conduct in a timely manner the required investigation and remediation activities (such as described in Parts VI.A.5 of this permit) for SWMUs and/or AOCs that are located on the operational range but not related to range activities, or which do not qualify for exemption pursuant to ADEM Admin. Code Rules 335-14-7-.13(3)(a), 335-14-7-.13(4)(a), 335-14-7-.13(5), or 335-14-7-.13(6)(a). The investigation and remediation of SWMUs and/or AOCs located on an operational range which are not directly related to range activities (e.g., burial pits, prior manufacturing areas, waste management areas, etc.) shall be conducted in a timely and expeditious manner and shall not be deferred until closure or cessation of range activities or the removal of the range from the Operational Range Inventory. (ADEM Admin. Code R. 335-14-7-13(3)(a)1(iii)).

V.D. REMOVAL FROM OPERATIONAL RANGE INVENTORY

1. The Permittee shall notify the Department within 30 days following removal of a range, or a portion of a range, from the Operational Range Inventory or otherwise determining that a range or portion of a range no longer qualifies as an operational range. This notification shall be accompanied by a request for permit modification (pursuant to Condition I.J. of this permit) to remove the range from the Operational Range Inventory included in Section J-1 (Tables J-2 and J-3) of the permit application.
2. Upon removal of a range, or a portion of a range, from the Operational Range Inventory, the Permittee shall comply with the requirements of Part VI (Solid Waste Management Unit/Area of Concern Identification and Evaluation) of this Permit for the entire range area (or the portion removed), including areas and activities utilized as a part of previous

operational range activities. Any SWMUs/AOCs located on or within a range will remain subject to all other applicable requirements of this permit.

PART VI

SOLID WASTE MANAGEMENT UNIT IDENTIFICATION AND EVALUATION

VI.A. APPLICABILITY

The Conditions of this Part apply to:

1. The solid waste management units (SWMUs) and areas of concern (AOCs) identified in Table VI.1;
2. The SWMUs/AOCs identified in Table VI.2, which require investigation and/or remediation;
3. The SWMUs/AOCs identified in Table VI.3, which require no further investigation under this permit at this time;
4. The SWMUs/AOCs identified in Table VI.4, which are regulated by Parts I-III and VI of this permit;
5. The SWMUs/AOCs identified in Table VI.5, which require Interim Measures and/or Source Removal;
6. The SWMUs/AOCs identified in Table VI.6, which require a Corrective Measures Implementation (CMI) Plan.
7. Any additional SWMUs or AOCs discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means; and,
8. Contamination beyond the facility boundary, if applicable. The Permittee shall implement corrective actions beyond the facility boundary where necessary to protect human health and the environment, unless the Permittee demonstrates to the satisfaction of the Department that, despite the Permittee's best efforts, as determined by the Department, the Permittee was unable to obtain the necessary permission to undertake such actions. The Permittee is not relieved of all responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis.

VI.B. NOTIFICATION AND ASSESSMENT REQUIREMENTS FOR NEWLY IDENTIFIED SWMUs AND AOCs

1. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional AOC(s) as described under Permit Condition VI.A.7. The notification shall include, at a minimum, the location of the AOC(s) and all available information pertaining to the nature of the release (*e.g.*, media affected, hazardous

constituents released, magnitude of release, *etc.*). If the Department determines that further investigation of an AOC is required, the permit will be modified in accordance with ADEM Admin. Code Rule 335-14-8-.04(2).

2. The Permittee shall notify the Department in writing, within 15 calendar days of discovery, of any additional SWMUs as described under Permit Condition VI.A.7.
3. The Permittee shall prepare and submit to the Department, within 90 calendar days of notification, a SWMU Assessment Report (SAR) for each SWMU identified under Permit Condition VI.B.2. At a minimum, the SAR shall provide the following information:
 - a. Location of unit(s) on a topographic map of appropriate scale such as required under ADEM Admin. Code Rule 335-14-8-.02(5)(b)19.
 - b. Designation of type and function of unit(s).
 - c. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings).
 - d. Dates that the unit(s) were operated.
 - e. Specification of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous constituents in the wastes.
 - f. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include groundwater data, soil analyses, air, and/or surface water data).
4. Based upon the results of the SAR, the Department shall determine the need for further investigations at the SWMUs covered in the SAR. If the Department determines that such investigations are needed, the Permittee shall initiate an investigation as outlined in Permit Condition VI.D.1 immediately upon receiving notification of the Department's determination.

VI.C. NOTIFICATION REQUIREMENTS FOR NEWLY DISCOVERED RELEASES AT PREVIOUSLY IDENTIFIED SWMUs or AOCs

1. The Permittee shall notify the Department in writing of any newly discovered release(s) of hazardous waste or hazardous constituents discovered during the course of groundwater monitoring, field investigations, environmental audits, or other means, within 15 calendar days of discovery. Such newly discovered releases may be from SWMUs or AOCs identified in Permit Condition VI.A.3 or SWMUs or AOCs identified in Permit Condition VI.A.7 for which further investigation was not required.
2. If the Department determines that further investigation of the SWMUs or AOCs is needed, the Permittee shall initiate an investigation as outlined in Permit Condition VI.D.1 immediately upon receiving notification of the Department's determination.

VI.D. RCRA FACILITY INVESTIGATION (RFI)

1. The Permittee must perform a RCRA Facility Investigation (RFI) for any SWMU and AOC identified by the Department in accordance with Permit Conditions VI.A.2, VI.B.4, and VI.C.2.
2. The RFI must completely identify the concentration of hazardous constituents released from each SWMU and AOC and fully delineate the area where such hazardous constituents have come to be located.
3. The RFI must fully characterize the nature and extent of contamination released from each SWMU or AOC under investigation.
4. The RFI must be performed in a manner consistent with the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.
5. Except as provided by Permit Condition VI.D.6., the RFI must be completed within 180 calendar days from the effective date of this permit or, for SWMUs or AOCs identified pursuant to Permit Condition VI.B. and C., within 180 calendar days from the receipt of notification from the Department that an RFI is required. If, prior to the effective date of this permit, the Department has approved a work plan that includes a schedule for completing the RFI, the RFI shall be completed in accordance with the approved schedule.
6. RFI Schedule of Compliance
 - a. For RFIs expected to require greater than 180 calendar days to complete, the Permittee may submit a schedule of compliance subject to Departmental approval and/or modification.
 - b. Submittal of an RFI Schedule of Compliance does not delay or otherwise postpone the Permittee's obligation to initiate the RFI.
 - c. The Schedule of Compliance must include:
 - i. A detailed narrative discussion, which explains why the RFI cannot be completed within 180 days; and,
 - ii. A detailed and chronological listing of milestones with estimated durations that provides sufficient information to track the progress of the investigation.
 - d. The RFI Schedule of Compliance shall be reviewed by the Department in accordance with Permit Condition VI.G.
 - e. The Permittee shall complete the RFI in accordance with the approved RFI Schedule of Compliance.

7. RFI Progress Reports

- a. For an RFI being conducted in accordance with the approved RFI Schedule of Compliance, the Permittee must submit progress reports on a monthly basis.
- b. The RFI Progress Reports must include:
 - i. A description of the RFI activities completed during the reporting period;
 - ii. Summaries of any problems or potential problems encountered during the reporting period;
 - iii. Actions taken to rectify problems;
 - iv. Changes in relevant personnel;
 - v. Projected work for the next reporting period;
 - vi. Any proposed revisions to the RFI Schedule of Compliance. Modifications of the RFI Schedule of Compliance are subject to approval by the Department; and,
 - vii. A summary of any data collected during the reporting period, including:
 - A. The location of each sampling point identified on a site map;
 - B. The concentration of each hazardous constituent detected at each sampling point; and,
 - C. Submittal of RFI Progress Reports, work plans, or other documents during the RFI does not alter the approved RFI Schedule of Compliance.

8. RFI Reports

- a. The Permittee shall prepare and submit to the Department an RFI Report within 60 calendar days from the completion of investigation activities in accordance with the approved RFI Schedule of Compliance, if applicable.
- b. The RFI Report must provide a detailed description of all required elements of the investigation as described in the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.
- c. The RFI Report shall be reviewed by the Department in accordance with Permit Condition VI.G.

VI.E. SELECTION OF CORRECTIVE MEASURES AND PERMIT MODIFICATION

1. The Permittee shall develop and submit to the Department a Corrective Measures Implementation (CMI) Plan for any areas of the Permittee's site where hazardous constituents have come to be located at concentrations exceeding those appropriate for the protection of human health and the environment. The CMI Plan must include all applicable elements of the proposed remedy pursuant to the most recent edition of the Alabama Environmental Investigation and Remediation Guidance.
2. The CMI Plan shall be submitted to the Department within 120 calendar days following the Permittee's submittal of the RFI Report indicating that hazardous constituents have come to be located at any area of the Permittee's facility, or beyond the facility, at concentrations exceeding those appropriate for the protection of human health and the environment, or within 120 calendar days following notification from the Department that a CMI Plan is required, whichever occurs earlier.
3. The CMI Plan shall be submitted along with a request for permit modification pursuant to ADEM Admin. Code R. 335-14-8-.04(2), and shall include any applicable fees pursuant to ADEM Admin. Code R. 335-1-6. This modification will serve to incorporate the proposed final remedy, including all procedures necessary to implement and monitor the remedy, into this permit.
4. The CMI Work Plan shall be submitted for the SWMUs/AOCs listed in Table VI.6 within 120 days from permit issuance.

VI.F. INTERIM MEASURES (IM)

1. IM Work Plan(s)
 - a. Upon notification by the Department, the Permittee shall prepare and submit an Interim Measures (IM) Work Plan for any SWMU or AOC that the Department determines is necessary. IM are necessary in order to minimize or prevent further migration of contaminants and limit human and environmental exposure to contaminants while long-term corrective measures are evaluated and, if necessary, implemented. The IM Work Plan shall be submitted within 30 calendar days of such notification and shall include the elements listed in Permit Condition VI.F.1.b. Such IM may be conducted concurrently with investigations required under the terms of this permit. The Permittee may initiate IM by submitting an IM Work Plan for approval and reporting in accordance with the requirements under Permit Condition VI.F.
 - b. The IM Work Plan shall ensure that the IM are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with and integrated into any long-term solution at the facility. The IM Work Plan shall include: the IM objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

- c. The IM Work Plan must be approved by the Department, in writing, prior to implementation. The Department shall specify the start date of the IM Work Plan schedule in the letter approving the IM Work Plan.
- d. The IM Report shall be reviewed by the Department in accordance with Permit Condition VI.G.
- e. The Permittee shall submit IM WPs for the SWMUs and AOCs listed in Table VI.5 of this permit to the Department for review and approval. The IM WPs shall be submitted within 180 days from the effective date of this permit.

2. IM Implementation

- a. The Permittee shall implement the IM in accordance with the approved IM Work Plan.
- b. The Permittee shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan.
- c. Final approval of corrective action required under ADEM Admin. Code Rule 335-14-5-.06(12), which is achieved through IM, shall be in accordance with ADEM Admin. Code Rule 335-14-8-.04(2) and Permit Condition VI.E.

3. IM Reports

- a. If the time required for completion of IM is greater than one year, the Permittee shall provide the Department with Progress Reports at intervals specified in the approved work plan. The Progress Reports shall, at a minimum, contain the following information:
 - i. A description of the portion of the IM completed;
 - ii. Summaries of any deviations from the IM Work Plan during the reporting period;
 - iii. Summaries of any problems or potential problems encountered during the reporting period;
 - iv. Projected work for the next reporting period; and,
 - v. Copies of laboratory/monitoring data.
- b. The Permittee shall prepare and submit the IM Report to the Department within 90 calendar days of completion of IM conducted under Permit Condition VI.F. The IM Report shall, at a minimum, contain the following information:
 - i. A description of IM implemented;
 - ii. Summaries of results;

- iii. Summaries of all problems encountered;
- iv. Summaries of accomplishments and/or effectiveness of IM; and,
- v. Copies of all relevant laboratory or monitoring data, *etc.*, in accordance with Permit Condition I.C.10.

VI.G. SUBMITTALS

1. All work plans, reports, schedules, and other documents ("submittals") required by this permit shall be subject to approval by the Department to assure that such submittals and schedules are consistent with the requirements of this Permit and with applicable regulations and guidance. The Permittee shall revise all submittals and schedules as directed by the Department.
2. The Department will review all submittals in accordance with the conditions of this permit. The Department will notify the Permittee in writing of any submittal that is disapproved, and the basis therefore. If the Department disapproves a submittal, the Department shall: (1) notify the Permittee in writing of the submittal's deficiencies and specify a due date for submission of a revised submittal, (2) revise the submittal and notify the Permittee of the revisions, or (3) conditionally approve the submittal and notify the Permittee of the conditions. Permit Condition VI.H. shall apply only to submittals that have been disapproved and revised by the Department, or that have been disapproved by the Department, then revised and resubmitted by the Permittee, and again disapproved by the Department.
3. All submittals shall be submitted within the time frame specified by the Department and in accordance with the approved schedule of compliance. Extensions of the due date for submittals may be granted by the Department based on the Permittee's demonstration that sufficient justification for the extension exists.
4. All submittals required by this permit shall be signed and certified in accordance with ADEM Admin. Code Rule 335-14-8-.02(2).
5. A copy of all submittals shall be provided by the Permittee to the Department in accordance with Permit Condition I.K. Hard copies shall be made available upon request.

VI.H. DISPUTE RESOLUTION

Notwithstanding any other provision in this permit, in the event the Permittee disagrees, in whole or in part, with the Department's revision of a submittal or disapproval of any revised submittal required by this Part, the following may, at the Permittee's discretion, apply:

1. In the event that the Permittee chooses to invoke the provisions of this section, the Permittee shall notify the Department in writing within 30 calendar days of receipt of the Department's revision of a submittal or disapproval of a revised submittal. Such notice shall set forth:

- a. The specific matters in dispute;
 - b. The position the Permittee asserts should be adopted as consistent with the requirements of this permit;
 - c. The basis for the Permittee's position; and,
 - d. Any matters considered necessary for the Department's determination.
2. The Department and the Permittee shall have additional 30 calendar days from the Department's receipt of the notification provided for in Permit Condition VI.H.1. to meet or confer to resolve any disagreement.
3. In the event agreement is reached, the Permittee shall submit and implement the revised submittal in accordance with and within the time frame specified in such agreement.
4. If agreement is not reached within the 30-day period, the Department will notify the Permittee in writing of his/her decision on the dispute, and the Permittee shall comply with the terms and conditions of the Department's decision in the dispute. For the purposes of this provision in this permit, the responsibility for making this decision shall not be delegated below the Land Division Chief.
5. With the exception of those conditions under dispute, the Permittee shall proceed to take any action required by those portions of the submission and of this permit that the Department determines are not affected by the dispute.

Table VI.1

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

It should be noted that as used in Table VI.1, VI.2, VI.3, VI.4, VI.5, VI.6, and VIII.1, the SWMU/AOC number is RSA - ### except where specifically noted otherwise (e.g., MSFC - ###).

Master List of known SWMUs/AOCs at the facility:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
001	Fox Army Community Hospital Incinerator	
002	In-ground Oil/Water Separator, Bldg 3338	
003	In-ground Oil/Water Separator, Bldg 3617	
004	In-ground Oil/Water Separator & Washrack	
005	Inactive Waste Accumulation Area	
006	Paint Shop & Sump at Motor Pool, Bldg 3634	
007	Hazardous Waste Storage Area, Bldg 3775	
008	Inactive Sewage Treatment Plant #4	
009	Inactive Sewage Treatment Plant #3	
010	Closed Sanitary Landfill	
011	Former Sewage Treatment Plant No. 1	
012	Active Open Burn Pans, Unit 2 (OB)	
013	Unlined Inactive Open Burn Pad	
014	Unlined Inactive Burn Trenches Unit #2	
015	Hazardous Waste Storage Igloo, No. 1 (8621)	
016	Hazardous Waste Storage Igloo, No. 2 (8622)	
017	Hazardous Waste Storage Igloo, No. 3 (8623)	
018	Hazardous Waste Storage Igloo, No. 4 (8624)	
019	Hazardous Waste Storage Igloo, No. 5 (8625)	
020	Hazardous Waste Storage Igloo, No. 6 (8630)	
021	Hazardous Waste Storage Igloo, No. 7 (8631)	
022	Hazardous Waste Storage Igloo, No. 8 (8632)	
023	Hazardous Waste Storage Igloo, No. 9 (8633)	
024	Hazardous Waste Storage Igloo No. 10	
025	Hazardous Waste Vacant Storage Igloo No. 11	
026	Hazardous Waste Vacant Storage Igloo No. 12	
027	Hazardous Waste Vacant Storage Igloo No. 13	
028	In-ground Oil/Water Separator, 5693 Area	
029	Redstone Arsenal Sanitary Sewer System	
030	Former Central Oil/Water Separator	
031	Former Central Oil/Water Separator Storage Tanks	
032	Inactive Scrap Metal Storage Area	
033	Plating Room Floor Drains, Bldg 5432	
034	Waste Aviation Fuel Temporary Storage Area	
035	In-ground Oil/Water Separator, Bldg 4812	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
036	In-ground Oil/Water Separator, Bldg 4832	
037	Underground Used Oil Storage Tank at Bldg 7857	
038	Underground Used Oil Storage Tank Bldg 3240	
039	Underground Used Oil Storage Tank Bldg 3338	
040	Underground Used Oil Storage Tank Bldg 3617	
041	Underground Used Oil Storage Tank Bldg 3636	
042	Underground Used Oil Storage Tank Bldg 4812E	
043	Underground Used Oil Storage Tank Bldg 5435A	
044	Underground Used Oil Storage Tank Bldg 5435B	
045	Smoke Munitions Plant 3	
046	Inactive Chemical Munition Test Site, Area CC	**
047	Chemical Training Facility, Area EE	
048	Inactive Sanitary Landfill, Area G	
049	Capped Arsenic Waste Lagoons – West, Area F	
050	Inactive Munitions Demil/Disposal Area H	
051	Inactive Munitions Demil/Disposal Area I	
052	Inactive Munitions Demil/Disposal Area N	
053	Inactive Sanitary & Industrial Landfill, Area Q3	
054	Inactive Sanitary & Industrial Landfill, Area T	
055	Inactive Sanitary & Industrial Landfill, Area S	
056	Closed Arsenic Waste Ponds (South) Area U	
057	Inactive Arsenic Waste Lagoons – East	
058	Inactive Rubble Fill/Waste Pile, Area W	
059	Inactive Construction Rubble Fill, Area R	
060	Inactive Sanitary & Industrial Landfill, Area Q4	
061	Inactive Munitions Demil/Disposal, Area P	
062	Inactive Munitions Demil	
063	Inactive Chemical Munitions Disposal, Area M	
064	Inactive Munitions Demil/Disposal Area BB	
065	Former Chemical Drum Storage Area, Area X	
066	Inactive Ash Disposal Site, Area X-1	
067	Former Chemical Drum Storage Area, Area AA	
068	Inactive Chemical Disposal Area, Area Z	
069	Former Chemical Drum Storage Area, Area Y	
070	Inactive Toxic Chemical Storage Area, Area Y1	
071	High Explosive Drop Test Site, Area A	**
072	Mortar Shell Test Site, Area B	**
073	High Explosive Impact Test Site, Area C	**
074	High Explosive Impact Test Site, Area D	**
075	Inactive Solid Waste Incinerator	
076	RDX/HMX Filtration Unit 1, Thiokol North	
077	RDX/HMX Filtration Unit 2, Thiokol South	
078	RDX/HMX Filtration Unit 1 Sump, Thiokol North	
079	RDX/HMX Filtration Unit 2 Sump, Thiokol South	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
080	RDX/HMX Suspension Transfer Pad/Sump	
081	RDX/HMX Filtration Units, Charcoal Column Dolly	
082	Former Sparging Unit, Bldg 7595	
083	Paint Spray Booth Sump, Bldg 7344	
084	Inactive Temporary Waste Storage Pad, Bldg 7344	
085	Inactive Temporary Waste Storage Pad 1, Bldg 7359	
086	Inactive Temporary Waste Storage Pad 2, Bldg 7359	
087	Inactive Temporary Waste Storage Pad 1&2, Bldg 7368	
088	Inactive Temporary Waste Storage Pad, Bldg 7625	
089	Inactive Temporary Waste Storage Pad, Bldg 7726	
090	Inactive Temporary Waste Storage Pad, Bldg 7340	
091	Inactive Temporary Waste Storage Pad, Bldg 7595	
092	Temporary Waste Storage Pad, Bldg 7552	
093	Reclaimed Empty Drum Storage Pad, Bldg 7368	
094	Chlorinated Solvent Distillation Unit 1, Bldg 7625	
095	Chlorinated Solvent Distillation Unit 2, Bldg 7368	
096	Chlorinated Solvent Distillation Unit 3, Bldg 7740	
097	Chlorinated Solvent Distillation Unit 4, Bldg 7726	
098	Chlorinated Solvent Distillation Unit 5, Bldg 7346	
099	Abandoned Plating Shop Tank/Sumps, Bldg 7614	
100	Aboveground Waste Oil Tank, Bldg 7630	
101 ^a	DDT Contaminated Area DD	
102	DDT Plant Site Q-6	
103	DDT Settling Lagoon	
104	Inactive ISP Wastewater Discharge Ditch	
105	DDT Drainage Ditches	
106	DDT Earthen Dams	
107	Closed DDT Soil/Debris Landfill	
108	Test Range 4 Missile Impact Site	
109	Former Chemical Munitions Staging Area	
110	Former Drum Storage/Construction Debris, Area Y	
111	Construction Debris, Area W	
112	Suspected Former Demil/Disposal, Area W	
113	Inactive Disposal Trenches/Burn Pits, Area W	
114	Inactive Madkin Mt Rock Quarry	
115	Inactive East Side Blowdown Lagoon, Test Area 5	
116	South Side Blowdown Lagoon, Test Area 5	
117	Former Liquid Caustic Mfg Plant, Area R	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
118	Inactive ISP Industrial Discharge Lagoon	
119 ^b	GAF Manufacturing Facility	
120	Matthew's Cave and Ravine	
121	Paint Shop/Paint Washout Booth, Bldg 4762	
122	Dismantled Lewisite Mfg. Plant, Area U	
123	Inactive Cement Plant Sump	
124	Dismantled Calgon DDT Contaminated Water Treatment Plant	
125	Satellite Waste Accumulation Area, Bldg 5477	
126	Inactive Open Burn Trench, Area U	
127	Photo Lab Process Wastewater Sump Bldg 5451	
128	Inactive Mustard Gas Demil Area, Area W	
129	Thiokol Burning Pit/Rocket Washout Area	**
130	Inactive Radiographic Septic Tank, Bldg 7345	
131	Active Open Detonation Area (OD)	
132	Dismantled Popping Furnace	
133	Inactive Rocket Washrack/Sump, Unit 2	
134	Inactive Disposal Trench/Burn Pit, Area U	
135 A-G, I-N	1.1 Propellant Waste Captive Sumps	
135 H	1.1 Propellant Waste Captive Sump, Bldg 7593	
136 A-J	1.1 Propellant Waste Drum Storage Pads	
137 A-L, N-P	1.3 Propellant Waste Sumps	
137M	Waste Sump and Captive Sump, Building 7722	
138 A-L, N-Q	1.3 Propellant Waste Drum Storage Pads	
138 M	ROP Tetryl Processing Line	
139	Closed Arsenic Waste Pond (North) Area U	
140	Inactive Disposal Area near T/S Tower	
141	4.2-inch Mortar Disposal Site, Bldg 4656	
142	TCE Spill by Thiokol Degreasing Process	
143	Petroleum Contaminated Soil Site, South of Bldg 3240	
144	Degreaser at Bldg 7554	
145	GW Northeast part of RSA (~9900 acres)	
146	GW Southeast part of RSA, underlies former Thiokol Plant (~6600 acres)	
147	GW Central part of RSA (~1300 acres)	
148	GW Central Area – East of MSFC (~3600 acres)	
149	GW West Central Area – West MSFC (~3900 acres)	
150	GW Western part of RSA (~3900 acres)	
151	GW Southern part of RSA, underlies OB/OD Area (~570 acres)	
152	GW Southern part of RSA, underlies GCWD (~570 acres)	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
153	GW Western edge of RSA (~6300 acres)	
154	GW South-Central part of RSA (~3300 acres)	
155	GW Southwestern area of RSA (1600 acres)	
156	GW Southern part of RSA (~1400 acres)	
157	GW Southeastern part of RSA, underlies GCWD Storage Area (~100 acres)	
158	Flammable Material Storage Bldg, TSA Bldg 3233	
159	Chemical Containment Storage, TSA Bldg 3327	
160	Mixer Bldg, TSA Bldg 7339	
161	Care Prep Bldg, TSA Bldg 7346	
162	Small Motor Loading "T", TSA Bldg 7347A	
163	Propellant Mixer, TSA Bldg 7353	
164	Mixer Bldg, TSA Bldg 7356	
165	Casting Bldg, TSA Bldg 7360	
166	Liner Preparation, TSA Bldg 7369	
167	Mixer Bldg, TSA Bldg 7382	
168	Motor Casting and Processing Bldg, TSA Bldg 7554	
169	Motor Assembly and Packout, TSA Bldg 7555	
170	Deaeration Cleanup, TSA Bldg 7593	
171	Propellant Mixing, TSA Bldg 7594	
172	Motor Pool, TSA Bldg 7630	
173	Chemistry Lab, Pad 1, TSA Bldg 7632	
174	Chemistry Lab, Pad 2, TSA Bldg 7632	
175	Physical Property Lab, Pad 1, TSA Bldg 7636	
176	Physical Property Lab, Pad 2, TSA Bldg 7636	
177	Small Motor Finishing, TSA Bldg 7654	
178	Control Lab and First Aid, Pad 1, TSA Bldg 7667	
179	Control Lab and First Aid, Pad 2, TSA Bldg 7667	
180	Nitramine Drying Pilot, TSA Bldg 7688	
181	Nitramine Grinding Pilot, TSA Bldg 7690	
182	1.1 Grinder Bldg "P2", TSA Bldg 7695	
183	Former Lewisite Manufacturing Lines 1 & 2	
187	Northern Thiokol Propellant Mixing Facility	
188	Northern Burial Area/Burning Ground #3	
189	Motor/Oxidizer Preparation Facilities, ROP Line 2 Area	
190	Disposal/Drainage Area West of ROP Line 2	
191	ROP Line 1 Service Facilities	
192	Tetryl and Igniter Processing, ROP Line 1 Area	
193	Igniter Preparation Facility	
194	Physical Test Laboratory and Storage Facilities	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
195	Propellant Mixing Facility #1, Bldg 7363	
196	Test Stand and Cleaning Bldg, Bldg 7373	
197	Rocket Motor Static Test Stand	
198	Equipment/Tool Cleaning Facility, Bldg 7359	
199	Propellant Mixing Facility #2, Bldg 7382	
200	ROP Line 5 Area Operations Facilities	
201	Research Laboratory, Bldg 7632	
202	Graded Area Northeast of ROP Storage Igloos	
203	Igloo Area Loading Dock, Bldg 7351	
204	Oxidizer Facility, Bldg 7691	
205	Photo Lab and Motor Service Facility, Former Bldg 7628	
206	Propellant Mixing Facility #2 and Casting Facility, Bldg 7339/40	
207	Gorgas Laboratory, Bldg 7770	
208	South Plant Testing Facilities	
209	Propellant Crushing/Grinding and Fuse Production	
210	Nitroglycerine Wash House	
211	South Plant Storage Magazines	
212	Propellant Dry Houses	
213	ROP Line 4 Area Operations Facilities	
214	ROP Line 6 Area Operations Facilities	
215	RSA-146 Historic Service Facilities	
216	Laboratory Injection Test Facility, Bldg 5475	
217	Inert Storage Warehouse Facilities	
218	Defense Reutilization Material Office (DRMO) Open Storage Area	
219	Chemical Storage Area in Salvage Yard	
220	Construction Material Storage Yard	
221	Fuse Storage and Munitions Disposal Area	
222	Roads and Grounds Maintenance Shop, Bldg 5494	
223	Central Railroad Classification Yard	
224	Container Storage Area	
225	Fuse Modification Line 7	
226	Open Storage 54-2	
227	Inactive Washrack (adjacent to Bldg 5492)	
228	Sewage Treatment Plant 2	
229	Former PX Service Station (Bldg 3197)	
230	Abandoned Rubble Pile	
231	SMF #1 Mixing& Prep Facilities	
232	SMF #1 Service Station	
233	SMF #2 Mixing & Prep Facilities	
234	Waste Disposal Pit	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
235	Bulk Fuel Storage Facility	
236	Grenade Packing & Assembly	
237	Propellant Cutting and Drying	
238	Plant 2, Mustard Lines 5 and 6	
239	ROP Line #1 Boiler House	
240	Substation No.7, Formerly Bldg 5290 (demolished)	
241	Hazardous Waste Storage Igloo, Bldg 7313	
242	Hazardous Waste Storage Igloo, Bldg 7314	
243	Propellant Storage, Bldg 7342	
244	Propellant Mixing Bldg, Bldg 7356	
245	Steam Heating Plant, Bldg 7579	
246	Sewer Ejector & Motor Pool, Bldg 7630	
247	Steel Fabrication/Maintenance Facility, Bldg 7644	
248	Battery Maintenance Shop, Bldg 3633	
249	Inactive Old Bone Yard Disposal Site 2	
250	Former Storage Warehouse, Bldg 778/5678	
251	Former Phosgene Plant	
252	Incendiary Bomb Facility Plant 2 Area	
253	Utility/Flammable Materials Storage (B6109)	
254	Range 1 Bombing Targets	**
255	Former Manganese Ore Storage Area, OU-8	
256	Scarred Area #2-NE of RSA-032 w/in Historic RR Spur Line	
257	Rock Pond	
258	Guard Shack Waiting Shelter/Paint Spray, Bldg 7862	
259	TA #2 Leach Field	
260	Test Stand C, TA#2 Bldg 7843	**
261	Lance Missile Conditioning Facility, Bldg 7847	
262	CWS Warehouse Area (Bldgs 8021, 8022, 8023, 8024, 8025, 8026, and 8027)	
263	CWS Motor Pool (Bldg 8017)/Change House (Bldg 8020)	
264	RR Spring	
265	Gasoline Drum Storage Area	
266	Gulf Chemical Depot Storage Magazines	
267	Drainage Ditch #4	
268	Sewage Treatment Plant, Bldg 8018	
269	Former UST, Bldg 7852	
270	Hazardous Waste TSA & Recycling Facility Bldg 5423	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
271	Former Boiler House, Bldg 7729	
272	Former UST for Boiler Unit, Bldg 7650	
273	Propellant Conditioning & Motor Cycling, Bldg 7364	
274	Physics Laboratory & High Explosives Storage Magazine, Bldg 7540	
275	Film Processing Laboratory, Former Bldg S-7173	
276	Former Boiler House, Bldg 7362	
277	Bldg 5487, Wastewater Maintenance Shop Acid Bath Wash Down Area	
278	Highway 565 Area	
279	Smoke Grenade Area	
280	Skunk Hollow Small Arms Range	
281	Disposal Trenches at RSA-046 Range	
282	Former Mortar Test Site (Not in Range)	Also known as RSA-072-R-01
283	Former Primary Substation No. 2 Bldg 3796	
284	Fire Training Area	
285	Former WP Grenade Test Area	
286	Boiler/Steam Plant, Bldg 3624	
287	Component Storage Warehouse, Bldg 3634	
288	Drinking WTP#1, Sludge Thickener & Drying Beds, Bldgs 8043 & 8044	
289	Drinking WTP#2, Sludge Thickener (Bldg 9102) & Sludge Drying Beds	
290	Drinking WTP#3, Sludge Thickener & Drying Beds, Bldgs 5431 & 5433	
291	UST at Former Bldg T-3162 (Steam Plant)	
292	UST at Bldg 3311 (Boiler & Compressor House)	
293	Former USTs at Bldg 3639 (Screening & Proportioning Smoke Components Bldg)	
294	Field Training Exercise Area E	
295	Hazardous Waste TSA, Bldg S-3335	
296	Disposal Area North of RSA-011	
297	Ammunition Packing/Shipping, Bldg 7551	
298	Hazardous Waste TSA, Bldg 8408	
299	Hazardous Waste TSA, Bldg 7216	
300	Hazardous Waste TSA, Bldg 7172	
301	Hazardous Waste TSA, Bldg 7173	
302	Hazardous Waste TSA, Bldg 3802	
303	Hazardous Waste TSA, Bldg 7700	
304	OWS, Washrack & Sump, adjacent to Bldg 5498	
305	Dispatcher's Office with Washrack, Bldg 3664	
306	Steam Heating Plant, Bldg 7291	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
307	Hazardous Waste TSAs B and C, Bldg 7347	
308	Exterior Sump at Bldg 7120	
309	Covered Trench & Sump at Bldg 7155	
310	Former OWS & Suspected OWS at Bldg 7289	
311	Exterior Sump & Interior Concrete Pits at Bldg 7352	
312	Former Range Area for Gate 7 Expansion	
313	Western Side of Former High Explosive Drop Area A	
314	Used Oil AST & Spill Site, Bldg 3670	
315	Abandoned Drum Area near the Golf Course	
316	7500 Area Hardstand Parking	
317	Construction Site East of Building 5674 off Technology Road	
318	Smoke Pot Disposal Area	
319	Former Oil/Water Separator, Bldg 4812 & Pad	
320	Parking/Equipment Staging Area	
321	Cleared Area East and Northeast of Bldg 3639	
322	Hazardous Waste Storage Igloo, Bldg 8205	
323	Hazardous Waste Storage Igloo, Bldg 8208	
324	Hazardous Waste Storage Igloo, Bldg 8209	
325	Hazardous Waste Storage Igloo, Bldg 8210	
326	Hazardous Waste Storage Igloo, Bldg 8211	
327	Hazardous Waste Storage Igloo, Bldg 8212	
328	Hazardous Waste Storage Igloo, Bldg 8213	
329	Hazardous Waste Storage Igloo, Bldg 8214	
330	Hazardous Waste Storage Igloo, Bldg 8216	
331	Hazardous Waste Storage Igloo, Bldg 8217	
332	Hazardous Waste Storage Igloo, Bldg 8218	
333	Hazardous Waste Storage Igloo, Bldg 8219	
334	Hazardous Waste Storage Igloo, Bldg 8220	
335	Hazardous Waste Storage Igloo, Bldg 8221	
336	Hazardous Waste Storage Igloo, Bldg 8222	
337	Hazardous Waste Storage Igloo, Bldg 8223	
338	Hazardous Waste Storage Igloo, Bldg 8224	
339	Hazardous Waste Storage Igloo, Bldg 8225	
340	Hazardous Waste Storage Igloo, Bldg 8226	
341	Hazardous Waste Storage Igloo, Bldg 8227	
342	Hazardous Waste Storage Igloo, Bldg 8228	
343	Hazardous Waste Storage Igloo, Bldg 8229	
344	Hazardous Waste Storage Igloo, Bldg 8230	
345	Hazardous Waste Storage Igloo, Bldg 8231	
346	White Phosphorous Smoke Grenades near TA-5	
347	Small Arms Range near Vincent Park	

Table VI.1 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
348	Automotive Skills Center Building 3617	
A	Inactive Propellant Storage Wells South	
B	Abandoned Army Propellant Mfg Bldg 7598	
C	Abandoned Army Propellant Mixing Bldg 7596	
D	Paint Storage Shed, Bldg 3547	
E	No. 2 Fuel Oil Spill, Tank 5693 at the Fuel Farm	
F	Fenced Open Storage/Laydown Yard	
MSFC-002/087	Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon	
MSFC-003	Inactive Old Bone Yard Disposal Site #1	
MSFC-027	Inactive (M-1) Waste Accumulation Area	
MSFC-033*	SWAA Bldg 4815	
MSFC-033A	Surface Soils East of Building 4816 Adjacent to MSFC-033	
MSFC-034	Former Chemical Production Area	
MSFC-035	Inactive Sump/Tiled Drain Field – East TA	
MSFC-043*	Waste Oil Trap for Bldg 4816	
MSFC-052E	Portion of Industrial Sewer East of MSFC Property	
MSFC-053	Former Propellant Storage Area and Test Stand Site	
MSFC-055	Dismantled Stauffer Chemical Mfg Plant	
MSFC-060	Drainage System for Historic Redstone Test Site	
MSFC-065	1800-Ft Surface Drainage Ditch/Area	
MSFC-068*	Bldg 4815 Surface Drainage Area	
MSFC-074	Inactive Disposal Site, East Test Area	
MSFC-077	Former Burning Pits	
MSFC-082	Former Mustard Gas Demil Site and Mustard Shell Disposal Trenches	
MSFC-D	Containment Area for Tanks 4234 A, B & C	
IOU-1	Huntsville Spring Branch East of McDonald Creek	
IOU-2	Huntsville Spring Branch East of Patton Road	
IOU-3	Huntsville Spring Branch Patton Road through Olin	
IOU-4	Huntsville Spring Branch, Indian Creek Confluence	
IOU-5	McDonald Creek	
IOU-6	Indian Creek	
IOU-7	Southeastern Boundary System	
IOU-8	McKinley Range	
IOU-9	Southwest Area	
IOU-10	Bradford Sinks	
IOU-11	Tennessee River East	
IOU-12	Tennessee River West	

Notes for Table VI.1

*** Denotes SWMUs/AOCs that are under the control of the MSFC; however, they are located on RSA (Army) Property.**

**** Denotes SWMUs/AOCs that are included in this table as a historical reference because they have been identified as SWMUs/AOCs in the permit as a part of previously approved RFAs. However, pursuant to the military munitions rule (MMR) and ADEM Admin. Code r. 335-14-7-.13, a military munition is not considered a solid waste when used for its intended purpose. Therefore, these locations are not considered Solid Waste Management Units under the MMR.**

^a – Denotes SWMUs/AOCs that are covered under the Olin-Triana Consent Decree

^b – For Generator purposes the SWMU/AOC has its own ID #

Table VI.2

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring a RCRA Facility Investigation (RFI):

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
010	Closed Sanitary Landfill	
028	In-ground Oil/Water Separator, 5693 Area	
051	Inactive Munitions Demil/Disposal Area I	
052	Inactive Munitions Demil/Disposal Area N	
061	Inactive Munitions Demil/Disposal, Area P	
062	Inactive Munitions Demil	
063	Inactive Chemical Munitions Disposal, Area M	
064	Inactive Munitions Demil/Disposal Area BB	
066	Inactive Ash Disposal Site, Area X-1	
068	Inactive Chemical Disposal Area, Area Z	
104	Inactive ISP Wastewater Discharge Ditch	
105	DDT Drainage Ditches	
110	Former Drum Storage/Construction Debris, Area Y	
112	Suspected Former Demil/Disposal, Area W	
113	Inactive Disposal Trenches/Burn Pits, Area W	
114	Inactive Madkin Mt. Rock Quarry	
117	Former Liquid Caustic Mfg. Plant, Area R	
118	Inactive ISP Industrial Discharge Lagoon	
126	Inactive Open Burn Trench, Area U	
128	Inactive Mustard Gas Demil Area, Area W	
146	GW Southeast part of RSA, underlies former Thiokol Plant (~6600 acres)	
147	GW Central part of RSA (~1300 acres)	
148	GW Central Area – East of MSFC (~3600 acres)	
149	GW West Central Area – West MSFC (~3900 acres)	
152	GW Southern part of RSA, underlies GCWD (~570 acres)	
154	GW South-Central part of RSA (~3300 acres)	
155	GW Southwestern area of RSA (1600 acres)	
188	Northern Burial Area/Burning Ground #3	

Table VI.2 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
219	Chemical Storage Area in Salvage Yard	
238	Plant 2, Mustard Lines 5 and 6	
257	Rock Pond	
264	RR Spring	
278	Highway 565 Area	
281	Disposal Trenches at RSA-046 Range	
291	UST at Former Bldg T-3162 (Steam Plant)	
293	Former USTs at Bldg 3639 (Screening & Proportioning Smoke Components Bldg)	
304	OWS, Washrack & Sump, adjacent to Bldg 5498	
317	Construction Site East of Building 5674 off Technology Road	
318	Smoke Pot Disposal Area	
319	Former Oil/Water Separator, Bldg 4812 & Pad	
320	Parking/Equipment Staging Area	
321	Cleared Area East and Northeast of Bldg 3639	
346	White Phosphorous Smoke Grenades near TA-5	
347	Small Arms Range near Vincent Park	
348	Automotive Skills Center Building 3617	
MSFC-003	Inactive Old Bone Yard Disposal Site #1	
MSFC-033	SWAA Bldg 4815	*
MSFC-034	Former Chemical Production Area	
MSFC-035	Inactive Sump/Tiled Drain Field – East TA	
MSFC-043	Former Waste Oil Trap and Separator (Bldg 4817)	*
MSFC-068	Surface Drainage for Bldg 4815	*
MSFC-082	Former Mustard Gas Demil Site and Mustard Shell Disposal Trenches	
IOU-1	Huntsville Spring Branch East of McDonald Creek	
IOU-2	Huntsville Spring Branch East of Patton Road	
IOU-3	Huntsville Spring Branch Patton Road through Olin	
IOU-4	Huntsville Spring Branch, Indian Creek Confluence	
IOU-5	McDonald Creek	
IOU-6	Indian Creek	
IOU-7	Southeastern Boundary System	
IOU-8	McKinley Range	
IOU-9	Southwest Area	

Table VI.2 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
IOU-10	Bradford Sinks	
IOU-11	Tennessee River East	
IOU-12	Tennessee River West	

* Denotes SWMUs/AOCs that are under the control of the MSFC; however, they are located on RSA (Army) Property.

** Denotes sites where the RFI is deferred until range closure.

Table VI.3

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring no further action at this time:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
001	Fox Army Community Hospital Incinerator	
002	In-ground Oil/Water Separator, Bldg 3338	
004	In-ground Oil/Water Separator & Washrack	
005	Inactive Waste Accumulation Area	
006	Paint Shop & Sump at Motor Pool, Bldg 3634	
007	Hazardous Waste Storage Area, Bldg 3775	
024	Hazardous Waste Storage Igloo No. 10	
025	Hazardous Waste Vacant Storage Igloo No. 11	
026	Hazardous Waste Vacant Storage Igloo No. 12	
027	Hazardous Waste Vacant Storage Igloo No. 13	
029	Redstone Arsenal Sanitary Sewer System	
030	Former Central Oil/Water Separator	
031	Former Central Oil/Water Separator Storage Tanks	
033	Plating Room Floor Drains, Bldg 5432	
034	Waste Aviation Fuel Temporary Storage Area	
035	In-ground Oil/Water Separator, Bldg 4812	
036	In-ground Oil/Water Separator, Bldg 4832	
037	Underground Used Oil Storage Tank at Bldg 7857	
038	Underground Used Oil Storage Tank Bldg 3240	
039	Underground Used Oil Storage Tank Bldg 3338	
040	Underground Used Oil Storage Tank Bldg 3617	
041	Underground Used Oil Storage Tank Bldg 3636	
042	Underground Used Oil Storage Tank Bldg 4812E	
043	Underground Used Oil Storage Tank Bldg 5435A	
044	Underground Used Oil Storage Tank Bldg 5435B	
047	Chemical Training Facility, Area EE	
050	Inactive Munitions Demil/Disposal Area H	
075	Inactive Solid Waste Incinerator	
076	RDX/HMX Filtration Unit 1, Thiokol North	
077	RDX/HMX Filtration Unit 2, Thiokol South	
078	RDX/HMX Filtration Unit 1 Sump, Thiokol North	
079	RDX/HMX Filtration Unit 2 Sump, Thiokol South	
080	RDX/HMX Suspension Transfer Pad/Sump	
081	RDX/HMX Filtration Units, Charcoal Column Dolly	
082	Former Sparging Unit, Bldg 7595	
084	Inactive Temporary Waste Storage Pad, Bldg 7344	

Table VI.3 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
086	Inactive Temporary Waste Storage Pad 2, Bldg 7359	
090	Inactive Temporary Waste Storage Pad, Bldg 7340	
091	Inactive Temporary Waste Storage Pad, Bldg 7595	
099	Abandoned Plating Shop Tank/Sumps, Bldg 7614	
100	Aboveground Waste Oil Tank, Bldg 7630	
102	DDT Plant Site Q-6	
103	DDT Settling Lagoon	
106	DDT Earthen Dams	
107	Closed DDT Soil/Debris Landfill	
108	Test Range 4 Missile Impact Site	
111	Construction Debris, Area W	
119	GAF Manufacturing Facility	
120	Matthew's Cave and Ravine	
121	Paint Shop/Paint Washout Booth, Bldg 4762	
123	Inactive Cement Plant Sump	
124	Dismantled Calgon DDT Contaminated Water Treatment Plant	
125	Satellite Waste Accumulation Area, Bldg 5477	
127	Photo Lab Process Wastewater Sump Bldg 5451	
130	Inactive Radiographic Septic Tank, Bldg 7345	
134	Inactive Disposal Trench/Burn Pit, Area U	
135 A-G, I-N	1.1 Propellant Waste Captive Sumps	
136 A-J	1.1 Propellant Waste Drum Storage Pads	
137 A-L, N-P	1.3 Propellant Waste Sumps	
137M	Waste Sump and Captive Sump, Building 7722	
138 A-L, N-Q	1.3 Propellant Waste Drum Storage Pads	
158	Flammable Material Storage Bldg, TSA Bldg 3233	
159	Chemical Containment Storage, TSA Bldg 3327	
160	Mixer Bldg, TSA Bldg 7339	
161	Care Prep Bldg, TSA Bldg 7346	
162	Small Motor Loading "T", TSA Bldg 7347A	
163	Propellant Mixer, TSA Bldg 7353	
164	Mixer Bldg, TSA Bldg 7356	
165	Casting Bldg, TSA Bldg 7360	
166	Liner Preparation, TSA Bldg 7369	
167	Mixer Bldg, TSA Bldg 7382	
168	Motor Casting and Processing Bldg, TSA Bldg 7554	
169	Motor Assembly and Packout, TSA Bldg 7555	
170	Deaeration Cleanup, TSA Bldg 7593	
171	Propellant Mixing, TSA Bldg 7594	
173	Chemistry Lab, Pad 1, TSA Bldg 7632	
174	Chemistry Lab, Pad 2, TSA Bldg 7632	

Table VI.3 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
175	Physical Property Lab, Pad 1, TSA Bldg 7636	
176	Physical Property Lab, Pad 2, TSA Bldg. 7636	
177	Small Motor Finishing, TSA Bldg. 7654	
178	Control Lab and First Aid, Pad 1, TSA Bldg. 7667	
179	Control Lab and First Aid, Pad 2, TSA Bldg 7667	
180	Nitramine Drying Pilot, TSA Bldg 7688	
181	Nitramine Grinding Pilot, TSA Bldg 7690	
182	1.1 Grinder Bldg "P2", TSA Bldg 7695	
190	Disposal and Drainage Area West of ROP Line 2 Area	
193	Igniter Preparation Facility	
202	Graded Area Northeast of ROP Storage Igloos	
216	Laboratory Injection Test Facility, Bldg 5475	
222	Roads and Grounds Maintenance Shop, Bldg 5494	
223	Central Railroad Classification Yard	
224	Container Storage Area	
228	Sewage Treatment Plant 2	
229	Former PX Service Station (Bldg 3197)	
232	SMF #1 Service Station	
235	Bulk Fuel Storage Facility	
240	Substation No.7, Formerly Bldg 5290 (demolished)	
241	Hazardous Waste Storage Igloo, Bldg 7313	
243	Propellant Storage, Bldg 7342	
244	Propellant Mixing Bldg, Bldg 7356	
246	Sewer Ejector & Motor Pool, Bldg 7630	
248	Battery Maintenance Shop, Bldg 3633	
251	Former Phosgene Plant	
253	Utility/Flammable Materials Storage (B6109)	
256	Scarred Area #2-NE of RSA-032 w/in Historic RR Spur Line	
258	Guard Shack Waiting Shelter/Paint Spray, Bldg 7862	
259	TA #2 Leach Field	
266	Gulf Chemical Depot Storage Magazines	
267	Drainage Ditch #4	
268	Sewage Treatment Plant, Bldg 8018	
270	Hazardous Waste TSA & Recycling Facility Bldg 5423	
276	Former Boiler House, Bldg 7362	
277	Bldg 5487, Wastewater Maintenance Shop Acid Bath Wash Down Area	
279	Smoke Grenade Area	
284	Fire Training Area	**
285	Former WP Grenade Test Area	

Table VI.3 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
287	Component Storage Warehouse, Bldg 3634	
289	Drinking WTP#2, Sludge Thickener (Bldg 9102) & Sludge Drying Beds	
290	Drinking WTP#3, Sludge Thickener & Drying Beds, Bldgs 5431 & 5433	
292	UST at Bldg 3311 (Boiler & Compressor House)	
295	Hazardous Waste TSA, Bldg S-3335	
296	Disposal Area North of RSA-011	
297	Ammunition Packing/Shipping, Bldg 7551	
298	Hazardous Waste TSA, Bldg 8408	*
299	Hazardous Waste TSA, Bldg 7216	*
300	Hazardous Waste TSA, Bldg 7172	*
301	Hazardous Waste TSA, Bldg 7173	
302	Hazardous Waste TSA, Bldg 3802	*
303	Hazardous Waste TSA, Bldg 7700	*
307	Hazardous Waste TSAs B and C, Bldg 7347	*
309	Covered Trench & Sump at Bldg 7155	
310	Former OWS & Suspected OWS at Bldg 7289	
316	7500 Area Hardstand Parking	
B	Abandoned Army Propellant Mfg., Bldg 7598	
F	Fenced Open Storage/Laydown Yard	
MSFC- 002/087	Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon	
MSFC-052E	Portion of Industrial Sewer East of MSFC Property	
MSFC-053	Former Propellant Storage Area and Test Stand Site	
MSFC-055	Site of Former Stauffer Chemical Company	
MSFC-060	Drainage System for Historic Redstone Test Site	
MSFC-065	1800-ft Surface Drainage Ditch/Area	
MSFC-074	Inactive Disposal Site, East Test Area	
MSFC-077	Former Burning Pits	
MSFC-D	Containment Area for Tanks 4234 A, B, & C	

* These sites are active and conditions will be re-evaluated when they are closed.

** NFA for the soil media and groundwater although the RFI did not include the sampling and analysis of per- and polyfluoroalkyl substances (PFAS).

Table VI.4

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs regulated by Parts I – III and VI of this permit.

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
012	Active Open Burn Pans, Unit 2 (OB)	
015	Hazardous Waste Storage Igloo, No. 1 (8621)	
016	Hazardous Waste Storage Igloo, No. 2 (8622)	
017	Hazardous Waste Storage Igloo, No. 3 (8623)	
018	Hazardous Waste Storage Igloo, No. 4 (8624)	
019	Hazardous Waste Storage Igloo, No. 5 (8625)	
020	Hazardous Waste Storage Igloo, No. 6 (8630)	
021	Hazardous Waste Storage Igloo, No. 7 (8631)	
022	Hazardous Waste Storage Igloo, No. 8 (8632)	
023	Hazardous Waste Storage Igloo, No. 9 (8633)	
131	Active Open Detonation Area (OD)	
322	Hazardous Waste Storage Igloo, Bldg 8205	
323	Hazardous Waste Storage Igloo, Bldg 8208	
324	Hazardous Waste Storage Igloo, Bldg 8209	*
325	Hazardous Waste Storage Igloo, Bldg 8210	*
326	Hazardous Waste Storage Igloo, Bldg 8211	
327	Hazardous Waste Storage Igloo, Bldg 8212	
328	Hazardous Waste Storage Igloo, Bldg 8213	
329	Hazardous Waste Storage Igloo, Bldg 8214	
330	Hazardous Waste Storage Igloo, Bldg 8216	
331	Hazardous Waste Storage Igloo, Bldg 8217	
332	Hazardous Waste Storage Igloo, Bldg 8218	
333	Hazardous Waste Storage Igloo, Bldg 8219	
334	Hazardous Waste Storage Igloo, Bldg 8220	
335	Hazardous Waste Storage Igloo, Bldg 8221	
336	Hazardous Waste Storage Igloo, Bldg 8222	*
337	Hazardous Waste Storage Igloo, Bldg 8223	*
338	Hazardous Waste Storage Igloo, Bldg 8224	
339	Hazardous Waste Storage Igloo, Bldg 8225	
340	Hazardous Waste Storage Igloo, Bldg 8226	
341	Hazardous Waste Storage Igloo, Bldg 8227	
342	Hazardous Waste Storage Igloo, Bldg 8228	
343	Hazardous Waste Storage Igloo, Bldg 8229	
344	Hazardous Waste Storage Igloo, Bldg 8230	*
345	Hazardous Waste Storage Igloo, Bldg 8231	

* Require upgrades prior to use.

Table VI.5

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

The following SWMUs and AOCs require Interim Measures (IM) and/or Source Removal:

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
051	Inactive Munitions Demil & Disposal, Area I	IM Work Plan to include removal of munitions/explosives in trenches.
052	Inactive Munitions Demil & Disposal, Area N	IM Work Plan to include removal of disposal trenches/UXO.
061	Inactive Munitions Demil/Disposal Area P	IM Work Plan to include removal of chemical agent in trenches.
063	Inactive Chemical Munitions Disposal Area M	IM Work Plan to include removal of CWM in burial trenches.
064	Inactive Munitions Demil/Disposal Area BB	IM Work Plan to include removal of chemical agent/CWM in trenches.
066	Inactive Ash Disposal Site, Area X-1	IM Work Plan to include removal of solvent contaminated waste disposal/demil areas.
068	Inactive Chemical Disposal, Area Z	IM Work Plan to include removal of explosive and laboratory contaminants in the burial trenches.
110	Former Drum Storage/Construction Debris, Area Y	IM Work Plan to include removal of surface MEC and piles of Dragon Rocket Motors.
112	Suspected Former Demil/Disposal, Area W	IM Work Plan to include removal of demil/disposal areas and UXO.
113	Inactive Disposal Trenches/Burn Pits	IM Work Plan to include removal of disposal trenches.
114	Inactive Madkin Mt Rock Quarry	IM Work Plan to include removal of waste piles and UXO.

Table VI.5 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT
188	Northern Burial Area/Burning Ground #3	IM Work Plan to include removal of debris piles, munitions, chemical & production wastes.
257	Rock Pond	IM Work Plan to include removal of UXO, slag/munitions debris piles.
264	RR Spring	IM Work Plan to include removal of munitions debris.
046/281	Disposal Trenches at RSA-046 Range	IM Work Plan to include removal of disposal trenches.
MSFC-003	Old Bone Yard Site	IM Work Plan to include removal of disposed chemical munitions, toxic materials, chemical wastes and burn pits.
MSFC-035	Inactive Sump/Tiled Drain Field – East TA	IM Work Plan to include removal of chemical wastes.

Table VI.6

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

The following SWMUs and AOCs require a Corrective Measure Implementation (CMI) Plan:

Some sites listed within this table have had corrective measures implemented for one or more medium, and require a CMI plan for different media. Corrective measures at these sites are described in the documents listed in Table VIII.1. For example, RSA-087 is included on this table as requiring a CMI plan for groundwater and is also included on Table VIII.1 as having a corrective measures plan for surface media.

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
008	Inactive Sewage Treatment Plant #4		Groundwater
011	Former Sewage Treatment Plant No. 1, OU-10	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
013	Unlined Inactive Open Burn Pad	Groundwater to be investigated and/or remediated as part of RSA-151.	Soil and Groundwater
014	Unlined Inactive Burn Trenches Unit #2	Surface media at RSA-014 South to be remediated. Groundwater under the entire site to be investigated and/or remediated as part of RSA-151.	Soil and Groundwater
032	Inactive Scrap Metal Storage Area	Groundwater to be investigated and/or remediated as part of RSA-152.	Groundwater
048	Inactive Sanitary Landfill, Area G		Soil and Groundwater
049	Capped Arsenic Waste Ponds – West, OU-5	Groundwater to be investigated and/or remediated as part of RSA-148.	Groundwater
056/139	Closed Arsenic Waste Ponds	Groundwater to be investigated and/or remediated as part of RSA-147.	Groundwater
057	Inactive Arsenic Waste Lagoons – East, OU-6	Groundwater to be investigated and/or remediated as part of RSA-147.	Groundwater
058	Inactive Rubble Fill/Waste Pile, Area W	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
059	Inactive Construction Rubble Fill, Area R		Soil and Groundwater
065	Former Chemical Drum Storage Area, Area X	Groundwater to be investigated and/or remediated as part of RSA- 152.	Soil and Groundwater
067	Former Chemical Drum Storage Area, Area AA		Soil
069/070	Former Chemical Drum Storage Area, Area Y/Inactive Toxic Chemical Storage Area, Area Y1	Groundwater to be investigated and/or remediated as part of RSA- 069.	Soil and Groundwater
087	Inactive Temporary Waste Storage Pad 1&2, Bldg 7368	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
088	Inactive Temporary Waste Storage Pad, Bldg 7625	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
089	Inactive Temporary Waste Storage Pad, Bldg 7726	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
092	Inactive Temporary Waste Storage Pad, Bldg 7552	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
093	Reclaimed Empty Drum Storage Pad, Bldg 7368	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
094	Chlorinated Solvent Distillation Unit 1, OU-10	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
095	Chlorinated Solvent Distillation Unit 2, Bldg 7368	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
096	Chlorinated Solvent Distillation Unit 3, Bldg 7740	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
097	Chlorinated Solvent Distillation Unit 4, Bldg 7726	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
109	Former Chemical Munitions Staging Area		Soil

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
115	Inactive East Side Blowdown Lagoon, Test Area 5		Groundwater
116	South Side Blowdown Lagoon, Test Area 5		Groundwater
122	Dismantled Lewisite Mfg. Plant, Area U	Groundwater to be investigated and/or remediated as part of RSA-147.	Soil and Groundwater
132	Dismantled Popping Furnace	Groundwater to be investigated and/or remediated as part of RSA-151.	Groundwater
133	Inactive Rocket Washrack/Sump	Groundwater to be investigated and/or remediated as part of RSA-151.	Groundwater
135H	1.1 Propellant Wastes Captive Sump, Bldg 7593	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
138M	ROP Tetryl Processing Line	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
140	Inactive Disposal Area near T/S Tower	Groundwater to be remediated with RSA-219	Groundwater
141	4.2-inch Mortar Disposal Site, Bldg 4656	Groundwater to be investigated and/or remediated by NASA	Soil, Soil Vapors, and Groundwater
142	TCE Spill by Thiokol Degreasing Process	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
143	Petroleum Contaminated Soil Site, S. of Bldg 3240		Soil and Groundwater
144	Degreaser at Bldg 7554	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
145	GW Northeast part of RSA (~9900 acres)		Groundwater
150	GW Western part of RSA (~3900 acres)		Groundwater
151	GW Southern part of RSA, underlies OB/OD Area (~570 acres)		Groundwater
153	GW Western edge of RSA (~6300 acres)		Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
156	GW Southern part of RSA (~1400 acres)		Groundwater
157	GW Southeastern part of RSA, underlies GCWD Storage Area (~100 acres)		Groundwater
172	Motor Pool, TSA Bldg 7630	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
183	Former Lewisite Manufacturing Plants 1 and 2, OU-5	Groundwater to be investigated and/or remediated as part of RSA-148.	Soil and Groundwater
187	Northern Thiokol Propellant Mixing Facility	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
189	Motor/Oxidizer Preparation Facilities (ROP Line 2 Area)	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
191	ROP Line 1 Service Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
192	Tetryl and Igniter Processing (ROP Line 1 Area)	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
194	Physical Test Laboratory and Storage Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
195	Propellant Mixing Facility #1, Bldg 7363	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
196/098	Test Stand and Cleaning Building/Chlorinated Solvent Unit Bldg 7346, OU-10	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
197	Rocket Motor Static Test Stand	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
198/085	Equipment/Tool Cleaning Facility, Bldg 7359/Inactive Temporary Storage Pad 1	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
199	Propellant Mixing Facility #2, Bldg 7382	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
200	ROP Line 5 Area Operations Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
201	Research Laboratory, Bldg 7632	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
203	Igloo Area Loading Dock, Bldg 7351	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
205	Photo Lab and Motor Service Facility, Former Bldg 7628	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
207	Gorgas Laboratory, Bldg 7770	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
208	South Plant Testing Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
210	Nitroglycerine Wash House	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
211	South Plant Storage Magazines	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
212	Propellant Dry Houses	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
213	ROP Line 4 Area Operations Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
214	ROP Line 6 Area Operations Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
215	RSA-146 Historic Service Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
217	Inert Storage Warehouse Facilities	Groundwater to be investigated and/or remediated as part of RSA-146.	Soil and Groundwater
218	Defense Reutilization Material Office (DRMO) Open Storage Area	Groundwater to be investigated and/or remediated as part of RSA-219.	Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
220	Construction Material Storage Yard	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
221	Fuse Storage and Munitions Disposal Area		Soil
226	Open Storage 54-2	Groundwater to be investigated and/or remediated as part of RSA-147.	Groundwater
227	Inactive Washrack (adjacent to Bldg 5492)	Groundwater to be investigated and/or remediated as part of RSA-147.	Groundwater
230	Abandoned Rubble Pile	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater
231	SMF #1 Mixing& Prep Facilities	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater
233	SMF #2 Mixing & Prep Facilities	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater
234	Waste Disposal Pit		Soil and Groundwater
236	Grenade Packing & Assembly	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater
237	Propellant Cutting and Drying	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
239	ROP Line #1 Boiler House	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
245	Steam Heating Plant, Bldg 7579	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
247	Steel Fabrication/Maintenance Facility, Bldg 7644	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
249	Inactive Old Bone Yard, Disposal Site 2		Soil and Groundwater
261	Lance Missile Conditioning Facility, Bldg 7847	Groundwater to be investigated and/or remediated as part of RSA-154.	Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
262	CWS Warehouse Area (Bldgs 8021, 8022, 8023, 8024, 8025, 8026 and 8027)		Soil and Groundwater
263	CWS Motor Pool (Bldg 8017)/Change House (Bldg 8020)		Groundwater
265	Gasoline Drum Storage Area	Groundwater to be investigated and/or remediated as part of RSA- 155.	Groundwater
271	Former Boiler House, Building 7729		Soil and Groundwater
272	Former UST for Boiler Unit, Bldg 7650	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
273	Propellant Conditioning & Motor Cycling, Bldg 7364	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
274	Physics Laboratory & High Explosives Storage Magazine, Bldg 7540	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
275	Film Processing Laboratory, Former Bldg S-7173	Groundwater to be investigated and/or remediated as part of RSA- 146.	Groundwater
282	Former Mortar Test Site (Not in Range)	Groundwater to be investigated and/or remediated as part of RSA- 150.	Soil and Groundwater
283	Former Primary Substation No. 2 Bldg 3796	Groundwater to be investigated and/or remediated as part of RSA- 145.	Groundwater
286	Boiler/Steam Plant, Bldg 3624		Soil and Groundwater
288	Drinking WTP#1, Sludge Thickener & Drying Beds, Bldgs 8043 & 8044	Groundwater to be investigated and/or remediated as part of RSA- 155.	Groundwater
305	Dispatcher's Office with Washrack, Bldg 3664	Groundwater to be investigated and/or remediated as part of RSA- 145.	Groundwater
306	Steam Heating Plant, Bldg 7291		Groundwater
308	Exterior Sump at Bldg 7120		Soil and Groundwater
311	Exterior Sump & Interior Concrete Pits at Bldg 7352		Groundwater

Table VI.6 (cont'd)

SWMU/AOC NUMBER	SWMU/AOC NAME	UNIT COMMENT	POTENTIALLY AFFECTED MEDIA*
312	Former Range Area for Gate 7 Expansion	Groundwater to be investigated and/or remediated as part of RSA-150/RSA-153	Soil and Groundwater
313	Western Side of Former High Explosive Drop Area A		Soil and Groundwater
314	Used Oil AST & Spill Site, Bldg 3670		Soil and Groundwater
A	Inactive Propellant Storage Wells South	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
C	Abandoned Army Propellant Mixing Bldg 7596	Groundwater to be investigated and/or remediated as part of RSA-146.	Groundwater
D	Paint Storage Shed, Bldg 3547	Groundwater to be investigated and/or remediated as part of RSA-145.	Groundwater
E	No. 2 Fuel Oil Spill, Tank 5693 at the Fuel Farm	Groundwater to be investigated and/or remediated as part of RSA-028.	Groundwater
MSFC-027	Inactive (M-1) Waste Accumulation Area	Groundwater to be investigated and/or remediated as part of MSFC.	Groundwater
MSFC-033A	Surface Soils East of Building 4816, Adjacent to MSFC-033	Groundwater to be investigated and/or remediated as part of MSFC.	Groundwater
IWWG	Installation-Wide Groundwater	LUCs	Groundwater

*The SWMUs that require CMI Plans for Groundwater only shall be submitted to the Department upon completion of investigation activities of the respective SWMUs (e.g., CMI for RSA-214 to be included in CMI Plan for RSA-146, etc.).

PART VII

GROUNDWATER MONITORING AND CORRECTIVE ACTION

VII.A. REQUIRED PROGRAM(S)

1. Groundwater monitoring shall consist of the General Groundwater Monitoring Program of Permit Condition VII.B., the Compliance Monitoring Program contained in Permit Condition VII.D and the Corrective Action Monitoring Program contained in Permit Condition VII.E.
 - a. The Permittee shall commence groundwater monitoring as required by this permit no later than 120 calendar days after the effective date of this permit.

VII.B. GENERAL GROUNDWATER MONITORING PROGRAM

1. Well Location, Installation and Construction

The Permittee shall install and/or designate groundwater monitoring wells in order to maintain a groundwater monitoring system to comply with the requirements of ADEM Admin. Code Rules 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11) as applicable and as specified below:

- a. The Permittee shall maintain all groundwater monitoring wells at the facility as identified in Table VII.1 of this permit, at the locations specified on Figure E-2 of the permit application, and any other groundwater monitoring wells specified by Permit Condition VII.B.1.d.
 - i. All groundwater monitoring wells shall be maintained in accordance with the plans and specifications presented in Section E of the permit application and in accordance with ADEM Admin. Code Rule 335-14-5-.06.
 - ii. A groundwater monitoring well shall not be removed from any monitoring program specified in this permit without an approved permit modification pursuant to Permit Condition I.J.
 - iii. If a groundwater monitoring well is damaged, the Permittee shall immediately notify the Department in writing, which includes a description of the well repair activities to be conducted. The well repair procedures must be approved by the Department prior to implementation. Within 30 calendar days after the well is repaired, the Permittee shall submit a written notification to the Department that the well repair activities were conducted in accordance with the approved procedures.
 - iv. If a groundwater monitoring well is deleted from the monitoring program(s) required by this permit in accordance with Permit Conditions

VII.B.1.a.ii. and I.J., it shall be abandoned within 90 calendar days after deletion using procedures to be approved by the Department. Within 30 calendar days after the well is abandoned, the Permittee shall submit a written notification to the Department that the well abandonment activities were conducted in accordance with the approved procedures.

- b. Groundwater monitoring wells RS107, RS108, RS209, RS211, RS2882, RS2883 and RS2884 shall define the point of compliance for the OB and OD Units. Groundwater monitoring well RS243 shall be used as the background well for the OB and OD units.
- c. The Permittee shall maintain the background monitoring well(s) listed in Table VII.1 to assess the groundwater quality for the respective units.
- d. The Permittee shall install and/or designate groundwater monitoring wells as necessary to assess changes in the rate and extent of any plume of contamination or as otherwise deemed necessary to maintain compliance with ADEM Admin. Code Rules 335-14-5-.06(6), 335-14-5-.06(8), 335-14-5-.06(9), 335-14-5-.06(10), and 335-14-5-.06(11), as applicable. A plan in the form of a permit modification, in accordance with Permit Condition I.J., request specifying the design, location and installation of any additional monitoring wells should be submitted to the Department at least 90 calendar days prior to installation which, at a minimum, shall include:
 - i. Well construction techniques including casing depths and proposed total depth of well(s);
 - ii. Well development method(s);
 - iii. A complete description of well construction materials;
 - iv. A schedule of implementation for construction; and,
 - v. Provisions for determining the lithologic characteristics, hydraulic conductivity, grain size distribution, and porosity for the applicable aquifer unit(s) at the location of the new well(s).

2. General Groundwater Monitoring Requirements

- a. The Permittee shall determine the groundwater surface elevation from all monitoring wells listed in Table VII.1 of this permit at least annually and each time a sampling event is conducted. The results of these determinations should be submitted in accordance with Permit Condition VII.B.6. Elevation data should be recorded and reported as mean sea level (MSL) and referenced to an appropriate North American Vertical Datum (NAVD) benchmark.
 - i. The Permittee shall sample GW Wells listed in Table VII.1 at the OB and OD areas for the constituents listed in Table VII.2 on an annual basis.

- b. The Permittee shall determine the groundwater flow rate and direction in the underlying aquifer(s) at least annually and submit the results in accordance with Permit Condition VII.B.6.
 - c. The Permittee shall determine background concentrations of hazardous constituents and other chemical parameters required to be monitored by this permit in accordance with Section E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(g).
- 3. Groundwater Protection Standard
 - a. The groundwater protection standard, as required under ADEM Admin. Code Rule 335-14-5-.06(3), shall consist of Table VII.3 of this permit which lists the hazardous constituents and their respective concentration limits.
 - b. The groundwater protection standard applies to all hazardous waste or hazardous constituent releases as deemed appropriate by the Department to protect human health and the environment.
- 4. Compliance Period
 - a. The compliance period, during which the groundwater protection standard specified in Permit Condition VII.B.3. applies, shall begin at the time of the first sampling event of the compliance monitoring program (Permit Condition VII.D.), or the corrective action monitoring program (Permit Condition VII.E.), whichever is earlier.
 - b. The compliance period shall continue (after beginning pursuant to Permit Condition VII.B.4.a.) until the groundwater protection standard as defined by Permit Condition VII.B.3.a. has not been exceeded for a period of three consecutive years.
 - c. If the Permittee is engaged in a corrective action program pursuant to Permit Condition VII.E., then the compliance period shall continue as required by ADEM Admin. Code Rule 335-14-5-.06(7)(c) until the groundwater protection standard has not been exceeded for a period of three consecutive years after corrective action has been terminated and this permit has been modified, in accordance with Permit Condition I.J., to implement a compliance monitoring program pursuant to Permit Condition VII.D. or a detection monitoring program pursuant to Permit Condition VII.C., as required by ADEM Admin. Code Rule 335-14-5-.06(11)(f).
- 5. Sampling and Analysis Procedures

The Permittee shall use the following techniques and procedures when obtaining and analyzing samples from the groundwater monitoring wells described in Permit Condition VII.B.1. to provide a reliable indication of the quality of the groundwater as required under ADEM Admin. Code Rules 335-14-5-.06(8)(d), (e), and (g):

- a. Samples shall be collected, preserved, and shipped (when shipped off-site for analysis) in accordance with the procedures specified in Section E of the permit application.
 - b. Samples shall be analyzed according to the procedures specified in Section E of the permit application, the most recent edition of SW-846 or other appropriate methods approved by the Department. Analytical method detection limits shall be less than or equal to the concentration limits specified in Table VII.3, unless otherwise approved in writing by the Department.
 - c. Samples shall be tracked and controlled using the chain-of-custody procedures specified in Section E of the permit application.
 - d. Statistical analyses used to evaluate the groundwater monitoring data shall be as described in Section E of the permit application and ADEM Admin. Code Rule 335-14-5-.06(8)(h).
 - e. All samples taken in accordance with this permit shall not be filtered prior to analysis.
6. Recordkeeping and Reporting
- a. The Permittee shall keep and maintain all monitoring, testing, and analytical data obtained in accordance with Permit Conditions VII.B., VII.C, VII.D, and VII.E. as required by Permit Condition I.C.10.
 - b. The Permittee shall submit to the Department written reports to include all analytical sampling data, established background values, statistical evaluations, groundwater elevations, associated potentiometric maps, and the annual groundwater flow rate and direction determinations. The analytical method and the method detection limit (MDL) for each constituent must be integrated into all reports of analysis. The reports shall be submitted within 60 calendar days after the first sampling events and on an annual basis thereafter. Copies of these reports shall be kept at the facility in accordance with Permit Conditions I.C.10.c. and I.C.10.e.
 - c. The Permittee shall submit progress reports to the Department describing implementation of groundwater monitoring and/or corrective action activities at the site as required by Part VII of this permit on a quarterly basis. The first progress report shall be submitted to the Department within 90 calendar days after the effective date of this permit. The progress reports shall continue until such time as the required monitoring and/or corrective action systems and activities required by this permit are fully constructed and operational. In the event that additional monitoring and/or corrective action requirements are imposed through a permit modification, in accordance with Permit Condition I.J., the quarterly reporting requirement shall resume, commencing upon the effective date of the permit modification and continuing until the required monitoring and/or corrective action systems and activities are again fully constructed and operational.

VII.C. DETECTION MONITORING PROGRAM (RESERVED)

VII.D. COMPLIANCE MONITORING PROGRAM

The requirements of this Condition are applicable to the OB and OD Units. Except as specified otherwise in this permit, the Compliance Monitoring Program shall be implemented in accordance with Section E of the permit application, and ADEM Admin. Code Rule 335-14-5-.06(10).

1. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition VII.B.2., the Permittee shall:

- a. Sample all point of compliance wells and background wells and analyze for the constituents listed in Tables VII.2. and VII.3. of this permit annually in accordance with Permit Condition VII.B.5 throughout the compliance monitoring period. This schedule shall begin within 120 calendar days of the effective date of this permit.
- b. Sample and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units), at all background and point of compliance monitoring well locations each time the well is sampled in accordance with Permit Condition VII.B.5 and as shown in Table VII.4. The data obtained should be submitted as raw data in the reports required by Permit Condition VII.B.6.
- c. Sample all point of compliance and designated background monitoring wells and analyze, in accordance with Permit Condition VII.B.5., for the constituents listed in ADEM Admin Code Rule 335-14-5-Appendix IX in addition to the constituents listed in Tables VII.2 and VII.3. of this permit at the beginning of the compliance monitoring period and thereafter on an annual basis throughout the compliance period. [ADEM Admin. Code Rule 335-14-5-.06(10)(g).]

2. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition VII.B.6., the Permittee shall perform statistical evaluation of monitoring well analytical data for each monitoring event pursuant to Permit Condition VII.B.5 and ADEM Admin. Code Rule 335-14-5-.06(10)(d).

- a. If the Permittee determines, pursuant to Permit Conditions VII.B.5. and VII.D.1.c. and ADEM Admin. Code Rules 335-14-5-.06(10)(d) and 335-14-5-.06(10)(g), that any constituent(s) listed in ADEM Admin. Code Rule 335-14-5-Appendix IX but not listed in Table VII.3. of this permit is detected at any point of compliance or background well, he or she must comply with ADEM Admin. Code Rule 335-14-5-.06(10)(g).

- b. If the Permittee determines pursuant to Permit Conditions VII.B.5. and VII.D.1.c. and ADEM Admin. Code Rule 335-14-5-.06(10)(d) that any concentration limits listed in Table VII.3 of this permit exceeded in any monitoring well at the point of compliance, he or she must comply with ADEM Admin. Code Rule 335-14-5-.06(10)(h).

VII.E. CORRECTIVE ACTION MONITORING PROGRAM

The requirements of this Condition are applicable to RSA-003, RSA-009, RSA-045, RSA-049, RSA-053, RSA-054/RSA-055, RSA-056, RSA-060, RSA-083, RSA-139, RSA-204, RSA-206, RSA-209, RSA-225, RSA-252, and RSA-269. Except as specified otherwise in this permit, the Corrective Action Monitoring Programs shall be implemented in accordance with the approved CMI Plans and Corrective Action Plans (CAPs) for the SWMUs/AOCs and ADEM Admin. Code Rule 335-14-5-.06(11).

1. Monitoring Systems

In addition to the point of compliance and background well monitoring systems identified in Permit Conditions VII.B.1.b. and VII.B.1.c., the Permittee shall:

- a. Maintain groundwater monitoring wells RS065, RS065A, RS066, RS070, RS643, RS961, RS1111, RS1114, RS1121, RS1148, RS1149, RS1151, RS1152, RS1153, RS1154, RS1157, RS1158, RS1159, RS1160, RS1164, RS1167, RS1294, RS1353, RS1413 (shallow and deep), RS1414, RS1416, RS1418, RS1419, RS1483, RS1486c, RS1488e, RS1489e, RS1514 (shallow and deep), RS1518 (all screened intervals), RS1520 (all screened intervals), RS1522 (shallow and deep), RS1523, RS1527, RS1534 (all screened intervals), RS1673a, RS1675 (shallow and deep), RS1711, RS1779, RS1783 (shallow and deep), RS1785 (shallow and deep), RS1786 (shallow and deep), RS1806 (all screened intervals), RS2109, RS2801, RS2802, RS2803, RS2804, MSW13, MSW14, MSW16, MSW18a, INCRK-01, OFF-SW27 and P-SW11 as boundary wells/sampling points for the entire facility as specified in Table VII.1 of this permit.
- b. Maintain groundwater monitoring wells RS842, RS1301, RS1302, RS1332, RS1333, RS1470, RS1471, and RS2816 as effectiveness wells for RSA-003, as specified in Table VII.1 of this permit. RS1560 and RS2455 shall be maintained as upgradient wells for RSA-003, and monitoring wells RS1355 and RS1562 shall be maintained as point of compliance wells for RSA-003.
- c. Maintain groundwater monitoring well RS1428 as an effectiveness well for RSA-009, as specified in Table VII.1 of this permit.
- d. Maintain groundwater monitoring wells RSP-1684 (spring), RS1743, RS1745, RS1821, RS2149, RS2153, RS2167, RS2169, RS2691, RS2692, RS2693, RS2788, RS2937, RS2938, RS2939, RS2940, RS2941, and RS2942 as effectiveness wells for RSA-045 as specified in Table VII.1 of this permit. Wells RS1744 and RS2788 shall be maintained as upgradient wells for RSA-045.

- e. Maintain groundwater monitoring wells RS054, RS263, RS633, RS635, RS636, RS1074, RS1090, RS1589, RS1590, RS1591, RS1592 and RS1973 as effectiveness wells for RSA-049 as specified in Table VII.1 of this permit. Wells RS634, RS1087, RS1593, and RS1594 shall be maintained as background wells for RSA-049.
- f. Maintain groundwater monitoring wells RS1996, RS1997, RS138, RS139, RS179, RS192, RS273, RS274, RS348 and RS349 as effectiveness wells for RSA-053, as specified in Table VII.1 of this permit. RS270, RS2175 and RS2003 shall be maintained as upgradient wells for RSA-053 and monitoring well RS195 shall be maintained as a point of compliance for RSA-053.
- g. Maintain groundwater monitoring wells RS038, RS039, RS165, RS166, RS200, RS201, RS223, RS297, RS384 and RS385 as effectiveness wells for RSA-054/RSA-055, as specified in Table VII.1 of this permit.
- h. Maintain groundwater monitoring wells RS048, RS518, RS521, RS630, RS1255, RS1257, RS1259, RS1261, RS1267, RS1273, and RS1275 as effectiveness wells and RS517 as a point of compliance well for RSA-056/RSA-139, as specified in Table VII.1 of this permit.
- i. Maintain groundwater monitoring wells RS020, RS022, RS197, RS282, RS552, RS555, RS556, RS2723, RS2876 and RS2877 as effectiveness wells for RSA-060, as specified in Table VII.1 of this permit. RS285 will be maintained as a background well for RSA-060.
- j. Maintain groundwater monitoring wells RS708, RS709, RS710, RS808, RS814, RS2545, RS2548, RS2549, RS2550, RS2637, RS2639, and RS2640 as effectiveness wells for RSA-083, as specified in Table VII.1 of this permit. RS2547, RS2638, and RS2641 shall be maintained as upgradient wells for RSA-083.
- k. Maintain groundwater monitoring wells RS690, RS691, RS1223, RS1550, RS2027, RS2029, RS2030, RS2031, RS2032, RS2033, RS2034, RS2668, RS2669, RS2670, RS2671, RS2672, RS2673, RS2674, RS2675, RS2676, RS2677, RS2678, RS2683, RS2791, RS2793 and RS2824 as effectiveness wells for RSA-204, as specified in Table VII.1 of this permit.
- l. Maintain groundwater monitoring wells RS1215, RS1654, RS1856, RS1857, RS1896, RS2024, RS2183, RS2184, RS2185, RS2186, RS2187, RS2188, RS2189, RS2190, RS2554, RS2555, RS2556, and RS2777 as effectiveness wells for RSA-206, as specified in Table VII.1 of this permit. RS1653 and RS1897 shall be maintained as upgradient wells for RSA-206.
- m. Maintain groundwater monitoring wells RS649, RS652, RS654, RS662, RS1110, RS1748, RS1753, RS2019, RS2020, RS2021, RS2022, RS2660, RS2661, RS2690, and RS2766 as effectiveness wells for RSA-209, as specified in Table VII.1 of this permit. RS2657, RS2658, RS2659, and RS2665 shall be maintained as upgradient wells for RSA-209.

- n. Maintain groundwater monitoring wells RS1899, RS1900, RS1901, RS1902, RS2044, and RS2471 as effectiveness wells for RSA-225, as specified in Table VII.1 of this permit. RS2043 shall be maintained as an upgradient well for RSA-225.
- o. Maintain groundwater monitoring wells RS349, RS350, RS1679, RS1682, RS1686, RS1885, RS1888, RS1889, RS1892, RS1994, RS2401, RS2402, RS2761, and RS2767 as effectiveness wells for RSA-252, as specified in Table VII.1 of this permit. RS2400, RS2845, RS2846, RS2847, RS2934, RS2935, and RS2936 shall be maintained as background wells for RSA-252.
- p. Maintain groundwater monitoring wells RS1622 and RS1623 as effectiveness wells for RSA-269, as specified in Table VII.1 of this permit. RS1625 shall be maintained as an upgradient well for RSA-269.
- q. **RESERVED**

2. Corrective Action Program

- a. The Permittee shall conduct a Corrective Action Program, as described in the approved CMI Plans, to remove or treat in place all hazardous constituents that exceed their respective groundwater protection standards as described in Table VII.3. of this permit at the point of compliance, between the point of compliance and the down-gradient facility property boundary, and beyond the facility boundary in accordance with ADEM Admin. Code Rule 335-14-5-.06(11)(e)2.
- b. Pursuant to ADEM Admin. Code Rules 335-14-5-.06(11)(c) and 335-14-5-.06(11)(e)3., the Permittee shall continue to implement the corrective action program as described in the approved CMI Plans within 120 calendar days after the effective date of this permit.
- c. The Permittee shall handle/treat groundwater in accordance with the approved CMI Plans and with the applicable requirements of the Hazardous Waste Facility Permit AL7 210 020 742 as issued by the Department.

3. Monitoring Requirements

In addition to the general groundwater monitoring requirements specified in Permit Condition VII.B.2., the Permittee shall:

- a. Sample all background, upgradient, point of compliance, boundary, and effectiveness monitoring wells shown in Table VII.1 of this permit and analyze for the constituents listed in Table VII.2. and Table VII.3. of this permit on an annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.
 - i. At RSA-003, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. The Permittee shall sample these groundwater wells on a quarterly basis during Years 1 and 2, on a semiannual basis during Years 3 and 4, and on an annual basis

through the remainder of the corrective measures. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.

- ii. At RSA-009, the Permittee shall sample the groundwater well listed in Table VII.1 on a semiannual basis for the constituents listed in Table VII.3.
- iii. At RSA-045, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. These groundwater wells shall be sampled during the baseline sampling event prior to injection activities and then on an annual basis as prescribed in the CMI Plan. Supplementary sampling events shall be conducted as needed to satisfy the requirements of the Underground Injection Control permit as described in the CMI Plan. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- iv. At RSA-049, the Permittee shall sample groundwater wells listed in Table VII.1 on a semiannual basis for the constituents listed in Table VII.3.
- v. At RSA-053, the Permittee shall sample groundwater wells listed in Table VII.1 on a quarterly basis for the constituents listed in Table VII.3. After two years of quarterly sampling, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Reports.
- vi. At RSA-054/RSA-055, the Permittee shall sample the groundwater wells listed in Table VII.1 on a semi-annual basis for the constituents listed in Table VII.3. After one year of semi-annual sampling, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- vii. At RSA-056/RSA-139, the Permittee shall sample the groundwater wells listed in Table VII.1 semiannually for the constituents listed in Table VII.3. After three years, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency based on sampling results presented in the Annual Effectiveness Report.
- viii. At RSA-060, the Permittee shall initiate sampling of the groundwater wells listed in Table VII.1 on a quarterly basis for the constituents listed in Table VII.3. After three years of quarterly monitoring, the Permittee may request a permit modification, in accordance with Permit Condition

I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.

- ix. At RSA-083, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. Two of the fifteen wells, RS2545 and RS2548, will be sampled during the baseline sampling event and then considered contingency wells for the remainder of the groundwater monitoring program. The Permittee shall sample the remaining groundwater wells on a quarterly basis during Year 1, on a semiannual basis during Years 2 and 3, and on an annual basis through the remainder of the remedial action. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- x. At RSA-204, the Permittee shall initiate sampling of the groundwater wells listed in Table VII.1 on a quarterly basis for the first year and then on a semiannual basis for the next two years as prescribed in the CMI Plan for the constituents listed in Table VII.3. After two years of semiannual monitoring, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- xi. At RSA-206, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. These groundwater wells shall be sampled during the baseline sampling event prior to injection activities. During the injection activities, the Permittee shall also sample these groundwater wells as a part of the supplementary sampling events conducted as needed to satisfy the requirements of the Underground Injection Control permit and then on an annual basis as prescribed in the CMI Plan. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- xii. At RSA-209, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. These groundwater wells shall be sampled during the baseline sampling event prior to injection activities and then on an annual basis as prescribed in the CMI Plan. Excluding groundwater wells RS649, RS652, RS1748, RS1753, RS2657, and RS2658, the Permittee shall sample the remaining groundwater wells as a part of the supplementary sampling events conducted as needed to satisfy the requirements of the Underground Injection Control permit as described in the CMI Plan. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.

- xiii. At RSA-225, the Permittee shall initiate sampling of the groundwater wells listed in Table VII.1 on a quarterly basis for the first year and then on a semiannual basis for the next two years as prescribed in the CMI Plan for the constituents listed in Table VII.3. After two years of semiannual monitoring, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency, to abandon the upgradient monitoring well RS2043, or analyte list based on sampling results presented in the Annual Effectiveness Report.
- xix. At RSA-252, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. Groundwater monitoring will begin with a baseline sampling event then continue on a semiannual basis until the groundwater analytical results indicate the cleanup goals have been attained for the groundwater constituents listed in Table VII.3 at RSA-252 for three consecutive years as prescribed in the CMI Plan. Long-term monitoring will continue and an annual report will be submitted to the Department to evaluate the effectiveness of monitored natural attenuation at RSA-252. The Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- xx. At RSA-269, the Permittee shall sample the groundwater wells listed in Table VII.1 for the constituents listed in Table VII.3. Monitoring wells RS1622, RS1623, and RS1625 will be sampled during the baseline sampling event and then on a quarterly basis. Following Year 1, the Permittee may request a permit modification, in accordance with Permit Condition I.J., to modify the sampling frequency or analyte list based on sampling results presented in the Annual Effectiveness Report.
- b. Sample all background, upgradient, point of compliance, effectiveness, and boundary monitoring wells shown in Table VII.1. of this permit and analyze for the constituents listed in Tables VII.2. and VII.3. of this permit on an annual basis beginning within 120 calendar days of the effective date of this permit and continuing through the end of the compliance period.
- c. Sample all background, upgradient, point of compliance, effectiveness, and boundary monitoring wells shown in Table VII.1. of this permit and analyze for temperature (degrees F or C), specific conductance (Mhos/cm), and pH (standard units) each time the well is sampled as shown in Table VII.4. The data obtained should be submitted as raw data in the reports required by Permit Condition VII.B.6.
- d. When evaluating the monitoring results to determine the effectiveness of the corrective measures, in accordance with Permit Condition VII.E.4., the Permittee shall:
 - i. Determine if the corrective action system effectively addresses the entire plume of contamination;

- ii. Determine if the concentration of the hazardous constituents are decreasing (pH increasing or decreasing toward neutrality, as applicable) in the effectiveness wells specified in Permit Condition VII.A.1.;
- iii. Determine if hazardous waste or hazardous constituents are being released into the environment; and,
- iv. Determine if hazardous constituents have been detected in the boundary wells specified in Permit Condition VII.A.1.

4. Reporting and Response Requirements

In addition to the recordkeeping and reporting requirements specified in Permit Condition VII.B.6.:

- a. The Permittee shall report the effectiveness of the corrective action program annually as required under ADEM Admin. Code Rule 335-14-5-.06(11)(g). These reports shall be submitted to the Department within 60 calendar days of each annual anniversary of this permit after corrective action is initiated and continue until corrective action is completed. The Permittee must provide data from groundwater monitoring along with an analysis of that data and any conclusions regarding the effectiveness of the program in accordance with Permit Condition VII.E.3.d. If the analysis of the data warrants any change to the corrective action program, the Permittee must include these revisions in the annual report which will be followed up within 90 calendar days with an application for permit modification in accordance with Permit Condition I.J.
- b. If corrective action is terminated under Permit Condition VII.B.4.c., the Permittee must sample all background, point of compliance, effectiveness and boundary sampling locations for the compounds listed in ADEM Admin. Code Rule 335-14-5-Appendix IX. Based upon the sampling results, the Permittee may petition the Department, in accordance with Permit Condition I.J., for a permit modification to implement either a detection monitoring program or a compliance monitoring program.

Table VII.1**MONITORING WELL DESIGNATIONS**

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS107	POC	34°34' 15.98"N	86°39' 56.34"W	OB and OD	43.0	569.29	571.58	30.0-40.0	Overburden
RS108	POC	34°34' 11.93"N	86°39' 54.58"W	OB and OD	27.5	563.09	565.32	15.0-25.0	Overburden
RS209	POC	34°34' 15.71"N	86°40' 07.07"W	OB and OD	35.0	566.83	568.88	21.0-31.0	Overburden
RS211	POC	34°34' 20.28"N	86°40' 02.06"W	OB and OD	32.0	562.33	565.18	18.0-28.0	Overburden
RS243	BKG	34°34' 90.95"N	86°39' 59.62"W	OB and OD	39.8	572.82	575.68	24.3-33.3	Overburden
RS2882	POC	34°34' 18.94"N	86°40' 4.19"W	OB and OD	23.1	566.62	566.32	12.7-22.7	Overburden
RS2883	POC	34°34' 15.80"N	86°40' 6.11"W	OB and OD	39.8	563.39	563.13	29.4-39.4	Overburden
RS2884	POC	34°34' 15.99"N	86°40' 1.05"W	OB and OD	23.8	566.75	566.34	13.6-23.6	Overburden
RS842	EFF	34°40' 19.70"N	86°38' 1.57"W	RSA-003	66	606.23	605.93	51.0-66.0	Bedrock
RS1301	EFF	34°40' 19.72"N	86°38' 2.40"W	RSA-003	21.5	606.15	606.40	11.3-21.3	Overburden
RS1302	EFF	34°40' 19.83"N	86°38' 1.97"W	RSA-003	20	605.86	606.15	9.0-19.0	Overburden
RS1332	EFF	34°38' 1.95"N	86°38' 1.95"W	RSA-003	39	606.08	605.60	29.0-39.0	Overburden
RS1333	EFF	34°38' 5.19"N	86°38' 5.19"W	RSA-003	70	610.31	609.94	55.0-70.0	Bedrock
RS1355	POC	34°40' 21.58"N	86°37' 58.62"W	RSA-003	44	604.10	606.87	34.0-44.0	Overburden
RS1470	EFF	34°40' 20.63"N	86°38' 1.69"W	RSA-003	41	605.85	605.67	21.0-41.0	Overburden
RS1471	EFF	34°40' 19.99"N	86°38' 1.14"W	RSA-003	32	606.31	608.71	12.0-32.0	Overburden
RS1560	UPG	34°40' 21.35"N	86°38' 10.05"W	RSA-003	60	613.42	613.19	45.0-60.0	Bedrock
RS1562	POC	34°40' 17.63"N	86°37' 55.86"W	RSA-003	66	600.46	600.23	51.0-66.0	Bedrock

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2455	UPG	34°40' 20.57"N	86°38' 05.21"W	RSA-003	32	610.17	609.86	22.0-32.0	Overburden
RS2816	EFF	34°40' 21.14"N	86°38' 1.58"W	RSA-003	40	606.00	606.00	20.0-40.0	Overburden
RS1428	EFF	34° 38' 24.00"N	86° 40' 48.00"W	RSA-009	10.0	562.40	565.48	5.0-10.0	Overburden
RSP-1684	EFF	34° 39' 46.73" N	86° 37' 11.97" W	RSA-045	N/A	567.20	N/A	N/A	Spring
RS1743	EFF	34° 39' 52.01" N	86° 37' 28.14" W	RSA-045	39.8	592.27	594.80	29.1 - 39.1	Overburden
RS1744	UPG	34° 39' 48.43" N	86° 37' 16.69" W	RSA-045	36.0	585.92	585.67	25.2 - 35.2	Overburden
RS1745	EFF	34° 39' 43.89" N	86° 37' 16.83" W	RSA-045	21.9	586.57	588.93	11.2 - 21.2	Overburden
RS1821	EFF	34° 39' 46.36" N	86° 37' 9.24" W	RSA-045	38.3	568.85	571.00	25.4 - 35.4	Overburden
RS2149	EFF	34° 39' 52.42" N	86° 37' 27.82" W	RSA-045	61.2	591.69	594.31	47.6 - 57.6	Overburden
RS2153	EFF	34° 39' 43.65" N	86° 37' 17.37" W	RSA-045	48.5	586.34	589.05	38.1 - 48.1	Overburden
RS2167	EFF	34° 39' 53.92" N	86° 37' 32.37" W	RSA-045	48.6	596.7	599.15	38.2 - 48.2	Overburden
RS2169	EFF	34° 39' 41.18" N	86° 37' 18.35" W	RSA-045	42.4	588.44	591.06	32.0 - 42.0	Overburden
RS2691	EFF	34° 39' 43.42" N	86° 37' 14.88" W	RSA-045	26.8	573.31	575.65	13.9 - 23.9	Overburden
RS2692	EFF	34° 39' 42.17" N	86° 37' 23.21" W	RSA-045	35.9	586.83	589.39	23.0 - 33.0	Overburden
RS2693	EFF	34° 39' 38.66" N	86° 37' 18.76" W	RSA-045	33.0	580.72	582.79	20.1 - 30.1	Overburden
RS2787	UPG	34° 39' 40.33" N	86° 37' 27.17" W	RSA-045	54.3	579.30	581.57	41.4 - 51.4	Overburden
RS2788	EFF	34° 39' 39.6" N	86° 37' 20.83" W	RSA-045	84.5	577.86	580.22	71.6 - 81.6	Bedrock
RS2937	EFF	34° 39' 43.07" N	86° 37' 21.14" W	RSA-045	N/A	N/A	N/A	N/A	Overburden
RS2938	EFF	34° 39' 41.56" N	86° 37' 21.76" W	RSA-045	N/A	N/A	N/A	N/A	Overburden
RS2939	EFF	34° 39' 42.79" N	86° 37' 23.88" W	RSA-045	N/A	N/A	N/A	N/A	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2940	EFF	34° 39' 43.40" N	86° 37' 25.09" W	RSA-045	N/A	N/A	N/A	N/A	Overburden
RS2941	EFF	34° 39' 40.97" N	86° 37' 23.99" W	RSA-045	N/A	N/A	N/A	N/A	Overburden
RS2942	EFF	34° 39' 42.12" N	86° 37' 20.17" W	RSA-045	N/A	N/A	N/A	N/A	Overburden
RS054	EFF	34° 39' 14.28"N	86° 39' 26.15"W	RSA-049	56.8	613.56	616.66	41.8-51.8	Overburden
RS263	EFF	34° 39' 13.23"N	86° 39' 24.34"W	RSA-049	42.4	608.86	610.76	32.4-41.8	Overburden
RS633	EFF	34° 39' 17.36"N	86° 39' 15.89"W	RSA-049	50.0	613.47	615.97	29.0-44.0	Overburden
RS634	BKG	34° 39' 21.04"N	86° 39' 20.58"W	RSA-049 (GW RSA-149)	33.5	612.93	615.43	17.8-32.8	Overburden
RS635	EFF	34° 39' 22.67"N	86° 39' 24.64"W	RSA-049	40.5	619.78	622.28	25.0-40.0	Overburden
RS636	EFF	34° 39' 17.36"N	86° 39' 27.79"W	RSA-049	43.5	621.77	624.44	27.5-42.5	Overburden
RS1074	EFF	34° 39' 13.29"N	86° 39' 16.54"W	RSA-049	106.0	608.57	611.36	95.7-105.7	Bedrock
RS1087	BKG	34° 39' 21.23"N	86° 39' 20.35"W	RSA-049 (GW RSA-149)	76.5	612.86	616.4	66.2-76.2	Bedrock
RS1090	EFF	34° 39' 18.46"N	86° 39' 27.81"W	RSA-049	95.0	623.20	626.04	83.0-92.7	Bedrock
RS1589	EFF	34° 39' 16.25"N	86° 39' 15.91"W	RSA-049	49.0	611.03	614.61	34.0-49.0	Overburden
RS1590	EFF	34° 39' 14.30"N	86° 39' 19.93"W	RSA-049	79.0	610.16	612.48	69.0-79.0	Bedrock
RS1591	EFF	34° 39' 14.16"N	86° 39' 21.80"W	RSA-049	66.0	610.53	613.71	51.0-66.0	Bedrock
RS1592	EFF	34° 39' 14.17"N	86° 39' 21.91"W	RSA-049	48.0	610.53	613.71	33.0-48.0	Overburden
RS1593	BKG	34° 39' 14.81"N	86° 39' 31.67"W	RSA-049 (GW RSA-149)	117.0	620.67	623.91	107.0-117.0	Bedrock
RS1594	BKG	34° 39' 14.68"N	86° 39' 31.78"W	RSA-049 (GW RSA-149)	45.0	620.32	623.86	30.0-45.0	Overburden
RS1973	EFF	34°39' 9.878"N	86°39' 16.988"W	RSA-049	46.0	614.83	617.54	36.0-46.0	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS138	EFF	34°37' 40.16"N	86°38' 42.51"W	RSA-053	43.0	568.54	571.54	21.5-41.5	Overburden
RS139	EFF	34°37' 39.98"N	86°38' 47.00"W	RSA-053	40.0	580.83	583.32	30.0-40.0	Overburden
RS179	EFF	34°37' 37.09"N	86°38' 47.35"W	RSA-053	24.9	559.27	561.31	19.7-24.7	Overburden
RS192	EFF	34°37' 45.18"N	86°38' 44.03"W	RSA-053	66.0	600.29	602.45	57.0-66.0	Overburden
RS195	POC	34°37' 37.50"N	86°38' 43.76"W	RSA-053	40.5	557.99	560.46	28.0-38.0	Overburden
RS270	UPG	34°37' 55.88"N	86°38' 57.55"W	RSA-053	46.6	591.48	594.2	36.6-45.6	Overburden
RS273	EFF	34°37' 50.13"N	86°38' 46.19"W	RSA-053	40.2	603.59	605.89	27.7-36.7	Overburden/ Perched
RS274	EFF	34°37' 50.19"N	86°38' 46.32"W	RSA-053	71.6	603.46	606.00	59.1-68.1	Overburden
RS348	EFF	34°37' 56.87"N	86°38' 52.45"W	RSA-053	38.0	603.51	606.36	26.0-36.0	Overburden/ Perched
RS349	EFF	34°37' 56.89"N	86°38' 52.32"W	RSA-053	63.0	603.67	606.34	52.0-62.0	Overburden
RS1996	EFF	34°37' 48.09"N	86°38' 51.83"W	RSA-053	52.5	605.77	607.97	42.1-52.1	Overburden
RS1997	EFF	34°37' 47.49"N	86°38' 51.39"W	RSA-053	90.0	605.13	607.85	80.0-90.0	Bedrock
RS2003	UPG	34°37' 52.58"N	86°38' 55.08"W	RSA-053	58.0	603.33	604.48	47.0-57.0	Overburden
RS2175	UPG	34°37' 52.58"N	86°38'55.01"W	RSA-053	92.0	603.71	605.04	81.0-91.0	Bedrock
RS038	EFF	34° 38' 30.46"N	86° 38' 28.93"W	RSA-054/055	52.5	625.69	628.56	37.5-47.5	Overburden
RS039	EFF	34° 38' 24.35"N	86° 38' 31.13"W	RSA-054/055	46.0	634.77	638.49	30.0-41.0	Overburden
RS165	EFF	34° 38' 41.58"N	86° 38' 29.24"W	RSA-054/055	44.0	609.28	611.99	21.0-41.0	Overburden
RS166	EFF	34° 38' 24.53"N	86° 38' 41.24"W	RSA-054/055	66.0	615.61	617.93	51.0-61.0	Overburden
RS200	EFF	34° 38' 44.88"N	86° 38' 33.19"W	RSA-054/055	41.0	604.26	607.00	26.0-37.0	Overburden
RS201	EFF	34° 38' 30.25"N	86° 38' 43.05"W	RSA-054/055	60.0	611.82	614.23	47.0-57.0	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS223	EFF	34° 38' 36.33"N	86° 38' 29.49"W	RSA-054/055	44.0	614.13	616.86	29.0-39.0	Overburden
RS297	EFF	34° 38' 42.21"N	86° 38' 43.02"W	RSA-054/055	44.4	627.86	630.65	31.9-40.9	Overburden
RS384	EFF	34° 38' 25.94"N	86° 38' 43.36"W	RSA-054/055	42.0	614.74	617.69	27.0-42.0	Overburden
RS385	EFF	34° 38' 37.37"N	86° 38' 45.74"W	RSA-054/055	40.0	630.40	632.66	30.0-40.0	Overburden
RS048	EFF	34°38' 36.101"N	86°38' 3.962"W	RSA-056/139	23.6	587.34	590.87	8.6-18.6	Overburden
RS517	POC	34°38' 29.72"N	86°38' 0.909"W	RSA-056/139	22.1	583.12	585.82	16.3-21.3	Overburden
RS518	EFF	34°38' 34.317"N	86°38' 1.093"W	RSA-056/139	28.1	586.36	587.96	22.6-27.6	Overburden
RS521	EFF	34°38' 34.093"N	86°38' 7.729"W	RSA-056/139	36.5	587.72	590.88	30.7-35.7	Overburden
RS630	EFF	34°38' 32.798"N	86°38'4.85"W	RSA-056/139	24.0	589.69	592.19	9.0-23.8	Overburden
RS1255	EFF	34°38' 36.243"N	86°38' 9.776"W	RSA-056/139	27.0	589.38	591.46	17.0-27.0	Overburden
RS1257	EFF	34°38' 36.041"N	86°38' 8.098"W	RSA-056/139	25.0	586.68	588.91	15.0-25.0	Overburden
RS1259	EFF	34°38' 34.513"N	86°38' 8.435"W	RSA-056/139	27.0	586.89	586.67	17.0-27.0	Overburden
RS1261	EFF	34°38' 35.495"N	86°38' 9.956"W	RSA-056/139	28.0	589.63	591.72	18.0-28.0	Overburden
RS1267	EFF	34°38' 32.508"N	86°38' 0.51"W	RSA-056/139	23.0	585.09	587.08	13.0-23.0	Overburden
RS1273	EFF	34°38' 30.591"N	86°38' 5.545"W	RSA-056/139	28.0	584.27	586.04	18.0-28.0	Overburden
RS1275	EFF	34°38' 32.203"N	86°38' 7.181"W	RSA-056/139	34.5	587.85	589.94	24.5-34.5	Overburden
RS020	EFF	34°37' 31.66"N	86°38' 22.77"W	RSA-060	26.0	556.36	570.56	10.0-21.0	Overburden
RS022	EFF	34°37' 29.49"N	86°38' 32.71"W	RSA-060	41.0	567.05	570.12	14.0-25.0	Overburden
RS197	EFF	34°37' 36.97"N	86°38' 36.23"W	RSA-060	52.2	574.78	576.50	39.0-49.0	Overburden
RS282	EFF	34°37' 37.03"N	86°38' 24.85"W	RSA-060	28.3	568.23	570.92	15.8-24.8	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS285	BKG	34°37' 44.14"N	86°38' 34.66"W	RSA-060	43.5	572.87	575.25	31.0-40.0	Overburden
RS552	EFF	34°37' 29.88"N	86°38' 32.58"W	RSA-060	62.0	569.90	572.61	52.0-62.0	Bedrock
RS555	EFF	34°37' 32.45"N	86°38' 33.60"W	RSA-060	47.0	573.10	575.94	37.0-47.0	Overburden
RS556	EFF	34°37' 25.615"N	86°38' 31.30"W	RSA-060	35.5	563.50	566.31	25.5-35.5	Interface
RS2723	EFF	34°37' 31.05"N	86°38' 27.67"W	RSA-060	18.0	571.04	573.38	7.6-17.6	Overburden
RS2876	EFF	34° 37' 35.76"N	86° 38' 34.77"W	RSA-060	54.0	576.32	578.7	43.6-53.6	Overburden
RS2877	EFF	34° 37' 40.01"N	86° 38' 33.72"W	RSA-060	36.5	572.11	574.14	26.1-36.1	Overburden
RS708	EFF	34°37' 16.029"N	86°37' 13.622"W	RSA-083	10.5	575.28	578.19	5.5-10.5	Overburden
RS709	EFF	34°37' 14.649"N	86°37' 11.879"W	RSA-083	14.0	569.58	572.10	4.0-14.0	Interface
RS710	EFF	34°37' 15.931"N	86°37' 10.863"W	RSA-083	15.0	571.81	574.75	5.0-15.0	Interface
RS808	EFF	34°37' 12.068"N	86°37' 14.784"W	RSA-083	8.0	569.71	571.80	3.0-8.0	Overburden
RS814	EFF	34°37' 14.471"N	86°37' 13.592"W	RSA-083	12.0	569.75	572.01	1.8-11.8	Overburden
RS2545	EFF	34°37' 14.766"N	86°37' 15.682"W	RSA-083	19.3	572.47	574.875	8.9-18.9	Interface
RS2547	UPG	34°37' 12.858"N	86°37' 12.065"W	RSA-083	12.2	570.34	572.58	1.8-11.8	Interface
RS2548	EFF	34°37' 17.798"N	86°37' 10.897"W	RSA-083	15.3	570.24	574.10	4.9-14.9	Interface
RS2549	EFF	34°37' 20.072"N	86°37' 7.786"W	RSA-083	14.6	571.84	574.27	4.2-14.2	Interface
RS2550	EFF	34°37' 18.138"N	86°37' 6.179"W	RSA-083	21.4	573.58	576.11	11.0-21.0	Interface
RS2637	EFF	34°37' 14.604"N	86°37' 4.931"W	RSA-083	17.8	573.83	576.25	7.4-17.4	Interface
RS2638	UPG	34°37' 12.522"N	86°37' 8.214"W	RSA-083	17.5	572.50	574.86	7.0-17.0	Interface
RS2639	EFF	34°37' 20.956"N	86°37' 8.605"W	RSA-083	16.3	571.74	574.10	5.9-15.9	Interface

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2640	EFF	34°37' 20.336"N	86°37' 4.782"W	RSA-083	19.5	573.16	575.62	9.1-19.1	Interface
RS2641	UPG	34°37' 9.859"N	86°37' 9.793"W	RSA-083	14.5	572.76	575.08	4.1-14.1	Interface
RS690	EFF	34° 37' 13.65"N	86° 36' 38.47"W	RSA-204	23.5	579.47	582.59	13.5 - 23.5	Overburden
RS691	EFF	34° 37' 17.50"N	086° 36' 35.04"W	RSA-204	22.0	577.53	580.64	12.0 - 22.0	Interface
RS1223	EFF	34° 37' 18.60"N	86° 36' 38.61"W	RSA-204	29.0	578.65	581.43	18.7 - 28.7	Interface
RS1550	EFF	34° 37' 21.73"N	86° 36' 35.61"W	RSA-204	26.0	575.04	575.28	16.0 - 26.0	Overburden
RS2027	EFF	34° 37' 21.09"N	86° 36' 40.47"W	RSA-204	34.7	580.94	583.40	24.3 - 34.3	Interface
RS2029	EFF	34° 37' 18.48"N	86° 36' 40.55"W	RSA-204	32.2	585.66	588.11	21.7 - 31.7	Interface
RS2030	EFF	34° 37' 13.79"N	86° 36' 36.26"W	RSA-204	24.2	581.54	584.12	13.8 - 23.8	Interface
RS2031	EFF	34° 37' 14.67"N	86° 36' 33.72"W	RSA-204	25.7	576.94	579.83	15.3 - 25.3	Interface
RS2032	EFF	34° 37' 18.92"N	86° 36' 35.04"W	RSA-204	32.5	577.66	576.91	22.1 - 32.1	Interface
RS2033	EFF	34° 37' 22.72"N	86° 36' 34.51"W	RSA-204	42.8	571.54	574.29	32.4 - 42.4	Interface
RS2034	EFF	34° 37' 22.84"N	86° 36' 37.54"W	RSA-204	24.6	576.73	579.13	14.2 - 24.2	Interface
RS2668	EFF	34° 37' 20.85"N	86° 36' 39.40"W	RSA-204	55	580.92	583.71	45 - 55	Bedrock
RS2669	EFF	34° 37' 19.34"N	86° 36' 37.09"W	RSA-204	60.0	576.91	579.33	50.0 – 60.0	Bedrock
RS2670	EFF	34° 37' 16.15"N	86° 36' 36.89"W	RSA-204	50	579.45	582.23	40 - 50	Bedrock
RS2671	EFF	34° 37' 14.91"N	86° 36' 35.67"W	RSA-204	65	581.01	580.78	55.0-65.0	Bedrock
RS2672	EFF	34° 37' 14.25"N	86° 36' 35.87"W	RSA-204	29.9	581.40	581.12	19.5 - 29.5	Interface
RS2673	EFF	34° 37' 15.16"N	86° 36' 36.59"W	RSA-204	27.2	582.14	582.05	16.8 - 26.8	Interface
RS2674	EFF	34° 37' 15.84"N	86° 36' 35.23"W	RSA-204	27.8	579.80	582.12	17.4 - 27.4	Interface

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2675	EFF	34° 37' 16.24"N	86° 36' 36.60"W	RSA-204	30.3	579.17	581.99	19.9 - 29.9	Overburden
RS2676	EFF	34° 37' 17.46"N	86° 36' 37.23"W	RSA-204	20.5	578.89	581.06	10.1 - 20.1	Overburden
RS2677	EFF	34° 37' 19.12"N	86° 36' 38.21"W	RSA-204	29.5	578.31	580.75	19.1 - 29.1	Overburden
RS2678	EFF	34° 37' 20.02"N	086° 36' 37.65"W	RSA-204	28.4	578.348	580.788	18.0 - 28.0	Overburden
RS2683	EFF	34° 37' 21.49"N	086° 36' 39.73"W	RSA-204	28.8	579.491	581.813	18.4 - 28.4	Overburden
RS2791	EFF	34° 37' 15.38"N	86° 36' 35.74"W	RSA-204	28.5	582.65	580.26	18.2 - 28.2	Interface
RS2793	EFF	34° 37' 19.06"N	86° 36' 36.93"W	RSA-204	24.9	579.43	577.16	14.6 - 24.6	Interface
RS2824	EFF	34° 37' 22.837"	86° 36' 40.33"	RSA-204	24.5	578.134	580.466	13.6 – 23.6	Interface
RS1215	EFF	34° 37' 39.02" N	86° 36' 44.73" W	RSA-206	20.0	566.3	568.7	9.3 - 19.3	Interface
RS1653	UPG	34° 37' 38.86" N	86° 36' 42.87" W	RSA-206	22.2	565.6	567.8	11.8 - 21.8	Interface
RS1654	EFF	34° 37' 40.04" N	86° 36' 46.41" W	RSA-206	9.4	562.8	565.1	3.9 - 8.9	Overburden
RS1856	EFF	34° 37' 38.66" N	86° 36' 45.71" W	RSA-206	12.6	563.8	566.3	7.2 - 12.1	Overburden
RS1857	EFF	34° 37' 32.05" N	86° 36' 43.65" W	RSA-206	18.4	566.7	568.8	8.0 - 18.0	Overburden
RS1896	EFF	34° 37' 40.02" N	86° 36' 43.93" W	RSA-206	27.8	570.4	570.2	17.4 - 27.4	Overburden
RS1897	UPG	34° 37' 31.75" N	86° 36' 42.72" W	RSA-206	13.7	570.3	571.9	3.3 - 13.3	Overburden
RS2024	EFF	34° 37' 39.28" N	86° 36' 45.30" W	RSA-206	12.0	563.9	566.2	7.5 - 11.5	Overburden
RS2183	EFF	34° 37' 41.29" N	86° 36' 47.44" W	RSA-206	13.3	562.0	564.4	7.9 - 12.9	Overburden
RS2184	EFF	34° 37' 41.99" N	86° 36' 45.63" W	RSA-206	11.2	562.5	565.0	5.8 - 10.8	Overburden
RS2185	EFF	34° 37' 39.37" N	86° 36' 47.05" W	RSA-206	12.9	563.4	565.6	7.5 - 12.5	Overburden
RS2186	EFF	34° 37' 37.57" N	86° 36' 47.51" W	RSA-206	6.3	564.1	566.2	2.9 - 5.9	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2187	EFF	34° 37' 33.38" N	86° 36' 43.15" W	RSA-206	27.5	566.6	569.0	17.1 - 27.1	Overburden
RS2188	EFF	34° 37' 32.96" N	86° 36' 44.88" W	RSA-206	12.3	566.3	568.5	6.9 - 11.9	Overburden
RS2189	EFF	34° 37' 32.41" N	86° 36' 43.18" W	RSA-206	42.3	566.7	569.1	31.9 - 41.9	Overburden
RS2190	EFF	34° 37' 30.33" N	86° 36' 43.32" W	RSA-206	14.2	567.6	569.7	8.8 - 13.8	Overburden
RS2554	EFF	34° 37' 32.34" N	86° 36' 47.73" W	RSA-206	15.0	567.4	569.7	4.6 - 14.6	Interface
RS2555	EFF	34° 37' 33.75" N	86° 36' 45.88" W	RSA-206	13.3	565.8	568.1	2.9 - 12.9	Interface
RS2556	EFF	34° 37' 34.66" N	86° 36' 43.09" W	RSA-206	33.2	567.9	570.4	22.8 - 32.8	Overburden
RS2777	EFF	34° 37' 41.19" N	86° 36' 49.94" W	RSA-206	20.2	563.3	565.8	19.8 - 9.8	Interface
RS649	EFF	34° 36' 18.71"N	86° 35' 35.20"W	RSA-209	25	573.47	573.19	15.0 - 25.0	Interface
RS652	EFF	34° 36' 13.91"N	86° 35' 36.93"W	RSA-209	25	578.01	580.82	8.0 - 23.0	Overburden
RS654	EFF	34° 36' 16.75"N	86° 35' 41.18"W	RSA-209	40	587.06	586.88	28.0 - 38.0	Interface
RS662	EFF	34° 36' 14.85"N	86° 35' 42.74"W	RSA-209	32	585.03	587.56	17.0 - 32.0	Interface
RS1110	EFF	34° 36' 14.36"N	86° 35' 41.22"W	RSA-209	46.5	583.86	586.63	30.0 - 45.0	Interface
RS1748	EFF	34° 36' 16.14"N	86° 35' 34.00"W	RSA-209	19.6	571.84	571.58	9.6 – 19.2	Overburden
RS1753	EFF	34° 36' 12.52"N	86° 35' 38.18"W	RSA-209	25.2	576.47	578.69	14.8 - 24.8	Overburden
RS2019	EFF	34° 36' 17.79"N	86° 35' 40.12"W	RSA-209	36.3	585.55	587.67	25.9 - 35.9	Interface
RS2020	EFF	34° 36' 17.14"N	86° 35' 41.88"W	RSA-209	30.2	589.03	591.73	19.8 - 29.8	Interface
RS2021	EFF	34° 36' 16.14"N	86° 35' 40.49"W	RSA-209	25.4	584.47	586.75	15.0 - 25	Interface
RS2022	EFF	34° 36' 16.49"N	86° 35' 38.21"W	RSA-209	34.4	578.09	580.19	24.0 - 34.0	Overburden
RS2657	UPG	34° 36' 18.43"N	86° 35' 43.84"W	RSA-209	27.1	586.19	588.66	16.7 - 26.7	Interface

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS2658	UPG	34° 36' 19.43"N	86° 35' 42.12"W	RSA-209	29.1	588.63	591.17	18.7 - 28.7	Interface
RS2659	UPG	34° 36' 17.66"N	86° 35' 42.53"W	RSA-209	21.8	590.44	593.06	11.4 - 21.4	Interface
RS2660	EFF	34° 36' 17.03"N	86° 35' 43.23"W	RSA-209	41.2	590.80	593.13	30.8 - 40.8	Interface
RS2661	EFF	34° 36' 16.18"N	86° 35' 41.90"W	RSA-209	27.6	586.34	588.97	17.2 - 27.2	Interface
RS2665	UPG	34° 36' 18.66"N	86° 35' 40.08"W	RSA-209	31.6	586.67	588.89	21.2 - 31.2	Interface
RS2690	EFF	34° 36' 16.75"N	86° 35' 41.35"W	RSA-209	65	587.15	589.95	55.0 - 65.0	Bedrock
RS2766	EFF	34° 36' 16.85"N	86° 35' 41.28"W	RSA-209	119	587.49	589.53	98.6 - 118.6	Bedrock
RS1899	EFF	34° 38' 28.49" N	86° 38' 19.07" W	RSA-225	43.8	610.01	609.80	33.0 - 43.0	Overburden
RS1900	EFF	34° 38' 26.50" N	86° 38' 15.74" W	RSA-225	39.6	600.67	602.64	29.1 - 39.1	Overburden
RS1901	EFF	34° 38' 25.26" N	86° 38' 16.80" W	RSA-225	34.3	602.21	601.95	23.8 - 33.8	Overburden
RS1902	EFF	34° 38' 24.26" N	86° 38' 14.84" W	RSA-225	42.6	600.26	599.90	31.9 - 41.9	Overburden
RS2043	UPG	34° 38' 29.35" N	86° 38' 19.13" W	RSA-225	41.5	607.97	607.60	31.1 - 41.1	Overburden
RS2044	EFF	34° 38' 28.42" N	86° 38' 17.54" W	RSA-225	29.5	605.93	608.01	19.1 - 29.1	Overburden
RS2471	EFF	34° 38' 22.24" N	86° 38' 15.63" W	RSA-225	35.6	611.03	613.19	20.2 - 35.2	Overburden
RS349	EFF	34° 37' 56.82" N	86° 38' 52.43" W	RSA-252	62.0	603.88	506.45	52.0- 62.0	Overburden
RS350	EFF	34° 37' 53.87" N	86° 38' 46.02" W	RSA-252	32.0	605.01	607.60	14.5 - 29.5	Overburden
RS1679	EFF	34° 38' 03.92" N	86° 38' 46.22" W	RSA-252	37.5	596.00	595.60	27.5 - 37.5	Overburden
RS1682	EFF	34° 37' 59.62" N	86° 38' 48.46" W	RSA-252	45.4	604.15	606.54	35.4 - 45.4	Overburden
RS1686	EFF	34° 37' 58.20" N	86° 38' 38.34" W	RSA-252	39.6	585.97	588.81	29 - 39	Overburden
RS1885	EFF	34° 38' 06.46" N	86° 38' 32.30" W	RSA-252	37.0	587.65	589.95	26.6 - 36.6	Overburden

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS1888	EFF	34° 37' 55.05" N	86° 38' 31.21" W	RSA-252	32.0	582.57	584.60	21.6 - 31.6	Overburden
RS1889	EFF	34° 37' 58.82" N	86° 38' 29.98" W	RSA-252	31.0	586.30	588.75	20.6 - 30.6	Overburden
RS1892	EFF	34° 38' 03.33" N	86° 38' 31.35" W	RSA-252	32.0	588.91	591.32	21.6 - 31.6	Overburden
RS1994	EFF	34° 38' 04.36" N	86° 38' 40.26" W	RSA-252	33.6	585.63	585.16	23.3 - 33.3	Overburden
RS2400	BKG	34° 38' 07.66" N	86° 38' 43.92" W	RSA-252	34.1	592.95	595.59	23.9 - 33.9	Overburden
RS2401	EFF	34° 38' 05.48" N	86° 38' 35.67" W	RSA-252	35.3	589.88	592.15	24.9 - 34.9	Overburden
RS2402	EFF	34° 38' 02.07" N	86° 38' 37.88" W	RSA-252	44.0	590.51	592.93	21 - 31	Overburden
RS2761	EFF	34° 38' 04.51" N	86° 38' 45.49" W	RSA-252	99.6	594.95	594.76	89.2 - 99.2	Bedrock
RS2767	EFF	34° 37' 55.73" N	86° 38' 37.40" W	RSA-252	34.1	589.69	591.93	23.7 - 33.7	Overburden
RS2845	BKG	34° 38' 12.70" N	86° 38' 39.49" W	RSA-252	48.8	592.68	594.76	38.4 - 48.4	Overburden
RS2846	BKG	34° 38' 12.47" N	86° 38' 43.02" W	RSA-252	38.4	593.13	595.67	28.0- 38.0	Overburden
RS2847	BKG	34° 38' 10.30" N	86° 38' 37.92" W	RSA-252	36.8	589.28	589.01	26.6 - 38.4	Overburden
RS2934	BKG	TBD	TBD	RSA-252	TBD	TBD	TBD	TBD	TBD
RS2935	BKG	TBD	TBD	RSA-252	TBD	TBD	TBD	TBD	TBD
RS2936	BKG	TBD	TBD	RSA-252	TBD	TBD	TBD	TBD	TBD
RS1622	EFF	34° 35' 48.13" N	86° 37' 58.79" W	RSA-269	26.9	575.66	577.95	6.5 – 26.5	Overburden
RS1623	EFF	34° 35' 48.11" N	86° 37' 59.20" W	RSA-269	25.5	573.06	575.51	5.1 – 25.1	Overburden
RS1625	UPG	34° 35' 48.00" N	86° 38' 0.16" W	RSA-269	25.5	570.42	570.17	5.1 – 25.1	Overburden
RS065	BDY	34°40' 58.86"N	86°36' 41.71"W	Facility-Wide	58.0	596.85	597.98	43.0-58.0	Interface
RS066	BDY	34°40' 02.80"N	86°36' 38.08"W	Facility-Wide	47.0	583.98	583.98	32.0-47.0	Interface

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS070	BDY	34° 35' 46.53"N	86° 35' 12.39"W	Facility-Wide	48.0	571.12	572.27	33.0-48.0	Interface
RS961	BDY	34°37' 37.52"N	86°35' 22.155"W	Facility-Wide	45.5	566.46	568.92	35.5-45.5	Interface
RS1111	BDY	34° 41' 46.97"N	86° 41' 58.25"W	Facility-Wide	25.0	605.75	608.36	15.0-25.0	Overburden
RS1114	BDY	34° 41' 00.30"N	86° 42' 52.73"W	Facility-Wide	61.0	598.59	601.27	50.6 – 60.6	Overburden
RS1121	BDY	34° 39' 42.59"N	86° 42' 50.81"W	Facility-Wide	16.0	584.49	587.36	5.6-15.6	Overburden
RS1153 EP ³ - 3	BDY	34° 34' 17.14"N	86° 40' 20.69"W	Facility-Wide	45.0	564.95	567.61	34.6-44.6	Interface
RS1159 EP ³ - 5	BDY	34° 35' 3.22"N	86° 36' 8.30"W	Facility-Wide	40.6	565.21	567.69	25.0-40.0	Interface
RS1353	BDY	34° 38' 43.58"N	86° 42' 35.94"W	Facility-Wide	36.0	581.39	584.01	25.8-35.8	Overburden
RS1414	BDY	34°41' 27.246"N	86°42' 44.679"W	Facility-Wide	85.0	643.30	645.47	75.0-85.0	Interface
RS1419	BDY	34°41 '0.625"N	86°37' 18.301"W	Facility-Wide	25.0	578.34	580.56	10.0-25.0	Overburden
RS1523	BDY	34° 37' 02.71"N	86° 35' 12.16"W	Facility-Wide	22.0	568.09	571.10	11.8 – 21.8	Interface
RS1527 (off site)	BDY	34° 36' 38.96"N	86° 35' 14.10"W	Facility-Wide	21.0	567.38	570.80	11.0 – 21.0	Interface
RS1711	BDY	34°36' 9.326"N	86°35' 15.345"W	Facility-Wide	54.0	565.72	568.23	44.0 – 54.0	Interface
MSW13	BDY	34°41' 48.127"N	86°41' 56.881"W	Facility-Wide	0.0	NA	NA	NA	Surface water
RS2109	BDY	34° 35' 46.53"N	86° 35' 12.39"W	Facility-Wide	30.8	571.12	572.27	20.4-30.4	Overburden
RS2801	BDY	34° 36' 27.28"N	86° 35' 21.67"W	Facility-Wide	16.3	568.88	571.27	5.9-15.9	Overburden
RS2802	BDY	34° 36' 17.77"N	86° 35' 20.66"W	Facility-Wide	18.5	568.53	571.02	8.1-18.1	Overburden
RS2803	BDY	34° 36' 10.52"N	86° 35' 19.40"W	Facility-Wide	30.3	566.23	568.74	19.9-29.9	Overburden
RS2804	BDY	34° 36' 01.56"N	86° 35' 18.59"W	Facility-Wide	50.0	568.71	570.34	39.6-49.6	Overburden
MSW14	BDY	34°42' 32.59"N	86°38' 21.466"W	Facility-Wide	0.0	NA	NA	NA	Surface water

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
MSW16	BDY	34°39' 40.587"N	86°36' 17.672"W	Facility-Wide	0.0	NA	NA	NA	Surface water
MSW18a	BDY	34°37' 18.974"N	86°35' 15.024"W	Facility-Wide	0.0	NA	NA	NA	Surface water
INCRK-01	BDY	34°34' 54.971"N	86°43' 47.586"W	Facility-Wide	0.0	556.00	NA	NA	Surface water
OFF-SW27 (off site)	BDY	34°35' 48.045"N	86°35' 9.743"W	Facility-Wide	0.0	NA	NA	NA	Surface water
P-SW11	BDY	34°34' 21.525"N	86°40' 20.909"W	Facility-Wide	0.0	556.00	NA	NA	Surface water
RS065A	BDY	34°40' 46.52"N	86°36' 37.19"W	Facility-Wide Bedrock	142.0	585.89	588.89	57.0 – 77.0 127.0-142.0	Bedrock
RS643	BDY	34°37' 29.87"N	86°35' 21.23"W	Facility-Wide Bedrock	56.0	577.66	580.11	44.7 – 55.1	Bedrock
RS1148 EP ³ - 1	BDY	34°35' 21.629"N	86° 41' 28.22"W	Facility-Wide Bedrock	194.0	565.09	568.07	182.3-192.3	Bedrock
RS1149 EP ³ - 1	BDY	34° 35' 21.65"N	86° 41' 28.31"W	Facility-Wide Bedrock	274.4	565.23	567.80	259.4-274.4	Bedrock
RS1151 EP ³ - 2	BDY	34° 35' 00.22"N	86° 40' 39.41"W	Facility-Wide Bedrock	235.5	560.22	565.00	225.0-235.0	Bedrock
RS1152 EP ³ - 2	BDY	34° 35' 00.11"N	86° 40' 39.24"W	Facility-Wide Bedrock	300.3	560.16	564.79	270.0-285.0	Bedrock
RS1154 EP ³ - 3	BDY	34°34' 17.042"N	86°40' 20.77"W	Facility-Wide Bedrock	191.0	565.06	567.73	176.0-191.0	Bedrock
RS1157 EP ³ - 4	BDY	34° 34' 41.19"N	86° 37' 00.55"W	Facility-Wide Bedrock	200.3	562.99	565.43	190.0-200.0	Bedrock
RS1158 EP ³ - 4	BDY	34° 34' 41.30"N	86° 37' 00.48"W	Facility-Wide Bedrock	327.8	562.81	565.34	316.0-326.0	Bedrock
RS1160 EP ³ - 5	BDY	34° 35' 03.17"N	86° 36' 08.41"W	Facility-Wide Bedrock	205.5	565.24	567.85	195.5-205.5	Bedrock
RS1164 EP ³ - 6	BDY	34° 35' 7.55"N	86° 35' 16.45"W	Facility-Wide Bedrock	278.8	563.31	566.47	268.8-278.8	Bedrock
RS1167	BDY	34° 38' 15.09"N	86° 36' 08.57"W	Facility-Wide Bedrock	198.0	566.36	568.28	182.2-192.2	Bedrock
RS1294 EP ³ - 6	BDY	34° 35' 07.73"N	86° 35' 16.61"W	Facility-Wide Bedrock	119.5	563.29	565.85	109.0-119.0	Bedrock
RS1413S	BDY	34°41' 47.371"N	86°41' 54.903"W	Facility-Wide Bedrock	175.0	609.56	612.28	90.0-120.0	Nested Bedrock

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS1413D	BDY	34°41' 47.371"N	86°41' 54.903"W	Facility-Wide Bedrock	175.0	609.56	612.28	155.0-175.0	Nested Bedrock
RS1416	BDY	34°42' 33.373"N	86°39' 3.342"W	Facility-Wide Bedrock	56.0	683.69	685.69	36.0-56.0	Bedrock
RS1418	BDY	34°42' 32.778"N	86°38' 25.385"W	Facility-Wide Bedrock	92.0	629.14	631.32	82.0-92.0	Bedrock
RS1483	BDY	34°41' 27.095"N	86°42' 44.787"W	Facility-Wide Bedrock	101.0	642.52	644.76	91.0-101.0	Bedrock
RS1486c	BDY	34°42' 33.373"N	86°39' 3.342"W	Facility-Wide Bedrock	258.0	683.30	685.65	144.0-154.5	CMT Bedrock
RS1488e	BDY	34°42' 32.817"N	86° 38' 25.297"W	Facility-Wide Bedrock	125.0	628.99	631.63	121.5-124.5	CMT Bedrock
RS1489e	BDY	34°41' 0.625"N	86°37' 18.301"W	Facility-Wide Bedrock	200.0	578.75	581.18	184.5-197.0	CMT Bedrock
RS1514S	BDY	34° 37' 16.10"N	86° 35' 30.17"W	Facility-Wide Bedrock	150.0	569.55	572.07	121.0-126.0	Nested Bedrock
RS1514D	BDY	34° 37' 16.10"N	86° 35' 30.17"W	Facility-Wide Bedrock	150.0	569.55	572.07	144.0-149.0	Nested Bedrock
RS1518a	BDY	34° 37' 02.71"N	86° 35' 12.12"W	Facility-Wide Bedrock	240.0	567.67	570.15	55.5-61.0	FLUTe Bedrock
RS1518b	BDY	34° 37' 02.71"N	86° 35' 12.12"W	Facility-Wide Bedrock	240.0	567.67	570.15	83.0-89.0	FLUTe Bedrock
RS1518c	BDY	34° 37' 02.71"N	86° 35' 12.12"W	Facility-Wide Bedrock	240.0	567.67	570.15	100.0-110.0	FLUTe Bedrock
RS1518d	BDY	34° 37' 02.71"N	86° 35' 12.12"W	Facility-Wide Bedrock	240.0	567.67	570.15	152.0-163.0	FLUTe Bedrock
RS1518e	BDY	34° 37' 02.71"N	86° 35' 12.12"W	Facility-Wide Bedrock	240.0	567.67	570.15	213.0-229.0	FLUTe Bedrock
RS1520a	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	67.0 – 75.0	FLUTe Bedrock
RS1520b	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	99.0-113.0	FLUTe Bedrock
RS1520c	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	130.0-143.0	FLUTe Bedrock
RS1520d	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	164.0-175.0	FLUTe Bedrock
RS1520e	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	210.0-214.0	FLUTe Bedrock
RS1520f	BDY	34° 36' 22.62"N	86° 35' 16.66"W	Facility-Wide Bedrock	260.0	569.09	571.76	230.5-244.5	FLUTe Bedrock

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS1522S (off site)	BDY	34° 36' 39.14"N	86° 35' 14.43"W	Facility-Wide Bedrock	182.0	567.56	570.06	100.0-110.0	Nested Bedrock
RS1522D (off site)	BDY	34° 36' 39.14"N	86° 35' 14.43"W	Facility-Wide Bedrock	182.0	567.56	570.06	172.0-182.0	Nested Bedrock
RS1534a	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	99.5-103.5	FLUTe Bedrock
RS1534b	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	127.3-134.3	FLUTe Bedrock
RS1534c	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	182.2-186.2	FLUTe Bedrock
RS1534d	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	218.6-225.9	FLUTe Bedrock
RS1534e	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	235.0-235.9	FLUTe Bedrock
RS1534f	BDY	34° 35' 50.22"N	86° 35' 24.43"W	Facility-Wide Bedrock	260.0	574.68	577.36	252.0-257.0	FLUTe Bedrock
RS1673a	BDY	34° 40' 59.57"N	86° 37' 37.65"W	Facility-Wide Bedrock	125.0	595.82	597.48	72.9 – 77.9	Bedrock
RS1675S	BDY	34°39'27.698"N	86°36'41.371"W	Facility-Wide Bedrock	171.0	567.42	569.77	102.0-117.0	Nested Bedrock
RS1675D	BDY	34°39'27.698"N	86°36'41.371"W	Facility-Wide Bedrock	171.0	567.42	569.77	161.0-171.0	Nested Bedrock
RS1779	BDY	34° 41' 00.44"N	86° 42' 52.97"W	Facility-Wide Bedrock	121.0	600.69	603.19	116.0-121.0	Bedrock
RS1783S	BDY	34° 38' 08.09"N	86° 42' 32.72"W	Facility-Wide Bedrock	122.0	584.20	586.61	44.0 – 54.0	Nested Bedrock
RS1783D	BDY	34° 38' 08.09"N	86° 42' 32.72"W	Facility-Wide Bedrock	122.0	584.20	586.61	117.0-122.0	Nested Bedrock
RS1785S	BDY	34° 36' 36.12"N	86° 42' 31.56"W	Facility-Wide Bedrock	120.0	560.86	563.31	38.5 – 48.5	Nested Bedrock
RS1785D	BDY	34° 36' 36.12"N	86° 42' 31.56"W	Facility-Wide Bedrock	120.0	560.86	563.31	110.0-120.0	Nested Bedrock
RS1786S	BDY	34° 35' 46.68"N	86° 43' 14.14"W	Facility-Wide Bedrock	190.0	571.66	574.26	38.0 – 48.0	Nested Bedrock
RS1786D	BDY	34° 35' 46.68"N	86° 43' 14.14"W	Facility-Wide Bedrock	190.0	571.66	574.26	178.0-188.0	Nested Bedrock
RS1806a	BDY	34° 33' 20.19"N	86° 39' 07.77"W	Facility-Wide Bedrock	257.0	567.86	570.15	51.0 – 64.0	FLUTe Bedrock
RS1806b	BDY	34° 33' 20.19"N	86° 39' 07.77"W	Facility-Wide Bedrock	257.0	567.86	570.15	96.0-101.0	FLUTe Bedrock

TEST LOCATION	TYPE ¹	LATITUDE	LONGITUDE	UNIT(S) MONITORED	DEPTH (ft)	GROUND ELEVATION (ft. MSL)	TOP OF RISER ELEVATION (ft. MSL)	SCREENED INTERVAL (ft. bgs)	MONITORED ZONE ²
RS1806c	BDY	34° 33' 20.19"N	86° 39' 07.77"W	Facility-Wide Bedrock	257.0	567.86	570.15	248.0-257.0	FLUTe Bedrock

¹ Well Type:

POC - Point of Compliance Well

EFF - Effectiveness Monitoring Well

BDY – Boundary Well

BKG – Background Well

UPG – Upgradient Well

² Monitored Zone:

Interface – Well screened across the overburden and bedrock

CMT - Continuous Multichannel Tubing, multi-screened well in a single borehole

FLUTe – Flexible Liner Underground Technologies, multi-screened well in a single borehole

Nested – Two separate wells in a single borehole

³ – EP – Exit Pathway Well Clusters along southern boundary⁴ – TBD - To Be Determined

TABLE VII.2**GROUNDWATER QUALITY MONITORING CONSTITUENTS***

UNIT*	HAZARDOUS CONSTITUENT
RSA-003	2-Nitrotoluene
	1,1-Dichloroethene
	1,2-Dichloroethane
	cis-1,2-Dichloroethene
	Trichloroethene
	Vinyl Chloride
	Benzo(a)anthracene
	3-Nitrotoluene
	1,1-Dichloroethane
	trans-1,2-Dichloroethene
	Methylene chloride
RSA-009	Benzo(a)Anthracene
	Benzo(b)Fluoranthene
	Dibenz(a,h)Anthracene
	Indeno(1,2,3-cd)Pyrene
RSA-045	1,1-Dichloroethene
	Carbon tetrachloride
	cis-1,2-Dichloroethene
	Trichloroethene
	trans-1 2-Dichloroethene
	Vinyl chloride
	2-Nitrotoluene
	Benzo(a)anthracene
	Nitrobenzene
RSA-049	Arsenic
	Mercury
	Carbon Tetrachloride
	Trichloroethene (TCE)
RSA-053	Chlorobenzene
	Benzene
	4,4'-DDD
	4,4'-DDE
	4,4'-DDT
	Aldrin
	Alpha-BHC
	Alpha-Chlordane
	Beta-BHC
	Delta-BHC
	Dieldrin
	Endosulfan I
	Endosulfan II

UNIT*	HAZARDOUS CONSTITUENT
RSA-053	Endosulfan Sulfate
	Endrin
	Endrin Aldehyde
	Endrin Ketone
	Gamma-BHC (Lindane)
	Gamma-Chlordane
	Heptachlor
	Heptachlor Epoxide
	Methoxychlor
	Toxaphene
RSA-054/055	VOCs ¹
	SVOCs ²
	Pesticides ⁵
	TAL Metals ³
	Trichlorotrifluoroethane
	Methyl Acetate
	Cyclohexane
	1,3-Dichloropropene
	2-Hexanone
	1,2-Dibromo-3-Chloropropane
	Benzaldehyde
	Acetophenone
	2-Nitrophenol
	Bis(2-Chloroethoxy)Methane
	Hexachlorobutadiene
	Caprolactam
	1,1-Biphenyl
	Fluorine
	4,6-Dinitro-2-Methylphenol
	4-Nitroaniline
	Atrazine
	Dibenz(a,h)Anthracene
	Aldrin
	Alpha-Chlordane
	Delta-BHC
	Endosulfan I
	Endosulfan II
	Endosulfan Sulfate
	Endrin Aldehyde
	Endrin Ketone
	Gamma-Chlordane
RSA-056/139	Arsenic
RSA-060	Arsenic
	Cadmium

UNIT*	HAZARDOUS CONSTITUENT
RSA-060	Iron
	Manganese
	2,4,6-Trinitrotoluene
	2-nitrotoluene
	4,4'-DDD
	4,4'-DDE
	4,4'-DDT
	Aldrin
	Alpha-BHC
	Beta-BHC
	Dieldrin
	4-chloroaniline
	1,1,2,2-tetrachloroethane
	1,1-dichloroethene
	cis 1,2-dichloroethene
	Benzene
	Chlorobenzene
	Tetrachloroethene
	Trichloroethene
	Vinyl Chloride
RSA-083	Trichloroethene
	cis-1,2-Dichloroethene
	Vinyl Chloride
	Chlorobenzene
	1,1-Dichloroethene
	2,4-Dinitrotoluene
RSA-204	1,3-Dinitrobenzene
	Perchlorate
	2,6-Dinitrotoluene
	2-Amino-4,6-dinitrotoluene
	2-Nitrotoluene
	3-Nitrotoluene
	HMX
	Nitrobenzene
	RDX
	Trichloroethene
	cis-1,2-Dichloroethene
	trans-1,2-Dichloroethene
	Vinyl Chloride
RSA-206	cis-1,2-Dichloroethene
	1,1-Dichloroethene
	Trichloroethene
	Tetrachloroethene

UNIT*	HAZARDOUS CONSTITUENT
RSA-206	Vinyl chloride
	Carbon Tetrachloride
	Perchlorate
	2-Nitrotoluene
	RDX
	1,3-Dinitrobenzene
	Nitrobenzene
	trans-1,2-Dichloroethene
RSA-209	Trichloroethene
	Tetrachloroethene
	Perchlorate
	2- Nitrotoluene
	RDX
	cis-1,2-Dichloroethene
	trans-1,2-Dichloroethene
	Vinyl Chloride
RSA-225	2,4-Dinitrotoluene
	2,6-Dinitrotoluene
	2- Nitrotoluene
	RDX
	Benzo(a)anthracene
	Benzo(b)fluoranthene
	1,1,2,2-Tetrachloroethane
	Tetrachloroethene
	Trichloroethene
RSA-252	alpha-BHC
	beta-BHC
	4,4-DDD
	Dieldrin
	Heptachlor epoxide
	4,4-DDE
	4,4-DDT
	Aldrin
	Toxaphene
	1,1,2,2-Tetrachloroethane
	Trichloroethene
RSA-269	Trichloroethene
	1,2- Dichloroethene
	Cis-1,2-Dichloroethen
	Trans-1,2-Dichloroethene
	Vinyl chloride
OB and OD	Energetics ⁶
	TAL Metals ³
	SVOCs ²

UNIT*	HAZARDOUS CONSTITUENT
OB and OD	PAHs ⁴
	Perchlorate
	VOCs ¹
Facility Wide	Energetics ⁶
	TAL Metals ³
	Perchlorate
	SVOCs ²
	PAHs ⁴
	PCBs ⁷
	Pesticides ⁵
	VOCs ¹
Facility-Wide Bedrock	Energetics ⁶
	TAL Metals ³
	Perchlorate
	SVOCs ²
	PAHs ⁴
	PCBs ⁷
	Pesticides ⁵
	VOCs ¹

* Identifies the unit(s) at which the given constituent must be monitored.

- VOCs shall include the following: acetone, acetonitrile, acrolein, acrylonitrile, aldrin, allyl chloride, benzene, bromodichloromethane (THM), bromoform (tribromomethane) (THM), bromomethane (methyl bromide), 2-butanone (methyl ethyl ketone), sec-butylbenzene, tert-butylbenzene, carbon disulfide, carbon tetrachloride, chlorobenzene (monochlorobenzene), chloroethane, chloroform (THM), chloromethane (methyl chloride), 2-chlorotoluene (o-chlorotoluene), dibromochloromethane (THM), 1,2-dibromo-3-chloropropane (DBCP), 1,2-dibromoethane (ethylene dibromide or edb), 1,3-dichlorobenzene (m-dichlorobenzene), dichlorodifluoromethane, 1,1-dichloroethane, 1,2-dichloroethane (EDC), 1,2-dichloroethene-(cis), 1,2-dichloroethene-(trans), 1,1-dichloroethene, 1,2-dichloropropane, 1,3-dichloropropene-(cis), 1,3-dichloropropene-(trans), ethylbenzene, formaldehyde, isobutyl alcohol (isobutanol), isopropylbenzene (cumene), methanol, methylene chloride (dichloromethane), 4-methyl-2-pentanone (methyl isobutyl ketone), methyl-tert-butyl-ether (MTBE), styrene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, tetrachloroethene (PCE), toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene (TCE), trichlorofluoromethane, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl acetate, vinyl chloride, xylenes (total).
- SVOCs shall include the following: acenaphthene, acenaphthylene, aniline, anthracene, azobenzene, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, benzyl alcohol, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether (2,2-oxybis(1-chloropropane)), bis(2-ethylhexyl)phthalate (DEHP), butyl benzyl phthalate, carbazole, 4-chloroaniline, chlorobenzilate, chloro-m-cresol, p- (4-chloro-3-methylphenol), 2-chloronaphthalene (beta-chloronaphthalene), 2-chlorophenol, 3-chlorophenol (m-chlorophenol), chrysene, di (2-ethylhexyl) adipate, dichloroacetic acid, di-n-butyl phthalate (dibutyl phthalate), di-n-octyl phthalate (dioctyl phthalate), dibenzo(a,h)anthracene, dibenzofuran, 1,2-dichlorobenzene (o-dichlorobenzene), 1,4-dichlorobenzene (p-dichlorobenzene), 3,3-

dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2,6-dimethylphenol, 3,4-dimethylphenol, dimethyl phthalate, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, , indeno(1,2,3-cd)pyrene, isophorone, 2-methylnaphthalene, methyl parathion, 2-methylphenol (o-cresol), 3-methylphenol (m-cresol), 4-methylphenol (p-cresol), monochloroacetic acid, naphthalene, n-nitroso-di-n-propylamine, n-nitrosodimethylamine, n-nitrosodiphenylamine, 2-nitroaniline, nitrobenzene, 4-nitrophenol (p-nitrophenol), parathion, pentachlorobenzene, pentachlorophenol, phenanthrene, phenol, propylene glycol, pyrene, 2,3,4,6-tetrachlorophenol, tetrahydrofuran, trichloroacetic acid, 1,2,4-trichlorobenzene, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 1,3,5-trinitrobenzene, and trinitrophenylmethylnitramine.

3. TAL Metals shall include the following: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium and Zinc.
4. PAHs shall include the following: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, carbazole, 4-chloroaniline, 2-chlorophenol, chrysene, dibenzo(a,h)anthracene, 1,2-dichlorobenzene (o-dichlorobenzene), 1,4-dichlorobenzene (p-dichlorobenzene), 3,3-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, di-n-butyl phthalate (dibutyl phthalate), 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, di-n-octyl phthalate (dioctyl phthalate), fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, isophorone, 2-methylnaphthalene, 2-methylphenol (o-cresol), naphthalene, nitrobenzene, n-nitroso di-n-propylamine, n-nitrosodiphenylamine, pentachlorophenol, phenanthrene, phenol, pyrene, 1,2,4-trichlorobenzene, 2,4,5-trichlorophenol and 2,4,6-trichlorophenol.
5. Pesticides shall include the following: alachlor, aldicarb, aldicarb sulfone, aldicarb sulfoxide, aldrin, atrazine, carbofuran, chlordane, chlorobenzilate, chlorpyrifos, 4,4' - DDD, 4,4' - DDE, 4,4' - DDT, diallate, 2,4-dichlorophenoxyacetic acid (2,4-d), dieldrin, dimethoate, 2,4-dinitro-6-sec-butylphenol (dinoseb), diquat, disulfoton, endosulfan , endothall, endrin, glyphosate, HCH (alpha) (alpha - BHC), HCH (beta) (beta - BHC), HCH (gamma) Lindane (gamma - BHC), heptachlor, heptachlor epoxide, kepone, malathion, methoxychlor, oxamyl (vydate), phorate, picloram, pronamide, simazine, sulfotep (tetraethyldithiopyrophosphate) and toxaphene.
6. Energetics shall include 1,3,5-Trinitrobenze (TNB); 1,3-Dinitrobenzene (DNB); 2,4,6-Trinitrotoluene (TNT); 2,4 and 2,6-Dinitrotoluene (DNT); Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine or High Melting point Explosive (HMX); 2-Nitrotoluene (NT), 3-NT and 4-NT; 4-Amino-2,6-DNT; 2 Amino-4,6-DNT; Tetryl; Nitrobenzene (NB); Pentaerythritol tetranitrate (PETN); and Cyclotrimethylenetrinitramine or Hexahydro-1,3,5-trinitro-1,3,5-triazine or Research Department Explosive or Royal Demolition Explosive (RDX)
7. PCBs shall include Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 5460, 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189), 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167), 2,3,3',4,4',5'- Hexachlorobiphenyl (PCB 157), 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 156), 3,3',4,4',5,5'- Hexachlorobiphenyl (PCB 169), 2',3,4,4',5-Pentachlorobiphenyl (PCB 123), 2,3',4,4',5- Pentachlorobiphenyl (PCB 118), 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105), 2,3,4,4',5- Pentachlorobiphenyl (PCB 114), 3,3',4,4',5-Pentachlorobiphenyl (PCB 126), 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) and 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

TABLE VII.3
GROUNDWATER PROTECTION STANDARD

UNIT ¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L) ²
OB and OD	Energetics ¹⁰	Background
	TAL Metals ⁴	Background
	SVOCs ⁵	Background
	PAHs ⁸	Background
	Perchlorate	See Note 3
	VOCs ⁶	Background
RSA-003	2-Nitrotoluene	2.7
	1,1-Dichloroethene	7
	1,2-Dichloroethane	5
	cis-1,2-Dichloroethene	70
	Trichloroethene	5
	Vinyl Chloride	2
	Benzo(a)anthracene	0.03
	3-Nitrotoluene	0.17
	1,1-Dichloroethane	2.8
	trans-1,2-Dichloroethene	100
	Methylene chloride	5
RSA-009	Benzo(a)Anthracene	EPA RSLs ⁹
	Benzo(b)Fluoranthene	EPA RSLs ⁹
	Dibenz(a,h)Anthracene	EPA RSLs ⁹
	Indeno(1,2,3-cd)Pyrene	EPA RSLs ⁹
RSA-045	1,1-Dichloroethene	7
	Carbon tetrachloride	5
	cis-1,2-Dichloroethene	70
	Trichloroethene	5
	trans-1,2-Dichloroethene	100
	2-Nitrotoluene	0.31
	Nitrobenzene	0.14
	Benzo(a)anthracene	0.03
	Vinyl chloride	2
RSA-049	Arsenic	Background
	Mercury	Background
	Carbon Tetrachloride	Background
	Trichloroethene (TCE)	Background
RSA-053	Chlorobenzene	100
	Benzene	5

TABLE VII.3 (con't)

UNIT ¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L) ²
RSA-053	4,4'-DDD	0.28
	4,4'-DDE	0.20
	4,4'-DDT	0.20
	Aldrin	0.00021
	Alpha-BHC	0.0062
	Alpha-Chlordane	2
	Beta-BHC	0.022
	Delta-BHC	0.27
	Dieldrin	0.0015
	Endosulfan I	7.8
	Endosulfan II	7.8
	Endosulfan Sulfate	7.8
	Endrin	2
	Endrin Aldehyde	0.17
	Endrin Ketone	0.17
	Gamma-BHC (Lindane)	0.2
	Gamma-Chlordane	2
	Heptachlor	0.4
	Heptachlor Epoxide	0.2
	Methoxychlor	40
	Toxaphene	3
RSA-054/055	VOCs ⁶	EPA RSLs ⁹
	SVOCs ⁵	EPA RSLs ⁹
	Pesticides ⁷	EPA RSLs ⁹
	TAL Metals ⁴	EPA RSLs ⁹
	Trichlorotrifluoroethane	530
	Methyl Acetate	1600
	Cyclohexane	5.3
	1,3-Dichloropropene	0.41
	2-Hexanone	3.4
	1,2-Dibromo-3-Chloropropane	0.2
	Benzaldehyde	150
	Acetophenone	150
	2-Nitrophenol	60
	Bis(2-Chloroethoxy)Methane	4.6
	Hexachlorobutadiene	0.26
	Caprolactam	770
	1,1-Biphenyl	0.83
	Fluorine	4000

TABLE VII.3 (con't)

UNIT ¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L) ²
RSA-054/055	4,6-Dinitro-2-Methylphenol	0.12
	4-Nitroaniline	3.3
	Atrazine	3
	Dibenz(a,h)Anthracene	0.0029
	Aldrin	0.004
	Alpha-Chlordane	2
	Delta-BHC	0.27
	Endosulfan I	7.8
	Endosulfan II	7.8
	Endosulfan Sulfate	7.8
	Endrin Aldehyde	0.17
	Endrin Ketone	0.17
	Gamma-Chlordane	2
RSA-056/139	Arsenic	10
RSA-060	Arsenic	10
	Cadmium	5
	Iron	1100
	Manganese	32
	2,4,6-Trinitrotoluene	0.76
	2-Nitrotoluene	0.27
	4,4'-DDD	0.28
	4,4'-DDE	0.20
	4,4'-DDT	0.20
	Aldrin	0.004
	Alpha-BHC	0.0062
	Beta-BHC	0.022
	Dieldrin	0.0015
	4-Chloroaniline	0.32
	1,1,2,2-Tetrachloroethane	0.066
	1,1-dichloroethene	7
	cis-1,2-Dichloroethene	70
	Benzene	5
	Chlorobenzene	100
	Tetrachloroethene	5
	Trichloroethene	5
	Vinyl Chloride	2
RSA-083	Trichloroethene	5
	cis-1,2-Dichloroethene	70

TABLE VII.3 (con't)

UNIT ¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L) ²
RSA-083	Vinyl Chloride	2
	Chlorobenzene	100
	1,1-Dichloroethene	7
	2,4-Dinitrotoluene	1.08
RSA-204	Trichloroethene	5
	Perchlorate	15
	cis-DCE	EPA RSLs ⁹
	trans-DCE	EPA RSLs ⁹
	Vinyl Chloride	EPA RSLs ⁹
	1,3-Dinitrobenzene	EPA RSLs ⁹
	2,6-Dinitrotoluene	0.1
	2-Amino-4,6-dinitrotoluene	EPA RSLs ⁹
	2-Nitrotoluene	0.7
	3-Nitrotoluene	EPA RSLs ⁹
	HMX	EPA RSLs ⁹
	Nitrobenzene	EPA RSLs ⁹
	RDX	0.5
RSA-206	cis-1,2-Dichloroethene	70
	1,1-Dichloroethene	7
	Trichloroethene	5
	Tetrachloroethene	5
	Vinyl chloride	2
	Carbon Tetrachloride	5
	Perchlorate	15
	2-Nitrotoluene	2.5
	RDX	1.4
	1,3-Dinitrobenzene	0.2
	Nitrobenzene	0.14
	trans-1,2-Dichloroethene	100
RSA-209	Perchlorate	15
	Trichloroethene	5
	Tetrachloroethene	5
	2- Nitrotoluene	1.35
	RDX	1.35
	cis-1,2-Dichloroethene	70

TABLE VII.3 (con't)

UNIT ¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L) ²
RSA-209	trans- 1, 2- Dichloroethene	100
	Vinyl Chloride	2
RSA-225	2,4-Dinitrotoluene	0.11
	2,6-Dinitrotoluene	0.05
	2- Nitrotoluene	0.31
	RDX	0.71
	Benzo(a)anthracene	0.020
	Benzo(b)fluoranthene	0.012
	1,1,2,2-Tetrachloroethane	0.38
	Tetrachloroethene	5
	Trichloroethene	5
RSA-252	4,4'-DDD	0.042
	4,4'-DDE	0.23
	4,4'-DDT	0.23
	Aldrin	0.0046
	alpha-BHC	0.0085
	beta-BHC	0.093
	Dieldrin	0.0029
	Heptachlor epoxide	0.2
	Toxaphene	3
	1,1,2,2-Tetrachloroethane	0.37
	Trichloroethene	5
RSA-269	Trichloroethene	5
	1,2- Dichloroethene	EPA RSLs ⁹
	cis-1,2-Dichloroethene	70
	trans-1,2-Dichloroethene	100
	Vinyl chloride	2
Facility-Wide	SVOCs ⁵	EPA RSLs ⁹
	PAHs ⁸	EPA RSLs ⁹
	Pesticides ⁷	EPA RSLs ⁹
	PCBs ¹¹	EPA RSLs ⁹
	VOCs ⁶	EPA RSLs ⁹
Facility-Wide Bedrock	Energetics ¹⁰	EPA RSLs ⁹
	Perchlorate	See Note 3
	VOCs ⁶	EPA RSLs ⁹
	TAL Metals ⁴	EPA RSLs ⁹
	SVOCs ⁵	EPA RSLs ⁹

TABLE VII.3 (con't)

UNIT¹	HAZARDOUS CONSTITUENT	MAXIMUM CONCENTRATION LIMIT (µg/L)²
Facility-Wide Bedrock	PAHs ⁸	EPA RSLs ⁹
	Pesticides ⁷	EPA RSLs ⁹
	PCBs ¹¹	EPA RSLs ⁹

Notes:

1. Identifies the unit(s) at which the given constituent must be monitored.
2. Drinking Water Standards and Health Advisories, USEPA MCL (latest edition). Background values are the calculated site-specific background concentration in accordance with ADEM Admin. Code R.335-14-5-Appendix IV. MDL must not exceed established MCL (Maximum Concentration Limit) regulatory levels. Where Background values do not exist, the values listed in the most recent US EPA Regional Screening Level (RSL) Table, using a Hazard Quotient (HQ) of 0.1 shall be referenced.
3. Perchlorate is not listed as a hazardous constituent in Appendix IX; however, it is a constituent of concern for RSA and shall be included in the groundwater protection standards. A background level for perchlorate does not exist; therefore, the standard listed in the most recent US EPA RSL Table, using a HQ of 0.1, shall be referenced.
4. TAL Metals shall include the following: Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium and Zinc.
5. SVOCs shall include the following: acenaphthene, acenaphthylene, aniline, anthracene, azobenzene, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, benzoic acid, benzyl alcohol, bis(2-chloroethyl)ether, bis(2-chloroisopropyl)ether (2,2-oxybis(1-chloropropane)), bis(2-ethylhexyl)phthalate (DEHP), butyl benzyl phthalate, carbazole, 4-chloroaniline, chlorobenzilate, chloro-m-cresol, p- (4-chloro-3-methylphenol), 2-chloronaphthalene (beta-chloronaphthalene), 2-chlorophenol, 3-chlorophenol (m-chlorophenol), chrysene, di (2-ethylhexyl) adipate, dichloroacetic acid, di-n-butyl phthalate (dibutyl phthalate), di-n-octyl phthalate (dioctyl phthalate), dibenzo(a,h)anthracene, dibenzofuran, 1,2-dichlorobenzene (o-dichlorobenzene), 1,4-dichlorobenzene (p-dichlorobenzene), 3,3-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2,6-dimethylphenol, 3,4-dimethylphenol, dimethyl phthalate, 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, fluoranthene, fluorene, hexachlorobenzene, hexachlorobutadiene, hexachlorocyclopentadiene, hexachloroethane, indeno(1,2,3-cd)pyrene, isophorone, 2-methylnaphthalene, methyl parathion, 2-methylphenol (o-cresol), 3-methylphenol (m-cresol), 4-methylphenol (p-cresol), monochloroacetic acid, naphthalene, n-nitroso di-n-propylamine, n-nitrosodimethylamine, n-nitrosodiphenylamine, 2-nitroaniline, nitrobenzene, 4-nitrophenol (p-nitrophenol), parathion, pentachlorobenzene, pentachlorophenol, phenanthrene, phenol, propylene glycol, pyrene, 2,3,4,6-tetrachlorophenol, tetrahydrofuran, trichloroacetic acid, 1,2,4-trichlorobenzene, 2,4,5-trichlorophenol, 2,4,6-trichlorophenol, 1,3,5-trinitrobenzene, and trinitrophenylmethylnitramine. Where background values do not exist, the values listed in the most recent US EPA RSL Table, using a HQ of 0.1 shall be referenced.

6. VOCs shall include the following: acetone, acetonitrile, acrolein, acrylonitrile, aldrin, allyl chloride, benzene, bromodichloromethane (THM), bromoform (tribromomethane) (THM), bromomethane (methyl bromide), 2-butanone (methyl ethyl ketone), sec-butylbenzene, tert-butylbenzene, carbon disulfide, carbon tetrachloride, chlorobenzene (monochlorobenzene), chloroethane, chloroform (THM), chloromethane (methyl chloride), 2-chlorotoluene (o-chlorotoluene), dibromochloromethane (THM), 1,2-dibromo-3-chloropropane (DBCP), 1,2-dibromoethane (ethylene dibromide or edb), 1,3-dichlorobenzene (m-dichlorobenzene), dichlorodifluoromethane, 1,1-dichloroethane, 1,2-dichloroethane (EDC), 1,2-dichloroethene-(cis), 1,2-dichloroethene-(trans), 1,1-dichloroethene, 1,2-dichloropropane, 1,3-dichloropropene-(cis), 1,3-dichloropropene-(trans), ethylbenzene, formaldehyde, isobutyl alcohol (isobutanol), isopropylbenzene (cumene), methanol, methylene chloride (dichloromethane), 4-methyl-2-pentanone (methyl isobutyl ketone), methyl-tert-butyl-ether (MTBE), styrene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, tetrachloroethene (PCE), toluene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene (TCE), trichlorofluoromethane, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl acetate, vinyl chloride and xylenes (total). Where background values do not exist, the values listed in the most recent US EPA RSL Table, using a HQ of 0.1 shall be referenced.
7. Pesticides shall include the following: alachlor, aldicarb, aldicarb sulfone, aldicarb sulfoxide, aldrin, atrazine, carbofuran, chlordane, chlorobenzilate, chlorpyrifos, 4,4' - DDD, 4,4' - DDE, 4,4' - DDT, diallate, 2,4-dichlorophenoxyacetic acid (2,4-d), dieldrin, dimethoate, 2,4-dinitro-6-sec-butylphenol (dinoseb), diquat, disulfoton, endosulfan, endothall, endrin, glyphosate, HCH (alpha) (alpha - BHC), HCH (beta) (beta - BHC), HCH (gamma) Lindane (gamma - BHC), heptachlor, heptachlor epoxide, kepone, malathion, methoxychlor, oxamyl (vydate), phorate, picloram, pronamide, simazine, sulfotep (tetraethyldithiopyrophosphate) and toxaphene. Where background values do not exist, the values listed in the most recent US EPA RSL Table, using a HQ of 0.1 shall be referenced.
8. PAHs shall include the following: acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, carbazole, 4-chloroaniline, 2-chlorophenol, chrysene, dibenzo(a,h)anthracene, 1,2-dichlorobenzene (o-dichlorobenzene), 1,4-dichlorobenzene (p-dichlorobenzene), 3,3-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, di-n-butyl phthalate (dibutyl phthalate), 2,4-dinitrophenol, 2,4-dinitrotoluene, 2,6-dinitrotoluene, di-n-octyl phthalate (dioctyl phthalate), fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, isophorone, 2-methylnaphthalene, 2-methylphenol (o-cresol), naphthalene, nitrobenzene, n-nitroso-di-n-propylamine, n-nitrosodiphenylamine, pentachlorophenol, phenanthrene, phenol, pyrene, 1,2,4-trichlorobenzene, 2,4,5-trichlorophenol and 2,4,6-trichlorophenol. Where background values do not exist, the values listed in the most recent US EPA RSL Table, using a HQ of 0.1 shall be referenced.
9. EPA RSLs are the values listed for Tap Water in the most recent US EPA Regional Screening Level (RSL) Table, using a Hazard Quotient (HQ) of 0.1.
10. Energetics shall include 1,3,5-Trinitrobenzene (TNB); 1,3-Dinitrobenzene (DNB); 2,4,6-Trinitrotoluene (TNT); 2,4 and 2,6-Dinitrotoluene (DNT); Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine or High Melting point Explosive (HMX); 2-Nitrotoluene (NT), 3-NT and 4-NT; 4-Amino-2,6-DNT; 2 Amino-4,6-DNT; Tetryl; Nitrobenzene (NB); Pentaerythritol tetranitrate (PETN); and Cyclotrimethylenetrinitramine or Hexahydro-1,3,5-trinitro-1,3,5-triazine or Research Department Explosive or Royal Demolition Explosive (RDX)
11. PCBs shall include Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor

1254, Aroclor 1260, Aroclor 5460, 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189), 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167), 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157), 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156), 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169), 2',3,4,4',5-Pentachlorobiphenyl (PCB 123), 2,3',4,4',5-Pentachlorobiphenyl (PCB 118), 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105), 2,3,4,4',5-Pentachlorobiphenyl (PCB 114), 3,3',4,4',5-Pentachlorobiphenyl (PCB 126), 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) and 3,4,4',5-Tetrachlorobiphenyl (PCB 81)

Table VII.4.
ADDITIONAL MONITORING PARAMETERS

PARAMETER	UNIT OF MEASURE	LOCATION
Temperature	Degrees, (°F or °C)	Field*
Conductivity	Mhos/cm	Field*
pH	Standard Units (S.U.)	Field*
Reduction oxidation potential	Millivolts (mV)	Field*
Dissolved Oxygen	Milligrams/liter (mg/l)	Field*
Turbidity	Nephelometric turbidity Units (NTU)	Field*

* To be submitted as raw data in the annual reports required by Permit Condition VII.B.6.b.

PART VIII

CORRECTIVE MEASURES IMPLEMENTATION

VIII.A. APPLICABILITY

The conditions of this Part apply to SWMUs and AOCs identified in Table VIII.1.

VIII.B. GENERAL CONDITIONS

1. The Permittee is required to perform corrective measures for the SWMUs and AOCs identified in Condition VIII.A. The approved remedy for these defined units, waterway areas, or land parcels includes any and all actions set forth in this permit and in the approved Interim Measures Plans, Corrective Measures Studies (CMSs), Corrective Measures Implementation (CMI) Plans, Records of Decision (RODs), Remedial Action Work Plans (RA WPs) and Land Use Control Remedial Design (LUC RD) Plans approved by the Department, as noted in Table VIII.1.

2. Remedial Cleanup Levels

Upon approval, pursuant to the Condition VI.E, of the CMI Plan designating applicable cleanup level(s), the cleanup level(s) for the areas specific to the CMI Plan will be deemed to be a condition of this permit.

3. Groundwater Monitoring and Remediation

Where required pursuant to Conditions VIII.B.1 and VIII.C of this permit, the Permittee shall comply with the general groundwater monitoring requirements of Part VII of this permit.

4. Land Use Controls

Where required pursuant to Conditions VIII.B.1 and VIII.C of this permit, the Permittee shall establish appropriate land use controls to achieve protection of human health and the environment. The Permittee shall comply with Conditions VIII.B.5 and VIII.B.6 of this permit when implementing corrective measures requiring land use controls. In the event an off-site property owner will not allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 calendar days of receipt of such written notification of the refusal by the off-site property owner. If the property owner does not provide a written refusal of the request to allow an environmental covenant to be imposed, the Permittee shall notify the Department within 14 days of delivery of the request to the off-site property owner. In such cases, the Department may allow the Permittee to propose an alternate area-specific land use control subject to the Department's review and approval.

5. Survey Plat

For corrective measures where residual concentrations of contaminants will remain in-place at levels greater than those appropriate for unrestricted land use, or for corrective measures that rely on land use controls, the Permittee must:

- a. No later than the submission of the certification of closure of each hazardous waste disposal unit, the Permittee shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of the SWMUs, AOCs, and capped or partially remediated areas with respect to permanently surveyed benchmarks, the locations of sampling points, and the concentrations of hazardous constituents detected. This plat must be prepared and certified by a professional land surveyor registered in the State of Alabama. The plat must be filed with the local zoning authority or the authority with jurisdiction over local land use and must contain a note, prominently displayed, which states the Permittee's obligation to limit the property to the specified restricted uses.
- b. Maintain the survey plat as described in Condition VIII.B.5.a of this permit and in the CMI Report, until the Permittee has demonstrated, to the satisfaction of the Department that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

6. Environmental Covenant

No later than the submission of the survey plat required in Condition VIII.B.5, the Permittee must:

- a. Record in the probate judge's office of the county in which the property is located or a portion thereof an environmental covenant or a notice of environmental use restriction (NEUR) in accordance with ADEM Admin. Code R. 335-5 that will in perpetuity notify any potential purchaser of the property that:
 - i. The land is contaminated with hazardous constituents in concentrations that exceed unrestricted use standards;
 - ii. The use of the property is restricted by this permit for certain residential, municipal, or industrial purposes and may lead to an increased risk of exposure to hazardous constituents depending upon the activities initiated at the site. Such activities may yield an increased level of human health risk to the owner;
 - iii. The potential purchaser or entity that desires to work in the contaminated area should notify the Permittee before mobilizing to the area covered by the land use control.

- b. Submit to the Department a certification, signed by the Permittee in accordance with Permit Condition I.C.11, that the environmental covenant or NEUR specified in this part has been performed. This certification must include a copy of the environmental covenant or NEUR and of the document in which the notation has been placed.
- c. Maintain the environmental covenant or NEUR described in Permit Condition VIII.B.6 until the Permittee has demonstrated, to the satisfaction of the Department that the levels of hazardous constituents in all contaminated media are within limits appropriate for unrestricted land uses.

7. Security

Security measures, where required by Conditions VIII.B.1 and VIII.C of this permit, will be conducted in accordance with ADEM Admin. Code R. 335-14-5-.02(5) and as prescribed in the approved CMI Plan, LUC RD or RA WP.

8. Inspection

Where corrective measures addressed in Conditions VIII.B.1 include provisions to cap in place or partially remediate properties or land areas, whether owned or not owned by the Permittee, the Permittee shall specify inspection protocols on a scheduled basis to ensure continued integrity of the remedy and to ensure that land use remains appropriately restricted per the environmental covenant or NEUR established pursuant to Permit Condition VIII.B.6. Inspection provisions shall be as prescribed in the approved CMI Plan.

VIII.C. AREA SPECIFIC CONDITIONS

The Permittee shall implement the actions and conditions as described in the referenced CMI Plans identified in Table VIII.1 and this Permit; the current area specific conditions are as follows:

- 1. Open Burning/Open Detonation (OB/OD) Area, RSA-012 and RSA-131: The Permittee shall increase the surface elevation in the OD area. The existing pedestals, firing pins and any excavated, contaminated soils shall be disposed offsite. The Permittee shall remove the berms that are located on three sides of the OD area. The materials excavated from the berms shall be tested to determine whether they can be stockpiled for reuse as fill in the OD area. The Permittee shall then place a stone base layer, a 30-mil polypropylene liner, a drainage layer, a geotextile, and compacted embankment over the OD area.

The surface elevation in the OD shall be increased to 580 feet above mean sea level, 9 feet above the 100-year flood elevation. The Permittee shall construct a holding pond southwest of the OD area to collect the water that accumulates in the drainage layer in accordance with the plans. A hazardous waste determination shall be made prior to

discharging the water from the holding pond. The Permittee shall conduct groundwater monitoring in accordance with Section VII of this permit.

- a. The open detonation (OD) area surface shall be visually inspected at least weekly to ensure that it remains at least nine feet above the 100-year flood elevation.
 - b. The holding pond shall be inspected at least weekly to verify it has not sustained any damage. Repair of a disturbance or breach of the holding pond shall be initiated within 10 days of identifying the need for such repairs.
 - c. The pits used for OD shall be excavated to a maximum depth of four feet. No other intrusive activities, including excavations and well installations, shall be permitted at the OD area that may compromise the newly installed liner and drainage system.
 - d. The site shall not be developed with residential, school, child care or playground facilities. A NEUR shall be completed in accordance with ADEM Admin. Code r. 335-5, incorporated into the facility Master Plan and recorded in the land records for the property.
 - e. The existing chain link fence, gates and warning signs shall be maintained and inspected at least weekly at the OB/OD area.
 - f. The Army shall monitor the presence and effectiveness of land use restrictions and controls in accordance with Section F-2 and Table F-1 of RSA's permit application. The Permittee shall report on the land use restrictions and controls annually.
 - g. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - h. The LUCs shall be maintained until the concentrations of hazardous substances at the OB/OD area are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J, to remove the LUCs is submitted to the Department for review and approval.
2. RSA-003, In-Ground Oil/Water Separator, Building 3617 OU-24: The Permittee shall survey and mark the 14 proposed in-situ enhanced bioremediation (ISEB) injection locations. Initial full-scale ISEB via 14 direct-push technology (DPT) shall be conducted. Four additional ISEB injections shall be conducted after two years. The Permittee shall conduct groundwater monitoring in accordance with Section VII of this permit. The effectiveness of the remedy shall be evaluated based on the groundwater monitoring results. Additional ISEB injections may be completed depending on the monitoring results.
3. RSA-009, Inactive Sewage Treatment Plant #3, OU-23: This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
 - a. The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will be stockpiled on impervious material and covered with waterproof material to prevent contaminant migration before transport to a Subtitle D landfill. Composite samples will be taken from the

- completed excavation sidewalls and from the excavation floor for COC analyses. One floor sample for every 2,500 square feet and one sidewall sample for every 50 linear feet of sidewall will be collected. At locations where detected concentrations exceed cleanup goals, over-excavation may be performed. Excavated soil with concentrations exceeding the cleanup goal will be shipped to a permitted Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required.
- b. The Permittee shall conduct groundwater monitored natural attenuation (MNA) monitoring in accordance with Section VII of this permit. The Permittee shall maintain the administrative controls currently in place for groundwater including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-009 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-149 groundwater unit.
4. RSA-045, Former Smoke Munitions Filling Plant 3, Operable Unit 02: This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
 - a. As described in the Revision 1 CMI Work Plan for RSA-045, the Permittee shall excavate contaminated soil, dispose it off-site, and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or stocked piled into impervious material within RSA-045 and covered with waterproof material to prevent contaminant migration. Composite samples of the stockpile will be taken at a frequency of one sample per 200 cubic yards of material for TCLP pesticides. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required.
 - b. The Permittee shall implement in situ enhanced bioremediation (ISEB) for groundwater via direct push-technology injection points and shall conduct groundwater monitoring in accordance with the CMI Plan and Part VII of this permit to monitor and evaluate monitored natural attenuation (MNA) as described in the CMI Plan.
 - c. The Permittee shall maintain the administrative controls currently in place for groundwater, including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-045 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-145 groundwater unit
 5. RSA-049, Capped Arsenic Waste Ponds – West, OU-5: The Permittee shall conduct groundwater monitoring in addition to inspecting and maintaining the existing multi-layer RCRA-type cap that was installed in 1997 and the following engineering and administrative controls. The Permittee shall conduct groundwater monitoring in accordance with Section VII of this permit.
 - a. No intrusive activities, including excavations and well installations, shall be permitted at RSA-049 that may compromise the existing cap.

- b. The site shall not be developed with residential, school, child care or playground facilities.
 - c. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - d. The cap shall be maintained by mowing and performing necessary repairs in a timely manner.
 - e. Cap inspections shall be performed as required in Appendix D of the operative edition of Redstone Arsenal Regulation 200-7 (Site Access Control Program), and whenever mowing is done.
 - f. No buildings that are to be occupied shall be constructed at RSA-049 without vapor barrier studies or engineered controls to prevent vapor intrusion. The Permittee shall submit building plans and engineering control remedial design plans to the Department for review and approval at least 90 days prior to scheduled commencement of construction activities.
 - g. No structures which have the potential to breach or negatively impact the cap shall be constructed on RSA-049.
 - h. The existing chain link fence and gates shall be maintained and warning signs shall be installed, inspected and maintained at RSA-049. The warning signs shall be installed at entrance locations and other locations to be seen from any approach legible from a distance of 25 feet.
 - i. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - j. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - k. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-049 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J, to remove the LUCs is submitted to the Department for review and approval.
6. RSA-053, Inactive Sanitary and Industrial Landfill, Operable Unit 07: The Permittee shall excavate soil from the southern waste disposal trench area (WDTA) and consolidate it in the northern WDTA. A low-permeability soil cap shall be installed and maintained to prevent exposure to the waste material remaining in the northern WDTA. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit in addition to maintaining the following institutional and engineering controls:
- a. Signs shall be maintained around the soil cover identifying it as a “No Dig Area”. The warning signs must meet the requirements specified in ADEM Administrative Code 335-14-5-.02(5)(c) and 335-14-6-.02(5)(c), which state that signs shall be posted at each entrance to the active portion of the facility and at other locations in sufficient numbers to be seen from any approach to the active portion and that they must be legible from 25 feet.
 - b. Fencing at RSA-053 shall meet the requirements specified in Alabama Administrative Code 335-14-5-.02(5).

- Residential use and/or residential development of the WDTA area of the site (southern and northern), including use or development for residential housing, elementary and secondary schools, child care facilities, and playgrounds, are prohibited. A NEUR shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
- c. No intrusive activities, including excavations and well installations, that would compromise the effectiveness of the multilayer RCRA-type cap are permitted at the site unless prior approval is obtained from ADEM.
 - d. Routine maintenance requirements include, but are not limited to the following:
 - i. Mowing shall be conducted a minimum of twice a year.
 - ii. Quarterly inspections must be performed on the soil cap in the northern WDTA.
 - iii. Repair of any disturbance or breach of the soil cap shall be conducted within 10 days of identifying the need for such repairs.
 - iv. Repairs to the warning signs shall be completed on an as-needed basis and shall be conducted within 10 days of identifying the need for such repairs.
 - e. Annually, the Permittee shall evaluate and determine whether any changes in site use or construction have occurred which are inconsistent with the restrictions described herein. If uses inconsistent with the CMI Plan are identified, ADEM shall be notified within 10 days after such uses are identified.
 - f. Inspection requirements include, but are not limited to the following:
 - i. Inspection of the warning signs surrounding the northern WDTA soil cap to ensure that they are present and legible shall be performed on an annual basis.
 - ii. Inspection of the soil cap for the northern WDTA shall be performed on a quarterly basis to ensure that no breach of the soil cap has occurred and that underlying waste is not exposed.
 - iii. An inspection/maintenance report shall be submitted to ADEM no less frequent than annually. This report may be submitted as a separate report or as part of another report for the site or as part of another inspection/maintenance report for other sites. The report shall document the results of the quarterly inspections, include a discussion of any maintenance activities conducted, and identify the status of the Land Use Controls (LUCs) identified in the CMI Plan and how any deficiencies or inconsistent uses have been addressed. The annual evaluation should address whether the use restrictions and controls referenced previously were recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls. The report should include a copy of the annual inspection report, any violations noted, and recommendations for any changes to the CMI Plan.
 - g. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Memorandum #304.

- h. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-053 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
7. RSA-054/RSA-055, Inactive Sanitary and Industrial Landfill, OU-1: The Permittee shall excavate soil and waste from the southern portion of the landfill (RSA-055), from under Fowler Road and from adjacent to Lindner Road near its intersection with Jungerman Road. The wastes shall be moved to and consolidated in the northern portion of the landfill (RSA-054). A low-permeability soil cover shall be installed over the consolidated wastes and maintained to prevent exposure to the waste. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit in addition to installing and maintaining the following institutional and engineering controls:
- a. Signs shall be installed and maintained around the soil cap identifying it as a “No Dig Area”. The warning signs shall be placed a maximum of 200 feet apart along Fowler and Lindner Roads and a maximum of 400 feet apart along the northern and western soil cover boundaries. The signs must be legible from 25 feet.
 - b. No structures are to be built over the northern portion of RSA-054/055 where the clay cover will be placed.
The entire site is unsuitable for residential use or residential development. No residential housing, elementary or secondary schools, child care facilities or playgrounds are to be constructed. Industrial structures may be constructed in the southern portion of RSA-054/055 (south of Fowler Road) provided that further evaluation indicates that there would be no unacceptable health risk associated with vapor intrusion or indoor air exposure. The Permittee shall obtain ADEM approval prior to any planned construction at RSA-054/055.
 - c. A NEUR shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - d. No intrusive activities, including excavations and well installations, that would compromise the effectiveness of soil cap, are permitted at RSA-054/055 unless prior approval is obtained from ADEM.
 - e. Routine maintenance and inspection requirements include, but are not limited to the following:
 - i. Mowing shall be conducted at least twice a year. Inspect the soil cap in the northern portion of RSA-054/055 at least once a quarter to ensure that no breach of the cap has occurred. Inspect the storm water conveyance system in the northern portion of RSA-054/055 at least quarterly to ensure that the system is uncompromised and in good working order.
 - ii. Repair any disturbance or breach of the soil cap or storm water conveyance system within 10 days of identifying the need for such repairs.
 - iii. Inspect the warning signs around the capped landfill area to ensure that they are present and legible at least annually.
 - iv. Repair the warning signs on an as-needed basis and within 10 days of identifying the need for such repairs.

- v. At least annually, evaluate RSA-054/055 to determine whether any changes in site use or construction have occurred that are inconsistent with the restrictions described herein. If inconsistent uses are identified, ADEM shall be notified within 10 days.
 - vi. An inspection/maintenance report shall be submitted to ADEM at least annually. This report may be submitted as a stand-alone report or as part of another report for RSA-054/055 or as part of another inspection/maintenance report for other sites. The report shall document the results of the quarterly cap and storm water conveyance system inspections, include a discussion of the maintenance activities conducted, and identify the status of the Land Use Controls (LUCs) identified in the CMI Plan and how any deficiencies or inconsistent uses have been addressed. The annual report should address whether the use restrictions and controls were recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls. The report should include any violations noted and the procedures followed to address the violations.
 - f. The annual monitoring report shall provide ADEM information regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work that is inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Memorandum #304.
 - g. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-054/055 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
8. RSA-056, Closed Arsenic Waste Ponds (South) Area U and RSA-139, Closed Arsenic Waste Pond (North) Area U – Operable Unit 06: The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit in addition to maintaining the following institutional and engineering controls:
- a. Inspection and maintenance of the existing capped areas shall be conducted to ensure their continued integrity.
 - b. An NEUR shall be completed, incorporated into the facility Master Plan and documented in the land records for the property. The NEUR shall restrict the RSA-056 and RSA-139 soil cover areas to industrial/commercial uses; prohibit activities that would disturb the soil cover areas; and require inspection, maintenance, and repair of fencing, signage, and the capped areas including the cap/creek interface.
 - c. At RSA-056, single wire, high visibility fencing shall be installed around the perimeter except for an approximately ten-foot distance on the eastern perimeter at a service road. A locking, single-chain gate will be installed at the service road to allow controlled site access.
 - d. At RSA-139, single wire, high visibility fencing shall be installed along the north, west and south boundaries. Riprap, shotcrete and a creek bed are present on the east side of RSA-139.

- e. Signs shall be included along the perimeter of both RSA-056 and RSA-139 to identify the site as a “No Dig Area”. A minimum of three new signs shall be installed along the eastern border of RSA-139, spaced no more than 100 feet apart.
 - f. Semiannual site inspections, consisting of complete walkthroughs and visual inspections of the covered areas, fencing, signs, cap/creek interface, and existing well network, shall be completed. The results of the inspections shall be submitted to the Department annually.
 - g. Repair of a capped area disturbance or breach that potentially impacts the integrity of the cover shall be initiated within 10 days of identifying the need for such repairs.
 - h. Repairs/replacements of the warning signs and fencing shall be completed on an as needed basis to maintain access control and shall be initiated within 10 days of identifying the need for such repairs/replacements.
 - i. Mowing of the soil covers shall be conducted at least twice a year to prevent growth of trees that could impact the capped areas and to allow adequate inspection of the capped areas.
 - j. Vegetation clearing along the cap/creek interface and removal of silt, debris, downed trees, and other impairments (e.g., beaver dams) that impact free flow through the creek shall be conducted as needed.
 - k. The existing monitoring well network shall be inspected during each sampling event at the sites to ensure the integrity of the monitoring wells is maintained. Repair or replacement of damaged wells shall be initiated within 10 days of identifying the need for such repairs.
 - l. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - m. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - n. The LUCs listed above shall be maintained until the concentrations of hazardous substances at RSA-056 and RSA-139 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the above LUCs is approved by the Department.
9. RSA-057, Inactive Arsenic Waste Lagoons – East, OU-6: The Permittee shall inspect and maintain LUCs required as follows.
- a. No residential use or development shall be permitted at RSA-057.
 - b. Maintain warning signs at key site entry points. The warning signs shall be installed at entrance and other locations to be seen from any approach legible from a distance of 25 feet.
 - c. Prevent exposure of construction worker to soils with arsenic concentrations of greater than 100 mg/kg.
 - d. No soils shall be excavated at the site without a use permit.
 - e. Special handling procedures shall be required for future site excavations for industrial development as outlined in all applicable documents (e.g., Soils Management Plan, Investigation-Derived Waste Management Plan, etc.)

- f. The Permittee shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - g. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-057 are at levels to allow for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J, to remove the LUCs is approved by the Department.
10. RSA-058, Inactive Rubble Fill/Waste Pile: The Permittee shall excavate soil, dispose off-site, and replace with clean soil. The corrective action has been designed to achieve industrial site use for surface media. The Permittee shall conduct fish tissue, surface water, and sediment monitoring annually in accordance with the CMI plan and inspect and maintain LUCs required as follows.
 - a. No residential use or development, including development for residential housing, elementary and secondary schools, child care facilities, and playgrounds shall be permitted at RSA-058.
 - b. Recreational fishing within the Central Swamp is prohibited.
 - c. Maintain warning signs for restrictions on fishing at locations to be seen from any approach legible from a distance of 25 feet.
 - d. Implement the long-term monitoring plan for fish tissue, surface water, and sediment at the site. Maintain biological fish tissue sampling locations 058-Fish01 and 058-Fish02, and surface water/sediment sampling locations 058-SWSD001, 058-SWSD002, 058-SWSD003 for RSA-058 as identified in the CMI Plan.
 - e. An NEUR shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property
 - f. An annual monitoring report on the presence and effectiveness of land use restrictions and controls shall be submitted to ADEM for the site. This report shall document the annual inspection and identify the status of the NEUR and how any deficiencies or inconsistent uses have been addressed. The annual evaluation shall address whether the use restrictions and controls referenced previously are communicated in the deed(s), whether the owners and state and local agencies are notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Memorandum #304.
 - g. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-058 are suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
11. RSA-060, Inactive Sanitary and Industrial Landfill, Operable Unit 7: The Permittee shall excavate soil from the southern portion of the site and consolidate it in the northern portion of the site. A low-permeability soil cap shall be installed and maintained to prevent exposure to the waste material remaining in the northern area of the site. The Permittee shall conduct groundwater monitoring in accordance with Part VII of this permit in addition to maintaining the following institutional and engineering controls:

- a. Signs shall be maintained around the soil cover identifying it as a “No Dig Area”. The warning signs must meet the requirements specified in ADEM Administrative Code 335-14-5-.02(5)(c) and 335-14-6-.02(5)(c), which state that signs shall be posted at each entrance to the active portion of the facility and at other locations in sufficient numbers to be seen from any approach to the active portion and that they must be legible from 25 feet.
- b. Fencing at RSA-060 shall consist of high visibility, plastic coated, single strand wire that will be maintained at a three-foot height above the ground surface with steel posts. The fence shall be installed as described in Appendix J of the CMI work plan and shall meet the requirements specified in Alabama Administrative Code 335-14-5-.02(5).
- c. Residential use and/or residential development of the waste disposal area of the site (southern and northern), including use or development for residential housing, elementary and secondary schools, child care facilities, and playgrounds, are prohibited.
- d. A NEUR shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
- e. No intrusive activities, including excavations and well installations, that would compromise the effectiveness of the multilayer RCRA-type cap are permitted at the site unless prior approval is obtained from ADEM.
- f. Routine maintenance requirements include, but are not limited to the following:
 - i. Mowing shall be conducted a minimum of twice a year.
 - ii. Quarterly inspections must be performed on the soil cap in the northern disposal area. Repair of any disturbance or breach of the soil cap shall be conducted within 10 days of identifying the need for such repairs.
 - iii. Repairs to the warning signs shall be completed on an as-needed basis and shall be conducted within 10 days of identifying the need for such repairs.
 - iv. Repairs to the perimeter fencing shall be completed on an as-needed basis and shall be conducted within 10 days of identifying the need for such repairs.
- g. Annually, the Permittee shall evaluate and determine whether any changes in site use or construction have occurred which are inconsistent with the restrictions described herein. If uses inconsistent with the CMI Plan are identified, ADEM shall be notified within 10 days after such uses are identified.
- h. Inspection requirements include, but are not limited to the following:
 - i. Inspection of the warning signs surrounding the northern disposal area soil cap to ensure that they are present and legible shall be performed on an annual basis.
 - ii. Inspection of the perimeter fence to ensure the fence is positioned at the proper height, not covered by vegetation, the components (wire, posts, fasteners, gates, locking mechanisms) meet the engineering specifications shall be performed on an annual basis.
 - iii. Inspection of the soil cap for the northern disposal area shall be performed on a quarterly basis to ensure that no breach of the soil cap has occurred and that underlying waste is not exposed.
 - iv. An inspection/maintenance report shall be submitted to ADEM no less frequent than annually. This report may be submitted as a separate report or as part of another report for the site or as part of another inspection/maintenance report for other sites. The report shall document

the results of the quarterly inspections, include a discussion of any maintenance activities conducted, and identify the status of the Land Use Controls (LUCs) identified in the CMI Plan and how any deficiencies or inconsistent uses have been addressed. The annual evaluation should address whether the use restrictions and controls referenced previously were recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls. The report should include a copy of the annual inspection report, any violations noted, and recommendations for any changes to the CMI Plan.

- i. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code r. 335-5-1-.02(3).
 - j. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-060 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
12. RSA-083, Paint Spray Booth Sump, Building 7344, OU-09: The Permittee shall conduct monitored natural attenuation (MNA) groundwater monitoring in accordance with Section VII of this permit. The Permittee shall maintain the administrative controls currently in place for groundwater including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-083 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-146 groundwater unit.
 13. RSA-101 shall be addressed in accordance with the Olin Consent Decree and the *Joint Technical Proposal to Implement Remedial Activities Pursuant to Consent Decree* (Reference Civil Action No. CV80-PT-5300-NE Filed May 31, 1983).
 14. RSA-140, Inactive Disposal Area near T/S Tower, OU-12: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or stockpiled onto impervious material within RSA-140 and covered with waterproof material to prevent contaminant migration. Composite samples of the stockpile will be taken at a frequency of one sample per 200 cubic yards of material for TCLP metals, pesticides, PAHs, or PCBs analysis as appropriate. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
 15. RSA-142, TCE Spill by Thiokol Degreasing Process, OU-9: As described in the Revision 1 CMI Work Plan for RSA-095 and RSA-142, the Permittee shall excavate perchlorate-contaminated vadose zone soil and dispose it off-site, implement soil, groundwater, condensate and vapor monitoring, ERH of soil and groundwater,

groundwater filtration, liquid-phase carbon adsorption of groundwater and vapors, thermal oxidation of vapors and sewer discharge of the filtered groundwater. The Permittee shall maintain the following institutional and engineering controls as described in the Revision 1 Addendum to the Revision 1 CMI Work Plan, RSA-095 and RSA-142:

- a. Intrusive activities, including excavations or other activities that would disturb the contaminated soil within the LUC area under Building 7700 and the engineered cover, are prohibited unless prior approval is granted by ADEM and the activities are conducted with appropriate health and safety precautions. If such activities are conducted, the features of Building 7700 and the engineered cover that was disturbed must be restored upon completion of the work.
- b. Any waste generated from the intrusive activity within the LUC and engineered cover area must be disposed of in accordance with ADEM regulations. This restriction does not apply to soils within the utility corridor under a portion of the engineered cover.
- c. Soil currently underlying Building 7700 and the engineered cover must remain covered unless soil confirmation sampling demonstrates that perchlorate concentrations are below the 1.7 milligrams per kilogram cleanup goal.
- d. The portion of the engineered cover over the utility corridor may be temporarily (less than 30 days) removed to allow access to the utility corridor. Temporary measures shall be taken to reduce the possibility of storm water infiltration while the utility corridor (and soil underneath) is uncovered. The engineered cover must be restored upon completion of the work.
- e. The boundary of the LUC area shall be identified with signage prohibiting digging without approval of the Chief of the Installation Restoration Branch of the Environmental Management Division at the United States Army Garrison, Redstone Arsenal.
- f. A NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
- g. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
- h. Routine maintenance requirements include, but are not limited to the following:
 - i. Site inspections shall consist of complete walkthroughs and visual inspections of the LUC area and engineered cover.
 - ii. ADEM must be notified within 10 days after uses inconsistent with the NEUR are identified.
 - iii. Repair of any disturbance or breach of the engineered cover shall be conducted within three months of identifying the need for such repairs.
 - iv. Repairs to the signage prohibiting digging shall be completed on an as-needed basis and shall be conducted within 30 days of identifying the need for such repairs.
- i. Inspection requirements include, but are not limited to the following:
 - i. Inspection of the signs installed at the boundary of the LUC area shall be performed annually to ensure that they are present and legible.
 - ii. ADEM must be notified within 10 days after uses inconsistent with the NEUR are identified.
 - iii. Inspection of the LUC and engineered cover area shall be performed annually to ensure that no breach of the engineered cover has occurred and that underlying waste is not exposed.

- iv. An inspection/maintenance report shall be submitted to ADEM at least annually. This report may be submitted as a separate report or as part of another report for the site or as part of another inspection/maintenance report for other sites. The report shall document the results of the annual inspections, include a discussion of any maintenance activities conducted, and identify the status of the LUCs and how any deficiencies or inconsistent uses have been addressed. The annual report should address whether the use restrictions and controls have been recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls.
 - v. Prior to modifying the inspection frequency, the Army shall submit a permit modification request to ADEM for review and approval.
 - j. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - k. The LUCs shall be maintained until Building 7700 and the engineered cover are removed and sampling confirms that the concentrations of hazardous substances at RSA-142 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is submitted to the Department for review and approval.
16. RSA-201, Research Laboratory, Building 7632, OU-10: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or be stockpiled onto impervious material within RSA-201 and covered with waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and PAH analyses will be performed. Soil meeting regulatory levels will be shipped to an off-site, permitted, Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
17. RSA-204, Oxidizer Facility, Building 7691, OU-10: This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
- a. As described in the Revision 2 CMI Work Plan for RSA-204, the Permittee shall excavate contaminated soil, dispose it off-site, and replace it with clean soil. The excavated, contaminated soil will be stockpiled onto impervious material within or nearby RSA-204 and covered with waterproof material to prevent contaminant migration. Composite samples of the stockpile will be taken at a frequency of one sample per 200 cubic yards of material for perchlorate analysis. If perchlorate concentrations are below the cleanup goal, the soil will be used as backfill during site restoration. Soil with perchlorate concentrations exceeding

the cleanup goal will be shipped to a permitted Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required.

- b. The Permittee shall implement in situ enhanced bioremediation (ISEB) for groundwater, introducing emulsified vegetable oil (EVO) via well points and direct push-technology injection points. The groundwater shall be monitored for attenuation (groundwater sampling and reporting) in accordance with the CMI Plan and Part VII of this permit.
- c. The Permittee shall maintain the administrative controls currently in place for groundwater, including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-204 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-146 groundwater unit.
- d. If not all of the perchlorate contaminated soil can be removed adjacent to the foundations of Building 7689, an impermeable, multi-layer cap, as described in the CMI WP, shall be installed and maintained to prevent exposure to any contaminated soil. In case a cap is required, the Permittee shall maintain the following institutional and engineering controls:
 - i. Excavation or other activities that would disturb the cap adjacent to Building 7689 are prohibited, unless prior approval by ADEM and conducted with appropriate health and safety precautions. If such activities are conducted, the cover must be restored upon completion of the work.
 - ii. The area of the cap shall be identified with signage prohibiting digging without approval of the Chief of the Installation Restoration Branch of the Environmental Management Division at the United States Army Garrison, Redstone Arsenal.
 - iii. Soil currently covered by Building 7689 must remain covered with the building unless soil confirmation sampling demonstrates that perchlorate concentrations are below the 1.7 milligrams per kilogram cleanup goal.
 - iv. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - v. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - vi. Routine maintenance requirements include, but are not limited to the following:
 - I. Site inspections shall consist of complete walkthroughs and visual inspections of the capped area.
 - II. Although the capped area will be paved with concrete, mowing shall be conducted in areas adjacent to the cap at least twice a year.
 - III. Repair of any disturbance or breach of the cap shall be conducted within 10 days of identifying the need for such repairs.
 - IV. Repairs to the signage prohibiting digging shall be completed on an as-needed basis and shall be conducted within 10 days of identifying the need for such repairs.

- vii. Inspection requirements include, but are not limited to the following:
 - I. Inspection of the signs prohibiting digging near the cap shall be performed semiannually to ensure that they are present and legible.
 - II. Inspection of the capped area shall be performed semiannually to ensure that no breach of the cap has occurred and that underlying waste is not exposed.
 - III. An inspection/maintenance report shall be submitted to ADEM at least annually. This report may be submitted as a separate report or as part of another report for the site or as part of another inspection/maintenance report for other sites. The report shall document the results of the semiannual inspections, include a discussion of any maintenance activities conducted, and identify the status of the LUCs and how any deficiencies or inconsistent uses have been addressed. The annual report should address whether the use restrictions and controls have been recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls.
 - IV. Prior to modifying the inspection frequency, the Army shall submit a permit modification request to ADEM for review and approval.
 - viii. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - ix. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-204 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
- 18. RSA-206, Propellant Mixing Facility #2 and Casting Facility, Bldg 7339/7340: This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
 - a. The Permittee shall implement in situ enhanced bioremediation (ISEB) for groundwater via direct push-technology injection points and shall conduct groundwater monitoring in accordance with the CMI Plan and Part VII of this permit to monitor and evaluate monitored natural attenuation (MNA) as described in the CMI Plan.
 - b. The Permittee shall maintain the administrative controls currently in place for groundwater, including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-206 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-146 groundwater unit.

19. RSA-209, Propellant Crushing/Grinding and Fuse Production, OU-09: This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
 - a. The Permittee shall implement in situ enhanced bioremediation (ISEB) for groundwater via direct push-technology injection points and shall conduct groundwater monitoring in accordance with the CMI Plan and Part VII of this permit to monitor and evaluate monitored natural attenuation (MNA) as described in the CMI Plan.
 - b. The Permittee shall maintain the administrative controls currently in place for groundwater, including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-209 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-146 groundwater unit.
20. RSA-225, Former Fuze Modification Line No. 7: The Permittee shall conduct monitored natural attenuation (MNA) groundwater monitoring in accordance with Section VII of this permit. The Permittee shall maintain the administrative controls currently in place for groundwater including the installation-wide groundwater IROD as implemented using RSA site access control (SAC) program. While this IROD is interim in nature it will apply to groundwater at RSA-225 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with RSA-147 groundwater unit.
21. RSA-242, Hazardous Waste Storage Igloo, Building 7314, OU-10: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or be stockpiled onto impervious material within RSA-242 and covered with waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and arsenic analyses will be performed. Soil meeting regulatory levels will be shipped to an off-site, permitted, Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.
22. RSA-247, Steel Fabrication/Maintenance Facility, Building 7644, OU-10: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or be stockpiled onto impervious material within RSA-247 and covered with waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and cadmium analyses will be performed. Soil meeting regulatory levels will be shipped to an off-site, permitted, Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.

23. RSA-250, Former Storage Warehouse, Building 778/5678, OU 03: This corrective action has been designed to achieve unrestricted site use.
 - a. The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or be stockpiled onto impervious material within RSA-250, surrounded by a one-foot high berm and covered with a waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and TCLP metals analyses will be performed. Soil meeting regulatory levels will be shipped to an off-site, permitted, Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required.
 - b. If unrestricted site use is not achieved, additional corrective actions will be required and/or the Permittee shall maintain the following institutional and engineering controls as shown below:
 - i. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - ii. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - iii. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - iv. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-250 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
24. RSA-252, Incendiary Bomb Facility Plant 2 Area, Building 5681: This corrective action has been designed to 1) monitored natural attenuation (MNA) of groundwater and land use controls (LUCs); 2) removal and disposal of contaminated soils from 10-separate areas within RSA-252 to achieve conditions suitable for industrial/commercial site use and employ LUCs around Building 5681 and any portions of the site that still exceed residential cleanup goals (CGs); 3) reduce leaching of contaminated soils from RSA-252 east unit to groundwater at concentrations that would pose an unacceptable health hazard to current receptors; and 4) LUCs will be employed at RSA-252 to address soils under Building 5681, which could not be accessed. In addition, long-term groundwater monitoring will continue and an annual report will be submitted to the Department to evaluate the effectiveness of MNA at RSA-252.
 - a. As described in the Revision 2 CMI Work Plan for RSA-252, the Permittee shall excavate contaminated soil, dispose it off-site, and replace it with clean soil. Due to the combination of wastes potentially present in these areas, staged soil will be segregated based on the location and anticipated type and then characterized for waste disposal. The following types of waste are potentially present in RSA-252

soil excavations and include; 1) nonhazardous special waste, 2) waste hazardous by characteristic of toxicity that meets land disposal restrictions (LDRs), 3) waste hazardous by characteristic of toxicity that exceeds LDRs, 4) listed waste that meets LDRs, and 5) listed waste that exceeds LDRs. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle D landfill or to a landfill based on its characterization or stocked piled into impervious material within RSA-252 and covered with waterproof material to prevent contaminant migration. Composite samples of the stockpile will be taken at a frequency of one sample per 200 cubic yards of material for TCLP pesticide and PCBs. Waste characterization samples from Excavation Area EA-8 will also be sampled for PAHs analysis as appropriate. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required.

- b. LUCs will be implemented around Building 5681 and any portions of the site that still exceed residential CGs. Within these portions of the site, the Permittee shall maintain the following institutional and engineering controls:
 - i. Installation of signage around Building 5681 and the LUC areas identifying them as a “No Dig Area”.
 - ii. Removal and relocation of existing signs along with any revisions to the site boundary.
 - iii. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - iv. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - v. Routine maintenance requirements include, but are not limited to the following:
 - I. Site inspections shall consist of complete walkthroughs and visual inspections of the LUC areas and around Building 5681.
 - II. Repairs to the signage prohibiting digging shall be completed on an as-needed basis and shall be conducted within 10 days of identifying the need for such repairs.
 - vi. Inspection requirements include, but are not limited to the following:
 - I. Inspection of the signs prohibiting digging within the LUC areas and around Building 5681 shall be performed semiannually to ensure that they are present and legible.
 - II. An inspection/maintenance report shall be submitted to ADEM at least annually. This report may be submitted as a separate report or as part of another report for the site or as part of another inspection/maintenance report for other sites. The report shall document the results of the semiannual inspections, include a discussion of any maintenance activities conducted, and identify the status of the LUCs and how any deficiencies or inconsistent uses have been addressed. The annual report should address whether the use restrictions and controls have been recorded in the land records and base master plan, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls.

- III. Prior to modifying the inspection frequency, the Army shall submit a permit modification request to ADEM for review and approval.
 - IV. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3)
- c. As described in the Revision 2 CMI Work Plan for RSA-252, MNA was selected as the remediation technology for groundwater and the Permittee shall monitor COCs in groundwater following the removal of contamination-impacted soil at RSA-252 and track the concentrations of contaminants in groundwater toward the attainment of the groundwater CGs. In addition, long-term monitoring will continue and an annual report will be submitted to the Department to evaluate the effectiveness of MNA at RSA-252.
 - d. The Permittee shall maintain the administrative controls currently in place for groundwater, including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-252 until groundwater at the site meets cleanup goals. The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-147 and RSA-148 groundwater unit.
25. RSA-255, Former Manganese Ore Storage Area: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be stockpiled on impervious material and covered with waterproof material to prevent contaminant migration or loaded directly onto dump trucks for transport to a Subtitle D landfill. Composite samples will be taken from the completed excavation sidewalls and from the excavation floor for TAL metals analyses. One floor sample for every 2,500 square feet and one sidewall sample for every 100 linear feet of sidewall will be collected. At locations where detected concentrations exceed cleanup goals, over-excavation may be performed. Clean soils excavated by benching/sloping near the perimeter of the excavation will be segregated and used for backfill during site restoration if sampling results demonstrate concentrations are below cleanup goals. Excavated soil with concentrations exceeding the cleanup goal will be shipped to a permitted Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, LUCs shall be implemented.
26. RSA-269, Former UST, Bldg 7852: The Permittee shall conduct monitored natural attenuation (MNA) groundwater monitoring in accordance with Section VII of this permit. The Permittee shall maintain the administrative controls currently in place for groundwater including the installation-wide groundwater IROD as implemented using the RSA site access control (SAC) program. While this IROD is interim in nature, it will apply to the groundwater at RSA-269 until groundwater at the site meets cleanup goals.

The decision to implement permanent LUCs for groundwater will occur in conjunction with the RSA-154/155 groundwater unit. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.

27. RSA-275, Film Processing Laboratory, Former Building S-7173, OU-09: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated contaminated soil will either be loaded directly for transport to a Subtitle D landfill for disposal or be stockpiled onto impervious material within RSA-275 and covered with waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and arsenic analyses will be performed. Soil meeting regulatory levels will be shipped off to an off-site permitted, Subtitle D landfill for disposal as a non-hazardous special waste. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.

28. RSA-280-R-01, Skunk Hollow Small Arms Range: The Permittee shall excavate contaminated soil and replace it with clean soil. The excavated, contaminated soil will either be loaded directly for transport to a Subtitle C or D landfill with preapproval or be stockpiled onto impervious material within RSA-280-R-01 and covered with waterproof material to prevent contaminant migration. Composite samples will be taken from each stockpile and lead analyses will be performed. Soil meeting regulatory levels will be shipped to an off-site, permitted, Subtitle D landfill for disposal as a non-hazardous special waste. The excavated soil that is stockpiled may undergo stabilization to render the material nonhazardous for waste disposal purposes. The Permittee shall ship excavated soil to an off-site, permitted, Subtitle C landfill for disposal as hazardous waste should stabilization not meet requirements to render the material as nonhazardous. Prior to transport and disposal of excavated waste, appropriate approval from ADEM and the selected waste disposal facility is required. This corrective action has been designed to achieve unrestricted site use. If unrestricted site use is not achieved, additional corrective actions will be required.

29. RSA-282, Former Mortar Test Site (Not in Range) – also known as RSA-072-R-01, Operable Unit 15: The Permittee shall implement restrictions on land use due to potential hazards with munitions and explosives of concern (MEC) which includes signage, and on-call unexploded ordinance (UXO) support for intrusive activities. The Permittee shall inspect and maintain LUCs required as follows:
 - a. RSA-282 shall be restricted to industrial/commercial uses. Residential use and/or residential development of the LUC area of the site, including use or development for residential housing, elementary and secondary schools, child care facilities, and playgrounds, are prohibited.
 - b. A NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - c. Inspection of the signs installed at the boundary of the LUC area shall be performed annually to ensure that they are present and legible. Sign repair or replacement will be made on an as-needed basis. The Army will notify ADEM

- within 10-days if the inspections identify any site uses inconsistent with the restrictions imposed on the site.
 - d. Intrusive activities within the site LUC boundaries will be conducted with appropriate approvals and safety controls (e.g., anomaly avoidance, on-call unexploded ordnance (UXO) support).
 - e. An annual monitoring report on the presence and effectiveness of land use restrictions and controls shall be submitted to ADEM for the site. This report shall document the annual inspection and identify the status of the NEUR and how any deficiencies or inconsistent uses have been addressed. The annual evaluation shall address whether the use restrictions and controls referenced previously are communicated in the deed(s), whether the owners and state and local agencies are notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Memorandum #304.
 - f. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - g. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-282 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
- 30. RSA-294-R-01, Field Training Exercise Area E, South of Martin Road, OU-15: The Permittee shall inspect and maintain LUCs required as follows:
 - a. RSA-294-R-01 shall be restricted to industrial/commercial uses. Residential use and/or residential development of the LUC area of the site, including use or development for residential housing, elementary and secondary schools, child care facilities, and playgrounds, are prohibited.
 - b. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - c. Inspection of the signs installed at the boundary of the LUC area shall be performed annually to ensure that they are present and legible. Sign repair or replacement will be made on an as-needed basis. The Army will notify ADEM within 10-days if the inspections identify any site uses inconsistent with the restrictions imposed on the site.
 - d. Intrusive activities within the site LUC boundaries will be conducted with appropriate approvals and safety controls (e.g., anomaly avoidance, on-call unexploded ordnance (UXO) support).
 - e. An annual monitoring report on the presence and effectiveness of land use restrictions and controls shall be submitted to ADEM for the site. This report shall document the annual inspection and identify the status of the NEUR and how any deficiencies or inconsistent uses have been addressed. The annual evaluation shall address whether the use restrictions and controls referenced

- previously are communicated in the deed(s), whether the owners and state and local agencies are notified of the use restrictions and controls affecting the property, and whether use of the property has conformed with such restrictions and controls. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Memorandum #304.
- f. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - g. The LUCs shall be maintained until the concentrations of hazardous substances at RSA-294-R-01 are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J., to remove the LUCs is approved by the Department.
31. RSA-315, Abandoned Drum Area Near the Golf Course, OU-01: The Permittee shall inspect and maintain LUCs required as follows:
- a. Intrusive activities, including excavations or other activities that would disturb the soil within the defined LUC area, are prohibited unless conducted with appropriate health and safety precautions and with Army approval.
 - b. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - c. Residential use or development, including use or development for residential housing, elementary and secondary schools, child care facilities, and playgrounds, are prohibited.
 - d. Routine inspection and maintenance activities on signage must be performed in accordance with the EUR.
 - e. Maintain warning signs at key site entry points. The warning signs shall be installed at entrance and other locations to be seen from any approach legible from a distance of 25 feet.
 - f. The Permittee shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - g. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - h. The LUCs shall be maintained until the Army can demonstrate that arsenic in soil no longer remains above the cleanup goals. Upon confirmation that concentrations of hazardous substances at RSA-315 are at levels suitable for unrestricted use and exposure, the Army may submit a permit modification request to remove the LUCs, in accordance with Permit Condition 1.J, to ADEM for review and approval.

32. MSFC-033A, Surface Soils East of Building 4815, Adjacent to MSFC-033: The Permittee shall maintain the following institutional and engineering controls:
 - a. MSFC-033A will be restricted to industrial/commercial uses. No residential use or development shall be permitted.
 - b. Intrusive activities, including excavations or other activities that would disturb the concrete utility pad or the contaminated soil under Building 4815 are prohibited.
 - c. The areas under the concrete utility pad and Building 4815 addition shall be identified with signage prohibiting digging without approval of the Chief, Installation Restoration Branch of the Environmental Management Division. The signs must be legible from 25 feet.
 - d. Soil currently covered by the Building 4815 addition and concrete utility pad must remain covered with concrete or other impermeable material until confirmation samples and risk analysis demonstrates that the PAH concentrations are below the risk thresholds.
 - e. The Army shall monitor and report on the presence and effectiveness of land use restrictions and controls annually.
 - f. An NEUR, in accordance with ADEM Admin. Code r. 335-5-1-.02(3), shall be completed, incorporated into the facility Master Plan and recorded in the land records for the property.
 - g. Notice shall be provided to ADEM in the annual monitoring report regarding any observed changes in use, any identified proposed changes in use, applications for building permits, or proposals for any site work inconsistent with the NEUR. RSA shall notify ADEM at least 90 days in advance of the proposed closing on any sale or other conveyance of any interest in any or all of the Property, in accordance with ADEM Admin. Code Rule 335-5-1-.02(3).
 - h. The LUCs shall be maintained until Building 4815 and the concrete utility pad are removed and sampling confirms that concentrations of hazardous substances at MSFC-033A are at levels suitable for unrestricted use and exposure, and a permit modification, in accordance with Permit Condition I.J, to remove the LUCs is submitted to the Department for review and approval.
33. Groundwater at the following SWMUs, where the contamination in the soil media was addressed under an approved document identified in Permit Condition VIII.B.1., shall be addressed as part of separate SWMUs. The Permittee shall conduct groundwater monitoring in accordance with Section VII of this permit.
 - a. RSA-011, Former Sewage Treatment Plant No. 1, OU-10: No further action required for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
 - b. RSA-087, Inactive Temporary Waste Storage Pads 1 & 2, Building 7368: No further action required for surface media. The groundwater shall be investigated and/or remediated as part of RSA-146.
 - c. RSA-088, Inactive Temporary Waste Storage Pad, Building 7625: No further action required for surface media. The groundwater shall be investigated and/or remediated as part of RSA-146.

- d. RSA-094, Chlorinated Solvent Distillation Unit 1, OU-10: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- e. RSA-095, Chlorinated Solvent Distillation Unit 2, Bldg 7368: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- f. RSA-096, Chlorinated Solvent Distillation Unit 3, Building 7740: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- g. RSA-194, Physical Test Laboratory and Storage Facilities: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- h. RSA-196/RSA-098, Test Stand and Cleaning Building, OU-10: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- i. RSA-198, Equipment/Tool Cleaning Facility, Bldg 7359/Inactive Temporary Storage Pad 1: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- j. RSA-199, Propellant Mixing Facility #2, Bldg 7382: No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-146.
- k. RSA-200, ROP Line 5 Area Operations Facilities: No further action required for surface media. The groundwater shall be investigated and/or remediated as part of RSA-146.
- l. RSA-227, Inactive Washrack (adjacent to Bldg 5492): No further action required at this time for surface media (i.e., surface soil, subsurface soil and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-147.
- m. MSFC-002/087, Inactive Abandoned Drum Disposal Site/Inactive Cyanide Lagoon, OU-18: No further action required for surface media (i.e., surface soil, subsurface soil, surface water, sediment, spring water, and soil vapor). The groundwater shall be investigated and/or remediated as part of RSA-149.
- n. MSFC-027, Inactive Waste Accumulation Area, OU-18: No further action required for surface media (i.e., surface soil, subsurface soil, surface water,

sediment, spring water, and soil vapor). The groundwater shall be investigated and/or remediated as part of MSFC.

34. Groundwater, Installation-Wide; As indicated in the IROD dated September 2007, LUCs are required as follows:
 - a. No drinking water wells shall be installed on the Arsenal. Groundwater, including springs and seeps shall not be used for drinking water, or irrigation.
 - b. Groundwater shall only be used for non-potable purposes, preventing human consumption and controlling other exposures.
 - c. The Permittee shall pursue formal coordination with the adjacent local government agencies (e.g., Madison County, Morgan County, and the City of Huntsville) regarding any pending groundwater actions (e.g., installation of groundwater wells where potentially contaminated groundwater may be encountered, etc.) off the Arsenal. The Permittee shall report the status of the coordination with the local governmental agencies in the annual corrective action effectiveness report.
 - d. The Permittee shall control the vapors from the groundwater by mitigating the plume off the Arsenal. The Permittee shall monitor and report on the land use restrictions and controls annually.
 - e. To determine the effectiveness of the Installation Wide Groundwater IROD, and in accordance with Permit Condition VII.B.1.c, the Permittee shall submit a Site Wide Groundwater Monitoring Plan to the Department for review and approval. The Site Wide Groundwater Monitoring Plan shall be submitted to the Department within 180 days from the effective date of this permit.

VIII.D. CORRECTIVE MEASURES IMPLEMENTATION (CMI) AND ANNUAL MONITORING REPORTS

1. CMI Progress and Annual Reports

If the time required to complete implementation of a specific set of corrective measures, as described in the Department-approved CMI Plan, is greater than 180 calendar days, the Permittee shall provide ADEM with progress reports according to the schedule approved by ADEM in the CMI Plan. If no schedule has been approved as part of the associated plan, progress reports shall be submitted at least quarterly. The progress reports shall, at a minimum, contain the following information:

- a. A description of the portion of CMI Plan, completed;
- b. Summaries of and deviations from the approved CMI Plan, during the reporting period;
- c. Summaries of current and potential problems, including recommended solutions and alternatives as well as corrective actions undertaken;

- d. Any monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and,
- e. Projected work for the next period and impacts to the approved schedule.

2. Final CMI Reports

Upon completion of construction of corrective measures systems, implementation of land use controls, interim removal actions, or other short-term activities required by this permit, or the approved CMI Plan, the Permittee shall submit to the Department a Final Report containing, at a minimum, the following:

- a. A description of activities completed;
- b. For cap and cover remedies, as-built construction drawings presenting the final in-place three-dimensional location of contaminated material. A plan view of the remediated areas shall be presented in addition to a cross section of the in-place capped areas;
- c. Hazardous waste manifests indicating the handling of any excavated material that has been shipped off-site to a Department-approved, certified landfill;
- d. For remedies involving land use controls, a copy of the survey plat and environmental covenant or NEUR required by Condition VIII.B of this permit;
- e. Monitoring data (soil, air, dust, water) collected for any reason during the construction period for the purposes of monitoring potential for human and ecological exposure; and
- f. Certification, prepared in accordance with ADEM Admin. Code Rule 335-14-8-02 (2)(d) by the Permittee and a registered Professional Engineer (State of Alabama), that the corrective measures implementation phase (*i.e.*, construction) required by this permit is complete and that the approved system and/or facilities are ready for operation in accordance with the intended design (*i.e.*, CMI Plan).

3. Corrective Measures (CM) Effectiveness Reports

- a. For corrective measures that have been fully implemented and where the corrective measures system(s) must operate for a period of time to achieve cleanup goals or levels, the Permittee shall submit an overall CM Effectiveness Report (addressing all Corrective Measures systems at the facility which are subject to this permit condition) annually, unless otherwise approved by the Department, beginning 180 calendar days following the Department's approval of the Final CMI Report for the initial Corrective Measures system subject to this permit condition. The overall CM Effectiveness Report shall include, at a minimum, the following information for each SWMU and/or AOC included in the report:

- i. A detailed narrative presenting an evaluation of the effectiveness of the selected remedy;
 - ii. Summaries of compliance with and progress toward achieving cleanup goals;
 - iii. Any significant revisions, adjustments, or proposed modifications to the selected remedy;
 - iv. Tabulated environmental sampling and monitoring data including, but not limited to, groundwater quality, elevation data, and a graphical representation of all constituents detected during each sampling event from recovery wells, monitoring wells, drinking water wells, and other locations;
 - v. Chain of custody, field reports, and laboratory data sheets to include the date of collection, the date the sample was extracted, and the date of sample analysis for samples collected during the reporting period;
 - vi. Any monitoring data (soil, air, dust, water) collected for any reason during the post-construction period for the purposes of monitoring potential for human and ecological exposure;
 - vii. Isoconcentration maps depicting the distribution of parameters for each sampling event;
 - viii. Time versus concentration plots for each monitoring parameter for each recovery well and a representative number of effectiveness wells;
 - ix. Tabulated volumetric data on groundwater pumped and pumping rates (monthly and cumulative) for each recovery well;
 - x. Records of any groundwater recovery system operation time, including shutdown periods, not including any minor (less than 24 hours) shutdowns for repairs, maintenance, etc.;
 - xi. Potentiometric surface maps;
 - xii. Description of land use during the reporting period at the designated area requiring corrective measures; and,
 - xiii. Findings of the Permittee's investigation into the continued effectiveness of land use controls per Condition VIII.B.
- b. If, at any time, the Permittee determines that any remedy selection specified in Condition VIII.B or VIII.C of this permit no longer satisfies the applicable requirements of ADEM Admin. Code R. 335-14-5-.06(12) or this permit for releases of hazardous waste or hazardous constituents originating from SWMUs or AOCs, the Permittee must, within 90 calendar days, submit an application for a permit modification, pursuant to Permit Condition I.J, to make any appropriate changes to the CMI Plan.

- c. The application for changes in the CMI Plan, including changes in inspection and monitoring provisions of the CMI Plan, shall be submitted as an application for a permit modification pursuant to the requirements of ADEM Admin. Code R. 335-14-8-.04.

4. Final Report of Corrective Measures

Within 90 calendar days following attainment of cleanup levels or goals as outlined in this Permit and the approved CMI Plans, the Permittee shall submit to the Department a Final Report of Corrective Measures (FRCM). The FRCM shall contain a certification by the Permittee and a registered Professional Engineer (State of Alabama), that all remedial measures required by this permit and the approved CMI Plan has been completed. The FRCM shall outline any procedures and schedules for dismantling of corrective measures systems, groundwater monitoring or recovery systems, removal of land use controls, and any other remedial systems or controls required by this permit or the approved CMI Plan.

Table VIII.1

The following Solid Waste Management Unit(s) (SWMU) and/or Area(s) of Concern (AOC) numbers and descriptions correspond with those noted in the RCRA Facility Assessment (RFA) Report. Where discrepancies exist, the permit will take precedence.

List of SWMUs and AOCs requiring Corrective Measures:

Although some sites are listed within this table as having corrective measures for specific media, additional corrective measures may be required for other media. For example, RSA-282 is included on this table as having corrective measures for surface media and is also included on Table VI.6 as requiring a CMI plan for the groundwater underlying the site.

Applicable SWMU/AOC	*CMS/CMI/ROD/LUC RD	Approval Date
Open Burning/Open Detonation Area	Revision 1 CMI Work Plan, OB/OD, dated August 17, 2017	01/08/2018
RSA-003, In-ground Oil/Water Separator, Bldg 3617	Revision 1 CMI Work Plan, RSA-003, dated October 1, 2018	08/20/2019
RSA-009, Inactive Sewage Treatment Plant #3, OU-23	Revision 1 CMI Work Plan, RSA-009, dated August 8, 2018	08/20/2019
RSA-045, Former Smoke Munitions Filling Plant 3, OU-2	Revision 1 CMI Work Plan for RSA-045, dated September 25, 2020	07/19/2021
RSA-049, Capped Arsenic Waste Ponds – West, OU-5	Final LUC RD for Surface Media at RSA-049, dated June 1, 2009	07/02/2009
RSA-053, Inactive Sanitary and Industrial Landfill, OU-7	CMI for Surface Media and Groundwater, RSA-053, dated September 10, 2012	04/16/2013
RSA-054/RSA-055, Inactive Sanitary and Industrial Landfill, OU-1	Revision 2, CMI Work Plan for Surface Media and Groundwater, RSA-054/055, dated December 10, 2012	04/16/2013
RSA-056, Closed Arsenic Waste Ponds (South) Area U	CMI Work Plan, RSA-056 and RSA-139, dated March 13, 2019	08/20/2019
RSA-058, Inactive Rubble Fill/Waste Pile	Revision 2 CMI Work Plan, RSA-058, dated November 14, 2014	05/15/2015
RSA-058, Inactive Rubble Fill/Waste Pile	Phase II CMI Work Plan, RSA-058, dated May 18, 2018	08/20/2019
RSA-060, Inactive Sanitary and Industrial Landfill, OU-7	Revision 1 CMI Work Plan, RSA-060, dated August 8, 2017	01/08/2018
RSA-083, Paint Spray Booth Sump, Bldg 7344	Revision 1 CMI Work Plan, RSA-083, dated April 11, 2019	08/20/2019

Table VIII.1 (con't)

Applicable SWMU/AOC	*CMS/CMI/ROD/LUC RD	Approval Date
RSA-101, DDT Contaminated Area DD	Consent Decree and <i>Joint Technical Proposal to Implement Remedial Activities Pursuant to Consent Decree</i> (Reference Civil Action No. CV80-PT-5300-NE)	Filed 05/31/1983
RSA-139, Closed Arsenic Waste Pond (North) Area U	CMI Work Plan, RSA-056 and RSA-139, dated March 15, 2019	08/20/2019
RSA-140, Inactive Disposal Area Near T/S Tower, OU-12	CMI Work Plan, RSA-140, dated June 26, 2018	08/20/2019
RSA-142, TCE Spill by Thiokol Degreasing Process, OU-9	Revision 1 CMI Work Plan for Surface Media, RSA-095 and RSA-142, dated September 6, 2013, Revised May 18, 2016	06/03/2016
	Revision 1 Addendum to the Revision 1 CMI Work Plan for Surface Media, RSA-095 and RSA-142, dated July 26, 2018, Revised October 24, 2018	08/20/2019
RSA-201, Research Laboratory, Building 7632	CMI Work Plan for Surface Media, RSA-201, RSA-242, and RSA-247, dated December 17, 2018	08/20/2019
RSA-204, Oxidizer Facility, Bldg 7691	Revision 2 CMI Work Plan for Surface Media and Groundwater, RSA-204, dated September 23, 2016	02/15/2017
RSA-206, Propellant Mixing Facility #2 and Casting Facility, Bldg 7339/7340	Revision 1 CMI Work Plan for Groundwater, RSA-206, dated November 19, 2020	07/19/2021
RSA-209, Propellant Crushing/Grinding and Fuse Production	Revision 1 CMI Work Plan for Groundwater, RSA-209, dated April 22, 2020	09/23/2020
RSA-225, Former Fuze Modification Line No. 7	Revision 1 CMI Work Plan for Groundwater, RSA-225, dated October 21, 2020	07/19/2021
RSA-242, Hazardous Waste Storage Igloo, Building 7314	CMI Work Plan for Surface Media, RSA-201, RSA-242, and RSA-247, dated December 17, 2018	08/20/2019
RSA-247, Steel Fabrication/Maintenance Facility, Building 7644	CMI WP for Surface Media, RSA-201, RSA-242, and RSA-247, dated December 17, 2018	08/20/2019
RSA-250, Former Storage Warehouse, Building 778/5678, OU-3	Revision 1 CMI Work Plan for Surface Media, RSA-250, dated July 20, 2016	9/29/2016
	CMI Report, RSA-250, dated September 14, 2017	2/20/2018

Table VIII.1 (con't)

Applicable SWMU/AOC	*CMS/CMI/ROD/LUC RD	Approval Date
RSA-252, Incendiary Bomb Facility Plant 2 Area, Building 5681	Revision 2 CMI Work Plan, RSA-252, dated November 10, 2020	07/19/2021
RSA-255, Former Manganese Ore Storage Area, OU-8	Revision 2 CMI Work Plan, RSA-255, dated December 12, 2017	04/09/2018
RSA-269, Former UST, Bldg 7852	CMI Work Plan, RSA-269, dated December 8, 2020	07/19/2021
RSA-275, Film Processing Laboratory, Former Bldg S-7173	Revision 1 CMI Work Plan, RSA-275, dated October 15, 2019	09/23/2020
RSA-280, Skunk Hollow Small Arms Range	Slip Pages to Rev 1 CMI Work Plan, RSA-280-R-01, dated May 29, 2020	09/23/2020
RSA-282, Former Mortar Shell Test Site (Not in Range), OU-15	Revision 0 CMI Work Plan, RSA-072-R-01 (RSA-282), dated July 26, 2019	09/23/2020
RSA-294, Field Training Exercise Area E	Revision 0 CMI Work Plan, RSA-294-R-01, dated June 20, 2019	09/23/2020
RSA-315, Abandoned Drum Area Near the Golf Course	Revision 1 CMI Work Plan, RSA-315, dated July 30, 2020	07/19/2021
Installation-Wide Groundwater Interim Record of Decision (IROD)	Interim ROD, Interim Remedial Action for Installation-Wide Groundwater, dated September 2007	09/21/2007
	Installation-Wide Groundwater LUC RD, dated June 1, 2009	
MSFC-033A, Surface Soils East of Building 4815	CMI Work Plan, MSFC-033A, dated May 30, 2018	08/20/2019

*Note: RODs, LUC RD and/or RA WP documents serve as the CMI Plan for some SWMUs/AOCs pursuant to this Permit and are subject to the same Permit requirements.

APPENDIX A

WASTE MINIMIZATION OBJECTIVES

APPENDIX A

WASTE MINIMIZATION OBJECTIVES

The Waste Minimization Program should include the following elements:

I. TOP MANAGEMENT SUPPORT

- A. Dated and signed policy describing management support for waste minimization and for implementation of a waste minimization plan.
- B. Description of employee awareness and training programs designed to involve employees in waste minimization planning and implementation to the maximum extent feasible.
- C. Description of how a waste minimization plan has been incorporated into management practices so as to ensure ongoing efforts with respect to product design, capital planning, production operations, and maintenance.

II. CHARACTERIZATION OF WASTE GENERATION

Identification of types, amounts, and hazardous constituents of waste streams, with the source and date of generation.

III. PERIODIC WASTE MINIMIZATION ASSESSMENTS

- A. Identification of all points in a process where materials can be prevented from becoming a waste, or can be recycled.
- B. Identification of potential waste reduction and recycling techniques applicable to each waste, with a cost estimate for capital investment and implementation.
- C. Description of technically and economically practical waste reduction/recycling options to be implemented, and a planned schedule for implementation.
- D. Specific performance goals, preferably quantitative, for the source reduction of waste by stream. Whenever possible, goals should be stated as weight of waste generated per standard unit of production, as defined by the generator.

IV. COST ALLOCATION SYSTEM

- A. Identification of waste management costs for each waste, factoring in liability, transportation, recordkeeping, personnel, pollution control, treatment, disposal, compliance and oversight costs to the extent feasible.
- B. Description of how departments are held accountable for the wastes they generate.
- C. Comparison of waste management costs with costs of potential reduction and recycling techniques applicable to each waste.

V. TECHNOLOGY TRANSFER

Description of efforts to seek and exchange technical information on waste minimization from other parts of the company, other firms, trade associations, technical assistance programs, and professional consultants.

VI. PROGRAM EVALUATION

- A. Description of types and amounts of hazardous waste reduced or recycled.
- B. Analysis and quantification of progress made relative to each performance goal established and each reduction technique to be implemented.
- C. Amendments to waste minimization plan and explanation.
- D. Explanation and documentation of reduction efforts completed or in progress before development of the waste minimization plan.
- E. Explanation and documentation regarding impediments to hazardous waste reduction specific to the individual facility.

References:

- "Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program", 54 FR 25056, June 12, 1989.
- "Waste Minimization Opportunity Assessment Manual", EPA/625/7-88/003, July 1988.