

April 1995

Final Report

**FINDING OF NO SIGNIFICANT IMPACT
and
ENVIRONMENTAL ASSESSMENT**

for

RSA-49

**(Closed Arsenic Impoundments)
REDSTONE ARSENAL, ALABAMA
U.S. ARMY MISSILE COMMAND
USEPA NO. 210020742**

Prepared for

**U.S. Army Corps of Engineers
Savannah District
Savannah, Georgia**

Funded by

**U.S. Army Missile Command
Redstone Arsenal, Alabama**

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**FINDING OF NO SIGNIFICANT IMPACT
INTERIM REMEDIAL ACTION AT RSA-49
REDSTONE ARSENAL, ALABAMA
U.S. ARMY MISSILE COMMAND
USEPA NO. 210020742**

1. **Name and Purpose of Action.** Proposed *Interim Remedial Action at RSA-49*, Redstone Arsenal, Alabama (U.S. Army Missile Command). The proposed clearing and capping of the closed arsenic impoundments at RSA-49 is needed to inhibit any further migration of contaminants from the site.

2. **Finding of No Significant Impact.** The attached Environmental Assessment (EA) was prepared and evaluated pursuant to the National Environmental Policy Act (Public Law 91-190, U.S.C. 4321 *et seq.*). It is concluded that the preferred alternative (clearing and capping the closed arsenic impoundments, and the rerouting of an existing drain to avoid the closure site) does not constitute a "major federal action significantly affecting the quality of the human environment" when considered individually or cumulatively in the context of the referenced act including both direct and indirect impacts. Therefore, the preparation of a more detailed environmental document, an Environmental Impact Statement, is not required.

3. **Description.** The U.S. Army Missile Command, Redstone Arsenal, Alabama, and U.S. Army Corps of Engineers, Savannah District propose to implement remedial action at RSA-49, Closed Arsenic Impoundments. This action will involve the construction of a clay cap to minimize the amount of precipitation infiltrating into the contaminated material. An existing ditch will be relocated to divert water away from the closed site. A seven-foot-high chain-link fence will be constructed around the site.

4. **Alternatives.** In addition to the no-action alternative, only capping the closed impoundments and the relocation of an existing drain was evaluated. While considered initially, no other alternative could fully accomplish the purpose of the action. Hence, only this alternative and the no-action alternative were evaluated in Section 5.0 of the attached EA.

5. **Anticipated Environmental Effects.**

a. **Concerns Determined to be Insignificant.** Based on context and intensity of anticipated impacts as defined in Section 1508.27 of the Council on Environmental Quality Regulations, the

following issues of consideration were determined to be insignificant: public health and safety; unique geographic (natural, historic or cultural) features; human environment impacts associated with highly uncertain or unknown risks; cumulative or synergistic effects; effects from future actions permitted from any precedence set in the presently evaluated action; and violations of Federal, State, or local laws.

b. **Impacts Evaluated in Detail.** Neither land use (EA, Section 5.1) nor cultural resources (EA, Section 5.6) would be affected by the preferred action alternative. However, minor air emissions (EA, Section 5.2) and cap-site vegetation destruction (EA, Section 5.5.1), are anticipated during cap placement and drain excavation/relocation activities. There are two endangered species known to occur within the Redstone Arsenal area. However, the proposed action will have no significant adverse impacts on these species.

c. **Mitigation.** To protect air quality, standard control measures should be incorporated into operation plans during construction. Fugitive dust emissions should be controlled with water applications.

6. **Public Comment.**

a. **Distribution.** As a matter of local or regional interest and in accordance with Part 1501.4(e) of Title 40 of the Code of Federal Regulations, a notice of availability of this Finding of No Significant Impact (FNSI) will be distributed to agencies, elected officials, organizations, and individuals who have expressed an interest in the project and others whom the proponent and preparers deem appropriate. In addition, a news release announcing these documents will be issued.

b. **Availability of Referenced Documents.** The EA, FNSI, and documents referenced therein will be available at the Huntsville-Madison County Public Library located at Main Branch in Huntsville, Alabama during the hours of 9:00 AM to 9:00 PM, Monday through Thursday; 9:00 AM to 5:00 PM, Friday and Saturday; and 1:00 PM to 5:00 PM, Sunday.

c. **Point of Contact.** Requests for further information or submittal of public comments may be made within 30 days after first publication date to:

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James M. Link
Major General, USA
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MICOM Environmental Officer

_____ DATE: _____
Wm. Verbon Black
MICOM Chief Counsel

**ENVIRONMENTAL ASSESSMENT AT RSA-49
(Closed Arsenic Impoundments),
Redstone Arsenal, AL
U.S. MISSILE COMMAND
USEPA NO. 210020742**

ENVIRONMENTAL ASSESSMENT AT RSA-49
(CLOSED ARSENIC IMPOUNDMENTS)
REDSTONE ARSENAL, ALABAMA
U.S. MISSILE COMMAND
USEPA NO. 210020742

PREPARED: April 1995

PROPONENT OF THE ACTION:

H. Sam Fields DATE: 4/26/95

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Director, Directorate of Environmental
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James M. Link
Major General, USA
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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers, Savannah District is in the process of implementing an interim remedial action at RSA-49, the Closed Arsenic Impoundments of Redstone Arsenal, Alabama. This action will call for the capping of the entire site to prevent any further migration of arsenic-contaminated waste into the groundwater and surrounding areas. An existing drainage ditch at the northeast corner of the site will be relocated to divert surface water flow away from the closed impoundments. A seven-foot-high chain-link fence will be constructed around the entire site to limit access.

There are only two alternatives discussed in this document, the proposed action and no-action. No other options were found to be economically or environmentally feasible for accomplishing the desired results. The no-action alternative will result in further contamination of the groundwater in the area of the impoundments; therefore, this alternative is not recommended.

A routine wetlands determination was performed to identify any wetland areas that may be impacted by the proposed action. The Corps of Engineers verified the Wetland Finding Report that no jurisdictional wetlands are present on RSA-49. A site visit was conducted at RSA-49 to characterize habitats at the site and to assess any potential impacts that may be caused by the proposed action.

Informational reviews and correspondence with State and Federal agencies revealed that no significant impacts to the biological resources of RSA-49 are likely. A Nationwide Permit #26 will be necessary for diverting the existing drainage ditch at RSA-49. Some mitigation measures that would reduce the impacts on natural resources from certain construction activities are also identified in this document.

ENVIRONMENTAL ASSESSMENT

1.0 PURPOSE, NEED AND SCOPE

1.1 Purpose and Need

The purpose of this study is to identify and evaluate the environmental aspects of implementing the Interim Corrective Measure (ICM) at the Closed Arsenic Impoundments (RSA-49) on Redstone Arsenal (RSA), Alabama, in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) Regulations and AR 200-2, Environmental Effects of Army Actions.

The ICM for RSA-49 is needed in order to inhibit any further migration of contaminants from the site. This action will include the clearing and capping of the impoundments and rerouting a nearby drainage ditch that crosses the northeast corner of the site in order to divert water flow from the site.

1.2 Scope

It is necessary to prepare an environmental assessment (EA) that provides an objective appraisal of the positive, as well as the negative, impacts of the proposed project and various alternatives. This EA also includes a discussion of mitigation and permit requirements. The proposed action is limited to the implementation of the ICM at RSA-49. The effects of this implementation on the environment of the project site is the primary focus of this study.

1.3 Impact Analysis

The analysis process involved the evaluation of environmental conditions on the project site based on field surveys, existing documentation, and information from State and Federal regulatory agencies.

2.0 DESCRIPTION OF THE PROPOSED ACTION

The U.S. Army Corps of Engineers, Savannah District is in the process of conducting an interim remedial action (IRA) at RSA-49. This task calls for capping the entire site and the diversion of an existing drainage ditch away from the impoundments. Accomplishing this goal begins with the design and construction of an ICM. This action proposes to remove all vegetation from the site and construct a clay cap over the site to minimize the infiltration that contacts the contaminated material, thereby reducing contaminated leachate. The cap would also prevent the erosion of contaminated surface material onto nearby land. The clay cap design will specify a minimum thickness of two feet and will satisfy Resource Conservation and Recovery Act (RCRA) closure specifications. Soils to be used in the cap construction will have a clay loam soil classification and have a moisture content between optimum and

three percent above optimum during placement in the cap. The compaction requirement for the cap will be 93 percent of the Standard Proctor maximum dry density, with a permeability of approximately 2.3×10^{-7} centimeters/second. Once the cap is graded to insure proper slope and finished grade, topsoil will be placed on the surface of the cap, providing a base on which grass will be planted. Furthermore, because the exposure pathway for soils has been rated as "moderate" (Ebasco, 1993), a seven-foot barrier-fence will be erected around the perimeter of the site.

The existing drainage ditch in the northeastern portion of the site will be diverted away from the impoundments to prevent contamination of surface water. The new drainage route (Figure 1) will be constructed around RSA-49 and connected to an existing drain downstream of RSA-49.

3.0 ALTERNATIVES CONSIDERED

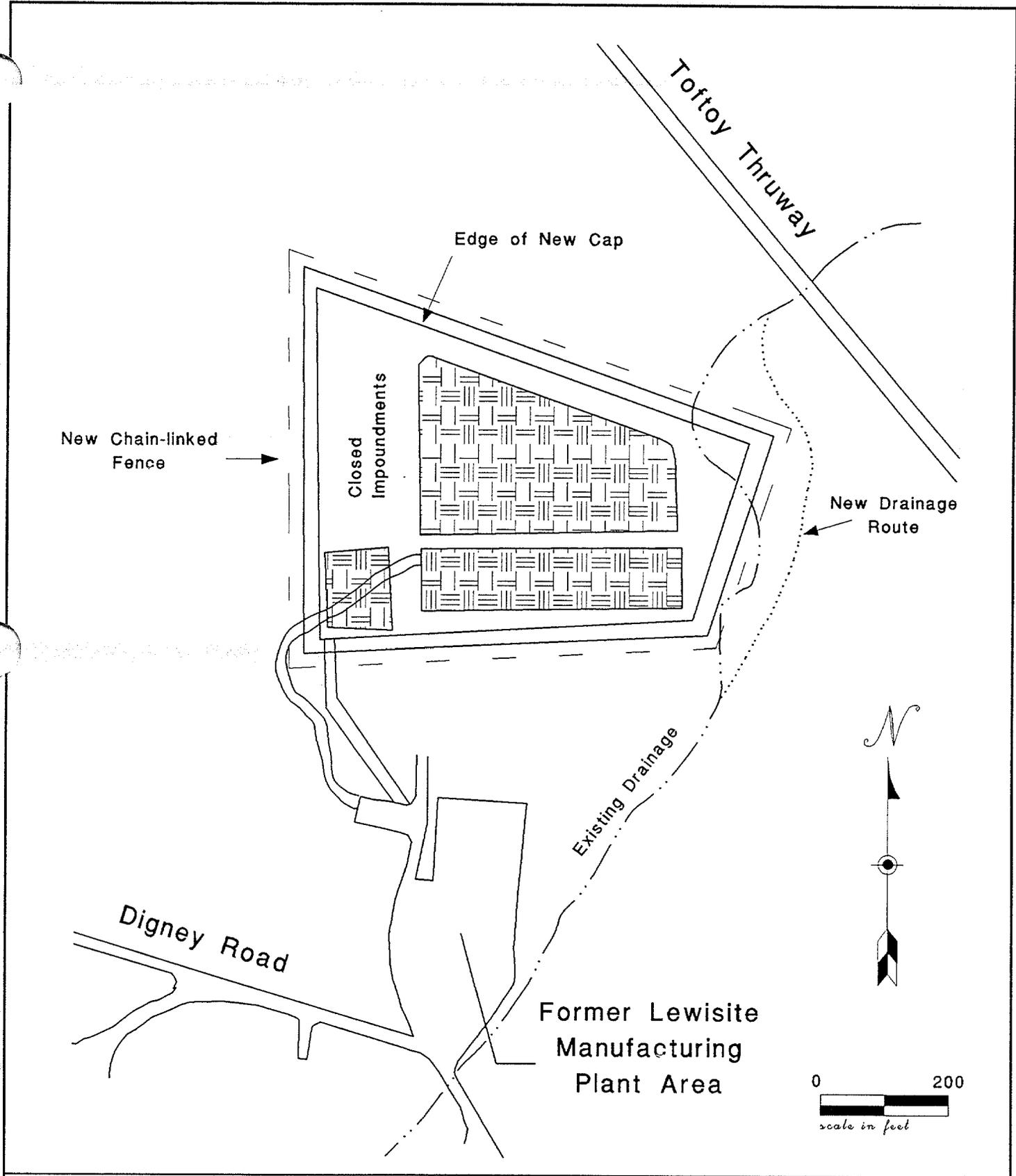
The proposed action at RSA-49 calls for the capping of the closed impoundments and the relocation of the drainage ditch in the northeastern portion of the site. The ICM study revealed that no other feasible alternatives are available to accomplish the desired action. Therefore, the only other alternative discussed is the "no-action" alternative. The no-action alternative would result in the project site remaining in the present status.

4.0 AFFECTED ENVIRONMENT

4.1 Setting

Redstone Arsenal is located in the southwestern portion of Madison County in north-central Alabama (Figure 2). The northern and eastern sides of the Arsenal are bounded by the city of Huntsville, Alabama, with the Tennessee River providing a southern perimeter. Although predominately located to the southwest of the Arsenal, Wheeler Wildlife Refuge traverses through the central portion of RSA.

Of the approximately 38,300 acres on the Redstone installation, woodlands cover approximately 15,500 acres, and 9,200 acres are leased for agricultural uses. Marshall Space Flight Center leases 1,841 acres in the central portion of the Installation. Wheeler National Wildlife Refuge covers 4,100 acres within the boundaries of RSA, and the Tennessee Valley Authority (TVA) owns 2,900 acres that are also within the boundaries of the Arsenal. Approximately 10,200 acres are covered by maintained fields, RSA facilities, roads, and buildings.



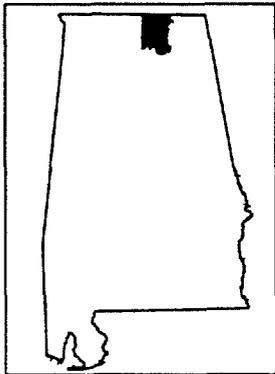
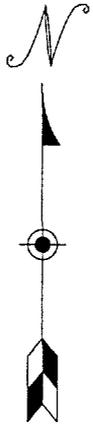
**SITE MAP
RSA-49
Closed Arsenic Impoundments**

FIGURE NO: 1
DRAWN BY: RBM
CHECKED BY: RBM
SCALE: 1" = 200'
DATE: 12/16/93

Madison County

Huntsville

Redstone
Arsenal



REDSTONE ARSENAL Location Map

GULF ENGINEERS & CONSULTANTS, INC.
ENGINEERING • ECONOMICS • SOCIAL ANALYSIS • ENVIRONMENTAL PLANNING

FIGURE NO: 2

DRAWN BY: RBM

CHECKED BY: RBM

SCALE: Not To Scale

DATE: 11/18/93

RSA-49, consisting of three closed arsenic impoundments, encompasses approximately five acres located in the central portion of RSA, just north of the former Lewisite Manufacturing Plant Area (Figure 3). The site was used to dispose of waste contaminated with arsenic from the Lewisite operations. Industrial waste and rubble were later disposed in these impoundments. In 1977, the impoundments were closed and capped (Ebasco, 1993). According to the Ebasco Environmental report "Interim Corrective Measure Design at RSA-49," the site has high concentrations of arsenic in both groundwater and soils. Although the general extent of the high concentrations is confined within the boundary of RSA-49, some high concentrations have been found just south of the site.

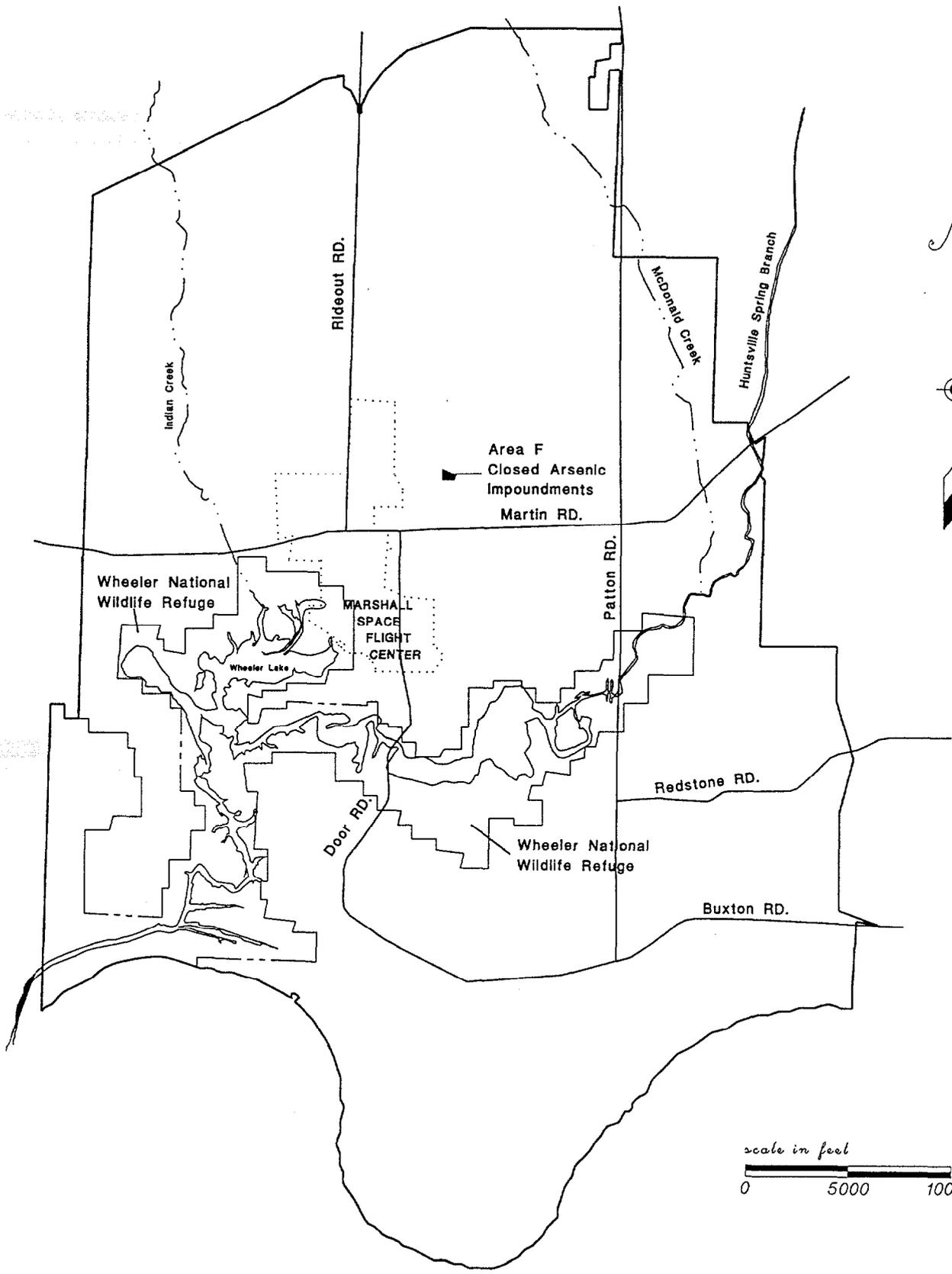
4.1.1 Climate: The climate at RSA is humid and temperate, with an average annual temperature of 62° Fahrenheit (F). Summers are usually long and hot with an average temperature of 78° F, and temperatures in the winter months are mild and pleasant, averaging 43° F. Occasionally, temperatures drop below freezing at night and may remain so for two to three days during winter. The average annual precipitation at RSA is 51 inches, with the majority in March, and the least during September and October. Flooding on RSA commonly occurs from mid-December to mid-April. Extensive flooding, although uncommon, may occur during the summer. Snowfall is infrequent with amounts ranging from one inch to 20 inches (Swenson, 1958).

Prevailing winds in Madison County are from the northwest, although winds from the west and north are also common in fall and winter months. Winter months have the highest velocity winds, and summer months have the lowest (Ebasco, 1993).

4.2 Land Use

The *Land Use Plan* for RSA divides the Arsenal into eight land use areas: ammunition supply, training, administration, research and development, community center, troop housing, family housing, and test and operations. Available land on the Arsenal is effectively and efficiently managed for future development.

RSA-49 was used in the past to dispose arsenic-contaminated waste. Other materials, such as rubble and industrial waste, were also discarded into these impoundments. Presently, the impoundments are capped and have been planted with loblolly pines. The area has been fenced to help limit access to the site.



RSA-49
CLOSED ARSENIC IMPOUNDMENTS
LOCATION MAP

GULF ENGINEERS & CONSULTANTS, INC.
 ENGINEERING • ECONOMICS • SOCIAL ANALYSIS • ENVIRONMENTAL PLANNING

FIGURE NO: 3
DRAWN BY: RBM/USGS
CHECKED BY: RBM
SCALE: N/A
DATE: 12/07/94

4.3 Air Quality

The State of Alabama and the City of Huntsville are bound by the National Ambient Air Quality Standards (NAAQS) established under the Clean Air Act, which specify allowable concentration limits for specific pollutants. The air quality standards for total suspended particulates (TSP), sulfur dioxide (SO₂), and nitrogen dioxide (NO₂) in the Redstone area have reached "attainment" status. Carbon monoxide and ozone are designated as "unclassifiable/attainment" in Madison County, and concentration standards for lead are not designated for Madison County (BNA, 1993).

Air emission permits for Redstone Arsenal are issued through the Alabama Department of Environmental Management (ADEM). Redstone Arsenal has permits for boilers, a propellant sparging unit, and petroleum storage tanks. Each of the operations is in compliance with permit regulations.

4.4 Water Resources

4.4.1 Surface Water: The Tennessee River, Huntsville Spring Branch, McDonald Creek, and Indian Creek are the major surface water sources on RSA. Other sources include smaller streams, ponds, and inundated wetlands. These surface waters flow in a southerly direction into the Tennessee River, which flows westward.

Potable water supplies for RSA and the city of Huntsville come from the Wheeler Reservoir, with groundwater supplementing the supply for the City of Huntsville. The reservoir is formed by Wheeler Dam, located 45 miles west of RSA on the Tennessee River. Water pumped from the reservoir for RSA is treated at one of two water treatment plants on the Arsenal. A standby treatment plant is also located on the installation for emergency backup to Treatment Plant No.1.

Most Alabama surface waters are designated with a water use classification from ADEM based on several physio-chemical criteria of the water body. The classifications are as follows:

1. Public Water Supply
2. Swimming and Other Whole Body Water-Contact Sports
3. Shellfish Harvesting
4. Fish and Wildlife
5. Agricultural and Industrial Water Supply
6. Industrial Operations
7. Navigation

Criteria generally used to determine these classifications are: sewage or waste present in the water, pH, temperature, dissolved oxygen, toxic substances, taste and odor producing substances, bacteria, radioactivity and turbidity. Three water bodies (Indian Creek, Huntsville Spring Branch, and the Tennessee River) on RSA are designated as a fish and wildlife waters. The Tennessee River is also classified as a public water supply (BNA, 1993).

There is a small drainage ditch in the northeastern portion of RSA-49 that drains stormwater from nearby uplands. All drainage is to the east into this intermittent drainage and eventually into Wheeler Reservoir. Under the preferred alternative, this drainage will be rerouted away from the impoundments to inhibit further migration of contaminants .

4.4.2 Groundwater: The main aquifers in the Redstone Arsenal area are water table and limestone. Water table aquifers generally range from 560 feet above mean sea level (MSL) in the southern portion of the Arsenal to 600 feet above MSL in the northern section. The flow of both aquifer types is generally north to south. Yields of the aquifers in the Redstone area have been known to be as high as 1,000 gallons per minute. However, none of the aquifers are designated as sole principal drinking water sources.

There are three water-bearing zones identified at RSA-49: (1) a sandy clay perched water bearing zone, (2) a sandy clay and chert rubble zone, and (3) the bedrock Tuscombua Limestone. The overburden at RSA-49 is characterized by a surficial sandy clay and poorly-sorted, clayey sand with weathered limestone and chert fragments, separated by a dense clay layer (Ebasco, 1993). The surface of the Tuscombua Limestone at RSA-49 ranges from 543 feet above MSL to 576 feet above MSL (Ebasco, 1993).

Groundwater from Arsenal wells is not used for potable purposes due to high concentrations of contaminants such as arsenic, trichloroethylene (TCE) and benzene at several areas on the base. Other contaminants having lesser concentrations include metals, explosives, and other organic solvents. RSA-49 is one of the areas on the arsenal that exhibits concentrations of arsenic in the groundwater exceeding the maximum concentration limits (MCLs) of 0.05 parts per million (ppm) for Primary Drinking Water Standards. Therefore, the interim corrective measure for RSA-49 was proposed to reduce the migration of the contaminants (Ebasco, 1993).

4.5 Geology and Soils

4.5.1 Geology: The rocks underlying Madison County are sedimentary in origin and range in age from Holocene alluvium in the floodplain of the Tennessee River to Ordovician limestones. The oldest rocks are the Chickamauga Limestone of Ordovician age, which is overlain by the Fort Payne Chert of Mississippian age. Next in the stratigraphic sequence is the Tuscumbia Limestone, also of Mississippian age. The Tuscumbia is the surface rock that extends from the mountainous eastern border to the northwestern quarter of Madison County. Other geological formations occurring in Madison County include the Monteagle Limestone, Pride Mountain Formation, Gasper Formation, Hartselle Sandstone, Bangor Limestone, Pottsville Formation and Stream Terrace. The Bangor and Pottsville formations occur as caps or upper slopes of the mountains along eastern Madison County. RSA has dominant outcropping formations of Tuscumbia Limestone with other significant outcrops of Pride Mountain, Monteagle, Hartselle, and Bagor formations.

The boundary between the Cumberland Plateau and the Highland Rim section of the Interior Low Plateau is in central Madison County. Redstone Arsenal is within the Highland Rim physiographic province, and the topography is gently rolling and sloping from north to south toward the Tennessee River. Elevations generally range from 765 feet above MSL at the northern arsenal boundary to 556 feet above MSL at the southern boundary. Topographically high areas are Weeden and Madkin Mountains, reaching a maximum elevation of 1,239 feet above MSL, and the topographic lows include the valleys and floodplains of the Tennessee River and its tributaries (Swenson, 1958).

4.5.2 Soils: The western half of RSA-49 is covered by Cumberland loam in its eroded, undulating phase. The surface layer is brownish-red loam with a dark reddish-brown to dark red very fine sandy clay loam to silty clay loam subsoil. Fine dark concretions are common throughout the profile of most of the soil horizon. Limestone bedrock is at depths between four and 15 feet. This soil has a pH range between 4.5 and 6.0, and a permeability between 0.6 and 2.0 inches per hour. The eastern half of the site is predominantly covered with Ooltewah silt loam, a brownish, somewhat poorly-drained local alluvium that was washed into depressions. Cumberland loam, eroded undulating phase, is also located in the far eastern end of the site (Swenson, 1958).

4.6 Biological Resources

4.6.1 Vegetation: RSA-49 consists of three closed arsenic impoundments, capped and planted with loblolly pines (*Pinus taeda*) and sericea lespedeza (*Lespedeza cuneata*). Other species occurring on the site include *Solidago* spp., *Rubus* spp., and Eastern red cedar (*Juniperus virginiana*). Along the eastern edge of RSA-49, the community changes to a slope hardwood with species such as cottonwood (*Populus deltoides*), blackcherry (*Prunus serotina*), hackberry (*Celtis laevigata*), black locust (*Robinia pseudoacacia*), honeysuckle (*Lonicera japonica*), black willow (*Salix nigra*), and *Rubus* species.

4.6.2 Wildlife Habitat: The 15 to 20 year-old loblolly pine habitat at RSA-49 has an average height of 25 feet, providing escape and nesting cover for a variety of mammals, birds, reptiles, and amphibians. Various shrubs and herbaceous plants supply browse and seeds for consumption by the various wildlife species utilizing this habitat.

4.6.3 Threatened and Endangered Species: Personnel with the U.S. Fish and Wildlife Service (USFWS) reviewed information on RSA-49 to determine the presence or absence of threatened or endangered species on the site that could potentially be impacted by the proposed project. The letter in Appendix A from the USFWS, states that two endangered species, the Alabama cave shrimp (*Palaemonias alabamiae*) and the pink mucket pearly mussel (*Lampsilis abrupta*), may occur within the general project impact area. Personnel from RSA also conducted a survey of the site and found no threatened and endangered species or suitable habitats.

Known populations of the Alabama cave shrimp is restricted to two cave systems in Madison County, one of which is located in the northwestern quadrant of Redstone. The other cave system is in the eastern section of Madison County. Extent of the habitat for these populations is not known.

4.6.4 Wetlands: A site investigation revealed that the small drainage ditch in the northeastern portion of RSA-49 may be considered to be Waters of the U.S. Vegetation near this ditch is not characteristic of wetland vegetation. Because of known soil contamination in the area, no soil sample was taken. (The wetlands report is provided in Appendix B.) The Madison County Soil Survey showed the eastern side of the site as dominated by the Ooltewah silt loam series, which is classified as a hydric soil by the Natural Resources Conservation Service. A memorandum (Appendix C) from the Nashville District, Corps of

Engineers verified that no wetlands are present on RSA-49; however, the drainage ditch proposed for relocation will require a permit.

4.7 Cultural Resources

According to a memorandum (Appendix D) from Charles M. Hubbert of RSA, there is no indication of any cultural resources within the vicinity of the site. Moreover, because RSA-49 has been highly disturbed by agriculture, erosion, and earth moving activities, it is impracticable to determine if there were ever cultural resources present at RSA-49. Alabama State Historic Preservation Office (SHPO) concurred with Redstone Arsenal in a letter (Appendix E) that there are no cultural resources on RSA-49.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Land Use

Proposed Action: The proposed action will have no significant adverse impact on the land use at RSA-49. This site will continue to be used as it is currently being used.

No-Action: If no-action is implemented, the present land use of the site will remain the same.

5.2 Air Quality

Proposed Action: There will be no significant adverse impact on air quality as a result of implementing the proposed action. However, implementation of the project could result in minor temporary air quality impacts from the emissions of the equipment used to prepare the site and construct the clay cap.

No-Action: The present air quality will remain unchanged.

5.3 Water Resources

Proposed Action: No significant adverse impacts on water quality are anticipated with the implementation of the proposed action. On the contrary, if the proposed action is implemented, the amount of arsenic-contaminated waste leaching into the groundwater should decrease. The ICM will also divert the existing intermittent stream; however, this action will not significantly impact the flow of surface water on the site. Temporary, minor elevations in concentrations of turbidity/suspended solids may be associated with construction.

No-Action: The quality of the surface water will remain at its present level if the project is not implemented. Precipitation will continue to infiltrate, and the contamination plume will expand into groundwater areas previously unaffected.

5.4 Geology and Soils

Proposed Action: Because there will be no major disruptions to the geology or soils associated with implementing the proposed action, there will be no significant adverse impacts on the soils and geology at RSA-49. By minimizing the rate of expansion of the contamination plume, the proposed action will reduce the amount of future contamination of subsurface strata.

No-Action: There will be no change in the present state of the soils and geology if the project is not implemented.

5.5 Biological Resources

5.5.1 Vegetation:

Proposed Action: Construction of the clay cap on RSA-49 will require the removal of approximately five acres of loblolly pines. The remaining stumps and roots will be left in place and covered by the cap. The area will be revegetated with grasses and maintained following construction. This action will cause a permanent change in plant communities at RSA-49. However, no significant adverse impacts to the plant communities of RSA are anticipated with the implementation of the proposed action.

No-Action: The existing vegetative cover will remain in its present state.

5.5.2 Wildlife Habitat:

Proposed Action: Implementation of the proposed action will convert a five-acre stand of loblolly pine to grasses. This will result in some loss of overall wildlife productivity and a change in the wildlife community at RSA-49.

No-Action: The existing habitat at RSA-49 will remain unchanged.

5.5.3 Threatened and Endangered Species:

Proposed Action: Since there will be no groundwater treatment or treated water discharge at RSA-49, no significant adverse impacts will be expected on the two endangered species possibly occurring in the general area of RSA-49.

No-Action: The present habitat conditions at RSA-49 will be maintained.

5.5.4 Wetlands:

Proposed Action: The Nashville District, U.S. Army Corps of Engineers, has verified that no jurisdictional wetlands occur on site RSA-49. No significant adverse impacts to wetlands are anticipated from implementation of the proposed action.

No-Action: There will be no hydrologic change at the site or any surrounding wetlands.

5.6 Cultural Resources

Proposed Action: There will be no significant adverse impacts on cultural resources if the ICM is implemented. Alabama SHPO has concurred with Redstone Arsenal that there are no cultural resources at RSA-49 and there will be no significant adverse impact on cultural resources.

No-Action: The present conditions at RSA-49 will remain unchanged.

6.0 MITIGATION/RESTRICTIONS ON CONSTRUCTION

6.1 Land Use

Implementation of the proposed action will create no significant adverse impacts on the land use at RSA-49. Therefore, no mitigation or restrictions on construction are required for ICM implementation.

6.2 Air Quality

To minimize emissions during construction, vehicles on the site will be maintained for maximum operating efficiency, with their exhaust systems likewise maintained for proper operation. Fugitive dust emissions from construction activities will be controlled by water application.

6.3 Water Resources

Elevated concentrations of suspended solids in surface water could occur during and following construction until the vegetation is reestablished. Accordingly, during construction of the cap and the new drainage route, measures to control stormwater discharge quality will be implemented. Fast-germinating grass will be established on cut slopes and other disturbed areas. Temporary controls and best management practices will be implemented during all activities to minimize sediment migration from the immediate project site.

6.4 Geology and Soils

Because no significant adverse impacts will occur, no mitigation is required.

6.5 Biological Resources

6.5.1 Vegetation: Because no significant adverse impacts will occur, no mitigation is required.

6.5.2 Wildlife: Because no significant adverse impacts will occur, no mitigation is required.

6.5.3 Threatened and Endangered Species: Mitigation will not be necessary, because no impacts to threatened or endangered species are expected.

6.5.4 Wetlands: Because no wetlands are located on the site, no mitigation is required.

6.6 Cultural Resources

Because no known cultural resources are present in the vicinity of the site, mitigation or construction restrictions are not necessary.

7.0 CONCLUSION

Based on the above information and discussion of alternatives, there are no significant long- or short-term impacts to the environment from this action. Therefore, an Environmental Impact Statement is not necessary, and a Finding of No Significant Impact will be published in accordance with NEPA.

8.0 REGULATORY REQUIREMENTS

8.1 Water Resources

According to the Nashville District, Corps of Engineers, the relocation of the minor tributary stream will be authorized under Nationwide Permit # 26.

9.0 LIST OF PREPARERS

Barry McCoy

Leonard Guilbeau

Cade E. Carter, P.E.

10.0 REFERENCES

The Bureau of National Affairs, Inc.(BNA). *Federal Regulations for Air Quality*. 1993.

The Bureau of National Affairs, Inc.(BNA). *Alabama Water Laws*. 1993.

Ebasco Environmental. *Interim Corrective Measure Design at Unit 2 Redstone Arsenal, Alabama*. 1993.

Godwin, James. Alabama Natural Heritage Program. Correspondence. 1993.

Swenson, *et.al.* Soil Survey of Madison County, Alabama. U.S. Department of Agriculture, Soil Conservation Service. February 1958.

Redstone Arsenal Master Plan Draft Environmental Assessment, 1993.

Appendix A

THREATENED AND ENDANGERED SPECIES DETERMINATION



United States Department of the Interior

FISH AND WILDLIFE SERVICE

2001-A Highway 98
P. O. Drawer 1190
Daphne, Alabama 36526

IN REPLY REFER TO:

4-3-95-141C

April 4, 1995

Mr. Wen Seyle
U.S. Army Corps of Engineers
P.O. Box 889
Savannah, GA 31402-0889

Dear Mr. Seyle:

Thank you for your letters of February 27 and March 10, 1995 requesting comments and providing additional information on the proposed cleanup operations at four sites on Redstone Arsenal in Madison County, Alabama. We have reviewed the information you enclosed and are providing the following comments in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. et seq.) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

A. Fish and Wildlife Coordination Act

Remedial actions have been identified at only two of the four proposed cleanup sites. The two identified remedial actions and site descriptions are:

1. Area F (RSA-49) - closed arsenic impoundments within an industrial area and pine plantation. The proposed action involves clay capping, drainage realignment, and fencing of the area.
2. Unit 2 (RSA-13) - open burn/open detonation area near the Tennessee River. The proposed action includes extraction and treatment of contaminated ground water with subsequent discharge to nearby surface waters

We do not expect the above proposed actions to result in significant adverse impacts to nonendangered fish and wildlife resources provided:

1. Wetland and aquatic habitats are avoided and protected during the proposed actions.
2. The best management practices are implemented, as appropriate, during remedial actions to reduce potential erosion in the project area and siltation of adjacent aquatic habitats.

3. All discharges associated with the proposed ground water extraction and treatment action meet Alabama's water quality standards and pollutants that could adversely impact aquatic resources are prevented from entering any surface waters.

B. Endangered Species Act

We have determined that the following Federally listed species may occur in the general project impact area:

1. Alabama cave shrimp (Palaemonias alabamiae), endangered.
2. Pink mucket pearly mussel (Lampsilis abrupta), endangered.

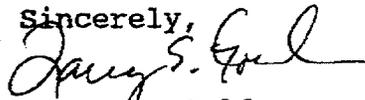
It is unlikely that the above Federally protected species would be adversely affected by the proposed actions provided appropriate safeguards to prevent impacts to these species or degradation their habitats are implemented during these remedial actions. However, if remedial actions would affect ground water habitats that are connected to known Alabama cave shrimp habitats or if associated discharges would reduce the water quality (temperature, turbidity, pH, BOD, TDS, or other potential pollutants) in the Tennessee River, we recommend further coordination with our office.

If deep groundwaters would be treated that lie in potential Alabama cave shrimp habitats but not connected to known habitats for this species, we suggest that the extracted groundwater, during initial well drilling and later water treatment, be filtered and periodically checked. This information would be useful in determining if the Alabama cave shrimp or other subterranean aquatic fauna occur at the cleanup sites. We request that you preserve all aquatic specimens that are observed during well testing or cleanup operations and notify this office as soon as possible for further project guidance.

When additional information on the remaining two cleanup sites (Unit 1 - adjacent to the backwaters of Wheeler Reservoir, and RSA-G - adjacent to or within Thiokol Industrial area) at Redstone Arsenal becomes available for our review, we will provide further Section 7 coordination.

If you have any questions or need additional information, please contact Mr. Carl Couret at (334) 441-5181.

Sincerely,



Larry E. Goldman
Field Supervisor

cc: Redstone Arsenal, AL
(Attn: AMSMI-RA-EH-EQ (Dunn))

Appendix B

WETLAND FINDING REPORT

November 22, 1993

Department of the Army
Savannah District, Corps of Engineers
P.O. Box 889
Savannah, GA 31402-0889
ATTN: Mr. David Barber

Dear Mr. Barber:

This letter report describes the findings of a preliminary wetland delineation conducted by Gulf Engineers & Consultants, Inc. (GEC) on October 19, 1993 at Area F (Closed Arsenic Impoundments) on Redstone Arsenal, Alabama. This site is approximately 5 acres in size and located in the central portion of Redstone Arsenal just north of the former Lewisite Manufacturing Plant Area (Figure 1). This area is situated in Section 29, T4S, R1W, Madison County, Alabama.

Area F consist of three closed ponds used for the disposal of arsenic-contaminated wastes. The site is somewhat level with a slight easterly slope. There is a small drainage ditch on the eastern side of the site which drains storm water from nearby uplands. The site is completely surrounded by a fence and posted as a contaminated area.

The wetland delineation was performed in accordance with the criteria set forth in the Technical Report Y-87_1, *Corps of Engineers Wetland Delineation Manual*, Section C, Subsection 2. Madison County Soil Survey Maps and U.S. Geological Survey (USGS) topographic quadrangle maps were reviewed to identify potential wetlands on the site. Adequate coverage of the site was ensured by a meander survey. There were only two communities encountered on the site: loblolly pine plantation and hardwood slope. A wetland data form was completed near the drainage ditch in the hardwood slope community. Because of the soil contamination there was no soil sample taken.

The soil Conservation Service (SCS) Soil Survey of Madison County showed two soil types occurring on the site: Cumberland loam and Ooltewah silt loam. However, the site has been highly disturbed through waste disposal activities and capping activities. There were no soil samples taken at this site due to the arsenic contamination in the soil; therefore, no site specific soil information is provide.

The pine plantation consisted of loblolly pine (*Pinus taeda*) and Eastern red cedar (*Juniperus virginiana*) in the tree stratum and *Rubus* sp., winged sumac (*Rhus copallina*), and sericea lespedeza (*Lespedeza cuneata*) in the shrub stratum. This community covered the majority of the site.

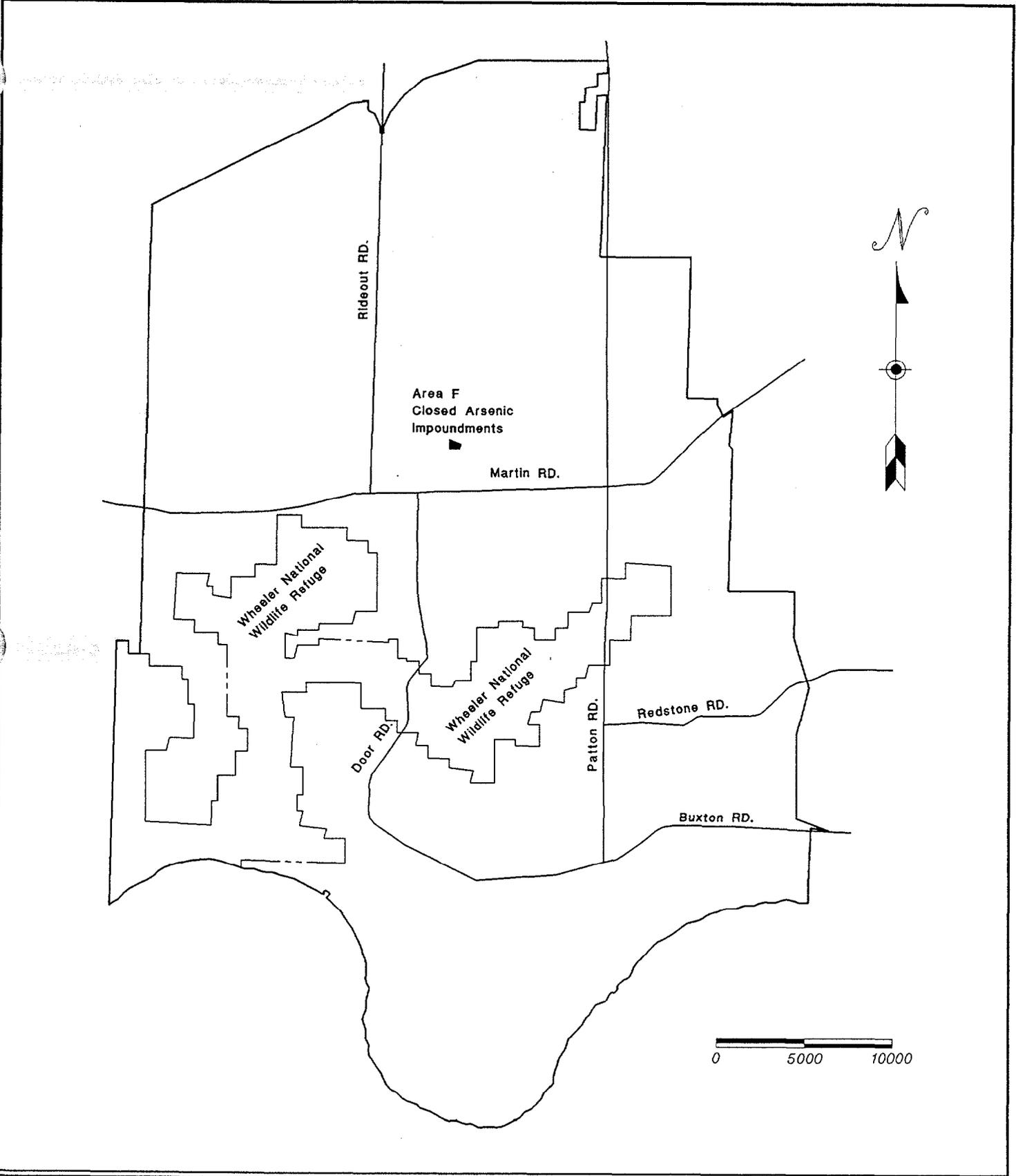
A hardwood community was located on the east side of the site along the edge of the existing slope of the impoundment cap. This community consisted of cottonwood (*Populus deltoides*), black cherry (*Prunus serotina*), black willow (*Salix nigra*), black locust (*Robinia pseudoacacia*), honeysuckle (*Lonicera japonica*), hackberry (*Celtis laevigata*), sericea lespedeza, *Rubus* spp., frost aster (*Aster pilosus*), *Smilax* spp. and *Solidago* spp.

All the information gathered indicated that the small drainage ditch in the northeast corner of the site could possibly be called wetlands. This ditch is shown in Figure 2. No other areas exhibited the three parameters for wetlands.

If you have any questions regarding this report or require any further information, please do not hesitate to call.

Sincerely,

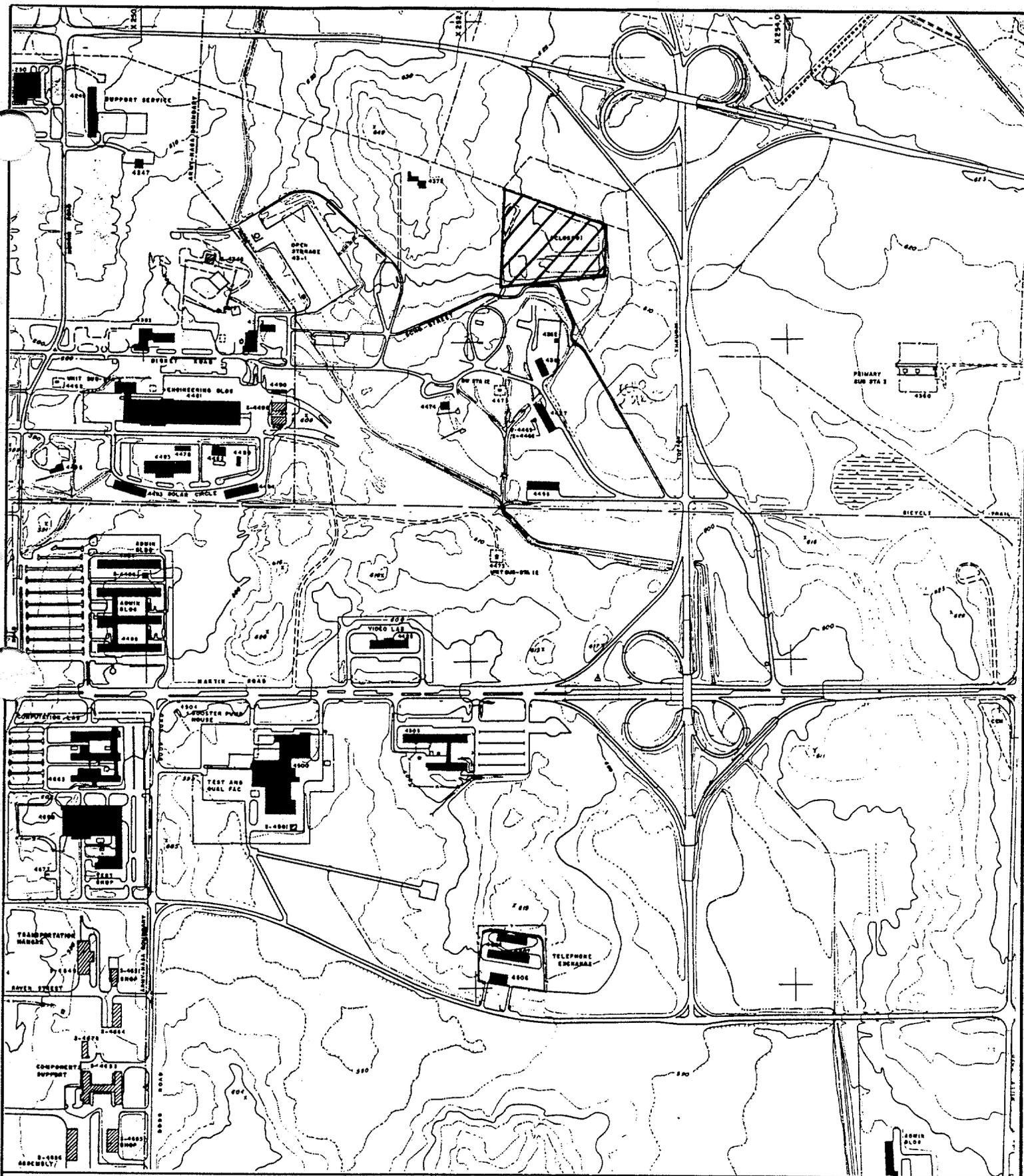
Barry McCoy
Environmental Resources



**AREA F
CLOSED ARSENIC IMPOUNDMENTS
LOCATION MAP**

FIGURE NO: 1
DRAWN BY: RBM/USGS
CHECKED BY: RBM
SCALE: N/A
DATE: 11/18/93

GULF ENGINEERS & CONSULTANTS, INC.
ENGINEERING • ECONOMICS • SOCIAL ANALYSIS • ENVIRONMENTAL PLANNING



SITE MAP
Area F
Closed Arsenic Impoundments

GULF ENGINEERS & CONSULTANTS, INC.
 ENGINEERING • ECONOMICS • SOCIAL ANALYSIS • ENVIRONMENTAL PLANNING

FIGURE NO: 2
DRAWN BY: RBM/COE
CHECKED BY: RBM
SCALE: 1" = 800'
DATE: 11/29/93



Photograph 1. Overview of existing drainage ditch in the northeast corner of Area F.



Photograph 2. Overview of existing drainage ditch in the northeast corner of Area F.



Photograph 3. Drainage canal through the northeast corner of Area F.

Appendix C

WETLAND VERIFICATION MEMORANDUM



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202-1070

22 NOV 1994

IN REPLY REFER TO
CEORN-CO-F (1145b)

MEMORANDUM FOR Commander, Corps of Engineers, Savannah
District, ATTN: PD-EC, P.O. Box 889
Savannah, GA 31402-0889

SUBJECT: Wetlands Delineation Verification and Permit
Requirements for Interim Remedial Action, Area F (Closed
Arsenic Impoundments), Redstone Arsenal, Alabama

1. Reference your 18 October 1994, memorandum to CESAM-OP-S, subject as above. Your memorandum was forwarded to this office for appropriate action.
2. Personnel from this office performed an on-site inspection with Redstone Arsenal staff on 3 November 1994. The inspection did not reveal the presence of any wetlands within the project limits. The proposed relocation of the minor tributary stream is authorized under authority of Nationwide Permit (NWP) #26 [33 CFR 330, Appendix A] which became effective 21 January 1992. Please refer to File No. 53,795 in any future correspondence related to this project. The enclosed Conditions for Nationwide Permits must be followed for the authorization to be valid. Please note that if you fail to comply with the conditions, this authorization may be modified, suspended, or revoked and an individual permit may be required pursuant to 33 CFR 330.5(d).
3. The notification that the work is approved under the NWP mentioned above is valid until two years from date of this letter unless the NWP is modified, suspended, or revoked. If the work has not been completed by that time, you should contact this office to obtain verification that the permit is still valid. Enclosed are postcards which must be mailed to this office prior to commencement and after completion of the approved work.
4. If you have any questions, please contact Mr. William L. James in our Regulatory Branch at the above address or telephone (615) 736-5181.

FOR THE COMMANDER:

Encls

Daniel F. Hall
DANIEL F. HALL
Chief, Operations, Construction
and Readiness Division

Appendix D

DETERMINATION MEMORANDUM FOR CULTURAL RESOURCES

Dec 5, 1994

MEMORANDUM FOR RECORD

From: Charles M. Hubbert
Archaeological Consultant
Environmental Quality Division
Redstone Arsenal, AL

To: Staff
IR Program
Environmental Quality Division
Redstone Arsenal, AL

Date: December 5, 1994

Subject: Cultural Resource Reconnaissance At IR Area F (Arsenic Ponds)

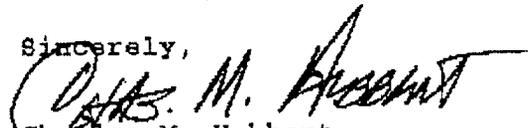
Dear Sirs,

I have conducted Cultural Resource reconnaissance in the vicinity of IR Area F in the north-central part of Redstone Arsenal. This is the area commonly called the Arsenic Pond. This area is located on slightly rolling plateau-land at approximately the 620' contour interval.

The area which will be impacted by the IR program as it is presently planned has been previously impacted by a number of factors including sustained agriculture, erosion, and earth moving developments such as those which make the IR program necessary. The net result of these developments has been to make it impossible to tell if cultural resources were ever located there. At the present time the area is covered in pine and brush. Subsoil-like soils are located immediately below the thin, recent humus. There is no indication of any cultural resources in the vicinity of Area F.

Cultural Resource concerns should have no bearing on continuing the planned IR activities at Area F.

Sincerely,



Charles M. Hubbert
Archaeologist

Appendix E

CULTURAL RESOURCES VERIFICATION LETTER

PD-EC



STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
468 South Perry Street
MONTGOMERY, ALABAMA 36130-0900



F. LAWRENCE OAKS
EXECUTIVE DIRECTOR

TELEPHONE NUMBER
242-3184

January 11, 1995

Mr. Paul S. Metz, Jr.
Dept. of the Army
Savannah Dist., COE
P. O. Box 889
Savannah, GA 31402-0889

Re: 95-0140
Cultural Eesource Assessment
Interim Remedial Actions
Units 1 & 2, Areas F & G
Redstone Arsenal
Madison County, AL

Dear Mr. Metz:

Based upon the cultural resource assessment conducted by Charles Hubbert, the State Historic Preservation Officer concludes that the above referenced project will have no effect on any cultural resources included in or eligible for nomination to the National Register of Historic Places. Therefore, our office concurs with the proposed project activities.

We appreciate your consideration in the protection of Alabama's nonrenewable cultural resources. If this office can be of further assistance, please do not hesitate to write or call.

Sincerely,

F. Lawrence Oaks
State Historic Preservation Officer

FLO/LAL/gtj

Appendix F

DISTRIBUTION LIST FOR ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

**DISTRIBUTION LIST FOR ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT**

Huntsville-Madison County
Public Library - Main Branch
ATTN: Mr. David Lilly
P.O. Box 443
Huntsville, AL 35804
Phone (205) 532-5940

Alabama Department of Environmental
Management
ATTN: Mr. Tom DeLoach, Water Treatment
1751 Congress W.L. Dickenson Dr.
Montgomery, AL 36130
phone (205) 271-7821
fax 205-270-5612

Alabama Department of Environmental
Management
ATTN: Mr. Jim Arnold, Water Supply Branch
1751 Congress W.L. Dickenson Dr.
Montgomery, AL 36130
phone (205) 271-7778
fax 205-270-5612

Alabama Department of Environmental
Management
ATTN: Mr. David Koonce, Water Division
Mining and Nonpoint Source Section
1751 Congress W.L. Dickenson Dr.
Montgomery, AL 36130
phone (205) 271-7782
fax 205-270-5612

TVA Resource Group
Mr. Terry E. Howard (Project Leader)
Reservoir Land Manager, Wheeler Reservoir
119 County Road 412
Town Creek, AL 35672
phone 205-685-3193
fax 205-685-0369

TVA Resource Group
ATTN: Mr. Randy McCann
Land Use Specialist, Wheeler Reservoir
119 County Road 412
Town Creek, AL 35672
phone 205-685-0499
fax 205-685-0369

TVA
ATTN: Mr. Ron Davis, Environmental
Coordinator
Ridgeway Road
Norris, TN 37828
phone 615-632-1530
fax 615-632-1612

TVA Resource Group
ATTN: Mr. Bennett Graham, Archaeologist
Ridgeway Road
Norris, TN 37828
phone 615-632-1583
fax 615-632-1612

Alabama Historic Commission
ATTN: Mr. F. Lawrence Oaks
State Historic Preservation Officer (SHPO)
468 South Perry Street
Montgomery, AL 36130-0900
phone 205-242-3184
fax 205-240-3477

Alabama Historic Commission
ATTN: Ms Lee Luis, Archaeologist
468 South Perry Street
Montgomery, AL 36130-0900
phone 205-242-3184
fax 205-240-3477

Alabama Historic Commission
ATTN: Mr. Greg Rhinehart
Cultural Resources Manager
468 South Perry Street
Montgomery, AL 36130-0900
fax 205-240-3477

USFWS Wheeler National Wildlife Refuge
ATTN: Mr Tuck Stone, Refuge Manager
Route 4, Box 250
Decatur, AL 35603
phone 205-353-7243

U.S. Fish & Wildlife Service
Ecological Services
446 Neal St.
Cookeville, TN 38501
phone 615-528-6481

U.S. Fish & Wildlife Service
Ecological Services
Box 1190
Daphne, AL 36526
phone 205-441-5181

U.S. Fish & Wildlife Service
Ecological Services
6578 Dogwood View Pkwy
Jackson, MS 39213
phone 601-965-4900

U.S. Fish & Wildlife Service
Ecological Services
ATTN: Mr. Dick Biggins
330 Richfield Ct.
Ashville, NC 28806
phone 704-665-1195

Geological Survey of Alabama
Biological Systems
ATTN: Mr. Stuart McGregor, Biologist
P.O. Box 0
Tuscaloosa, AL 35486
phone 205-349-2852 ext 283
fax 205-349-2861

Geological Survey of Alabama
Environmental Systems
ATTN: Mr. Everett Smith
P.O. Box 0
Tuscaloosa, AL 35486
phone 205-349-2861 ext 219
fax 205-349-2861

Geological Survey of Alabama
Water Resources Division
ATTN: Mr. Danny Moore
P.O. Box 0
Tuscaloosa, AL 35486
phone 205-349-2861 ext 317
fax 205-349-2861

U.S. Army Corps of Engineers
Mobile District, Redstone Area Office
ATTN: CESAM-CD-ENA (Mr. Jimmy Stevens)
Redstone Arsenal, AL 35808-0162
phone 205-876-1642
fax 205-876-3011

U.S. Army Corps of Engineers
Mobile District, Redstone Area Office
ATTN: CESAM-CD-ENA (Ms. Claudimette
Purifoy)
Redstone Arsenal, AL 35808-0162
phone 205-876-1642
fax 205-876-3011

U.S. Army Corps of Engineers
Mobile District, Redstone Area Office
ATTN: CESAM-CD-ENA (Mr. Terry Asher)
Redstone Arsenal, AL 35808-0162
phone 205-876-1447
fax 205-876-3011

U.S. Army Corps of Engineers
Mobile District, Redstone Area Office
ATTN: CESAM-CD-ENA (Mr. Steve Arrendale)
Redstone Arsenal, AL 35808-0162
phone 205-876-3801
fax 205-876-3011

U.S. Army Corps of Engineers
Waterways Experiment Station
Vicksburg, MS 39180-6199
phone 601-634-3701

Susan F. Weber
Contracting Ecologist
1623 Monte Sano Blvd.
Huntsville, AL 35801
phone 205-539-3747

Alabama A&M University
Biology Department
P.O. Box 610
Normal, AL 35762
phone 205-851-5329

HDQ AMC
Environmental Quality Division
ATTN: Mr. Stan Lowe, NEPA
5001 Eisenhower Ave.
Alexandria, VA 22333-0001
phone 703-274-9386

U.S. Army Environmental Center
ATTN: SFIM-AEC-RMB (Ms. Claudette Diggin)
Aberdeen Proving Ground, MD 21010-5401
phone 410-671-1643
fax 410-671-1695

U.S. Army Environmental Center
ATTN: SFIM-AEC-ECN (Ms. Annie Pettegrew)
Aberdeen Proving Ground, MD 21010-5401
phone 410-671-1566
fax 410-671-1695

U.S. Army Environmental Center
ATTN: SFIM-AEC-ECN (Mr. David Guldenzopf)

Aberdeen Proving Ground, MD 21010-5401
phone 410-671-1580
fax 410-671-1695

U.S. Army Medical Research Acquisition Activity
ATTN: MCMR-RMA-RM (Ms. Melanie Harman)
Ft. Detrick
Frederick, MD 21702-5014
phone 301-619-2579

U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365

Alabama Natural Heritage Program
Department of Conservation and
Natural Resources
ATTN: Mr. James Godwin, Zoologist
64 North Union Street, Rm 421
Montgomery, AL 36130
phone 205-242-3007
fax 205-242-0999

State of Alabama
Alabama Natural Heritage Program
Department of Conservation and
Natural Resources
ATTN: Ms. Jarel Hilton, Botanist
64 North Union Street, Rm 421
Montgomery, AL 36130
phone 205-242-3007
fax 205-242-0999

State of Alabama
Alabama Natural Heritage Program
Department of Conservation and
Natural Resources
ATTN: Mr. Chris Oberholster, Community
Ecologist
64 North Union Street, Rm 421
Montgomery, AL 36130
phone 205-242-3007
fax 205-242-0999

Mississippi Department of Wildlife Conservation
Mississippi Museum of Natural Sciences
ATTN: Mr. Paul Hartfield, Biologist
Curator of Invertebrates
The Fannye A. Cook Memorial
111 N. Jefferson Street
Jackson, MS 39202-2897
phone 601-354-7303
fax 601-965-4340

U.S. Fish & Wildlife Services
Natural Wetlands Inventory
ATTN: Mr. Lee Lyons
9720 Executive Center
Ste 101 Monroe Bldg
St. Petersburg, FL 33702
phone 813-570-5428
fax 813-570-5420

U.S. Army Corps of Engineers
ATTN: CEORN-CO-F (Mr. William James)
Western Regulatory Section
P.O. Box 1070
Nashville, TN 37202-1070
phone 615-736-5181
fax 615-736-7145

U.S. Army Corps of Engineers
ATTN: Mr. Wade Whittinghill, Biologist
Western Regulatory Section
P.O. Box 1070
Nashville, TN 37202-1070
phone 615-736-5181
fax 615-736-7145

U.S. Army Corps of Engineers
ATTN: Mr. Ronnie Smith, Biologist
Chief Western Regulatory Section
Operations, Construction and Readiness Div
P.O. Box 1070
Nashville, TN 37202-1070
phone 615-736-5181
fax 615-736-7145

U.S. Army Corps of Engineers
Fort Worth District
ATTN: Mr. Bill Metz, Archaeologist
Army Cultural Resources Legacy POC
819 Taylor Street
Fort Worth, TX 76102
phone 817-334-2625
fax 817-334-2098

Commander, USAMC Installation and
Services Activity
ATTN: AMXEN-M (Mr. Rich Clewell)
Natural Resources and AMC Legacy Projects
Rock Island, IL 61299-7190
phone 309-782-8252
fax 309-782-7566

Commander, USAMC Installation and
Services Activity
ATTN: AMXEN-M (Mr. Bill Woodson)
Natural Resources
Rock Island, IL 61299-7190
phone 309-782-8252
fax 309-782-7566

Commander, USAMC Installation and
Services Activity
ATTN: AMXEN-M (Ms. Erin Manning)
AMC Legacy Projects
Rock Island, IL 61299-7190
phone 309-782-5050
fax 309-782-7566

U.S. Army Medical Research Acquisition Activity
ATTN: MCMR-RMA-RM (Ms. Joyce Richardson)
POC for Legacy Sensitive Flora &
Fauna Project
Ft. Detrick
Frederick, MD 21702-5014
phone 301-619-2709

Huntsville City Schools
EARTHSCOPE
Mr. Dave Brotherton
Environmental Teacher
1107 Monte Sano Blvd.
Huntsville, AL 35801
phone 205-532-4883
fax 205-532-4826

Huntsville City Schools
EARTHSCOPE
Mr. Jim Fanning
Environmental Teacher
1107 Monte Sano Blvd.
Huntsville, AL 35801
phone 205-532-4883
fax 205-532-4826