8760

U.S. Army Environmental Center

Site Management Plan

Alabama Army Ammunition Plant
Talladega County, Alabama

Prepared for:
Alabama Army Ammunition Plant, Childersburg, Alabama

Prepared By:
United States Army Environmental Center
Base Closure Division
Aberdeen Proving Grounds, Maryland 21010

May 10, 1995

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

ADEM	Alabama Department of Environmental Management
AEHA	U.S. Army Environmental Hygiene Agency
A-E	Architectural and Engineering
CFR	Code of Federal Regulation
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
EPA	U.S. Environmental Protection Agency Region IV
FFA	Federal Facilities Agreement
FS	Feasibility Study
FY	Fiscal Year
K	Thousand
ALAAP	Alabama Army Ammunition Plant
NCP	National Oil and Hazardous Substance Contingency Plan
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List (Priorities is correct)
OBG's	Open Burning Grounds
OU1	Operable Unit One
OU2	Operable Unit Two
OU3	Operable Unit Three
PA	Preliminary Assessment
PA/SI	Preliminary Assessment/Site Investigation
RA	Remedial Action
RAR	Remedial Action Report
RCRA	Resource Conservation and Recovery Act of 1976
R&D	Research and Development
RD	Remedial Design
RD/RA	Remedial Design/Renedial Action
RD/RC	Remedial Design/Remedial Construction
TNT	Trinitrotolune
RI	Remedial Investigation
ROD	Record of Decision
SI	Site Investigation
TNT	Trinitrotoluene (Explosive)
USACE	U.S.Army Corp of Engineers
USAEC	U.S. Army Environmental Center (formerly U.S. Army Toxic and Hazardous Material Agency)

1.0 PURPOSE AND SCOPE:

1.1 This Site Management Plan (SMP) addresses the plans and strategies of the U. S. Army, U.S Environmental Protection Agency Region IV, and Alabama Department of Environmental Management to investigate and remediate Alabama Army Ammunition Plant (ALAAP), Childersburg, AL. The SMP provides background information on the ALAAP and describes the projected future actions needed to establish permanent remedies at the facility, including closure and monitoring requirements. The SMP is based on previous and on-going investigations at the facility. This SMP represents the best-available projections regarding known and potential sources of contamination and impact areas, and potentially feasible remedies leading to complete and final contamination control and/or cleanup actions at the facility. Due to the dynamic nature of the remedial investigation, remedial action activities and the complexity of the site, this plan will require modification as the program progresses. The SMP updated annually (September) to reflect work in progress; additional work to be conducted; changes in schedules; and new information or requirements (site or regulatory related).

1.2 All investigations and remedial actions at ALAAP will be conducted in accordance with the 1989 Federal Facility Agreement between the U. S. Army, the U. S. Environmental Protection Agency (EPA), and the State of Alabama.

1.3 The SMP addresses areas known to be or potentially contributing to environmental contamination at ALAAP. These areas contain sites used for burial, detonation, burning and other types of disposal of ordnance materials and other hazardous substances. Environmental studies conducted since 1985 have shown that releases of hazardous substances have occurred from the source areas, resulting in contamination of groundwater and other media that may ultimately pose unacceptable health or environmental risks. Current data shows that groundwater contamination originates from several source areas, but the full nature and extent of the problem have not been determined.

2.0 BACKGROUND:

2.1 **Physical Setting:** ALAAP is located in Northeastern Alabama (Talladega County), approximately 40 miles east-southeast of Birmingham and 70 miles north of Montgomery, the state capital. The nearest town is Childersburg, Alabama, four miles south of ALAAP (see Figure 2-1). The plant was established in 1941 on 13,233 acres of land near the junction of Talladega Creek and the Coosa River. The terrain is level to rolling and largely suited to pasture and timber, with elevations ranging from 384 to 600 feet above mean sea level (feet-msl).

2.1.1 Physiography and Topography:

2.1.1.1 All of ALAAP is in the Coosa Valley district of the Valley and Ridge physiographic province (Fenneman, 1938; Johnston, 1933). The border between the Valley and Ridge province and the Piedmont province is south of ALAAP between Talladega and Tallaseehatchee Creeks.

2.1.1.2 Topography within ALAAP generally ranges from remnant river floodplain over the western portion of the site (Area B) grading to wooded uplands over the eastern portion of the site (Area A). Elevations range from approximately 400 ft.-msl near the Coosa River to over 550 ft.-msl within Area A. Much of the topography was modified to accommodate farming activities prior to site construction, and, then again during the construction and operation of the site.

2.1.2 Climatology:

2.1.2.1 Talladega County's climate (including ALAAP) is temperate. The weather during fall, winter, and spring is controlled by frontal systems and contrasting air masses. Summer weather, which lasts from May or June, until September or October, is almost subtropical because maritime tropical air prevails along the Bermuda high-pressure system.

2.1.2.2 Average daily temperatures at Talladega are 75 degrees Fahrenheit (°F) for the high and 50°F for the low. Summer high temperatures are commonly 90°F or above; occasionally, maximum temperatures exceed 100°F. Temperatures below 32°F occur approximately 60 days per year, primarily in December and January.

2.1.2.3 Mean annual rainfall is 52 inches. The lowest average monthly rainfall (2.2 inches) occurs in October, and the highest average monthly rainfall (6.4 inches) occurs in March. Talladega County has two rainy seasons per year. The winter rainy season is from December to April, and the majority of rain is associated with the passage of frontal systems. The summer rainy season is from May through September, with the highest rainfall occurring in June and July. Summer rains are normally convective thundershowers.

2.1.3 **Geologic Setting:**

2.1.3.1 The bedrock underlying ALAAP has been mapped on a regional scale and has been identified as undifferentiated Knox Group of Upper Cambrian to Lower Ordovician age dolomite. The dolomite underlying ALAAP is thick-to medium-bedded, cherty, and penetrated by numerous solution cavities, joints, and fractures. It is overlain by residual soil derived from it by weathering processes. This soil matrix consists primarily of clay, with some silt, sand, and occasional chert boulders, and varies in thickness from less than three feet to over 90 feet.

2.1.3.2 There appears to be a difference in the nature of the uppermost bedrock between the western and eastern portions of the site. Well borings completed in the eastern portion of the site (Area A) revealed a very weathered surface with a large number of horizontally trending rock ledges and cavities. Borings completed in the western portion of the property near the Coosa River (Area B) did not have this highly weathered zone. The top of the weathered bedrock is located at a higher elevation in Area A than the top of the solid bedrock in Area B. This may reflect a fracture/cavity network beneath Area A that is trending primarily along bedding planes rather than vertical fracture networks. This highly permeable, horizontal weathered zone has likely been eroded from the bedrock in Area B, possibly by the action of the Coosa River.

2.1.4 **Surface Hydrology:**

2.1.4.1 The majority of the surface runoff from ALAAP drains either west or southwest into the Coosa River. A small portion of the southern and eastern side of ALAAP drains toward Talladega Creek, a tributary of the Coosa River. Prior to construction of ALAAP, the area consisted of farms, woodlands, and wetlands. Much of the western half of ALAAP was poorly drained. Small natural drainages were enlarged and re-routed to provide drainage at the sites of the various manufacturing operations.

2.1.4.2 Two natural drainage systems within Area B conveyed surface runoff from the plant west to the Coosa River. Liquid industrial wastes from the explosives manufacturing operations were conveyed west to the Coosa River by a man-made channel, the Red Water Ditch (Study Area 21). No natural ponds existed on ALAAP during its operation. Two large storage lagoons (Red Water Basin and Aniline Sludge Basin) were constructed to retain industrial wastes. Extensive wooded swamp and open pond areas have developed in the drainage systems at ALAAP, since the beginning of demolition activities in 1973, primarily as a result of damming of drainages by beavers.

2.1.5 **Soils:**

2.1.5.1 The soils at ALAAP are generally divided into three associations. Soils of the Bodine-Minvale association are found on the high ground of the eastern portion of ALAAP. This association is composed of deep, well-drained, steep, cherty, medium-textured soils derived from limestone and dolomite. Most of ALAAP is covered by soils of the Decatur-Dewey-Fullerton association, which are also deep, well-drained, loam soils derived from limestone and dolomite. The soils of the floodplain of Talladega Creek and the Coosa River have been classified as the Chewacla-Chenneby-McQueen association. These are deep, nearly level, alluvial loam soils that grade from somewhat poorly drained to well-drained and are subject to flooding.

2.1.5.2 These broad-based associations represent agricultural classifications rather than engineering descriptions. Soil constitution within the three associations may range from soils consisting primarily of sand and silt with little clay to soils comprised almost entirely of clay.

2.1.6 **Groundwater:**

2.1.6.1 Potable groundwater from the dolomite aquifer of the Coosa Valley supplies the needs of the communities, homes, farms, and industries around ALAAP. The majority of the successful wells draw water from solution cracks and cavities in the dolomite. A few wells are completed in the residual soil, but these wells are less productive than those drilled into the dolomite.

2.1.6.2 No map of the potentiometric surface in the vicinity of ALAAP has been published, however, water-level data measured in nearby wells during four days in October and November 1962 was published. No historical data exist for the water-table aquifer in the vicinity of ALAAP. An inventory of domestic wells in the vicinity of

ALAAP was completed during the RI and is presented in the final 1986 RI Report. Potable wells in the vicinity of ALAAP were sampled during the Supplemental RI for Area B in 1991. No contamination was detected in any of the wells tested.

2.1.7 **Ecological Systems:**

2.1.7.1 The environment at ALAAP has sustained three major perturbations in the past 40 years. Prior to construction of the facility, the area consisted primarily of cropland and woodland. During its operational years, much of ALAAP consisted of maintained industrial areas. A woodland management plan, instituted after the cessation of operations, extensively modified ALAAP by allowing for the planting of 3,411 acres of controlled pine forest. The third major change occurred as a result of demolition of various areas.

2.1.7.2 Currently, many of the formerly maintained drainages, pine plantations, and cleared areas have undergone considerable vegetative overgrowth. Much of the planted pine has been harvested, and reforestation has occurred through natural revegetation. Damming of surface drainages by beavers has modified the drainage systems; drainage has become much slower, and extensive wooded swamp and shallow pond areas have developed. As a result of these changes, the major ecological systems currently consist of the following types: grassland/old field association, upland pine forest/pine plantations, oak forests, low moist pine woods, hardwood swamps, intermittent streams, shallow ponds, and drainage ditches.

2.1.7.3 These systems support abundant populations of aquatic and terrestrial organisms. White-tailed deer, introduced in the 1960s, have become abundant, as have certain predators (the red-tailed hawk, the marsh hawk, and the bobcat).

2.1.7.4 The extensive development of shallow beaver ponds has resulted in large populations of amphibians and aquatic reptiles, and the East Beaver Pond provides roosting for waterfowl.

2.2 **Facility History:**

2.2.1 The plant was built in 1941 and operated during World War II (WWII) as a government-owned/contractor-operated (GO/CO) facility by E.I. du Pont de Nemours & Co. to produce nitrocellulose (NC), single-base smokeless powder and tetryl, TNT, and dinitrotoluene (DNT). Activities at ALAAP included the manufacture of explosives, DNT, and the chemicals sulfuric acid (H_2SO_4), aniline, diphenylamine, and

N,N-dimethylaniline; recycling of spent acids; and the disposal of wastes resulting from these operations. Operations were terminated at ALAAP in August 1945, and the plant converted to standby status.

2.2.2 The plant was maintained in various stages of standby status until the early 1970s. In 1973, the Army declared ALAAP excess to its needs. In the same year, the General Services Administration (GSA) declined to accept 1,620 acres of the former manufacturing area because the area could not be certified free from contamination. In 1977, a 1,354-acre parcel was sold to Kimberly Clark, Inc. To facilitate the release of portions of the property, ALAAP was divided into two major regions: Area A and Area B (see Figure 2-2). Area A consists primarily of the former storage and GSA areas, while Area B consists of manufacturing areas. In 1990, Area A was sold to a private group who currently retains title to the land.

2.3 **Land Use:**

2.3.1 Area B, is currently in an inactive caretaker status with controlled access. The only activity occurring on ALAAP is occasional Army-supervised logging. The land surrounding ALAAP is a mixture of recreational and industrial activity. ALAAP is bordered on the west side by a country club; on the south by a paper products company; on the east by wooded, private property; and on the north by a water treatment plant.

2.3.2 Area A was auctioned on May 10, 1990, and was conveyed to the new owners on August 31, 1990 for unrestricted use. Currently Area A is used as a hunting preserve and occasional logging.

3.0 **SUMMARY OF EXISTING STUDIES:** The Studies described below are primary source documents used in the investigation of ALAAP. A list of all primary and secondary documents are provided in Appendix A.

3.1 **Installation Assessment of Alabama Army Ammunition Plant, Report No. 130 (May 1978):** This report (which consisted of a records search) was prepared to confirm previously known areas of contamination and to determine whether other (undocumented) contaminated areas exist. It concluded that areas were potentially contaminated with chemical and explosive manufacturing wastes, including trinitrotoluene, dinitrotoluene, trinitrophenol methylnitramide (tetryl), smokeless powders, acid/organic compounds, and heavy metals. In addition, the report indicated that due to past disposal practices (discharge of explosive contaminated waters into the Red Water Ditch), there is the potential for contaminated surface runoff during inclement weather. Finally, the report indicated that the installation was potentially contaminated with lead compounds and asbestos that spread when buildings were demolished by burning.

3.2 **Environmental Survey of Alabama Army Ammunition Plant (July 1981):** The purpose of the survey was to identify the type and extent of contamination due to past operation in order to release the ALAAP as excess property. Such release requires certification that the released property is free from contamination and may be released without restrictions imposed. In order to establish priorities for releasing ALAAP, the Army divided the property into three areas: the Industrial Area, Leaseback Area, and the General Services Administrative (GSA) Area. The industrial area was the central portion of the plant used in the production of high explosives. The leaseback area included the nitrocellulose and smokeless powder production lines and associated facilities. The remainder of the installation the GSA Area, included the former plant administration facilities, storage and shipping facilities, the magazine area, the cannon range, and the small arms ballistics range.

3.2.1 Sampling and analysis of groundwater, surface water, sediments, soils, buildings, and industrial sewers were conducted. Explosives-related contaminants were detected in all environmental matrices, including the groundwater in the center of the explosives manufacturing area. Sampling found no evidence of contamination in the surface drainage beyond the boundaries of Alabama Army Ammunition Plant. Principal organic contaminants were trinitrotoluene, tetryl, 2,2-dinitrotoluene, and 1,3,5-trinitrobenzene. Lead and asbestos contamination was also detected in the soils. Many of the buildings that remained standing contained asbestos with trace levels of nitrocellulose

contamination and/or high explosive residues. The industrial sewer system was also identified as contaminated with nitroaromatic materials, explosives, and propellants.

3.3 **Confirmatory Environmental Survey, Alabama Army Ammunition Plant, Final Report (June 1983):** The purpose of the confirmatory survey was to more precisely define the extent of contamination in the Industrial Area and part of the GSA as well as characterize the hydrogeology of the site. The confirmatory survey concluded the following findings:

3.3.1 A single aquifer system occurs in the subsurface of the southern and northern TNT manufacturing Areas with groundwater movement northwest toward the Coosa River.

3.3.2 Significant migration of contaminants through the groundwater or surface water is not occurring in 11 study areas.

3.3.3 Nitroaromatic residues are present in the soils of the Southern and Northern TNT Manufacturing Areas and the sediments in the Red-Water Ditch Area. Although, the concentrations of the nitroaromtics encountered in the solid/sediments are well below the maximum levels allowable for industrial use, these soils/sediments have been identified as the source of groundwater contamination in the area.

3.3.4 Surface water from the Southern and Northern Manufacturing Areas do not contain nitroaromatics contaminants above applicable levels beyond the boundary of ALAAP.

3.3.5 The concentration of nitroaromatics in the groundwater are estimated to be below applicable water quality standards by the time the contaminants reach the Coosa River.

3.3.6 The surface water in the Beaver Pond stream are being impacted by nitroaromatics. However, the levels of contaminants in the stream are below applicable criteria.

3.4 **Alabama Army Ammunition Plant Remedial Investigation Final Report (July 1986):** The Remedial Investigation Report presented the hydrologic conditions of the site and quantified the extent of contamination in soil, groundwater, surface water,

sediments, and sewer lines. The Remedial Investigation survey yielded or confirmed the following:

3.4.1 No significant contaminant migration has occurred in the surface or groundwater as a result of past industrial activities in 19 study areas.

3.4.2 Sediments of the three major drainage systems (Beaver Pond drainage system, Crossover Ditch, and Red Water Ditch) are contaminated with nitroaromatic compounds.

3.4.3 Runoff from the spoil piles and occasional discharge from contaminated sewer lines present the potential for contaminate migration through the upstream surface waters of the Red Water Ditch.

3.4.4 Nitroaromatic contamination exists in the shallow groundwater beneath the southern and northern trinitrotoluene manufacturing areas.

3.4.5 As a result of explosives manufacturing activities and subsequent demolition of buildings, the soils of the southern and northern trinitrotoluene manufacturing areas and the old burning ground and sediments of the Red Water Ditch contain nitroaromatic residues. Contamination detected in soil, although well below the maximum levels permitted for industrial use, was identified as a source of groundwater contamination.

3.4.6 All soils tested for reactivity were found to be nonreactive.

3.4.7 Extractable lead above the extraction procedure toxicity limit was detected in soil at the lead remelt facility.

3.4.8 Asbestos materials were scattered over all areas where buildings were demolished. The sanitary landfill and the demolition landfill also contained asbestos. No asbestos was found to be migrating through surface waters.

3.4.9 Many of the buildings that existed at the time of the study were contaminated with low levels of nitroaromatic compounds.

3.4.10 Beaver Pond Stream was contaminated with nitroaromatic compounds as a result of groundwater inflow; however, the levels of contamination in the stream are below those requiring remedial action.

3.5 **Draft Supplemental Remedial Investigation/Feasibility Study for Area B, Alabama Army Ammunition Pl t (October 1990):** The Draft Supplemental Remedial Investigation/Feasibility S y was prepared to fill data gaps in the Remedial Investigation for Area B and to answer concerns identified by USEPA. It covers eight study areas (propellant shipping area, northern and southern trinitrotoluene manufacturing areas, tetryl manufacturing area, flashing ground, lead remelt facility, rifle powder finishing area, red water ditch, and the crossover ditch) within Area B. During the investigation, no significant contamination migration was found to be occurring in the shallow or deep aquifers of the combined (northern and southern) trinitrotoluene man acturing areas. At the flashing ground, no contamination was found in the deep aquifer; contamination in the shallow aquifer was confined and was not significantly migrating. No detectable concentrations of nitroaromatic compounds or tetryl were detected in the surface water or sediment collected from the Red Water Ditch, the Crossover Ditch, and the Beaver Pond Drainage System.

3.6 **Supplemental RI/FS for Area B, Alabama Army Ammunition Plant Draft Endangerment Assessn nt, Volume I & II (December 1990):** This document attempted to provide the risk assessment, that would define the potential for hazardous substances originating at Area B of ALAAP to cause harm to public health, welfare, and the environment.

3.7 **Remedial Investigation/Feasibility Study of the Industrial Sewer System, Alabama Army Ammunition Plant (September 1991):** The purpose of the report was to identify the nature and extent of contamination within the industrial sewer system (ISS) in the four former production areas (Northern and Southern TNT Manufacturing Areas, Tetryl Manufacturing Area, and the Acid/Organic Manufacturing Area) and select a remedial response that either successfully decontaminates the ISS or prevents contaminant migration. The results of the Remedial Investigation determined that soils, ditch sediment, and surface water in the vicinity of the sewer lines and manholes at the combined TNT manufacturing area and the tetryl manufacturing area were contaminated to various degrees by nitroaromatic compounds. The Feasibility Study addressed remediation of the industrial sewer lines and manholes in these areas. The remedial action recommended by the Feasibility Study for the ISS was excavation, on-site mobile rotary kiln incineration, and on-site landfilling.

3.8 **Record of Decision, Alabama Army Ammunition Plant, Alabama Stockpile Soils Area Operable Unit (December 1991):** The Record of Decision presented the selected remedial action for the Stockpile Soils Area Operable Unit. The Operable Unit

consisted of soils located within Building TC4A and a concrete slab covered with an impermeable membrane in Area B of ALAAP. The document states that actual or threatened release of hazardous substances from this site, if not remediated, may present an imminent and substantial threat to public health, welfare, or the environment. The principal threats posed by the stockpile soils were from explosives, lead, and asbestos-containing material. The selected remedy consists of on-site thermal treatment of stockpile soils, on-site disposal of treated soil, and on-site or off-site disposal of asbestos-containing material.

3.9 **Supplemental Remedial Investigation/Feasibility Study for Area B, Alabama Army Ammunition Plant, Draft Final Feasibility Study (March 1992):** This FS is base on the information and data generated during all previous field investigation (exploratory, confirmatory and RI Survey) and the exposure pathways, potential receptors and corresponding cleanup criteria identified in the Supplemental RI/FS for Area B, Alabama Army Ammunition Plant Draft Endangerment Assessment, Volume.

3.9.1 Significant findings associated with this investigation included: leaking industrial sewer systems in Areas 6,7,8 and 10

3.10 **Supplemental Remedial Investigation/Feasibility Study for Area B, Alabama Army Ammunition Plant, Final Baseline Risk Assessment, Volume I and II, (August 1992):** This report is a component of the Remedial Investigation/Feasibility Study for Area B of Alabama Army Ammunition Plant. The purpose of the Risk Assessment was to determine the health and environmental risks associated with the no-action alternative. The risk and impact characterization of the areas included in the quantitative Risk Assessment indicates that none of the areas pose unacceptable health risks or impacts, because of the installation's current caretaker status. However, based on future industrial use of the installation, 12 areas may pose unacceptable human health risks and/or hazards. The future residential use scenario indicated 13 areas that may pose unacceptable human health risks and/or hazards due to the presence of site-related contaminants in one or all of the media sampled (soil, groundwater, surface water, and sediment). The ecological risk evaluation indicates that 14 of the areas may have adverse ecological effects under each of the three scenarios.

3.11 **Supplemental Remedial Investigation/Feasibility Study for Soils in Area A, Alabama Army Ammunition Plant, Final Feasibility Study, (December 1992):** A supplemental RI/FS was conducted to verify the effectiveness of the completed

remedial actions in Area A. The study determined that soils at two study areas within Area A (Study Areas 12 and D) continue to contain lead and explosives at unacceptable concentrations. The supplemental RI/FS concluded that approximately 2,200 yd^3 of lead-contaminated soil from Study Area 12 and approximately 5 yd^3 of explosives-contaminated soil from Study Area D required further remediation.

3.12 **Supplemental Remedial Investigation/Feasibility Study for Area A, Soil Operable Unit, Alabama Army Ammunition Plant, Final Feasibility Study (December 1992):** The Final Supplemental Remedial Investigation/Feasibility Study was prepared at the request of U.S.EPA Region IV to fill data gaps in the Remedial Investigation for Area A and to verify the effectiveness of the completed remedial actions in Area A. The supplemental FS evaluated alternative remedial responses to uncontrolled releases of hazardous substances for all known sites within Area A. However, only two study areas within Area A (Study Areas 12 and D) contain contaminates which required Remedial Action. Areas 12 and D contained unacceptable concentrations of lead and explosives. The selected recommended remedial action consisted of solidification of approximately 2,200 yd^3 of lead-contaminated soil from Study Area 12 and incineration of approximately 5 yd^3 of explosives-contaminated soil from Study Area D.

3.13 **Supplemental Remedial Investigation/For Soils/Feasibility Study for Area A, Alabama Army Ammunition Plant, Final Remedial Investigation (January 1993):** This document updated the ALAAP RI final report (ESE 1986) by summarizing the data collected during previous investigations of Area A, and analyzed additional data collected form Area A during this investigation. The first objective of this study was focused on verification of remedial activities at three study areas: the Old Burning Grounds (Study Area 12), the New Trench (Study Area D) and the Disposal Area (Study Area E). The second objective was to test soils downwind of the Propellant Shipping Area (Study Area 17).

3.13.1 Significant findings associated with this investigation included: Elevated lead, and chromium concentrations remain in portions of the shallow soils in Study Area 12. Nitroaromatic compounds were detected within two soil samples collected during this investigation from Study Area D.

3.14 **Supplemental Remedial Investigation/Feasibility Study for Area B, Alabama Army Ammunition Plant, Final Remedial Investigation Volume I & II (June 1993):** This document updated the ALAAP RI Final Report (ESE 1986). This

document more further characterizes Area B by summarizes the data collected during this investigation with data obtained from previous surveys (Exploratory Survey, Confirmatory Survey, and the Final RI 1986). The supplemental RI field program includes the following areas of concerns:

3.14.1 Combined TNT Manufacturing Areas (Study Areas 6 & 7)

3.14.2 Flashing Ground (Study Area 16)

3.14.3 Red Water Ditch (Study Area 21)

3.14.4 Crossover Ditch (Study Area 26)

3.14.5 Beaver Pond Drainage System (Study Area 27)

3.14.6 Area A and B Divide

3.15 **Interim Record of Decision, Alabama Army Ammunition Plant, Study Areas 12 and D of the Area A Soil Operable Unit April 1994:** This Interim Record of Decision presents the selected interim remedial action for the soils of Study Areas 12 and D within the Area A Soil Operable Unit (OU) at Alabama Army Ammunition Plant (ALAAP), Childersburg, AL. The selected alternative for this action consisted of removal and subsequent incineration of explosive-contaminated soils and solidification of lead-contaminated soils. Approximately 5 cubic yards of 2-4-6 TNT contaminated soil in Study Area D was excavated to meet the remediation level of 21 mg/kg and 2,179 cubic yards of lead contaminated soil in Study Area 12 was excavated to meet the remediation of 500 mg/kg. Contaminated soils from Areas 12 and D was transported to the Mobile Incinerator located within Area B. Contaminated soil was then thermally treated and solidified prior to on-site landfilling. This decision is documented in the Administrative Record (AR) for the site.

3.16 **Interim Record of Decision, Alabama Army Ammunition Plant, Study Areas 6, 7, 10, and 21 of the Area B Soil Operable Unit, November 1994:** This Interim Record of Decision presents the selected interim remedial action for the soils from Study Areas 12 and D within the Area B Soil Operable Unit at Alabama Army Ammunition Plant (ALAAP), Childersburg, AL. This interim remedial action consists of excavating, transporting, on-site thermal treatment/solidification and landfilling of 400,000 cubic yard of contaminated soils. The contaminated soil is a direct or indirect

result of past explosive production operations of TNT and Tetryl. The thermal treatment shall be accomplish using a Mobile Incinerator located in Area B. This interim action began in December 1994 and is expected to last for approximately one year. This decision is documented in the Administrative Record (AR) for the site.

4.0 **AREA A SITE DESCRIPTIONS:** This section summarizes the principal findings from previous investigations within Area A (exploratory, confirmatory, RI and supplemental RI/FS reports), summarizes the known history and presents the finding for each area of concern. Table 1 list all Study Areas in Area A.

4.1 **Study Area 11 - Magazine Area:** The Magazine Area, located in the north central portion of Area A, consists of a series of storage buildings. This Area is the largest study area in ALAAP Area A. The Series 260 Buildings are designated for storing DNT, the Series 1010 Buildings for storing tetryl, and the Series 811 Buildings for storing TNT.

4.1.1 Soils were sampled at two different times as part of the RI effort and analyzed for explosives and inorganic chemicals. Of the 40 samples collected during the post-cleanup investigation (the second sampling effort) one sample indicated the presence of 1,3-dinitrobenzene (13DNB) at 0.53 milligrams per kilogram (mg/kg) concentration. No other explosive of organic chemicals were detected at this study area. The primary migration pathways of munitions detected in soil are fugitive dust or particulate emission. In addition, due to the proximity of a hardwood swamp near Study Area 11, the potential exists for chemicals in soil to migrate to the swamp via surface runoff during periods of heavy rainfall. These compounds may subsequently undergo photolytic and biological degradation in the swamp. The amount of munitions reaching groundwater from this area is expected to be low because of the low concentrations detected in the soils. Parts of this area are being logged and cleared for hunting.

4.2 **Study Area 12 - Old Burning Ground:** This study area is located in the northern section of Area A and was the primary disposal site for unacceptable batches of explosives, propellants, and other reactive wastes. Periodic burning of the study area's vegetation was practiced during plant operation to minimize the danger of wildfires. This study area also included a former Lead Remelt Facility. Surface water flow, in this area is intermittent and occurs only during heavy rain events.

4.2.1 Elevated lead and chromium concentrations remain in portions of the shallow soils; additionally, one soil sample contained 12.9 parts per million (ppm) of 246TNT. Lead, chromium, and arsenic were widely distributed in the soils, indicating that these compounds occur naturally in the native soils at concentrations up to 30 ppm (ESE, 1992b).

4.2.2 Organic and metallic chemicals were detected at this study area. The primary migration pathways of munitions and metals detected in soil are fugitive dust or

particulate emission. In addition, the potential exists for chemicals in soil to migrate via surface runoff during periods of heavy rainfall. The amount of munitions reaching groundwater from this area is expected to be low because of the low concentrations detected in the soils.

4.2.3 Interim remedial action for contaminated soil within study Area 12 was completed in November 1994. An Interim Record of Decision was approved that selected removal and subsequent incineration of explosive-contaminated soils and solidification of lead-contaminated soils. 2,179 cubic yards of lead contaminated soil in Study Area 12 was excavated to meet the remediation of 500 mg/kg. Contaminated soils from Areas 12 solidified prior to on-site landfilling within Area B.

4.3 **Study Area 13 - Small Arms Ballistics Range:** This study area is approximately 3.7 acres, located centrally at the northern boundary of Area A. This area was covered by gravel during the operational period and was used as a training range for small arms ballistics. A ballistics laboratory was adjacent to this area during the operational period. Currently, no buildings exist on this site.

4.3.1 The results from soil and sediment sampling indicated the presence of bis (2-ethylhexyl) phthalate (B2EHP), iron, lead, and n-nitrosodiphenylamine (NNDPA). Organic and metallic chemicals were detected at this study area. The primary migration pathways of NNDPA, B2EHP, and metals detected in soil are fugitive dust or particulate emission. In addition, the potential exists for contaminates in soil to migrate via surface runoff during periods of heavy rainfall. The amount of NNDPA and B2EHP reaching groundwater from this area is expected to be low because of the low concentrations detected in the soils.

4.4 **Study Area 14 - Cannon Range:** This study area, used for cannon test firing, is approximately 13 acres located at the northeast corner of the northern boundary of Area A. Access to this area is restricted by a fence and locked gate. Since operations ceased at ALAAP all buildings have been removed and the remaining area has not been maintained.

4.4.1 Only lead was detected at this study area, and the lead levels appear to be similar to the concentrations across Area A, indicating that lead is not associated with a source. The primary release mechanism for lead at this site would be via release to the atmosphere as particulate or dust emissions. However, due to the degree of vegetative cover and relatively few areas of bare soils, this migration pathway is not considered significant.

4.5 **Study Area 15 - Old Well:** The Old Well was a relict hand-dug well, located in the northeast portion of Area A, which served a farm or residence prior to construction of ALAAP. The well was reported to be approximately 30 ft deep and 5 ft in diameter. During the razing of the laboratory building which supported the explosives manufacturing operations, laboratory reagents, non-sparking paints, 55-gallon (gal) drums of a tar-like material, fire retardant paint, containers of other unidentifiable materials, and old tires were reportedly disposed of in this well.

4.5.1 Soil samples contained only lead at a maximum concentration of 12.8 ppm (within normal range). Surface water samples contained bis(2-ethylhexyl)-o-phthalate and methylene chloride.

4.5.2 Organic and metallic chemicals were detected at this study area. The primary migration pathways of the organics and metals detected in soil are fugitive dust or particulate emission. In addition, the potential exists for chemicals in soil to migrate via surface runoff during periods of heavy rainfall. The amount of munitions reaching groundwater from this area is expected to be low because of the low concentrations detected in the soils. The well and surrounding soils were removed during a remedial action in 1986.

4.6 **Study Area 17 - Propellant Shipping Area:** The propellant shipping houses are located in the south-central portion of ALAAP and overlaps into Area B. However, the contamination status of Area 17 was included in the Area A RI/FS process. The shipping house area (Series 229 Buildings) used to store propellant prior to shipment and consisted of 48 buildings, 13 of which are located on the land previously sold to Kimberly Clark. The remaining 35 buildings, located within the current ALAAP boundary, comprise Study Area 17.

4.6.1 Soil samples from this study area were collected during initial RI efforts as well as after the cleanup was complete. No organic contaminants were detected in the first sampling effort. All of the soil samples collected as part of the supplemental RI contained detectable levels of lead. The average lead concentration in the soils was approximately 20 ppm and ranged from 8.83 to 130 ppm. Only four of the samples exhibited a lead concentration greater than 30 ppm.

4.6.2 Based on the short duration of the burning operations and the relatively small quantity of lead (from the bullets in the target backdrops at the Small Arms Ballistics Range) that was burned, it is assumed that the lead present in the soils at Study Area 17 (at levels up to 30 ppm) is naturally occurring. This assumption is consistent with the

results of the exploratory survey, which indicated that lead concentrations at the shipping buildings ranged from 10 ppm (detection limit at the time) to 30 ppm.

4.6.3 Only lead was detected at this study area. The levels of lead appear to be similar to the concentrations across Area A, indicating that lead is not associated with a source. The primary release mechanism for lead at this site would be via release to the atmosphere as particulate or dust emissions. However, due to the degree of vegetative cover and relatively few areas of bare soils, this migration pathway is not considered significant. The shipping houses were removed during a remedial action completed in 1986.

4.7 **Study Area D - New Trench Area:** During remedial activities conducted by Roy F. Weston, Inc. (Weston) in 1988, Study Area D was identified. This area is approximately 2.9 acres located north of Study Area A. Area D was used for disposing of equipment and other general wastes.

4.7.1 Nitroaromatic compounds were detected in 3 of the 34 soil samples collected during the Supplemental investigation. All three samples, which were collected from the 0- to 3-ft depth, contained 246-TNT, with one sample containing a high concentration (13,900 ppm) of this compound. Although the concentration of 246-TNT in the second sample was an order of magnitude lower (1,400 ppm), the results suggest the presence of an area of high nitroaromatic contamination. Of the three samples that contained 246-TNT, two also contained 135-TNB. The presence of these contaminants is due to past disposal practices in the area.

4.7.2 Munitions and metallic chemicals were detected at this study area. The primary migration pathways of the organics and metals detected in soil are fugitive dust or particulate emission. In addition, the potential exists for chemicals in soil to migrate via surface runoff during periods of heavy rainfall. The important fate and transport processes of the metals in the terrestrial environment are adsorption/desorption, precipitation/dissolution, and speciation. The rate and extent of these processes are influenced by Ph, ionic strength, inorganic and organic ligands, and redox conditions. The metals are expected to be in the adsorbed phase or in solution form and be transported via surface runoff or leaching.

4.7.3 Interim remedial action for contaminated soil within study Area D was completed in November 1994. The selected alternative for this action consists of removal and subsequent incineration of explosive-contaminated soils. 5 cubic yards of 2-4-6 TNT contaminated soil was remediated to meet the remediation level of 21

mg/kg. Contaminated soils from Areas D was transported to the Mobile Incinerator (currently at ALAAP to incinerate stockpiled soils) located in Area B, thermally treated and placed in an on-site landfill.

4.8 **Study Area E - Disposal Area:** During remedial activities conducted by Weston in 1988, Study Area E was identified. This area is less than 1 acre and is located north of Study Area 11 and east of Study Areas D and 12. Study Area E was used for disposing of equipment and other general wastes.

4.8.1 No nitroaromatic contamination was detected in any of the soil samples collected as part of the supplemental investigation. Lead and arsenic were detected in all 32 samples, and chromium was also detected in 19 of the samples. Metals were present at levels that are believed to be background concentrations at the site (ESE, 1992b).

4.8.2 Only metals were detected at this study area. The important fate and transport processes of the metals in the terrestrial environment are adsorption/desorption, precipitation/dissolution, and speciation. The rate and extent of these processes are influenced by Ph, ionic strength, inorganic and organic ligands, and redox conditions. The metals are expected to be in the adsorbed phase or in solution form and be transported via surface runoff or leaching.

4.9 **Study Area F - Number 2 Rubble Pile and Study Area G - Henningsburg Area:** During remedial activities conducted by Weston in 1988, Study Areas F and G were identified. These tracts were suspected to have been localized areas used for the disposal of equipment and other general wastes. Study Area F is located near the Area A northwest boundary, and Study Area G is located centrally near the Area A east boundary. The Weston investigation indicated that the analytical results for these two areas were below detection limits.

4.10 **Study Area H - 229 Area:** During remedial activities conducted by Weston in 1988, Study Area H was identified. This area was used for disposing of equipment and other general wastes and is located directly south of Study Area 17.

4.10.1 Only lead was detected at this study area. The levels of lead appear to be similar to the concentrations across Area A, indicating that lead is not associated with a source. The primary release mechanism for lead at this site would be via the atmosphere as particulate or dust emissions. However, due to the degree of vegetative

cover and relatively few areas of bare soils, this migration pathway is not considered significant.

5.0 **AREA B, SITE DESCRIPTIONS:** Area B comprises the western portion of ALAAP, which contained most of the industrial facilities at ALAAP. This section summarizes the principal findings from previous investigations within Area B (exploratory, confirmatory, RI and supplemental RI/FS reports), summarizes the known history and presents the finding for each area of concern. Table 2 list all Study Areas in Area B.

5.1 **Study Area 2 - Smokeless Power Facility:** Most of the smokeless powder facility is located in the leaseback area. The Installation Assessment indicated that smokeless powder pellets often spilled during the loading of packages of explosive pellets into fiber boxes for shipping.

5.1.1 The initial environmental survey identified the following: levels of zinc and mercury just above background levels in groundwater; 2,4-dinitrotoluene in sediment samples; and dinitrololuene residues in soil samples. Asbestos contamination was found to be minimal.

5.1.2 The Confirmatory Survey of the area concluded that no further investigation of the study area was necessary because the extent of any contamination was sufficiently defined so that decontamination and salvage could be successfully accomplished and release action taken. The Remedial Investigation reported that the buildings were decontaminated and burned, the equipment decontaminated and salvaged, and the area has been transferred back to Kimberly Clark. A portion of Study Area 2 that still remains in Area B and has not been remediated. It appears that soil contamination is present in the area.

5.2 **Study Area 3 - Sanitary Landfill and Lead Facility:** The sanitary landfill was located in the west-central portion of the industrial area. According to the Environmental Survey, most of the fill material was domestic solid waste and building rubble. The only industrial, chemical, or reactive wastes disposed of in this landfill were limited quantities of material contaminated with explosives. The landfill was operational from the beginning of World War II operations until at least the late 1970's.

5.2.1 During the initial environmental survey soil samples were collected and analyzed. Two samples were contaminated with lead. Of the four samples analyzed for mercury, two had low levels. Only one soil sample had detectable concentrations of trinitrotoluene, nitrobenzene, and 1,3,5-trinitrobenzene. Three samples contained nitroaromatic residues. Asbestos materials were also evident in these samples. One groundwater monitoring well was installed in this area during the initial environmental

survey. The analysis of samples showed no detectable concentrations of contaminants of concern. The area was visually inspected for asbestos; both friable and Transite asbestos materials were found to be mixed in the landfill soil. Asbestos contamination is estimated to cover 11,000 square meters and to occupy a volume of 16,500 cubic meters within the landfill. Based on the findings of the initial environmental survey, the confirmatory survey concluded that the extent of contamination and its migration potential had been adequately defined for the Sanitary Landfill and Lead Facility. Therefore no additional investigation of Study Area 3 was conducted during the confirmatory survey.

5.2.2 A groundwater sample was collected, from each and analyzed for nitroaromatics and lead. No nitroaromatics or lead were detected in either well. Five soil samples were also collected and analyzed. One sample contained a low level of extractable lead.

5.3 **Study Area 4 - Manhattan Project Area:** Located in the western portion of the General Services Administration area, the Manhattan Project used a small part of the ALAAP from 1943 to 1945. According to a letter from a staff member at Formerly Utilized Sites Remedial Action Program to the Department of the Army, dated October 1989, an investigative records search was completed in October 1985 to determine the potential for radioactive contamination at the site. The letter states that the installation was designed to produce 1,600 pounds of heavy water per month, but records indicate that it produced under 600 pounds per month. A total of 11,160 pounds of heavy water were produced from January 1944 through July 1945. Storage tanks were formerly located at the site. In 1945/46 all buildings were removed except for one small brick building, which still remains. No records were found to describe site closeout activities. No information was available concerning any chemical use at this site.

5.3.1 During the Environmental Survey one groundwater monitoring well was installed near the middle of the study area. Groundwater sampling did not reveal nitroaromatic compounds. In two soil samples, a significant concentration of lead was found. A visual inspection and walkover of the area revealed only Transite asbestos materials, which were widely scattered over a surface area of approximately 3,700 square meters.

5.3.2 Based on the findings of the Environmental Survey, it was concluded that the contamination in the Manhattan Project Area was sufficiently defined; therefore, this study area was not evaluated further in the Confirmatory Assessment or the Remedial Investigation.

5.4 **Study Area 5 - Red-Water Storage Basin:** The Red-Water Storage Basin was intended to be used as a settling basin for trinitrotoluene manufacturing process wastewaters. It was constructed on the northern side of the Red-Water Ditch, several hundred meters to the west of the southern trinitrotoluene manufacturing area. The basin covered an area of 395,000 square feet and was surrounded by a 6-foot earth berm. The dike and the basin floor were made of clay. An entry pipe was located at the southeast corner and an exit flume was located in the southwest corner. Only the flume still exists. The basin contains some water during even the driest periods of the year.

5.4.1 During the Environmental Survey three groundwater monitoring wells. Of the three groundwater samples collected one sampled contained of trace levels of nitroaromatics. Surface water samples showed no concentrations of any contaminants. Of the seven sediment samples analyzed, only those in the immediate area of the waste inlet were contaminated with trinitrotoluene and sulfate.

5.4.2 An additional groundwater monitoring well was installed during the confirmatory survey. Groundwater samples were collected from the new well and the previously installed well which had showed trace levels of nitroaromatics. No contaminants were detected in either of the wells.

5.4.3 Based on the findings of the Environmental Survey and the Confirmatory Survey, the Remedial Investigation concluded that the extent of contamination and contaminant migration potential had been adequately defined for the Red-Water Storage Basin; therefore, it was not included in the Remedial Investigation.

5.5 **Study Area 6 - Southern Trinitrotoluene Manufacturing Area:** Study Area 6 was the new dinitrotoluene and trinitrotoluene manufacturing area. Ditches are present where wooden flumes formerly carried wastes to the industrial sewers. The production lines in this area were extensively bulldozed during demolition. All that remains as evidence of the former structures are the roadways and portions of building foundations. Any contaminated soil, initially situated adjacent to certain buildings, must therefore be assumed to have been dispersed throughout the area in a random pattern.

5.5.1 Environmental Survey sampling activities included the installation of two groundwater monitoring wells. One of the wells was found to contain a significantly high level of nitrite and nitrate, indicative of contamination of this aquifer by wastes from nitric acid production and nitration operations. This same well contained concentrations of nitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 1,3-dinitrobenzene, 2,4,6-trinitrotoluene, 1,3,5-trinitrobenzene, 2,4-dinitrophenol, and 2-

methy-4,6-dinitrophenol. Of 12 soil samples taken, nitroaromatic residues were detected in 11 of them. Five of the eight samples from the production line contained trinitrotoluene; 2,4-dinitrotoluene and 1,3,5-trinitrobenzene were each detected at separate sampling locations. Soil samples, consisting of spoil dredged from the Red-Water Ditch sediments deposited on the edge of the drain-way during the 1953-1954 renovation, were highly contaminated with trinitrotoluene. 2,4-dinitrotoluene and 2,6-dinitrotoluene were also detected. A walk-through survey was made to observe the extent of soil contamination by asbestos. Most of the Transite-containing rubble from building demolition is located around or near the building foundations. All open areas have been thoroughly bulldozed, scattering Transite materials throughout an estimated 69,000 square meters. Friable asbestos was difficult to locate due to the extent of destruction; however, it was found in large pieces along the pipelines in areas where bulldozing would be difficult. Due to the amount of destruction, it is likely that virtually all of the friable asbestos is now mixed into the soil.

5.5.2 Three additional groundwater monitoring wells and one piezometer cluster were installed as part of the Confirmatory Survey. Sampling results from the three new wells and the two previously installed wells showed concentrations of 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, nitrobenzene, 1,3-dinitrobenzene, and 1,3,5-trinitrobenzene. Following this sampling round, a total of 18 wells and 2 piezometer clusters were installed around the perimeter of the southern and northern trinitrotoluene manufacturing areas to better define the groundwater hydrology and extent of contamination in this area. Three soil cores were collected, and results found 2,4,6-trinitrotoluene, 2,4-dinitrotoluene, and 2,6-dinitrotoluene present in varying concentrations.

5.5.3 During the Remedial Investigation, five soil samples were collected and analyzed for extractable lead. The results were below the detection limit for all five samples. Four groundwater samples were collected from the existing wells and analyzed for six nitroaromatic compounds. In only one of the wells was the level of all compounds below the detection limit.

5.5.4 During the Supplemental Remedial Investigation, field sampling activities for the northern and southern trinitrotoluene manufacturing areas were combined. The Supplemental Remedial Investigation activities included installation of seven groundwater monitoring wells. Groundwater samples were collected from the seven new wells and from three previously installed wells. Nitroaromatic contaminants were detected in 3 of the 10 wells sampled.

5.5.5 Nitroaromatic contamination exists in the water table aquifer beneath the study area. In many instances, applicable water quality criteria were exceeded. The concentrations of nitroaromatics that may reach the Coosa River through subsurface migration from the study area are not predicted to exceed the applicable water quality criteria, even at the lowest daily river flow of the 64-year period of record. The Confirmatory Survey indicated that a relatively impermeable single aquifer system is present in the subsurface of the study area. According to results from the Supplemental Remedial Investigation, contaminant migration does not appear to be occurring in the shallow and deep aquifers of the study area.

5.6 **Study Area 7 - Northern Trinitrotoluene Manufacturing Area:** Industrial activities in this area (known as the old trinitrotoluene manufacturing area), produced 2,4,6-trinitrotoluene and 2,4-dinitrotoluene. The area consisted of four 2,4,6-trinitrotoluene production lines and one dinitrotoluene production line. Red water from this area was also dumped into the open Red Water Ditch. Ditches indicate the locations where wooden flumes formerly carried wastes to the industrial sewers. Like the southern trinitrotoluene manufacturing area, this production area has been completely razed. Material was spread over a wide area during the demolition; only foundations and portions of the sewer system remain.

5.6.1 Environmental Survey activities included collection and analysis of 10 soil samples. The results showed that all of the samples contained nitroaromatic compounds. 2,4-dinitrotoluene was detected in the surface soils of the dinitrotoluene production area. Sampling results from one of two groundwater monitoring wells showed a significantly high level of trinitrotoluene and dinitrotoluene, and detectable concentrations of 2,4-dinitrotoluene, 2,6-dinitrotoluene, and 2,4,6-trinitrotoluene A walk-through survey was conducted to observe the extent of soil contamination by asbestos. Most of the Transite-containing rubble from building demolition is located around or near the building foundations. All open areas have been thoroughly bulldozed, scattering Transite materials throughout these areas (an estimated 58,000 square meters). Friable asbestos was difficult to locate due to the extent of destruction; however, it was found in large pieces along the pipelines in areas where bulldozing would be difficult. Considering the amount of destruction, it is likely that virtually all of the friable asbestos is now mixed into the soil.

5.6.2 Two groundwater monitoring wells were installed as part of the Confirmatory Survey, and 2,4,6-trinitrotoluene and 2,6-dinitrotoluene were detected in the groundwater samples. Five soil cores were collected and analyzed. Various levels of

2,4,6-trinitrotoluene, 2,4-dinitrotoluene, and 2,6-dinitrotoluene were present in the cores.

5.6.3 The Remedial Investigation activities included collection and analysis of soil samples to determine the level of extractable lead. Of the five samples, levels in one sample were below the detection limit while the remaining five had concentrations well below the established extraction procedure toxicity criterion. Three groundwater samples were collected from the existing wells and analyzed; all contained detectable concentrations of all six nitroaromatic compounds.

5.6.4 Nitroaromatic contamination exists in the water table aquifer beneath the study area. In many instances, applicable water quality criteria are exceeded. However, the concentrations of nitroaromatics that may reach the Coosa River through subsurface migration from the study area are not expected to exceed the applicable water quality criteria even at the lowest daily river flow of the 64-year period of record. The Confirmatory Survey states that a relatively impermeable single aquifer system is present below the surface of the study site. According to the results of the Supplemental Remedial Investigation, contaminant migration does not appear to be occurring in the shallow and deep aquifers under the study area.

5.7 **Study Area 8 - Acid/Organic Manufacturing Area:** In the acid/organic manufacturing area, nitrobenzene was made and reduced to form aniline, N-,N-dimethylaniline, and diphenylamine. Concentrated nitric acid, oleum (fuming sulfuric acid), and sodium sulfite (sellite) were also produced. Included in this area is a former sulphur burning pit that could contain residual sulfur. The buildings have been completely razed, and rubble has been spread over the entire acid and sellite areas.

5.7.1 Environmental Survey activities included the collection and analysis of six soil samples. Nitrobenzene was detected in soils at Building 904-A. In addition, significant concentration of lead was present in one soil sample collected. Two groundwater monitoring wells were installed, and one of them was found to contain a significantly high level of nitrite and nitrate. High nitrite and nitrate levels in soil indicative of contamination of this aquifer by wastes from nitric acid production and nitration operations. No detectable nitroaromatic residues or organic bases were detected. A walk-through survey was conducted to observe the extent of soil contamination by asbestos. Extensive bulldozing resulted in the mixing of both Transite and friable asbestos with the soils, covering an estimated 165,000 square meters. Particles of sulfur up to 3 centimeters in diameter were abundant on the soil surface in the sulfur storage

area. The area contaminated by sulfur and acid wastes covers approximately 22,500 square meters.

5.7.2 On the basis of the findings of the Environmental Survey, the Confirmatory Survey concluded that the extent of contamination and contaminant migration potential had been adequately defined for the acid/organic manufacturing area and therefore was not included in the Confirmatory Survey.

5.7.3 Five soil samples were collected during the Remedial Investigation. No detectable concentrations of lead were found in any of the samples.

5.7.4 As part of the Supplemental Remedial Investigation, one down-gradient monitoring well was sampled. Neither nitroaromatic compounds nor tetryl were detected in this sample.

5.7.5 The study area was sufficiently defined by the Environmental Survey and therefore was not addressed in the Confirmatory Survey. The Remedial Investigation concluded that no significant contaminant migration occurs in the surface or ground waters as a result of past industrial activities at the study area.

5.8 **Study Area 9 - Aniline Sludge Basin:** The sludge basin, with an area of approximately 20,000 square feet, was unlined and constructed of clay dikes and a clay bottom. Liquid wastes and sludges from the production of aniline in the acid/organic manufacturing area were deposited in the basin. Ash from the northern power plant may also have been disposed of in the basin. There is an industrial inlet, but no exit, on the western side of the basin. Although the pond contains water year-round, it becomes shallow during the dry season. The bottom of the basin is now covered with a very fine, black silt that varies from 5 to 10 centimeters in depth. An area approximately 150 meters by 15 meters in the southern end of the basin is underlain by fractured butuminous like material.

5.8.1 The Environmental Survey activities included installation of four groundwater monitoring wells. Sampling results from one of the wells showed a significantly high level of trinitrotoluene and dinitrotoluene. The second well contained 2,4-dinitrotoluene just above the minimum detectable concentration. Concentrations of trinitrotoluene, 1,3-dinitrobenzene, and 1,3,5-trinitrobenzene were found at one sediment sampling location where a waste-water line from the acids area entered the basin. Two sediment samples revealed the presence of cadmium, nickel, chromium, copper, and zinc. Surface water sampling revealed no concentrations of contaminants.

5.8.2 One groundwater monitoring well was installed as part of the Confirmatory Survey. Groundwater samples were collected and analyzed from this well and the previously installed well where concentrations of nitroaromatics were found. No detectable nitroaromatic residues were found in either sample.

5.8.3 One groundwater sample was scheduled to be collected from a monitoring well during the Remedial Investigation. Due to low water-table conditions, this was not possible. No further work was done at this site as part of the Remedial Investigation.

5.9 **Study Area 10 - Tetryl Manufacturing Area:** The Tetryl Manufacturing Area consisted of 12 manufacturing lines, where tetryl was produced in a 2-step process by first sulfating N-N-dimethylaniline and then nitrating the resulting intermediate. Extensive amounts of lead were used in the piping, floors, and fittings of the four nitration houses. Lead scrap as well as melted chucks of lead were abundant in the soil adjacent to most of the nitrating houses in the area. The buildings have been razed and rubble spread over areas about 25 meters on either side of the manufacturing lines. All that remain of each line are the concrete foundations of the buildings and the concrete wheeling walk that linked the process buildings. During the 1978 assessment, team members recovered explosive material from the soil surface.

5.9.1 Environmental Survey activities included the collection and analysis of seven soil samples. A high lead content was found in a sample taken near the nitrating house. Tetryl was found in low concentrations at the north tetryl nailing house and at high concentrations in the soils around the two drying and finishing houses. Two groundwater monitoring wells were installed. Diphenylamine was detected in one well, and tetryl was detected in the other well. A walk-through survey was conducted to observe the extent of soil contamination by asbestos. Extensive bulldozing scattered both types of asbestos-containing materials over an area covering approximately 176,000 square meters.

5.9.2 Two additional groundwater monitoring wells were installed during the Confirmatory Survey. Four groundwater sampling were collected, one from each well. Trace level of tetryl was found in one of the wells.

5.9.3 Five soil samples were collected as part of the Remedial Investigation. Lead concentrations were below the detection limit in all five samples. Two groundwater samples were collected from existing monitoring wells. No nitroaromatics present above the detection limit.

5.9.4 As part of the Supplemental Remedial Investigation, one down-gradient monitoring well was sampled. Nitroaromatic compounds and tetryl were detected in this sample.

5.10 **Study Area 16 - Flashing Ground:** The Flashing Ground consists of burning trenches that were active after World War II. According to the Installation Assessment, combustible trash and explosive materials were burned in this area.

5.10.1 Environmental Survey activities included the collection and analysis of 13 soil samples. Analytical results revealed the presence of lead, nitrocellulose, trinitrotoluene, dinitrotoluene, trinitrobenzene, and tetryl in all but one of the samples. Four groundwater monitoring wells were installed. Trace amounts of 2,4-dinitrotoluene were found in one water sample. A walk-through survey was conducted to observe the extent of soil contamination by asbestos. Transite asbestos was found around the building that was located just inside the entry to the Flashing Ground. Small quantities of Transite materials were found along the burial pits on the western side of the area. No friable asbestos materials were found. Asbestos contamination is estimated to cover 55,000 square meters, with an estimated volume of 55,000 cubic meters.

5.10.2 Confirmatory Survey field sampling activity consisted of the installation of one groundwater monitoring well. Two groundwater samples were collected, one from the new well and one from a previously installed well. No residues were detected in either of the two groundwater samples.

5.10.3 Soil sampling was conducted as part of the Remedial Investigation. Of the 10 soil samples collected, three contained concentrations of lead greater than the extraction procedure toxicity criteria. Of the three groundwater samples planned, only one was collected due to a slow recharge rate. 2,4,6-trinitrotoluene was detected in the sample.

5.10.4 Supplemental Remedial Investigation activities included installation of eight additional groundwater monitoring wells. Groundwater samples were collected from the eight new wells and from two existing wells. Nitroaromatic compounds were detected in 2 of the 10 water samples. Dissolved lead was detected in all but two of the wells sampled.

5.10.5 The Remedial Investigation concluded that no significant contaminant migration occurs along surface or ground waters as a result of past industrial activities in the study area. According to the results of the Supplemental Remedial Investigation, the deep

aquifer exhibits no contamination, and contamination in the shallow aquifer is confined to one corner and is not migrating significantly.

5.11 **Study Area 17 - Propellant Shipping Area:** This site was originally identified in the 1978 Records Search as an old farm well located in the southern portion of the ALAAP that dated back before the land was acquired. It was reported that the well was used only to dispose of inert material. As of the 1981 Environmental Survey, this area was identified as the propellant shipping area, located in the General Services Administration study area. The shipping houses (Series 229 Buildings), used to store smokeless propellant prior to shipment, totalled 48 buildings. Thirteen of the 48 shipping buildings are located on land previously sold. Contamination occurred from sweeping debris from the floor of the buildings onto the ground surface and by spills and breaks during the storage and shipping process.

5.11.1 Environmental Survey activities included the installation of one groundwater monitoring well. No of nitroaromatics were detected in the groundwater sample. Soil sampling results revealed that only one building had a concentration of 2,4-dinitrotoluene above the detection limit and a low incidence of dinitrotoluene and nitrocellulose. A walk-through survey was conducted to observe the extent of soil contamination by asbestos. All buildings in this area are covered with Transite shingles or panels. Because the buildings were not heated, no steam lines were present in this area. No friable asbestos was found. All 35 buildings within the present ALAAP boundary were inspected and spot tested for the presence of nitrocellulose. Selected samples were collected and spot tests conducted for nitroaromatic residues. Eighty-four percent of the spot tests were positive for nitrocellulose but were below the reportable detection limit. Only one spot test for nitroaromatic compounds was positive, revealing a trace level of dinitrotoluene at Shipping House 229-18.

5.11.2 Based on the findings of the Environmental Survey, the Confirmatory Survey and Remedial Investigation concluded that the contamination in the propellant shipping area was sufficiently defined; therefore, this study area was not evaluated in these reports.

5.12 **Study Area 18 - Blending Tower Area:** This site was originally identified in the 1978 record search as five unlined settling basins. The record search revealed three of the five basins were used by the Beaunit Mills Company. Beaunit Mills Company leased Army property for the purpose of producing rayon fabric. In the process of making the fabric, acid, cellulose and organic materials were generated. The acid, cellulose and organic wastes generated from the process was disposed of in three out of

the five settling basins. The settling basins were designed and installed by the Army, however, they were never used by the Army. As of the 1981 Environmental Survey, the site was identified as the blending tower area.

5.12.1 The Environmental Survey activities consisted of an asbestos survey and soil sampling. Analysis of the soil sampling did not reveal nitroaromatic or organic base residues. Transite asbestos was found in this area around the foundations of demolished buildings. Bulldozing during building demolition scattered the transite material. Friable asbestos was not found in this area. Asbestos contamination in this area is estimated to cover 21,000 square meters. The Confirmatory Survey and Remedial Investigation concluded that the contamination in the blending tower area was sufficiently defined; therefore, this study area was not evaluated in these reports.

5.13 **Study Area 19 - Lead Facility:** The old lead facility was operated post 1973 during the demolition of Tetryl Area, recovering lead from lead lined piping and equipment. At the time of the Environmental Survey, numerous large pieces of lead, some weighing several kilograms, remained on the soil surface in this area and were thrown outside the flashing ground fence. Sparse vegetation was observed, possibly caused by soil contamination. Environmental Survey activities included the collection and analysis of five soil samples, which were found to contain significantly high levels of lead. A walk-through survey was conducted to observe the extent of soil contamination by asbestos. This area did not contain any Transite or friable asbestos.

5.13.1 Based on the findings of the Environmental Survey, the Confirmatory Survey concluded that the extent of contamination and its migration potential had been adequately defined for the lead facility; therefore, it was not included in the Confirmatory Survey.

5.13.2 Soil sampling was conducted as part of the Remedial Investigation. Analytical results for the samples were above the established extraction procedure toxicity criterion for lead.

5.14 **Study Area 20 - Rifle Powder Finishing Area:** No background history was available for the rifle powder finishing area. Environmental Survey activities included a walk-through asbestos survey and soil sampling. Of the nine soil samples analyzed, six contained significant concentrations of 2,4-dinitrotoluene. The asbestos survey found Transite asbestos around all building foundations and scattered throughout the area, covering an estimated 120,000 square meters. Friable asbestos was found along all former steam line routes.

5.14.1 Based on the findings of the Environmental Survey, the Confirmatory Survey and Remedial Investigation concluded that the contamination in the rifle powder finishing area was sufficiently defined; therefore, this study area was not evaluated in these reports. The Remedial Investigation concluded that no significant contaminant migration occurs in the surface or ground waters as a result of past industrial activities.

5.15 **Study Area 21 - Red-Water Ditch:** The Red-Water Ditch carried the industrial process wastewaters produced by the manufacture of tetryl and trinitrotoluene. The Red-Water Ditch also collected industrial process wastes and surface runoff from the acid/organic manufacturing area (Study Area 8) and the tetryl manufacturing area (Study Area 10). As initially constructed, the Ditch extended from the western side of the Tetryl Manufacturing Area through the northern TNT Manufacturing Area (Study Area 7), and the southern TNT-Manufacturing Area (Study Area 6). Industrial wastes generated in the Acid/Organic Manufacturing Area were discharged into the ditch immediately east of Building 806C (northern TNT Manufacturing Area). The areas drained by the Red-Water Ditch were involved in the production of acids (sulfuric and nitric), organics (diphenylaniline, aniline, and N,N-dimethylaniline), and explosives (trinitrotoluene, dinitrotoluene, and tetryl) and their process byproducts. Other organics and inorganics (benzene, toluene, sodium sulfite, and elemental sulfur) were also stored in these areas.

5.15.1 The Red-Water Ditch contains flowing water only during wet periods. During dry periods, the ditch contains water in only a few scattered locations. The Red-Water Ditch was constructed with steep sides and has a depth that varies from approximately 1 to 3 meters. The ditch was cleaned at least once since its original construction. Sediments dredged from the ditch during the cleaning operations were deposited along the ditch. When intersecting other drainage systems, the Red-Water Ditch crosses the other systems through vitrified pipes. The Red-Water Ditch drainage system carries approximately 17 percent of the surface water at ALAAP, which is ultimately discharged into the Coosa River.

5.15.2 The Environmental Survey conducted sampling activities along the Red-Water Drainage Ditch System. The survey concluded that the waters were contaminated by low levels of nitroaromatic compounds where the ditch traverses the southern and northern trinitrotoluene manufacturing areas and by diphenylamine immediately downstream of the outfall that discharges from the acid/organic manufacturing area. In addition, inorganic contamination (lead, nitrate, and sulfate) was present in two sampling locations. Waters in the middle section of the Red-Water Ditch were contaminated by low levels of 2,4-dinitrotoluene, 2,6-dinitrotoluene, and trinitrotoluene.

Diphenylamine was detected immediately downstream from the main acid/organic manufacturing area discharge point. Asbestos fibers were also found in the surface water. The sediments from the northern trinitrotoluene manufacturing area to the crossover point are contaminated by trinitrotoluene, as are the sewers and soils adjacent to the ditch in the southern and northern trinitrotoluene manufacturing areas.

5.15.3 Based on the findings of the Environmental Survey, the Confirmatory Survey concluded that the extent of contamination and contaminant migration potential had been adequately defined for the Red-Water Ditch; therefore, it was not included in the Confirmatory Survey.

5.15.4 Sediment and soil samples were conducted as part of the Remedial Investigation. Low concentrations of 2,4,6-dinitrotoluene were found in two of the three sediment samples. Soil sample analytical results showed 2,4,6-dinitrotoluene in all five samples and extractable lead in two of the three samples analyzed for this contaminant. Although plans were made to collect and analyze one surface water sample, this was not possible due to dry conditions.

5.15.5 During the Supplemental Remedial Investigation, four surface water samples and four sediment samples were analyzed. No nitroaromatic compounds or tetryl concentrations were found in any of these samples. According to the Remedial Investigation the drainage system is contaminated with nitroaromatic compounds. However, these sediments have been buried by channel wall erosion and sedimentation and do not contribute to surface water contamination. Low levels of nitroaromatic compounds were detected in the upstream surface waters of the Red-Water Ditch during the Environmental Survey. Runoff from the spoil piles and occasional discharge from contaminated sewer lines are identified as the source of the low levels of nitroaromatic compounds present.

5.16 **Study Area 22 - Demolition Landfill:** This disposal area, located near the flashing ground, consists of a semicircular landfill in a swale extending approximately 150 meters along Patrol Road. At this site, rubble from demolition activities was dumped in a 15 meters-wide semicircle around the edge of the swale to an average depth of approximately 2 meters. Several hundred kilograms of lead were found on the surface at this site in the form of sheets, wire, and pipe. Large amounts of cast iron, stainless steel fittings, aluminum, Transite, and other rubble were partially buried by concrete and earth. Friable asbestos was also distributed in the soil of this area. Soil sampling identified lead residues in concentrations above background in two samples and a small concentration of tetryl.

5.16.1 According to the Confirmatory Survey report, this site was not investigated because it had been sufficiently defined by the Environmental Survey.

5.16.2 Remedial Investigation sampling activities consisted of the collection and analysis of five soil samples. Results showed elevated levels of lead; however, none were above the established extraction procedure toxicity criterion.

5.17 **Study Area 25 - Storage Battery/Demolition Debris:** During the June 1985 site visit conducted as part of the Remedial Investigation, a previously undocumented disposal site, found during controlled hunting during the fall of 1984, was identified. Inspection of the disposal site indicated the presence of rubble and a number (at least 20) of heavy-duty lead acid battery casings. These consisted of approximately 30 pounds of lead components in a glass casing. Along with the batteries, several mercury switches (three of four observed), each containing 3 to 4 milliliters of mercury metal (liquified), were observed. The disposal site is located in a steep, overgrown ditch bank and is periodically flooded by backwater from the Coosa River. The batteries are reportedly still present at the site.

5.17.1 During the Remedial Investigation, samples were taken from soil and groundwater monitoring wells. Nine soil samples were collected and analyzed. Arsenic, chromium, copper, lead, nickel, thallium, zinc, and 2,4,6-trinitrotoluene were found in the soil at concentrations below the extraction procedure toxicity criteria used to define hazardous waste. In the groundwater sample, lead, thallium, and zinc concentrations were below the Federal drinking water standards.

5.18 **Study Area 26 - Crossover Ditch:** The Crossover Ditch was not identified as a study area until the Remedial Investigation, although the area was investigated during the Confirmatory Survey. The Crossover Ditch drains surface waters from the leaseback area, the rifle powder finishing area, the blending tower area, part of the northern and all of the southern portions of the propellant shipping area, the southern portion of the southern trinitrotoluene manufacturing area, and the sanitary landfill and lead facility. Two beaver dams have been constructed on the Crossover Ditch, a small one immediately east of the Series 223 Buildings and a large one south of the southern trinitrotoluene manufacturing area.

5.18.1 Although the Crossover Ditch drains areas that produced nitrocellulose and smokeless powder, contaminants from other sources may enter this drainage system. Potential sources of other contaminants include the coal pile at the Kimberly Clark power plant, the sanitary landfill and lead facility, the pipe flashing area immediately

east of Study Area 3, and the large industrial waste reservoir on Kimberly Clark land directly south of the rifle powder finishing area. It is estimated that the Crossover Ditch collects and discharges into the Coosa River approximately 25 percent of the surface waters generated on or adjacent to ALAAP property.

5.18.2 During the Environmental Survey, lead, cadmium, copper, and zinc were found in samples of surface water. The upper reaches of the Crossover Ditch had an iron oxide film on the water surface and iron staining of the sediments and aquatic vegetation, due to the impact of the coal pile. No detectable explosives-related contaminants were found. Asbestos fibers were found in the surface water. Analysis of 17 sediment samples showed residues from coal pile runoff in the upper reaches and evidence of coal pile particulate runoff throughout. Dinitrotoluene was found in all 17 samples.

5.18.3 Based on the findings of the Environmental Survey, the Confirmatory Survey concluded that the extent of contamination and contaminant migration potential had been adequately defined for the Crossover Ditch; therefore, it was not included in the Confirmatory Survey.

5.18.4 Two sediment samples were collected and analyzed as part of the Remedial Investigation. A concentration of 2,4-dinitrotoluene was found in one sample; in the second, a concentration of lead was found, but it was below extraction procedure toxicity criterion. It was not possible to take a surface water sample, due to dry conditions.

5.18.5 The Remedial Investigation concluded that no significant contaminant migration occurs in the surface waters as a result of past industrial activities at the study area. According to the Remedial Investigation the drainage system is contaminated with nitroaromatic compounds. However, these sediments have been buried by channel wall erosion and sedimentation and do not contribute to surface water contamination. The low levels of nitroaromatic compounds found in the surface water during the Environmental Survey can be attributed to spoil pile runoff and sewer leakage.

5.18.7 Supplemental Remedial Investigation field activities included the collection and analysis of four surface water samples. No detectable concentrations of nitroaromatic compounds or tetryl were found in any of the samples.

5.19 **Study Area 27 - Beaver Pond Drainage System:** The Beaver Pond drainage system was not identified as a study area until the Remedial Investigation, although the

area was investigated prior to this. The Beaver Pond drainage system flows west between the southern and northern trinitrotoluene manufacturing areas and derives its name from three large beaver ponds that have greatly changed the original ditch. The drainage system is a natural system that collects surface runoff from areas of planted trees and grassland. It originates in undeveloped areas south and east of the tetryl manufacturing area.

5.19.1 Potentially contaminated surface runoff in the Beaver Pond drainage system originates from the southern end of the tetryl manufacturing area and the shipping houses. Some surface drainage from the acid/organic manufacturing area, the tetryl manufacturing area, and the northern trinitrotoluene manufacturing area now enters the Beaver Pond drainage system. The system accounts for approximately 20 percent of the surface waters discharged from ALAAP. Very large quantities of water are stored year-round in the three ponds.

5.19.2 The Environmental Survey conducted surface water sampling which found that the waters of the drainage system appear to be uncontaminated except for one location, the groundwater seepage in the northern trinitrotoluene manufacturing area, where the sample contained trinitrotoluene. Asbestos fibers were also found. No contaminants flowed from ALAAP through this drainage system. Sediment samples showed concentrations of nitroaromatic compounds.

5.19.3 Surface water sampling activities were conducted as part of the Confirmatory Survey. Levels of 2,4,6-trinitrotoluene and 2,4-dinitrotoluene that were detected in the stream water were below applicable criteria.

5.19.4 As part of the Remedial Investigation, one water sample was collected and analyzed. All compounds analyzed for were below the detection limits.

5.19.5 Supplement Remedial Investigation field activities included the collection and analysis of four surface water samples and four sediment samples. None of these samples contained detectable concentrations of nitroaromatic compounds or tetryl.

5.20 **Industrial Sewer System:** The industrial sewer system for the entire plant was originally investigated in the environmental survey. In Area B, the industrial sewer lines totaled approximately 32,500 feet in length, of which approximately 31,000 feet remain buried. The Remedial Investigation defined the nature and extent of contamination within the industrial sewer system in the four former production areas (northern and southern trinitrotoluene manufacturing areas, tetryl manufacturing area, and acid/organic

manufacturing area) at ALAAP. A total of 98 soil samples from within and outside the industrial sewer system, 14 sediment samples, and 7 water samples from within the surface drainages were collected and analyzed. Sampling results found varying concentrations of nitroaromatics compounds present throughout the samples areas. A Feasibility Study was conducted based on the results of the Remedial Investigation.

5.21 **TC4A, TC4B & Concrete Slab - Stockpile Soils:** Structures TC4A, TC4B and a concrete slab contained contaminated soil that was excavated from Area A and placed in Area B pending incineration. TC4A and TC4B are buildings the concrete slab is a membrane-covered concrete storage pad. Contaminated soils from Area A (adjacent property) were removed between 1986 and 1987. In February 1990, a tornado demolished Building TC4B. Soils from the demolished building were added to the concrete slab and secured with the membrane liner. In February 1991, a feasibility study was conducted for the Stockpile Soils Area. The study concluded that explosives, lead, and asbestos contamination were present above regulatory limits. A feasibility study was conducted in July 1991 and a Record of Decision was released in December 1991. The selected remedy for the Stockpile Soils Area was to thermally treat and dispose of the soil on-site.

5.22 **Additional Areas Identified by the Community Environmental Response Facilitation Act (CERFA) Investigation:** The new areas described below were identified during the CERCLA investigation. These new areas of environmental concerns were associated with CERCLA-related environmental issues and identified through on-site inspections, personnel interviews, and record searches. These areas have not been investigated during any Remedial Investigation activities.

5.22.1 **Coke Oven:** The coke oven had a concrete-covered pit of unknown dimensions located next to it. According to the caretaker, the pit was used as a burning pad. Transformer oil was poured onto copper wire to burn off the insulation covering the copper. It is unknown whether the transformer oil contained any PCBs. The concrete pad is still present and the pit is not accessible.

5.22.2 **Downed Utility Poles with Transformers:** During the CERFA visual inspection a downed utility pole was noted. The soil under and around the broken transformer was blackened and bare of vegetation. The ALAAP Caretaker (Mr. Ronny Wynn) stated that numerous such sites existed within Area B and identified their location on a map. None of the transformers had been tested for PCB contamination. A total of 27 sites were identified, all located within the southern section of the General

Services Administration Area except for one located in the smokeless powder manufacturing area. These sites were assigned a number that corresponds to the closest building and are listed below.

5.22.2.1 708A: Three utilities poles are located north of Building 708A.

5.22.2.2 703E: Two utility poles are located along the northwest portion of Building 703E.

5.22.2.3 703A: Two utility poles are located along the southwest portion of Building 703A and one at the southeast corner.

5.22.2.4 2240: Eight utility poles are located south of Building 2240 (which is titled PURCH'D POWER).

5.22.2.5 2170: One utility pole is located near the southeast corner of Building 2170 with two more located south of the building.

5.22.2.6 704Y: Three utility poles are located north of Building 704Y, one directly north and two northeast.

5.22.2.7 717A: Two utility poles are located along the northeast portion of Building 717A, and one is located southwest of the building.

5.22.2.8 715C: One utility pole is located off the southeast corner of Building 715C.

5.22.2.9 227D: One utility pole is located north of Building 227D, in the smokeless powder manufacturing area.

5.22.3 **Gas Stations:** One gas station listed in the Inventory of Military Real Property was located in Area B. Building 724E is described as a gas station without a building (i.e., pump stations). The only information available stated that the underground storage tanks were installed in 1942. All underground storage tanks have since been removed.

5.22.4 **Transformer Storage Buildings:** According to the CERFA Report the ALAAP Caretaker (Mr. Ronny Wynn) stated that it was likely that transformers were at one time stored behind Building 2240, an instrument shop. However there was no evidence of stressed vegetation during the site inspection. The ALAAP Caretaker also reported, leaking transformer was stored in Building 2180, part of the Manhattan Project Area, and was removed in 1987. When demolition activities began in Area A

around 1973-1974, the contractor stored transformers removed from Area A in Building 2180. The caretaker further stated that when the transformers were removed, cleanup activities by the contractor consisted of throwing absorbent on any liquids present; and that old transformers stored behind Building 708A (a cafeteria) have been ransacked.

5.22.5 **Underground Storage Tanks:** According to the CERFA Report the ALAAP Caretaker (Mr. Ronny Wynn) stated that two underground storage tanks were recently removed, one near Building 302B and one near a flammable materials storehouse, Building 715C. One contained gasoline and the other contained diesel fuel; they each had a capacity of 12,000 gallons.

5.22.6 **Pesticide Storage Building:** According to the CERFA Report Building 223B was to have stored fertilizers and pesticides. It was leased out approximately 20 years ago by the Parker Fertilizer Company in Sylacagua, Alabama, for storage. As of 1991 the building was cleaned out when demolition activities began at the ALAAP. There were no reported releases.

6.0 OFF POST PATHWAYS OF CONCERN:

6.1 **Existing or Potential Pathways of Contamination Migration:** Topographic and hydrogeological information for the ALAAP reviewed to assess potential contamination migration pathways onto the property from adjacent properties. This information was used in combination with data on potential contamination sources on adjacent and surrounding property to determine if there were any existing or potential environmental impacts on the ALAAP property from offsite sources. Contamination source data were obtained through record searches, review of existing environmental reports, personnel interviews, and property site visits. The result of these adjacent and surrounding property evaluations are described below.

6.1.1 Potential pathways of contamination onto the ALAAP property are from stormwater runoff and groundwater migration. Drainage onto the ALAAP property occurs in several locations. The Crossover Ditch, collects and discharges into the Coosa River approximately 25 percent of the surface waters on or adjacent to the ALAAP property. Potential contaminants from adjacent properties include Kimberly Clark's power plant coal pile, sanitary landfill, and a large industrial water reservoir. In general, groundwater flow onto the ALAAP property is from the north and west. The direction of groundwater flow is from the topographically higher areas in the northeast portion of the parcel toward the Coosa River to the west and the Talladega Creek to the southeast. A steep groundwater gradient slopes from the upland areas to the lowland areas where the groundwater flow is divided by the Coosa River and Talladega Creek.

6.2 **Environmental Concerns from Adjacent and Surrounding Properties:** To identify potential offsite contamination sources for the ALAAP facility, a records search of Federal and State data bases was conducted. The search indicated the following:

6.2.1 The Beaunit Corporation, which lies in the industrial park north of ALAAP, went out of business in 1972. The area is currently under CERCLA review. No other information is available concerning the Beaunit Corporation.

6.2.2 Wesley Industries, Inc., also in the industrial park, is a RCRA generator and is required to submit air emissions reports.

6.2.3 No hazardous spills were reported within the zip code area of the ALAAP.

6.2.4 The Kimberly Clark Corporation, is a RCRA generator, has a National Pollution Discharge Elimination System permit for release to surface water, and is required to

submit air emissions reports. According to the ALAAP caretaker, violations of the National Pollution Discharge Elimination System have occurred over the years.

7.0 **FUTURE LAND USE SCENARIO:** In order to effectively structure and execute the Remedial Action Plant ALAAP, the projected outcome or reuse of ALAAP is essential. Environmental cleanup standards are a function of the projected or future use of ALAAP. This section selected the future use for ALAAP.

7.1 **Current Land Use:**

7.1.1 **Area B:** Area B, is currently in an inactive caretaker status with controlled access. The only activity occurring on ALAAP is occasional Army-supervised logging. The land surrounding ALAAP is a mixture of recreational and industrial activity.

7.1.2 **Area A:** Area A, was auctioned on May 10, 1990, and was conveyed to the new owners on August 31, 1990 for unrestricted use. Currently Area A is used as a hunting preserve and timber source.

7.2 **Adjacent and Surrounding Properties:** Land use in the vicinity of ALAAP i a mix of residential, agricultural, recreational, industrial, and rural usages. Residences are buffered from the ALAAP by other industry or extensive undeveloped or wooded areas. Three farms border the installation and a small residential community lies several thousand feet southeast of it, next to Talladega Creek; an estimated 40 residents live within 1 to 2 miles. The property is surrounded as follows:

7.2.1 **North**: A small industrial park, owned by Talladega County, lies north of the installation. A wastewater pump and filter station are located in this area. The Beaunit Corporation was at one time located in this industrial park.

7.2.2 **South**: A paper plant, located on land south of the site, is owned by Kimberly Clark. The leaseback area is also located here.

7.2.3 **East**: The McDonald Land Company is conducting wildlife management and research on the property (formerly Area A) and plans to leave it undeveloped.

7.2.4 **West**: West of the site flows the Coosa River, which is bordered by a golf course owned by Kimberly Clark.

7.3 **Reuse Scenarios:** Based the existing documentation and the surrounding landuse, the following three future reuse scenarios were evaluated: residential, industrial, and hunter/wildlife Preserve.

7.4 Selected Future Reuse:

7.4.1 **Area A:** Currently Area A is used as a hunting/wildlife preserve. However, in 1991 the property was transferred to a new owner for unrestricted use. Based on the property transfer agreement, remedial investigation/action efforts were/are predicted on a residential future use.

7.4.2 **Area B:** Base on the current and historical use of Area B (hunting/ wildlife preserve, logging, industrial activities) and the surrounding land use, remedial investigation/action efforts, property transfer, sells or leases will be restricted to an industrial reuse scenario.

8.0 GENERAL APPROACH

8.1 **Programmatic Strategy:** This SMP has been developed to allow efficient use of funding and time for remedial response activities at ALAAP. The SMP shall be revised annually.

8.2 **Implementation Strategy:** The primary implementation strategy planned for the RI/FS activities at ALAAP is the division of the facility into two major study areas, (Area A and Area B) within each further subdivided into operable units. Each areas is being addressed by a continuous, concurrent and decisive program of remedial investigation, feasibility study, administrative action (Proposed Plan and Record of Decision), remedial design, remedial construction/ implementation, and operation and maintenance of the installed remedies that support the reuse strategy described in section 8.0.

8.2.1 **Area A:**

8.2.1.2 Operable Unit 1: Area A Soils and Groundwater.

8.2.1.1 Operable Unit 2: Study Areas 12 and D Interim Soils Response (remediation completed).

8.2.2 **Area B:**

8.2.2.2 Operable Unit 1: Area B Soils and Groundwater.

8.2.2.1 Operable Unit 2: Stockpiled Soils (remediation completed).

8.2.2.1 Operable Unit 3: Study Areas 6, 7, 10 and 21 Interim Soil Response (remediation currently underway).

8.2.3 The overall listing and schedule of remedial response activities and deliverable for each Operable Unit are shown in Figures 8-1 through 8-5 and Figure 8-A through 8-E. The SMP is designed to follow the general approach established by actions to date at the installation. Specifically, a complete RI/FS has either been planned or completed to address all major study areas and sub-units contained within the facility and which will lead to permanent remedies. Concurrently, the plan provides for focusing feasibility determinations for accelerated actions within specific study areas or subunits as data

become available. This strategy will continue to allow implementation, at the earliest opportunity, of interim or early remedial responses which ultimately contribute to the permanent solution.

8.3. SCHEDULED GENERAL ACTIVITIES:

8.3.1 The SMP schedule shows the approximate time-phasing and expected duration of each major work activity through fiscal year 1999, suitable for long-term planning and funding considerations. The schedule for RI/FS activities through 1996 is based on a relatively fast-paced and constant series of activities. There is a considerable degree of uncertainty and possible flexibility in efforts scheduled for the 1996-2001 time frame.

8.3.2 The RI/FS has been planned to address all major study areas and subunits, transport media, and potentially impacted environmental systems at the facility and beyond. Studies will determine both human health and environmental risks posed by contaminated soil, groundwater, surface water, sediments, and air; and feasible methods for mitigation or prevention of adverse effects. The potential impact to biotic populations and ecosystems will be evaluated by studies of effects on indigenous species and habitats, as well as toxicity studies on contaminated media. A full range of potentially feasible remedial alternatives including source removal or control, leachate control, transport control, treatment and prevention of exposures will be evaluated.

8.3.3 The complexity of the facility hydrogeology, the proximity to sensitive ecosystems and human populations, the wide range of contaminant concentrations, and the broad areas encompassed by potential sources at the facility may require specific research and development (R&D) efforts with the goal of generating improved methods both for characterizing each site (e.g., methods for sampling and analysis) and for evaluating or developing potential remedies (e.g., methods for removal, treatment, and control of wastes or contaminated media). Such efforts of a basic research nature have not been included in this SMP, and only applied research to evaluate the feasibility of treatment process options has been included in the SMP at appropriate points. In view of the broad contaminant classes and contamination levels, it has been assumed that treatability testing at bench and pilot scales may be required prior to selection of permanent remedies.

8.3.4 Following implementation of interim or early remedies in each study area, a program of monitoring and/or closure activities will be required. For units where remedies require prolonged treatment, monitoring will be performed through the life of the remedial action. In addition, a program review will be conducted every five years

by EPA, State of Alabama and the Army in accordance with CERCLA requirements as necessary.

8.4 **Detailed Description of Planned Activities:** This section provides a description of planned activities and time-phasing of the various work elements for each Operable Unit within each Major Study Area. A complete RI/FS for each major study area will be conducted to provide the baseline information required to select and design the appropriate remedial response. This program will be conducted in full compliance with the NCP and will proceed through an initial planning stage, associated R&D efforts, one or more phases of field studies and assessments, and will lead to a Proposed Plan, and a Record of Decision. The activities following the Record of Decision are the design, construction, and implementation of the selected remedy .

8.4.1 **Area A:**

8.4.1.1 **Area A Soils and Groundwater, (Area A, OU1):** On August 31, 1990 the ownership of Area A was conveyed from the Army to a new owner. The Army transferred the property for unrestricted use with contractual obligation. To investigate and remediate Area A to that end. From 1991 through 1994 the Army completed a Supplemental RI/FS, separate Baseline Risk Assessment and a Proposed Plan. However, in December 1993 (during the final approval of the Area A, Record of Decision), EPA Region IV identified investigative shortfalls that require additional characterization efforts to meet the Army's requirement of unrestricted use in Area A. An agreement was reached between the Army and EPA to revise the RI/FS Report based on additional data collected from the installation of 12 new groundwater monitoring wells, resampling of 12 existing monitoring wells, collection of 20 background soil samples, and the collection of 53 additional soil samples. Figure 8-1 shows the schedule of remedial response activities for Area A, OU1. Figure 8-A shows required deliverable for Area A, OU1.

8.4.1.2 **Study Areas 12 and D Interim Soils Response, (Area A, OU2):** The Supplemental Investigation of Area A concluded that there are two sites within Area A that required remedial action. Areas 12 and D both posed unacceptable risk for unrestricted use. In order to expedite the restoration; the Army, EPA and State of Alabama decided to continue on with the remediation process of Areas 12 and D as a separate Interim Operable Unit for Area A (OU2). The selected remedy for Study Area 12 and D was completed in December 1994. Figure 8-2 shows the schedule of

remedial response activities for Area A, OU2. Figure 8-B shows required deliverable for Area A, OU2.

8.4.2. **Area B:**

8.4.2.1 **Area B Soils and Groundwater (Area B, OU1):** From 1990 through 1994 the Army completed an Supplemental RI and a separate Baseline Risk Assessment for Area B. However, EPA Region Iv review of the Draft Final FS identified investigative shortfalls that require an additional characterization effort. The additional characterization of Area B includes the installation of 40 monitoring wells and 60 soil borings; re-sampling of 30 existing monitoring wells; collecting 20 background, and 100 site-specific soil samples, and 10 surface water samples. Following the site characterization, the Army shall submit an addendum RI/FS for regulatory review followed by the Area B Proposed Plan and Record of Decision. Figure 8-3 shows the schedule of remedial response activities for Area B, OU1. Figure 8-C shows required deliverable for Area B, OU1.

8.4.2.2 **Stockpile Soils (Area B, OU2):** Contaminated soils from Area A were removed between 1986 and 1987. This contaminated soil was then placed in structures TC4A and TC4B in Area B pending incineration. In February 1991, a FS was conducted for the stockpile soils area. The study concluded that explosives, lead, and asbestos contamination were present above regulatory limits. A feasibility study was conducted in July 1991 and a Record of Decision was released in December 1991. The selected remedy for the stockpile soils was completed in December 1994. Figure 8-4 shows the schedule of remedial response activities for Area B, OU2. Figure 8-D shows required deliverable for Area B, OU2.

8.4.2.3 **Study Area 6,7,10 and 12 Interim Soils Response (Area B, OU3):** The Supplemental Remedial Investigation of Area B and Baseline Risk Assessment concluded that there are four sites within Area B that required remedial action. Areas 6,7,10 and 12 all posed unacceptable risk. In order to expedite the restoration program and utilize the on-site transportable incinerator currently incinerating Stockpile Soils (Area B, OU2) the remediation of Areas 6,7,10 and 21 has been segregated into a separate Interim Operable Unit for Area B (OU3). This interim action began in December 1994 and is expected to last approximately one year. Figure 8-5 shows the schedule of remedial response activities for Area B, OU3. Figure 8-E shows required deliverable for Area B, OU3.

8.5 **Interim Action Program Elements:** The long-term remedies resulting from the RI/FS process described in section 8.3 will be accomplished in the shortest time possible, given the length of time required for planning, accomplishment, and administrative actions. As data on the various study areas become available and as risks are evaluated, it may be necessary to consider additional interim or early actions as contributions to the permanent remedies for each site. This plan includes the potential that interim or early remedies will be evaluated for each defined study area. Potentially feasible interim or early remedies will implemented in accordance with EPA regulation for conducting Non-Time Critical Removal Actions with an accelerated schedule of accomplishments and approvals led by up-front agreements and prior approvals by the parties to the Federal Facility Agreement.

8.6 **Removal Actions:** During the course of the investigation process at ALAAP, releases or threats of release may be discovered that will threaten public health or the environment within a length of time shorter than that in which the remedial program can respond. In this situation, it is necessary and appropriate to use removal action authority to quickly abate or remove the threat. If removal action is required, the Army will act as the lead agency and will conduct the removal action in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Superfund Amendments and Reauthorization Act (SARA), National Contingency Plan (NCP), EPA Region IV, and State of Alabama guidance.

FIGURES

SITE MANAGEMENT PLAN

ALABAMA ARMY AMMUNITION PLANT

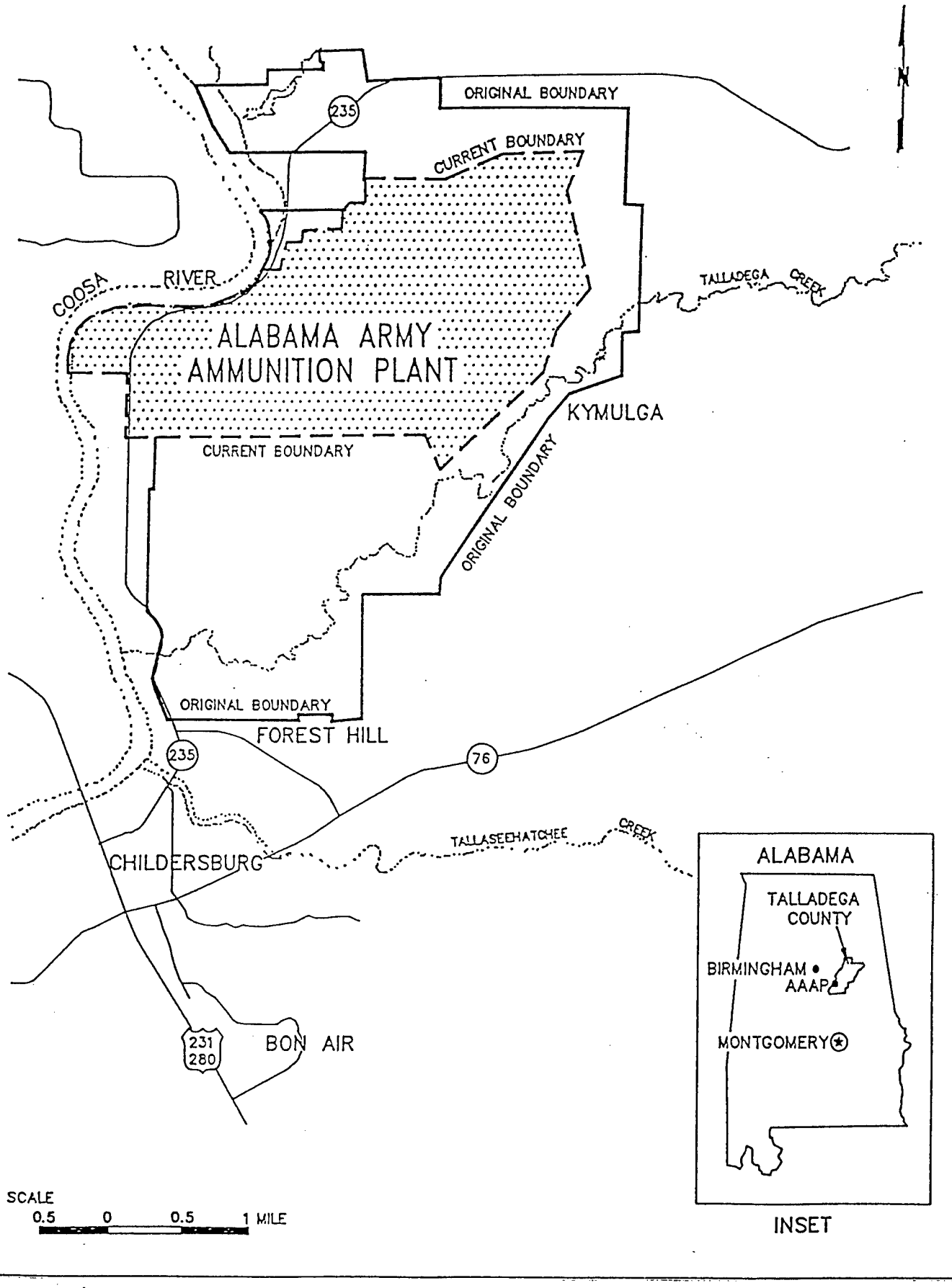

FIGURE 2-1
GENERAL LOCATION OF ALAAP

U.S. ARMY ENVIRONEMTAL CENTER

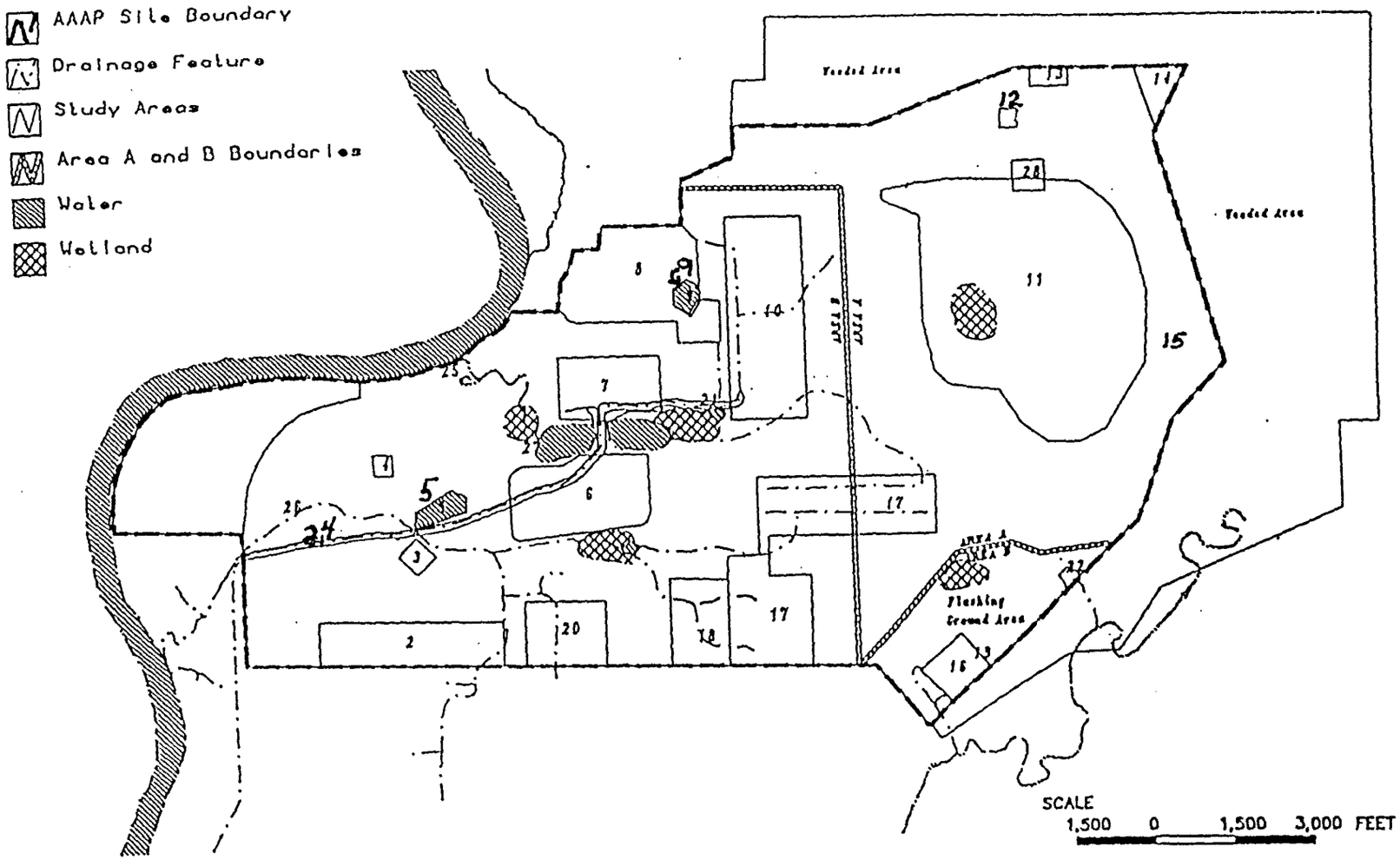

FIGURE 2-2
STUDY AREAS AT ALAAP

U.S. ARMY
ENVIRONEMTAL
CENTER

ALABAMA ARMY AMMUNITION PLANT
AREA A SOILS AND GROUNDWATER (AREA A OU1)
PROGRAMMATIC SCHEDULE
FIGURE 8-1
(May 10, 1995)

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army awards investigative contract		Actual date completed	05/01/94
Army submits addendum RI/FS work plans letter, Version 1	EPA/ADEM	Actual date completed	05/02/94
EPA/ADEM provides approval, addendum RI/FS work plans letter	Army	Actual date completed	05/13/94
Field work begins, Version 1	Army	Actual date completed	05/16/94
Army submits Interim Draft RI/FS Report.	Army	Actual date completed	09/28/94
Army submits Addendum RI/FS Work Plan letter, Version 2	EPA/ADEM	Actual date completed	02/23/95
Additional field work begins, Version 2	Army	Actual date completed	03/06/95
Additional field work completed, Version 2	Army	Actual date completed	04/14/95 9/15/97
Army submits Draft RI Report, (all inclusive)	EPA/ADEM		07/20/95 12/01/95
EPA/ADEM provides comments for the Addendum Draft RI Report	Army	60 days after receipt of Draft RI Report	~~08/20/95~~ 11/01/97
Army submits Addendum Draft FS Report	EPA/ADEM		08/20/95 12/01/97
Army submits the Addendum Final RI Report	EPA/ADEM	20 days after receipt of regulatory comments	~~09/10/95~~ [redacted]
EPA/ADEM provides comments for the Addendum Draft FS Report	EPA/ADEM	30 days after receipt of Draft FS Report	~~09/20/95~~ 01/01/97
EPA/ADEM provides approval of the Addendum Final RI Report	Army	30 days after receipt of Final RI Report	~~10/10/95~~ 12/31/97

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army submits Addendum Final FS Report	Army	20 days after receipt of regulatory comments	~~10/10/95~~ 12/11/97
EPA/ADEM provides approval of the Addendum Final FS Report	EPA/ADEM	~~30~~ 30 day after receipt of Final FS RI Report	~~11/10/95~~ 12/31/97
Army submits Draft PP	EPA/ADEM	30 days after approval of the Final FS Report	~~12/10/95~~ 6/15/96
EPA/ADEM provides comments for the Draft PP	Army	30 days after receipt of Draft PP	~~01/10/96~~ 7/1
Army submits Final PP	EPA/ADEM	15 days after receipt of regulatory comments	~~01/25/95~~ 08/15/96
EPA/ADEM provides approval of the Final PP	Army	15 days after receipt of Final PP	~~02/10/96~~
Public comment period begins	All	10 days after receipt of regulatory approval	~~02/20/96~~ Aug 15/96
Public comment period ends	All	30 days after public comment period begins	~~03/30/96~~ Sept 15/96
Army submits Draft ROD	EPA/ADEM	30 days after the Public comment period ends	04/30/96 09/10/96
EPA/ADEM provides comments on Draft ROD	Army	20 days after receipt of Draft ROD	04/30/96 11/15/96
Army submits Final ROD	EPA/ADEM	30 days after receipt of comments	05/30/96 01/15/97
EPA/ADEM/Army approves/signs, Final ROD	All	30 days after receipt of Final ROD	~~06/30/96~~ 03/27/97
Army submits Draft RD/RA Work Plan	EPA/ADEM	120 days after receipt of ROD approval	~~10/30/96~~
EPA/ADEM provides comments on Draft RD/RA Work Plan	Army	30 days after receipt of Work Plan	~~11/30/96~~
Army submits Final RD/RA Work Plan	EPA/ADEM	30 days after receipt of comments	~~12/30/96~~
EPA/ADEM Provides approval for Final RD/RA Work Plan	Army	30 days after receipt of Work Plan	~~01/30/97~~
Army begins RA	Army	30 days after approval of Work Plan	~~02/02/97~~

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
RA complete	Army	365 day after RA begins	~~02/02/98~~
Army submits RAR Report	EPA/ADEM	60 days after the completing RA	~~04/02/98~~

ALABAMA ARMY AMMUNITION PLANT
STUDY AREA 12 AND D INTERIM RESPONSE ACTION (AREA A OU2)
PROGRAMMATIC SCHEDULE
FIGURE 8-2
(May 10, 1994)

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army Submits Draft Interim ROD For Areas 12 and D	EPA/ADEM	Actual date completed	05/13/94
EPA/ADEM Provides Comments on Interim ROD	ARMY	Actual date completed	06/13/94
Army Submits Final Interim ROD	EPA/ADEM	Actual date completed	06/23/94
EPA/ADEM/ARMY Approves and Signs Interim ROD	EPA/ADEM ARMY	Actual date completed	09/09/94
Army Submits Remedial Design /Remedial Action Work Plan	EPA/ADEM	Actual date completed	07/06/94
EPA/ADEM Provides Comments/ Approval on RD/RA work Plan	ARMY	Actual date completed	08/05/94
Army Submits Final RD/RD Work Plan	EPA/ADEM	Actual date completed	08/10/94
EPA/ADEM Provides Approval of RD/RA	ARMY	Actual date completed	08/10/94
RA Begins	Army	Actual date completed	08/10/94
RA Completed	Army	Actual date completed	12/07/94
Army Submits RAR	EPA/ADEM	Actual date completed	02/27/95

ALABAMA ARMY AMMUNITION PLANT
AREA B SOILS AND GROUNDWATER (AREA B OU1)
PROGRAMMATIC SCHEDULE
FIGURE 8-3
(May 10, 1995)

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army awards investigative contract	Army	Actual date completed	06/15/94
Army submits Draft Addendum RI/FS Work Plans	EPA/ADEM	Actual date completed	09/30/94
EPA/ADEM provides comment, Draft Addendum RI/FS Work Plans	Army	Actual date completed	01/12/94
Army submits Final Addendum RI/FS Work Plans	EPA/ADEM		05/15/95
EPA/ADEM provides approves of the Final Addendum RI/FS Work Plans	Army	30 days after receipt of Addendum Work Plan	06/15/95
Field work begins 9/15/97	Army	Actual date completed	03/06/95
Field work completed	Army	160 days after field work begins	08/15/95
Army submits ~~Addendum~~ Supplemental Draft RI/FS Report DATA	EPA/ADEM	~~106~~ days after field work ends	~~12/01/95~~ 8/30/97
EPA/ADEM provides comments, Addendum Draft RI/FS Report	Army	36 days after receipt of Draft RI/FS Report	~~01/05/96~~ 9/30/97
Army submits response to regulatory comments	Army	15 day after receipt of regulatory comments	~~01/20/96~~ 10/30/97
Army submits Addendum Final RI/FS Report	EPA/ADEM	45 days after receipt of comments	~~02/20/96~~ 11/30/97
EPA/ADEM provides approval of the Addendum Final RI/FS Report	Army	30 days after receipt of Final RI/FS Report	~~03/22/96~~ 12/31/97
Army submits Draft PP	EPA/ADEM	30 days after receipt of regulatory approval	~~04/22/96~~
EPA/ADEM provides comment of the Draft PP	Army	30 days after receipt of Draft PP	05/22/96

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army submits Final PP	EPA/ADEM	30 days after receipt of comments	06/22/96
EPA/ADEM provides approval of the Final PP	Army	30 day after receipt of Final PP	07/22/96
Public comment period begins	All	10 days after receipt of regulatory approval	08/02/96
Army submits Draft ROD	EPA/ADEM	40 days from start of public comment period	09/12/96
EPA/ADEM provides comments on Draft ROD	Army	30 days after receipt of Draft ROD	10/12/96
Army submits Final ROD	EPA/ADEM	30 days after receipt of comments	11/12/96
EPA/ADEM/Army approves/signs, Final ROD	All	Within 30 days after receipt of Final ROD	12/12/96
Army submits Draft RD/RA Work Plan	EPA/ADEM	120 days after receipt of Final ROD approval	03/12/97
EPA/ADEM provides comments on Draft RD/RA Work Plan	Army	30 days after receipt of Draft Work Plan	04/12/97
Army submits Final RD/RA Work Plan	EPA/ADEM	30 days after receipt of comments	05/12/97
EPA/ADEM Provides approval for Final RD/RA Work Plan	Army	30 days after receipt of Final Work Plan	06/12/97
Army begins RA	Army	120 days after approval of Work Plan	10/12/97
RA complete	Army	365 day after RA begins	10/12/98
Army submits RAR Report	EPA/ADEM	60 days after the completing RA	12/12/98

ALABAMA ARMY AMMUNITION PLANT
STOCKPILED SOILS (AREA B OU2)
PROGRAMMATIC SCHEDULE
FIGURE 8-4
(May 10, 1995)

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
EPA/ADEM/Army approved, Final ROD	All	Actual date completed	12/01/91
EPA/ADEM Provides approval for Final RD/RA Work Plan	Army	Actual date completed	03/04/94
Army begins RA	Army	Actual date completed	04/09/94
RA complete	Army	Actual date completed	12/07/94
Army submits RAP Report	EPA/ADEM	Actual date completed	02/13/95

ALABAMA ARMY AMMUNITION PLANT
STUDY AREAS 6,7,10 AN 21 INTERIM SOIL RESPONSE (AREA B OU3)
PROGRAMMATIC SCHEDULE
FIGURE 8-5
(May 10, 1995)

ITEMS/TASKS	SUBMIT TO	DURATION	DATE
Army submits Draft Interim ROD	EPA/ADEM	Actual date completed	07/20/94
EPA/ADEM provides comments on Draft Interim Final ROD	Army	Actual date completed	09/16/94
30 day public comment period begins	Public	Actual date completed	09/19/94
30 day public comment period ends	Public	Actual date completed	10/19/94
Army submits Final Interim ROD with Responsiveness Summary	EPA/ADEM	Actual date completed	10/24/94
EPA/ADEM/Army signs Final Interim ROD with responsiveness summary	All	Actual date completed	11/30/94
Army submits Draft RD/RA Work Plan	EPA/ADEM	Actual date completed	08/05/94
EPA/ADEM provides comments on Draft RD/RA Work Plan	Army	Actual date completed	10/31/94
Army submits Final RD/RA Work Plan	EPA/ADEM	Actual date completed	11/07/94
EPA/ADEM Provides approval for Final RD/RA Work Plan	Army	Actual date completed	11/17/94
Army begins RA	All	Actual date completed	12/19/94
RA complete	All	~~365 day after RA begins~~ Funding Requirement	~~12/19/95~~
Army submits RAR Report	EPA/ADEM	60 days after the completing RA	~~02/19/96~~

ALABAMA ARMY AMMUNITION PLANT
FISCAL YEARS 1995 and 1996
FIGURE 8-A

UPDATED: May 10, 1995
OPERABLE UNIT NUMBER: Area A, OU1
OPERABLE UNIT DESCRIPTION: Area A Soils and Groundwater.

FY95 DELIVERABLES:

PRIMARY DOCUMENT	SUBMISSION DATE
- Interim Addendum Draft RI/FS Report	9/28/94
- Addendum Draft RI Report	07/20/95
- Addendum Draft FS Report	08/20/95
- Addendum Final RI Report	09/10/95

SECONDARY DOCUMENTS: None

FY96 DELIVERABLES:

- Addendum Final FS Report	10/10/95
- Draft Proposed Plan	12/10/95
- Final Proposed Plan	01/25/96
- Draft Record of Decision	04/30/96
- Final Record of Decision	05/30/96

SECONDARY DOCUMENTS: None

ALABAMA ARMY AMMUNITION PLANT
FISCAL YEARS 1995
FIGURE 8-B

UPDATED: May 10, 1995
OPERABLE UNIT NUMBER: Area A OU2
OPERABLE UNIT DESCRIPTION: Study Areas 12 and D Interim Soils Response

FY95 DELIVERABLES:

PRIMARY DOCUMENT:	SUBMISSION DATE
Final Remedial Action Report	02/27/95

SECONDARY DOCUMENTS: None

ALABAMA ARMY AMMUNITION PLANT
FISCAL YEARS 1995 and 1996
FIGURE 8-C

UPDATED: May 10, 1995
OPERABLE UNIT NUMBER: Area B OU1
OPERABLE UNIT DESCRIPTION: Area B Soils and Groundwater

FY95 DELIVERABLES:

PRIMARY DOCUMENT	SUBMISSION DATE
Draft Addendum Work Plan	09/30/94
Final Addendum Work Plans	06/15/95

~~SECONDARY~~ DOCUMENT: None

FY96 DELIVERABLES:

PRIMARY DOCUMENTS: OHM	SUBMISSION DATE
Draft ~~Addendum RI/FS Report~~ Supplemental RI Report	~~12/01/95~~ FEB 96
FY 97 Deliverables Final Addendum RI/FS Report	02/20/96
Draft Proposed Plan	04/22/96
Final Proposed Plan	06/22/96
Draft Final ROD	9/12/96

~~SECONDARY DOCUMENTS: None~~

ALABAMA ARMY AMMUNITION PLANT
FISCAL YEARS 1995
FIGURE 8-D

UPDATED: May 10, 1995
OPERABLE UNIT NUMBER: Area B OU2
STUDY AREA DESCRIPTION: Stockpiled Soils

FY95 DELIVERABLES:

PRIMARY DOCUMENT	SUBMISSION DATE
Final Remedial Action Report	02/13/95

~~SECONDARY DOCUMENTS:~~ None

ALABAMA ARMY AMMUNITION PLANT
FISCAL YEARS 1995 and 1996
FIGURE 8-E

UPDATED: May 10, 1995
OPERABLE UNIT NUMBER: Area B OU3
STUDY AREA DESCRIPTION: Study Areas 6, 7, 10 and 21 Interim Soil Response

FY95 DELIVERABLES:

PRIMARY DOCUMENT	SUBMISSION DATE
Final Interim Record of Decision	10/24/94
Final Remedial Design/Action Work Plans	11/07/94

SECONDARY DOCUMENTS: None

FY96 DELIVERABLES:

PRIMARY DOCUMENT	SUBMISSION DATE
Final Remedial Action Report	02/19/96

SECONDARY DOCUMENTS: None

TABLE 1
ALABAMA ARMY AMMUNITION PLANT
AREA A STUDY AREAS

STUDY AREA	DESCRIPTION
11	Magazine Area
12	Old Burning Ground
13	Small Arms Ballistics Range
14	Cannon Range
15	Old Well
17	Propellant Shipping Area (Eastern Portion)
C	Rubble Pile
D	New Trench Area
E	Disposal Area
F	Number 2 Rubble Pile
G	Henningburg Area
H	229 Area

TABLE 2
ALABAMA ARMY AMMUNITION PLANT
AREA B STUDY AREAS

STUDY AREA	DESCRIPTION
3	Sanitary Landfill and Lead Facility
4	Manhattan Project Area
5	Red-Water Storage Basin
6	Southern TNT Manufacturing Area
7	Northern TNT Manufacturing Area
8	Acid/Organic Manufacturing Area
9	Aniline Sludge Basin
10	Tetryl Manufacturing Area
16	Flashing Ground
18	Blending Tower Area
19	Lead Remelt Facility
20	Rifle Powder Finishing Area
21	Red Water Ditch
22	Demolition Landfill
23	Burial Trench
24	Oil Dump
25	StorageBattery/Demolition Debris
26	Crossover Ditch
27	Beaver Pond Drainage System
A/B	Areas A and B Divide
28	Flake Screen Wash Area

Additional Areas Identified during the CERFA Investigation:

Coke Oven
Downed Utility Pole with Transformers
Gas Station
Transformer Storage Building
Underground Storage Tanks
Pesticide Storage Building