U.S. Army BRAC 2005
Environmental Condition of Property Report
Mississippi Army Ammunition Plant
Hancock County, MS

Final

30 November 2006

FINAL

ENVIRONMENTAL CONDITION OF PROPERTY REPORT
MISSISSIPPI ARMY AMMUNITION PLANT
30 November 2006

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Mississippi Army Ammunition Plant

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ACRONYMS AND ABBREVIATIONS

The following list of acronyms, abbreviations, and definitions are intended to be comprehensive and are contained in this report.

List of Acronyms

ACM	Asbestos-Containing Material
AD	Anno Domini
AEDB-R	Army Environmental Database-Restoration (formerly DSERTS)
AGT	Applied Geo Technologies, Inc.
AM	Administrations Manager
Am	Americium
AMCCOM	U.S. Army Armament, Munitions and Chemical Command
AMCCOM-D	U.S. Army Armament, Munitions and Chemical Command – Picatinny Arsenal, Dover, New Jersey
AOC	Area of Concern
APCS	Air Pollution Control System
AR	Army Regulation
Army	U.S. Army
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
ATK	A.T. Kearney, Inc.
BC	Before Christ
BEC	BRAC Environmental Coordinator
bgs	below ground surface
Bldg	Building
BRAC	Base Realignment and Closure
BRRM	Base Redevelopment and Realignment Manual
BTC	Base Transition Coordinator
C-4	Composition 4 Explosive
CEC	Chemical Environmental Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CESQGs	Conditionally Exempt Small Quantity Generators

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
Ci	Curie
CMB	Chemical Manufacturing Branch
CMPT	Cargo Metal Parts
Comp A-5	Composition A-5 Explosive
CONSENT	Superfund (CERCLA) Consent Decrees
CORRACTS	Corrective Action Report
Cs	Cesium
CSC	Computer Sciences Corporation
CWP	Contaminated Waste Processor
DA	Department of the Army
DD	Decision Document
DOD	Department of Defense
DOE	Department of Energy
DPDO	Defense Property Disposal Office
DPM	Deputy Program Manager
DRYCLEANERS	Drycleaners Facility Listing
DSERTS	Defense Site Environmental Restoration Tracking System (now AEDB-R)
DU	Depleted Uranium
DV	Dead Vegetation
EA	Environmental Assessment
EarthCon	Earth Consulting Group, Inc.
EBS	Environmental Baseline Survey
EC	Environmental Coordinator
ECP	Environmental Condition of Property
EDR	Environmental Data Resources, Inc.
EDTA	Ethylenediaminetetraacetic acid
EE	Environmental Engineer
EIS	Environmental Impact Statement
EMTF	Energetic Materials Test Facility
EPIC	Environmental Photographic Interpretation Center
ERNS	Emergency Response Notification System
ES	Environmental Scientist

ACRONYMS AND ABBREVIATIONS

ESA	Environmental Site Assessment
ESE	Environmental Science and Engineering, Inc.
ESHO	Environmental Safety and Health Officer
ESP	Electrostatic Precipitator
EWI	Explosive Waste Incinerator
°F	Degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FGD	Flue Gas Desulfurization
FINDS	Facility Index System/Facility Registry System
FONSI	Finding of No Significant Impact
Foster Wheeler	Foster Wheeler Environmental Corporation
FS	Feasibility Study
FTTS	Federal Insecticide, Fungicide, and Rodenticide Act/TSCA Tracking System
FUDS	Formerly Used Defense Sites
GS	Ground Scarring
HMIRS	Hazardous Materials Information Reporting System
IAM	Igloo Area Manager
ICIS	Integrated Compliance Information System
ICRMP	Integrated Cultural Resources Management Plan
INDIAN LUST	LUSTs on Indian Land
INDIAN RESERVE	Indian Reservations
INDIAN UST	USTs on Indian Land
IPMP	Integrated Pesticide Management Plan
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
Keiser and Lago	Dr. Edmund D. Keiser and Dr. Paul K. Lago
kV	kilovolts
kw	kilowatt
LAP	Load, Assemble, and Pack
lb/hr	pounds per hour
LBP	Lead-Based Paint
LQG	Large Quantity Generator
LTF	Light-Toned Fill

ACRONYMS AND ABBREVIATIONS

LUST	Leaking Underground Storage Tank
Malcolm Pirnie	Malcolm Pirnie, Inc.
MCI	Mason Chamberlain Inc.
mCi	millicurie
MDEQ	Mississippi Department of Environmental Quality
MDFA	Mississippi Department of Finance and Administration
MDNR	Mississippi Department of Natural Resources
MEC	Munitions and Explosives of Concern
MeV	Mega Electron Volt
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MINES	Mines Master Index File
MLTS	Material Licensing Tracking System
mm	millimeter
MMRP	Military Munitions Response Program
MPCPB	Mississippi Pollution Control Permit Board
MRL	Method Reporting Limit
MSAAP	Mississippi Army Ammunition Plant
MSDH	Mississippi State Department of Health
msl	mean sea level
MTI	Mason Technologies Inc.
MTO	Mississippi Test Operations
NARA	National Archives and Records Administration
NASA	National Aeronautics and Space Administration
NAVOCEANO	Naval Oceanographic Office
NAVSCIATTS	Naval Small Craft Instruction and Technical Training School
Navy	U.S. Navy
n.d.	no date
NEPA	National Environmental Policy Act
NFA	No Further Action
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRM	Natural Resources Manager
NRMP	Natural Resources Management Plan

ACRONYMS AND ABBREVIATIONS

NSTL	National Space Technology Laboratory
OB/OD	Open Burning/Open Detonation
ODI	Open Dump Inventory
OM	Operations Manager
OMD	Operations and Maintenance Division
PADS	PCB Activity Database System
pai	pounds of active ingredient
PCB	Polychlorinated Biphenyl
pCi/L air	picocuries per liter of air
PMP	Pesticide Management Plan
PMPT	Projectile Metal Parts
PP	Proposed Plan
PRGs	Preliminary Remediation Goals
QA	Quality Assurance
Ra	Radium
RAATS	RCRA Administrative Action Tracking System
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RDX	Cyclotrimethylenetrinitramine
RF	Resident Forester
RFA	RCRA Facility Assessment
RI	Remedial Investigation
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
RTK NET	Right-to-Know Network
SAA	Satellite Accumulation Area
SBT22	Navy Special Boat Team-22
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SPCC	Spill Prevention, Control, and Countermeasures
SPCCP	Spill Control and Contingency Plan
SSC	John C. Stennis Space Center
SSTS	Section 7 Tracking System

ACRONYMS AND ABBREVIATIONS

SQG	Small Quantity Generator
SVOCs	Semi-Volatile Organic Compounds
SWF/LF	Solid Waste Facilities/Landfill Sites
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
SWRCY	Mississippi Recycling Directory
SWTP	Sanitary Wastewater Treatment Plant
TCE	trichloroethene
Tetra Tech	Tetra Tech, Inc.
TOL	Tech/Ops Landauer, Inc.
TPH	Total petroleum hydrocarbons
TRGs	Target Remediation Goals
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
TSI	Thermal System Insulation
µg/l	micrograms per liter
UMTRA	Uranium Mill Tailing Sites
UPS	Uninterrupted Power Supply
US BROWNFIELDS	Brownfields Sites
US ENG CONTROLS	Engineering Controls Sites List
US INST CONTROLS	Sites with Institutional Controls
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine (formerly USAEHA)
USAEC	U.S. Army Environmental Center
USAEHA	U.S. Army Environmental Hygiene Agency (now USACHPPM)
USASMDC	U.S. Army Space and Missile Defense Command
USATHMA	U.S. Army Toxic and Hazardous Material Agency (now USAEC)
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank
UV	Ultraviolet

ACRONYMS AND ABBREVIATIONS

UV/OX	Ultraviolet/Oxidation
UXO	Unexploded Ordnance
v	volts
VCP	Voluntary Evaluation Program Sites
VOCs	Volatile Organic Compounds
VSI	Visual Site Inspection
WLF	Ware Lind Furlow/Aquaterra

DEFINITIONS

List of Definitions

Base Closure Law	The provisions of Title II of the Defense Authorization Amendments and Base Closure and Realignment Act (Pub. L. 100-526, 102 Stat. 2623, 10 U.S.C. § 2687 note), or the Defense Base Closure and Realignment Act of 1990 (Pub. L. 101-510, Part A of Title XXIX of 104 Stat. 1808, 10 U.S.C § 2687 note).
BRAC Environmental Coordinator (BEC)	An employee assigned to provide work as the lead Base Realignment and Closure (BRAC) environmental coordinator for a wide variety of technical situations and activity operational requirements, directing actions with regard to schedules, priorities, methods, materials, and equipment. The role of the BEC is to provide principle oversight for the Activity Base Commander, Lead Organization, and Base Realignment and Closure Division (BRACD) regarding all BRAC related environmental programs for the installation.
Closure	All missions of the installation have ceased or have been relocated. All personnel positions (military, civilian and contractor) have either been eliminated or relocated, except for personnel required for caretaking, conducting any on-going environmental cleanup, and disposal of the base, or personnel remaining in authorized enclaves. In the context of this document, this may be referred to as “full closure.”
Disposal	Per United States Army Regulation (AR) 405-45, any authorized method of permanently divesting the Army of control and responsibility for real estate and real property.
Environmental Baseline Survey (EBS)	A process by which a characterization of the environmental condition of a facility or property is conducted. An EBS is required by the Army for the transfer or acquisition of real property and identifies potential cleanup requirements and liabilities. See definition for Environmental Condition of Property (ECP).
Environmental Condition of Property (ECP)	A management approach for providing efficient and effective development of a comprehensive environmental condition / liability characterization for a facility or property. The ECP process applies industry best practices and standards; provides effective oversight and quality assurance, and unifies the EBS and the Munitions and Explosives of Concern (MEC) Archives Search Report steps taken in prior BRAC rounds into a unified effort. The ECP is based on the Initial Site Investigation (ISI) project approved by the Business Initiative Council (BIC). The Army’s ECP Report meets Department of Defense (DOD) ECP Report requirements.

DEFINITIONS

Environmental Professional	EPA's All Appropriate Inquiry Final Ruling (40 CFR Part 312) states the definition of an Environmental Professional establishes a balance between the merits of setting a high standard of excellence for the conduct of all appropriate inquiries through the establishment of stringent qualifications for environmental professionals and the need to ensure that experienced and highly competent individuals currently conducting all appropriate inquiries are not displaced. In summary, the definition of environmental professional included in the final rule includes individuals who possess the following qualifications: • Hold a current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or U.S. territory and have the equivalent of three (3) years of full-time relevant experience; or • Be licensed or certified by the federal government, a state, tribe, or U.S. territory to perform environmental inquiries as defined in Sec. 312.21 and have the equivalent of three (3) years of full-time relevant experience; or • Have a Baccalaureate or higher degree from an accredited institution of higher education in science or engineering and the equivalent of five (5) years of full-time relevant experience; or • Have the equivalent of ten (10) years of full-time relevant experience. The definition of "relevant experience" is "participation in the performance of environmental site assessments that may include environmental analyses, investigations, and remediation which involve the understanding of surface and subsurface environmental conditions and the processes used to evaluate these conditions and for which professional judgment was used to develop opinions regarding conditions indicative of releases or threatened releases to the subject property." The final rule retains the proposed requirement that environmental professionals remain current in their field by participating in continuing education or other activities and be able to demonstrate such efforts.
Excess Real Property	Per AR 405-45, any real property under the control of any Federal agency that the head of the agency determines is not required for agency needs and discharge of the responsibilities of the agency or the installation where the property is located. The excess status is assigned to the real property once a formal report of excess has been processed. Real property that has been determined excess to the Department of the Army must be screened with other Department of Defense elements before it is excess to Department of Defense.

DEFINITIONS

Installation	Per AR 405-45, an aggregation of contiguous or near contiguous, common mission-supporting real property holdings under the jurisdiction of or possession controlled by the Department of the Army or by a State, commonwealth, territory, or the District of Columbia, and at which an Army unit or activity (Active, Army Reserve, or Army National Guard) is assigned. An installation is a single site or a grouping of two or more sites for the purposes of real property inventory control. The real property accountability officer is at the installation level.
Installation Commander	Per AR 600-20, the installation commander is normally the senior commander on the installation. In addition to mission functions, the installation commander has overall responsibility for all real estate, facilities, base support operations, and activities on the installation.
Layaway (Laid away)	Layaway is the process of retaining and storing industrial facilities that are no longer required to support current production but are required to support approved forces in an emergency. It also encompasses the procedure/tool to take a facility from an active status to the inactive status. The layaway effort accomplishes tasks such as: explosive decontamination, cleaning/preservation of production equipment, establishment of storage conditions, and deactivation of utility systems and buildings. Maintenance funding is used after completion of the layaway project to retain, maintain, and protect that portion of the equipment/facilities which are accepted as laid away. The installation would be placed in inactive status, however, the natural resources program would continue.
Lead Organization	Per the BRAC 2005 Implementation Plan Guidance, the Army organization that will have the lead responsibility for preparation of an installation Implementation Plan. This will generally be the Army organization that has operational control of the installation identified in the BRAC recommendations.
Military Installation	Per Section 2910 of Title XXIX, Defense Base Closure and Realignment Act of 1990, as amended, the term "military installation" means a base, camp, post, station, yard, center, homeport facility for any ship, or other activity under the jurisdiction of the Department of Defense, including any leased facility. This term does not include any facility used primarily for civil works, rivers and harbors projects, flood control, or other projects not under the primary jurisdiction or control of the Department of Defense.

DEFINITIONS

Military Munitions	Military munitions means all ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the Coast Guard, the Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges; and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C. 2011 et seq.) have been completed. (10 U.S.C. 101(e)(4)(A) through (C)).
Munitions and Explosives of Concern (MEC)	MEC distinguishes specific categories of military munitions that may pose unique explosives safety risks, including unexploded ordnance (UXO), as defined in 10 U.S.C. 2710(e)(9); DMM, as defined in 10 U.S.C. 2710(e)(2); and munitions constituents (MC) (e.g., TNT, RDX) present in high enough concentrations to pose an explosive hazard.
Munitions Constituents (MC)	Any materials originating from UXO, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions. (10 U.S. C. 2710(e)(4)). Munitions constituents may be subject to other statutory authorities, including but not limited to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 et seq.) and Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.).
Personal Property	According to 41 CFR 102-36.40, personal property is defined as: "Any property except real property. The term excludes records of the Federal Government, and naval vessels of the following categories: battleships, cruisers, aircraft carriers, destroyers, and submarines." "Related personal property" means any personal property that is an integral part of real property. It is: Related to, designated for, or specifically adapted to the functional capacity of the real property and removal of this personal property would significantly diminish the economic value of the real property, or Determined by the Administrator of General Services to be related to the real property.

DEFINITIONS

Real Property	AR 405-90: Real property consists of lands and improvements to land, buildings, and structures, including improvements and additions, and utilities. It includes equipment affixed and built into the facility as an integral part of the facility (such as heating systems), but not movable equipment (such as plant equipment). In many instances, this term is synonymous with 'real estate'.
Realignment	Any action that both reduces and relocates functions and DOD civilian personnel positions, but does not include a reduction in force resulting from workload adjustments, reduced personnel or funding levels, skill imbalances, or other similar cause. A realignment may terminate the DOD requirement for the land and facilities on part of an installation. That part of the installation shall be treated as "closed," and in the context of this document referred to as a "partial closure."
Uncontaminated Property	Per CERCLA 120(h)(4), uncontaminated property is a parcel of real property on which no hazardous substances and no petroleum product or their derivatives were known to have been released or disposed of.
Unexploded Ordnance	Military munitions that (A) have been primed, fuzed, armed, or otherwise prepared for action; (B) have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and (C) remain unexploded whether by malfunction, design, or any other cause. (10 U.S.C. 101(e)(5)(A) through (C)).

Purpose

The purpose of this Environmental Condition of Property (ECP) report was to characterize the existing environmental conditions at the Mississippi Army Ammunition Plant (MSAAP). The ECP assessed the components identified in the Department of Defense (DOD) *Base Redevelopment and Realignment Manual* (BRRM), dated 1 March 2006, 4165.66-M, C.8.3 and AP2.

This ECP Report provides information for determining the suitability for transfer of MSAAP, and meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, § 373.1, and United States Army (Army) Regulation (AR) 200-1, *Environmental Quality, Environmental Protection and Enhancement*. AR 200-1 requires an Environmental Baseline Survey be prepared to determine the environmental conditions of properties being considered for disposal. While the ECP assessed the components identified in the BRRM, it also closely parallels the American Society for Testing and Materials (ASTM) 6008-96, *Standard Practice for Conducting Environmental Baseline Surveys* (ASTM 2005).

The ECP meets the appropriate requirements of federal and state laws as they apply to the disposal of federal properties.

The information gathered during this assessment can be used to assist the Army and NASA in making informed business decisions about the return of permitted property to NASA by reducing uncertainty regarding its environmental condition.

The Army prepares an ECP Report for the following purposes:

- Identify, characterize, and document the presence or likely presence of a release of any hazardous substances or petroleum products into the environment, which includes the ground, groundwater, or surface water of the property associated with the historical and current use of the installation.
- Identify, characterize, and document the release or possible release of any hazardous substances or petroleum products from an adjacent property that would likely cause or contribute to contamination at the installation.
- Provide a basis for determining if the property is suitable for transfer, lease, or assignment.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that require a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

Location

MSAAP is located in the southwest corner of Mississippi in Hancock County, about 50 miles northeast of New Orleans, Louisiana, and 30 miles from the Mississippi Gulf Coast. Communities in the vicinity include Picayune (population 10,535) 10 miles to the northwest, Slidell (25,695) 10 miles to the southwest, and Bay St. Louis (8,209) 13 miles to the southeast (**Figure ES-1**). MSAAP covers 4,214 acres within the northern portion of the National Aeronautics and Space Administration's (NASA's) John C. Stennis Space Center (SSC) (USACE 2002).

Operations

In the early 1940s, the War Department began leasing land in the area of present-day MSAAP/SSC for use as a bombing and gunnery range. Forty tracts of land, consisting of 30,622.38 acres, were leased, and in 1942 construction of the Hancock Bombing Range and Gunnery Range began (USACE 1995). On 25 October 1961, NASA announced its decision to establish a national rocket test site in the same general vicinity of the Hancock Bombing and Gunnery Range (NASA 2000). NASA's land acquisition totaled approximately 13,800 acres (the Fee Area) and included bomb targets that are partially within the current MSAAP boundary. A permanent easement known as the Buffer Zone prohibits any habitable structure being placed on land surrounding the NASA installation (NASA 2000).

On 7 July 1978, the Army obtained a 50-year irrevocable permit (Permit No. DACA01-4-78-673), effective 1 January 1978 through 31 December 2027 and renewable at the Army's option for an additional 50 years, from NASA to use approximately 7,148.6 acres of SSC property to construct and operate MSAAP. The permit has been amended four times to return land and property to NASA. MSAAP now covers 4,214 acres of land within the boundaries of SSC and the SSC buffer zone. (USACE 2002)

The Army selected Mason Technologies Inc. (MTI), formerly Mason Chamberlain Inc., as the contractor operator of MSAAP. The primary mission of the facility was the managing, testing, developing, and manufacturing of the M483, a dual-purpose projectile for the 155-millimeter (mm) Howitzer using anti-armor/anti-personnel controlled M42 and M46 grenades. MSAAP was capable of producing 120,000 packaged rounds per month. Facility construction started in 1978 and the first testing of a completed projectile was in 1984. MSAAP production facilities consisted of three separate manufacturing complexes: the Projectile Metal Parts (PMPT) area; the Cargo Metal Parts (CMPT) area; and the Load, Assemble, and Pack (LAP) area. These three production complexes were supported by other industrial facilities, including igloo storage areas, an industrial wastewater treatment plant (IWTP), mechanical plant, explosive waste incinerator (EWI), contaminated waste processor (CWP), landfill, on site laboratories, and a vehicle maintenance shop.

In 1990, DOD placed MSAAP on inactive status and began the layaway process for the equipment and facilities. Production at PMPT ceased in 1990; however, all missions necessary to produce the 155-mm M483 projectile were retained. In the late 1990s, the LAP and projectile mission was discontinued but the grenade production mission was retained. Through a facility use contract, the plant is available to the private sector to provide or produce commercial services and products. In January 2006, Applied Geo Technologies, Inc. (AGT) became the MSAAP operating contractor.

Environmental Conditions

Resource Conservation and Recovery Act Status

MSAAP is currently listed as a small quantity generator (SQG) under U.S. Environmental Protection Agency (USEPA) identification number MS6210020560, generating 220 to 2,200 pounds of hazardous waste per month. While the facility was operating as an ammunition plant, MSAAP was listed as a large quantity generator, generating more than 2,200 pounds per month. Several MSAAP tenants are listed as a Conditionally Exempt SQG or SQG. No violations were cited for these tenants prior to 14 July 2004 (RTK NET 2006).

Hazardous waste is collected in 55-gallon drums at a satellite accumulation area (SAA) located along the north side of Building 9148. When full, the drums are transported to the 90-day accumulation area at Building 9157 (MTI 1998c). An acetone recovery still (for recycling acetone) is currently located at Building 9157.

On 9 September 1983, MSAAP was issued a Resource Conservation and Recovery Act (RCRA) permit (USEPA ID No. MS0800016123) to operate the EWI, which was a 1.00 ton per hour incinerator. The Mississippi Bureau of Pollution Control issued MSAAP a 90-day Emergency Permit on 4 September 1984 for the temporary storage of reactive hazardous waste until the EWI was operational. The permit was modified numerous times prior to expiring on 9 September 1993 (ATK 1993). MTI submitted a closure certification report to USEPA in November 1994, and the incinerator was shown as “clean closed” on 17 December 2002 in a comprehensive permitting report run by MDEQ on 7 July 2006 (MDEQ CMB 2006).

Underground Storage Tanks, Aboveground Storage Tanks, Oil/Water Separators, and Sumps

There are no active underground storage tanks (USTs) at MSAAP. Six known USTs were located at MSAAP but have since been removed. The USTs were used to store motor fuels and heating oil (USACE 1989). Additionally, two USTs were reportedly located on property not operated by MSAAP. They include USTs associated with former rural gas stations located at the Shorty’s Bar site and in the vicinity of the area formerly utilized as the MTI grounds and storage yard (AGT DPM 2006).

There are currently 62 aboveground storage tanks (ASTs) within the survey area, 33 of which are empty and not currently in use. Ten ASTs and the majority of their associated piping have been removed from the site (AGT DPM 2006).

One oil/water separator was used at MSAAP during production activities for the recovery of oily wastes generated from the forge and heat treatment areas in Building 9101. The separator is identified as Solid Waste Management Unit (SWMU) 27 in the 1993 RCRA Facility Assessment (RFA) and is located north of Building 9101 (ATK 1993). One grease trap is located east of Building 9110 to recover spent food-preparation byproducts from the building's cafeteria. Seven septic tanks are located at MSAAP.

Fourteen sumps collected wastewaters associated with LAP Area operations. Eleven of the sumps were installed to collect explosive-contaminated wastewater generated during munitions loading operations in the 9300 Area. All of the sumps have reportedly been cleaned and decommissioned (AGT DPM 2006), and four of the sumps have been filled with sand and capped with a concrete seal (MSAAP BEC 2006). No confirming documentation of cleaning and decommissioning was found in government or operating contractor files at MSAAP.

National Pollutant Discharge Elimination System

MSAAP manages wastewater discharge at three outfalls under National Pollutant Discharge Elimination System (NPDES) permit number MS0040797. The NPDES permit was renewed by MSAAP on 31 October 2005. The permit was subsequently transferred to AGT on 1 January 2006 and will expire on 30 September 2010. A total of 32 NPDES permitted outfalls were operated during active munitions production.

MSAAP treats sanitary wastewater at their Sanitary Wastewater Treatment Plant (SWTP). Five lift stations ultimately terminate at the SWTP. At the present time, the facility treats approximately 35,000 gallons of sanitary waste per day. The SWTP discharges to Outfall 002.

Drinking Water

Drinking water is supplied to the majority of MSAAP buildings and facilities by two Mississippi Department of Environmental Quality (MDEQ)-permitted groundwater wells, MS-GW-02614 and MS-GW-02615. Both wells draw groundwater from the Catahoula aquifer, which is then chlorinated at each well prior to distribution or storage. Potable water is available at a capacity of 2-million gallons per day (USASMDC 1999). Water storage is provided via a 250,000-gallon water storage tank. A water sharing agreement between MSAAP and NASA permits potable water supplied by NASA to be circulated throughout the MSAAP water distribution system in the event that the MSAAP water supply system is temporarily inoperable (AGT DPM 2006). Limited historical water system inspection and water quality parameter testing reports indicate that MSAAP's water supply system has conformed to all applicable water quality standards.

Air

MSAAP is designated as a true synthetic minor source and currently holds no air permits. Current anticipated emission rates do not require air permitting; however, MSAAP is required by the MDEQ to monitor and sample air discharges (MDEQ 2006b). Historically, MDEQ has issued multiple air pollution control permits and subsequent modifications for MSAAP under Facility Permit Numbers 1000-00029 and 1000-00018.

Nuclear Regulatory Commission Licenses

MSAAP holds no current or active Nuclear Regulatory Commission licenses, but has historically held registrations with the State of Mississippi for use of radioactive materials in non-destructive testing and quality control instrumentation. These radioactive materials have been transferred, returned to vendors, or reportedly removed from MSAAP.

Installation Restoration Program

A 1990 survey identified 46 potentially contaminated sites at MSAAP (MSAAP 1992), 13 of which had been identified as SWMUs in a 1988 U.S. Army Environmental Hygiene Agency evaluation (USAEHA 1988a). The 2006 MSAAP Installation Action Plan identified 46 sites as Installation Restoration Program response complete (RC) sites with RC dates of August 1990 (MSAAP 2006).

A 1997 Relative Risk Site Evaluation (RRSE) concluded there was no technical basis to the identification of the 46 sites and recommended they be removed from the Defense Site Environmental Restoration Tracking System (now called the Army Environmental Database-Restoration (AEDB-R)). The RRSE also concluded that nine sites identified during a 1993 draft RFA should be listed in AEDB-R (USACHPPM 1997).

Previous Environmental Investigations

The 1993 draft RFA identified 29 SWMUs and 1 Area of Concern (AOC). Additional investigations were recommended for seven of the SWMUs and for the AOC; no further action was recommended for the remaining 22 SWMUs (ATK 1993). USACHPPM completed an RRSE in 1997 that included sampling at six of the SWMUs and the AOC identified in the RFA as needing additional study (USACHPPM 1997).

Military Munitions Response Program

There are no active ranges at MSAAP. A Phase 3 Army Range Inventory identified two closed/inactive ranges as eligible for the Military Munitions Response Program: the Spin Launch Site and the Old Kellar Test Range (Malcolm Pirnie 2003). A NASA technical support contractor conducted explosives, propellants and pyrotechnics tests at the Old Kellar Test Range from 1969 until August 1980, prior to the establishment of MSAAP (NASA 2000). This test range, while within the MSAAP boundary, was not used by MSAAP as part of their mission. The range also included disposal pits and a scrap metal pile. The Spin Launch Site was used to perform explosive quality assurance testing of the M42 and M46 grenades (ESE 1984).

A 1995 Archive Search Report of the Former Hancock Bombing and Gunnery Range found two targets partially located on MSAAP (USACE 1995). The west quarter of the West Bomb Target, including the West Bomb Target Safety Zone, is located along MSAAP's eastern boundary west of Main Line Road. The north half of the High Altitude Bomb Target is located between MSAAP's southern boundary and the Spin Launch Site.

Hazardous Substances

In support of specific missions during production activities, a large variety of potentially toxic/hazardous chemicals, including acids, bases, and flammable organic solvents, as well as explosive compounds, were stored at MSAAP (ESE 1984). Hazardous substances, including cutting fluids/oils and solvents, were used in processes such as forge press, heat treatment, machining, coloring/stenciling, and cleaning/rinsing. Freon 113®, trichloroethene, ethylene glycol, hexavalent chrome, alkaline cleaner, cutting coolants, and paints were used for specific processes at the PMPT and CMPT buildings (USAEHA 1987a, USAEHA 1987b, AGT DPM 2006).

Polychlorinated Biphenyls

Electrical transformers containing polychlorinated biphenyls (PCBs) are reportedly not present at MSAAP (ESE 1984, AGT DPM 2006). Three transformers suspected of containing PCBs were identified in 1985 (MCI 1985b). These transformers were reportedly removed from the site, though documentation related to the disposition of the transformers was not available. There is no record of PCB sampling being completed at MSAAP, and a comprehensive inventory of oil-containing electrical equipment, or suspected PCB-containing equipment, has reportedly never been completed.

Asbestos-Containing Materials

Asbestos-containing materials (ACMs) have been detected in several MSAAP buildings, including, but not limited to: Buildings 9100, 9101, 9110, 9302, 9323, and 9324 (Johnson Controls 1997, AGT DPM 2006). Suspected ACM, including thermal system insulation, floor tile, ceiling tile, and roofing materials were observed during the visual site inspection (VSI) in buildings throughout the 9100 Area. MSAAP has requested funding for a facility-wide asbestos survey since 1992; however, as of 2005, funding had not been appropriated (AGT DPM 2006).

Lead and Lead-Based Paint

Lead-based paint (LBP) is known to exist, at a minimum, in Buildings 9100 and 9101 at MSAAP. A comprehensive facility-wide LBP survey has not been completed. The MSAAP water tower has been repainted twice since it was constructed. No containment was used during the first repainting in approximately 1991, and results of containment sampling from repainting in approximately 2003 were not available for review.

Historically, lead-acid battery charging stations have been located in Buildings 9100, 9101, 9114, 9322, 9325, and 9600. The charging stations in Buildings 9322, 9325, and 9600 have been removed. The intact charging stations are configured with trench drains or sumps beneath, or directly adjacent to, the battery/vehicle storage areas. Surface staining of the drain and sump basins was observed during the VSI. Lead-acid batteries associated with the uninterrupted power supply (UPS) for the IWTP are located in Building 9148. A UPS system was located in Building 9110; however, the system was removed in approximately 1998 when the Navy began utilizing the building (AGT DPM 2006). The U.S. Navy presently utilizes a large quantity of lead-containing dry-cell batteries in support of its ongoing mission at the 9300 Area (NAVOCEANO ESHO 2006).

Radioactive Material

No radioactive materials or contamination from use of radioactive materials or sealed sources are known to be currently present at MSAAP.

Landfills/Dumps

MSAAP operated a sanitary landfill under MDEQ permit number SW02301B0289 from 1983 until 1994. The landfill occupied approximately 33 acres, but had a fill area of approximately 11 acres. Landfilled waste materials consisted primarily of construction debris and included plastic, paper, metal, glass, and calcium sulfate-based flue gas desulfurization sludge, as well as a small percentage of putrecible waste. The landfill was covered and closed in compliance with applicable state regulations (MDEQ 1997).

A rubbish disposal area received construction debris, including paving materials, near the northern MSAAP boundary. The area appears to have begun operating between 1978 and 1981 and was covered in the mid-1990s (AGT DPM 2006). MSAAP also managed a lined Coal Pile Run-off Pond (SWMU 25) to collect stormwater runoff from the coal pile.

From 1969 to 1980 (prior to the establishment of MSAAP), several land-based units at the Old Kellar Test Range were used for disposal of explosive materials, scrap metal, and other materials used in range testing activities by a NASA technical support contractor. The area also received sulfuric acid waste from nitrator studies conducted at the range (USAEHA 1988a). NASA operated a landfill from 1962 until, reportedly, 1985 in an area west of Trent Lott Parkway and Leonard Kimball Road, outside the current MSAAP property boundary. Items from NASA test operations were reportedly disposed in the landfill (USAEHA 1990).

Potentially Explosive Contaminated Structures

In the approximately 10-acre LAP area, explosive charges and propellants were loaded into grenades and projectile casings in a semi-automated production line, then sealed and palletized for storage or shipment (ATK 1993). The LAP facility generated industrial wastewaters that may have been contaminated with cyclotrimethylenetrinitramine (RDX) from floor and equipment wash water, scrubbing of airborne fumes and dust, and from a laundry facility (USACE 1990). Sumps that collected these wastewaters have reportedly been cleaned and decommissioned (AGT DPM 2006).

All LAP production equipment has been removed, and the structures were reportedly decontaminated to the "3X" level (AGT DPM 2006, MCI IAM 2006). No decontamination classification markings were visible on LAP structures during the VSI. An accidental discharge of a fire suppression water deluge system in October 1985 discharged approximately 9,000 gallons of water, with approximately 5,500 gallons exiting Building 9324 (MSAAP 1985). Soils impacted with RDX were reportedly excavated and treated in the CWP (MCI IAM 2006).

Bulk explosives and finished projectiles were stored in 30 earth-covered, steel arch-type igloos (Buildings 9604 through 9633). One reported spill occurred in Building 9607 that caused Composition A-5 explosives to spill on the floor. The Comp A-5 was immediately swept from the floor (MCI IAM 2006). According to 1993 correspondence, the floors of the 9600 Area igloos were swept to remove trash and debris as part of decontamination, but since they were never contaminated with explosives they were marked and tagged to indicate a zero contamination level (MTI 1993b). Nine LAP area service magazines and grenade hold igloos provided storage of explosives during the ammunition loading process (ESE 1984). Six igloos located in the 9500 Area provided storage for explosives, including off-specification grenades, prior to incineration (USACE 1990). Building 9402 in the 9400 Test Area stored Composition 4 (C-4) explosive and blasting caps for use in penetration testing (Malcolm Pirnie 2003, AGT DPM 2006).

Radon

As a requirement of the Army Radon Reduction Program, MSAAP conducted monitoring of indoor air for radon in 17 MSAAP buildings during January through May 1990. All results were less than 4.0 picocuries per liter of air (TOL 1990).

Conclusions

Conclusions are based on the available sources of information concerning both past and present uses of the property. Information included readily available data associated with adjacent property records; aerial photography; personnel interviews; Army environmental programs and associated documentation; current and historic investigations; and ongoing response actions. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at the installation.

Discrete areas, referred to as parcels, were classified into one of seven standard ECP area types (categories) as defined by ASTM 5746-98, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities* (ASTM 2002). The parcels are depicted on **Figure ES-2**. A total of 15 parcels were identified for MSAAP.

ECP Category 1

The parcel identified as ECP Category 1 is considered uncontaminated. The ECP Category 1 parcel contains 3,634.39 acres of land. This parcel primarily consists of undeveloped land outside the production areas. This parcel also includes the storage igloos and surrounding area. The igloos have been utilized by the Army for the storage of a variety of materials, including raw explosives materials, finished munitions, and off-specification munitions. Based on the VSI and personnel interviews completed as part of this ECP, there was no evidence that a release or disposal of hazardous substances or petroleum products or their derivatives has occurred in these areas. The ECP Category 1 parcel is identified in white on **Figure ES-2** as 1(1).

ECP Category 2

ECP Category 2 consists of three parcels and 11.83 acres of land. The parcels are identified in blue on **Figure ES-2** as 2(2)PR, 3(2)PR, and 4(2)PR.

ECP Category 3

No parcels were identified as ECP Category 3 at MSAAP.

ECP Category 4

ECP Category 4 consists of two parcels and 108.2 acres of land. The parcels are identified in dark green on **Figure ES-2** as 8(4) and 9(4)HR.

ECP Category 5

ECP Category 5 consists of one 69.68-acre parcel of land. The parcel is identified in yellow on **Figure ES-2** as 7(5)X.

ECP Category 6

ECP Category 6 consists of one 0.71-acre parcel of land. The parcel is identified in red on **Figure ES-2** as 5(6)HR.

ECP Category 7

ECP Category 7 consists of seven parcels and 389.19 acres of land. The parcels are identified in gray on **Figure ES-2**. Information gathered during the ECP process indicates that some of the sites have been evaluated, in part or in whole, for the presence of chemical or explosives hazards. The results or limited scopes of the completed investigations indicate that additional data should be collected at these sties. The remaining sites have not been investigated; however, the ECP findings suggest that these sites may have been impacted by chemical or explosives contamination.

- 9100 Area – This area includes Buildings 9100 and 9101, IWTP, coal runoff pond, and other locations associated with PMPT and CMPT production. Limited environmental investigations have been completed in these areas. There is a potential for contamination from petroleum and hazardous substances, including Freon and metals, in this area (depicted on **Figure ES-2** as 6(7)HR).
- 9400 Area – Explosive quality assurance testing of M42 and M46 grenades, including penetration testing using C-4 to detonate grenades, was done in this area. There is a potential for contamination from metals and explosives in this area (depicted on **Figure ES-2** as 10(7)HRX).
- 9500 Area – This area includes the EWI, CWP, associated SAAs, sumps and piping systems, and a former UST site. There is a potential for petroleum and metals contamination in these areas (depicted on **Figure ES-2** as 11(7)HRPR and 12(7)HR).

- Sandblasting/Painting Area – This parcel near the 9100 Area by the sanitary landfill was used for periodic sandblasting and painting of MSAAP vehicles and hardware. There is a potential for contamination from solvents and metals in this area (depicted on **Figure ES-2** as 13(7)HR).
- Target Areas D, E, and F – These parcels include portions of the High Altitude Bomb Target, West Bomb Target, and West Bomb Target Safety Zone of the Former Hancock Bombing and Gunnery Range. There is a potential for MEC presence in these areas (depicted on **Figure ES-2** as 14(7)X and 15(7)X).

ECP Category Parcel and Acreage Summary

The parcel categorizations are summarized in **Table ES-1** and depicted on **Figure ES-2**.

TABLE ES-1
MSAAP PROPERTY CATEGORIES

ECP Category	Acres	Category Definition	Parcels
1	3,634.39	Areas where no release or disposal of hazardous substances or petroleum products has occurred, including no migration of these substances from adjacent areas.	1(1)
2	11.83	Areas where only release or disposal of petroleum products has occurred.	2(2)PR 3(2)PR 4(2)PR
3	0	Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial action.	No parcels
4	108.2	Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken.	8(4) 9(4)HR
5	69.68	Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required actions have not yet been implemented.	7(5)X
6	0.71	Areas where release, disposal, and/or migration of hazardous substances have occurred, but required removal or remedial actions have not yet been initiated.	5(6)HR
7	389.19	Areas that were not evaluated or require additional evaluation.	6(7)HR 10(7)HRX 11(7)HRPR 12(7)HR 13(7)HR 14(7)X 15(7)X

URS

LOCATION MAP
MISSISSIPPI ARMY AMMUNITION PLANT
JOHN C STENNIS SPACE CENTER

DRN. BY: DPG	DATE: 11/27/06	PROJECT NO. 16170064	FIG. NO. ES–1
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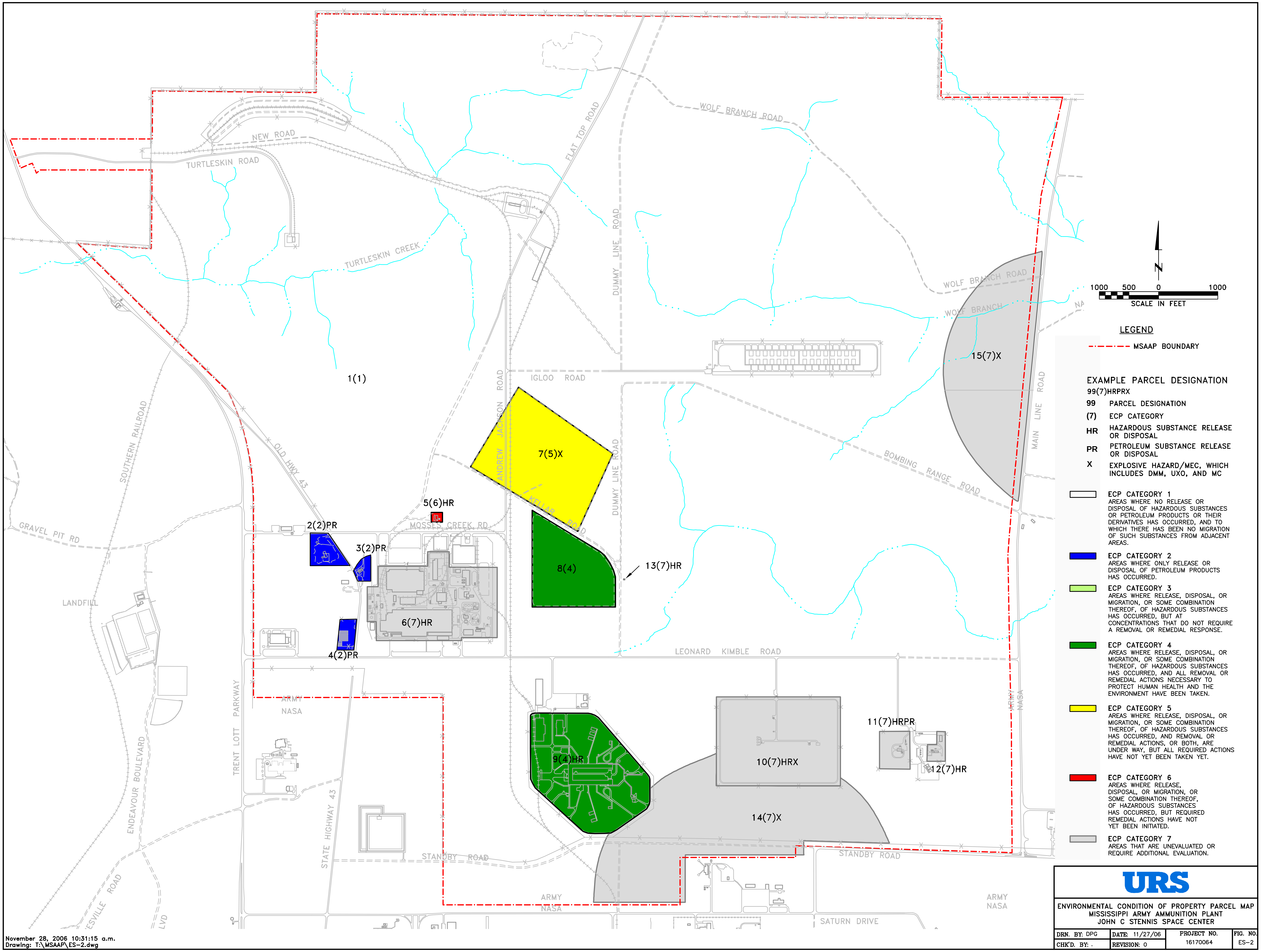
1(1)
2(2)PR
3(2)PR
4(2)PR
5(6)HR
6(7)HR
7(5)X
8(4)
9(4)HR
10(7)HRX
11(7)HRPR
12(7)HR
13(7)HR
14(7)X
15(7)X
NEW ROAD
TURTLESKIN ROAD
TURTLESKIN CREEK
FLAT TOP ROAD
WOLF BRANCH ROAD
WOLF BRANCH
DUMMY LINE ROAD
IGLOO ROAD
ANDREW JACKSON ROAD
KELLAR ROAD
MOSSES CREEK RD
BOMBING RANGE ROAD
MAIN LINE ROAD
LEONARD KIMBLE ROAD
OLD HWY 43
SOUTHERN RAILROAD
GRAVEL PIT RD
LANDFILL
TRENT LOTT PARKWAY
ENDEAVOUR BOULEVARD
STATE HIGHWAY 43
STANDBY ROAD
SATURN DRIVE
ARMY
NASA
1000 500 0 1000
SCALE IN FEET
LEGEND
MSAAP BOUNDARY
EXAMPLE PARCEL DESIGNATION
99(7)HRPRX
99 PARCEL DESIGNATION
(7) ECP CATEGORY
HR HAZARDOUS SUBSTANCE RELEASE OR DISPOSAL
PR PETROLEUM SUBSTANCE RELEASE OR DISPOSAL
X EXPLOSIVE HAZARD/MEC, WHICH INCLUDES DMM, UXO, AND MC
ECP CATEGORY 1
AREAS WHERE NO RELEASE OR DISPOSAL OF HAZARDOUS SUBSTANCES OR PETROLEUM PRODUCTS OR THEIR DERIVATIVES HAS OCCURRED, AND TO WHICH THERE HAS BEEN NO MIGRATION OF SUCH SUBSTANCES FROM ADJACENT AREAS.
ECP CATEGORY 2
AREAS WHERE ONLY RELEASE OR DISPOSAL OF PETROLEUM PRODUCTS HAS OCCURRED.
ECP CATEGORY 3
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, BUT AT CONCENTRATIONS THAT DO NOT REQUIRE A REMOVAL OR REMEDIAL RESPONSE.
ECP CATEGORY 4
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, AND ALL REMOVAL OR REMEDIAL ACTIONS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT HAVE BEEN TAKEN.
ECP CATEGORY 5
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, AND REMOVAL OR REMEDIAL ACTIONS, OR BOTH, ARE UNDER WAY, BUT ALL REQUIRED ACTIONS HAVE NOT YET BEEN TAKEN YET.
ECP CATEGORY 6
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, BUT REQUIRED REMEDIAL ACTIONS HAVE NOT YET BEEN INITIATED.
ECP CATEGORY 7
AREAS THAT ARE UNEVALUATED OR REQUIRE ADDITIONAL EVALUATION.
URS
ENVIRONMENTAL CONDITION OF PROPERTY PARCEL MAP
MISSISSIPPI ARMY AMMUNITION PLANT
JOHN C STENNIS SPACE CENTER
DRN. BY: DPG
CHK'D. BY: -
DATE: 11/27/06
REVISION: 0
PROJECT NO. 16170064
FIG. NO. ES-2
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The Environmental Condition of Property (ECP) process is a systematic process that evaluates and documents the potential for environmental contamination and liability and identifies the scope of investigative effort required to confirm suspected potential contamination. The purpose of this ECP report is to characterize the existing environmental conditions at the Mississippi Army Ammunition Plant (MSAAP). The ECP assessed the components identified in the Department of Defense (DOD) *Base Redevelopment and Realignment Manual* (BRRM) dated 1 March 2006, 4165.66-M, C.8.3 and AP2.

1.1 GENERAL

This ECP Report provides information for determining the suitability for transfer of MSAAP, and meets the requirements of Title 40, Code of Federal Regulations (CFR), Part 373, § 373.1, and U.S. Army (Army) Regulation (AR) 200-1, *Environmental Quality, Environmental Protection and Enhancement*. AR 200-1 requires an Environmental Baseline Survey (EBS) be prepared to determine the environmental conditions of properties being considered for disposal. While the ECP assessed the components presented in the BRRM, it also closely parallels the American Society for Testing and Materials (ASTM) 6008-96, *Standard Practice for Conducting Environmental Baseline Surveys* (ASTM 2005).

The ECP meets the appropriate requirements of federal and state laws as they apply to the disposal of federal properties.

The information gathered during this assessment can be used to assist the Army and NASA in making informed business decisions about the return of permitted property to NASA by reducing uncertainty regarding its environmental condition.

The Army prepares an ECP Report for the following purposes:

- Identify, characterize, and document the presence or likely presence of a release of any hazardous substances or petroleum products into the environment, which includes the ground, groundwater, or surface water of the property associated with the historical and current use of the installation.
- Identify, characterize, and document the release or possible release of any hazardous substances or petroleum products from an adjacent property that would likely cause or contribute to contamination at the installation.
- Provide a basis for determining if the property is suitable for transfer, lease, or assignment.

The ECP contains the information required to comply with the provisions of 40 CFR, Part 373 that requires a notice to accompany contracts for the sale of, and deeds entered into the transfer of, federal property on which hazardous substances may have been stored, released or disposed. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §120(h) stipulates that a notice is required if certain quantities of designated hazardous substances have been stored on the property.

The ECP Report is not prepared to satisfy a real property purchaser's duty to conduct an "all-appropriate inquiry" to establish an "innocent purchaser defense" to CERCLA 107 liability. Any such use of the ECP Report by any party is outside the control of the Army and beyond the scope of the ECP Report. The Army, its officers, employees or contractors makes no warranties or representations that any ECP Report satisfies any such requirements for any party.

1.2 SCOPE

The scope of work for this ECP requires conformance with AR 200-1 (paragraph 15-6), *Environmental Quality, Environmental Protection and Enhancement*, dated 21 February 1997, and CERCLA §120.

MSAAP is located in the southwest corner of Mississippi in Hancock County, about 50 miles northeast of New Orleans, Louisiana, and 30 miles from the Mississippi Gulf Coast. MSAAP covers 4,214 acres within the northern portion of the National Aeronautics and Space Administration's (NASA's) John C. Stennis Space Center (SSC), and is held under a 50-year irrevocable permit (Permit No. DACA01-4-78-673) effective 1 January 1978 through 31 December 2027, and renewable at the Army's option for an additional 50 years from NASA (USACE 2002). A site location map is provided in **Appendix B** as **Figure B-1**.

1.3 ASSUMPTIONS

The environmental conditions at MSAAP are based on information from the site reconnaissance, interviews, and collection and review of readily available information. New information or changes in property use could require a review and possible modification of the findings and conclusions contained in this report.

The information obtained from the Army, the Army's representatives, individuals interviewed and prior environmental reports was assumed to be accurate unless reasonable inquiries indicated otherwise. Conditions observed were considered representative of areas that were not accessible unless otherwise indicated.

1.4 LIMITATIONS

This ECP Report presents a summary of readily available information on the environmental conditions of, and concerns relative to, the land, facilities, and real property assets at MSAAP. The ECP Report findings are based on environmental investigations and reports, historical documents, and a site reconnaissance conducted 5 June through 9 June 2006. Information obtained from these other studies is reflected within this ECP Report by reference. A complete list of references is provided in **Section 7**. This ECP report should be reviewed and used in its entirety as excerpting individual sections may present information out of context. The ECP process recognizes that the condition of property can change many times before transfer. Property classifications can change as historical contamination is cleaned up or if a new source of contamination is identified. Records reviewed during the Phase I assessment were accepted as accurate and a reasonable effort was made to resolve discrepancies identified during the document review.

During the ECP Phase I assessment, consideration of all available sources of information concerning both past and present environmentally significant uses of the property was reviewed. This included readily available data associated with adjacent property records; interviews; Army environmental programs and associated documentation; aerial photography; current and historic investigations; and ongoing response actions. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injection, dumping, abandonment, or storage of hazardous substances or petroleum products at the installation. The visual site inspection (VSI) and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

VSIs were completed to the extent practical during the 2006 ECP. The inspections consisted of building inspections, installation property line drive, and an automobile tour of portions of MSAAP. A VSI of all buildings was not practical due to the number of buildings and tenant access restrictions. VSIs of all undeveloped areas could not be performed, including portions of the MSAAP property line. No sampling or analysis was conducted during the VSI.

1.5 REPORT ORGANIZATION

The remainder of the ECP is organized as follows:

Section 2 – Survey Methodology: This section provides a description of the data collection methods employed and describes the methodology used.

Section 3 – Property Description: This section provides the location and description of MSAAP; the environmental setting, including climate, topography, geology and demography; the biological and cultural resources summary; and a description of MSAAP utilities, including water, industrial/sanitary sewer systems, stormwater systems, and the electrical system.

Section 4 – Environmental Conditions: This section provides a consolidated summary of MSAAP environmental conditions and identifies the location of off-site areas of environmental concerns, past hazardous substance/petroleum products practices and current hazardous substance/petroleum products practices.

Section 5 – Summary and Conclusions: This section provides a summary of the ECP and resulting parcel categories.

Section 6 – Certification: This section documents the approval of the ECP Report.

Section 7 – References: This section provides an inventory of the reference material used in the preparation of this ECP Report.

The appendixes are arranged as follows:

Appendix A: Methodology and Data Records

Appendix B: Site Maps and Figures

Appendix C: Building Hazards Classifications

Appendix D: Interview Forms

Appendix E: Aerial Photographs

Appendix F: ECP Visual Site Inspection Photographs

Appendix G: 1985 Chromium Release Documents

Appendix H: Industrial Wastewater Treatment Plant Closure Plan

Appendix I: 1987/1988 MSAAP Chemical Inventory

Appendix J: Key Personnel Qualifications

2.1 DEVELOPMENT OF STUDY SECTIONS

The MSAAP property was divided into study sections to assist with data retrieval and management. Data (e.g., historical use and practices, process descriptions, current use, chemical usage, and storage) were collected and organized by study section. Development of sections was based on the following considerations:

- Boundaries must be readily identifiable in the field;
- Boundaries must correspond closely with those of properties destined for transfer to specific entities;
- Boundaries have to be of a manageable size for survey;
- Study sections must encompass all of the MSAAP property; and
- No land area can fall into more than one section.

Section boundaries were generally designated at the center of roads or streams, along fences, and currently identified work areas (e.g., administrative, production, storage, maintenance, and water treatment).

2.2 VISUAL SITE INSPECTION

As required by CERCLA 120(h)(4)(A)(iv) and (v), a VSI of the real property and properties immediately adjacent to the subject property (MSAAP) was conducted as part of the ECP process during the period of 5 June through 9 June 2006. The VSI conducted by the field team included grounds, buildings, structures, and equipment. Inspection methods included drive-by inspections and walking surveys.

The VSI included driving each paved road on the property and driving several secondary roads that were accessible by a two-wheel drive vehicle. Due to the large extent of the buffer zone surrounding MSAAP and the lack of roads within the buffer zone, driving the entire property boundary was not practical, but was done to the extent possible. General observations of MSAAP property and structures made during the VSI are included throughout **Section 4** of this report. General observations of adjacent properties are included in **Section 4.15** of this report.

Table 2-1 lists the property area facilities that were visually inspected. A reconnaissance of the MSAAP perimeter was conducted to evaluate adjacent property uses that could potentially contribute to environmental contamination detected on MSAAP. These perimeter properties are comprised of the SSC buffer zone and contain no habitable development. The VSI of the open and wooded areas was performed by an automobile survey with photographs taken at several locations along the perimeter of MSAAP.

Walking surveys of facilities included external and, if appropriate for the facility type, internal inspections. External walking surveys were limited to inspections of facility exteriors and grounds. Photographs taken during the VSI are presented in **Appendix F**.

TABLE 2-1 VISUAL INSPECTIONS CONDUCTED AT MSAAP	
Facility	**Survey Type**
9100 Area	
Shorty's Residence (Facility 8302)	Walking Survey
Cargo Metal Parts (CMPT) (Facility 9100)	Walking Survey
Projectile Metal Parts (PMPT) (Facility 9101)	Walking Survey
Parking Lot – CMPT (Facility 9102)	Driving/Walking Survey
Parking Lot PMPT Bldg (Facility 9103)	Driving/Walking Survey
Cooling Tower (Deionization water) (Facility 9104)	Walking Survey
Compressor Building (Bldg) (Facility 9105)	External Walking Survey
Parking Lot W Admin Bldg (Facility 9108)	Driving/Walking Survey
Parking Lot E Admin Bldg (Facility 9109)	Driving/Walking Survey
Administration Bldg (Facility 9110)	Walking Survey
Parking Lot – Area Engineering Office (Facility 9111)	Walking Survey
Area Engineering Office (Facility 9112)	External Walking Survey
Motor Pool/Maintenance Shop (Facility 9114)	Walking Survey
Blount Bldg (Facility 9115)	External Walking Survey
Forge Lube/Drum Storage (Facility 9117)	Walking Survey
Drum Storage Pad (Facility 9118)	Walking Survey
Storage Yard (Facility 9119)	Drive-by Inspection
Guard House – Post 10 (Facility 9120)	Walking Survey
Security and Personnel Bldg (Facility 9121)	Walking Survey
Water Well No. 1 and Pump House (Facility 9123)	Walking Survey
Water Well No. 2 and Pump House (Facility 9124)	Walking Survey
Interim Industrial Waste Facility (Facility 9125)	Walking Survey
Water Storage Tank (Facility 9128)	Walking Survey
Parking Lot/Hard Stand (Facility 9129)	Walking Survey
Sludge Dewatering Bldg (Facility 9130)	Walking Survey
Pump Station No. 2 (Facility 9131)	Walking Survey
Pump Station No. 3 (Facility 9132)	Walking Survey
Pump Station No. 1 (Facility 9133)	Walking Survey
Central Receiving Warehouse (Facility 9134)	Walking Survey
Nitrogen Generation Facility (Facility 9135)	Walking Survey
Suspect Rail/Truck Area (Facility 9137)	Walking Survey
Block and Brace Facility (Facility 9138)	Walking Survey
Railroad Interchange (Facility 9139)	Driving/Walking Survey

TABLE 2-1 VISUAL INSPECTIONS CONDUCTED AT MSAAP	
Facility	**Survey Type**
Coal Storage Facility (Facility 9140)	Walking Survey
Salvage/Scrap Area (Facility 9141)	Walking Survey
Mechanical Plant (Facility 9143)	Walking Survey
Flue Gas Desulfurization (FGD) Bldg (Facility 9144)	Walking Survey
Central Flammable Storage Bldg (Facility 9145)	Walking Survey
Coal Sampling Bldg (Facility 9146)	Walking Survey
Industrial Wastewater Treatment Plant (IWTP) (Facility 9148)	Walking Survey
Electrostatic Precipitator (ESP) Oil Separator (Facility 9149)	Walking Survey
Inert Waste Process Bldg (Facility 9150)	Walking Survey
Cooling Tower (Industrial Water) (Facility 9154)	Walking Survey
Sanitary Waste Treatment Plant (SWTP) (Facility 9155)	Walking Survey
Chemical Storage Temporary Control (Facility 9156)	Walking Survey
Waste Accumulation Facility (Facility 9157)	Walking Survey
Redistribution Bldg (Weaver Yard) (Facility 9158)	Walking Survey
Railroad Support Bldg (Facility 9159)	Walking Survey
Solvent Recovery Bldg (Freon Reclaim) (Facility 9160)	Walking Survey
Propane Storage Facility (Facility 9161)	Walking Survey
Control House – Tank Farm (Facility 9162)	Walking Survey
Tank – Fuel Oil (Facility 9163)	Walking Survey
Tank Farm (Facility 9164)	Walking Survey
Demilitarization/Storage Bldg (Facility 9165)	Walking Survey
Metal Parts Spares Warehouse (Facility 9166)	Walking Survey
Compressed Gas Bottle Storage (Facility 9167)	Walking Survey
Aluminum Storage Bldg (Facility 9169)	Walking Survey
Parking Lot 9121 East (Facility 9170)	Walking Survey
Parking Lot 9134 (Facility 9171)	Walking Survey
Parking Lot 9121 (West) (Facility 9174)	Walking Survey
Water Well – Block and Brace (Old and New) (Facility 9175)	Walking Survey
Diesel Pump (Facility 9177)	Walking Survey
Gas Pump (Facility 9178)	Walking Survey
Load, Assemble, and Pack (LAP) 9300 Area	
Box Opening Bldg (Facility 9302)	Drive-by Inspection
Screening Bldg (Facility 9303)	Drive-by Inspection
Expulsion Charge Assembly Bldg (Facility 9304)	Drive-by Inspection

TABLE 2-1 VISUAL INSPECTIONS CONDUCTED AT MSAAP	
Facility	**Survey Type**
Body Load Hold Igloo No. 2 (Facility 9305)	Drive-by Inspection
Body Load Hold Igloo No. 1 (Facility 9306)	Drive-by Inspection
Shipping Dock (Facility 9307)	Drive-by Inspection
Flammable Storage Bldg No. 1 (Facility 9308)	Drive-by Inspection
M-10 Service Magazine (Facility 9309)	Drive-by Inspection
A-5 Service Magazine (Facility 9310)	Drive-by Inspection
Flammable Storage Bldg No. 2 (Facility 9311)	Drive-by Inspection
Parking Lot (LAP) (Facility 9312)	Drive-by Inspection
Line Office Bldg (Facility 9313)	Drive-by Inspection
Hold Igloo Control Bldg (Facility 9315)	Drive-by Inspection
Grenade Hold Igloo No. 1 (Facility 9316)	Drive-by Inspection
Grenade Hold Igloo No. 2 (Facility 9317)	Drive-by Inspection
Grenade Hold Igloo No. 3 (Facility 9318)	Drive-by Inspection
Grenade Hold Igloo No. 4 (Facility 9319)	Drive-by Inspection
Grenade Hold Igloo No. 5 (Facility 9320)	Drive-by Inspection
Grenade Hold Igloo No. 6 (Facility 9321)	Drive-by Inspection
Central Receiving Warehouse (Facility 9322)	Walking Survey
LAP Bldg (North) (Facility 9323)	Drive-by Inspection
LAP Bldg (South) (Facility 9324)	Drive-by Inspection
LAP Service Bldg (Facility 9325)	Drive-by Inspection
Carbon Wastewater Treatment Facility (Facility 9348)	Drive-by Inspection
Guard House – Post 3 (Facility 9352)	Drive-by Inspection
Rework/Fuse Storage (Facility 9353)	Walking Survey
Compressor Bldg (Facility 9354)	Drive-by Inspection
Auxiliary Operations/Machine Shop (Facility 9355)	Drive-by Inspection
Test Area 9400	
Test Fire Control House (Facility 9401)	Drive-by Inspection
Explosive Storage Bldg (Facility 9402)	Walking Survey
Penetration Test Facility (Facility 9403)	Walking Survey
Spin Gun Test Facility (Facility 9404)	Walking Survey
Guard House – Post 4 (Facility 9505)	Walking Survey
Incinerator Area 9500	
Incinerator Office Bldg (Facility 9501)	Driving Survey
Service Magazine No. 1 (Facility 9502)	Walking Survey

TABLE 2-1
VISUAL INSPECTIONS CONDUCTED AT MSAAP

Facility	Survey Type
Service Magazine No. 2 (Facility 9503)	Walking Survey
Service Magazine No. 3 (Facility 9504)	Walking Survey
Explosive Waste Incinerator (EWI) (Facility 9505)	Walking Survey
Contaminated Waste Processor (CWP) (Facility 9506)	Walking Survey
Guard House – Post 5 (Facility 9507)	Drive-by Inspection
Fuel Tank (Propane) (Facility 9508)	Walking Survey
Vacuum Bldg (Facility 9511)	Walking Survey
Compressor Bldg EWI (Facility 9512)	Walking Survey
Compressor Bldg CWP (Facility 9513)	Walking Survey
Carbon Absorption Facility (Facility 9514)	Walking Survey
Scrap Sort Bldg (Facility 9516)	Walking Survey
Storage Igloo (Facility 9517)	Walking Survey
Storage Igloo (Facility 9518)	Walking Survey
Storage Igloo (Facility 9519)	Walking Survey
Igloos Area 9600	
Dispatch Office (Facility 9601)	Drive-by Inspection
Forklift Shelter (Facility 9602)	Drive-by Inspection
Guard House – Post 6 (Facility 9603)	Drive-by Inspection
Storage Igloo (Facility 9604)	Walking Survey
Storage Igloo (Facility 9605)	Drive-by Inspection
Storage Igloo (Facility 9606)	Drive-by Inspection
Storage Igloo (Facility 9607)	Drive-by Inspection
Storage Igloo (Facility 9608)	Walking Survey
Storage Igloo (Facility 9609)	Drive-by Inspection
Storage Igloo (Facility 9610)	Drive-by Inspection
Storage Igloo (Facility 9611)	Walking Survey
Storage Igloo (Facility 9613)	Drive-by Inspection
Storage Igloo (Facility 9614)	Drive-by Inspection
Storage Igloo (Facility 9615)	Drive-by Inspection
Storage Igloo (Facility 9616)	Drive-by Inspection
Storage Igloo (Facility 9617)	Drive-by Inspection
Storage Igloo (Facility 9618)	Drive-by Inspection
Storage Igloo (Facility 9619)	Drive-by Inspection
Storage Igloo (Facility 9620)	Drive-by Inspection

TABLE 2-1 VISUAL INSPECTIONS CONDUCTED AT MSAAP	
Facility	**Survey Type**
Storage Igloo (Facility 9621)	Drive-by Inspection
Storage Igloo (Facility 9622)	Drive-by Inspection
Storage Igloo (Facility 9623)	Drive-by Inspection
Storage Igloo (Facility 9624)	Walking Survey
Storage Igloo (Facility 9625)	Drive-by Inspection
Storage Igloo (Facility 9626)	Drive-by Inspection
Storage Igloo (Facility 9627)	Drive-by Inspection
Storage Igloo (Facility 9628)	Walking Survey
Storage Igloo (Facility 9629)	Drive-by Inspection
Storage Igloo (Facility 9630)	Walking Survey
Storage Igloo (Facility 9631)	Drive-by Inspection
Storage Igloo (Facility 9632)	Drive-by Inspection
Storage Igloo (Facility 9633)	Drive-by Inspection
Battery Charging Bldg (Facility 9634)	Drive-by Inspection
Water Well and Pump House (Facility 9635)	Drive-by Inspection
Containerization Pad (Facility 9645)	Walking Survey
Sanitary Landfill (Facility 9650)	Walking Survey
Other Areas	
Kellar Range	Drive-by Inspection
Rubbish Disposal Area	Walking Survey
Switching Station (Facility 9714)	Walking Survey

2.3 AERIAL PHOTOGRAPHY ANALYSIS

Fire insurance maps were typically only generated for areas with high population densities and areas within commercial and business districts of towns and cities. Historical fire insurance maps are not available for the area currently occupied by MSAAP.

An aerial photography analysis was conducted as part of the 2006 ECP. Photographs covering the entire facility for the period from 1961 to 2004 were obtained from NASA, U.S. Army Environmental Center (USAEC) [U.S. Geological Survey (USGS) and Agricultural Stabilization and Conservation Service photography], the Mississippi Automated Resource Information System (USGS photography), and the U.S. Army Corps of Engineers (USACE) Mobile District (USGS photography). Aerial photography details are presented in **Table 2-2**. The reviewed aerial photographs are included in **Appendix E**.

TABLE 2-2 AERIAL PHOTOGRAPHS REVIEWED			
Photo Date	**Agency/Provider**	**Approximate Scale**	**Photo Type**
1961	NASA	1:12,000	Black and White
1969	USGS/Agricultural Stabilization and Conservation Service[1]	1:20,500	Black and White
1978	USGS/Agricultural Stabilization and Conservation Service[1]	1:16,000	Color Infrared
1981	USGS/Agricultural Stabilization and Conservation Service[1]	1:20,500	Black and White
1995/1996	USGS	1:40,000	Color Infrared
2004	USGS	Unknown Scale	True Color

[1]USGS and the Agricultural Stabilization and Conservation Service were identified as the sources for 1969, 1978, and 1981 photography in an Environmental Photographic Interpretation Center report (EPIC 1983), but the specific source for each individual year was not defined.

The Environmental Photographic Interpretation Center (EPIC) provided imagery analysis support for the 1984 U.S. Army Toxic and Hazardous Material Agency (USATHMA) installation assessment project. Their analysis included a review of 1969, 1978, and 1981 aerial photograph mosaics of MSAAP. This analysis is included below.

EPIC Aerial Photography Analysis

1969 Photography

This photograph (**Figure E-2**) shows MSAAP while the property is still under NASA ownership (NASA's test facilities are visible along the southern edge of the photograph). An intensive road network is present within the future MSAAP boundary in 1969. Several clearings and/or open fields are present in the area. The majority of land appears as young second growth forest. The only significant disturbance is the Mississippi Test Operations (MTO) landfill located west of the MSAAP boundary. (EPIC 1983)

1978 Photography

This photograph (**Figure E-3**) shows MSAAP under construction. Drainage channelization is visible at the construction site and has disrupted the natural drainage of the area. Dead vegetation (DV) is visible along the former drainage path located west of the construction site. The foundation of a building under construction (Building 9101) is visible. A test range (Old Kellar Test Range) is located northeast of the construction site. Ground scarring (GS), an earthen berm and a revetted enclosure are located on this range. No other significant changes are visible within MSAAP's boundary. (EPIC 1983)

1981 Photography

This photograph (**Figure E-4**) shows considerable expansion of the construction site since 1978. One rectangular building (Building 9101) has been erected on the construction site at "A;" the foundation of another building (Building 9100) is adjacent to it. Access roads, piping and materials are visible. Additional site preparation and construction of a U-shaped building (Buildings 9323/9324/9325) are visible at B. The stream has been channelized as part of site preparation. Railroad access has been extended from the Southern Railway, south to both “A” and “B.” (EPIC 1983)

Light-toned fill (LTF) has been placed in a roughly triangular area east of “A.” The fill area is in the area of the sanitary landfill. A linear rectangular cleared area is located northeast of “A” (9600 igloo area). The Old Kellar Test Range is still visible and cleared. A second range is visible east of the MSAAP boundary. In addition, a surface disturbance similar to the LTF in the area of the sanitary landfill is visible inside the northern MSAAP boundary. This feature is in the area of the rubbish disposal area (described in **Section 4.8**). (EPIC 1983)

2006 ECP Aerial Photography Analysis

1961 Photography

This black and white mosaic (**Figure E-1**) shows the MSAAP site at the time NASA announced its decision to establish a national rocket test site, named MTO, in the same general vicinity of the Hancock Bombing and Gunnery Range. The majority of land appears as it did in the later 1969 aerial photography, with forested areas interspersed with clearings and/or open fields of probable rural agricultural nature. A road network is in place within the MSAAP boundary area. Concentric rings forming the bulls-eye portion of the west bomb target at the former bombing range are visible east of the MSAAP boundary.

1995/1996 Photography

This color infrared mosaic (**Figure E-5**) shows MSAAP in its completed state but after production had ceased. Areas formerly cleared for construction of MSAAP, including production and associated areas, are showing revegetation. Small, generally rectangular, clearings are visible throughout the facility. According to interviews, these are the result of timber harvesting over the years. No previously unknown areas of concern were identified.

2004 Photography

This true color photograph (**Figure E-6**) shows the continued revegetation of former MSAAP production and associated areas. It also shows new areas cleared by timber harvesting, as well as the revegetation of previously cleared timber harvest areas. No previously unknown areas of concern were identified.

2.4 RECORDS REVIEW

2.4.1 Standard Environmental Record Sources

A search of state and federal environmental databases was contracted with Environmental Data Resources, Inc. (EDR) to conduct an environmental regulatory database search of known underground storage tanks; landfills; hazardous waste generation or treatment, storage and disposal facilities; and subsurface contamination in the surrounding area. This information was reviewed to assess if activities on or near the subject property would potentially threaten the environmental quality of the subject property. The findings of the search are summarized in **Table 2-3** and the complete list of databases reviewed by EDR and search results are presented in **Appendix A**.

TABLE 2-3
STANDARD ENVIRONMENTAL RECORD SOURCES REVIEWED

Record(s) Source	Number of Sites	Minimum Search Distance
Federal Records		
National Priorities List (NPL)	0	1.0 Mile
Proposed NPL	0	1.0 Mile
Delisted NPL	0	1.0 Mile
NPL Recovery (Liens)	0	Target Property
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	1	0.5 Miles
CERCLIS No Further Remedial Action Planned (CERC-NFRAP)	0	0.5 Miles
Corrective Action Report (CORRACTS)	0	1.0 Mile
Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal Facilities (TSDF)	1	0.5 Miles
RCRA Large Quantity Generator (LQG)	1	0.25 Miles
RCRA Small Quantity Generator (SQG)	2	0.25 Miles
Emergency Response Notification System (ERNS)	2	Target Property
Hazards Materials Information Reporting Systems (HMIRS)	0	Target Property
Engineering Controls Sites List (US ENG CONTROLS)	0	0.5 Miles
Sites with Institutional Controls (US INST CONTROLS)	0	0.5 Miles
DOD Sites	0	1.0 Mile
Formerly Used Defense Sites (FUDS)	1	1.0 Mile
Brownfields Sites (US BROWNFIELDS)	0	0.5 Miles
Superfund (CERCLA) Consent Decrees (CONSENT)	0	1.0 Mile
Records of Decision (ROD)	0	1.0 Mile
Uranium Mill Tailing Sites (UMTRA)	0	0.5 Miles
Open Dump Inventory (ODI)	0	0.5 Miles
Toxic Chemical Release Inventory System (TRIS)	0	Target Property
Toxic Substances Control Act (TSCA)	0	Target Property
Federal Insecticide, Fungicide, and Rodenticide Act/TSCA Tracking System (FTTS)	0	Target Property
Section 7 Tracking System (SSTS)	0	Target Property
Integrated Compliance Information System (ICIS)	0	Target Property

TABLE 2-3 STANDARD ENVIRONMENTAL RECORD SOURCES REVIEWED		
Record(s) Source	**Number of Sites**	**Minimum Search Distance**
Polychlorinated biphenyl (PCB) Activity Database System (PADS)	1	Target Property
Material Licensing Tracking System (MLTS)	0	Target Property
Mines Master Index File (MINES)	0	0.25 Miles
Facility Index System (FINDS)	1	Target Property
RCRA Administrative Action Tracking System (RAATS)	0	Target Property
State and Local Records		
State Hazardous Waste	0	0.5 Miles
Solid Waste Facilities/Landfill Sites (SWF/LF)	1	0.5 Miles
Mississippi Recycling Directory (SWRCY)	0	0.5 Miles
Leaking Underground Storage Tank (LUST)	2	0.5 Miles
Underground Storage Tank (UST)	3	0.25 Miles
Aboveground Storage Tank (AST)	0	0.25 Miles
Permits	0	
ENG CONTROLS	0	0.5 Miles
INST CONTROL	0	0.5 Miles
Voluntary Evaluation Program Sites (VCP)	0	0.5 Miles
Drycleaners Facility Listing (DRYCLEANERS)	0	0.25 Miles
Brownfields	0	0.5 Miles
Mississippi National Pollutant Discharge Elimination System (NPDES)	0	
Tribal Records		
Indian Reservations (INDIAN RESERV)	0	1.0 Mile
LUSTs on Indian Land (INDIAN LUST)	0	0.25 Miles
USTs on Indian Land (INDIAN UST)	0	0.25 Miles
EDR Proprietary Records		
Manufactured Gas Plants	0	1.0 Mile

MSAAP was identified on the RCRA-TSDF, RCRA-SQG, and State of Mississippi UST databases. The U.S. Army Armament, Munitions and Chemical Command (AMCCOM) was identified on the RCRA-SQG and FINDS databases. AMCCOM-Picatinny Arsenal, Dover, New Jersey (AMCCOM-D) was contracted by NASA to test explosives, propellants, and pyrotechnics at the Old Kellar Test Range. Two ERNS sites were identified at Dummyline Road and Leonard Kimble Road (within MSAAP property boundary). Hancock Bombing and Gunnery Range was identified on the FUDS database. The west bomb range and high altitude bomb target areas are partially within the MSAAP property boundary. Information related to the databases is presented in **Appendix A**.

SSC was identified on federal CERCLIS, RCRA-LQG, and PADS databases, and on State of Mississippi SWF/LF, LUST, and UST databases. MSAAP is located within the northern portion of SSC. Information related to surface drainage and groundwater flow at MSAAP is included in **Section 3.5**. Based on surface drainage and groundwater flow information, SSC activities performed outside MSAAP boundaries are not expected to present a recognized environmental condition to MSAAP.

The EDR report included information on an additional 72 orphan sites that were not mapped due to inadequate address information; three of these sites are on MSAAP or SSC property. MSAAP was identified as an orphan site on the SWF/LF database (with an address of SSC). The Naval Oceanographic Office (NAVOCEANO) was identified as an orphan site on the RCRA-SQG and FINDS databases. National Space Technology Laboratory (NSTL)/SSC was identified as an orphan site on the SWF/LF database. Additional research on the remaining 69 orphan sites to identify their approximate locations indicated they were beyond the approximate minimum search distance from MSAAP.

For information related to adjacent properties not identified by the standard environmental record sources, refer to **Section 4.15**.

2.4.2 Additional Record Sources

Reasonably accessible Army environmental documents and aerial photographs of the property were reviewed to investigate land uses at the site. State authorities were contacted to learn about historic uses of buildings and lands on the site. Available information on past land uses and their potential impacts was assessed. Other documents and resources queried for information of historical importance include:

- Readily available records and files documenting where hazardous materials are stored and used on site.
- Files from the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM).
- Environmental documents and files at the USAEC.
- Historical documents and maps at the National Archives and Records Administration (NARA). (No relevant records were identified through queries of NARA databases.)
- Copies of permit applications and any notices of violations concerning the site.
- Federal databases associated with the right-to-know network.

The documents presented in **Table 2-4** are the primary documents used in the preparation of this ECP Report.

TABLE 2-4
PRIMARY DOCUMENTS REVIEWED

Document Title	Author	Date
Imagery Analysis Support for the 1984 U.S. Army Toxic and Hazardous Material Agency Installation Assessment	EPIC	1983
Installation Assessment of Mississippi Army Ammunition Plant	Environmental Science and Engineering, Inc. (ESE)	June 1984
Radiation Protection Survey No. 27-43-0107-88, Mississippi Army Ammunition Plant, 16-17 December 1987	U.S. Army Environmental Hygiene Agency (USAEHA)	22 March 1988
Cultural Resources Investigations for National Aeronautics and Space Administration at National Space Technology Laboratories	USACE - Mobile District	May 1988
Environmental Assessment for the Layaway of Mississippi Army Ammunition Plant	U.S. Army Materiel Command	September 1990
RCRA Facility Assessment of Mississippi Army Ammunition Plant	A.T. Kearney, Inc (ATK).	September 1993
Ordnance and Explosive Waste Archive Search for the Former Hancock Bombing and Gunnery Range, Defense Environmental Restoration Program for Formerly Used Defense Sites	USACE- Rock Island District U.S. Army Defense Ammunition Center and School	September 1995
Facility Reuse Environmental Assessment, Mississippi Army Ammunition Plant	Mason Technologies Inc. (MTI)	11 July 1997
Relative Risk Site Evaluation, Hazardous and Medical Waste Study No. 37-EF-5703-97, Mississippi Army Ammunition Plant, 21-25 July 1997	USACHPPM	July 1997
Draft Environmental Site Assessment, Building 9101, Mississippi Army Ammunition Plant	EMCON	23 March 1998
Phase II Environmental Assessment, Building 9101, John C. Stennis Space Center	EMCON	4 December 1998
Environmental Assessment, Laser Test Facility	U.S. Army Space and Missile Defense Command (USASMDC)	December 1999
Wetlands Inventory of Mississippi Army Ammunition Plant	U.S. Fish and Wildlife Service (USFWS)	June 2000
Final Planning Level Surveys for Fauna, Flora, and Vegetative Communities, Mississippi Army Ammunition Plant	Tetra Tech, Inc.	July 2002
Final Remedial Investigation Report for Area I (Old Kellar Range), Stennis Space Center	Foster Wheeler Environmental Corporation	July 2003
Final U.S. Army Closed, Transferring and Transferred Range/Site Inventory for Mississippi Army Ammunition Plant	Malcolm Pirnie, Inc.	16 December 2003
Environmental Baseline Investigation, Building 9115, Mississippi Army Ammunition Plant	Earth Consulting Group, Inc. (EarthCon)	22 April 2005

2.5 INTERVIEWS

To facilitate the review of MSAAP's environmental history and practices, interviews of current and former MSAAP employees involved in operations were conducted as part of this ECP process. Similar interviews were also conducted with MSAAP tenants, State agencies and NASA. To ensure the interview process was thorough, standardized interview forms were utilized where appropriate. Interview records from the ECP process are included in **Appendix D**. **Table 2-5** lists the individuals who were interviewed.

TABLE 2-5
MSAAP-AFFILIATED PERSONNEL INTERVIEWED

Name	Title	Organization	Telephone Number	Period Associated with Area or MSAAP
Wayne Gouguet	Deputy Program Manager	Applied Geo Technologies, Inc. (AGT)	(228) 689-8170	1983 to 2006
Bob Hancock	President	Entech/Power Dynamic	(228) 689-8580	1994 to Present
Terry Shelby	Environmental Safety & Health Manager	NAVOCEANO	(228) 828-5394	2000 to Present
Keith Smith	President	JKS International	(228) 689-8999	1996 to Present
Marianne Smith	Environmental Health & Safety Specialist	Pratt & Whitney/ Rocketdyne	(228) 688-3949	1999 to Present
Terry Stevenson	Base Transition Coordinator	MSAAP	(228) 689-8939	1977 to Present
Patricia Anderson	Environmental Scientist	U.S. Environmental Protection Agency (USEPA) Region IV	(404) 562-8490	1985 to Present
Toby Cook	Chief, Chemical Manufacturing Branch – Environmental Permits Division	Mississippi Department of Environmental Quality (MDEQ)-Environmental Permit Division	(601) 961-5067	Not provided
Craig Case	Resident Forester, Real Estate Division	USACE Mobile District	(228) 688-7142	1998 to Present
Hugh Carr	Natural Resources Manager	NASA	(228) 688-2466	1999 to present
John Cecconi	Administrative Contracting Officer, Base Realignment and Closure (BRAC) Environmental Coordinator	MSAAP	(228) 689-8904	1998 to 27 September 2006
Billy Sheffield	Administrations Manager	AGT	(228) 689-8620	1978 to Present
Jenette Gordon	Environmental Specialist	NASA	(228) 688-1416	1984 to Present

TABLE 2-5 MSAAP-AFFILIATED PERSONNEL INTERVIEWED				
Name	**Title**	**Organization**	**Telephone Number**	**Period Associated with Area or MSAAP**
Don Bales	Pest Control Coordinator/Natural Resources Manager	MTI	(601) 606-8881	1982 to 1993
Frank Lewis	Environmental Coordinator	MSAAP	(660) 826-2683	1978 to 1990
Larry Herwick	Operations Manager	AGT	(228) 689-8610	1980 to Present
Lynn Landrum	Maintenance and Utilities Manager	MTI	(601) 549-6229	1978 to 1994
Jerry Pankow	Environmental Engineer	Mason Chamberlain Inc. (MCI)	(985) 643-7886	1980 to 1989
Harvey Smith	9600 Area Manager	MCI	(601) 749-7700	1980 to 1990
Robert Heitzmann	Chief, Operations and Maintenance Division	NASA	(228) 688-210	1980 to 1989

2.6 DATA MANAGEMENT

Data obtained during the ECP assessment were provided in an electronic and/or hard copy format. The primary documents used to develop the ECP are identified in **Table 2-4**. A complete list of documents is provided in **Section 7**. Hard copy documents were filed in the project central file located at URS Group, Inc.'s Omaha office.

3.1 INSTALLATION LOCATION AND DESCRIPTION

MSAAP is located in the southwest corner of Mississippi in Hancock County, about 50 miles northeast of New Orleans, Louisiana, and 30 miles from the Mississippi Gulf Coast. The MSAAP administrative office (Building 9100) is located at approximately 30^{o}23’21” north latitude and 89^{o}36’41” west longitude. Communities in the vicinity include Picayune (population 10,535) 10 miles to the northwest, Slidell (25,695) 10 miles to the southwest, and Bay St. Louis (8,209) 13 miles to the southeast (population figures are from 2000 Census data and do not reflect changes caused by Hurricane Katrina relocations). A site location map is provided as **Figure B-1**.

MSAAP covers 4,214 acres within the northern portion of NASA’s SSC and is held under an irrevocable permit from NASA (further described in **Section 3.3**). The combined MSAAP/SSC property of approximately 13,500 acres is located in a controlled buffer area of approximately 125,000 acres. Easements held by the U.S. Government on the buffer zone largely restrict land use within the buffer zone to farming, grazing and timber production with no human habitation permitted.

Two guarded NASA security gates control access to MSAAP. Trent Lott Parkway (Highway 607) parallels the western boundary of MSAAP providing access from NASA’s north and south gates. Interstate 10 is approximately 5 miles south of MSAAP through the south gate. MSAAP is bounded on the east by Main Line Road and on the south by Standby Road; there are no northern boundary roads.

3.2 HISTORIC LAND USE

In the early 1940s, the War Department began leasing land in the area of present-day MSAAP/SSC for use as a bombing and gunnery range to train combat crews flying B-17s. The range was planned to support units stationed at New Orleans, Louisiana, and units of the 5th Air Support Command located at Gulfport, Mississippi. Forty tracts of land, consisting of 30,622.38 acres, were leased. In 1942, construction of the Hancock Bombing Range and Gunnery Range began with the establishment of three bomb targets, a rifle range, two machine gun ranges, and a ground strafing range. Two of these range features, the west bomb range and the high altitude bomb target, are partially within the current MSAAP boundary (**Section 3.3.4**). (USACE 1995)

In 1946, the Army reported the site as excess, and utilization of the property was subsequently conveyed to the U.S. Navy (Navy). The Navy granted a revocable permit to the U.S. Air Force to use the site from 1948 until 1955 (USACE 1995). On 25 October 1961, NASA announced its decision to establish a national rocket test site, named MTO, in the same general vicinity of the Hancock Bombing and Gunnery Range (NASA 2000). The U.S. Government, acting through the Army as an agent for NASA, used NASA funds to acquire fee simple title and easements in the area of the former range. The Navy continued to use the site until 1963 when their leases were terminated (USACE 1995).

NASA’s land acquisition totaled approximately 13,800 acres (the Fee Area) and included the west bomb range and the high altitude bomb target that are partially within the current MSAAP boundary. Within the Fee Area, NASA and other resident government agencies constructed test facilities, laboratories, and support buildings necessary for conducting operations. A permanent easement known as the buffer zone prohibits any habitable structure being placed on land surrounding the NASA installation. The NASA facility is currently known as SSC (NASA 2000).

Old Kellar Test Range is located on MSAAP property in an area north of Kellar Road and generally east of Andrew Jackson Road (**Figure B-9**). The range was used from 1969 to 1980 as an explosive test range. Activities were performed through a NASA support contractor, Computer Sciences Corporation (CSC), for AMCCOM-D to test explosives, propellants, and pyrotechnics. Operations and investigation activities at the Old Kellar Test Range are described in **Section 4.2.2**. With the establishment of MSAAP, test activities were moved from Old Kellar Range to the Energetic Materials Test Facility (EMTF) (NASA 2000).

3.3 FACILITY HISTORY

On 7 July 1978, the Army obtained a 50-year irrevocable permit (Permit No. DACA01-4-78-673), effective 1 January 1978 through 31 December 2027 and renewable at the Army's option for an additional 50 years, from NASA to use approximately 7,148.6 acres of SSC property to construct and operate MSAAP. The permit has been amended four times to return land and property to NASA. (USACE 2002)

- Amendment 1: 13 February 1985, returned 1,003.6 acres of land together with certain facilities.
- Amendment 2: 12 May 1989, returned 1,808 acres of land.
- Amendment 3: 1 September 1999, returned control of specific electrical system items.
- Amendment 4: 27 November 2002, returned 123 acres of land together with any pre-existing easements.

MSAAP now covers 4,214 acres of land within the boundaries of SSC and the SSC buffer zone.

MTI, formerly MCI, was selected as the contractor operator of MSAAP. Facility construction started in 1978 and the first testing of a completed projectile was in 1984. Production ceased in 1992. In January 2006, AGT became the MSAAP operating contractor.

Hurricane Katrina

On 29 August 2005, Hurricane Katrina, a Category 4 hurricane, moved across the Louisiana, Mississippi, and Alabama gulf coasts. The eye of the hurricane passed over MSAAP and the surrounding area resulting in significant damage to the facility's infrastructure and natural resources. Immediate effects of the storm included numerous downed power lines and poles with transformers, specifically on the north side of the Shorty's Bar site, south of the sanitary landfill along Dummy Line Road, and in the 9400 Area; damage to many of MSAAP's buildings; and the loss of an estimated 10 to 20 percent of MSAAP's timber resource (**Section 3.6.1.1**).

Post-hurricane impacts to MSAAP as a result of serving as a staging area for relief efforts included an approximately 200-gallon diesel fuel release in the vicinity of Building 9158, which was being used by the Federal Emergency Management Agency (FEMA) as a refueling area (**Section 4.4**). Temporary housing trailers were installed in the 9300 Area to provide housing for civilians and government employees whose homes were affected by the hurricane. The placement of the trailers also included the installation of a septic system to process sanitary wastes. Trailers and tents were also staged in the 9100 Area to serve as command posts and administrative areas for more than a dozen agencies supporting relief efforts.

3.3.1 Operational History

MSAAP was the first and only ammunition plant to be built by the Army after the Korean War, and was first established as the only ammunition plant where total M483 155-millimeter (mm) Howitzer projectile and grenade were produced and assembled into live projectiles (MSAAP 2006). The primary mission of the facility was the managing, testing, developing, and manufacturing of the M483 155-mm artillery improved conventional munition. The M483 was a dual-purpose projectile for the 155-mm Howitzer using anti-armor/anti-personnel controlled M42 and M46 grenades. MSAAP was capable of producing 120,000 packaged rounds per month.

In 1990, DOD placed MSAAP on inactive status and began the layaway process for the equipment and facilities. Production at PMPT ceased in 1990; however, all missions necessary to produce the 155-mm M483 projectile were retained. In the late 1990s, the LAP and projectile mission was discontinued but the grenade production mission was retained. Through a facility use contract, MSAAP is available to the private sector to provide or produce commercial services and products. (AGT DPM 2006)

3.3.2 Process Descriptions

MSAAP production facilities consisted of three separate manufacturing complexes: the PMPT Area, the CMPT Area, and the LAP Area. These three production complexes were supported by other industrial facilities, including igloo storage areas, the IWTP, the mechanical plant, the EWI, the CWP, landfill, on site laboratories, and a vehicle maintenance shop. These facilities are described in detail below.

Projectile Metal Parts

At PMPT (Building 9101), which covers 566,049 square feet, 155-mm projectile cylindrical steel casings, aluminum bases and ogives were produced in two parallel, multi-stage production lines (AGT DPM 2006). The production steps included forging hot steel were produced and aluminum bars to rough dimensions, cooling, rough machining, heat treatment, and final machining. The three separate projectile pieces were then assembled and painted (ESE 1984).

The projectile fabrication process utilized two different forging operations: steel body forges and aluminum presses. In total, there were five separate forges which had their emissions controlled by four electrostatic precipitators (ESPs). The projectiles body was forged from steel at 2,000 degrees Fahrenheit (°F) in a three-step process. MSAAP had two steel-body forges each capable of processing 240 projectiles per hour. Each steel-body forge exhausted through a collection hood to one of the ESPs. (USAEHA 1986b)

The bases of the projectiles were forged in three aluminum presses. The maximum capacity of each of the aluminum presses was 420 presses per hour. The exhaust from the aluminum presses was collected by hoods and routed to a common exhaust duct. From the common exhaust duct, the aluminum press exhaust could be routed to any of the four ESPs. (USAEHA 1986b)

Dampers were used to segregate each of the forge exhaust flows so that one forge would exhaust through one ESP (AGT DPM 2006). The ESPs were identical three-stage units with identical air flows. The three ESP stages included a mesh screen filter, a precipitator, and a mist eliminator. Originally, a continuous oil spray was utilized to aid in the collection and removal of particulates (USAEHA 1984a). However, due to recurring fire problems with the continuous oil wash, an intermittent oil wash was implemented to clean the ESPs. The intermittent washing of the ESPs occurred while the ESPs were shutdown (USAEHA 1986b).

The process included seven machining systems that machined aluminum, copper, brass, steel, or fiberglass (USAEHA 1987b). Wastes generated from this process included cutting oils, cleaning baths, etching solutions, plating baths, solvent rinses, and water rinses. Drainage sumps and containment barriers directed spills and tank overflows to the IWTP (ESE 1984). There were no direct discharges within the PMPT building to the stormwater drainage system. Eight of the nine machining systems used a semi-synthetic coolant; one used water as a coolant (USAEHA 1987b). Air emission control devices were installed on all equipment having a potential air contaminant discharge (USACE 1990, MSAAP 1986).

State of Mississippi Air Pollution Standards for the MSAAP forge operations are shown in **Table 3-1** (USAEHA 1986b).

TABLE 3-1
FORGE OPERATION EMISSION STANDARDS

	Process Emissions (uncontrolled)		**Stack Emissions**	
Process	**Pounds/hour**	**Tons/year**	**Pounds/hour**	**Tons/year**
Steel-Body Forge				
Particulate	7	22	1	3.3
Hydrocarbon	47	148	47	148
Aluminum Press				
Particulate	3.5	11	0.5	1.5
Hydrocarbon	24	74	24	74

Cargo Metal Parts

The 232,000-square foot CMPT facility produced the small cup-shaped metal grenades that were carried inside the projectile casing. The grenades were processed from steel through a series of presses and annealing operations. Cutting machines obtained the final dimensions of the grenades. Finally, the grenades were heated to increase strength, and then finished and plated (ESE 1984). There were two machining operations for small steel grenades in Building 9100. One operation consisted of four systems that used a heavy mineral oil cutting fluid. The second operation consisted of two systems: one for the inside diameter boring of the grenades and one for the outside diameter grinding of grenades (USAEHA 1987b).

Wastes generated from this area included cutting oils, cleaning baths, plating baths, and solvent rinses (ESE 1984, AGT DPM 2006). As with the PMPT, drainage sumps, containment barriers, and air emission control devices were installed throughout the building (USACE 1990, MSAAP 1986). Freon 113®, used in the vapor degreasers, was hard piped to the Freon Recovery Building where it was reclaimed through distillation. The CMPT also housed two spray paint booths for painting signs (ATK 1993). Both machining operations used a semi-synthetic coolant (USAEHA 1987b).

Load, Assemble, and Pack Area

In the approximately 10-acre LAP area, explosive charges and propellants were loaded into grenades and projectile casings (MCI IAM 2006). This process occurred in a semi-automated production line where approximately 30.5 grams of Composition A-5 (Comp A-5) explosive was loaded into grenade bodies that were then independently fuzed and loaded into a 155-mm projectile casing. The munitions were then sealed and palletized for storage or shipment (ESE 1984, ATK 1993). The LAP facility generated industrial wastewaters from floor and equipment wash water, scrubbing of airborne fumes and dust, and from a laundry facility. The wastewaters may have been contaminated with Comp A-5, a cyclotrimethylenetrinitramine (RDX)-based explosive compound (USACE 1990, NASA OMD 2006). Additional information regarding the LAP Area is included in **Section 4.9**.

Igloo Storage Areas

Bulk explosives and finished projectiles were stored in 30 earth-covered, steel arch-type igloos (Buildings 9604 through 9633). Each igloo has an area of 2,785 square feet and an explosive capacity of 250,000 pounds (USACE 1990). Palletized bulk explosives were brought to the 9600 Igloo Area from the Block and Brace Facility (Building 9138). Explosive products included 60-pound cardboard boxes of Comp A-5 and 250-pound drums of RDX. Finished projectiles were stored eight per pallet in bundles of three. Other stored items included fuzes, Composition 4 (C-4) explosives, M-55 primers, blasting caps, and off-specification grenades. No hazardous materials or wastes were stored in the igloos (MCI IAM 2006).

Nine LAP area service magazines and grenade hold igloos provided storage of explosives during the ammunition loading process (ESE 1984). Six igloos located in the incinerator area (9500 Area) provided storage for explosives, including off-specification grenades, prior to incineration (USACE 1990).

Industrial Wastewater Treatment Plant

The IWTP was utilized to process metal parts-related wastewater until 1992 when production operations at MSAAP were discontinued (MSAAP EC 2006). Since that time, the IWTP has been maintained in a ready status to treat rainwater accumulated within the IWTP holding tanks, miscellaneous oily waste streams, and boiler blowdown (AGT DPM 2006). A complete description of the IWTP is provided in **Section 3.4.2.2**.

Mechanical Plant

MSAAP operated a coal-fired steam plant consisting of four 32,000-pound per hour (lb/hr) boilers. The four boilers exhausted via a common header to two separate air pollution control systems (APCS). Each APCS contained a Precipitair three-field ESP that exhausted via two induced draft fans to a dual alkali counter-flow sulfur dioxide (SO_2) absorber tower (USAEHA 1984b). Each absorber vented to its own stack; however, both stacks were housed in a common shroud. Steam-heated coils provided stack reheated air to avoid acid corrosion problems. Continuous monitors, located on the exhaust stacks, monitored the stack emission for opacity, $SO_{2,}$ and oxygen (USAEHA 1984c).

The boilers were laid away with the installation of four gas-fired units in 1988. The gas-fired plant consisted of two 15,000-lb/hr boilers plus two 17,500-lb/hr steam generators. The plant provided the steam and compressed air required for various processes within the production facilities as well as the heat source for space heating. Wastes generated at the plant included coal pile runoff, cooling tower blowdown, boiler blowdown, and equipment washing water. (The coal pile runoff pond has been backfilled.) All liquid wastes were conveyed to the IWTP for treatment and disposal (USACE 1990, MSAAP EC 2006). Solid wastes generated from the FGD Building (Facility 9144) were initially disposed of in the MSAAP sanitary landfill or utilized as roadway topping material. Solid wastes from the FGD building were later transported off-site for disposal following concerns by MDEQ that the material was considered hazardous and not suitable for use as a paving material (NASA OMD 2006).

Explosive Waste Incinerator

The EWI was used to dispose of off-specification grenades and explosive-contaminated metal parts. Incinerated wastes were limited to those generated from operations at MSAAP. The facility operated from 1985 to 1992. The unit is located in the 9500 Area at the end of Leonard Kimble Road. The EWI was composed of the following sub-units: the incinerator, the gas washers (2), the cyclone, the baghouse, the ash separator, the loading dock, and the waste feed collection trench. The central features of the incinerator included the rotary kiln primary chamber and the afterburner. The kiln was constructed of four cast-steel retort sections. The retort used sectioned feed and discharge conveyors for routine operations. Each section of the kiln contained internal spiral flights that created an auger-type of conveyance for the waste feed items through the retort. The retort burner and afterburner used fuel oil No. 2. The afterburner provided additional residence time at elevated temperatures for the exhaust gases from the retort. Bulk wastes were fed to the retort in paper bags in one pound increments. (USAEHA 1985)

The maximum possible feed rates for some of the wastes were listed in the original Part B Permit Application (see below) (USAEHA 1985).

- M42/M46 Grenade - 71.4 (based on a feed rate of 1,080 grenades per hour)
- Bulk RDX - 200
- Explosive charge-nitrocellulose - 189.88
- Bulk 10 propellant (as nitrocellulose) - 198
- Bulk Comp A-5 - 198

Grenades were punched before they were incinerated. The punch machines were automatically controlled once the grenade was loaded into the punch device. The sequence was activated manually and the grenade was transferred to the inside of the explosive barrier where it was punched. After the punch cycle was complete, the grenade dropped down a chute into the retort chamber. The APCS consisted of (in order) a high temperature gas cooler, dilution air damper, low temperature gas cooler, cyclone, baghouse, and induced draft fan. Particulate emission reduction was the only function of the APCS. (USAEHA 1985)

Within the waste feed room, there was a waste feed and collection trench that led to a sump. The trench collected material from the floor drains, which in turn collected water generated from washing the floor. The waste feed room was also equipped with ultraviolet sensors that were installed to detect explosions and turn off the waste feed mechanisms. The bottom ash from the retort was transferred to an ash separator. Large pieces of steel were separated out during a segregation process, and the ash that remained from the segregation process was drummed for disposal and transferred to the EWI satellite accumulation area (SAA) (AGT DPM 2006). Ash collected from the gas washers, cyclone, and baghouse was stored in the EWI SAA. Prior to being shipped for disposal, the waste was tested to determine if it was hazardous, then it was disposed of accordingly. (ATK 1993)

Prior to the construction of Building 9516 in 1989, scrap from metal components (grenades and their components) processed in the EWI was stored in open gondolas outside the EWI on the east end of the parcel. Large quantities were collected before removal by semi-trailer. Some of these materials reportedly contained potential cadmium-contaminated residual ash/dust from the incineration process. After 1989, a conveyor system moved scrap components from the EWI to building 9516 for storage. (AGT DPM 2006)

The EWI was also equipped with a sump that contained washdown from the gas washer cleaning operations. Wash waters were meant to be held in the sump until they were sampled (ATK 1993). Prior to approximately 1988, water collected in the sump was discharged to the ground surface. Following that time, wastewater was tested for heavy metals and either discharged to the ground surface or transported to the IWTP for processing. (AGT DPM 2006)

Contaminated Waste Processor

This facility operated in the western portion of the 9500 Area from 1985 to 1992. The CWP is composed of a processor, gas washer, cyclone, and baghouse. The processor was constructed of steel and was located inside a steel fabricated structure with a concrete floor slab. The processor included a car bottom furnace on steel runners to feed the waste material. The car bottom (basket) was rolled from under the processor, filled with the contaminated materials from the various plant processes, and rolled back under the processor. The processor furnace was a single-chamber furnace fired with No. 2 fuel oil. (AGT DPM 2006, ATK 1993)

After cooling, the baskets and cooling area were vacuum-cleaned to collect any residual ash. The flashed metal was recovered for recycling. The bottom ash from the CWP was drummed for disposal and taken to the CWP SAA. When the unit was active, the hot air from the processor was vented to the gas washer, then through the cyclone and baghouse. Particulate material removed from the air was collected in drums located beneath the units. Wastes managed at this facility included process residues from the burning of cardboard and contaminated rags (restrictive wastes). (AGT DPM 2006, ATK 1993)

On Site Laboratories

Laboratory operations at MSAAP included activities performed at the Chemical Environmental Control (CEC) Laboratory, Quality Assurance (QA) Laboratory, the Mechanical Plant Boiler Water Analysis Laboratory, the FGD Laboratory, the LAP Facility Laboratory, and the Health Clinic Laboratory (ESE 1984).

The CEC Laboratory was located in Building 9148. This laboratory performed process control chemistry monitoring of waste streams within the IWTP, the FGD system, metal plating and rinse baths, and cooling tower blowdown (AGT DMP 2006). Analyses included metals, cyanide, oil and grease, suspended solids, chemical oxygen demand, sulfate, conductance and pH. Various acids (sulfuric, nitric, and hydrochloric) and bases (sodium hydroxide) were used in the preparation of samples, analyte standards, and reagents. All sink drains in the laboratory were connected to the IWTP system. All waste from the laboratory was treated for metal removal and pH adjustment prior to being sent through the IWTP. (ESE 1984)

The QA Laboratory was located in Building 9101. This laboratory conducted specification testing of various raw materials supplied to MSAAP, including metallurgical analysis of bulk steel, aluminum, brass, and copper; analysis of lubricants and paints; and coal analysis. This laboratory also conducted various QA tests on the projectile and its components at several stages of manufacture. These tests included corrosion tests, projectile casing integrity, and calibration checks. The laboratory used a variety of cleaning and etching chemicals, including acids (hydrochloric, hydrofluoric, nitric, and acetic), bases (sodium hydroxide, ammonium hydroxide, and sodium bicarbonate), and organic solvents (acetone, methyl isobutyl ketone, benzene, formaldehyde, methyl ethyl ketone, and Freon). All sink and floor drains discharged into a sump that was equipped with a level-activated control pump. When the quantity of waste in the sump activated the pump, the waste was pumped into the IWTP system for treatment. A large etching tank which contained ammonium hydroxide solution was also located in this laboratory. (ESE 1984)

The Mechanical Plant (steam generation facility, Building 9143) housed a small bench-scale water analysis laboratory to check the chemistry of the process water used in the plant. The process water was tested every eight hours during the production years. Analyses conducted included pH, conductance, alkalinity, hardness, sulfite, and ethylenediaminetetraacetic acid (EDTA). Small quantities of dilute acids and bases were used in the analyses. Waste reagents and samples were disposed of by discharging to sink drains that were connected to the IWTP (AGT DMP 2006). A second small laboratory in Building 9143 provided limited bench-scale support to the process streams of the FGD system. These analyses included pH, alkalinity, and suspended and dissolved solids. Limited quantities of reagents were used and wastes were discharged to the IWTP. (ESE 1984)

Laboratory operations at the LAP facility (Building 9323) generated waste acetone, methanol, and Carl Fischer reagent (pyridine, iodine, ethylene glycol monoethyl ether or methanol) during moisture content testing of various materials. All chemical wastes were collected in containers and picked up by CEC personnel. Non-hazardous waste was treated by the IWTP system. Hazardous waste was disposed of at an off-site hazardous waste disposal facility by an off-site contractor. The laboratory also included an x-ray unit with an in-line cartridge-type silver recovery unit for treatment of spent developing solutions. Following treatment, the wastes were discharged to the sanitary sewer system. (ESE 1984)

The Health Clinic occupied approximately 2,120 square feet in Building 9110. The clinic consisted of waiting rooms, an x-ray room and equipment, examination rooms, an operating room, and administrative areas. Clinic wastes, including bio-medical waste, were removed in accordance with operational procedures and no bio-medical hazards were known to exist. No listed hazardous waste was stored at the clinic. (MSAAP 1990)

An industrial hygiene laboratory was located in Building 9101, Room 117 (MCI 1988). Other on site laboratories were located in Buildings 9100 and 9125 (AGT DPM 2006); however, no documentation regarding these laboratories was found during the ECP process.

<u>Vehicle Maintenance</u>

The vehicle maintenance facility provided routine servicing and overhauling of all MSAAP motor vehicles, as well as battery recharging capabilities (MSAAP EC 2006). The type of vehicles serviced ranged from motor scooters to railroad locomotives, with the majority being trucks and heavy equipment (forklifts and tractors). The facility had the capability to service 300 units per month. Reportedly, waste oil and sludges, spent solvents from degreasing operations, contaminated rags, and paint sludges generated at the facility were drummed at the point of generation and periodically transferred to the Defense Property Disposal Office (DPDO) at the Naval Air Station in Gulfport for resale. Battery servicing operations included battery charging and water addition only. Unserviceable batteries were palletized in bulk (i.e., electrolyte not drained) and transferred to the DPDO for resale. MSAAP contracted with a private off-site vendor for battery cell replacement. (ESE 1984)

3.3.3 Occupancy, Lease, and Easement History

MSAAP leases space to government and commercial tenants. A current tenant list is provided in **Table 3-2**.

TABLE 3-2
CURRENT TENANT LIST FOR MSAAP

Facility	Tenant	Activity Description	Lease Number	Date of Occupation	Lease Expiration	Square Footage Utilized
8302	Boe-Tel	IT Contractor	05T003	2005	2006	813
9101	Oologah Entech Systems Pratt Whitney Ionatron	Computer Applications Oil Field-Related Fabrication Manufacturing Rocket Motors Electronic Assembly	04T003 98T004 98T006 04T002	2005 1998 1999 2005	2006 2008 2010 2010	1,986 16,119 94,213 50,696
9110	Navy Schaefer's at Stennis	Regional Personnel Center-Administration Cafeteria Operator	N62467-06-D-5728 00T002	1998 1999	2008 2006	43,273 3,729
9112	NAVOCEANO	Training	N62467-06-D-5727	1992	2008	7,564
9115	Omni Technologies, Inc.	Navy Contractor, Electronic Assembly	05T001	2005	2006	2,400
9121	Planning Systems, Inc.	Navy Computer Application; Technology Company	02T003	1995	2007	11,325
9134	NAVOCEANO	Warehousing	N62467-06-D-5727	1992	2008	137,073
9158	CSC	Records Storage	05T002	2006	2007	4,000
9165	NAVOCEANO	Equipment Handling & Maintenance	N62467-06-D-5727	1992	2008	4,000
9166	Power Dynamics	Design & Repair of Hydraulic Systems	96T007	1994	2009	33,504
9312	Naval Small Craft Instruction and Technical Training School (NAVSCIATTS)	Training for Foreign Nationals	N62467-06-D-5730	1999	2008	5,402
9322, 9307	NAVOCEANO	Navy Project	N62467-06-D-5727	1997	2008	72,952
9353	JKS International	Fabrication of Flexible Liquid Storage Tanks	04T001	1997	2006	12,856
9355	Department of Energy (DOE)	Equipment Storage	DE-RL96-04PO92407	2004	2009	61,396
9502, 9503, 9504, 9517, 9518, 9519	Navy Special Boat Team – 22 (SBT22)	Maintenance, Supply, and Administration	N62467-06-D-5729	1998	2007	3,630
9601, 9605, 9607, 9609, 9611, 9613, 9615, 9617, 9619, 9635	NAVOCEANO	Computer Media Storage, Support	N62467-06-D-5727	2001	2008	22,846

TABLE 3-2
CURRENT TENANT LIST FOR MSAAP

Facility	Tenant	Activity Description	Lease Number	Date of Occupation	Lease Expiration	Square Footage Utilized
9604	NAVOCEANO	Warehousing	Unknown	Unknown	Unknown	2,785
9606	Graebel	Household Goods Storage	96T002	1998	2006	2,785
9614, 9616, 9618, 9620	SBT22	Supply Storage	N62467-06-D-5729	1998	2007	11,140
9100[1]	JWM[1]	Welding and Fabrication[1]	Unknown	1992[1]	Unknown	Unknown
9100[1]	Accurate Machinery[1]	Precision Parts Machining[1]	Unknown	Unknown	Unknown	Unknown
9100[1]	AMTECH[1]	Small Caliber Ammunition Manufacturing[1]	Unknown	1998[1]	2000[1]	Unknown
9355[1]	VersaTech[1]	High-Speed Production Equipment Manufacturing [1]	Unknown	1995[1]	1998[1]	Unknown
9100[1]	TechForm Metals[1]	Metal Parts Stamping[1]	Unknown	1999[1]	2002[1]	Unknown
9313[1]	MsET[1]	Small Assembly[1]	Unknown	Unknown	Unknown	Unknown
9516[1]	Coastal Precision Machinery[1]	Precision Machine Shop[1]	Unknown	1996[1]	2004[1]	Unknown
9501[1]	Coastal Precision Machinery[1]	Business Office[1]	Unknown	1996[1]	2004[1]	Unknown
9114[1]	Coastal Marine[1]	Marine Industry Fabrication/Machine Shop[1]	Unknown	1999[1]	2004[1]	Unknown
9114[1]	SEAREX[1]	Marine Industry Fabrication Machine Shop[1]	Unknown	mid-1990s[1]	late-1990s[1]	Unknown
9145[1]	SBT22[1]	Supply Warehousing[1]	Unknown	Unknown	Unknown	Unknown
9158[1]	NAVSCIATTS[1]	Boat and Outboard Motor Service and Repair Training[1]	Unknown	1998[1]	2002[1]	Unknown
8302[1]	USACE[1]	Resident Forester Office[1]	Unknown	1990[1]	2002[1]	Unknown
9115[1]	NAVOCEANO[1]	Electronic Board Repair Shop[1]	Unknown	mid-1990s[1]	2003[1]	Unknown

[1]Information based on interview; no lease documentation available.
Source: AGT DPM 2006, MSAAP BTC 2006

3.3.4 Range Operations

There are no active ranges at MSAAP. Two closed/inactive ranges, the Old Kellar Test Range and the Spin Launch Site, are being managed under the Military Munitions Response Program (MMRP) (MSAAP 2006). These MMRP sites are discussed in **Section 4.2.2**.

The Old Kellar Test Range was active from 1969 until 1980 in an area north of Kellar Road and generally east of Andrew Jackson Road (**Figure B-9**). When MSAAP was established, testing operations were moved to the Hazards Test Range, also known as the EMTF, an area east of the Old Kellar Test Range and Main Line Road (NASA 2000). This test range, while within the MSAAP boundary, was not used by MSAAP as part of their mission. In 1989, the irrevocable permit between the Army and NASA concerning the MSAAP property was amended. The amendment returned 1,808 acres to NASA, including the EMTF site (USACE 2002). The EMTF is outside the MSAAP footprint, and no EMTF testing occurred on current MSAAP property. NASA has completed a number of investigations at the Old Kellar Test Range to further characterize the site and determine cleanup options and costs, and has installed fencing around range areas where buried metallic objects were discovered (NASA 2005). These investigations and the testing activities that took place at Old Kellar Test Range are described in **Section 4.2.2**.

A 1995 Archive Search Report of the Former Hancock Bombing and Gunnery Range (USACE 1995) found two targets partially located on MSAAP. The west quarter of the West Bomb Target, including the West Bomb Target Safety Zone, is located along MSAAP's eastern boundary west of Main Line Road. The north half of the High Altitude Bomb Target is located between MSAAP's southern boundary and the Spin Launch Site (**Figure B-15**).

While the Archive Search Report identified all historic range areas, it only evaluated those areas eligible for the FUDS program. Portions of the target sites on MSAAP were not evaluated as the land they are on is under DOD control, and therefore are not FUDS eligible. The evaluation results for the adjoining portions of the sites outside the MSAAP boundary are described below. No additional documentation related to these sites was identified. **Table 3-3** provides a list of the ranges that were operated by MSAAP or were on MSAAP property.

TABLE 3-3
MSAAP RANGES

Range	Status	Acreage	Current Use	Historic Use
Old Kellar Test Range	Closed	54	Inactive	Testing of explosives, propellants, and pyrotechnics from 1969 until August 1980
Spin Launch Site	Closed	63	Inactive	Explosive quality assurance testing of the M42 and M46 grenades
EMTF	Closed	200	Inactive – site returned to NASA in 1989	Testing of explosives, propellants, and pyrotechnics

TABLE 3-3 MSAAP RANGES				
Range	**Status**	**Acreage**	**Current Use**	**Historic Use**
Former Hancock Bombing and Gunnery Range (portions of two targets and one safety zone)	Closed	245 (total)	Inactive	Test range for strafing, inert bomblets, rockets (types of ordnance used unavailable)

Area D, High Altitude Bomb Target

The bull's-eye portion of the target (Area D-1) is on SSC property. Several buildings have been built within the area and there were no reports of munitions and explosives of concern (MEC) being found during construction. This area was considered potentially contaminated because documentation indicated a target was located within the area. The portion of this area on MSAAP (Area D-2, 231 acres) was not evaluated as it was not FUDS eligible (USACE 1995).

Area E, West Bomb Target

This area was littered with the remains of 100 pound practice bombs and the residue of numerous types of ordnance that were tested on the range during the 1980s. The area has been the subject of several decontamination efforts in the past, but is considered to be contaminated. The portion of this area on MSAAP (Area E-2, 13 acres) was not evaluated as it was not FUDS eligible (USACE 1995).

Area F, West Bomb Target Safety Zone

No MEC was found in the area perimeter, but the potential for MEC presence exists within this safety zone due to potential performance and/or targeting errors during testing. Therefore, this area is considered potentially contaminated. The portion of this area on MSAAP (Area F-2, 100 acres) was not evaluated as it was not FUDS eligible (USACE 1995).

3.4 INSTALLATION UTILITIES (HISTORIC AND CURRENT)

3.4.1 Water Systems

A total of 10 known groundwater wells have been installed at MSAAP. Potable, process, and fire-suppression water at MSAAP are primarily provided via two groundwater wells installed approximately 600 to 700 feet below ground surface (bgs) in the Catahoula aquifer. The wells are permitted by the MDEQ as MS-GW-02614 and MS-GW-02615 and have permissible extraction rates of 1,500 gallons of water per minute (USASMDC 1999). The wells are identified as Facilities 9123 and 9124, respectively. The MSAAP water supply system is a non-community, non-transient system registered by MDEQ as Drinking Water System 230052 (Army 1990).

Groundwater extracted from the primary MSAAP production wells (Facilities 9123 and 9124) is chlorinated at each extraction point prior to distribution (Army 1990, AGT DPM 2006). Water storage is provided via a 250,000-gallon water storage tank identified as Facility 9128.

Additional potable water wells are installed at the Block and Brace Building (Building 9138), Building 9115, and the EMTF (ESE 1984). The Block and Brace well is installed to a depth of 640 feet bgs and is identified as Facility 9175. The well installed at Building 9115 is installed to an approximate depth of 100 feet bgs and is identified as Facility 9766 (MTI 2004). The shallow well installed at the EMTF has not been assigned an MSAAP facility number.

Two non-potable water supply wells have been installed at the Igloo Storage Area (Facility 9635). One well is installed to a depth of approximately 620 feet bgs and supports ongoing Navy operations at the facility (MTI 2002, NAVOCEANO ESHO 2006). The other well is installed to an approximate depth of 600 feet bgs (MTI 2004). Both are used for supplying irrigation water. One additional non-potable water well is located at the MSAAP Landfill (Facility 9651) and is installed to a depth of approximately 100 feet bgs (MTI 2002).

Four additional shallow wells are reportedly located at the EMTF, former MTI Grounds and Storage Yard (Facility 9119), Shorty's Bar, and Shorty's Residence (Facility 8302). Additional information regarding these was not available for review. Reportedly, other wells existed in the former towns that were displaced when NASA acquired the area, but no exact locations are available (ESE 1984).

3.4.2 Industrial and Sanitary Sewers and Treatment Plants

3.4.2.1 Sanitary Wastewater Treatment Plant

The MSAAP sanitary wastewater collection system consists of 3-inch to 12-inch diameter sewer lines that run throughout the site. The sewer lines are connected to a series of five lift stations that ultimately terminate at the sanitary wastewater treatment plant (SWTP). The SWTP consists of three extended-aeration treatment units with capacities of 20,000, 50,000, and 80,000 gallons. The units can be operated independently or in parallel, depending upon the waste generation rates (ESE 1984). During MSAAP operation, the 80,000-gallon treatment cell was utilized to meet waste-processing needs. At the present time, sanitary wastes are processed through the 50,000-gallon cell, which is adequate to meet the facility's waste treatment demands of approximately 35,000 gallons per day (USASMDC 1999, AGT DPM 2006).

Wastewater entering the SWTP for processing through the 20,000-gallon unit is placed directly into the unit's aeration tank. Wastewater to be processed through the 50,000-gallon or 80,000-gallon units is directed through a 30,000-gallon surge tank prior to placement into the respective unit's aeration tank. In additional to extended aeration, wastewater is processed through a clarifier, post-aeration tank, and ultraviolet (UV) treatment prior to discharge (ESE 1984, USAEHA 1988a). Wastewater was originally processed through a chlorination chamber. The UV treatment process has eliminated the need for wastewater chlorination (AGT DPM 2006). Treated wastewater from the SWTP is discharged to NPDES Outfall Number 002 (MDEQ 2006a).

3.4.2.2 Industrial Wastewater Treatment Plant

MSAAP has an on site IWTP designed with a maximum peak daily outflow of 275,000 gallons of water per day and total system capacity of 13 million gallons. The IWTP was brought online in June 1983 (MCI 1984). The IWTP was utilized to process munitions-production related wastes until 1992 when production operations at MSAAP were discontinued. Since that time, the IWTP has been maintained in a ready status to treat rainwater accumulated within the IWTP holding tanks, miscellaneous oily waste streams, and boiler blowdown (AGT DPM 2006). Treated wastewater from the IWTP is discharged under NPDES permit number MS0040797 to NPDES Outfall Number 001 (MDEQ 2006a). The IWTP was identified as Solid Waste Management Unit (SWMU) 8 in a 1993 RFA (ATK 1993).

The IWTP was designed for physical-chemical processes, including: precipitation; clarification and filtration for heavy metal removal; gravity separation for oil, grease, and suspended solid removal; and carbon adsorption for detergent removal (MCI 1984). Influent wastewater was generated from the following areas: PMPT, CMPT, mechanical plant, coal pile, and miscellaneous processes (ESE 1984). A summary of historical IWTP waste streams is presented in **Table 3-4**.

TABLE 3-4
SUMMARY OF HISTORICAL IWTP WASTE STREAMS

Waste Type	Source
Alkaline waste-batch	PMPT and CMPT facilities
Acid waste-batch	PMPT and CMPT facilities
Soluble coolant batch	PMPT and CMPT facilities
Nondetergent oily wastes-continuous	PMPT and CMPT facilities, Building 9114
Acid/alkali rinse-continuous	PMPT and CMPT facilities, mechanical plant
Chromium rinse-continuous	PMPT and CMPT facilities
Containerized wastes-batch	PMPT and CMPT facilities
Boiler blowdown	Mechanical plant, Building 9114

Source: USACE 1990

The transmission system for industrial wastes consists of a series of sumps installed within production and support buildings and overhead piping routed across the site (ESE 1984, USACE 1990). During munitions production, industrial wastes were transferred through building infrastructure to blind sumps. The accumulated wastes were then pumped, through the overhead piping, to the IWTP for processing.

Wastewater generated in the LAP area that potentially contained explosive residues was treated separately by carbon-filter columns specifically designed for explosive-contaminated wastewater (USACE 1990). Explosive-contaminated wastewater that was treated through MSAAP's portable carbon treatment system was transported to the IWTP prior to discharge. LAP area wastewaters treated through the carbon wastewater treatment facility (Building 9348) were discharged directly to the MSAAP drainage canal system.

The overhead piping utilized to transfer wastewaters to the IWTP was flushed with clean water following the cessation of production activities. However, confirmation sampling was not completed to verify that all residual wastes were flushed from the piping system. The fiberglass piping utilized to transfer wastes to the IWTP was susceptible to ruptures caused by the freezing of liquid wastes during periods of cold weather (USAEHA 1987a, AGT DPM 2006). Numerous releases of contaminated wastewater to the ground surfaces beneath the overhead pipe racks across MSAAP were reported. (AGT DPM 2006)

Permissible NPDES discharge parameters and concentrations have been amended periodically throughout the operational lifecycle of the IWTP. **Table 3-5** provides a summary of the discharge parameter monitoring under the current NPDES permit. The active permit is effective through 30 September 2010 (MDEQ 2006a).

TABLE 3-5
IWTP DISCHARGE PARAMETERS

Parameter	Discharge Limitations			
	Concentration/ Quality Minimum	Concentration/ Quality Average	Concentration/ Quality Maximum	Concentration/ Quality Units
Aluminum (total recoverable)	None	Report Monthly Average	0.750	Milligrams per Liter (mg/L)
Ammonia nitrogen total (as nitrogen)	None	2	3	mg/L
Copper (total recoverable)	None	0.078	0.135	mg/L
Lead (total recoverable)	None	0.021	0.533	mg/L
Oil and grease	None	10	15	mg/L
Oxygen, dissolved	6.0	None	None	mg/L
pH	6.0	None	9.0	Standard unit
Solids (total suspended)	None	30	45	mg/L
Zinc (total recoverable)	None	1.14	1.14	mg/L

Note: Minimum, average, and maximum discharge limitations are per month.

Numerous spills have occurred at the IWTP (AGT DPM 2006). The majority of the spills were reportedly sufficiently small as to be remediated by MSAAP staff and did not require notification of MDEQ or USEPA. Spills within the bermed areas north of the IWTP control building were typically contained by the concrete secondary containment structure; however, spills occurring in the un-bermed areas south of the control building may have impacted subsurface soils and groundwater.

In 1985, approximately 13,000 gallons of chromium-contaminated rinse water were released to the subsurface at the IWTP due to the failure of a valve at Tank 451 (NASA OMD 2006, MSAAP EC 2006). Subsequent remedial activities included the installation of groundwater extraction and monitoring wells to recover chromium-contaminated groundwater and reduce detected chromium concentrations in groundwater to below 0.05 mg/L. Groundwater monitoring data suggested that remedial activities were completed; however, MDEQ provided no documentation confirming that the remedial objectives had been met. Documentation related to the 1985 chromium release at the IWTP, and subsequent remedial actions, is included in **Appendix G**.

EarthCon prepared a closure plan in 2004 that describes the required decontamination activities and estimated costs associated with the decommissioning of the IWTP. A copy of the IWTP closure plan is included in **Appendix H**. The closure plan was reviewed by the MDEQ; however, the plan was not approved as it did not meet the requirements of MDEQ NPDES regulations. Specifically, while the closure plan states how the closure of the IWTP will be completed, the plan does not state when the IWTP is to be decommissioned. MDEQ regulations require that the closure plan be resubmitted for department review no less than 90 days prior to the beginning of abandonment activities at the IWTP (EarthCon 2004, MDEQ 2004).

3.4.3 Stormwater System

Surface waters from built-up portions of MSAAP drain primarily through two tributaries of the Pearl River: Turtleskin Creek and Mikes River. Non-built-up areas of the site are principally drained through two tributaries of the Jourdan River: Wolf Branch and Lion Branch (ESE 1984, USAEHA 1988a, USACE 1990).

Stormwater is largely transported from MSAAP through a series of vegetated drainage canals located throughout the site (MSAAP EC 2006). Surface waters are directed to the canals via overland flow or through underground storm sewer piping. The canals are typically between 5 and 20 feet deep with approximately 10-foot wide bases. Runoff from the canals is directed to either Turtleskin Creek or through an unnamed tributary to Mikes River. The runoff eventually drains to the southern branch of the Pearl River (USACE 1990). The MSAAP stormwater sewer system is identified as SWMU 24 in the MSAAP RFA (ATK 1993).

Stormwater discharges at MSAAP are permitted through MDEQ Baseline Stormwater General NPDES permit number MSR110012. The current permit was issued on 7 July 2006 and expires on 30 September 2010 (MDEQ 2006a). MSAAP is required to submit annual inspection reports to the MDEQ in accordance with applicable stormwater discharge regulations. A copy of the current MSAAP Stormwater Pollution Prevention Plan (SWPPP) was not available for review; however, a historical MSAAP SWPPP dated November 2001 (MTI 2001) was reviewed.

3.4.4 Electrical System

MSAAP's main electrical substation is located southeast of Building 9101. Electrical service is provided via two 13.8 kilovolt (kV) service lines originating on SSC property and is purchased through the Mississippi Power Company (NASA OMD 2006). An emergency load-sharing agreement is in effect between MSAAP and NASA (AGT OM 2006).

MSAAP's electricity is transmitted via Army-owned transmission lines at 13.8 kV service voltage. Electrical distribution is through 18 2,000-kilovolt-amps electrical substations located across MSAAP. End use of electricity is provided at 480 volts (v), 220v, and 110v (AGT OM 2006, USASMDC 1999).

3.4.5 Natural Gas

MSAAP uses natural gas for the generation of process and building heat steam. Natural gas is purchased from Reliant Energy through a direct government contract (AGT DPM 2006).

3.5 ENVIRONMENTAL SETTING - NATURAL AND PHYSICAL ENVIRONMENT

3.5.1 Climate

The characteristic climate at MSAAP is humid subtropical. The mean annual temperature is approximately 65.6°F, with a mean low of 52°F in January and a mean high of 82°F in July. Average rainfall is 58.5 inches, with July and August being the wettest months and October and November being the driest (USAEHA 1990). Monthly weather parameters collected by the U.S. Weather Service for Slidell, Louisiana are shown in **Table 3-6**.

TABLE 3-6
SUMMARY OF SLIDELL, LOUISIANA CLIMATE DATA

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average High	61°F	64°F	71°F	77°F	84°F	89°F	91°F	91°F	88°F	80°F	71°F	64°F
Average Low	40°F	43°F	50°F	56°F	65°F	71°F	73°F	72°F	68°F	57°F	49°F	42°F
Mean	51°F	54°F	61°F	67°F	74°F	80°F	82°F	82°F	78°F	69°F	60°F	53°F
Average Precipitation	6.42 inches	5.03 inches	5.94 inches	4.76 inches	5.76 inches	4.27 inches	6.55 inches	5.85 inches	5.16 inches	3.10 inches	5.13 inches	4.69 inches
Record High	81°F (1972)	86°F (1957)	89°F (1963)	92°F (1987)	95°F (2002)	104°F (1964)	102°F (1986)	103°F (1970)	99°F (1989)	94°F (1963)	90°F (1965)	86°F (1961)
Record Low	8°F (1985)	15°F (1996)	22°F (1980)	32°F (1987)	42°F (2004)	50°F (1984)	57°F (1967)	58°F (2004)	42°F (1967)	31°F (1993)	24°F (1976)	9°F (1989)

3.5.2 Topography

MSAAP is located on the lower Gulf Coastal Plain between Picayune and St. Louis Bay in Hancock County, Mississippi. The landward edge of the Coastal Plain forms a boundary between elevated and dissected uplands and relatively low and undissected seaward-sloping plains (USAEHA 1990).

The terrain of the lower Gulf Coastal Plain is low-lying and generally level. Elevations on MSAAP range from approximately 10 feet above mean sea level (msl) in the southern portion of the site to approximately 33 feet above msl along the northern portion (USAEHA 1990).

MSAAP consists of forested and non-forested lowlands and wetlands. Pine flatwoods cover most of the central, northern, and southeastern portions of MSAAP. The installation is drained by several streams (USAEHA 1990).

3.5.3 Surface Water Hydrology

MSAAP occupies the Pearl and Jourdan River drainage basins. Each river system drains approximately 50 percent of the site (**Figure B-10**). Two tributaries of the Pearl River, Turtleskin Creek and Mikes River, drain the western half of MSAAP. Wolf Branch and Lion Branch, which are tributaries of the Jourdan River, drain the eastern half of MSAAP (USAEHA 1990).

Turtleskin Creek drains the northwestern corner of the site before flowing off-post into Mikes River. A westerly flowing unnamed tributary drains the southwestern portion of MSAAP and also flows off-post into Mikes River. After confluence with these two tributaries, Mikes River flows in a southerly direction for roughly 1.5 miles before emptying into the Pearl River. The Pearl River then flows south and discharges to the Gulf of Mexico.

The Jourdan River is formed by the confluence of Dead Tiger Creek and Catahoula Creek in the northeast portion of MSAAP and the SSC buffer zone. Two intermittent streams, Wolf and Lion Branches, flow toward the east in a parallel manner before emptying into Dead Tiger Creek and Catahoula Creek, respectively. The Jourdan River empties into St. Louis Bay approximately 15 miles southeast of the confluence of the tributaries.

Several drainage canals divert stormwaters into Turtleskin Creek in the northwestern portion and into an unnamed tributary in the southwestern portion of the site. Except for flooded, inactive gravel pits along the western boundary, no lakes or large ponds occur on the site.

3.5.4 Geology

Three major soil associations ranging in thickness from a trace to 60 inches are present on MSAAP (**Figure B-11**). The Atmore-Beauregard-Escambia Association covers approximately 30 percent of MSAAP; the Atmore-Smithton-Escambia Association covers approximately 60 percent of MSAAP; while the Arkabutla-Rosebloom Association covers approximately 10 percent of MSAAP (SCS 1981).

The Atmore-Beauregard-Escambia Soil Association is nearly level to gently sloping on broad, wet upland flats and low ridges. The soils of this association are moderately well drained to poorly drained silty soi1s. The Atmore-Smithton-Escambia Association is a nearly level to gently sloping association occurring on broad, wet upland flats, drainageways, and low upland ridges. The association is made of poorly drained to somewhat poorly drained silty and loamy soils. The Arkabutla-Rosebloom Association is nearly level to gently sloping and occurs on broad flood plains. The association consists of poorly drained to somewhat poorly drained silty soils.

Beneath the surface soil deposits, MSAAP is underlain by approximately 3,000 feet of unconsolidated alluvial (delta) sediments consisting of interbedded sand, silt, and clay (**Figure B-12**). The stratigraphic units at MSAAP, from oldest to youngest, are Catahoula, Hattiesburg, Pascagoula, Graham, Ferry, and Citronelle. The alluvium is underlain by salt domes in some areas. (USAEHA 1990)

The Catahoula Formation consists of sandstone, sand, and gravel beds interlayered with clays. The sand and gravel beds thicken toward the Gulf of Mexico. The Hattiesburg Formation is nearly indistinguishable from the underlying Catahoula Formation and overlying Pascagoula Formation at MSAAP. These stratigraphic units are Miocene in age. The Graham Ferry Formation consists of interbedded sands and clays. The Citronella Formation covers most of the surface in Hancock County, Mississippi, although the Citronelle can be missing due to erosion or it may underlie terrace deposits. The Citronelle, approximately 100 feet thick, consists of coarse-grained sand, gravel, and highly colored clays. (USAEHA 1990)

The aquifers underlying MSAAP are the Catahoula, Hattiesburg, Pascagoula, Graham Ferry, and Citronelle. Most of these aquifers are capable of supplying large volumes of water to wells in Hancock County. The base of the freshwater at MSAAP is approximately 3,000 feet below sea level. These aquifers are confined artesian systems, many having a hydraulic head above land surface. However, in areas of excessive pumping, the heads are declining (Mississippi Bureau of Geology 1944). The direction of groundwater flow is south-southwest, depending upon the slope of' the water-bearing bed. (USAEHA 1990)

3.5.5 Demography and Land Use

Much of the current land use in the region of the MSAAP is devoted to farming and the processing of forest products. In adjacent counties, more than 41 percent of the land is used for crop production, orchards, pastures, or forest. NASA is the dominant land user of the area and owns approximately 13,500 acres. NASA-controlled land occupies almost 36 percent of Hancock County. In addition, NASA also holds a restrictive lease that prohibits construction of any habitable structures on privately owned lands encircling SSC for a distance of approximately five miles from the property line. SSC’s engine test facility, MSAAP, and several Navy and other U.S. government agency functions are located within NASA property.

The MSAAP natural resources management plan (NRMP) (USACE 1998) provides the following land use categories and acreages for the installation:

- Building and structures: 37 acres
- Rock gravel areas for dust control: 162 acres
- Pavement and railroads: 100 acres
- Mowed lawns: 51 acres
- Ranges, open areas, etc.: 98 acres

- Non-merchantable forest land: 155 acres
- Commercial forest land: 3,628 acres

As stated earlier, 123 acres of easements was transferred back to NASA in 2002. This transfer is not reflected in the acreages listed above.

3.6 BIOLOGICAL AND CULTURAL RESOURCES SUMMARY

3.6.1 Biological Resources

MSAAP has been operating under the existing NRMP since 1998, requesting and receiving extensions as necessary (USACE RF 2006). SSC is currently updating their integrated NRMP, which will include the area within MSAAP (NASA NRM 2006).

3.6.1.1 Flora

MSAAP is located within the Lower Coastal Plain and the plant communities are typical for those associated with Slash Pine forests (USACE 1998). Five major plant community types were identified within and around the MSAAP site during the 1999 to 2000 survey conducted by Tetra Tech, Inc. These community types are: pine plantation/savanna, mixed pine/hardwood, bottomland hardwood, pitcher plant bogs and savannas, and open fields/grasslands (Tetra Tech 2002). The following paragraphs discuss the communities in more detail.

Pine forest communities (predominantly slash pine plantation) account for the majority of the vegetation in the uncleared portions of MSAAP. The dominant species in these communities are slash pine (*Pinus elliottii*) interspersed with some cypress (*Taxodium distichum and T. ascendens*), loblolly pine (*Pinus taeda*), black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), and sweet gum (*Liquidambar stryrciflua*). Underbrush in these communities includes gallberry (*Ilex spp*.), wax myrtle (*Myrica spp.*), huckleberries (*Vaccinium spp*.), grasses and cane (*Arundinaria gigantea*). (Tetra Tech 2002)

Bottomland hardwood communities, such as those found along the Turtleskin Creek and Lion Branch drainages and other low lying areas throughout MSAAP, occur in low, poorly drained soils that may have standing or slowly moving water. The dominant species in these communities are black gum (*Nyssa sylvatica var. bifora*), red maple, laurel and water oak (*Quercus laurifolia and Q. nigra*), pond and bald cypress, and occasionally tupelo gum (*Nyssa aquatica*). The underbrush includes ash species (*Fraxinus spp*.), dogwood (*Cornus florida*), white titi (*Cyrilla racemiflora)*, Virginia willow (*Itea virginica*), poison ivy (*Rhus radicans)*, swamp azaleas (*Rhododendron spp*.), yellow Jessamine (*Gelsimium sempervirens*), and grapes (wild muscadine, *Vitis rotundifloia* and *V. angustifolia*). Very few grass or forb species occur in these communities. (Tetra Tech 2002)

Pitcher plant bogs are unique to the coastal plain of the southeastern United Sates and occur in low-lying, poorly drained areas with acidic soil. The few mature trees, if any are present, are generally cypress species and sparse slash pine. These communities occur where the area is burned regularly, which prevents transition to forest or bottomland hardwood communities. The dominant herbaceous species in the bogs include orchids, sundews (*Drosera spp*.), pitcher plants (*Sarracenia alata* and *S. Psittasina*), pipeworts (*Eriocaulon spp*.), and yellow-eyed grass (*Xyris spp*.). (Tetra Tech 2002)

Grasslands often occur in disturbed areas where the land has been cleared for construction or burned. The most common grass species in the MSAAP area include broomsedges (*Andropogon spp*.) and panic grasses (*Panicum spp*.). Other plants occurring in grasslands communities include rushes and cane. In low areas, pipeworts, milkworts (*Polygala spp*.), and sedges may occur; while in drier grasslands, throughworts (*Eupatorium spp*.) rabbit tobacco (*Gnapthalium spp*.), and goldenrod (*Solidago spp*.) may be found. (Tetra Tech 2002)

The forest management program includes specific instructions for prescription mapping, prescribed burning, timber harvest, and forest regeneration methods (USACE 1997). Commercial forest land comprises approximately 85 percent of the MSAAP acreage (USACE 1998). Commercial timber types include southern pine pulpwood and sawlogs and limited quantities of hardwood pulpwood (USACE 1997). The primary management method at MSAAP is an even-aged system for pine and hardwood. Fully stocked stands receive intermediate harvests until the rotation age of 60 is reached. Annual harvests are made primarily to thin, young, overstocked stands. Cutting for timber occurs every 5 to 20 years depending on the age and quality of the stand (USACE 1998). A new timber inventory is currently being completed by SSC (USACE RF 2006, NASA NRM 2006).

Hurricane Katrina, a Category 4 hurricane, moved across the Louisiana, Mississippi, and Alabama gulf coasts on 29 August 2005. MSAAP was included in the impacted area. Although no official damage assessment survey has been completed, it is estimated that 10 to 20 percent of the timber resource was lost. This loss would defer some timber harvesting further into the future as stands recover, but it would expedite some regeneration harvests of under stocked stands. The lack of a current integrated NRMP could impact future harvesting and stand recovery (USACE RF 2006). SSC is currently completing a damage assessment that will include the MSAAP property (NASA NRM 2006).

3.6.1.2 Fauna

The diverse terrestrial habitats at MSAAP and the surrounding areas of SSC support a diverse population of wildlife. Ecological surveys were conducted approximately every 3 years from 1988 through 1995. The results of these can be found in the *Planning Level For Fauna, Flora, and Vegetative Communities, Mississippi Army Ammunition Plant* (Tetra Tech 2002). The most recent survey was conducted between 1999 and 2000 (Tetra Tech 2002). The results of this survey are presented below.

<u>Mammals</u>: Twenty-two species of mammals were identified during the survey. These species included the coyote (*Canis latrans*), beaver (*Castor canadensis*), bobcat (*Lynx rufus*), striped skunk (*Mephitis mephitis*), whitetail deer (*Odocoileus virginianus*), common raccoon (*Procyon lotor*), eastern fox squirrel (*Sciurus niger*), eastern cottontail rabbit (*Sylvilagus aquaticus*), feral pig (*Sus scrofa*), and red fox (*Vulpes fulva*).

Birds: The bird survey's primary goals were to produce a list of species found on MSAAP and develop a site-wide index of breeding bird activity. The breeding bird survey was conducted during May 2000. Ninety-five species of birds were recorded during the survey. These species included the following common permanent residents: little blue heron (*Egretta caerulea*), turkey vulture (*Cathartes aura*), Cooper's hawk (*Accipiter cooperii*), northern bobwhite (*Colinus virginianus*), pileated woodpecker (*Dryocopus pileatus*), red-bellied woodpecker (*Melanerpes carolina*), downy woodpecker (*Picoides pubescens*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), Carolina wren (*Thyrothorus ludovici*anus), brown thrasher (*Toxostoma rufum*), eastern bluebird (*Sialia sialis*), pine warbler (*Dendroica pinus*), eastern meadowlark (*Sternella magna*), northern cardinal (*Cardinalis cardinalis*), and rufous-sided towhee (*Pipilo erthyrophthalmus*).

Common spring/summer resident species include the yellow-billed cuckoo (*Coccyzus americanus*), chimney swift (*Chaetura pelagica*), eastern kingbird (*Tyrannus tyrannus*), great-crested flycatcher (*Myiarchus crinitus*), northern rough-winged swallow (*Stelgydopterix serripennis*), purple martin (*Progne subis*), yellow-breasted chat (*Icteria virens*), and summer tanager (*Piranga rubra*). Common winter residents include the American robin (*Turdus mirgratorius*), ruby-crowned kinglet (*Regulus calendula*), yellow-rumped warbler (*Dendroica coronata*), dark-eyed junco (*Junco hymalis*), chipping sparrow (*Spizella passerine*), and swamp sparrow (*Melispiza Georgiana*).

Fish: The 1999 to 2000 fish survey was the first survey targeting fish for MSAAP since the environmental impact statement (EIS) for the construction of MSAAP (Tetra Tech 2002). Twenty-five species of fish were identified during the survey. Abundant species included the largemouth bass (*Micropterus salmoides*), bayou topminnow (*Fundulus notti*), golden topminnow (*Fundulus chrysotus*), mosquitofish (*Gambusia affinis*), banded pygmy sunfish (*Elassoma zonatum*), dollar sunfish (*Lepomis marginatus*), and least killifish (*Heterandria formosa*).

Reptiles and Amphibians: Twenty reptile species and 17 amphibian species were identified on MSAAP during the 1999 to 2000 survey. Reptiles occurring on MSAAP include the eastern mud turtle (*Kinosternon subrubrum*), eastern river cooter (*Pseudemys concinna*), eastern box turtle (*Terrapene Carolina*), red-eared slider (*Trachemys scripta*), green anole (*Anolis carolinensis*), fence lizard (*Sceloporus undulates*), ground skink (*Scincella lateralis*), cottonmouth (*Agkistrodon piscivorus*), eastern racer (*Coluber constrictor*), corn snake (*Elaphe guttata*), and the common kingsnake (*Lampropeltis getula*). Amphibians occurring on MSAAP include the mole salamander (*Ambystoma talpoideum*), two-toed amphiuma (*Amphiuma means*), cricket frogs (*Acris spp*.), southern toad (*Bufo terrestris*), treefrogs (*Hyla spp.*), bull frog (*Rana catesbeiana*), and southern leopard frog (*Rana sphenocephala*).

3.6.1.3 Protected Species

Five federal listed threatened or endangered animal species and one federal listed threatened or endangered plant species have historically been found in the proximity of SSC (USFWS 1999). These species include:

- Gopher tortoise (*Gopherus polyphemus*)
- Eastern indigo snake (*Drymarchon corais couperii*)
- Red-cockaded woodpecker (*Picoides borealis*)
- American peregrine falcon (*Falco peregrinus*)
- Louisiana black bear (*Ursus americanus luteolus*)
- Louisiana quillwort (*Isoletes louisianensis*)

Surveys for the gopher tortoise and eastern indigo snake were conducted on or adjacent to SSC in 1988 and annually from 1991 through 1997 (USFWS 1999). In 1994, only one gopher tortoise burrow was found. Surveys for the red-cockaded woodpecker and peregrine falcon were conducted in 1991 and 1994. Neither the birds nor the nesting habitat for the red-cockaded woodpecker were found. In 1995, a survey conducted for the Louisiana black bear found no bears in the area.

In 1998, a survey was conducted on SSC for the five federal threatened or endangered listed animal species shown above. None of these species were found during the survey nor were any indications of current occurrence noted during the survey (Keiser and Lago 1998).

No federally threatened or endangered species were found on MSAAP during the 1999 to 2000 surveys, although the ringed map turtle and gopher tortoise have been observed on SSC (Tetra Tech 2002). Additionally, although the Louisiana black bear is not currently using MSAAP, the species has used the area in the recent past. Therefore, MSAAP should be considered part of the recovery range for this species (Tetra Tech 2002).

Additionally, the Mississippi Natural History Inventory was searched for state-listed species within Hancock County. None of the 34 “species of special concern” listed for Hancock County was identified at MSAAP during a 2002 planning level survey (Tetra Tech 2002).

No threatened or endangered species surveys have been completed since the 1998-1999 surveys. However, there are plans to complete a survey for threatened or endangered species on both MSAAP and SSC by the end of 2007 (USACE RF 2006, NASA NRM 2006).

3.6.1.4 Wetlands

MSAAP lies between the East Pearl River and Jourdan River watersheds. Some intermittent streams flow south to Devil’s Swamp. Other streams such as Lion Branch, Double Bay and Wolf Branch flow east to Catahoula Creek. The dominant soil types (Atmore silt loam, Guyton silt loam, Smithton fine sandy loam and Escambia loam) have all been classified as hydric soils by the Soil Conservation Service (SCS) (USACE 1998).

A wetland inventory of MSAAP was completed by the USFWS in 1999 (USFWS 2000). In total, MSAAP contains approximately 2,422 acres of wetland habitat, which is approximately 57 percent of the facility’s total land area. Six different wetlands types were identified during the survey: palustrine forested wetlands, palustrine forested/scrub-shrub, palustrine scrub-shrub, palustrine emergent wetland, palustrine emergent/scrub-shrub wetland, and palustrine unconsolidated bottom. Palustrine forested wetlands represent approximately 76 percent of the identified wetlands. The predominant tree species were slash and loblolly pine. Mixed wetlands of trees and shrubs were also common (palustrine forested/scrub shrub). Linear wetlands totaled 14 miles, including rivers and streams. (USFWS 2000)

It is important to note that the above report was an inventory of wetland habitat on MSAAP and not wetland delineation. Therefore, the actual number of acres of wetlands reported in the inventory could be off by hundreds of acres (USACE RF 2006). Additionally, although no formal delineation has been done, most of MSAAP's wetlands would likely be considered jurisdictional by the USACE and subject to their regulation (USACE RF 2006). No wetlands surveys or delineations are scheduled for the MSAAP property (NASA NRM 2006).

3.6.2 Cultural Resources

MSAAP does not have a current integrated cultural resources management plan (ICRMP). The requirement for an ICRMP was waived in 1999 due to a lack of significant historic properties at MSAAP (Army 1999). The Mississippi State Historic Preservation Office (SHPO) concurred that MSAAP had no properties eligible for listing on the National Register of Historic Places during the layaway process in 1990 (SHPO 1990). Below is summary of previous investigations at MSAAP and SSC that lead up to the finding of no significant cultural resources at MSAAP.

3.6.2.1 Prehistory and History of the Region

Archaeological investigations of SSC and the region of the Pearl River Basin indicated that human occupation of the area first occurred approximately 12,000 years ago. Occupation within the region is divided into three periods: Paleo-Indian Period (10,000 Before Christ (BC) to 6,000 BC), the Archaic Period (6,000 BC to 2,000 BC), and the Post-Archaic Period (2,000 BC to 1,700 Anno Domini (AD)). (USASMDC 1999)

The recorded history of the area began in 1699 with the arrival of the French explorer Pierre LeMoyne Sieur d'Iverville. French domination of the area lasted until 1763 when, according to the Treaty of Paris, areas east of the Mississippi River were ceded to Great Britain. Ownership of the region changed hands several times between 1779 and 1817, when Mississippi became a state and the majority of the population was either English or American. (USASMDC 1999)

During the early 1800s, settlement patterns were primarily along the Pearl River and in 1830 the county seat was moved to Gainesville. Large sawmills were built at Gainesville and Logtown in the 1840s, and during the late 1800s and early 1900s, the railroad and Pearl River were primary systems for the transportation of cotton and lumber. The river was also heavily used by Confederate troops during the Civil War. The timber mill at Pearlington is believed to have been the largest in the world at the time and the most important commercial center in southern Mississippi during this period; however, shortly after the turn of the century, the timber industry began to wane and most of the mills closed. The agricultural and timber industry eras were essentially over by the end of World War II, but logging is still an important industry in and around the SSC area, with a large portion of the land in the buffer zone continually harvested for timber. (USASMDC 1999)

3.6.2.2 Historic Structures

In 1988, USACE-Mobile District conducted systematic investigations of four locations at the SSC for the *Advanced Solid Rocket Motors Environmental Assessment* (EA) and reconnaissance-level examination of the remainder of the Fee Area (including a resurvey of MSAAP). The survey identified six buildings that predated the acquisition of the property for the construction of NSTL. One structure was built in 1936; the other five were constructed no earlier than 1945. Shorty's residence is the only one of these six structures located within MSAAP boundaries. The survey indicated all six had been extremely modified on the exterior and interior. Therefore none of these structures, including Shorty's residence, possess the characteristics to make them eligible for the National Register of Historic Places (USACE 1988).

MSAAP was constructed between 1978 and 1988. Therefore, none of the buildings constructed for MSAAP operations is over 50 years old and none of them have any unique features that would make them eligible for listing on the National Register of Historic Places (USACE 1988).

3.6.2.3 Archaeological Sites

SSC (and the associated buffer zone) was established in 1961 and encompassed five existing towns: Napoleon, Santa Rosa, Logtown, and Westonia located in the buffer zone, and the town of Gainesville located within the Fee Area. When the land was acquired for construction, most of each of the town's buildings was removed. (USASMDC 1999)

Archaeological investigations of the SSC region are believed to have begun in 1974 with a reconnaissance-level survey by an archaeologist from Louisiana State University; however, reports of this survey are unsubstantiated and no report is extant. The next survey was undertaken in 1984 by the National Park Service and was confined to the MSAAP. No sites were recorded; however, the survey was limited and no systematic transects or subsurface testing was conducted. (USASMDC 1999)

In 1988, USACE-Mobile District conducted systematic investigations of four locations at SSC for the *Advanced Solid Rocket Motors EA* and reconnaissance-level examination of the remainder of the Fee Area (including a resurvey of the MSAAP) (USACE 1988). Except for the Gainesville and Logtown townsites, no archaeological sites were located anywhere within the boundary of the Fee Area, and three previously recorded sites reported from the Pearl River floodplain area at Gainesville could not be relocated (USASMDC 1999). All of these archaeological sites are located outside the boundary of MSAAP (USACE 1988).

Other archaeological surveys conducted in the area include a survey of a proposed 40-acre landfill in the buffer zone conducted by the USACE-Mobile District in 1981, and a 3-acre survey of an area north of Igloo Road conducted in 1997 for NASA's laser test facility program. No archaeological sites were recorded during either survey (USASMDC 1999). Therefore, there are currently no known archaeological sites located on MSAAP.

Native Populations/Traditional Resources

At the time of European contact (1699), the SSC region was populated by the Choctaw. Primarily agriculturalists, the Choctaw material culture is most often recognized by double-weave (baskets within baskets) swamp cane and oak basketry. (USASMDC 1999)

In 1830, the Indian Removal Act authorized relocation of many Native American tribes to the western United States. One of the most notable of the relocations involved the Five Civilized Tribes of the Choctaw, Chickasaw, Creek, Cherokee, and Seminole. The Treaty of Dancing Rabbit Creek (also in 1830) forcibly relocated most of the Choctaw Nation from their homeland in Mississippi, west to what is now southeastern Oklahoma. (USASMDC 1999)

Significant traditional resources sites are subject to the same regulations and are afforded the same protection as other types of historic properties. Traditional sites associated with the Choctaw could include archaeological and burial sites, mounds, ceremonial areas, caves, rockshelters, hillocks, water sources, plant habitat or gathering areas, or any other natural area important to this culture for religious or heritage reasons. By their nature, traditional resources sites often overlap with (or are components of) archaeological sites. As such, any archaeological sites in the vicinity of SSC could also be considered traditional resources sites or contain traditional resources elements. Currently, no traditional cultural properties have been identified within MSAAP. (USASMDC 1999)

3.7 SITE MAPS

All supporting maps and figures are provided in **Appendix B** of this ECP.

4.1 ENVIRONMENTAL PERMITS/LICENSES

4.1.1 RCRA Status

MSAAP is currently listed as a SQG (USEPA identification number MS6210020560) generating 220 to 2,200 pounds of hazardous waste per month. While the facility was operating as an ammunition plant, MSAAP was listed as a LQG, generating more than 2,200 pounds per month.

Hazardous waste is collected at an SAA located along the north side of Building 9148. The SAA consists of three 55-gallon drums designated for solid flammable hazardous wastes, liquid solvent hazardous wastes, and aerosol cans. When full, the drums are transported to the 90-day accumulation area at Building 9157 (MTI 1998c). Building 9157 has four levels of containment, consisting of an underliner, concrete, coatings, and containers. The facility, which was constructed in 1988, stores drums of 55 gallons or less and is located southeast of the IWTP (MTI 1994). Prior to the construction of Building 9157, waste acetone was stored in ASTs at Building 9125. An acetone recovery still (for recycling acetone) is currently located at Building 9157.

During production, wastes were stored and managed in 55-gallon drums throughout the facility. The drums were stored at SAAs along curbs (AGT DPM 2006) and in the production areas. During a 1993 RFA (ATK 1993), nine SAAs were identified as SWMUs. The historical SAAs managed incinerator ash from the CWP and EWI, contaminated wastewaters, paints, and solvents. Descriptions of the SAAs as identified in the RFA are summarized in the **Table 4-1**.

TABLE 4-1
HISTORICAL SATELLITE ACCUMULATION AREAS

Satellite Accumulation Area	Description	Wastes Managed
CWP SAA	7x10-foot area on asphalt in the 9500 Area, outdoors	Waste ash from CWP
EWI SAA	8x10-foot area on asphalt in the 9500 Area, outdoors	Cadmium ash from EWI
Forge lube SAA	25x15-foot concrete pad with aluminum roof and open sides, Building 9117	Primarily contaminated wastewaters from ESP closed loop system, forge shop
Fiberglass SAA	7x10-foot area on concrete base, indoors, Building 9101	Spent acetone from fiberglass operations
Waste TCE degreaser SAA	Next to Building 9162 TCE degreaser, indoors on concrete	Waste trichloroethene (TCE) from degreaser
Paint mix room SAA	10x10-foot enclosed area on concrete the north-central portion of Building 9101	Waste paint and spent solvent

TABLE 4-1 HISTORICAL SATELLITE ACCUMULATION AREAS		
Satellite Accumulation Area	**Description**	**Wastes Managed**
Paint filter SAA	Concrete area of unknown size located on the north side of Building 9101 near the paint mix area, surrounded by soil	Waste paint filters and water from paint spray booths
Vehicle maintenance SAA	7x5-foot area on concrete base inside vehicle maintenance Building 9114, area also used as a paint touch-up booth	Waste paint and solvents
Former vehicle maintenance SAA	8x6-foot concrete area outside vehicle maintenance Building 9114	Waste paint and solvents

In 1980, MSAAP submitted a Hazardous Waste Notification Form to USEPA and subsequently submitted a RCRA Part A permit application in 1981 for the treatment of explosive waste. In December 1981, MSAAP submitted a RCRA Part B Permit application for the EWI and CWP, which was revised in January 1983 to exclude the CWP since the CWP was a non-hazardous waste incinerator. On 9 September 1983, MSAAP (USEPA ID No. MS0800016123) was issued the first RCRA permit for an incinerator in the country (MCI EE 2006). The permit was issued for the operation of the EWI, which was a 1.00-ton per hour incinerator for explosives. The permit was modified numerous times prior to expiring on 9 September 1993. According to the 1993 RFA, the reasons for permit modifications included, but were not limited to, increasing the feed rate, using a new gas cooling process, and using fuel oil instead of natural gas for burning (ATK 1993).

As required under RCRA, MSAAP actively implemented measures to minimize hazardous waste generation. Waste minimization efforts consisted of source reduction and recycling programs and employee incentives for the identification and implementation of those programs. Process-specific assessments or audits were conducted to identify potential practices that would reduce hazardous waste generation at the site, and source reduction activities were implemented to reduce the volume and/or toxicity of hazardous waste at MSAAP. Waste minimization activities included projects such as distillation of solvents, including TCE, Freon 113®, and trans-1-2-dichloroethylene; adsorption of wastewaters after solvent recovery; and carbon filtration of air emission control backwash and condensation separation. Recycling activities were also implemented for lead-acid batteries, solvents, and silver from x-ray and photographic solutions. (MSAAP 1987, MSAAP 1989)

MSAAP was issued a 90-day Emergency Permit from the Mississippi Bureau of Pollution Control for the temporary storage of 7,500 pounds of reactive hazardous waste until the EWI was operational. The permit was issued on 4 September 1984 and modified to increase the storage capacity to 17,000 pounds. The waste was soil and sediment contaminated with hydraulic oil and undissolved explosive. (MPCPB 1984)

Internal audits were conducted by the Army to ensure RCRA compliance at MSAAP. Additionally, comprehensive evaluation inspections were conducted by MDEQ and/or USEPA.

According to the right-to-know network, 15 violations were cited during state and federal inspections between 1987 and 2000. According to inspection notes dated 19 October 1987, nine violations were cited by the USEPA during a compliance inspection. The violations during this inspection varied from failure to record calibration and sprinkler system inspections to failure to record draft probe reading and pressure drop across the baghouse in the EWI operating log. Other violations noted included failure to properly mark containers as hazardous waste and/or identify contents and failure to mark drums with accumulation dates. A review of the EDR report (EDR 2006), which searches all available state and federal databases, all violations were resolved. During a RCRA Compliance Evaluation Inspection of the EWI on 3 May 1989, the EWI was operating and seven violations of the RCRA permit were cited. The violations included improper storage of hazardous waste; an open container of stored hazardous waste; unmarked accumulation date on drums; failure to provide written notification of land disposal restrictions on waste; improper handling and disposal of waste; failure to meet all operating conditions while incinerating hazardous waste; failure to identify a hazardous waste; and improperly handling, treatment, storage, and disposal of a hazardous waste (USEPA 1989). Enforcement actions for the violations cited by USEPA were the responsibility of MDEQ.

According to the USEPA (USEPA ES 2006), no corrective action was imposed since the permit was issued prior to the 1984 Hazardous and Solid Waste Amendments and the permit was not renewed. Additionally, since the permit expired prior to the completion of the 1993 RFA recommending further investigations, no Order was ever issued by the USEPA (USEPA ES 2006). However, a review of the EDR report indicates a low corrective action was assigned to the facility on 28 July 1994 subsequent to the RFA. MTI submitted a closure certification report to USEPA in November 1994, and the incinerator was shown as “clean closed” on 17 December 2002 in a comprehensive permitting report run by MDEQ on 7 July 2006 (MDEQ CMB 2006).

MSAAP tenants that are listed as Conditionally Exempt Small Quantity Generators (CESQGs) or SQGs in the USEPA right-to-know Resource Conservation and Recovery Information System database include: Boeing (now Pratt Whitney), DOE, NAVOCEANO, NAVSCIATTS, and SBT22. No tenants are listed as TSDFs. No violations were cited for these tenants prior to 14 July 2004. (RTK NET 2006)

4.1.2 Solid Waste Permits

MSAAP currently holds no solid waste permits. Solid waste generated at MSAAP is transported by a third-party contractor and disposed of at an off-site disposal facility. Solid waste management at MSAAP is the responsibility of each tenant generating the waste.

From 1983 to 1997, MSAAP operated an industrial/special waste landfill (SWMU 1) under Solid Waste Management Permit No. SW02301B0289 issued on 3 May 1983. The sanitary landfill was used for general refuse, including ash, cardboard, metal, dry sewage sludge, pallets, and possibly aerosol cans. An estimated volume of 91,300 cubic yards of solid waste was disposed of in the landfill (WLF 1995, ATK 1993). According to a 24 March 1997 letter from MDEQ, the permitted solid waste landfill “…appears to have been covered and closed in compliance with the applicable state regulations.” Maintenance of the cap, through mowing and inspections, is performed in accordance with the MDEQ-approved landfill closure plan.

4.1.3 Underground Storage Tank/Above Ground Storage Tank Permits

Lists of the ASTs and USTs at MSAAP (AGT DPM 2006) are presented in **Sections 4.1.3.1** and **4.1.3.2** of this report, respectively. Information regarding specialty tanks including septic tanks, oil/water separators, sumps, and grease traps are summarized in **Section 4.1.3.3**.

4.1.3.1 Above Ground Storage Tanks

There are currently 62 ASTs within the survey area. Thirty-three of these ASTS are empty and not currently in use. The tanks are owned by MSAAP and are identified in **Table 4-2**. The table includes the location of each AST, as well as the tank identification number, date of installation, maximum capacity, construction material, and contents (current or historical).

Ten ASTs have been removed from the site and are also identified in **Table 4-2**. The majority of the piping associated with the removed ASTs has been removed (AGT DPM 2006); however, records detailing the final disposition of the removed tanks and piping are not available.

TABLE 4-2
ASTs LOCATED AT MSAAP

Building Location	Tank Number	Capacity (gallons)	Contents	Secondary Containment	Construction Material	Date Installed	Status
9148	101[1]	13,000	Alkaline oily waste	Concrete	Steel	1982	Laid away
9148	102[1]	13,000	Alkaline oily waste	Concrete	Steel	1982	Laid away
9148	201[1]	7,000	Acid oily waste	Concrete	Steel	1982	Laid away
9148	301[1]	36,000	Soluble oily waste	Concrete	Steel	1982	Laid away
9148	302[1]	36,000	Soluble oily waste	Concrete	Steel	1982	Laid away
9148	303[1]	500	Soluble oily waste	Concrete	Steel	1982	Laid away
9148	351[1]	100,000	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	352[1]	89,000	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	353[1]	1,600	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	354[1]	2,000	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	355[1]	2,000	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	356[1]	1,600	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	357[1]	140,000	Non-detergent oily waste	Concrete	Steel	1982	Laid away
9148	401[1]	100,000	All waste streams	Concrete	Steel	1982	Active
9148	402[1]	100,000	All waste streams	Concrete	Steel	1982	Active
9148	451[1]	30,000	Chromium rinse	Concrete	Steel	1982	Laid away
9148	452[1]	30,000	Chromium rinse	Concrete	Steel	1982	Laid away
9148	501[1]	7,500	FGD	Concrete	Steel	1982	Laid away

TABLE 4-2 ASTs LOCATED AT MSAAP							
Building Location	Tank Number	Capacity (gallons)	Contents	Secondary Containment	Construction Material	Date Installed	Status
9148	502[1]	7,500	FGD	Concrete	Steel	1982	Laid away
9148	551[1]	2,000	Acid phosphate	None	Steel	1982	Laid away
9148	552[1]	2,000	Containerized oily waste	None	Steel	1982	Laid away
9148	553[1]	2,000	Containerized oily waste	None	Steel	1982	Laid away
9148	601[1]	5,400	All waste streams	None	Steel	1982	Active
9148	602[1]	1,600	All waste streams	None	Steel	1982	Active
9148	603[1]	110,000	All waste streams	None	Steel	1982	Active
9148	604[1]	7,000	All waste streams	None	Steel	1982	Active
9148	605[1]	7,000	All waste streams	None	Steel	1982	Active
9148	606[1]	3,500	All waste streams	None	Steel	1982	Active
9148	607[1]	5,400	All waste streams	None	Steel	1982	Active
9148	608[1]	1,600	All waste streams	None	Steel	1982	Active
9148	609[1]	110,000	All waste streams	None	Steel	1982	Active
9148	6010[1]	5,700	All waste streams	None	Steel	1982	Active
9148	6011[1]	7,000	All waste streams	None	Steel	1982	Active
9148	6012[1]	3,500	All waste streams	None	Steel	1982	Active
9148	6013[1]	2,800	All waste streams	None	Steel	1982	Active
9148	6014[1]	18,000	All waste streams	None	Steel	1982	Active
9130	6016[1]	50,000	All waste streams	None	Steel	1982	Laid away
9130	701[1]	27,000	Oily sludge	None	Steel	1982	Laid away
9130	702[1]	27,000	Oily sludge	None	Steel	1982	Laid away
9148	811[1]	6,000	Sodium hydroxide	Concrete	Steel	1982	Active
9148	812[1]	200	Caustic day tank	Building	Steel	1982	Active
9148	821[1]	6000	Sulfuric Acid (93%)	Concrete	Steel	1982	Laid away
9148	822[1]	500	Acid Day Tank	Building	Steel	1982	Active
9148	831[1]	8,500	5% hydrated lime	Concrete	Steel	1982	Active
9133	871[1]	500	Ferrous sulfate	Building	Steel	1983	Active
9163	91T6[2]	350,000	Fuel oil	Concrete	Steel	1981	Laid away
9164	91T1[2]	50,000	Draw lube	Concrete	Steel	1981	Laid away
9164	91T8[2]	10,000	Phosphate ester oil	Concrete	Steel	1981	Laid away
9149	9149[2]	10,000	Precipitator oil	Concrete	Steel	1981	Removed
9149	9149[2]	10,000	Precipitator oil	Concrete	Steel	1981	Removed
9101	Unnumbered[2]	7,000	Oily waste	Concrete	Steel	1981	Removed
9164	91T7[2]	15,000	Freon 113®	Concrete	Steel	1981	Laid away
9164	91T9[2]	7,500	Freon 113®	Concrete	Steel	1981	Laid away
9164	91T10[2]	7,500	TCE	Concrete	Steel	1981	Laid away
9164	Unnumbered[2]	20,000	Solvent wastewater carbon column	Concrete	Steel	1981	Laid away

TABLE 4-2
ASTs LOCATED AT MSAAP

Building Location	Tank Number	Capacity (gallons)	Contents	Secondary Containment	Construction Material	Date Installed	Status
9161	91T2[2]	200,000	Propane	None	Steel	1981	Removed
9144	Unnumbered[2]	2,500	Soda ash mix	None	Steel	1981	Removed
9144	Unnumbered[2]	10,000	Surge tank	None	Steel	1981	Removed
9144	Unnumbered[2]	2,000	Primary reaction tank	None	Steel	1981	Removed
9144	Unnumbered[2]	10,000	Secondary reaction tank	None	Steel	1981	Removed
9144	Unnumbered[2]	37,000	Thickener Tank A	None	Steel	1981	Laid away
9144	Unnumbered[2]	37,000	Thickener Tank B	None	Steel	1981	Laid away
9154	Unnumbered[3]	5,000	Diesel	Concrete	Steel	1981	Active
9110	Unnumbered[3]	1,000	Diesel	Double Walled	Steel	1981	Active
9114	Unnumbered 116 kilowatt (kw) generator[3]	200	Diesel	None	Steel	1988	Active
9124	Unnumbered 175 kw generator[3]	180	Diesel	None	Steel	1988	Active
9121	Unnumbered 100 kw generator[3]	200	Diesel	None	Steel	1988	Active
9157	Unnumbered[3]	350	Used oil	Concrete	Plastic	1988	Active
9166	Unnumbered[3]	400 (2 to 5)	Used oil and hydraulic fluids	None	Steel	1988	Active
9508	Unnumbered[2]	10,000	Propane	None	Steel	1988	Removed
8302	Not Assigned[4]	Unknown	Diesel and/or gasoline	Unknown	Unknown	~ 1960	Removed

Note: Laid away is defined in the definitions at the front of the document under layaway.
[1] EarthCon 2004
[2] MTI 1992b
[3] AGT 2006
[4] MCI 1989b
Sources: EarthCon 2004, MTI 1992b, AGT 2006, MCI 1989b

Records indicate that two ASTs were historically located south of Building 8302. Gulf Oil Distributors installed the tanks for the Weaver Construction Company in the early 1960s (MCI 1989b). The ASTs have been removed from the site; however, the concrete pads installed beneath the tanks are visible. Closure documentation for the ASTs was not available.

Six ASTs were located east of Building 9101 (Facility 9125) during the period before construction and operation of the IWTP. Wastewater was pumped, by type, to the tanks for transport from the site by outside contractors. During this time, multiple loads of wastewater were removed from the site each day. After startup of the IWTP, the tanks were used for storage of various chemicals and wastes, including spent solvents and oils. Prior to installation of the acetone recovery still at Building 9157, waste acetone was placed in one or more of the tanks for holding prior to disposal. A vapor emission recovery system was installed beneath the tanks for use during the time that spent acetone was being stored in the ASTs (AGT DPM 2006). There are no documents regarding remedial action in this area.

During production operations in the PMPT, solvent recovery systems were utilized in association with vapor-degreasing and painting operations (ESE 1984). Both systems utilized automated, dual-chambered filtration columns. During operation, solvent vapors were filtered through one of the two carbon filters and exhausted to the atmosphere. The remaining column was steam stripped and resulting condensate drained to sumps located beneath the equipment. A solvent-water separator was utilized to recover free-product solvent prior to the discharge of wastewater to the sumps. The resulting wastewater was pumped from the sumps through overhead piping to a condensate storage tank (91T10) located in the MSAAP tank farm. During initial operations, solvent-contaminated wastewater was pumped via a pneumatic pump through a series of carbon-filled drums located outside of the Tank 91T10 containment berm. The filtered wastewater was transferred through overhead piping to the IWTP for processing.

Later, an in-line carbon-treatment column was installed to the west of Tank 91T10. Solvent-contaminated wastewater was hard-piped directly through the carbon column and transferred to the IWTP for processing. During the time period when the carbon-filled drums were actively used, small-quantities of solvent-contaminated wastewater were routinely released to the ground surface (AGT DPM 2006). The waste solvent tank is identified as SWMU 12 in the MSAAP RFA (ATK 1993). Spent media from the carbon filtration columns and drums was removed from MSAAP for offsite disposal (USAEHA 1987a). During the time period when the carbon-filled drums were actively used, small-quantities of solvent-contaminated wastewater were routinely released to the ground surface (AGT DPM 2006).

A 15,000-gallon steel AST (Tank 91T7) is located west of Building 9101 and was utilized as part of a closed-loop Freon-degreasing system. The AST was originally installed for the storage of TCE, but was never utilized for this purpose (ESE 1984). The tank is presently in laid-away status (AGT DPM 2006).

Numerous spills occurred in the vicinity of the former Freon recovery still, historically located in Building 9160 (AGT DPM 2006). Freon spills were typically small (less than 1 gallon); however, several spills are known to have occurred resulting in the release of approximately 40 to 50 gallons of Freon in the vicinity of Building 9160 (AGT DPM 2006). This unit received still bottoms from the nine Freon degreasers located in Building 9100 (CMPT). Still bottom wastes were placed under vacuum in Building 9160 and Freon was recovered for reuse. Degreaser still bottoms were contained in a receiving tank within the building before processing. Numerous stains were observed on the floor of the building during the VSI. The Freon still is identified as SWMU 13 in the MSAAP RFA (ATK 1993). All of the Freon recovery equipment, including the holding tank(s) and still, have been removed from the building.

Two 10,000-gallon conical-shaped ASTs were historically located at Building 9149 as part of a closed-loop vapor extraction system for the ESPs installed above the Building 9101 forge press room (ESE 1984). Non-PCB transformer oil was circulated through the ESPs to the tanks to allow for settling while applied heat would remove any water contained within the oil. The tanks have been removed; however, staining of the concrete containment berm was observed during the VSI. The condition of the underground piping between Buildings 9101 and 9149 is unknown (AGT DPM 2006).

4.1.3.2 Underground Storage Tanks

There are no active USTs at MSAAP (AGT DPM 2006). Historically, six known USTs have been in use at the site, all of which have been removed. Additionally, two USTs have been reported to have been in use at non-MSAAP facilities (AGT DPM 2006), but no confirming documentation was found. **Table 4-3** lists all of the former USTs and includes the location of each UST, the tank identification number, date of installation, date removed, maximum capacity, construction material, and contents (ESE 1984, USACE 1989).

TABLE 4-3
FORMER USTs LOCATED AT MSAAP

Building Location	Tank Number	Capacity (gallons)	Contents	Construction Material	Date Installed	Date Removed
9110	MSAAP001	1,000	Diesel	Fiberglass	1983	~ 2000
9112	MSAAP002	500	Diesel	Steel	1979	~ 2000
9114	MSAAP003	12,000	Diesel	Steel	1983	April 1992
9114	MSAAP004	12,000	Gasoline	Steel	1983	April 1992
9114	MSAAP005	12,000	Gasoline	Steel	1983	April 1992
9506	MSAAP006	10,000	Diesel	Steel	1983	January 1993

The 1,000-gallon UST located at Building 9110 was removed from the site in the late 1990s or early 2000 (AGT DPM 2006). Confirmation soil samples were reportedly collected following the removal of the UST; however, analytical laboratory results and documentation related to the UST closure activities were not available for review.

The 500-gallon heating oil tank located at Building 9112 was removed in approximately 2000. Confirmation soil samples were reportedly collected following the removal of the UST; however, analytical laboratory results and documentation related to the UST closure activities were not available for review (AGT DPM 2006).

Records indicate that the three 12,000-gallon USTs located at Building 9114 were removed from the site in 1992. UST closure records and communications from MDEQ indicate that the tanks were closed in accordance with all applicable regulations and that no remedial actions were required (MTI 1992, MDEQ 1992).

The 10,000-gallon UST located at Building 9506 (CWP) was removed in 1993. Documentation indicates that during the UST removal activities, heavy rainfall resulted in the displacement of the tank from the UST excavation and the release of approximately 20 to 30 gallons of fuel oil to the surrounding surface soils. The impacted soils and water were removed and analytical testing indicated that the remedial action was completed per MDEQ recommendations (MTI 1993a).

No correspondence from the MDEQ was identified confirming the completion of the UST removal activities.

At least two rural filling stations are believed to have been located at MSAAP when NASA acquired the site in the early 1960s. USTs may have been located in the vicinity of Shorty's Bar east of Building 9112 and in the vicinity of the area previously utilized as the MTI Grounds and Storage Yard. A non-intrusive subsurface investigation was completed at both sites in 1991 or 1992 to determine if USTs were present. The results of that investigation were reportedly inconclusive (AGT DPM 2006). Documentation of the investigation results was not available.

4.1.3.3 Specialty Tanks

One oil/water separator was utilized during production activities for the recovery of oily wastes generated from the forge and heat treatment areas at Building 9101. Wastewater was pumped from sumps located in the forge press and oil-quench heat treat pit areas through the separator. Wastewater was then transferred through overhead piping to the IWTP for treatment. Free product was recovered via a vacuum truck and removed from the site by an independent contractor for disposal (AGT DPM 2006). The separator is identified as SWMU 27 in the 1993 RFA and was located north of Building 9101. The separator is no longer at the site, but the containment structure remains.

One grease trap is located east of Building 9110 to recover spent food-preparation byproducts from the building's cafeteria. The MSAAP IWTP treats oily wastes generated in the trap. The cafeteria operator coordinates the operation and maintenance of the grease trap.

Fourteen sumps collected wastewaters associated with LAP Area operations. A summary of these sumps is presented in **Table 4-4**. Eleven of the sumps were installed to collect explosive-contaminated wastewater generated during munitions loading operations in the 9300 Area. Wastewater collected in these sumps was processed through the LAP wastewater treatment facility (Building 9348) or MSAAP's mobile carbon treatment column. Wastewater processed at the LAP treatment facility was discharged directly to MSAAP's drainage canal system at the LAP area. Wastewater processed through the portable treatment column was discharged to the drainage canals via a sump (K045) located at the CWP (Building 9514) (AGT DPM 2006).

The sump associated with the laundry facility in Building 9313 collected wash water generated during laundering of LAP personnel clothing. Wash water was tested for the presence of explosives prior to discharge (NASA OMD 2006). Explosive-contaminated wash water was treated through the carbon filtration columns (MTI 1990) and discharged at the CWP. Uncontaminated wash water was discharged to the IWTP. Wastewater collected in the LAP battery charging and compressor areas (Building 9325) was transferred directly to the IWTP for processing. All of the sumps located in the LAP Area have reportedly been cleaned and decommissioned (AGT DPM 2006). Sumps 9334, 9336, 9342, and 9343 have been filled with sand and capped with a concrete seal (MSAAP BEC 2006).

TABLE 4-4 LAP AREA OPERATIONS WASTEWATER SUMPS			
Sump Description	**Facility ID**	**Building**	**Capacity (gallons)**
Explosive Sump # 1	9334	9323	3,700 (2) - closed
Explosive Sump # 2	9335	9302	1,500 (2)
Explosive Sump # 3	9336	9324	3,700 (2) - closed
Explosive Sump # 4	9337	9325	2,000 (2)
Explosive Sump # 5	9338	9304	1,600 (2)
Explosive Sump # 6	9339	9304	2,800
Exterior Explosive Sump	9343	9324	4,000 (2) - closed
Exterior Explosive Sump	9342	9323	4,000 (2) - closed
Explosive Sump – S.E. Corner	9344	9303	3,600 (2)
Explosive Sump – N.E. Corner	9345	9303	1,500
Laundry Sump	9340	9313	Not reported
Battery Charging Acid Sump	9341	9325	Not reported
Air Compressor Sump	9346	9325	Not reported
Contaminated Sump	K045	9514	8,640

A total of seven septic tanks are located at MSAAP. **Table 4-5** provides a summary of the septic tanks, including the status of the systems.

TABLE 4-5 MSAAP BUILDINGS EQUIPPED WITH INDEPENDENT SEPTIC SYSTEMS			
Facility ID	**Building ID**	**Date of Last Use**	**Septic System Status**
9743	9138 (Block and Brace)	~ 1998	Inactive
9744	9401	~ 1991	Inactive
9745	9112	~1988	Inactive
9746	9115 (Blount Building)	Present	Active
9747	8301	~ 1988	Inactive
9757	9501	~ 2005	Inactive
9758	9506	~ 1988	Inactive

4.1.4 National Pollutant Discharge Elimination System Permits

MSAAP manages wastewater discharges under NPDES permit number MS0040797. The NPDES permit was renewed by MSAAP on 31 October 2005. The permit was subsequently transferred to AGT on 1 January 2006 and will expire on 30 September 2010 (MDEQ 2006a). Stormwater discharges are permitted under Baseline Stormwater General NPDES permit number MSR110012. The current stormwater permit was issued to AGT on 7 July 2006 and will expire on 30 September 2010 (MDEQ 2006a).

During active munitions production, 32 NPDES permitted outfalls were operated for the discharge of waste and stormwaters (**Figure B-19)**. The three outfalls currently authorized by the NPDES permit are described below. All three outfalls currently discharge wastewater. Wastewater is discharged into unnamed tributaries of, and ultimately to, Mikes River. A summary of the outfalls is presented in **Table 4-6** (MDEQ 1981, MDEQ 1988, MDEQ 1994, MDEQ 2006a).

TABLE 4-6
MSAAP NPDES OUTFALLS (CURRENT AND HISTORICAL)

Outfall Number	Source	Currently Permitted (Yes/No)	Comments
001	Industrial wastewater	Yes	Currently permitted to discharge treated stormwater and condensate/boiler blowdown
002	Sanitary wastewater	Yes	None
003	Industrial wastewater	No	Batch-treated LAP wastewater
004	Non-contact cooling water	No	None
005	Intermittent cooling tower blowdown	Yes	Historically permitted for discharge of stormwater runoff
006	Stormwater runoff	No	None
007	Stormwater runoff	No	None
008	Stormwater runoff	No	None
009	Stormwater runoff	No	None
010	Stormwater runoff	No	None
011	Stormwater runoff	No	None
012	Stormwater runoff	No	None
013	Stormwater runoff	No	None
014	Heavy equipment rinse water and stormwater runoff	No	Discharge of heavy equipment rinse water is not currently permitted
015	Stormwater runoff	No	None
016	Stormwater runoff	No	None
017	Stormwater runoff	No	None
018	Stormwater runoff	No	None
019	Stormwater runoff	No	None
020	Stormwater runoff	No	None
021	Stormwater runoff	No	None
022	Stormwater runoff	No	None
023	Stormwater runoff	No	None
024	Stormwater runoff	No	None
025	Stormwater runoff	No	None

TABLE 4-6 MSAAP NPDES OUTFALLS (CURRENT AND HISTORICAL)			
Outfall Number	**Source**	**Currently Permitted (Yes/No)**	**Comments**
026	Stormwater runoff	No	None
027	Stormwater runoff	No	None
028	Stormwater runoff	No	None
029	Stormwater runoff	No	None
030	Stormwater runoff	No	None
031	Stormwater runoff	No	None
032	Stormwater runoff	No	None

- Outfall 001 contains treated stormwater and condensate/boiler blowdown water from the IWTP with an allowable average monthly discharge volume of 63,000 gallons of water.
- Outfall 002 contains treated sanitary wastewater from the SWTP. The wastewater is treated through the MSAAP SWTP, which consists of a sediment trap, 33,000-gallon surge tank, 50,000-gallon aeration tank, clarifier, post-aeration tank, and UV treatment. The wastewater is then discharged through the outfall and the sludges generated during the water treatment process are dried on sand drying beds adjacent to the system. Effluent flow volumes are measured using a staff gauge installed on the flush-out flume. The current NPDES permit does not regulate the maximum allowable discharge volume.
- Outfall 005 contains intermittent cooling tower blowdown from Building 9154. The outfall is utilized sporadically and the current NPDES permit does not regulate the maximum allowable discharge volume.

A number of NPDES monthly monitoring reports were identified during the VSI; however, a complete permit monitoring history was not readily available. Reportedly, a number of NPDES permit excursion violations have occurred at MSAAP. Documentation specifically identifying the violations was not available during the VSI. The violations include exceedances of permitted limits for total suspended solids, ammonia, coliform, and chlorine. The violations also included ammonia and chlorine excursions in August 2001 related the unscheduled elimination of active treatment-system biomass. The incident is believed to have been related to the introduction of a petroleum product into the sanitary sewer system by an unknown source. The SWTP was “reseeded” with bacteria and the system was returned to operation. (AGT DPM 2006)

4.1.5 Drinking Water Permits

Drinking water is supplied to the majority of MSAAP buildings and facilities by two groundwater wells (ESE 1984, USAEHA 1988a)). The wells are permitted by MDEQ as MS-GW-02614 and MS-GW-02615 and are identified as Facilities 9123 and 9124, respectively. Facility 9123 is located east of the IWTP. Facility 9124 is located north of Building 9134. Potable water is available at a capacity of 2-million gallons per day (USASMDC 1999). Both wells draw groundwater from the Catahoula aquifer approximately 600 to 700 feet bgs. Extracted groundwater is chlorinated at each well prior to distribution or storage. Following chlorination, treated groundwater complies with applicable MDEQ drinking water standards (Army 1990, AGT DPM 2006).

A water sharing agreement is in place between MSAAP and NASA. In the event that the MSAAP water supply system is temporarily inoperable, a 2-inch underground cross-over system, located near of Building 9110, permits potable water supplied by NASA to be circulated throughout the MSAAP water distribution system (NASA OMD 2006).

Water storage is provided via a 250,000-gallon water storage tank located north of Facility 9124. The storage tower is identified as Facility 9128. The water storage tank has been repainted twice since its construction in 1981 (AGT DPM 2006). **Section 4.6** of this report contains more information regarding potential lead contamination surrounding the tower.

Potable water quality testing is completed as directed by the Mississippi State Department of Health (MSDH). Current water quality records were not readily available for review; however, limited historical water system inspection and water quality parameter testing reports indicate that MSAAP's water supply system historically has conformed to all applicable water quality standards (MSDH 2000, MSDH 2004a, MSDH 2004b, MSDH 2004c).

4.1.6 Air Permits

MSAAP is currently designated as a true synthetic minor source and holds no air permits. Air Pollution Control Permit No. 1000-00018 was revoked on 24 May 2006. The current anticipated emission rates do not require air permitting; however, MSAAP is required by MDEQ to monitor and sample air discharges. Modifications to air emissions equipment may require a permit in the future. (MDEQ 2006b)

Historically, MDEQ has issued multiple air pollution control permits and subsequent modifications for MSAAP under Facility Permit Numbers 1000-00029 and 1000-00018. On 20 September 1978, MDEQ issued Air Pollution Control Permit No. 1000-00029 for MSAAP to construct air emission control equipment. **Table 4-7** shows the 1978 permitted emission points.

TABLE 4-7
1978 MSAAP EMISSION POINTS

Emission Points	Description
001	PMPT (Building 9101)
002	CMPT (Building 9100)
003	LAP Area (Buildings 9302, 9303)
004	CWP (9500 Area)
005	Four coal-fired broilers (Building 9143)
006	Four diesel electric generators (Building 9143)

TABLE 4-7 1978 MSAAP EMISSION POINTS	
Emission Points	**Description**
007	Two inert waste incinerators (Building 9150)
008	EWI (9500 Area) (added during revisions)

Air emissions from the PMPT (Building 9101) were produced primarily from steel and aluminum forge pressing operations. A total of five separate forging processes produced air emissions that were controlled through a series of four ESPs. Exhausts generated by the steel forge presses were routed through collection hoods to a common header duct, which in turn could be routed through one of the four ESPs. The exhaust systems for the aluminum forge presses were configured similarly. The ESPs utilized were designed for identical airflow capacities and consisted of three stages: a mesh screen filter; a precipitator; and a mist eliminator. The three precipitator stages were configured with three precipitator cells (USAEHA 1986d).

The MSAAP mechanical plant (Building 9143) primarily produced air emissions through four coal-fired boilers with chain-grade spreader stokers. Each boiler was designed to produce 32,000 lbs of steam at a pressure of 125 pounds per square inch. The boilers exhausted via a common header to two three-field ESPs. Each ESP exhausted to a dual alkali counterflow SO_2 absorber tower. Each absorber vented to its own stack. Both stacks were housed in a common shroud (USAEHA 1986c).

Emissions control equipment installed at the EWI were designed primarily to control particulate emissions. The APCS installed at the EWI consisted of (in order) a high temperature gas cooler, dilution air damper, low temperature gas cooler, cyclone, baghouse, and induced draft fan (USAEHA 1985).

Applications to revise the original air permit were submitted to MDEQ to address operational and equipment modifications and changes. The changes were implemented in either newly issued permits or modifications to existing permits; changes were addressed July 1982, March 1983, May 1983, June 1983, September 1985, and November 1985 (MCI 1985c). In accordance with the general conditions of the air permit, air emissions tests at the mechanical plant were performed routinely, and monitoring results were submitted to MDEQ on a semi-annual basis (USAEHA 1984a, USAEHA 1984b, MDNR 1983, USAEHA 1986c, ESE 1984). Additionally, air emission equipment outages were reported to MDEQ on a quarterly basis as required under the Federal Facility Compliance Agreement between the Army and MDEQ (MCI 1985a).

A Performance Evaluation Permit was issued 4 May 1990 for emission points 006 and 008. After several extensions, the permit expired on 1 August 1991. On 28 January 1992, an air permit to operate air emissions equipment was issued for emission points AA-004, AA-006 and AA-0058 (**Table 4-8**).

TABLE 4-8 1992 MSAAP EMISSION POINTS	
Emission Points	**Description**
AA-004	CWP with cyclone and baghouse for emissions control (Building 9506)
AA-006	Four gas fired boilers in the steam/nitrogen producing system (Building 9135)
AA-008	EWI with cyclone and baghouse for emissions control (Building 9505)

On 13 October 2001, MDEQ issued Air Pollution Control Permit No. 1000-00018 to operate air emissions equipment at synthetic minor sources. The permit underwent modifications in July 2002, July 2004, November 2005, and January 2006, and was revoked by MDEQ in May 2006 (MDEQ 2006b). The emission points for the minor sources covered by this permit are shown in **Table 4-9** and on **Figure B-20**.

TABLE 4-9 2004 MSAAP EMISSION POINTS	
Emission Points	**Description**
AC-001	Natural gas fired boiler (Boiler No. 1)
AC-002	Natural gas fired boiler (Boiler No. 2)
AC-006	Diesel generator (Building 9101)
AC-007	Diesel generator (Building 9124)
AC-008	Diesel generator (Building 9110)
AC-009	Diesel generator (Building 9121)
AC-010	Diesel generator (Building 9114)
AC-011	Propane fueled generator (Building 9148)
AC-012	Natural gas fired boiler (Building 9110)
AC-014	Maintenance shop parts washer (Building 9114)
AC-015	8,000-gallon waste oil tank
AC-016	5,000-gallon fuel storage tank
AC-022	Natural gas fired boiler
AC-023	Natural gas fired boiler for space heat (Building 9101)
AC-024	Natural gas fired boiler for space heat (Building 9101)
AC-025	Natural gas fired emergency generator (Building 9101)
AC-026	Natural gas fired boiler (Building 9322)
AC-027	MTI maintenance painting operations
AC-028	13 ceiling mounted natural gas fired unit heaters (Building 9355)
AC-029	Natural gas fired emergency electric generator (Building 9355)
AC-030	Natural gas fired boiler

4.1.7 Nuclear Regulatory Commission Licenses

MSAAP holds no U.S. Nuclear Regulatory Commission licenses, but has historically held registrations with the MSDH for use of radioactive materials in non-destructive testing and quality control instrumentation.

MSAAP held 2 Americium (Am)-241 sources with 1 curie (Ci) of activity each (source model SS-3A, serial numbers 5066LA and 5067LA) under Department of the Army (DA) Permit P-16-MC-02 and General License 185 from the State of Mississippi. The sources, received by MSAAP in February 1984, were part of LFE Gamma Gauges mounted on the input side of embossing mills to determine the thickness of steel coil stock prior to embossing [MCI no date (n.d.)]. According to a radiation protection survey completed in December 1987, the devices were non-operational, the shutters were closed, and they were deactivated at their control panels (USAEHA 1988b). MSAAP disposed of both Am-241 sources in May 1989 by returning them to the vendor, Integrated Industrial Systems (Integrated Industrial Systems 1989).

MSAAP operated a 4 mega electron volt (MeV) Varian Linatron (model 838049-06, serial number 39) industrial radiographic system in LAP Building 9325, Room 126, for metal material quality control. Approximately 20 millicuries (mCi) (approximately 86.5 pounds) of depleted uranium (DU) was permanently mounted in the Linatron's x-ray head as an integral collimating and shielding material. The DU shielding was registered with the Mississippi State Board of Health under Registration Number DU-002 for use of DU under general license on 3 December 1984. The Linatron was registered with the Mississippi State Board of Health as a source of ionizing radiation under Registration Number A-7 on 12 December 1984, and through a series of amendments had a registration expiration date of 1 December 1990. The Linatron was also held under DA Permit P17-02-01. (USAEHA 1988b, MCI n.d.) MSAAP rendered the Linatron inoperative in preparation for long-term storage in August 1990 (MCI 1990). MSAAP signed a requisition and invoice/shipping document (Form 1149) on 26 January 2000 for shipment of the unit to Lone Star Army Ammunition Plant (MSAAP 2000).

MSAAP held a 100-mCi sealed source of Cesium (Cs)-137 (serial number MB-1680) contained in a Texas Nuclear model 5190 density gauge (serial number B3613) under DA Permit P16-MC-01. The gauge was mounted on sludge underflow piping between the MSAAP mechanical plant and the FGD building to measure sludge density for control purposes (MCI n.d.). The source was removed from the gauge in August 1987 (MCI 1988) and returned to Texas Nuclear for final disposition (Texas Nuclear 1987).

MSAAP held six additional sealed sources of Cs-137 with activity of less than 10 microcuries each under DA Permit P17-02-01 (MCI n.d.). One Cs-137 dosimeter calibrator (Dosimeter Corp. of America, model 3060) was originally used in LAP Building 9325, Room 126, and then transferred to the industrial hygiene lab in Building 9101, Room 117. Three Cs-137 check sources were located in Building 9325, Room 126; 2 Cs-137 check sources were located in the industrial hygiene lab (MCI 1988). The check sources (Nuclear Associates, catalog number 62-103) were used to check survey instrument response to radiation prior to use. The Cs-137 sources were reportedly removed when MSAAP was inactivated (MSAAP BTC 2006), but no records were identified during the VSI to confirm this disposition.

The Mississippi State Board of Health issued Radioactive Material License Number MS-575-01 on 2 December 1983 to MSAAP for use of Radium (Ra)-226, not to exceed 0.007 mCi of activity, in an Amersham Searle Model RAM X452 sealed source. The source was contained in an Alnor Instrument Company model 7000U dewpointer for determining the dew point temperature of air or other non-corrosive gases in the PMPT and CMPT areas (Mississippi State Board of Health 1983). A DA permit application dated 5 October 1983 was identified during the VSI, but documentation of an approved DA permit was not found in Army or contractor records. Amendment Number 1 to License Number MS-575-01 terminated the license on 31 October 1985. No documentation regarding final disposition of the Ra-226 source was identified during the VSI.

The former MSAAP Medical Clinic (Building 9110, Room 152) housed a Picker model BGX625R single-phase x-ray system with model PX1301C radiographic tube housing (USAEHA 1988b). The machine was registered under State of Mississippi Registration Number 23-2-005 and received from Picker International Inc. in September 1986 (MCI n.d.). On 17 April 1995, a representative of Hancock Medical Center in Bay St. Louis, Mississippi, picked up and assumed responsibility for the x-ray equipment identified above (MDFA 1995). The lead shielding in the walls of the diagnostic x-ray room was reportedly also transferred to Hancock Medical Center (AGT DPM 2006).

Smoke detectors and self-illuminating exit signs potentially containing radionuclides were used at MSAAP. The smoke detectors reportedly were removed and shipped off site. Building 9355 was known to have self-illuminating exit signs and they may have been used in other buildings. Some of these signs were reportedly shipped off site since 2004. There have been no surveys for these and other commodities potentially containing radionuclides, and no documentation regarding their use or disposition was identified during the VSI. (AGT DPM 2006)

4.1.8 Other Permits/Licenses

MSAAP does not hold additional permits or licenses.

4.2 ENVIRONMENTAL CLEANUP

4.2.1 Installation Restoration Program

According to a 1997 written correspondence from the Army (MSAAP 1997), MTI (MSAAP contractor at the time) was exempt from the Defense Site Environmental Restoration Tracking System (DSERTS) data calls.

The 2006 MSAAP Installation Action Plan identified 46 installation restoration program (IRP) sites. No detailed description or location for each of the sites was provided, and each site was given final response complete (RC) status in August 1990 with no cleanup being initiated or completed. No documentation indicating how MSAAP arrived at the RC status or providing state or federal concurrence to the RC status of the 46 sites could be located during the archive search and June 2006 document review. According to a 23 November 1992 memorandum to the U.S. Army Armament, Munitions and Chemical Command, MSAAP requested a ROD or decision document (DD) for Defense Environmental Restoration Program Management Information System sites requiring no further remedial action (MSAAP 1992). The request was based on four separate surveys: (1) 1984 installation assessment by ESE; (2) Evaluation of SWMUs conducted by USAEHA in 1988; (3) 1990 preliminary assessment for SSC conducted for NASA; and (4) a 1990 survey conducted by Weston for USATHMA. These documents are discussed in **Section 4.2.4**. No response to the memorandum was discovered.

A 1997 relative risk site evaluation (RRSE) (USACHPPM 1997) was conducted to assess previously uninvestigated sites at MSAAP that were eligible for the Army environmental restoration program. The evaluation was conducted according to the RRSE guidelines as defined by the Army, and data generated during this assessment was for environmental restoration program management purposes only. The USACHPPM defined the data as minimal Level III and specifically excluded the data from being used as evidence of presence or absence of contamination or to support any quantitative health risk assessment.

The survey concluded that the 46 sites listed in the DSERTS database were identified with no technical basis; therefore all 46 sites should be removed from the database. Furthermore, nine of the ten sites identified during the USEPA 1993 RFA as requiring further assessment should be listed in the database. These sites scored low using the RRSE criteria. The RRSE site rankings were determined based on contaminant hazard factor (maximum contaminant concentration and corresponding standard comparison), migration pathway factor (potential for contaminant migration to a point of exposure), and receptor factor (potential for receptor to come into contact with a contaminant). One site excluded from listing was the sanitary landfill since the unit was granted clean closure. (USACHPPM 1997)

4.2.2 Military Munitions Response Program

A Phase 3 Army Range Inventory was completed at MSAAP in December 2003. The inventory identified two sites as eligible for the MMRP: Old Kellar Test Range (MSAAP-001-R-01) and the Spin Launch Site (MSAAP-002-R-01). (Malcolm Pirnie 2003)

<u>Old Kellar Test Range</u>

Old Kellar Test Range is in the central portion of MSAAP and covers approximately 54 acres. This test range, while within the MSAAP boundary, was not used by MSAAP as part of their mission. A NASA technical support contractor, CSC, conducted a variety of explosives, propellants and pyrotechnics tests for AMCCOM-D at the site from 1969 until August 1980, prior to the establishment of MSAAP. In 1981, these activities were moved to the EMTF. The testing programs are listed below. (NASA 2000)

- Hazard classification tests (transport and storage)
- Trinitrotoluene equivalency tests
- Safe separation tests
- Suppressive/operational shield tests
- Mine neutralization program

- Blending of starter mixtures
- Suppressive structures tests
- U.S. Department of Transportation oxidizer, energy output, and classification tests (using ammonium perchlorate, ammonium nitrate, and rocket propellant)
- Shielding tests
- Other tests as necessary

Testing took place in the northern portion of the range in an approximately 200-square-foot area identified as the Former Kellar Test Range Open Burning/Open Detonation (OB/OD) Ground. Two types of large grain solid propellant have been found on the surface, and there has been evidence of burning at the site. Unknown quantities of explosive items, powder, fuses, and pyrotechnics have been disposed at the OB/OD Ground. In the northeastern portion of the range is a clamshell-lined pit of unknown size identified as Former Kellar Range Disposal Area No. 2, also known as the Acid Neutralization Pit. The pit was used to neutralize sulfuric acid that remained after nitrator studies. Range operators reportedly closed the pit by filling it with the earth originally removed during pit construction. (USAEHA 1988a)

The range also included disposal pits and a scrap metal pile. Materials used in range testing activities were disposed in the pits, identified as Former Kellar Range Disposal Area No. 1. Items disposed of in the pits included packaging and shipping containers, as well as metal fragments that remained after testing. Scrap iron framework from abandoned office trailers and buildings burned after their use at the range was collected at the approximately 2,500 square-foot area identified as the Former Kellar Range Scrap Metal Pile. (USAEHA 1988a)

NASA has completed a number of investigations at the Old Kellar Test Range (Area I in the NASA environmental cleanup program) to further characterize the site and determine cleanup options and costs. A 1990 preliminary assessment recommended sampling and removal of solid propellant residue at the range. A 1993 screening site inspection identified site features such as the concrete pad, OB/OD area, acid neutralization pit, and disposal trenches. A 1997 expanded site inspection included a geophysical study that indicated possible disposal trenches, as well as installation of new monitoring wells. A 1998 supplemental investigation included additional geophysics and excavation of test pits, which found one explosive compound and indications of disposal of burned inert materials. (Foster Wheeler 2003)

NASA finalized the remedial investigation (RI) for this site in 2003 and reported low levels of naphthalene and explosives in shallow groundwater. The RI indicated that no further action (NFA) is required to ensure protection of human health. NASA submitted NFA documentation to MDEQ in October 2003 but has not yet received a ruling (NASA 2005). In 2004, NASA installed fencing around range areas where buried metallic objects were discovered. In addition, NASA has prepared a Phase II potentially responsible party analysis to determine responsibility for investigation and cleanup costs at the Old Kellar Test Range (NASA 2000).

Spin Launch Site

The Spin Launch Site is part of an area known as the 9400 Test Area. The area covers about 63 acres in the southeastern portion of MSAAP. The site was used to perform explosive quality assurance testing of the M42 and M46 grenades, which are loaded in the 155-mm M483 projectile. The area consists of five buildings with associated test barricades (**Figures B-6 and E-11**). The buildings include the main control house (Building 9401), storage house (Building 9402), penetration test control house (Building 9403), spin gun test launch control house (Building 9404), and a guard house (Building 9405). (ESE 1984)

Grenades were launched from Building 9404 towards barricades to test the grenade fuze and arming mechanism. The penetration test consisted of placing grenades on blocks of steel behind test barricades at four individual test stands and detonating them with C-4 explosive to observe penetration through the steel plate. C-4 and blasting caps were stored in Building 9402 for use in the penetration tests (Malcolm Pirnie 2003, AGT DPM 2006). The steel blocks were reportedly removed and sold as scrap in approximately 2000 (MSAAP BTC 2006). During the VSI, most of the barriers were tipped onto the ground and appeared to be rusting. The explosive classification “XXX” was observed on Building 9402 during the VSI.

The area is now undeveloped, fenced with locked gates and security control, and has returned to a natural wooded state. MSAAP personnel indicated there are concerns of potential lead azide contamination at both ends of the test area (AGT DPM 2006). Downed power poles and wires were observed in the 9400 Area during the VSI. According to a 2003 site visit, no evidence was found to indicate an unexploded ordnance (UXO) survey or remediation had been performed over the area (Malcolm Pirnie 2003).

4.2.3 Compliance Cleanup

MSAAP does not currently have any compliance cleanup sites in the Army Environmental Database-Restoration (AEDB-R).

4.2.4 Previous Environmental Investigations

Several environmental surveys and investigations have been conducted for MSAAP from 1975 through 2005. Prior to construction of the facility, an EIS was prepared identifying likely impacts to the environment due to the construction of MSAAP. Subsequent investigations were conducted following construction and prompted by various activities. This section summarizes each of the previous investigations.

1975 Environmental Impact Statement

In 1975, the Army prepared an EIS for MSAAP assessing potential impacts related to the pre-construction, construction, and operation of MSAAP (DA 1975). The document identified impacts associated with the site clearing and grading, and MSAAP construction and operations. Anticipated impacts to plant and animal life during the site clearing were identified. Short-term impacts during construction included disturbed soil cover, noise, solid waste generation, and potential for rain water effects on disturbed or unprotected soil. Long-term impacts included disturbed soil from sanitary landfill operation and use of Pearl River's waste assimilative capacity from discharge of treated domestic waste.

1984 Installation Assessment

An installation assessment (ESE 1984) was conducted on 23-27 October 1983 at MSAAP to determine the presence of any toxic or hazardous materials, especially those that could potentially migrate off site. The document stated that the mechanical plant boilers were not operating in compliance with the air permit; the EMTF disposal pits were not operating in compliance with state, federal, and Army guidelines; and there was no host-tenant agreement with the MSAAP landfill operators. The document also addressed concerns with a NASA/NSTL landfill and chemical waste disposal area that are no longer on MSAAP property. The NASA/NSTL landfill is discussed in **Section 4.8**. Recommendations included the following:

1. Remove the landfill and chemical waste disposal areas from the MSAAP permit and return the areas to NASA;
2. Continue with efforts to bring the emissions from boilers located at Building 9143 (mechanical plant) into compliance with applicable state permit requirements and regulations;
3. Bring the EMTF disposal pits into compliance; and
4. Establish a host-tenant support agreement with the resident office of the Army Armament Research and Development Center, which was the operator of the EMTF.

No field activities were recommended during the installation assessment. USEPA responded that no further action was required (MSAAP 1992).

1988 Evaluation of Solid Waste Management Units

In 1988, the USAEHA performed an evaluation of SWMUs (USAEHA 1988a). The 13 SWMUs identified in the evaluation and their recommendations are summarized in **Table 4-10**.

TABLE 4-10
1988 MSAAP SWMUs

Site No.	Unit Name	Unit Type	Recommendations
MSAAP-001	Sanitary Landfill	Landfill	Sample groundwater and surface water for hazardous waste.
MSAAP-002	Former Kellar Range: Disposal Area 1	Landfill	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.
MSAAP-003	Former Kellar Range: Disposal Area 2	Waste treatment	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.

TABLE 4-10 1988 MSAAP SWMUs			
Site No.	**Unit Name**	**Unit Type**	**Recommendations**
MSAAP-004	Former Kellar Range: OB/OD Ground	Waste treatment	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.
MSAAP-005	Former Kellar Range: Scrap Metal Pile	Waste pile	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.
MSAAP-006	EWI	Waste treatment and incinerator	None
MSAAP-007	CWP	Waste treatment and incinerator	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.
MSAAP-008	SWTP	Wastewater treatment unit	Sample drying bed sludge for hazardous waste and dispose of properly.
MSAAP-009	IWTP	Wastewater treatment unit	None
MSAAP-010	CWP Wastewater Treatment Unit	Wastewater treatment unit	Sample outflow for hazardous waste constituents before discharge.
MSAAP-011	Drum Storage Area (90-day)	Container storage	Sample soil, wastes, and groundwater for hazardous waste. Cleanup and dispose of waste appropriately.
MSAAP-012	Temporary Drum Storage Area	Container storage	Sample and identify contents of unlabeled drums. Construct containment berm around site perimeter. Seal concrete surface and construct cover over storage area.
MSAAP-013	IWTP Drum Handling Area	Transfer station	Sample surface sediment on asphalt for hazardous waste constituents. Construct containment berm around drain(s).

As a result of subsequent sampling by USAEHA, only two areas warranted further investigations. These areas included the sanitary landfill (SWMU 1) and the Old Keller Test Range (SWMUs 2, 3, 4, and 5). Core drilling and ground water sampling were conducted at both sites. No contamination was found in the groundwater, but propellant was found on the surface at the range. This report was submitted to USEPA and MDEQ; however, no response was received (MSAAP 1992).

Preliminary Assessment for Stennis Space Center

This assessment was initiated by NASA during 1990 and included MSAAP since the property is on NASA-owned land. Two potential contaminated sites were identified, including the Old Kellar Test Range (SWMUs 2 through 5) and Shorty's Bar (SWMU 13). According to a 1992 memorandum, the detailed description in the assessment pertains to Shorty's Residence (Building 8302), and NASA has agreed that the area in question is in fact Shorty's Residence (MSAAP 1992). NASA also performed sampling in 1992 at the Old Kellar Test Range and at Shorty's Residence (Building 8302). No report was prepared following the sampling (MSAAP 1992).

1990 Weston Survey

This survey identified 46 potentially contaminated sites and served as the basis for data used in the Defense Environmental Restoration Program Annual Report to Congress. Thirteen of the 46 sites were in the 1988 USAEHA evaluation of SWMUs (USAEHA 1988a). The report does not include Shorty's Residence, which was identified in the 1990 NASA report. USATHMA indicated that a DD should be developed for each of these sites (MSAAP 1992).

1990 Environmental Baseline Survey for Building Outgrants

This survey (MSAAP 1990a) was conducted to assess the environmental status of MSAAP Buildings 9110, 9112, 9138, 9313, and 9322 for potential outgrant. There were no significant environmental remedial actions required and no environmental concerns associated with the buildings that would oppose outgrant.

1993 Draft RCRA Facility Assessment

The draft RFA conducted in September 1993 (ATK 1993) presented the results of a preliminary review and VSI. The RFA resulted in the identification of 29 SWMUs and one area of concern (AOC). Additional investigations were recommended for seven of the SWMUs and for the AOC; NFA was recommended for the remaining 22 SWMUs. Areas requiring further investigation for potential releases of contamination included the sanitary landfill, the CWP and associated equipment, the IWTP, three SAAs (CWP SAA, EWI SAA, and the forge lube SAA), a drum processing area, vehicle wash rack, coal pile runoff pond, and a test range detonation area. Potential release pathways included air, groundwater, soil, subsurface gas, and surface water.

Descriptions of the seven SWMUs (the three SAAs are listed under one SWMU number as 14A, 14B, and 14C) and one AOC are provided below. **Table 4-11** presents the identified AEDB-R sites (described in **Section 4.2.1)** and SWMUs/AOCs at MSAAP. USEPA submitted a draft report to MDEQ in 1994 suggesting select sampling on the designated areas. There had been no response or directives from the state agency since submittal of the report. No sampling in response to the RFA recommendations was performed by USEPA, but USACHPPM completed an RRSE in 1997 that included sampling at six of the SWMUs and the AOC identified in the RFA as needing additional study (USACHPPM 1997). The RRSE is described below following the SWMU descriptions.

TABLE 4-11 IDENTIFIED AEDB-R SITES AND SWMUs			
AEDB-R Site Number[1]	**AEDB-R Site Name[1]**	**SWMU Number[2]**	**EPA Site Name[2]**
MSAAP-001	MSAAP Active Sanitary Landfill	SWMU 1	Sanitary Landfill
MSAAP-002	Former Kellar Range Disposal Area 1	SWMU 2	Former Keller Range Disposal Area No. 1
MSAAP-003	Former Kellar Range Disposal Area 2	SWMU 3	Former Keller Range Disposal Area No. 2
MSAAP-004	Former Kellar Test Range OB/OD Ground	SWMU 4	Former Keller Range OB/OD Ground
MSAAP-005	Former Kellar Range Scrap Metal Pile	SWMU 5	Former Keller Range Scrap Metal Pile
MSAAP-006	EWI	SWMU 6	EWI and Equipment
MSAAP-007	CWP	SWMU 7	CWP and Equipment
MSAAP-008	MSAAP Sanitary STP	NA	NA
MSAAP-009	Industrial Wastewater STP	NA	NA
MSAAP-010	CWP Wastewater Treatment Facility	NA	NA
MSAAP-011	Drum Storage Area Hazardous Waste	SWMU 9	Building 9157 Waste Storage Area
MSAAP-012	Drum Storage Area	NA	NA
MSAAP-013	IWTP Drum Handling Area	SWMU 15	Drum Processing Area
MSAAP-014	PMPT Area	NA	NA
MSAAP-015	CMPT Area	NA	NA
MSAAP-016	LAP Area	NA	NA
MSAAP-017	Former Steam Plant	NA	NA
MSAAP-018	CEC Laboratory	NA	NA
MSAAP-019	QA Laboratory Buildings #9100, 9101	NA	NA
MSAAP-020	FGD Lab	NA	NA
MSAAP-021	LAP Laboratory	NA	NA
MSAAP-022	Maintenance Area	NA	NA
MSAAP-023	Indoor Test Facility (9400 Area)	NA	NA
MSAAP-024	Flammable Materials Building	NA	NA
MSAAP-025	600 Area Igloos (30)	NA	NA
MSAAP-026	LAP 300 Area Igloos (9)	NA	NA
MSAAP-027	500 Igloos (6)	NA	NA
MSAAP-028	Aboveground Petroleum Storage Tanks	NA	NA
MSAAP-029	Aboveground Solvent Storage Tank (1) at Tank Farm	NA	NA
MSAAP-030	USTs (3)	NA	NA
MSAAP-031	LAP A300 Area Sumps (18)	NA	NA
MSAAP-032	Flammable Materials Building #9311	NA	NA

TABLE 4-11
IDENTIFIED AEDB-R SITES AND SWMUs

AEDB-R Site Number[1]	AEDB-R Site Name[1]	SWMU Number[2]	EPA Site Name[2]
MSAAP-033	ASTs -(1) 15,000 Gallon, (1) 7,500 Gallon	NA	NA
MSAAP-034	Oil Separator-7,000 Gallon	NA	NA
MSAAP-035	Waste Accumulation Area	NA	NA
MSAAP-036	Former Coal Runoff Basin (313,800 Gallon Capacity)	SWMU 25	Coal Pile Runoff Pond
MSAAP-037	Mobile Tote Tanks (38)	NA	NA
MSAAP-038	Septic Tank/Leachfield (7)	NA	NA
MSAAP-039	Scrap Metal Wash Area	NA	NA
MSAAP-040	Vehicle Wash Rack	SWMU 19	Vehicle Wash Rack
MSAAP-041	Vehicle Wash Area-Landfill	NA	NA
MSAAP-042	Former Drum Storage Area	NA	NA
MSAAP-043	Lift Station (5)	NA	NA
MSAAP-044	ASTs (6) (Inactive)	NA	NA
MSAAP-045	Construction Materials Landfill	NA	NA
MSAAP-046	Spill Area (Chromium)	SWMU 8	IWTP
MSAAP-047*	CWP SAA	SWMU 14A	CWP SAA
MSAAP-048*	EWI SAA	SWMU 14B	EWI SAA
MSAAP-049*	Forge Lube SAA	SWMU 14C	Forge Lube SAA
MSAAP-050*	Test Range Detonation Area	AOC A	Test Range Detonation Area
NA	NA	SWMU 10	EWI Dumpster
NA	NA	SWMU 11	Paint Spray Booth and Pollution Control Equipment
NA	NA	SWMU 12	Waste Solvent Tank
NA	NA	SWMU 13	Freon Still
NA	NA	SWMU 14D	Fiberglass SAA
NA	NA	SWMU 14E	Waste TCE Degreaser SAA
NA	NA	SWMU 14F	Paint Mix Room SAA
NA	NA	SWMU 14G	Paint Filter SAA
NA	NA	SWMU 14H	Vehicle Maintenance SAA
NA	NA	SWMU 14I	Former Vehicle Maintenance SAA
NA	NA	SWMU 16	Carbon Treatment Facility
NA	NA	SWMU 17	Outdoor Carbon Treatment Facility Holding Water Tanks
NA	NA	SWMU 18	Process Wastewater Collection Sumps
NA	NA	SWMU 20	Portable Carbon Treatment Unit

TABLE 4-11 IDENTIFIED AEDB-R SITES AND SWMUs			
AEDB-R Site Number[1]	**AEDB-R Site Name[1]**	**SWMU Number[2]**	**EPA Site Name[2]**
NA	NA	SWMU 21	Acetone Recovery Still
NA	NA	SWMU 22	Off-Specification Igloo
NA	NA	SWMU 23	Former Scrap Metal Storage Area
NA	NA	SWMU 24	Stormwater Sewer System
NA	NA	SWMU 26	Former Coal-Fired Steam Generation Plant Pollution Control Equipment
NA	NA	SWMU 27	Forge Area Oil/Water Separator
NA	NA	SWMU 28	Scrap Metal Storage Pad
NA	NA	SWMU 29	IWTP Sludge Collection Bin

NA = not applicable (not all AEDB-R sites have corresponding SWMU or EPA Site Names).
[1]MSAAP 2006
[2]ATK 1993
*Recommended AEDB-R Site Number and Name.
Sources: ATK 1993, USACHPPM 1997, MSAAP 2006
Note[1]: AEDB-R Site Numbers MSAAP-001 through MSAAP-046 were "Response Complete" in August 1990.

Sanitary Landfill (SWMU 1)

This unit occupied approximately 33 acres east of Andrew Jackson Road. Bound on the northeast by Kellar Road, the landfill is comprised of six cells. The landfill operated from 1983 to 1994 under MDEQ Solid Waste Management Permit Number SW02301B0289. The permitted landfill was designed for non-hazardous waste and was clean closed in 1997. An estimated 91,300 cubic yards of industrial waste was disposed of at the landfill. Waste that was managed at the landfill included paper, cardboard, pallets, general trash, wood, metal, dry sewage sludge, and possibly ash from the CWP (SWMU 7). Empty aerosol spray cans were also reportedly visible at the landfill during the RFA investigation.

The unit was designed to release leachate to a runoff collection system. Ditches around the landfill reportedly appeared to be discharge zones for the groundwater and leachate. In 1994, groundwater was measured at approximately 3 feet bgs in some areas of the landfill. Although some groundwater sampling had been conducted and results indicated the presence of no contaminants in excess of the drinking water standards, confirmatory sampling was recommended at the time of the RFA. The RFA was conducted prior to landfill closure.

Contaminated Waste Processor and Equipment (SWMU 7)

This unit included the CWP and associated pollution control equipment, including a gas washer, cyclone, and baghouse. The location and operation of the CWP is described in **Section 3.3.2**. According to the 1993 draft RFA, dust was observed on surface soil surrounding the concrete floor. Although the equipment appeared to be in good condition and no cracks in the concrete were observed, the 1993 draft RFA recommended confirmatory sampling of the unit.

Industrial Wastewater Treatment Plant (SWMU 8)

The IWTP is located in the southeastern portion of the 9100 Area and consists of 49 aboveground storage and process tanks and equipment used to move the wastewater through the system. The wastewater is stored, the pH is adjusted, and sludge is removed. The dried sludge is collected in a sludge collection bin (SWMU 29). Prior to 27 October 1989, when the sludge was delisted as a hazardous waste (Auger 1989), the sludge was shipped off-site for disposal at a hazardous waste site. Confirmatory sampling of the IWTP was recommended in the RFA. Additional details regarding the IWTP, including the 1985 chromium-contaminated wastewater spill, are provided in **Section 3.4.2.2**.

Satellite Accumulation Areas (SWMU 14A-14C)

This SWMU consists of three temporary drum storage areas for the CWP, the EWI, and the forge lube area. At each of these sites, wastes were accumulated in 55-gallon drums and then transported to the Building 9157 waste storage area (SWMU 9 in the RFA, NFA recommended). Wastes included ash from the EWI and CWP processes, contaminated wastewaters, paint, and solvents.

The CWP SAA (SWMU 14A), which was operational from 1984 to 1992, was a 7-by-10-foot outdoor area with asphalt cover and surrounded by soil. A storm sewer drainage ditch is located approximately 10 feet to the south of the SAA. Waste included ash from the CWP and contaminated rags until 1990 and steel parts (for flashing) after 1990. Asphalt cracking and drum ring stains were noted in the RFA.

The EWI SAA (SWMU 14B), which was operational from 1985 to 1992, was an 8-by-10-foot outdoor area with asphalt cover and surrounded by soil. A storm sewer drainage ditch is located approximately 10 to 15 feet north of the SAA. Waste included cadmium ash from the EWI. Asphalt cracking and drum ring stains were noted in the RFA.

The forge lube SAA (SWMU 14C) was operational from 1983 to 1990 and stored drummed waste from the ESP forge shop. This unit is designated as Facility 9117 and located south of Building 9100 and north of Building 9101. The unit is a concrete pad surrounded by concrete and covered by an aluminum roof. This unit stored contaminated wastewater from the closed loop system ESPs. Cracked concrete and staining were noted in the RFA.

Drum Processing Area (SWMU 15)

This unit consists of a drum wash area and associated sump located south of the IWTP (SWMU 8) in the 9100 Area. The wash area had been used since the early 1980s. The unit is constructed of concrete and covered by steel grates, and concrete surrounds the unit. According to the RFA, the unit was originally 6 to 8 feet deep, but has since been filled with concrete to about 1.5 ft bgs, with the exception of the 4-foot deep sump in the northeast corner.

Drums from the entire MSAAP facility were cleaned at this unit and wash water was collected in the sump. The wash water was processed at the IWTP (SWMU 8) and the cleaned drums were crushed. Prior to 1992, the crushed drums were used as scrap metal; from 1992 to 1997 the drums were reportedly disposed of at the sanitary landfill (SWMU 1).

Wastewater and drum residues from the activities at this unit may include such materials as oils/lubricants, solvents, acetone, or acids. During the RFA site visit, heavy staining and sludge at the bottom of the sump were observed. Soil sampling around the perimeter of the unit and integrity testing of the sump were recommended in the RFA.

Vehicle Wash Rack (SWMU 19)

According to the RFA, this SWMU had been a wash pad for MSAAP and Navy vehicles since 1988. The unit is a concrete wash pad located along the eastern edge of the 9100 area, north of the IWTP. There are 5-foot walls along the north, west, and south sides of the pad, and a ramp similar to a loading dock is located on the east side. A drain is located at the base of the unit on the west side. The wash water drains to a sump and is then treated at the IWTP. During the RFA, stressed vegetation was noted. The pad was also reportedly used as a waste drum storage area prior to 1988. Confirmatory sampling was recommended in the RFA.

Coal Pile Run-off Pond (SWMU 25)

This SWMU is located along Andrew Jackson Road, east of Building 9100 near a drainage field. The pond was south of the coal conveyer system and is currently overgrown with vegetation. The run-off pond was lined and collected surface runoff from coal piles used for the coal-fired steam plant. The water was pumped to the IWTP for treatment. The SWMU was also used for "emergency transfer waste." Specifically, a dilute solution of soda ash and lime with pH values between 9.5 and 10.0 was pumped from the mechanical plant in July 1985. According to the RFA, the run-off pond historically overflowed during heavy rainfall. Confirmatory sampling was recommended in the RFA.

Test Range Detonation Area (AOC A)

This AOC is a grenade detonation area, also known as the penetration test area, located in the western half of the 9400 Test Area. The area consists of four outdoor test areas where grenades were detonated. During the RFA site visit, dust and residues were observed on the surrounding soil. The RFA recommended confirmatory sampling as this unit potentially contains explosive materials. This area is further described in **Section 4.2.2**.

Findings for the Former Hancock Bombing and Gunnery Range

This archives search report was prepared by USACE under the Defense Environmental Restoration Program for Formerly Used Defense Sites (USACE 1995). It identified two bombing ranges, the west bomb range and the high altitude bomb target, that are partially in MSAAP. The results of the archive search report are described further in **Section 3.3.4**.

1997 Relative Risk Site Evaluation

USACHPPM completed an RRSE in 1997 (USACHPPM 1997) to assess previously uninvestigated sites at MSAAP that were eligible for the Army environmental restoration program. The evaluation was conducted according to the RRSE guidelines as defined by the Army, and data generated during this assessment was for environmental restoration program management purposes only. The USACHPPM defined the data as minimal Level III and specifically excluded the data from being used as evidence of presence or absence of contamination or to support any quantitative health risk assessment.

Of the 30 sites (29 SWMUs and one AOC) identified during the 1993 RFA, further action was recommended at eight of the sites. One of the eight sites is the MSAAP Sanitary Landfill (SWMU 1), which has undergone closure since the RFA was completed, and another of the sites consists of three actual management units (SWMUs 14A, 14B, and 14C). The nine remaining sites evaluated during the RRSE are described below. The RRSE reported that USEPA and MDEQ have both verbally agreed to the conclusions in the RFA, but there had been no written verification of the agreement. No written verification of this agreement was identified during the VSI records search.

Contaminated Waste Processor and Equipment (SWMU 7)

The RFA identified process dust in soil surrounding CWP pollution control equipment and recommended confirmation sampling for SWMU 7. USACHPPM collected three surface soil samples around the concrete pad that contained the pollution control equipment and analyzed them for metals and explosives. Surface soil sampling results for cadmium (170 milligrams per kilogram (mg/kg)) and iron (100,000 mg/kg) exceeded USEPA Region 9 preliminary remediation goals (PRGs). All other sample results were below PRGs.

Industrial Wastewater Treatment Plant (SWMU 8)

USACHPPM collected three soil samples from around the perimeter of the chromium-contaminated wastewater spill site at a depth just below the depth of the failed containment (36 to 42 inches) and analyzed them for metals. All sample results were below PRGs. The RRSE stated that this sampling effort was not sufficient to accomplish the additional sampling requested by USEPA and MDEQ to confirm that the levels of chromium in groundwater were acceptable, only to score the site for future funding prioritization.

CWP SAA (SWMU 14A)

The RFA identified asphalt cracking and rings from drums at SWMU 14A and recommended confirmation sampling. USACHPPM collected three surface soil samples from surrounding soils and analyzed them for metals, explosives, and semi-volatile organic compounds (SVOCs). All sample results were below PRGs.

EWI SAA (SWMU 14B)

The RFA reported cracked asphalt, staining, and rust rings from drums at SWMU 14B and recommended confirmation sampling. USACHPPM collected three surface soil samples from surrounding soils and analyzed them for metals, explosives, and SVOCs. All sample results were below PRGs.

Forge Lube SAA (SWMU 14C)

SWMU 14C received waste, primarily wastewaters deemed contaminated, from the forge shop. The RFA identified cracked concrete and staining from leaking drums. USACHPPM collected two surface soil samples at a gap between the concrete pad and surrounding asphalt pavement and analyzed them for metals and SVOCs. All sample results were below PRGs.

Drum Processing Area (SWMU 15)

SWMU 15 is a bermed concrete pit used to process drums from throughout MSAAP. The RFA identified cracked heavy staining of the concrete surrounding the unit and cracks the corner of the associated sump. USACHPPM collected two surface soil samples at a gap between the pit and surrounding pavement and analyzed them for metals, explosives, and SVOCs. All sample results were below PRGs.

Vehicle Wash Rack (SWMU 19)

SWMU 19 was used as a wash rack for MSAAP and Navy vehicles. Prior to 1988 the area reportedly was used to store waste drums with unknown contents. USACHPPM collected two surface soil samples at gaps in the pavement and analyzed them for metals and SVOCs. All sample results were below PRGs.

Coal Pile Run-off Pond (SWMU 25)

SWMU 25 collected surface water runoff from the coal pile during the early 1980s. SWMU 25 also was used during the emergency transfer of wastes from the IWTP while a tank was being refurbished. USACHPPM collected seven surface soil and two subsurface soil samples and analyzed them for metals and SVOCs. All sample results were below PRGs.

Test Range Detonation Area (AOC A)

The penetration test facility is located in the western half of the parcel. The draft RFA identified dusts and residues on the soil surrounding the test stands. USACHPPM collected ten surface soil samples and two groundwater samples and analyzed them for metals and explosives. Surface soil sampling results for copper (25,000 mg/kg) and iron (24,000 mg/kg) exceeded PRGs. All other sample results were below PRGs.

1997 Environmental Assessment for Leasing Space

An EA was conducted in 1997 (MTI 1997) to evaluate the potential environmental impacts caused by leasing space and equipment to businesses listed as SQG and CESQGs. The assessment was performed based on the tenants' actions and intent. Following the assessment and evaluation, a Finding of No Significant Impact (FONSI) was issued.

Building 9101 Phase II Environmental Assessment

A Phase II EA for Building 9101 was conducted in December 1998 (EMCON 1998b) following the recommendations of a Phase I environmental site assessment (ESA) conducted in March 1998 (EMCON 1998a). TCE was detected in four groundwater samples at levels ranging from 2 micrograms per liter (µg/L) to 180 µg/L. These detections suggest that a prior release occurred at the site. Due to the locations of the contaminated groundwater samples, it is unclear as to the potential origin or complete area of impact of the detected contamination. A TCE recovery unit was previously used in the building. No soil samples contained levels of volatile organic compounds (VOCs) or SVOCs above the method reporting limit (MRL). High levels of petroleum hydrocarbon residues, lead, and chromium were present throughout the interior of the building. No PCBs were detected above the MRL in the transformer oils sampled.

Based on the Phase II EA findings, additional investigations were recommended (EMCON 1998b). A review of available records and documents indicated no additional investigations were conducted at Building 9101.

Building 9115 Environmental Baseline Investigation

An environmental baseline investigation of Building 9115 was conducted in April 2005 (EarthCon 2005) to investigate the history of the site and determine if the previous property use had impacted soil and groundwater. Chloroform, 1,2,4-trimethylbenzene, and naphthalene were detected in the groundwater on the south side of Building 9115 at concentrations exceeding the MDEQ Tier 1 target remediation goals (TRGs). The Tier 1 TRGs are generic, conservative risk-based action levels. The report recommended submitting the report to MDEQ for review, sampling the identified water supply well for VOCs, and evaluating the availability of an alternate source of potable water or installation of point-of-use treatment for building usage.

4.3 HAZARDOUS SUBSTANCES

Hazardous substances have been stored, used, and generated at MSAAP since the early 1980s when production began. Small quantities of hazardous substances, including but not limited to solvents, fuels, and insecticides, are currently stored in flammable cabinets throughout the facility. According to a Tier Two Emergency and Hazardous Chemical Inventory dated 3 April 2001, large quantities (greater than 100 pounds) of chlorine (CAS No. 7782-505), sulfuric acid (CAS No. 7664-939), and sodium hydroxide (CAS No. 1310-732) have also been present at MSAAP. These materials have been used in the industrial and solid waste treatment plants and been stored at Building 9145, which is the central flammable storage building. Liquid chlorine has also been stored at the water well pump houses, Buildings 9123 and 9124. (MSAAP 2001)

Historically, MSAAP handled and stored hazardous materials, including PCBs, various chemicals, explosives, and radiological materials. In support of specific missions during production activities, a large variety of potentially toxic/hazardous chemicals, including acids, bases, and flammable organic solvents, were stored at a central storage facility, Building 9145. Various explosive compounds were stored at Buildings 9604 through 9633 (storage igloos). (ESE 1984)

Hazardous substances, including cutting fluids/oils and solvents, were used in processes such as forge press, heat treatment, machining, coloring/stenciling, and cleaning/rinsing. Freon 113®, TCE, ethylene glycol, hexavalent chrome, alkaline cleaner, cutting coolants, and paints were used for specific processes at the PMPT and CMPT buildings (AGT DPM 2006). A complete inventory of chemicals (MCI 1989a) used at MSAAP during 1987 and 1988 is provided in **Appendix I**. Hazardous wastes generated between 1987 and 1998 from MSAAP processes and from maintenance and layaway activities include F001, F002, F003, F005, F019, D001, D002, D003, D004, D005, D006, D007, D009, D0018, D035, D039, D040, K045, and U226. In 1989, the F019 wastewater treatment sludge from chemical conversion coating of aluminum was delisted as per the Federal Register 43818 (Auger 1989). The 1983 hazardous waste report (MDNR 1984) listed the waste materials as "corrosive material" and "combustible liquid."

Hazardous substances have been containerized in 55-gallon drums, USTs, and ASTs at MSAAP. Three regulated USTs containing motor fuels and three unregulated USTs containing heating oil were identified on MSAAP in a 1990 summary table of active USTs (MSAAP 1990b). USTs and ASTs and their contents are discussed in **Section 4.1.3**. Four historical waste storage areas were evaluated in the 1997 RRSE. These areas included: the CWP Satellite Accumulation Area (SWMU 14A); EWI Satellite Accumulation Area (SWMU 14B); Forge Lube Satellite Accumulation Area (SWMU 14C); and Drum Processing Area (SWMU 15) (USACHPPM 1997). Additional information regarding the results of the RRSE is included in **Section 4.2.1**.

4.4 PETROLEUM AND PETROLEUM PRODUCTS

According to facility personnel, there are currently no active USTs used for the storage of petroleum products at MSAAP (USASMDC 1999, AGT DPM 2006). Historically, six known USTs were utilized at the facility to store gasoline and diesel fuel for vehicle and building-heating purposes (USACE 1989). Confirmation sampling was completed during the removal of all of the tanks (AGT DPM 2006); however, documentation from MDEQ confirming the approved removal of only three of the USTs (Building 9114 tanks) was identified during the VSI. Additional information regarding the USTs is provided in **Section 4.1.3.2** of this report.

According to the MSAAP spill prevention, control, and countermeasures (SPCC) plan, current above ground storage of petroleum products at MSAAP includes tanks, drums, and totes containing diesel fuel, used oil, used heating, ventilation and air conditioning oil, hydraulic oil, and miscellaneous lubricants (AGT 2006). Minimal quantities of phosphate ester and precipitator oils associated with previous manufacturing activities may also be present in several decommissioned ASTs located within the MSAAP tank farm (Facility 9164). Additional information regarding the ASTs at MSAAP is provided in **Section 4.1.3.1** of this report.

Petroleum-based products were utilized in numerous manufacturing processes at MSAAP. These products included hydraulic fluids, engine fuels, non-PCB-containing transformer oils for the operation of ESPs, and cutting fluids, among others. Buildings 9100 and 9101 were equipped with below-grade cooling pits and conveyer systems that were filled with cutting fluids and coolants. Recovered fluids were recirculated throughout the buildings or transferred from blind sumps to the IWTP through overhead piping. The majority of the pits, sumps, and trenches are constructed of concrete, and cracks in or saturation of the concrete may have resulted in the release of petroleum products to subsurface. The release of petroleum products to the ground surface also occurred during material handling and transfer activities (AGT DPM 2006).

A review of petroleum-related releases identified in the MSAAP SPCC indicates that between 1991 and 2005 the following petroleum releases were reported (MSAAP 2006):

- Approximately 3 gallons of diesel-contaminated wastewater was spilled and exposed to stormwater at the IWTP on 12 January 1993. Changes were implemented in IWTP operational procedures to prevent similar releases in the future.
- Approximately 5 gallons of hydraulic fluid-contaminated water were released from the landfill through Outfall 014 on 15 April 1996. The release was contained and remediated.
- Approximately 200 gallons of diesel fuel were released in the vicinity of Building 9158 during Hurricane Katrina response activities by FEMA. The petroleum-impacted soils were reportedly removed and disposed of off site. Incident management and oversight was provided by NASA during the spill response effort and subsequent restoration activities. Incident reports generated by stakeholders involved with the cleanup activities following the release were available for review. A comprehensive summary of the remedial activities was reportedly prepared but not available for review (AGT DPM 2006, MSAAP BEC 2006). This spill was completely managed by FEMA and NASA, and as such, is not under the control of MSAAP.

In addition to the reported petroleum releases identified in the MSAAP SPCC, a review of readily available spill records for the period between 1985 and 1990 and VSI interviews indicate that petroleum releases that did not require notification of MDEQ or USEPA occurred throughout the facility during that time (AGT DPM 2006). The majority of spills involved the release of minor quantities of fuels and lubricants that were remediated by MSAAP staff. Numerous minor spills were reported within, and around, the motor pool and maintenance shop (Building 9114) (AGT DPM 2006).

Repair and maintenance activities that generate waste oils are primarily completed in Building 9114 and several tenant spaces, including Buildings 9101 and 9166. Waste oils typically consist of engine oils and hydraulic fluids. Waste oils are temporarily stored in each facility in totes or drums prior to transfer to Building 9157. An outside contractor removes waste oils from MSAAP. Staining was observed during the VSI on the floors surrounding the waste oil storage area in Building 9114.

4.4.1 Polychlorinated Biphenyls

Electrical transformers containing PCBs are reportedly not present at MSAAP (ESE 1984, AGT DPM 2006). Three transformers suspected of containing PCBs were identified in 1985 (MCI 1985b). These transformers were reportedly removed from the site; however, documentation related to the transformer's disposition was not available. The remainder of the oil-containing transforming equipment at MSAAP was declared to be PCB-free in 1986 (MCI 1986). There is no record of PCB sampling being completed at MSAAP and a comprehensive inventory of oil-containing electrical equipment, or suspected PCB-containing equipment, has reportedly never been completed.

A number of electrical transformers were observed during the VSI. The transformers included equipment presently in service and transformers stockpiled in Building 9143, west of Building 9158, north of Building 9505, and east of Building 9506. None of the transformers were marked with signage stating if the transformers contained PCBs. Except for one transformer at Building 9505, there was no evidence of leaks or stains around any of the observed transformers; however, an abbreviated listing of transformers dated July 1996 within the available MSAAP environmental records indicated that at least one transformer located in the Weaver Yard area was leaking at that time (MTI 1996).

Several pole-mounted electrical transformers were observed on the ground during the VSI north of the Shorty's Bar area. The poles on which the transformers had been mounted were damaged during Hurricane Katrina. The transformers were not closely inspected due to the presence of downed power lines in the general vicinity of the equipment.

4.5 ASBESTOS-CONTAINING MATERIALS

Suspected asbestos-containing material (ACM), including thermal system insulation (TSI), floor tile, ceiling tile, and roofing materials, were identified during the VSI in buildings throughout the 9100 Area. Suspected ACM observed during the VSI included damaged TSI on the floor of Building 9101 in several locations. Some of the suspected ACM observed during the VSI, including TSI and ceiling tiles, may be considered friable. The majority of the observed suspected ACM appeared to be intact and did not, at the time of the VSI, appear to represent a potential human health risk. The suspected ACM debris observed on the floor of Building 9101 has the potential to be disturbed and generate airborne asbestos fibers. MSAAP has requested funding for a facility-wide asbestos survey since 1992; however, as of 2005, funding had not been appropriated (AGT DPM 2006).

Known ACM has been identified in at least two facilities at MSAAP: Building 9101 and Building 9110 (AGT DPM 2006). A summary of the ACM identified in each facility is provided below.

- Approximately 340 linear feet of asbestos-containing transite water pipe were removed during renovation activities on the southeast side of Building 9101 in 1999. The majority of piping was removed in complete sections and disposed of at an off-site landfill. Approximately 40 to 60 linear feet of piping in smaller sections and construction site spoils were disposed of on MSAAP property immediately northwest of the intersection of Moses Cook Road and Flat Top Road. Laboratory analysis of asbestos samples collected from piping disposed on site indicated that the piping contained approximately 31 percent, by weight, asbestos. Approximately 40 to 50 feet of the transite pipe sections were removed by asbestos-trained workers and disposed of at an off-site facility; smaller pieces may remain mixed with the construction spoils (MTI 1999). Transite piping is regarded as non-friable.

- Johnson Controls, Inc. completed an asbestos survey in Building 9110 in 1997. The building materials surveyed included ceiling tiles, flooring, and accessible TSI. Laboratory analysis indicated that approximately 250 square feet of asbestos-containing vinyl floor tile were located within Room 158 of the building (Johnson Controls 1997). The asbestos-containing floor tile was removed from the building in approximately 1998 (AGT DPM 2006). Documentation related to the asbestos-removal activities was not available for review.

In addition to the asbestos materials identified in Buildings 9101 and 9110, the Navy encountered asbestos-containing roofing materials during the renovation of Building 9324. Miscellaneous ACM was also encountered at Buildings 9302 and 9323. The ACM was abated and transported to a permitted landfill for disposal (NAVOCEANO ESHO 2006).

4.6 LEAD AND LEAD-BASED PAINT

Lead-based paint (LBP) is known to exist, at a minimum, in Buildings 9100 and 9101 at MSAAP. A comprehensive facility-wide LBP survey has not been completed. NASA reportedly completed a LBP survey of Building 9100 in 2005. The survey was completed to determine the availability of MSAAP buildings for potential use as temporary emergency housing (AGT DPM 2006). A copy of the survey report was not available for review.

The MSAAP water tower has been repainted twice since it was constructed. No containment was used during the first repainting in approximately 1991, and results of containment sampling from repainting in approximately 2003 were not available for review.

Historically, lead-acid battery charging stations were located in Buildings 9100, 9101, 9114, 9322, 9325, and 9600. The charging stations in Buildings 9322, 9325, and 9600 have been removed. The Navy removed the charging stations in Buildings 9322 and 9325 in support of on-going naval operations in those buildings (AGT DPM 2006). The battery charging stations in Buildings 9100, 9101, and 9114 remain intact. The intact charging stations are configured with trench drains or sumps beneath, or directly adjacent to, the battery/vehicle storage areas. Surface staining of the drain and sump basins was observed during the VSI.

Lead-acid batteries associated with the uninterrupted power supply (UPS) for the IWTP are located in Building 9148. The system consists of a series of 30 dry-cell batteries stored in a battery storage rack in the treatment system control building. A UPS system was located in Building 9110; however, the system was removed in approximately 1998 when the Navy began utilizing the building (AGT DPM 2006). The Navy presently utilizes a large quantity of lead-containing dry-cell batteries in support of its ongoing mission at the 9300 Area (NAVOCEANO ESHO 2006).

4.7 RADIOACTIVE MATERIAL

No radioactive materials, sealed sources, or contamination from use of radioactive materials are known to be currently present at MSAAP. Radioactive sources historically held at MSAAP are described in **Section 4.1.7**.

4.8 HISTORICAL LANDFILLS/DUMPS

The MSAAP sanitary landfill (SWMU 1) occupied approximately 33 acres east of Andrew Jackson Road for disposal of general refuse generated throughout the facility. Closure geotechnical investigations determined the fill area to be approximately 11 acres in size (WLF 1996). The landfill began operating in 1983 under MDEQ permit number SW02301B0289. Waste materials placed in the landfill consisted primarily of construction debris, but also included plastic, paper, metal, glass, and calcium sulfate-based FGD sludge, as well as a small percentage of putrecible waste. The landfill received no waste after 14 March 1994 (WLF 1995). In a letter dated 24 March 1997, MDEQ indicated the site appeared to have been covered and closed in compliance with applicable state regulations (MDEQ 1997). The sanitary landfill is further described in **Section 4.2.4**.

A rubbish disposal area operated near the northern MSAAP boundary west of Flat Top Road. Based on aerial photography, the area appears to have begun operating between 1978 and 1981 (**Appendix E**, **Figure E-3**, **Figure E-4**). The rubbish disposal area received construction debris, including paving materials, from periods of MSAAP construction. The area was covered in the mid-1990s (AGT DPM 2006). No documentation of rubbish disposal area operations was identified during the 2006 ECP; paving materials were observed at the surface during the VSI.

From 1969 to 1980, CSC (a NASA technical support contractor) conducted a variety of explosives, propellants and pyrotechnics tests for AMCCOM-D at the Old Kellar Test Range, a 54-acre area in the central portion of MSAAP (NASA 2000). Several disposal sites associated with range activities were located in this area. These sites included the OB/OD Ground (SWMU 4); Former Kellar Range Disposal Area No. 2, also known as the Acid Neutralization Pit (SWMU 3); Former Kellar Range Disposal Area No. 1 (SWMU 2), where materials used in range testing activities were disposed; and the Former Kellar Range Scrap Metal Pile (SWMU 5) (USAEHA 1988a). These Old Kellar Test Range sites are further described in **Section 4.2.2**.

MSAAP also managed a coal pile run-off pond (SWMU 25) near the IWTP. This pond was lined approximately three years into its operation (NASA OMD 2006) and collected stormwater runoff from the coal pile, which fueled the former coal-fired steam generation plant. SWMU 25 is further described in **Section 4.2.4**.

NASA/NSTL began operating a landfill in 1962 in an area west of Trent Lott Parkway and Leonard Kimball Road. The landfill was within the MSAAP property boundary prior to the return of the area to NASA under an amendment to the irrevocable use permit described in **Section 3.3**. The NASA/NSTL landfill is outside the current MSAAP property boundary (**Figure B-18**). At the time of the 1984 initial installation assessment, the landfill was expected to close by the end of 1985. Items reportedly disposed in the landfill included pesticides and pesticide containers, waste oils, waste solvents, paints and paint thinners, several truckloads of nickel-cadmium and lead-type storage batteries, metal sludges, and waste chemicals from NASA test operations (ESE 1984). Landfill management practices had reportedly not followed regulations (USAEHA 1990). As noted above, this landfill is not on MSAAP property.

4.9 POTENTIALLY EXPLOSIVE CONTAMINATED STRUCTURES

Explosive Classifications

Explosive residues may be present in production areas (buildings, ventilation systems, vacuum systems, sewer lines, dispensing lines) but not yet have been characterized or quantified. Explosives residues may be in specific production buildings such as screening/blending, melt/pour, cooling, pelleting, wash racks, LAP; in ventilation, vacuum, and product distribution system piping; and settling tank systems and sumps. In addition, industrial and sanitary sewer lines, sumps, and settling tanks remaining in the ground have the potential to be contaminated with explosives and/or to have contaminated the surrounding soil. The Army Technical Bulletin 700-4, *Decontamination of Buildings and Equipment* (DA 1978) defines the decontamination levels as:

- 1X indicates that the equipment or facilities have been partially decontaminated and require additional decontamination.
- 3X indicates the equipment or facilities have been examined and decontaminated by approved procedures and no contamination can be detected by appropriate instrumentation, test solutions or by visual inspection on easily accessible surfaces or in concealed housings, and are considered safe for the intended use.
- 5X indicates the equipment or facilities have been completely decontaminated, are free of hazard and may be released for general use or to the general public.
- Zero indicates the item, although located in a contaminated area, was never directly exposed to contamination.

No documentation of formal classification by MSAAP or of explosives decontamination was identified during the ECP process; therefore, facilities with expected explosives use were assigned a “1X” classification.

In addition, MSAAP buildings also underwent a more thorough explosive residue presence classification based upon operations associated with that building. Military Munitions Center of Expertise Interim Guidance Document 06-03, *Buildings and Installed Equipment Containing Explosive Residues that Present Explosion Hazards* (USACE 2006), was used to assign specific production building types with an explosives residue presence classification of “significant” or “limited.” A significant presence classification was assigned to buildings that have operations that can result in extensive migration of explosive contamination in the buildings or the installed equipment. A limited presence classification was assigned to buildings that have a minor potential for release of explosives with no potential to migrate. A "non-suspected" classification was assigned to buildings that had no known explosive operations or storage. The explosive residue classification for MSAAP buildings is presented in **Appendix C**, **Table C-2**.

Load, Assemble, and Pack Area

In the approximately 10-acre LAP area, explosive charges and propellants were loaded into grenades and projectile casings. This process occurred in a semi-automated production line where the explosives were loaded into the grenade then grenades and propellant charges were loaded into the main projectile casing. The munitions were then sealed and palletized for storage or shipment (ESE 1984). The main LAP production area consists of three buildings (9323, 9325, and 9324) in a horseshoe configuration, with Buildings 9323 and 9324 configured as mirror images. Building 9323 reportedly never produced munitions (AGT DPM 2006), but according to an MCI employee involved in LAP Area decontamination the production line was operated for testing the load line, including loading explosives (MCI IAM 2006).

The LAP facility generated industrial wastewaters from floor and equipment wash water, scrubbing of airborne fumes and dust, and from a laundry facility. The wastewaters may have been contaminated with Comp A-5, an RDX-based explosive compound (USACE 1990). Ten sumps were historically located in the LAP 300 area to collect explosive-contaminated wastewater generated during munitions loading operations. All of the sumps have reportedly been cleaned and decommissioned (AGT DPM 2006); however, documents confirming sump cleaning and decommissioning have not been identified. The sumps at Buildings 9323 and 9324 have been filled with sand and capped with concrete (MSAAP BEC 2006). A summary of the sumps located in the LAP area is presented in **Table 4-4**.

The laundry facility and change house was located in Building 9313. At the end of each shift, LAP Area employees were required to change out of their uniforms for them to be laundered (NASA OMD 2006). The laundry area contained commercial-type washing and drying equipment. Laundry wastewater discharged to Sump 9340 where it was tested for explosives before discharge (MSAAP 1990a). Occasional leaks from the washing machines were wiped up or washed to the sump for collection (NASA OMD 2006). If no explosives were detected, the water was discharged to the sanitary sewer system; water contaminated with explosives would be treated by the carbon column system. A 1990 environmental baseline survey reported that no explosives had been detected in laundry wastewater, and that there was no known history or evidence of explosive contamination in the laundry or change house (MSAAP 1990a).

Access to the LAP area was limited during the VSI due to security concerns by NAVOCEANO, the area's major tenant. NAVOCEANO has reportedly removed the majority of the interior structure of Buildings 9323, 9324, and 9325 and is in the process of reconstruction for future use (AGT DPM 2006, NAVOCEANO ESHO 2006). All LAP production equipment was removed prior to NAVOCEANO's work in this area, and the structures were reportedly decontaminated to the "3X" level (AGT DPM 2006, MCI IAM 2006).

The decontamination process reportedly included removing loose explosive powder with a rotoclone, steam cleaning, and wiping surfaces with acetone and/or mineral spirits until a safety officer tested the item as clean (MCI IAM 2006). No decontamination classification markings were visible on LAP structures during the VSI. The VSI identified documents providing procedures for explosive decontamination of equipment and buildings, but did not identify documents confirming explosive decontamination.

The only documented LAP spill identified during the VSI occurred in October 1985 when the fire suppression water deluge system in Bay 122 of Building 9324 accidentally discharged. The deluge system discharged approximately 9,000 gallons of water, with approximately 5,500 gallons exiting the building at the location of Sumps 9336 and 9343. Four 1,200-gallon batches of water were removed from Sump 9343 during cleanup of the water remaining in the building. MSAAP personnel collected samples from the sumps and from ditches outside Building 9324 for RDX analysis. Results ranged from non-detect to 11.55 parts per million (MSAAP 1985). Impacted soils were reportedly excavated and treated in the CWP (MCI IAM 2006). No documentation of cleanup activities was identified during the VSI.

Storage Areas

Bulk explosives and finished projectiles were stored in 30 earth-covered, steel arch-type igloos (Buildings 9604 through 9633). The only identified spill of explosives occurred in Building 9607 when a forklift operator punched a hole in a box causing 70 pounds of Comp A-5 to spill on the floor. The Comp A-5 was immediately swept from the floor (MCI IAM 2006). According to 1993 correspondence from MTI, the floors of the 9600 Area igloos were swept to remove trash and debris as part of decontamination, but since they were never contaminated with explosives they were marked and tagged to indicate a zero contamination level (MTI 1993b).

The interiors of six igloos in the 9600 Area were inspected during the VSI (Buildings 9604, 9608, 9611, 9624, 9628, and 9630). Building 9604 is occupied by NAVOCEANO and holds equipment for their computer projects. The remaining inspected igloos were either empty or being used for storage of inert items such as pallets, pallet racks, empty cabinets, and shelving units, and there were no visible signs of contamination. Eight igloos (Buildings 9605, 9607, 9609, 9611, 9613, 9615, 9617, 9619) occupied by NAVOCEANO for computer media storage/support and four igloos (Buildings 9614, 9616, 9618, 9620) occupied by SBT22 for inert supply storage under tenant agreements were not accessible during the VSI. The remaining 9600 Area igloos are reportedly used for inert storage (AGT DPM 2006). The exteriors of the igloos occupied by NAVOCEANO have well-maintained landscaping with no brush or trees on top of or between the igloos. Two igloos (Buildings 9606 and 9610) are covered by black geotextile fabric. The remaining igloos have brush and trees growing on and around the structures.

Nine LAP area service magazines and grenade hold igloos provided storage of explosives during the ammunition loading process (ESE 1984). Six igloos located in the incinerator area (9500 Area) provided storage for explosives, including off-specification grenades, prior to incineration (USACE 1990). The 9500 Area igloos are currently occupied by SBT22 under a tenant agreement. Buildings 9502 through 9404 are used for inert storage; Buildings 9517 though 9519 store finished munitions. The interior of Building 9517 was inspected during the

VSI. This igloo stored finished munitions on the floor in cases and storage pallets, and there were no visible signs of contamination. The exteriors of the 9500 Area igloos were well maintained. Building 9402 in the 9400 Test Area stored C-4 and blasting caps for use in penetration testing (Malcolm Pirnie 2003, AGT DPM 2006). The explosive classification “XXX” was observed on Building 9402 during the VSI.

4.10 RADON

The USEPA and USGS have evaluated the radon potential in the United States and have mapped the general radon concentrations. The USEPA map of radon zones for Mississippi indicates that Hancock County and all the surrounding counties have a low potential for average short-term radon concentrations to exceed 2 picocuries per liter of air (pCi/L air).

As a requirement of the Army Radon Reduction Program, MSAAP conducted monitoring of indoor air for radon in 17 MSAAP buildings during January through May 1990. All results indicated that radon concentrations averaged less than 4.0 pCi/L air. The results for each building monitored are on file at MSAAP (TOL 1990). No mitigation actions were necessary based on the test results.

4.11 PESTICIDES

Pesticide use at MSAAP has been directed by a pesticide management plan (PMP) since 1983. The program was supervised by the CEC department manager and the forester (ESE 1984). The Spill Control and Contingency Plan (SPCCP) and the SPCC addressed the handling and disposal of pesticides at MSAAP. The PMP, SPCCP, and SPCC have all been submitted to lead Army agencies for review and/or retention.

The 1984 installation assessment indicated that pest control services at MSAAP during operating years were provided through a state-certified contractor (ESE 1984). The services provided by the contractor included structural, health-related, and nuisance insect and rodent control programs; weed control at security fences, parking areas, and utility sites; and programs involving turf areas and ornamental trees and shrubs. Initially (less than one year), MSAAP handled their own pesticide application (MTI NRM 2006). However, due to the extensive Army regulations regarding the storage and use of pesticides, MSAAP changed to an off-site state-certified contractor (MTI NRM 2006).

The contractor did not store any pesticides on site; all pesticides were transported to MSAAP and mixed on site (ESE 1984). Although the water supply points used by the contractor may not have had backflow prevention devices, the contractor used intermediate containers for the transfer of water. Pesticide formulations and containers were disposed of off site (ESE 1984, MTI NRM 2006). Pest control reports (DOD Form 1532) were completed on a monthly basis by the contractor and filed with the CEC department. A review of the available forms during the installment assessment did not find any use of non-standard or USEPA-banned pesticides (ESE 1984).

Initially, herbicide application was handled by land management branch personnel who were in the process of obtaining DOD certification (ESE 1984). MSAAP application of herbicides continued longer than the pesticide application; however, the length could not be determined. Extensive Army regulations regarding the storage and use of these chemicals resulted in MSAAP out-sourcing the herbicide applications to an off-site contractor. All pesticides and herbicides on site at the time of out-sourcing were “excessed” following Army regulations; however, some of them may have remained on site for more than a year before being removed. (MTI NRM 2006)

Historically, pesticides were stored and mixed at Building 9150 (AGT DPM 2006). The exact location of pesticide/herbicide storage and mixing by MSAAP personnel could not be verified as the installation assessment (ESE 1984) did not indicate a specific building and no other personnel contacted regarding pesticide use could recall a specific building number or area. There was no area on MSAAP where pesticides/herbicides were spilled (during mixing or otherwise) and no areas where pesticides/herbicides were dumped or otherwise illegally disposed of by MSAAP or pest management contractor (MTI NRM 2006).

In 1986, during a review of the pesticide management program, it was noted that a substantial quantity of herbicides was improperly stored in a railcar west of Building 9145. These herbicides were excess and were turned over to the Defense Reutilization and Marketing Service (USAEHA 1986a). MSAAP was in the process of hiring an off-site contractor to handle the herbicide requirements for MSAAP. No herbicides have been stored on site since the commencement of that contract.

MSAAP reported 2,763 pounds of active ingredient (pai) for application of pesticides/herbicides/fungicides/insecticides for fiscal year 1993 (FY93) (USACHPPM 1998). This value decreased significantly over the next several years with 64 pai reported for FY97 (MTI 1998a), 69 pai reported for FY98 (MTI 1998b), 78 pai reported in 2000 (MTI 2000), and a total usage of 2.78 gallons of concentrate insecticide in FY03 (MTI 2004).

Pesticides used under the 1995 pest management plan (MTI 1995) included:

- Avert
- Contrac Bloc
- Diazinon
- Dragnet
- Dursban
- Empire
- It Works
- Maxforce Ant System
- Maxforce Roach System
- Orthene PT280
- PT565
- Saga
- Talon G
- Yardex

Currently, pesticide use at MSAAP is conducted according to an integrated pesticide management plan (IPMP) (Harrison 2005) and is implemented by an off-site subcontractor. However, minor amounts of pesticides are stored in a flammable materials safety cabinet in Building 9114. These pesticides include such items as wasp and hornet aerosol spray cans and glue boards for mice. The types of pests controlled by the IPMP include spiders, ants, roaches, termites, wasps/bees, mice, and unwanted vegetation. Vegetation control occurs only in the developed areas of MSAAP.

The IPMP indicates that pest control through non-chemical measures would be implemented first, including such things as good sanitation in food areas and the mowing and trimming of vegetation. Nonetheless, the IPMP outlines a control plan for each type of pest, including the proposed chemical agent.

According to the current IPMP, application of most pesticides occurs in and around the buildings with infestations. Generally, the chemicals are placed as bait or glue board in areas with known infestations. However, some chemicals are sprayed into cracks and crevices to control pests. Chemicals approved for use at MSAAP by the current IPMP are listed below. (Harrison 2005)

- Cypermethrin
- Fipronil
- Sulfonamid
- Pyrethrin
- Brodifacoum
- Abemectin
- Cyfluthrin
- Cyphalothrin
- Perfluorooctane
- Imidazolidinimine
- Deltamethrin
- Bifenthrin
- Disodium Octoborate
- Allethrin
- Chlorfenzpyr
- Diazinon
- Tetramethrin
- Glyphosate

The subcontractor hired to provide pest management services is required to adhere to the following conditions documented in the MSAAP IPMP (Harrison 2005):

- Use only USEPA and State registered pesticides.
- Application of pesticides will be in accordance with label directions.
- The applicator must comply with all Federal, State, and local regulations.
- Pesticides must be mixed, stored, and disposed of in accordance with Federal, State, and local regulations, and with procedures established by MSAAP.
- The subcontractor will bring all pesticides and application equipment onto the installation each day that services are provided. No pesticides or pesticide application equipment will be stored or maintained on the installation by a subcontractor.

4.12 OTHER IDENTIFIED CONCERNS

During the VSI and interviews, additional concerns not specifically addressed in this ECP were identified. These concerns are summarized below.

- **Sandblasting/Painting Area near Sanitary Landfill.** MSAAP maintenance personnel reportedly used this area for periodic sandblasting and painting of large vehicles and hardware (AGT DPM 2006, MSAAP BTC 2006). An approximately 8-foot diameter corrugated pipe fashioned as a bunker/igloo with a secured door and roof ventilation stored miscellaneous painting materials, including a compressor, paint hoses, sprayer, ladder, one-gallon containers of enamels, and primer in spray cans. Sandblasting media was visible on a hardstand east of the storage bunker and on surrounding ground during the VSI. A thin layer of soil covered the hardstand and the area was highly disturbed from timer harvesting. No records of the sandblasting and painting operations were identified during the VSI.

- **Sandblasting/Painting Area North of Building 9115 near Kellar Road.** MSAAP maintenance personnel used this area for periodic sandblasting and spot painting of large vehicles and hardware (AGT DPM 2006, AGT AM 2006). The area was highly disturbed from timber harvesting, and as such no evidence of sandblasting activities was visible during the VSI. No records of the sandblasting and painting operations were identified during the VSI.

- **Building 9101.** Numerous spills occurred in and around Building 9101, specifically, oils associated with ESPs, ethylene glycol associated with the deionized-water closed-loop cooling tower (Facility 9154), and water-soluble machining coolant washed off scrap hoppers (AGT DPM 2006). Releases of machining coolants were typically the result of rainfall coming in contact with exposed scrap metal. Rainwater would rinse the coolant from the scrap and the resulting mixture would be transported across the site via overland flow towards stormwater collection inlets. Machining coolants that had saturated exposed soils and railway bedding materials would reportedly leach to the ground surface during periods of heavy rainfall (NASA OMD 2006). The volume of machining coolant released during a spill event was variable and was largely affected by environmental conditions. Available spill-incident documents indicate that coolant-water mixture releases from less than 5-gallons to more than 2,500-gallons were reported.

- **Building 9100.** The release of Freon 113® within the sub-floor degreasing equipment pits may have migrated through the concrete floor to the subsurface. Freon 113® also leaked from overhead Freon lines between Buildings 9100 and 9160 that would freeze during periods of cold weather. Freon was typically released to asphalt-covered areas in quantities of less than 1 gallon (AGT DPM 2006).

- **Building 9149.** Oil releases reportedly would drain in the vicinity of Building 9100 loading docks and coolants would wash down the manhole near Building 9149 (AGT DPM 2006).

- **Building 9101.** Safety concerns associated with the interior of the building include, but are not limited to, open pits with inadequate caution signs/barriers and (presumably) product on the floor in the forge room next to 55-gallon drums marked phosphate ester.

- **Facility 9119 Storage Yard**. From 1978 through approximately 1983, this storage yard was utilized by MSAAP as a temporary management office during facility construction, a motor pool, and as a grounds maintenance and storage yard. USACE – Huntsville District has occupied this area since 1992 for the storage of steel tanks and piping reportedly associated with a canceled DOD program. Preventative maintenance, including painting and possible sandblasting activities, have been conducted on the parcel since the occupation of the site by USACE. The nature and extent of the activities and materials used during these operations is not known. (MSAAP BTC 2006, AGT DPM 2006, NASA OMD 2006))

4.13 NATIONAL ENVIRONMENTAL POLICY ACT

4.13.1 Recent Documentation

Three National Environmental Policy Act (NEPA) documents have been prepared for activities on MSAAP since its proposed deactivation. In 1990, an EA was prepared for the layaway of MSAAP. This EA resulted in a signed FONSI. In 1997, MSAAP prepared an EA to identify the potential impacts of leasing building space and equipment to three small businesses. That EA resulted in a signed FONSI. In 1999, Ballistic Missile Defense Organization funded an EA to identify the impacts of constructing a laser test facility at three different locations within the United States, including MSAAP (USASMDC 1999). The EA resulted in a signed FONSI.

4.13.2 Anticipated Level of Documentation

Based on the results of the ECP Report, the results of previous EAs for various uses of portions of MSAAP, and the likely future use of the facility by other government agencies as office and other non-manufacturing space, the NEPA team has come to a preliminary conclusion that an EA would be adequate to meet NEPA requirements for the property transfer.

4.14 APPLICABLE REGULATORY COMPLIANCE ISSUES

The Army currently tracks issues concerning compliance with environmental laws and regulations through the Environmental Quality Report and formerly used the Army Compliance Tracking System. MSAAP is required to enter lawsuits, notices of violation and warning letters into the system and to track response actions. There were no audits, fines, or violations entered through the second quarter 1998 reporting period. In addition, a search of USEPA’s Enforcement and Compliance History Online shows no formal enforcement actions or penalties in the last three years, with the last inspection being on 17 September 2004.

4.15 ADJACENT PROPERTIES

The property adjacent to MSAAP is owned and operated by NASA for the SSC. The adjacent areas of SSC include mowed open areas along roadways, forested areas, and building complexes. SSC is surrounded by an acoustic buffer zone covering approximately 125,000 acres. The buffer zone consists primarily of dense forest; buildings suitable for human habitation are not allowed within the buffer zone. Due to restricted access on SSC and the density of the forested buffer zone, the adjacent properties were viewed via an automobile survey with photographs taken at limited locations.

The adjacent property includes two areas that were formerly within the MSAAP boundary but were returned to NASA under amendments to the irrevocable use permit described in **Section 3.3** (**Figure B-18**). The 1,003.6 acres of land returned in February 1985 included a landfill operated by NASA/NSTL that was located west of Trent Lott Parkway and Leonard Kimball Road (**Section 4.8**). This landfill was not operated by the Army and is not within the current MSAAP property boundary.

The 1,808 acres of land returned in May 1989 included the EMTF located east of Main Line Road (**Sections 3.3.4** and **4.2.2**, and **SSC Area H** below). Besides its use for testing activities, the EMTF was also the location of a former pistol range (ESE 1984) and portions of the West Bomb Target of the Former Hancock Bombing and Gunnery Range (**Section 3.3.4**). The EMTF is outside the current MSAAP boundary, and no EMTF testing occurred on current MSAAP property.

SSC has operated since the mid-1960s and, as part of historic operations, used and disposed of various chemicals that may have resulted in the release of contaminants to the environment. SSC began a site identification and investigation process in 1990 that identified 40 potentially contaminated sites. Of the 40 original sites, currently 30 are NFA sites, one is a potential NFA site, one is a long-term monitoring site, seven are cleanup sites, and one is a potential cleanup site. (NASA 2004)

All the SSC sites described in the following subsections, with the exception of Area I, lie outside the current MSAAP boundary. The potential for migration of contaminants from SSC sites onto MSAAP is unlikely as only one of the SSC cleanup or potential cleanup sites (Area H) is located upgradient of MSAAP. Area H and the other SSC cleanup and the potential NFA sites are described below.

SSC Area A (Former Site 007)

Area A, known as the Air Force Disposal Site/Pesticide Operations Area, is located on the western boundary of SSC near Buildings 2501 and 2502. The area was in use from the 1970s to 1990s (SSC 2006). Contamination exists in soils in the trench areas and in shallow groundwater. Contaminants of concern at this site include VOCs and dioxins. The cleanup remedy includes building an underground containment wall around the trenches where wastes were buried and installing an engineered cap on top of the trenches to prevent rain water from soaking into the trenches. The wall and cap were installed in summer 2001 (NASA 2002). Shallow contaminated groundwater is being treated with a passive treatment wall that has been installed underground around the area of contamination. The installation of this remedy was completed in June 2002 (NASA 2002). Monitoring includes a documented annual inspection of the site, and sampling and analyzing the groundwater from select wells according to an approved plan. The analytical data is presented to MDEQ on an annual basis (SSC 2006).

SSC Area B (Former Site 011)

Area B is located in the southwestern portion of SSC and includes Buildings 2205, 2206, and 2201. Paint shop and degreasing operations, battery storage/acid neutralization, and waste oil storage activities occurred in this area from the 1960s to the 1990s (SSC 2006). Contaminants detected at the site include VOCs, SVOCs, metals and PCBs. Affected media includes sediments, soils, surface water and shallow groundwater. The cleanup remedy includes the removal of contaminated sediments and surface soils, which was completed in 1999. Contaminated groundwater is being treated using pump and treat technology, consisting of ultraviolet/oxidation (UV/OX) and carbon adsorption flowed by natural attenuation (NASA 2002). Groundwater treatment began in February 2003. It is expected that after approximately five years, pumping can cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from the pump and treat unit and from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (SSC 2006).

SSC Area C (Former Site 032)

Area C, known as the Salvage Material Storage Yard, is located in the southwestern portion of SSC near Building 2207. Various salvage materials have been stored in this area since the 1970s (SSC 2006). Contaminants detected at this site include VOCs, SVOCs, PCBs, and total petroleum hydrocarbons (TPH). Affected media include sediments, soils and shallow groundwater. The cleanup remedy included removing contaminated sediment and surface soils (completed in 1999) (NASA 2002).

An active groundwater pump and treat system is being used to treat the contaminated groundwater through carbon adsorption, followed by natural attenuation. Treatment of the groundwater began in February 2002. It is expected that after approximately 13 years, pumping will cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from the pump and treat unit and from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (NASA 2002, SSC 2006).

SSC Area D (Former Site 006)

Area D, known as the Recreational Disposal Area, is located in the southwestern portion of SSC near Building 2411. The area was used during the 1960s and 1970s when used chemicals were discharged into limestone pits for treatment (SSC 2006). Contaminants at this site include VOCs and SVOCs. Affected media include sediments, soils, surface water and shallow groundwater. The cleanup remedy includes filling in the depression at the bottom of the hillside to prevent the collection of water (completed in 2000), removing contaminated surface soils (completed in 1999), and treating contaminated groundwater by using pump and treat technology. The groundwater treatment system consists of carbon adsorption followed by natural attenuation (NASA 2002). Groundwater treatment began in February 2003. It is expected that after approximately five years, the pumping will cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from the pump and treat unit and from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (SSC 2006).

SSC Area E (Former Site 037)

Area E, known as the RP-1 Storage Tank Site, is located in the south-central portion of SSC, near Building 3308. The area was used from the 1960s to the 1990s. Solvents were used for on site cleaning and solvent waste was released (SSC 2006). Contaminants at this site include VOCs, SVOCs, and TPH. Affected media include sediments, soils, surface water and shallow groundwater. The cleanup remedy includes removing contaminated surface soils (completed in 1999) and treating contaminated groundwater by using pump and treat technology. The groundwater treatment system consists of UV/OX and carbon adsorption followed by natural attenuation (NASA 2002). Active groundwater pump and treat began in February 2002. It is expected that after approximately 20 years, the pumping will cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from the pump and treat unit and from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (SSC 2006).

SSC Area F (Former Site 005)

Area F, known as the Fire Department Training Area, is located on the western boundary of SSC on the west side of Dean Road. The site was active during the 1960s and 1970s. A shallow burn pit was used for fire training exercises (SSC 2006). Contaminants at this site include VOCs, SVOCs, and PCBs. Affected media include soils and shallow groundwater. The cleanup remedy includes removing contaminated surface soils (completed in 1999) and treating contaminated groundwater by using a pump and treat technology (NASA 2002). Active groundwater pump and treat began in June 2004. Contaminated groundwater is extracted from the ground and transferred via underground piping to the pump and treat unit located at Area B. It is expected that after approximately two years the pumping will cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (SSC 2006).

SSC Area G (Former Site 031)

Area G, known as the High Pressure Gas Facility, is located in the south central portion of SSC near Building 3305. The site was active from the 1970s to the 1990s and a leach pit was used for compressor discharge (SSC 2006). Contaminants at this site include VOCs, SVOCs, and PCBs. Affected media include soils, sediments, surface water and shallow groundwater (NASA 2002). The cleanup remedy includes active groundwater pump and treat, which began in June 2004. Contaminated groundwater is extracted from the ground and transferred via underground piping to the pump and treat unit located at Area E. It is expected that after approximately three years, the pumping will cease and natural attenuation will continue to degrade whatever contamination remains in the groundwater. Monitoring includes sampling and analyzing water from select wells according to an approved plan. The analytical data is presented to the MDEQ on an annual basis (SSC 2006).

SSC Area H (Former Site 030)

Area H, also known as the EMTF, is located in the northeastern portion of SSC near Building 9801. The area was operative from 1980 until 1991 and various explosives were tested at this site (SSC 2006). During that time period, waste chemicals were introduced into environmental media. According to the Army, the site was used as a strafing and bombing range, inert rocket impact area, and an explosives test activity range. In 1991, all explosive test activities were halted. Currently the site is inactive and is held under NASA control (NASA 2004).

An RI, feasibility study (FS), and draft proposed plan (PP) have been completed. A fact sheet that presented various cleanup alternatives from the FS and the preferred alternative was made available for public review and comment from 15 August 2004 to 15 September 2004 in lieu of holding a public information session. The draft PP indicates that the preferred alternative is groundwater pump and treat. There were no public comments to the preferred option; however, cleanup activities have been postponed since there are no current regulatory cleanup standards for site contaminants. Meanwhile, SSC has elected to review other innovative technologies and funding resources to initiate groundwater remediation efforts. To date, limited removal of UXO materials in shallow soil along the eastern side of Mainline Road has been completed, and the installation of fencing and signage along the eastern boundary of this excavation was initiated in late 2004 (SSC 2006).

SSC Area I (Former Site 001): Old Kellar Test Range

Area I is located in the north-central portion of SSC inside the MSAAP boundary (**Figure B-9**). Although it is on MSAAP property, Area I is discussed here as it is part of the SSC environmental program. Additional operational and investigative details are provided in **Section 4.2.2**.

Since 1980, the site has been inactive, has returned to its natural vegetative state, and is currently under lease to the Army. Buried metallic objects and low levels of explosive compounds in groundwater have been detected at the site (NASA 2005, SSC 2006). According to the completed RI, no further action is required to ensure protection of human health. In late 2004, NASA began installing a fence around a trench that contains UXO material to eliminate/reduce risk of exposure to the material. NASA submitted a final NFA document dated October 2003 to MDEQ. NASA expects Area I will be a NFA site following final review by MDEQ (SSC 2006).

5.1 SUMMARY

MSAAP is located in the southwest corner of Mississippi in Hancock County, about 50 miles northeast of New Orleans, Louisiana, and 30 miles from the Mississippi Gulf Coast. Facility construction started in 1978 and the first testing of a completed projectile was in 1984. MSAAP's primary mission was the manufacturing of the M483, a dual-purpose projectile for the 155-mm Howitzer using anti-armor/anti-personnel controlled M42 and M46 grenades. MSAAP production facilities consisted of three separate manufacturing complexes – PMPT, CMPT, and the LAP area. These three production complexes were supported by other industrial facilities, including igloo storage areas, an IWTP, landfill, mechanical plant, EWI, CWP, on-site laboratories, and a vehicle maintenance shop. Production at MSAAP ceased in 1992.

Through a facility use contract, MSAAP is available to the private sector to provide or produce commercial services and products. In January 2006, AGT became the MSAAP operating contractor. The 2005 BRAC Commission directed the closure of MSAAP and the transfer of 4,214 acres of land.

This ECP Report was prepared to characterize the existing environmental conditions at MSAAP. It is intended to be an aid in the disposal of real property under the BRAC 2005 program and is a basis for determining if the property is suitable for transfer, lease, or assignment. The ECP Report findings are based on environmental investigations and reports, historical documents, aerial photography, and a site reconnaissance conducted 5 June through 9 June 2006. As part of the ECP process, key elements that were evaluated included MSAAP's RCRA (hazardous waste), landfill, NPDES, air, UST/AST, ACM, lead/LBP, PCB, pesticides, IRP, MMRP, ranges, radon, radioactive materials, and natural/cultural resource programs.

5.2 CONCLUSIONS

The following identifies the conclusions made following the ECP process. The conclusions were based on the available sources of information concerning both past and present environmentally significant uses of property. Information included readily available data associated with adjacent property records; aerial photography; personnel interviews; Army environmental programs and associated documentation; current and historic investigations; and ongoing response actions. In addition, record sources were reviewed to determine if there have been spills, leaks, discharges, leaching, underground injections, dumping, abandonments, or storage of hazardous substances or petroleum products at MSAAP. The VSI and interview process included inquiries and requests into the existence and availability of records that support the environmental condition of the property.

Discrete areas, referred to as parcels, were classified into one of seven standard ECP area types (categories) as defined by ASTM 5746-98, *Standard Classification of Environmental Condition of Property Area Types for Defense Base Closure and Realignment Facilities* (ASTM 2002). A total of 15 parcels were identified at MSAAP and classified into one of seven standard ECP categories. Each parcel was assigned a unique parcel identification number, ECP category classification (in parenthesis), and the type(s) of release(s) that has been identified or suspected for that parcel. An example parcel designation is provided below.

99(7)HRPRX
99 = Parcel designation
(7) = ECP category
HR = Hazardous substance release or disposal
PR = Petroleum substance release or disposal
X = Explosive hazard/MEC, which includes discarded military munitions (DMM), UXO, and munitions constituents (MC)

The following sections present the results of the ECP process by ECP category. **Tables 5-1 through 5-3** list the parcels identified as ECP Categories 2, 4, and 7. Details of each individual parcel and the basis for determining their appropriate ECP category are presented in **Table 5-4**. A map showing the location of all parcels and their classification is included as **Figure 5-1**. The MSAAP building hazards classifications are presented in **Appendix C**.

5.2.1 ECP Category 1

ECP Category 1 is defined as "areas where no release or disposal of hazardous substances or petroleum products or their derivatives has occurred, and to which there has been no migration of such substances from adjacent areas" (ASTM 2002). The ECP Category 1 parcel contains 3,634.39 acres of land. This parcel primarily consists of undeveloped land outside the production areas. Approximately 39 acres of this parcel include the storage igloos and surrounding area. An inspection of representative igloo types (approximately 25 percent) from each igloo storage area was completed as part of the 2006 ECP VSI. Based on the VSI, personnel interviews, and historical records review, the igloos have stored various items, including raw explosives materials, finished munitions, and off-specification munitions. Based on the VSI and personnel interviews completed as part of this ECP, there was no evidence that a release or disposal of hazardous substances or petroleum products or their derivatives has occurred in these areas. The Category 1 parcel is identified in white on **Figure 5-1** as 1(1).

5.2.2 ECP Category 2

ECP Category 2 is defined as "areas where only release or disposal of petroleum products has occurred" (ASTM 2002). The ECP Category 2 parcels are presented in **Table 5-1**. The parcels are identified in blue on **Figure 5-1** and summarized in **Table 5-4**.

TABLE 5-1
ECP CATEGORY 2 PARCELS

Acres	Parcels
11.83	2(2)PR 3(2)PR 4(2)PR

5.2.3 ECP Category 3

ECP Category 3 is defined as "areas where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response" (ASTM 2002). There are no ECP Category 3 parcels on MSAAP.

5.2.4 ECP Category 4

ECP Category 4 is defined as "areas where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and all removal or remedial actions necessary to protect human health and the environment have been taken" (ASTM 2002). The ECP Category 4 parcels are presented in **Table 5-2**. The parcels are identified in dark green on **Figure 5-1** and summarized in **Table 5-4**.

TABLE 5-2
ECP CATEGORY 4 PARCELS

Acres	Parcels
108.2	8(4) 9(4)HR

5.2.5 ECP Category 5

ECP Category 5 is defined as "areas where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, and removal or remedial actions, or both, are underway, but all required actions have not yet been taken yet" (ASTM 2002). ECP Category 5 consists of one 69.68-acre parcel of land. The parcel is identified in yellow on **Figure 5-1** as 7(5)X and summarized in **Table 5-2**.

5.2.6 ECP Category 6

ECP Category 6 is defined as "areas where release, disposal, or migration, or some combination thereof, of hazardous substances has occurred, but required remedial actions have not yet been initiated" (ASTM 2002). ECP Category 6 consists of one 0.71-acre parcel of land. The parcel is identified in red on **Figure 5-1** as 5(6)HR and summarized in **Table 5-2**.

5.2.7 ECP Category 7

ECP Category 7 is defined as "areas that are unevaluated or require additional evaluation" (ASTM 2002). ECP Category 7 consists of 7 parcels and 389.19 acres of land. Based on available information obtained during the ECP process, these Category 7 parcels were either unevaluated or require additional evaluation, which may involve a Phase II evaluation. The ECP Category 7 parcels are presented in **Table 5-3**. The parcels are identified in grey on **Figure 5-1** and summarized in **Table 5-4**.

TABLE 5-3 ECP CATEGORY 7 PARCELS		
Acres	**Parcels**	
389.19	6(7)HR 10(7)HRX 11(7)HRPR 12(7)HR	13(7)HR 14(7)X 15(7)X

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
1(1)	3,634.39	Various	1	This parcel is associated with the areas of MSAAP where there has been no documented release, disposal, or known migration from adjacent properties of hazardous substances or petroleum products.		None Apparent
2(2)PR	6.21	9100 Area Building 8302 Weaver Yard	2	This parcel is classified as a Category 2 because of potential petroleum releases from activities prior to Army use of the parcel. This parcel includes Buildings 8302, also known as Shorty's Residence, and 9158, and the surrounding areas collectively referred to as the "Weaver Yard." Historical parcel uses have reportedly included heavy equipment fueling and repair, electrical equipment storage, and general construction activities. The parcel has been used as such by the Army as well as other government agencies. There was no sign of contamination during the VSI.	MCI 1989b MTI 1996 AGT DPM 2006 MSAAP BTC 2006 VSI 2006	None
3(2)PR	2.23	9100 Area Shorty's Bar	2	This parcel is classified as a Category 2 because of potential petroleum releases from pre-Army and pre-NASA use of the property as a rural gas station.	MCI 1989b AGT DPM 2006 NASA OMD 2006 VSI 2006	None

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
4(2)PR	3.39	9100 Area 9119 (Storage Yard)	2	This parcel is classified as Category 2 because of potential petroleum releases from pre-Army and pre-NASA use of the property as a rural gas station. This parcel was reportedly utilized as a rural gas station prior to NASA and Army use of the property. Prior to the construction of MSAAP, the property was reportedly used by other government agencies. From 1978 through approximately 1983, the parcel was utilized by MSAAP as a temporary management office during facility construction, a motor pool, and as a grounds maintenance and storage yard. The parcel has been used as such by the Army as well as other government agencies. There was no sign of contamination during the VSI. Skidded ASTs were reportedly located on the parcel.	MCI 1989 AGT DPM 2006 NASA OMD 2006 MSAAP BTC 2006 VSI 2006	None

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
5(6)HR	0.71	9100 Area Building 9115	6	This parcel is classified as a Category 6 because hazardous compounds have been detected above regulatory limits but response actions have not been initiated. This parcel is occupied by a one-story building identified as the "Blount Building." The parcel was historically utilized by MSAAP for training, electronics repair, and administrative functions. Several tenants, including the Navy and Omni Tech, Inc., have also occupied the parcel. The parcel is equipped with a septic system and on site well for water production. An environmental baseline investigation completed at the parcel in 2005 identified the presence of chloroform (1 µg/L), 1,2,4-trimethylbenzene (35 µg/L), and naphthalene (36 µg/L) above MDEQ Tier I TRGs in groundwater. The results of the environmental baseline investigation were reportedly distributed to MDEQ; however, no documentation related to the MDEQ's reported response was available for review.	EarthCon 2005 AGT DPM 2006 VSI 2006	None

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
6(7)HR	61.67	9100 Area Building 9100 Building 9101 Industrial Waste Treatment Plant Coal Runoff Pond Others	7	This parcel is classified as Category 7 based on the potential presence of hazardous substances from reported releases and the need for further evaluation of sites identified for inclusion in AEDB-R. This parcel includes the majority of buildings, facilities, and infrastructure associated with M42 and M46 grenade and 155-mm projectile manufacturing and production operations. The 1993 draft RFA recommended additional sampling of five SWMUs within this parcel: SWMU 8 (IWTP) ; SWMU 14C (Forge Lube SAA); SWMU 15 (Drum Processing Area); SWMU 19 (Vehicle Wash Rack); and SWMU 25 (Coal Pile Run-off Pond). These SWMUs were evaluated as part of a USACHPPM RRSE in 1997. Approximately 13,000-gallons of chromium-contaminated wastewater was released to the subsurface at SWMU 8 in 1985. Subsequent monitoring of groundwater reportedly indicated that detected concentrations were below regulatory levels. As part of the 1997 RRSE, USACHPPM collected three soil samples from around the perimeter of the spill site at a depth just below the depth of the failed containment (36 to 42 inches) and analyzed them for metals. All sample results were below USEPA Region 9 preliminary remediation goals (PRGs). Documentation confirming that response actions were completed was not available.	EMCON 1998b MCI 1985b MCI 1986 USACE 1989 MSAAP 1990 MDEQ 1992 MTI 1992 ATK 1993 USACHPPM 1997 MSAAP 1998 MTI 1999 AGT DPM 2006 NASA OMD 2006 VSI 2006	IWTP Chromium release response (1985) UST Removal – Building 9114 (1992) Transite piping removal – Building 9101 (1999)

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				SWMU 14C received waste, primarily wastewaters deemed contaminated, from the forge shop. The draft RFA identified cracked concrete and staining from leaking drums. As part of the 1997 RRSE, USACHPPM collected two surface soil samples at a gap between the concrete pad and surrounding asphalt pavement and analyzed them for metals and SVOCs. All sample results were below PRGs. SWMU 15 is a bermed concrete pit used to process drums from throughout MSAAP. The draft RFA identified cracked heavy staining of the concrete surrounding the unit and cracks the corner of the associated sump. As part of the 1997 RRSE, USACHPPM collected two surface soil samples at a gap between the pit and surrounding pavement and analyzed them for metals, explosives, and SVOCs. All sample results were below PRGs. SWMU 19 was used as a wash rack for MSAAP and Navy vehicles. Prior to 1988 the area reportedly was used to store waste drums with unknown contents. As part of the 1997 RRSE, USACHPPM collected two surface soil samples at gaps in the pavement and analyzed them for metals and SVOCs. All sample results were below PRGs. The Coal Pile Runoff Pond (SWMU 25) collected surface water runoff from the coal pile during the early 1980s. SWMU 25 also was used during the emergency transfer of wastes		

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				from the IWTP while a tank was being refurbished. SWMU 25 reportedly was not lined until approximately three years into operations. Heavy rains resulted in the overflow of SWMU 25, with runoff discharged to the MSAAP drainage canal system. The area is now covered with grass. As part of the 1997 RRSE, USACHPPM collected seven surface soil and two subsurface soil samples and analyzed them for metals and SVOCs. All sample results were below PRGs. Processes at this parcel required the storage and use of large quantities of petroleum products, solvents, paints, degreasing agents (including Freon 113®), acids, and metals. TCE was detected in groundwater above MDEQ screening levels east of Building 9101. The contamination was detected during a Phase II ESA completed in 1998 for Boeing North American, Inc. Industrial wastewater was released throughout the parcel from overhead piping ruptured by below-freezing temperatures. The exact locations and full extent of the releases are unknown. Scrap metal and metal cuttings were routinely stored in open railcars and scrap hoppers outside of Buildings 9100 and 9101. Water-soluble coolants were rinsed from the cuttings by rainfall and directed toward the MSAAP stormwater system. Former MSAAP personnel indicated that coolants were observed leaching to the surface of railway bedding during periods		

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				of heavy rain. Spill records indicate that coolant may have reached the MSAAP drainage canal system.		
7(5)X	69.68	Old Kellar Test Range	5	This parcel is classified as Category 5 because all response actions are not complete. NASA requested NFA status for the parcel, but MDEQ had not provided a ruling at the time this document was written. This parcel includes the Old Keller Test Range previously utilized for a variety of explosives, propellant, and pyrotechnic tests from 1969 until August 1980 by a NASA technical support contractor. This parcel, while within the MSAAP boundary, was not used by MSAAP as part of their mission. Large grain solid propellant was found on the surface, and there was evidence of burning at the site. Unknown quantities of explosive items, powder, fuses, and pyrotechnics were disposed at the OB/OD Ground. A clamshell-lined pit was used to neutralize sulfuric acid that remained after nitrator studies. Materials used in range testing activities were disposed in pits, including packaging and shipping containers, as well as metal fragments that remained after testing. Scrap iron framework from abandoned office trailers and buildings burned after their use at the range was collected at a scrap metal pile.	USAEHA 1988a NASA 2005 MSAAP 2006	An institutional control (fencing) was installed to limit access to areas known to contain buried metallic objects (2004)

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				NASA finalized an RI for the parcel in 2003 that stated environmental issues associated with the parcel require no further action to ensure protection of human health. MDEQ has not issued a ruling on NASA's request for NFA status.		
8(4)	38.47	Sanitary Landfill	4	This parcel is classified as Category 4 because all actions necessary to protect human health and the environment have been completed. This parcel includes the former MSAAP Sanitary Landfill (SWMU 1), which began operating in 1983 under MDEQ permit SW02310B0289.Approximately 91,300 cubic yards of solid waste materials were disposed of in the landfill. Waste materials consisted primarily of construction debris, but also included plastic, paper, metal, glass, and calcium sulfate-based FGD sludge, as well as a small percentage of putrecible waste. The 1993 draft RFA recommended additional sampling of SWMU 1. The landfill received no waste after March 1994. In a 24 March 1997 letter, MDEQ indicated the site appeared to have been covered and closed in compliance with applicable state regulations. The 1997 USACHPPM RRSE stated that SWMU 1 had undergone closure.	ATK 1993 WLF 1995 MDEQ 1997 USACHPPM 1997 VSI 2006	None

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
9(4)HR	69.73	9300 Area	4	This parcel is classified as Category 4 because all actions necessary to protect human health and the environment have been completed. This parcel includes all of the buildings and related infrastructure associated with the MSAAP LAP 9300 Area, with the exception of Buildings 9355 and 9312. The main LAP production area consists of three buildings (9323, 9325, and 9324) in a horseshoe configuration, with Buildings 9323 and 9324 configured as mirror images. The LAP facility generated explosives-contaminated wastewaters from floor and equipment wash water, scrubbing of airborne fumes and dust, and laundry operations. Wastewaters from these processes were collected in sump pits The accidental discharge of a fire suppression water deluge system in Building 9324 in October 1985 caused approximately 5,500 gallons of RDX-contaminated water to exit the building. Four 1,200-gallon batches of water were removed from Sump 9343 during cleanup of the water remaining in the building. RDX was detected in the sumps and ditches outside Building 9324. Impacted soils were reportedly excavated and treated in the CWP, but no documentation of cleanup activities was identified during the VSI.	ESE 1984 USACE 1990 NAVOCEANO ESHO 2006 AGT DPM 2006 MCI IAM 2006 NASA OMD 2006 VSI 2006	None

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
10(7)HRX	72.14	9400 Area	7	This parcel is classified as Category 7 based on the potential presence of hazardous substances and MEC. This parcel was used for explosive quality assurance testing of M42 and M46 grenades. A 2003 closed, transferred and transferring range inventory identified the 9400 Area as the Spin Launch Site. The parcel is fenced with locked gates controlled by security personnel. The spin gun test facility is located in the eastern half of the parcel. Spin guns in Building 9404 launched grenades towards barricades to test the fuze and arming mechanisms. The penetration test facility is located in the western half of the parcel. The 1993 draft RFA identified the penetration test facility as AOC A, Test Range Detonation Area. At four individual test stands, grenades were placed on blocks of steel behind test barricades and detonated to observe penetration through steel. C-4, which was used to detonate the grenades, was stored in Building 9402. The draft RFA identified dusts and residues on the soil surrounding the test stands. The barriers and steel blocks appeared to be rusting. As part of the 1997 RRSE, USACHPPM collected ten surface soil samples and two groundwater samples and analyzed them for metals and explosives. Surface soil sampling results for copper (25,000 mg/kg) and iron (24,000 mg/kg) exceeded PRGs. All other sample results were below PRGs. The steel	ATK 1993 USACHPPM 1997 Malcolm Pirnie 2003 MSAAP 2006 AGT DPM 2006 MSAAP BTC 2006 VSI 2006	None

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				blocks were reportedly removed and sold as scrap in approximately 2000. Potential lead azide contamination at this parcel was identified as a concern during interviews. No documentation was available indicating if a UXO survey or remediation has been performed at the parcel. The 1997 USACHPPM RRSE report indicated there was no evidence of contaminant migration in groundwater.		
11(7)HRPR	7.49	9500 Area Contaminated Waste Processor	7	This parcel is classified as Category 7 based on the potential presence of hazardous substances. This parcel includes the MSAAP CWP and associated pollution control equipment, wastewater sump and piping, fuel-oil UST removal site, and former temporary drum storage area. The CWP was identified as SWMU 7 in the 1993 draft RFA. The temporary drum storage area was identified as SWMU 14A (CWP SAA). The CWP operated under MDEQ Air Permit 1000-0029 from 1984 to 1992 and was utilized to process contaminated waste from various MSAAP activities, including suspected explosive-contaminated metal parts. The CWP SAA operated from 1984 to 1992 and was used for the accumulation of ash from the CWP and contaminated rags. The draft RFA identified process dust in soil surrounding CWP pollution control equipment and recommended confirmation sampling for the	USEPA 1989 ATK 1993 MTI 1993a USACHPPM 1997 AGT DPM 2006 MCI EE 2006 VSI 2006	UST removal response action (1993)

TABLE 5-4

ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				CWP (SWMU 7). As part of the 1997 RRSE, USACHPPM collected three surface soil samples around the concrete pad that contained the pollution control equipment and analyzed them for metals and explosives. Surface soil sampling results for cadmium (170 mg/kg) and iron (100,000 mg/kg) exceeded PRGs. All other sample results were below PRGs. The draft RFA identified asphalt cracking and rings from drums at the CWP SAA (SWMU 14A), and recommended confirmation sampling. As part of the 1997 RRSE, USACHPPM collected three surface soil samples from surrounding soils and analyzed them for metals, explosives, and SVOCs. All sample results were below PRGs. The wastewater sump and piping received treated wastewater from MSAAP's portable explosive-contaminated treatment column. Treated wastewater was discharged to the ground surface south of the CWP. In 1993, a 10,000-gallon UST that stored heating oil for the CWP's furnace was removed from an area southeast of the CWP. During removal activities, the UST was displaced from the ground by heavy rainfall resulting in the release of approximately 20 to 30 gallons of fuel oil to the ground surface. MSAAP documents suggest analytical sampling confirmed the removal of petroleum-impacted soils; however, documentation from the MDEQ confirming that		

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				the UST removal activities were completed in accordance with applicable regulations was not available. The fuel oil conveyance piping from the UST to the CWP is still intact.		
12(7)HR	2.73	9500 Area Explosive Waste Incinerator	7	This parcel is classified as Category 7 based on the potential presence of hazardous substances. This parcel includes the MSAAP EWI and associated pollution control equipment, treated grenade body conveyer system, scrap sort building (Building 9516), wash water collection sumps, and temporary drum storage area. The temporary drum storage area was identified as SWMU 14B (EWI SAA) in the 1993 draft RFA. The EWI operated from 1983 through 1993 under MDEQ Permit MS6210020560, MDEQ Air Permit 1000-00029, and RCRA Permit MS0800016123. Off-specification grenades, grenade components, and explosives were incinerated within the EWI. The EWI SAA operated from 1985 to 1992 and was used for the accumulation of ash from the EWI gas washers, cyclone, and baghouse. Prior to the construction of Building 9516 in 1989, scrap from metal components (grenades and their components) processed in the EWI was stored in open gondolas outside the EWI on the east end of the parcel. Large quantities were collected before removal by semi-trailer. Some of these materials reportedly contained potential cadmium-contaminated residual ash/dust from	USEPA 1989 ATK 1993 USACHPPM 1997 USEPA ES 2006 MCI EE 2006 AGT DPM 2006 VSI 2006	Cadmium-impacted soil and surface water removal (1991)

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				the incineration process. After 1989, a conveyor system moved scrap components from the EWI to building 9516 for storage. In 1991, cadmium-contaminated wash water from the EWI gas washer was determined to have been released to a drainage ditch south of the EWI. The cadmium-impacted soils and surface waters were reportedly remediated and the response action accepted by the MDEQ. The draft RFA reported cracked asphalt, staining, and rust rings from drums, and recommended confirmation sampling for the EWI SAA (SWMU 14B). As part of the 1997 RRSE, USACHPPM collected three surface soil samples from surrounding soils and analyzed them for metals, explosives, and SVOCs. All sample results were below PRGs.		
13(7)HR	0.75	Sandblasting/ Painting Area Near Sanitary Landfill	7	This parcel is classified as a Category 7 based on the potential for activities to have released hazardous substances. This includes potential LBP releases from outdoor sandblasting and potential solvent releases from painting activities. This parcel includes an area previously utilized by MSAAP maintenance personnel for periodic sandblasting and painting of MSAAP vehicles and hardware. The full extent of activities performed at the site is not known. Documentation regarding the site is not available.	AGT DPM 2006 MSAAP BTC 2006 VSI 2006	None

TABLE 5-4
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				An approximately 8-foot diameter corrugated pipe fashioned as a bunker/igloo with a secured door and roof ventilation stored miscellaneous painting materials, including a compressor, paint hoses, sprayer, ladder, one-gallon containers of enamels, and primer in spray cans. Sandblasting media was visible on a hardstand east of the storage bunker and on surrounding ground during the VSI.		
14(7)X	140.56	Area D – High Altitude Bomb Target (D2)	7	This parcel is classified as a Category 7 based on the potential for MEC presence. This parcel includes the portions of the High Altitude Bomb Target (D2) of the Former Hancock Bombing and Gunnery Range located on MSAAP property. The bull's-eye portion of the Target (D1) is on SSC property. Documentation does not indicate that the target was located during construction activities completed at the D1 site, therefore the area was considered potentially contaminated. The parcel (D2) was not evaluated as it was not FUDS eligible.	USACE 1995	None
15(7)X	103.85	Areas E/F – West Bomb Target/Test Range and Safety Zone (E2 and F2)	7	This parcel is classified as a Category 7 based on the potential for MEC presence. This parcel includes portions of the West Bomb Target (E2) and West Bomb Target Safety Zone (F2) of the Former Hancock Bombing and Gunnery Range located on MSAAP property.	USACE 1995	None

TABLE 5-4

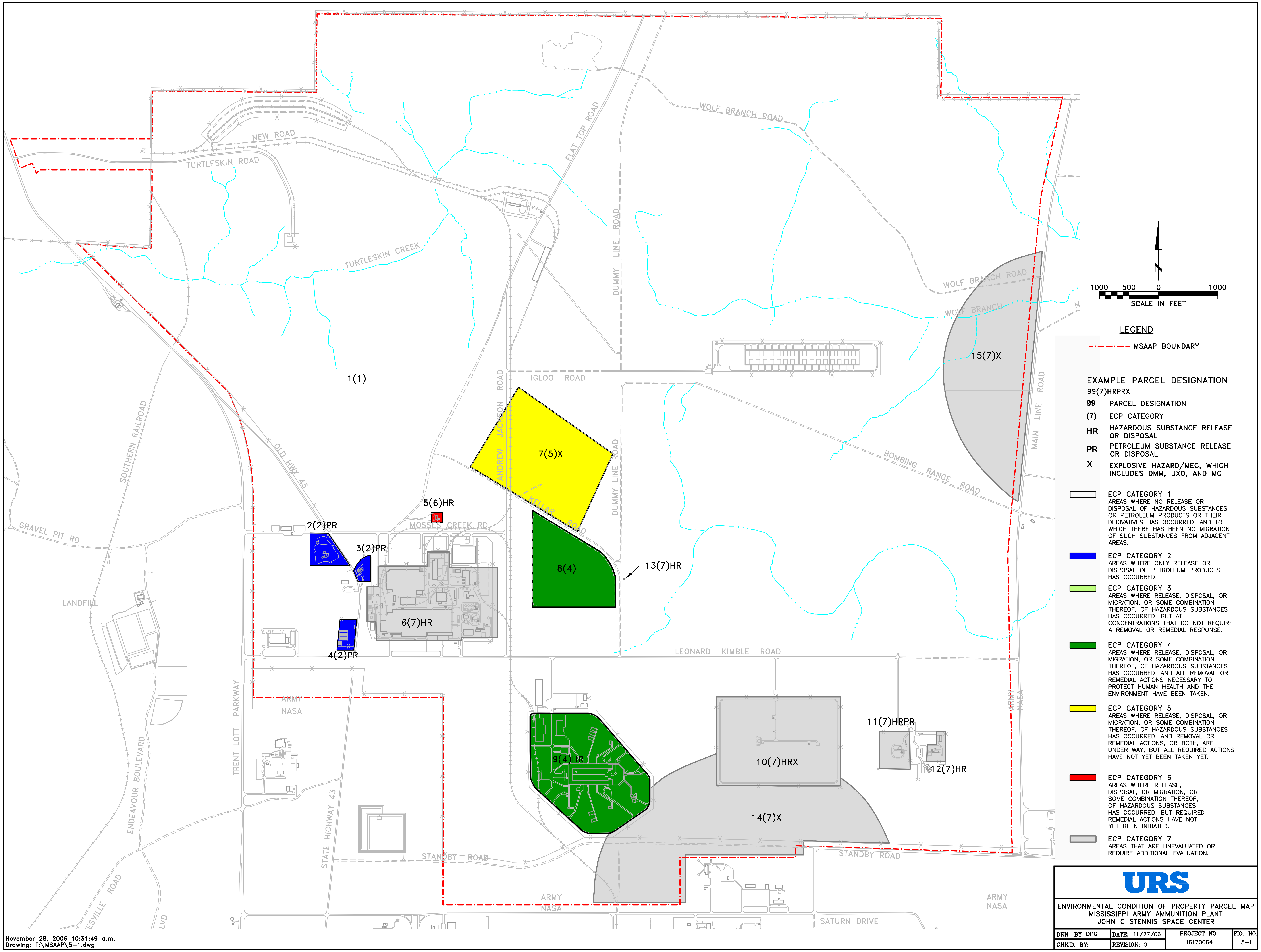
ENVIRONMENTAL CONDITION OF PROPERTY CATEGORIES FOR MSAAP PARCELS

Parcel No. & Label[a]	Approx. Size (acres)	Area[b]	ECP Category	Basis	Source of Evidence[c]	Remediation / Mitigation
				The portions of the West Bomb Target located on SSC property (E1) were reportedly littered with remains of 100-pound practice bombs and residues of various ordnance types in the 1980s and considered potentially contaminated. The E2 parcel was not evaluated as it was not FUDS eligible. MEC was not identified on the portions of the West Bomb Target Safety Zone on SSC property (F1), however the area was considered to be potentially contaminated. The F2 parcel was not evaluated as it was not FUDS eligible.		

[a]Environmental parcel label definitions are as follows:

HR = hazardous substance release or disposal
PR = petroleum release or disposal
X = explosive hazard/MEC, which includes DMM, UXO, and MC

[b]Acreage figures are approximate; they have been calculated using AutoCAD 2004.
[c]Source of Evidence refers to Section 7 of this report.



NEW ROAD
TURTLESKIN ROAD
TURTLESKIN CREEK
FLAT TOP ROAD
WOLF BRANCH ROAD
DUMMY LINE ROAD
WOLF BRANCH
IGLOO ROAD
ANDREW JACKSON ROAD
BOMBING RANGE ROAD
MAIN LINE ROAD
SOUTHERN RAILROAD
OLD HWY 43
GRAVEL PIT RD
KELLAR ROAD
MOSSES CREEK RD
LANDFILL
LEONARD KIMBLE ROAD
TRENT LOTT PARKWAY
ENDEAVOUR BOULEVARD
STATE HIGHWAY 43
STANDBY ROAD
SATURN DRIVE
ARMY NASA
1(1)
2(2)PR
3(2)PR
4(2)PR
5(6)HR
6(7)HR
7(5)X
8(4)
9(4)HR
10(7)HRX
11(7)HRPR
12(7)HR
13(7)HR
14(7)X
15(7)X
1000 500 0 1000
SCALE IN FEET
N
LEGEND
MSAAP BOUNDARY
EXAMPLE PARCEL DESIGNATION
99(7)HRPRX
99 PARCEL DESIGNATION
(7) ECP CATEGORY
HR HAZARDOUS SUBSTANCE RELEASE OR DISPOSAL
PR PETROLEUM SUBSTANCE RELEASE OR DISPOSAL
X EXPLOSIVE HAZARD/MEC, WHICH INCLUDES DMM, UXO, AND MC
ECP CATEGORY 1
AREAS WHERE NO RELEASE OR DISPOSAL OF HAZARDOUS SUBSTANCES OR PETROLEUM PRODUCTS OR THEIR DERIVATIVES HAS OCCURRED, AND TO WHICH THERE HAS BEEN NO MIGRATION OF SUCH SUBSTANCES FROM ADJACENT AREAS.
ECP CATEGORY 2
AREAS WHERE ONLY RELEASE OR DISPOSAL OF PETROLEUM PRODUCTS HAS OCCURRED.
ECP CATEGORY 3
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, BUT AT CONCENTRATIONS THAT DO NOT REQUIRE A REMOVAL OR REMEDIAL RESPONSE.
ECP CATEGORY 4
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, AND ALL REMOVAL OR REMEDIAL ACTIONS NECESSARY TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT HAVE BEEN TAKEN.
ECP CATEGORY 5
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, AND REMOVAL OR REMEDIAL ACTIONS, OR BOTH, ARE UNDER WAY, BUT ALL REQUIRED ACTIONS HAVE NOT YET BEEN TAKEN YET.
ECP CATEGORY 6
AREAS WHERE RELEASE, DISPOSAL, OR MIGRATION, OR SOME COMBINATION THEREOF, OF HAZARDOUS SUBSTANCES HAS OCCURRED, BUT REQUIRED REMEDIAL ACTIONS HAVE NOT YET BEEN INITIATED.
ECP CATEGORY 7
AREAS THAT ARE UNEVALUATED OR REQUIRE ADDITIONAL EVALUATION.
URS
ENVIRONMENTAL CONDITION OF PROPERTY PARCEL MAP
MISSISSIPPI ARMY AMMUNITION PLANT
JOHN C STENNIS SPACE CENTER
DRN. BY: DPG
DATE: 11/27/06
PROJECT NO. 16170064
FIG. NO. 5-1
CHK'D. BY: -
REVISION: 0
November 28, 2006 10:31:49 a.m.
Drawing: T:\MSAAP\5-1.dwg

All information/documentation provided accurately reflects the condition of the property. This report meets the DOD requirements for completion of an Environmental Condition of Property Report.

Todd T. Beckwith
Environmental Engineer
U. S. Army Environmental Center

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Appendices redacted.

APPENDIX B

Site Maps and Figures

Appendices redacted.

APPENDIX C

Building Hazards Classifications

Appendices redacted.

RECORD OF CONVERSATION

Date: June 5, 2006
Time: 1230
Contact: Patricia Anderson, USEPA Region IV
Atlanta, GA
Phone: (404) 562-8490

RE: RCRA Permitting of MSAAP

RCRA permit was effective 8/9/83 to 9/9/83. There were associated amendments with the permit. No orders were issued since the permit was issued before HZWA. No RFI.

Ms. Anderson provided information pulled from an existing MSAAP file at EPA. Ms. Anderson provided a summary of RCRA activities that occurred at MSAAP. See attached document: MS6-210-020-560.

Referred to Greg Burgess with MDEQ (601) 961-5620

Mason Technologies Inc.   MS6-210-020-560

State Contact: Les Herrington Compliance Eng.

USA MS Army Ammunition Plant/Stennis Space Center   (601) 961-5010

Greg Burgess   (601) 961-5620

Hancock Co., Ms Army Contact: John Cecconi,   (228) 689-8904

Kimberly High   (512) 419-5046

This former large quantity generator facility with a 1.00 ton/hr. incinerator operated under a RCRA based operating permit from 8/9/83 to 9/9/93. This permit was not renewed, as the incinerator was dismantled and military closed, but not RCRA closed (?) prior to the permit expiration date. During the military closing process unexploded grenades were disposed, and all incinerator parts were shipped off-site, only the main body remains. The inside of the walls were cleaned with acid and tested for decontamination verification. However, the results were inconclusive, as the metal concentrations detected could be due to the acid decontamination process causing metal leaching. Therefore, Ms. Anderson thinks no AClean Closure@ letter was ever written.

This base RCRA permit was issued in 1983, prior to the adoption of the 1984 HSWA amendments. According to the EPA Project Manager, EPA did not have any authority to impose corrective action as the HSWA Amendments could not be imposed retroactively on previously issued base RCRA Permits. Nevertheless, under the base RCRA Permit an RFA was initiated in 1993 and completed 6/22/94. Because this base RCRA Permit was not renewed (see above discussion), there was no RCRA mechanism to impose corrective action through the permitting process after 1993.

The only mechanism for conducting an RFI was through an Order, which could have been imposed if there was an imminent threat (7003). However, the EPA Project manager did not think there were any sleeping giants and did not think the RFA came up with much. Therefore, no Order was ever issued. It was determined that the facility cleanup would need to be conducted under one of the other authorities such as the Installation Restoration Program or one of Mississippi's state programs (Voluntary Cleanup Program). The facility was not a very high priority for those programs.

The base RCRA permit expired prior to completion of the RFA and no Order was issued. Therefore, no HSWA permit or Order was ever written; and, no RFI was initiated or completed. An RFI is needed to collect groundwater, surface water, and soil data to verify the extent of contamination. Once this information is obtained EPA can determine what remediation is required and implement Institutional Controls, if necessary.

The RFA, completed 6/22/94, identified 29 SWMUs and 1 AOC. Twenty-three (23) SWMUs require No Further Action, including the 4 SWMUs, managed by CERCLA, while 7 SWMUs and the AOC required Confirmatory Sampling or integrity testing. The RFA states the release potentials for these SWMUs were as follows: Air (L), Groundwater (L- H, U), Soil (M - H), Subsurface gas (L - M), Surface Water (L-H).

The latest correspondence, 6/23/97 to Mason Technologies states that EPA was in agreement with the RFA's recommendations for further action. Based on a phone conversation with Wayne Gouguet, Mason Technologies, only limited activity has occurred since this facility received the 6/97 letter. A Phase I and II RFI was conducted for a specific building, and the Landfill, SWMU 1, was RCRA closed (work completed). No additional work has been conducted on SWMUs 7, 8, 15, 14 A and C, 19, and 25 and AOC A. He also stated there are probably other SWMUs requiring an investigation. He stated that groundwater is contaminated with 180 Φg/l TCE.

The incinerator is an inactive/closing regulated unit that may not have been RCRA closed (3/7/80). However, the facility is on the base closure list, so the incinerator may be RCRA closed in the near future.

This 14,000 acre site, owned by NASA, was used for the production of space shuttles. The Army initiated operation at this site in 1976 or 1978 with a 100 year lease. This facility (buildings and operation) is owned by the Army with Mason Technologies as the Army=s operator, and the property is owned my NASA.

When the program was downsized the site was redeveloped to accommodate industrial tenants. Previously they had 6-7 tenants, but with the weak economy only an Ammo Packaging Plant was on-site for awhile. With economic improvement there are now 5 tenants (2004).

The site has a waste water treatment plant and generates varying amount of hazardous waste depending on the number and type of tenants. The facility generated a few 55-gal. drums of paint and other paint related materials as hazardous wastes.

The schedule for CEIs varies with the number of tenants. During 2001-2002, this site had major status (6-7 tenants). However when they lost tenants, it was relisted as minor status. In 2004, there are five (5) tenants with DOE contracts. The 3/18/2004 CEI found no violations, so there was no enforcement activity. No violations have been noted at this facility, since 1991.

This facility operates under the Rock Island, Illinois Army Command (Joint Munitions Command). John Cecconi, AOC (Administrative Contracting Officer), is the Army contact.

This is a low priority facility not GPRA.

Hurricane Katrina conditions:
Problems with a 500 gal. fuel spill at vehicle loading area most contained within a bermed area, electricity down.
Building damage Mission (Grenade) Production Equipment Exposed - no hazardous waste.
Will wait a few months before contacting them for a site visit.

RECORD OF INTERVIEW

Interviewee: Mr. Don Bales
Former Pest Control Coordinator at MSAAP (1982-1993)
(601) 606-8881

Date: 31 August 2006

Interviewer: Sue Volkmer

Re: Pest control management program

Mr. Bales description of the pest control management program during his tenure is below.

For a very brief period (less than a year), MSAAP handled their own pest control. However, due to the extensive Army regulations regarding the storage and use of pesticides and herbicides, MSAAP changed to an off-site state certified contractor implementation of their pesticide management program. The pesticide program was the first to be converted to an off-site contractor. Herbicide application was maintained for a while longer. (Mr. Bales was not sure how long, but at max not more that a year or two). All pesticides and herbicides on-site at the change over were “excessed” following Army regulations. However, some of them may have remained on-site for more than a year before being removed from MSAAP.

The contractor brought everything to MSAAP. Nothing was stored on-site by the contractor. The contractor did mix on-site; however, they used a transfer container for water so that there was no chance of the groundwater source becoming contaminated with pesticides.

Mr. Bales did not recall the number of the building where pesticides were stored and/or mixed while MSAAP implemented their own program. However, Mr. Bales did say that there was no area on MSAAP where pesticides/herbicides were spilled (during mixing or otherwise) and no areas where pesticides/herbicides were dumped or otherwise disposed of that anyone taking over the property should be concerned about.

RECORD OF INTERVIEW

Interviewee: Mr. Mike Burr
MSAAP Water Treatment Plant Operator

Date: 7 September 2006

Interviewer: Dave Berger

Re: UPS batteries in IWTP control building (9148)

1) **How many batteries as associated with the IWTP UPS system?**
There are 30 batteries that support the IWTP UPS system.

2) **Are the batteries wet or dry cells?**
The batteries are dry cell batteries.

RECORD OF INTERVIEW

Interviewee: Mr. Hugh Carr
Natural Resources Manager, Stennis Space Center
(228) 688-2466

Date: August through September 2006

Interviewer: Sue Volkmer

1) **How long (19___ to ____) you have been the Natural Resources Manager at Stennis.**
1999 to present (2006) – 7 years

2) **Craig (Craig Case, MSAAP and Stennis Forester) indicated that new T&E surveys were scheduled to be completed for Stennis (including MSAAP) in 2007. Is this still the case?**
Yes

3) **Are any other surveys scheduled?**
A forestry inventory and damage assessment is being done. Also, we are updating the INRMP for Stennis, and will be including the area within MSSAP.

4) **Are there any plans to resurvey the wetlands? Craig indicated that the 2000 survey, being a survey could be fairly inaccurate. Also, to your knowledge has anyone done an actual wetlands delineation for MSAAP?**
Although we made a "wetlands" map over Stennis which contained hydric and hydric-inclusive soils, this map was for general use and did not specifically indicate what was actually wetlands. Wetland determination is done on a case-by-case basis per the Corps of Engineers instruction. Therefore, a "survey" has not be done for wetlands, and will not be done for the area as a whole. I have no knowledge as to whether a wetlands delineation has been completed for MSSAP. To my knowledge, Stennis has not developed a wetlands delineation map for the MSSAP area.

5) **The USACE did a survey in 1988, based on what I have read of that document, it included MSAAP. Is this correct?**
I'm not sure what type of survey you are referencing.

6) **My understanding is that the Gainesville and Logtown archaeological sites are located outside the MSAAP boundaries, correct?**
Yes, this is correct.
So, there are no known archaeological sites located on MSAAP itself, correct?
I have no knowledge of such sites, therefore I refer you to the Mississippi State Historical Preservation Officer for such information.

7) **Regarding historic structures, my understanding is that there are no buildings currently on MSAAP that qualify for listing on the National Register. The question has been raised about Shorty's residence. Based on what I have read in the 1988 report and assuming that the survey area included MSAAP, the residence lacked characteristics to make it eligible. Is this also correct.**
I have no knowledge of any of this, therefore I really can't make any comment on it.

RECORD OF INTERVIEW

Interviewee: Mr. Craig Case
NASA Forester/MSAAP Natural Resources Manager
(228) 688-7142

Date: 17-18 August 2006

Interviewer: Sue Volkmer

Re: Summary of e-mails regarding MSAAP natural resources

1) **How long have you been at MSAAP/Stennis?**
I have been associated with MSAAP and Stennis since 1988(18 years)

2) **Are you also the NASA natural resources person or are there others at Stennis?**
I am the Forester for NASA. Hugh Carr is Stennis Space Center's Natural Resource Manager

3) **You are responsible for maintaining the Natural Resources Management Plan, correct?**
I am responsible for MSAAP INRMP

4) **What is the status of the updated Natural Resources Management Plan? Any chance I could get a copy yet?**
Status is in a pending status. DOD has not funding any updates to the 1998 INRMP. I suspect they will not because of BRAC status. However a new timber inventory is being accomplished by Stennis with anticipation of land transferring

5) **Regarding wetlands on MSAAP: Has anyone delineated the wetlands and determined whether or not any are jurisdictional? Would it be possible to get a map showing the location of the wetland areas and the MSAAP boundary (do you currently have one)?**
I can send you my original National Wetlands Inventory Report of MSAAP. I'll need this report returned along with the other documentation soon. I think all our wetlands are jurisdictional.

6) **Regarding T&E species: Have any surveys been done since 1999?**
No other T&E surveys have been completed since 1999. However there currently efforts to complete one by end of 2007 for both MSAAP and Stennis.

7) **What impact has Hurricane Katrina had on timber harvesting and/or the forest management program?**
As far as hurricane impacts, that's a 2000 word essay. But there is no official damaged assessment survey has been accomplished. Salvage operation are winding down and I will have a better idea on the amount of salvaged timber we have harvested. Overall MSAAP has fared much better than SSC. I am guestimating [sic] that we have lost possibly 10-20% of the timber resource. This loss will defer some timber harvesting further into the future as stands recover. It will also expedite some regeneration harvests of under stocked stands. However, without a current INRMP, perhaps neither will be forthcoming. Hardwood drains are especially damaged with most drainages filled with timber debris.

RECORD OF CONVERSATION

Date: June 6, 2006
Time: 1520
Contact: Toby Cook, P.E.
MDEQ
Environmental Permit Division
Office of Pollution Control
Phone: (601) 961-5067

RE: RCRA Permit Modifications

NOTE: Initial contact was made with MDEQ on 6/5/06. Message was left for Greg Burgess who referred the message to Toby Cook. Toby Cook returned call on 7/6/06.

As per Mr. Cook, MDEQ granted a modification to the RCRA permit on 11/13/84. On 3/26/85, modification was approved; 9/13/88 the Permit Board modified the HW permit.

Toby Cook performed a file review for MSAAP based on the ID number. The results were emailed. See attached document (MS6210020560).

Comprehensive Permitting Report

Report run on: July 7, 2006 - 10:21 AM

Version: 3.0

User Selection Criteria

Location: MISSISSIPPI

County: All County Codes.

Handler Name:

Handler ID: MS6210020560

Group of IDs: None Chosen

Results

Data meeting the criteria you selected follows.

Total Pages: 3 Total Handlers: 1

Report Description

This report lists all permitting data for all facilities that meet the selection criteria. Unlinked Events are shown for each facility, as are Units that are not linked to either an Event or Unit Detail.

Report Information

Name:	compperm.rdf
Developed by:	EPA Headquarters, Office of Solid Waste
Deployed:	November 2002
Last Updated:	January 2006
Contact:	rcrainfo.help@epa.gov
Tables Used:	hreport_univ3, pseries, pevent, pln_event_unit, punit_detail, punit, lu_state, hid_groups, gpra_ca, aevent, aln_area_event, aarea
Libraries:	decodes.pll

Report run on: July 7, 2006 - 10:21 AM

List of Handler Universe Abbreviations

Generator	Indicates that the facility is a Large Quantity Generator (LQG), Small Quantity Generator (SQG), Conditionally Exempt Small Quantity Generator (CEG), or not a generator (N).
Transporter	Indicates that the facility Transports waste subject to RCRA regulations. ('Y' indicates that the facility is in this universe).
Operating TSDF	Indicates that the facility is a Treatment, Storage or Disposal facility subject to any type of enforcement. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
IC in Place	Indicates that the facility has Institutional Controls in place. ('Y' indicates that the facility is in this universe).
EI Indicator (HE/GW)	Indicates that the facility has controls in place for Environmental Indicators. HE - Human Exposures ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist) GW - Groundwater Release ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist)
Perm Prgrs	Indicates that the facility is part of the Permitting/Closure/Post-Closure Progress universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
PermWrkld	Indicates that the facility is part of the Permit Workload universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
Clos Wrkld	Indicates that the facility is part of the Closure Workload universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
Pclos Wrkld	Indicates that the facility is part of the Post-Closure Workload universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
Permits GPRA 06	Indicates that the facility is part of the Permits GPRA 2006 universe. ('+' indicates that the facility is on the Permits GPRA 2006 Baseline and meeting the goal; '-' indicates that the facility is on the Permits GPRA 2006 Baseline and not meeting the goal; 'N' indicates that the facility is not on the Permits GPRA 2006 Baseline)
Renewals GPRA 06	Indicates that the facility is part of the Renewals GPRA 2006 universe. ('+' indicates that the facility is on the Renewals GPRA 2006 Baseline and meeting the goal; '-' indicates that the facility is on the Renewals GPRA 2006 Baseline and not meeting the goal; 'N' indicates that the facility is not on the Renewals GPRA 2006 Baseline)
Subj CA	Indicates that the facility is part of the Subject to Corrective Action universe. ('Y' indicates that the facility is in this universe).
Subj CA TSD 3004	Indicates that the facility is a Treatment, Storage or Disposal facility Potentially Subject to Corrective Action Under 3004(u)/(v). ('Y' indicates that the facility is in this universe).
Subj CA TSD Discr	Indicates that the facility is a Treatment, Storage or Disposal facility Subject to Corrective Action Under Discretionary Authorities. ('Y' indicates that the facility is in this universe).
Subj CA Non-TSD	Indicates that the facility is a Non-Treatment, Storage or Disposal facility where Corrective Action has been imposed. ('Y' indicates that the facility is in this universe).
CA Wrkld	Indicates that the facility is part of the Corrective Action Workload universe. ('Y' indicates that the facility is in this universe).
CA GPRA 08	Indicates that the facility is part of the Corrective Action GPRA 2008 universe. ('Y' indicates that the facility is in this universe).

Comprehensive Permitting Report

Report run on: July 7, 2006 10:21 AM

MISSISSIPPI ARMY AMMUNITION PLANT County Name / Code: HANCOCK / MS045 **MS6210020560**
REGION 04

Location: BUILDING #9100, STENNIS SPACE CENTER, MS 39529-7099
Mailing: BUILDING #9100, STENNIS SPACE CENTER, MS 39529-7099

Activity Location: MS State District: Non-Notifier: Extract: Y Active: Y

Generator: SQG	Transporter: N	Operating TSDF: -----	IC In Place: N	EI Indicator (HE / GW): N / N
Perm Prgrs: -I---	Pclos Wrkld: -----	Subj CA: N	Subj CA Non-TSD: N	CA GPRA 08: N
Perm Wrkld: -----	Permits GPRA 06: N	Subj CA TSD 3004: N	CA Wrkld: N	
Clos Wrkld: -----	Renewals GPRA 06: N	Subj CA TSD Discr: N		

Series Name	Seq.
PERMIT 01	1

Unit Name	Seq.	Process Code / Legal and Operating Status / Notes	# Units	Capacity	UOM	Effective Date
INCINERATE	1-1	INCINERATOR Permit Terminated/Permit Expired, Not Continued - Inactive/Closing, but not Yet RCRA closed	1	1.00	T/Hr	03/07/1980

Event	Owner	Event Seq.	Resp. Agcy	Act.Loc.	Actual Date	Sched. Orig.	Sched. New
OP270	HQ	1	STATE	MS		09/09/1993	09/09/1993
Description: PERMIT EXPIRES							
OP240OH	US	1	STATE	MS	11/13/1984		
Description: MODIFICATION DETERMINATION-MOD. OTHER THAN AC, CA, OR GW							
OP200PP	HQ	1	STATE	MS	08/09/1983		
Description: FINAL DETERMINATION-RCRA PERMIT ISSUED, NO HSWA PERMIT YET							
OP160DP	HQ	1	STATE	MS	04/03/1983		
Description: PUBLIC NOTICE-DRAFT PERMIT ISSUED							
OP150	US	1	STATE	MS	03/07/1983		
Description: DETERMINED TO BE COMPLETE/TECH ADEQUATE							
OP100	US	1	STATE	MS	05/05/1982		
Description: NOTICE OF DEFICIENCY							
OP020	US	1	STATE	MS	04/13/1982		
Description: PART B RECEIVED							
OP001	HQ	1	STATE	MS	03/07/1980		
Description: PART A RECEIVED							
OP110	US	1	STATE	MS	03/07/1980		
Description: REVISIONS RECEIVED							

Unit Name	Seq.	Process Code / Legal and Operating Status / Notes	# Units	Capacity	UOM	Effective Date
INCINERATE	1-2	INCINERATOR Permit Terminated/permit Expired, Not Continued - Clean Closed	1	1.00	T/Hr	12/17/2002

Event	Owner	Event Seq.	Resp. Agcy	Act.Loc.	Actual Date	Sched. Orig.	Sched. New
OP380AC	US	1	STATE	MS	12/17/2002	12/17/2002	
Description: CLOSURE VERIFICATION-ACCEPTABLE CLOSURE							
OP370YE	US	1	STATE	MS	11/01/1994	11/01/1994	
Description: RECEIVE CLOSURE CERTIFICATION-ACCORDING TO PLAN							

Unlinked Units and Seq. No.

Unlinked Events	Owner	Event Seq.	Resp. Agcy	Act.Loc.	Actual Date	Sched. Orig.	Sched. New

*** End of Report ***

Sample Personnel Interview Questionnaire
Building 9101 and Adjacent Tank Farm

Installation: MSAAP
Interviewee: Wayne Gouget
Job Title: Deputy Program Mgr.
Interviewer: Kim High
Interview Date: 6-6-06
Interview Start time: 1520
Interview Finish Time: ____

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).
Deputy Program Mgr. – 6 mos
Mktg. Mgr. & Env. Oversight – 13 yrs; Env. – 1980-93

Site Information

2. Describe the history of the site?

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	__ Yes	_X No	__ Don't Know
Motor repair facility	_X Yes	__ No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	__ Yes	_X No	__ Don't Know
Plating shop	_X Yes	__ No	__ Don't Know
Medical or dental facility	_X Yes	__ No	__ Don't Know
Junkyard or landfill	_X Yes	__ No	__ Don't Know
Training area	_X Yes	__ No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	_X Yes	__ No	__ Don't Know

Please describe:
Temporary fueling at 9178; junkyard, no landfilld
Training area; fire suppression
Areas adjacent to 9101 and tank farm: gas/fueling station, motor repair facility, and junkyard

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	_X Yes	__ No	__ Don't Know
Automotive batteries	_X Yes	__ No	__ Don't Know

Drums, sacks, cartons, or bulk chemical containers	_X Yes	__ No	__ Don't Know
Hazardous materials	_X Yes	__ No	__ Don't Know
Industrial batteries	_X Yes	__ No	__ Don't Know
Paints	__ Yes	__ No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	_X Yes	__ No	__ Don't Know
Petroleum products	_X Yes	__ No	__ Don't Know
Radioactive materials	_X Yes	__ No	__ Don't Know

Please describe (include site and length of time of storage/use and condition of item):
Past and some current
Gauging equipment
Used pesticides, etc.

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know
Hazardous substances	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Ordnance/explosives	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Tires	__ Yes	_X No	__ Don't Know
Any other waste materials	__ Yes	_X No	__ Don't Know

Please describe (locations and time periods of disposal):

6. How were hazardous materials used at the site disposed of?
On-site throw industrial waste shipped off in drums

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

_X Yes __ No __ Don't Know

Please describe:
Mercury used in the lab

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

_X Yes __ No __ Don't Know

Please describe:

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
MSDEQ, no documentation necessarily for minor spills on floor; disposed of off site.

10. Was soil and/or groundwater affected as a result of the discharges/spills?
_X Yes __ No __ Don't Know

Please describe:
TCE – Identified in 1998; GW
Acetone, TCE, solvents – Bi-annual reports

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

__ Yes _X No __ Don't Know

Please describe:

12. Was any of the property used for fire training?

_X Yes __ No __ Don't Know

Please describe:
Fire suppression; burning drum (south of 9169)

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes __ No __ Don't Know

Please describe:
Stored historically at 9150. Chemicals 1981/82 stored in 9101 (possibly pesticide) then moved to 9145. Contract Pest Control – mix, store off site.

14. Have there been any demolition activities in this area or in relation to this facility?

_X Yes __ No __ Don't Know

Please describe:
Pratt-Whitney, Lonitron, Entech, south side offices
Demolition also occurred during production activities

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

_X Yes __ No __ Don't Know

Please describe:
All pits off surface treatment, process pits, battery charge, etc.

16. If wastewater was generated at the site, where/how was it treated?
Pumped through IWTP or SWTP

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes _X No __ Don't Know

Please describe:
Discharges East of IWTP

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

_X Yes __ No __ Don't Know

Please describe:
Electrostatic, air violations, violation of 116/hr., (fines, etc)

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

_X Yes __ No __ Don't Know

Please describe:
Spills outside the bldg. - glycol

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes __ No __ Don't Know

Please describe:

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

__ Yes __ No __ Don't Know

Please provide names:
Entire Plant – Jerry Pankow (985) 643 7886; Env. Mgr. 1981- (Slidell, LA)
Len Landrum wk (601) 796 7688 Chem. Eng./Chemist (Lumberton)

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes __ No __ Don't Know

Please provide names:

Additional Information:

- Check Boeing Ph. II, boring drilled hole near 91T10
- Draw Lube Tank held waste oil then pump elsewhere, moved by mobile tank; outside vender dispose
- Freon Still (SWMU) - 9160
- Paint Booth (SWMU) (photos 62/63) 9101
- Electrostatic closed loop system – non PCB transformer oil
- Open top rail cars for cuttings (hoppers, gondolas, etc)
- Charged leak loop (vented) 9104 w/ethyl glycol, cooled Forge Rm
- API Sep. – oily ww, pull off oil, ship disposal, remaining water to IWTP
- Heat Treat used drench oil; all oil went to API Separator
- Vapor degreaser – (TCE)
- Acetone Dip Tank in the Acetone Area; tooling was dipped into Acetone

Tank Raw product in by drum, waste acetone & rags drummed, entered waste water stream until 88 when recycled.

- Paint Booth Area was a storage area for rags, etc.
- Overhead switch gears, sumps, piping to underground in case of rupture
- 9125 – tanks used before IWTP on line; waste hauled offsite (acetone drum → vault → still)
- Air emissions vapor system under 9125

In Person Interview

Interviewee: Wayne Gouget — Conducted by: Dave Berger and Kim High
Date: 6-9-06 — Time: 2:00-4:00 p.m.

9145	Chemical Storage, no recollection West side – open drum storage and on hard pad
9150	80's pesticide storage, acids, paints, various chem., dry sumps, contained
9166	Inert and spare parts
9156	Fiberglass wrap resin storage *Use acetone only during cleanup. [*Len production eng. for fiberglass wrap activities Process Treatment operations]
9	"Roads and Grounds" equipment (current) Cooling tower – biocides, (no hexav. chr. for corrosion), discharge directly to ditch. Diesel tank on south end – no known releases, env. acceptable chemicals used.
9114	(Paint Booth) Sheet metal room – oily water sump to IWTP north half of 9114 separate from south for tenant. Unregulated UST, dispenser west of 9114 diesel out of concrete, corrosion – dug up, diesel truck in, to RR Env. potential – batt charge area, sump Laydown yard (north of 9114) – no known spills
9135	Empty N-tanks; drains & sumps (boiler blow down) goes to IWTP *Vert boiler tubes failed (1-2 yrs ago), reclaimed N, modified boilers (cut down on blow down)
9143	Caustic noted, contained area w/sump, salt water brine, stored boiler water treatment chemicals; if spills occurred probably just sprayed down (sump). In boiler area, no known regulation issues except air (particulate, SO_2). No known asbestos. Ash, air issues, sulfates/sulfites fall to ground west side of FGD. Coal plant - Rail line would dump coal through grates; water from coal pond overflow to ditch (east) from pond, piped underground. *FGD sludge hauled directly to landfill.
9144	Dry line tank SW corner inside, Haz drum storage area then veh. wash area w/sump *"Lots" of spills north side of 9144 in tank area and west side of 9143.
9165	Originally for demilling grenades, only operated maybe. Wells – chlorination w/chlorine gas; water directly from ground & add chlorine.
9128	Baseline (~2003/2004) no Pb.
9155	Sanitary WT – used gaseous chlorine and dechlor, now UV (20/50/80) Sludge went to sanitary landfill, now once a yr or 2 ship offsite. Lift station southwest is main station. Sanitary – few minor discharge issues, few overflow issues. Plant was killed; notify state, speculate hydraulic oil but not confirmed, had to correct, "seed." Haz storage – '88/89 online, no known spills other than minor spills near acetone still w/sumps.

	Schedule Rs and biannual rpts for haz wast records (late 80's). Chronate spill – trying to meet ".05" no closure, no letters or records (1985), containment lined after '87 tank overflows, and "lost tank bottoms" Now protective measures implemented – tank will emit water before bottom gives out. IWTP – south tanks considered process so containment not issue, "never" been cited for violation.
9148 area	Bulk Storage Containment – no known issue. Inside 2 day use tanks (acid) many issues. Sump in bulk storage would flow to drum cleaning area. *Drum cleaning area – all chemicals Sludge holding tanks south of bulk storage area Listed orig. as HW (b/c electroplating), petitioned and delisted (ased on test results). Freon 113 degreasers, salt, batt charging station, paint stencil, waste ac. area on east wall, lab. - Chiller on west PMPTS for ge only - 2 chillers in middle (add ethylene glycol prevent freezing) OP 2235 Hard Coat Ops

<u>PMPTS</u>
Operations 1155, 2235, 3065, 1050 – Chrome used
"Clean Ops" Clean Body – alkaline cleaner, spray on body, close loop systems, when changing pump to sump
Stress Relief – heat treat
Slow Cool – heat treat
Heat Treat & Cool – 1105 heat quench treat dip oil
HT & Age – water quench 2160, 2162, 3045

<u>CMPTS LaStar 2005</u>
Blank disc – heavy oil
Draw Restrike
Grind OD – oil
HT – salt 2075/6075 ($NaNO_3$ $NaNO_2$)
Phosphate – Chromes, Alk cleaners, acids, etc.
Color 6095 – Stencil (solvent)

<u>M42</u>
Degreaser, Freon 113
Conveyor w/grenade through Freon, dump grenade, continue.
Freon 113 – Asphixiation danger, no other safety issues
*TCE degreaser – own system, TCE still at 9101
Waste Water
9160 only for Cargo 113
*CMPTS – Sump on southwest corner outside, behind lab.

Telephone Interview

Interviewee: Wayne Gouget | Conducted by: Dave Berger
Date: 6-30-06 | Time: 1330-1400

Q: Was a facility-wide summary of electrical equipment, including electrical transformers, ever prepared?
A: A base-wide electrical equipment inventory is not believed to have ever been generated. A limited transformer inventory was generated in the middle 1980's to address the presence of several older transformers that were found on base. No former, comprehensive transformer inventory was ever prepared.

Q: Have, or are, the MSAAP ASTs regulated or permitted by the State?
A: No, none of the ASTs are permitted or regulated.

Q: Is there a comprehensive list of all of the ASTs that have ever been located at MSAAP?
A: No, the most comprehensive list would be in one of the SPCC plans prepared in the early to mid 1980's.

Q: Are you are aware of the number of ASTs that have been removed from MSAAP, their disposition, and the disposition of any associated piping or hardware?
A: The only tanks that are known to have been removed were from the vicinity of the Coal-fired boiler building and the FGD building. Several stainless steel and fiberglass tanks were removed, however their disposition, and the disposition of the associated hardware and piping is not known.

Q: Is there any known documentation related to the removal of the UST at Building 9110?
A: There is no known documentation. Soil samples may have been collected following the removal of the tank to determine if the UST had leaked.

Q: What is the status of the USTs in the vicinity of Shorty's Bar and Building 9158?
A: USTs may have been located at the Shorty's Bar site and in the vicinity of the former Grounds Maintenance and Storage Yards, not at 9158. A non-instrusive investigation completed in 1991-1992 in both locations failed to determine if any USTs were present.

Q: Where are the known septic systems at MSAAP located and what is their status?
A: Septic systems are identified as: 9743, 9744, 9745, 9746, 9747, 9757, and 9758. All are inactive except for the system at Building 9115. All of the septic systems have the capacity to be reactivated, if needed.

Q: What is the configuration of the SWTP process?
A: The SWTP flow is: Grate to remove sands, surge tank (33,000-gallon), 50,000-gallon aeration tank, clarifier, post-aeration tank, UV-treatment, and discharge.

Q: How much water can be discharged from Outfall 005?
A: The maximum quantity is not regulated. The average flow is reported in monthly reports to the State of Mississippi.

Q: How much water can be discharged from Outfall 002?
A: Same as Outfall 005. There is no maximum volume.

Q: Does all stormwater run through the IWTP?
A: Only stormwater that collects within the IWTP holding tanks and containment areas is processed through the IWTP. The only other materials that are actively processed through the IWTP include small quantities of miscellaneous wastes generated in several of the active buildings.

Sample Personnel Interview Questionnaire

Installation: MSAAP 9101W/9166
Interviewee: Bob Hancock
Job Title: President Entech/Power Dynamic
Interviewer: Jeff Zaleski
Interview Date: 6/7/06
Interview Start time: 9:05 a.m.
Interview Finish Time: ______

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).
Build hydraulic equipment, steel work & fabrication, hydraulic engines

Site Information

2. Describe the history of the site?
On-site 12 years; 9101 – steel work; 9166 – inert warehouse (not used much, PDI is only tenant)

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	_X Yes	__ No	__ Don't Know
Motor repair facility	__ Yes	_X No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	__ Yes	_X No	__ Don't Know
Plating shop	__ Yes	_X No	__ Don't Know
Medical or dental facility	__ Yes	_X No	__ Don't Know
Junkyard or landfill	__ Yes	_X No	__ Don't Know
Training area	__ Yes	_X No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	__ Yes	_X No	__ Don't Know

Please describe:
Diesel from barrel to LARK, ethylene glycol

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	_X Yes	__ No	__ Don't Know

Drums, sacks, cartons, or bulk chemical containers	_X Yes	__ No	__ Don't Know
Hazardous materials	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Paints	_X Yes	__ No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	__ Yes	_X No	__ Don't Know
Petroleum products	_X Yes	__ No	__ Don't Know
Radioactive materials	__ Yes	_X No	__ Don't Know

Please describe (include site and length of time of storage/use and condition of item):
Forklift batteries, hydraulic oil, paints (9101W < 5 gal/mo) (paint booth in 9166)
soluble coolants, 90W oil
Welding → aluminum only

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know
Hazardous substances	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Ordnance/explosives	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Tires	__ Yes	_X No	__ Don't Know
Any other waste materials	__ Yes	_X No	__ Don't Know

Please describe (locations and time periods of disposal):
Buying → hydraulic barrels (500 gals on-site), going to tote tanks
Disposal → pumped into barrels, then to waste truck & taken off-site
Wayne Gouget: North side of building hydraulic leak under slab

6. How were hazardous materials used at the site disposed of?

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes _X No __ Don't Know

Please describe:

---

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

__ Yes _X No __ Don't Know

Please describe:

---

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
N/A – no agencies notified of the hose-burst for hydraulic leak

10. Was soil and/or groundwater affected as a result of the discharges/spills?
__ Yes _X No __ Don't Know

Please describe:

---

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

__ Yes _X No __ Don't Know

Please describe:

---

12. Was any of the property used for fire training?

__ Yes _X No __ Don't Know

Please describe:

---

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes _X No __ Don't Know

Please describe:

---

14. Have there been any demolition activities in this area or in relation to this facility?

__ Yes __ No __ Don't Know

Please describe:
9166 – demo concrete; 9101W also – these are historic

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes _X No __ Don't Know

Please describe:

16. If wastewater was generated at the site, where/how was it treated?
Waste water stored in barrels & hauled away with waste oil

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes _X No __ Don't Know

Please describe:

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes _X No __ Don't Know

Please describe:

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

__ Yes _X No __ Don't Know

Please describe:

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _X_ No __ Don't Know

Please describe:

___

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

__ Yes _X_ No __ Don't Know

Please provide names:

___

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes _X_ No __ Don't Know

Please provide names:

___

Additional Information:

9114 → 2 years in late 90's Searex → fabrication only

Searex then, coastal marine

Coastal ~ metal wenches, hydraulic

Personnel Interview Questionnaire

Installation: MSAAP
Interviewee: Bob Heitzman
Job Title: Chief, Operations & Maintenance Division, Center Operations Directorate, NASA, Stennis Space Center
Phone: 228-688-2210 E-mail: robert.j.heitzmann@nasa.gov
Interviewers: Dave Berger / Jeff Zaleski Interview Date: 11/09/06
Note: Phone Interview of Historical MSAAP Operations

Background

Q: What position did you hold at MSAAP?
A: Industrial engineer. Titled position was Facility Engineer. Had some involvement during construction of the facility as a project manager the assumed a position in facility operations.

Q: What years were you employed at MSAAP?
A: 1980 to December1989

Site Utilities

Q: Is the electrical service for MSAAP supplied through NASA? If so, does the power come through one primary substation, or is it fed through multiple substations? Are you aware of a load-sharing agreement between NASA and MSAAP?
A: Power is supplied through one main substation located on NASA property. Power is then routed through one primary MSAAP substation. Mississippi Power supplies electricity to NASA which in turn bills MSAAP. Current electrical system configuration is nearing capacity at NASA and may be the same at MSAAP due to tenant usage.

Q: Is the water-distribution system at MSAAP configured to allow for water to be supplied to the facility by NASA, in the event that the MSAAP water distribution system in inoperable?
A: A system is in place to provide MSAAP with water in the event that the MSAAP water distribution system is inoperable. Water is supplied to MSAAP from NASA via a 2-inch cross over located near the Navy human resource building [9110] by Trent Lott Parkway.

Q: Are you aware of the presence of PCBs in any of the electrical equipment that has historically been utilized at MSAAP? Do you know if a survey or inventory of potential PCB-containing electrical equipment was ever completed at MSAAP?
A: Small pole-mounted transformers that were located at the facility prior to construction may have been present. These would have been removed in the 1980s. Unaware of any PCB inventory having been completed.

Q: Do you have any knowledge of the release of industrial wastes from overhead piping during periods of cold weather?
A: Aware of at least two occasions during the period between 1985 and 1987. Piping in a large portion MSAAP froze resulting in numerous ruptured pipes. Some cleanup was done, but unaware of the extent of soil cleanup beneath the piping, if any.

Production Operations

Q: **Could you briefly describe the use of Freon at MSAAP? Are you aware of any Freon releases, either inside the production buildings, outside, or at the Freon recovery building (9160)?**

A: Freon was used in both Buildings 9100 and 9101. May have been scheduled for change out through VE projects. No recollection of any major spills.

Q: **Are you familiar with the release of machining coolants from scrap metal that was exposed to the elements? Do you recall where those releases most frequently occurred? Would you be able to estimate the approximate volume of material that was released? Do you recall what the typical response procedures consisted of?**

A: Coolant would wash off of metal cuttings stored in rail cars. Some cleanup and spill recovery was done, though some of the releases may have reached the canals. Released materials would have a milky appearance. Coolants that had been released to the railway bedding would leach to the surface during heavy rains.

Q: **Are you familiar with the use of lead-acid batteries in the production facilities? Do you recall any potential environmental issues associated with the use, storage, or disposal of these batteries?**

A: Lead-acid batteries were utilized throughout MSAAP. Battery overcharging/leaks were relatively common, but were always cleaned up. Releases were to concrete surfaces. Batteries were recycled or scrapped. Batteries are not believed to have been disposed of at the MSAAP landfill.

Q: **Are you aware of any releases of explosives-contaminated water or materials from LAP Area buildings?**

A: Unaware of any major releases of explosives-contaminated water at the LAP area. There may have been occasional leaks from the washing machines in the laundry facility, however these would have been wiped up or washed to a sump for collection.

Q: **Do you have any knowledge of the laundry operations at the LAP area (9325)? If so, could you describe what was done?**

A: Washwater was processed through some sort of separator. Explosive-contaminated water would then be processed through a treatment column. Each shift was required to change clothing and all uniforms were to stay at the facility.

Q: **Do you have any knowledge of the explosives decontamination that was completed in the LAP and/or igloo areas? If so, could you describe what was done?**

A: Unaware of the decontamination procedures as was no longer employed at MSAAP during the time this work was completed.

Hazardous Materials

Q: **Are you aware of any releases associated with the storage of industrial wastes in the 9125 area?**

A: There may have been small fuel release(s), however these would likely have been contained within the concrete berm. Releases would have been small (surface sheen), and not measurable.

Q: **Are you familiar with any releases of industrial wastes or hazardous materials at the IWTP?**

A: Most of the releases were smaller chrome spills that were contained by the IWTP containment. The largest release was the loss of 10,000+ gallons of chromium-contaminated wastewater that has been reported. Response was provided by the MDEQ and Coast Guard Gulf Strike Team.

Q: Do you have any knowledge regarding the Coal Runoff Pond?

A: The liner in the pond was installed approximately 3 to 4 years after use of the pond started. Unaware of any investigation/remediation that might have been done at the pond prior to liner installation. Some concern about the integrity of the coal pit located adjacent to the rail line used for coal delivery. Coal was placed in the pit prior to distribution and use.

Q: Do you know if the soil/groundwater was ever impacted by the release of hazardous materials at MSAAP? Do you recall what corrective actions were taken, if any?

A: Unaware of any contamination, except that resulting from the large IWTP chromium release. The only monitoring wells known to exist at the site were around the IWTP and at the landfill. Most releases would not have likely reached the soil due to the large quantity of concrete and asphalt paved areas.

Q: Do you know if lead-based paints are present in the MSAAP facilities?

A: USACE used LBP on superstructure of 9100 and 9101.

Q: Do you know if asbestos-containing materials are present in the MSAAP facilities?

A: Some ACM in at least one of the 9100 equipment rooms. Likely would have been pipe insulation.

Q: Do you know if mercury-containing equipment (i.e. valves, gauges, etc.) were utilized at MSAAP?

A: Unaware of any mercury-containing equipment or spills other than thermometers in labs that would have been cleaned up with spill kits.

Q: Do you know if pesticides were mixed or stored at MSAAP?

A: Unaware of any issues associated with pesticide usage or storage.

Q: Do you have any knowledge of documented environmental violations at MSAAP? If so, do you know how those issues were resolved?

A: Aware of some concerns with air permitting at the MSAAP coal-fired boilers and smaller point-discharge issues associated with the IWTP.

Q: Do you have any knowledge of environmental issues or concerns with the properties adjacent to MSAAP?

A: NASA allowed the Army to conduct some materials testing on NASA facility. One site is on NASA property [EMTF], the other is on MSAAP [Old Kellar Range]. Cleanup has been assumed by NASA.

Q: Do you have any knowledge of the presence of USTs at the Shorty's Bar site?

A: NASA contractor had an AST beside the building. Cannot recall others.

Q: Do you have any knowledge of the presence of USTs at the Storage Yard site (Facility 9119)? Are you familiar with any maintenance activities, including the refurbishing of USACE materials, at this site?

A: Area functioned as a temporary office/management area during MSAAP construction. Recalls the use of skidded ASTs in this area, but unaware of any USTs. Unfamiliar with any refurbishing of USACE materials that may have been done.

Q: **Do you have any knowledge of painting or sandblasting operations that might have been done at any of the landfill operations, our outside of the MSAAP operational area?**
A: Unaware of any operations.

Q: **Do you know how the ASTs that were removed from the site were disposed of?**
A: Unaware of the disposition of these tanks.

Q: **Do you have any knowledge of the release of solvents from the area around the 91T10 tank?**
A: Unaware of any major spills associated with this area.

Q: **Do you have any knowledge of the release of coolant from the DI cooling tower at Building 9101?**
A: Doesn't know of any issues or of coolants being used. Releases would have likely contacted concrete surfaces beneath the cooling tower.

Q: **Do you have any knowledge of the release of coolants or other materials from the sumps and basins in Buildings 9100 and 9101?**
A: The production lines were always active. As such, there was no way to verify any cracks or holes in the basins. Unaware of any large volume losses from the pits.

Q: **Do you have any knowledge of spills that may have occurred around the FGD or Boiler Buildings?**
A: Some spill or materials released. Lime and ash were combined with water that was passed over exhaust column. Attempted to use the resulting gypsum-like material (slaker system) as a road topping, however the State considered the material hazardous with some radioactivity (common for the material). Waste material was removed in large volume (daily truck loads) from the site for disposal. Some of the material produced during early plant operations was disposed of at the MSAAP landfill.

Q: **Do you have any knowledge of hazardous materials or wastes being disposed of in the MSAAP landfill(s)?**
A: Aware of only one 55-gallon drum that was partially filled with paint. The drum was removed from the site for disposal.

Q: **Do you have any knowledge about the operation of or materials disposed in the rubbish disposal area near the northern MSAAP boundary?**
A: This area was utilized as a spoils area. Only materials known to enter this area included overburden and grubbed trees and roots.

General

Q: **Do you know of anyone that might have additional information about the activities at the site?**
A: Primary sources are deceased. Wayne Gouguet. Dana Matherly (lives in Slidell, was Bob Heitzmann's supervisor).

Q: **Are you aware of any reports or documents that might provide additional information about the environmental condition of the MSAAP property?**
A: Permits for coal plant, documentation that might exist about the chrome spill at the IWTP or NPDES documents about the few known excursion. No other documents specifically recalled.

Q: Are you aware of any environmental investigations there were completed to investigate the known, or possible, release of hazardous materials at MSAAP?
A: Only investigations recalled include work done regarding the IWTP chrome spill and anything that may have been done for the MSAAP landfill.

Q: Do you know of any storage of scrap material outside the EWI?
A: Scrap was trucked to the storage facility to the east. Unaware of a conveyer system between the EWI and the storage building.

Q: Any concerns with test area (spin launch, penetration test)?
A: Unaware of any specific concerns with this area.

Q: With the Navy activities taking place in the LAP Area, do you have any general concerns about explosives contamination?
A: No.

Q: Any other areas you have concern with?
A: None.

RECORD OF INTERVIEW

Interviewee: Mr. Larry Herwick
Operations Manager, AGT

Date: 7 September 2006

Interviewer: Dave Berger

Re: Electrical distribution system at MSAAP

1) **How long have you been employed at MSAAP?**
Started during plant construction in 1980 while working for Higgins Rigging and Heavy Haulers. Started working for MCI in 1982, now AGT.

2) **How is electrical service fed to MSAAP?**
Electrical service is provided by the Mississippi Power Company to a primary substation located on NASA property. Two 13.8 kV transmission lines feet power to MSAAP's primary substation located southeast of Building 9101. Power is then distributed to 18 substations located through the plant. Power is supplied at 480V, 240/220V, and 115 V.

Name:____Lynn Landrum_________________Phone: ____601-549-6229_______________
Organization: __Mason Technologies Inc____________________________
Title/Responsibility:____Maintenance and Utilities Manager__
Years of employment:__1978-1994_____________________________________

Date:_____Sept 6, 2006__________ **Time:** ___0930_________________________

1. **What hazardous substances were used, managed, handled, and generated in the laboratories?** 3 labs
   1-PMPT – solvents, acids, bases, etc.; analysis of metal parts, chemicals
   1-CMPT – as above
   1-IWTP – testing effluent

2. **Do you recall any major spills?**
   Chromate spills ~30K gallons

   What chemicals and where did the spills occur?
   Hazardous waste – minor spills wiped with rags or sorbent material

   What were the reporting procedures when a spill occurred?
   According to SPCC – environmental control group determined whether to report the spill or not

3. **Where was hazardous waste disposed (onsite/offsite)?**
   Chemical Waste Mgmt in Livingston, AL and BFI in Livingston, IN
   Was it ever disposed of at the MSAAP industrial landfill? No

4. **Where was the IWTP sludge disposed of?**
   MSAAP landfill after delisted

5. **When was Building 9157 (Haz Waste Accumulation Facility) built and online for use?**
   Built in 1980-81 (maybe 1979-80); used as soon as built; Haz Mat storage on one side, waste on other side

6. **Where were the satellite accumulation areas?**
   Don't recall

7. **Where were the hazardous materials stored?**
   Bldg 9157 since construction

8. **How did the solvent condensate system work?**
   Acetone – distillation; recycling
   Freon 114 (heavy Freon) – one with each vapor degreaser (~12); recycled
   TCE degreaser (1) – carbon for emission control

9. **Do you recall any areas used for sandblasting or painting activities? Specifically, undesignated, maybe wooded areas? Where? No painting**
   Yes – sandblasting, somewhere outside but don't recall where; used black beauty (carbide material only); river sand on water tower.

10. **Do you have any knowledge of the rumored gas station at/near Shorty's Bar?**
    Heard rumors, but no tank knowledge
    Do you know if there was a gasoline/diesel underground or above ground storage tank(s)?
    Don't recall

11. **Can you identify any environmental issues that were handled on a daily basis?**
    IWTP – permits, sludge operations, HW incinerator in LAP, AP – smog hogs in Forge Room
    FGD – Thinks state closed site
    Lined retention pond (coal pile) – acid water from "coal pile runoff", treated boilers
    NOTE: (40-50 employees in environmental group to handle issues on daily basis)

12. **How were environmental issues documented?**
    Reported to Environmental Group

13. **Did you work directly with the USEPA or MDEQ addressing environmental concerns at the facility?**
    Yes, so did Wayne Gouguet, Doug Tolle (deceased), Jerry Pankow, Toby

Personnel Interview Questionnaire

Installation: _MSAAP_____
Interviewee: Frank Lewis
Job Title: Director of Engineering/ Environmental Coordinator
Interviewer: _Dave Berger_______ Interview Date: ___8/30/06_____
Interview Start time: _____0900__ Interview Finish Time:____0930__

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).
Employed by USACE – Mobile District during construction of MSAAP as resident engineer beginning in approximately 1978. Transferred to Huntsville District to oversee construction. Employed by MCI beginning in approximately 1980 through 1990.

Site Information

2. Describe the history of the site?
Portions of the site were historically used as bombing test ranges. Constructed for production of artillery munitions.

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	_x_ Yes	__ No	__ Don't Know
Motor repair facility	_x_ Yes	__ No	__ Don't Know
Dry cleaners	__ Yes	_x_ No	__ Don't Know
Photo developing laboratory	__ Yes	_x_ No	__ Don't Know
Plating shop	_x_ Yes	__ No	__ Don't Know
Medical or dental facility	_x_ Yes	__ No	__ Don't Know
Junkyard or landfill	_x_ Yes	__ No	__ Don't Know
Training area	_x_ Yes	__ No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	_x_ Yes	__ No	__ Don't Know

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	_x_ Yes	__ No	__ Don't Know
Automotive batteries	_x_ Yes	__ No	__ Don't Know
Drums, sacks, cartons, or bulk chemical containers	_x_ Yes	__ No	__ Don't Know
Hazardous materials	_x_ Yes	__ No	__ Don't Know

Industrial batteries	_x_ Yes	__ No	__ Don't Know
Paints	_x_ Yes	__ No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	_x_ Yes	__ No	__ Don't Know
Petroleum products	_x_ Yes	__ No	__ Don't Know
Radioactive materials	__ Yes	__ No	_x_ Don't Know

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_x_ No	__ Don't Know
Automotive batteries	__ Yes	_x_ No	__ Don't Know
Hazardous substances	__ Yes	_x_ No	__ Don't Know
Industrial batteries	__ Yes	_x_ No	__ Don't Know
Ordnance/explosives	__ Yes	_x_ No	__ Don't Know
Paints	__ Yes	_x_ No	__ Don't Know
Pesticides	__ Yes	_x_ No	__ Don't Know
Petroleum products	__ Yes	_x_ No	__ Don't Know
Tires	__ Yes	_x_ No	__ Don't Know
Any other waste materials	_x_ Yes	__ No	__ Don't Know

Comments:
The MSAAP landfills were used for the disposal of a variety of wastes. Unaware of everything that may have entered the landfill. Chemical wastes were disposed of at off-site facilities or processed through the IWTP.

6. How were hazardous materials used at the site disposed of?
Most of the wastes generated by the production operations were processed through the IWTP. Hazardous wastes were hauled off-site for disposal.

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes __ No _x_ Don't Know

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

_x_ Yes __ No __ Don't Know

Comments:
Numerous spills at various locations throughout the plant. Most memorable was the release of chromium-contamainated wastewater at the IWTP.

9. What regulatory agencies were notified of the discharge/spill?

Comments:
State of Mississippi; Federal offices in Rock Island, Illinois

10. Was soil and/or groundwater affected as a result of the discharges/spills?
_x_ Yes __ No __ Don't Know

Comments:
Several memorable liquid spills to the drainage canals at the IWTP. The canals were damned and the liquids collected for processing through the IWTP.

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

_x_ Yes __ No __ Don't Know

12. Was any of the property used for fire training?

__ Yes _x_ No __ Don't Know

Comments:
State of Mississippi did conduct controlled burns in the areas around the plant, and there was likely fire-training on the NASA property, but not at MSAAP.

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes __ No _x_ Don't Know

14. Have there been any demolition activities in this area or in relation to this facility?

__ Yes _x_ No __ Don't Know

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes _x_ No __ Don't Know

Comments:
There may have been one, or more, lagoons, on the NASA facility and the coal pond was used for collecting runoff.

16. If wastewater was generated at the site, where/how was it treated?
Wastewater was treated through the IWTP.

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes _x_ No __ Don't Know

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes __ No _x_ Don't Know

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

__ Yes _x_ No __ Don't Know

Comments:
There was a newspaper article written a number of years ago discussing the air pollution generated by the plant. The article resulted in concerns being raised by the generated public, however the information used in the article was not correct.

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _x_ No __ Don't Know

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

_x_ Yes __ No __ Don't Know

Please provide names:
Wayne Gouguet would likely be best source of information

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes _x_ No __ Don't Know

Additional Information:
The fuel pumps at the Shorty's Bar site had been removed by the time that the construction of MSAAP began. No recollection of ever encountering any USTs at the site.

Name:____Jerry Pankow____________**Phone:** ____985-643-7886_______________
Organization: __Mason Chamberlain Inc___________________________
Title/Responsibility:____Environmental Engineer_____________________________
Years of employment:__9 yrs (1980-1989)___________________________________

Date:_____Sept 6, 2006__________ **Time:** ___1030__________________________

1. **What hazardous substances were used, managed, handled, and generated in the laboratories?**
   small quantities of various chemicals typically, most handled through chemical waste treatment; very few disposed of as hazardous waste.

2. **Do you recall any major spills?**
   High explosive spills at LAP, 1 waste treatment discharge exceeded limit

   What chemicals and where did the spills occur?
   High explosive (LAP), shoveled into barrels, didn't incinerate in EWI

   What were the reporting procedures when a spill occurred?
   Reported to state and federal govt; maybe annual report; state conducted 2 inspections/yr; feds conducted 1 inspect/yr

3. **Where was hazardous waste disposed (onsite/offsite)?**
   Livingston, AL and Livingston, IN
   Was it ever disposed of at the MSAAP industrial landfill? No

4. **Where was the IWTP sludge disposed of?**
   Offsite until delisted, then to MSAAP landfill

5. **When was Building 9157 (Haz Waste Accumulation Facility) built and online for use?**
   Built in 1989

6. **Where were the satellite accumulation areas?**
   PMPTs – 2 or 3 SSAs (drums, mostly rinse (cleaning chemicals)); 1-CMPTs, 1-LAP, 1-EWI/CWP (ash) – storage for drums in between 2 bldgs on cement pad, IWTP

7. **Where were the hazardous materials stored?**
   Don't recall

8. **How did the solvent condensate system work?**
   Don't recall

9. **Do you recall any areas used for sandblasting or painting activities? Specifically, undesignated, maybe wooded areas? Where?**
   No

10. **Do you have any knowledge of the rumored gas station at/near Shorty's Bar?**
    Don't recall (Shorty was a woman)
    Do you know if there was a gasoline/diesel underground or above ground storage tank(s)?
    Explosive test group at Shorty's Bar; did contract work for NASA.

11. **Can you identify any environmental issues that were handled on a daily basis? Violations?**
    close tabs; satellite sites were inspected daily and hazardous waste operations inspected weekly.

12. **How were environmental issues documented?**
    Negotiated remedial actions with the state

13. **Did you work directly with the USEPA or MDEQ addressing environmental concerns at the facility?**
    EPA – don't recall
    MDEQ – office in Jackson MS

    NOTES: RCRA Part B – 1st permit in nation, 1st permitted HW incinerator in country.
    - No testing was required
    - Tested Boiler Plant before converted to electric gen. (passed)
    - Smog Hog-ESP-heavy pres – Air Permitting issues, tested Smog Hog once a yr, results submitted to EPA and MDEQ, no significant failures (that he recalls)

    HW spills were all resolved, all mitigated unless more after 1989.

Sample Personnel Interview Questionnaire

Installation: MSAAP Navy Oceano

Interviewee: Terry Shelby — Job Title: Env. Safety & Health Mgr.

Interviewer: Jeff Zaleski — Interview Date: 6-7-06

Interview Start time: 9:02 a.m. — Interview Finish Time: 9:21 a.m.

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).

Oversees the environmental compliance, safety and health issues for the Navy Oceanographic Office tenants at MSAAP

Site Information

2. Describe the history of the site?

Terry's been here 6 years, Navy at least 10 years?

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	_X Yes	__ No	__ Don't Know
Motor repair facility	_X Yes	__ No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	__ Yes	_X No	__ Don't Know
Plating shop	__ Yes	_X No	__ Don't Know
Medical or dental facility	__ Yes	_X No	__ Don't Know
Junkyard or landfill	_X Yes	__ No	__ Don't Know
Training area	__ Yes	_X No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	__ Yes	_X No	__ Don't Know

Please describe:

Closed landfill

Gas/fueling stations on NASA side

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	_X Yes	__ No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know

Drums, sacks, cartons, or bulk chemical containers	_X Yes	__ No	__ Don't Know
Hazardous materials	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Radioactive materials	__ Yes	_X No	__ Don't Know

Please describe (include site and length of time of storage/use and condition of item):
Asbestos in LAP area: transite in building 9325 and 9302 wall panels
Building 9322 Machine Shop: 55-gal drums of hydraulic fluid and flammable storage lockers

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know
Hazardous substances	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Ordnance/explosives	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Tires	__ Yes	_X No	__ Don't Know
Any other waste materials	__ Yes	_X No	__ Don't Know

Please describe (locations and time periods of disposal):
Terry's answers were based on the "other than Navy" stipulation

6. How were hazardous materials used at the site disposed of?
Don't know

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes _X No __ Don't Know

Please describe:

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

__ Yes _X_ No __ Don’t Know

Please describe:

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
None

10. Was soil and/or groundwater affected as a result of the discharges/spills?
__ Yes __ No __ Don’t Know

Please describe:
N/A

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

__ Yes _X_ No __ Don’t Know

Please describe:

12. Was any of the property used for fire training?

__ Yes _X_ No __ Don’t Know

Please describe:

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes _X_ No __ Don’t Know

Please describe:

14. Have there been any demolition activities in this area or in relation to this facility?

__ Yes _X_ No __ Don’t Know

Please describe:
None other than their own → waste offsite disposal; asbestos was manifested for proper disposal (permitted landfill)

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes _X No __ Don't Know

Please describe:

16. If wastewater was generated at the site, where/how was it treated?
Goes to sanitary sewer to treatment plant

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

_X Yes __ No __ Don't Know

Please describe:
(Storm water) 9300 complex discharges to NASA and on to Pearl River

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes _X No __ Don't Know

Please describe:

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

__ Yes _X No __ Don't Know

Please describe:

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _X_ No __ Don't Know

Please describe:

____

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

__ Yes __ No __ Don't Know

Please provide names:
Terry Risley ran warehouse system for Navy (now in Oregon)
____
____

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes _X_ No __ Don't Know

Please provide names:
Terry did offer manifests
____
____

Additional Information:
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RECORD OF INTERVIEW

Interviewee: Mr. Terry Shelby
EHS Manager, NAVOCEANO

Date: 24 August 2006

Time: 1000

Interviewer: Dave Berger

1) **Did the Navy install a well for use at the 9600 Igloo Facility?**
   Yes, the Navy did install a well at the 9600 complex, but only for irrigation purposes. The well is not utilized as a potable water supply. Unsure of details regarding well construction.

2) **What is the nature and extent of battery usage by the Navy at MSAAP?**
   NAVOCEANO utilizes a large number of dry-cell batteries in its ongoing operations at the 9300 complex. The nature of the activities at that facility, however, is not open for discussion.

RECORD OF INTERVIEW

Interviewee:	Mr. Harvey Smith Former 600 Area (Igloos) Manager (601) 749-7700
Date:	August 31, 2006
Time:	1430
Interviewer:	Jeff Zaleski

Re: Storage igloos and LAP area decommissioning

Mr. Smith managed the igloo storage area and participated in LAP decommissioning before leaving MSAAP in 1990.

<u>Igloo Area</u>

Mr. Smith stated that palletized bulk explosives were brought to the igloo area from the block and brace facility. Product included 60-pound cardboard boxes of Comp A-5 and 250-pound drums of RDX (wet). Finished projectiles were stored eight per pallet in bundles of three. Other stored items included fuzes, Com C-4, M-55 primers, blasting caps, and off-spec grenades. Mr. Smith stated that no hazardous materials or wastes were stored in the igloos.

Mr. Smith stated the igloos were never wet washed, only swept. Personnel attempted to sweep each igloo once each month. Mr. Smith recalled only one spill during his tenure. A forklift operator punched a hole in a box of Comp A-5 in Bldg. 9607 causing 70 pounds of product to spill on the floor. All product was immediately swept from the floor. In a separate incident, an Army inspector dropped one M-55 primer/detonator in the grass outside an igloo. The primer was never found.

<u>LAP Area</u>

Mr. Smith indicated that although the "A line" (Bldg 9323) was not run in full production, it was fully run for testing purposes using explosives.

Mr. Smith stated he believed all equipment and buildings were decontaminated to the "3X" level. He described the decontamination of all LAP equipment as follows:

- All equipment, from ductwork down to the floor, had loose powder removed with rotoclones (Mr. Smith indicated there was a lot of loose powder).
- All equipment was steam cleaned.
- All equipment was wiped with acetone, mineral spirits, etc.
- Safety officers tested the cleaned equipment. If cleaning didn't achieve the required standard, the process was repeated.

This process was used for presses, grenade assembly machines, box opening equipment, conveyors, etc. Structures, including walls and framework, were steam cleaned and wiped. Mr. Smith stated that workers did not document cleaning activities, and he did not know what type of documentation safety officers completed.

Mr. Smith was aware of a spill caused by a malfunctioning water deluge system in Building 9324. He reported the impacted soils were excavated and treated in the contaminated waste processor.

Sample Personnel Interview Questionnaire

Installation: MSAAP 9353
Interviewee: Keith Smith
Job Title: Pres., JKS International
Interviewer: Jeff Zaleski
Interview Date: 6/7/06
Interview Start time: 8:40
Interview Finish Time: 8:55

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).
President of the company

Site Information

2. Describe the history of the site?
Manufacture bladders, weld – 10 years on-site prior to then building not used
MEK, denatured alcohol, toluene

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	__ Yes	_X No	__ Don't Know
Motor repair facility	__ Yes	_X No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	__ Yes	_X No	__ Don't Know
Plating shop	__ Yes	_X No	__ Don't Know
Medical or dental facility	__ Yes	_X No	__ Don't Know
Junkyard or landfill	__ Yes	_X No	__ Don't Know
Training area	__ Yes	_X No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	__ Yes	_X No	__ Don't Know

Please describe:

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know
Drums, sacks, cartons, or bulk			

chemical containers	__ Yes	_X No	__ Don't Know
Hazardous materials	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Radioactive materials	__ Yes	_X No	__ Don't Know

Please describe (include site and length of time of storage/use and condition of item):
They use gallon containers only
Paints: an occasional spray can

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	_X No	__ Don't Know
Hazardous substances	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	_X No	__ Don't Know
Ordnance/explosives	__ Yes	_X No	__ Don't Know
Paints	__ Yes	_X No	__ Don't Know
Pesticides	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Tires	__ Yes	_X No	__ Don't Know
Any other waste materials	__ Yes	_X No	__ Don't Know

Please describe (locations and time periods of disposal):

6. How were hazardous materials used at the site disposed of?
Waste is taken offsite by Waste Management (stored in skit)

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes _X No __ Don't Know

Please describe:

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

__ Yes _X No __ Don't Know

Please describe:

---

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
N/A (no)

10. Was soil and/or groundwater affected as a result of the discharges/spills?
__ Yes _X No __ Don't Know

Please describe:

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11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

__ Yes _X No __ Don't Know

Please describe:

---

12. Was any of the property used for fire training?

__ Yes _X No __ Don't Know

Please describe:

---

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes _X No __ Don't Know

Please describe:

---

14. Have there been any demolition activities in this area or in relation to this facility?

__ Yes _X No __ Don't Know

Please describe:

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes _X No __ Don't Know

Please describe:

16. If wastewater was generated at the site, where/how was it treated?
None generated

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes _X No __ Don't Know

Please describe:

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes _X No __ Don't Know

Please describe:

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

__ Yes _X No __ Don't Know

Please describe:
9325 → black powder – Wayne Gouget

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _X No __ Don't Know

Please describe:

____

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

__ Yes _X No __ Don't Know

Please provide names:

____
____
____

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes _X No __ Don't Know

Please provide names:

____
____
____

Additional Information:

____
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____

Sample Personnel Interview Questionnaire

Installation: MSAAP
Interviewee: Marianne Smith
Job Title: Env. H&S Special
Interviewer: Kim High
Interview Date: 6-8-06
Interview Start time: 0800
Interview Finish Time: 0945

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).
Env. H & S, all Rocketdyne Op & SSC (9101, 3202, tests and test Control areas 4995)

Site Information

2. Describe the history of the site?
Broke ground, Ops start late 99, Offices built in 1999; 2nd floor office renovated since Hurricane Katrina in 2005

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	__ Yes	_X No	__ Don't Know
Motor repair facility	__ Yes	_X No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	__ Yes	_X No	__ Don't Know
Plating shop	__ Yes	_X No	__ Don't Know
Medical or dental facility	__ Yes	_X No	__ Don't Know
Junkyard or landfill	__ Yes	_X No	__ Don't Know
Training area	__ Yes	__ No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	__ Yes	__ No	__ Don't Know

Please describe:

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	_X Yes	__ No	__ Don't Know
Automotive batteries	_X Yes	__ No	__ Don't Know
Drums, sacks, cartons, or bulk chemical containers	_X Yes	__ No	__ Don't Know

Hazardous materials	__ Yes	__ No	__ Don’t Know
Industrial batteries	_X Yes	__ No	__ Don’t Know
Paints	_X Yes	__ No	__ Don’t Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	__ Yes	_X No	__ Don’t Know
Petroleum products	_X Yes	__ No	__ Don’t Know
Radioactive materials	__ Yes	_X No	__ Don’t Know

Please describe (include site and length of time of storage/use and condition of item):
Wasp-treat, hydraulic fluid, compressor oil, fork lift batteries, UPS industrial batteries; cans of bug repellent. Asbestos roof abated; hydraulic elevator; hydraulic elevator; maintained by AGT.

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don’t Know
Automotive batteries	__ Yes	_X No	__ Don’t Know
Hazardous substances	__ Yes	_X No	__ Don’t Know
Industrial batteries	__ Yes	_X No	__ Don’t Know
Ordnance/explosives	__ Yes	__ No	_X Don’t Know
Paints	__ Yes	_X No	__ Don’t Know
Pesticides	__ Yes	_X No	__ Don’t Know
Petroleum products	__ Yes	_X No	__ Don’t Know
Tires	__ Yes	_X No	__ Don’t Know
Any other waste materials	__ Yes	_X No	__ Don’t Know

Please describe (locations and time periods of disposal):

6. How were hazardous materials used at the site disposed of?
Packaged, containerized (5 gal., 10, etc.), 3rd party removal (except SGQ) ~ once/yr; Kleen Harbors
Exempt SQG

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes _X No __ Don’t Know

Please describe:

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

_X Yes __ No __ Don't Know

Please describe:
Small, batt acid, hyd., rpts. avail.

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
None, non-reportable

10. Was soil and/or groundwater affected as a result of the discharges/spills?
__ Yes _X No __ Don't Know

Please describe:

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

__ Yes __ No __ Don't Know

Please describe:
Hist. - yes

12. Was any of the property used for fire training?

__ Yes _X No __ Don't Know

Please describe:
Fire ext. training elsewhere

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes _X No __ Don't Know

Please describe:

14. Have there been any demolition activities in this area or in relation to this facility?

_X Yes __ No __ Don't Know

Please describe:
Preconst., excav.

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes _X No __ Don't Know

Please describe:

16. If wastewater was generated at the site, where/how was it treated?
Pit in truck area – pumped manually washwater in treat plat pumped manually

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes __ No __ Don't Know

Please describe:

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes _X No __ Don't Know

Please describe:

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

_X Yes __ No __ Don't Know

Please describe:
EA – TCE, gw

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _X No __ Don't Know

Please describe:

____

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

__ Yes __ No __ Don't Know

Please provide names:

____
____
____

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes _X No __ Don't Know

Please provide names:

____
____
____

Additional Information:
Boeing directed EBI investigation.
____
____
____
____

Additional notes taken during the interview:

- Cleaned and filled pits; backfilled with dirt then 1 foot of concrete
- Found TCE under slab NW of Boeing occupied space
- NW corner concrete demolished: LBP and GW contamination; encapsulated the LBP
- Compressed hydraulic fluid for testing engines

- Flammable cabinets – SQ chems
  - Isopropanol
  - Leak check soln
- Refrigerated – adhesives, epoxies, etc.
- Hazardous waste cans emptied into drum in Haz Waste Storage

- Above ground hoists are self contained
- Wash floors with isopropanol once/week; Seal floor seams because oil seeping out due to traffic
- Worst peeling paint was along the north side of warehouse area
- Building was completely renovated; asbestos in roof was replaced when new roof was installed
- Oil under concrete coming up through cracks in foundation
- Used waste oil – 3rd party disposal
- Communication room – potential EPS (UPS?) batteries and spent batteries
- Chargers, welders
- Two coolant pits broken up and concrete removed; 1 HT pit backfilled with concrete over the top
- Natural gas generator
- All HP new piping
- Condensate system drain
- Battery charge areas, exhaust fans along north wall
- Floor drains: 2 in janitor's closet, 1 in office, 1 at condensation area
- Electric and hydraulic ramps removed
- At track bays – spill response equipment cabinet
- Compressed nitrogen and helium, hydraulic fluid – 55 gal
- Oil-free compressor
- Engine assembly facility; hazardous waste storage area
- Gas generators, gas, acetone, 2 photos
- Trench drain in dock area
- Oily waste tank in dock area

Sample Personnel Interview Questionnaire

Installation: MSAAP
Interviewee: Terry Stevenson
Interviewer: Sue Volkmer
Interview Start time: 9:50 a.m.

Job Title: BTC (current)
Interview Date: 06/09/06
Interview Finish Time: 11:20 a.m.

Interviewee Background

1. Job responsibilities, areas of oversight (area/building/site-wide).

Beginning → work for Mason Chamberlain as oversight of funds
Now → Base Transition Coordinator

Site Information

2. Describe the history of the site?

3. Is the property or any adjoining property used for any of the following?

Gasoline/fueling station	_X Yes	__ No	__ Don't Know
Motor repair facility	__ Yes	__ No	__ Don't Know
Dry cleaners	__ Yes	_X No	__ Don't Know
Photo developing laboratory	_X Yes	__ No	__ Don't Know
Plating shop	__ Yes	__ No	__ Don't Know
Medical or dental facility	_X Yes	__ No	__ Don't Know
Junkyard or landfill	__ Yes	_X No	__ Don't Know
Training area	_X Yes	__ No	__ Don't Know
Waste treatment, storage, disposal, processing or recycling facility	__ Yes	__ No	__ Don't Know

Please describe:
9114 diesel by coolant tower still active as old gas station
LAP – 9325 and 9110 → developing
Medical in 9110
Steam plant slab used for fire training
Junkyard behind Weaver Yard

4. Are there currently, or have there been previously any of the following stored on or used at the property or any adjoining property:

Asbestos	_X Yes	__ No	__ Don't Know
Automotive batteries	__ Yes	__ No	__ Don't Know

Drums, sacks, cartons, or bulk chemical containers	__ Yes	__ No	__ Don't Know
Hazardous materials	_X Yes	__ No	__ Don't Know
Industrial batteries	__ Yes	__ No	__ Don't Know
Paints	__ Yes	__ No	__ Don't Know
Pesticides (insecticides, herbicides, fungicides, avicides, rodenticides)	__ Yes	__ No	_X Don't Know
Petroleum products	__ Yes	__ No	__ Don't Know
Radioactive materials	_X Yes	__ No	__ Don't Know

Please describe (include site and length of time of storage/use and condition of item):
During production haz material were used on site, but no specific knowledge of what was used
Radioactive material: x-ray machine

5. To the best of your knowledge, have any of the following been dumped, buried and/or burned on the property?

Asbestos	__ Yes	_X No	__ Don't Know
Automotive batteries	__ Yes	__ No	__ Don't Know
Hazardous substances	__ Yes	_X No	__ Don't Know
Industrial batteries	__ Yes	__ No	__ Don't Know
Ordnance/explosives	__ Yes	_X No	__ Don't Know
Paints	__ Yes	__ No	__ Don't Know
Pesticides	__ Yes	_X No	__ Don't Know
Petroleum products	__ Yes	_X No	__ Don't Know
Tires	__ Yes	_X No	__ Don't Know
Any other waste materials	__ Yes	_X No	__ Don't Know

Please describe (locations and time periods of disposal):

6. How were hazardous materials used at the site disposed of?
No knowledge of the process specifically (not part of job responsibility)

7. Was mercury used or contained in any machinery parts, or electrical, pressure, vacuum instruments, sprinkler check valves, or other items?

__ Yes __ No __ Don't Know

Please describe:

---

8. Have there been any discharges/spills of hazardous materials or petroleum products and their derivatives on the property?

__ Yes _X No __ Don't Know

Please describe:
Recent FEMA spill

9. What regulatory agencies were notified of the discharge/spill?

Please describe:
N/A

10. Was soil and/or groundwater affected as a result of the discharges/spills?
__ Yes __ No __ Don't Know

Please describe:
N/A

11. Was any of the property used as a firing and/or bombing range (including skeet/trap and indoor ranges)?

_X Yes __ No __ Don't Know

Please describe:
Spin Launch Penetration & Kellar Range

12. Was any of the property used for fire training?

_X Yes __ No __ Don't Know

Please describe:
Only for fire extinguishing

13. Was there a pesticide shop, storage or mixing area located on-site?

__ Yes __ No _X Don't Know

Please describe:
Probably somewhere over in maint. 9114, 9145

14. Have there been any demolition activities in this area or in relation to this facility?

_X Yes __ No __ Don't Know

Please describe:
Shorty's Bar, several construction projects, 9110 was gutted, floor removed & replaced with thicker slab, contractor's responsible for removal of debris

15. Are there currently, or have there been previously, any pits, ponds or lagoons located on the property in connection with waste treatment or waste disposal?

__ Yes __ No __ Don't Know

Please describe:
SE side of square tanks related to sanitary sewer treatment plant

16. If wastewater was generated at the site, where/how was it treated?

17. Does the property discharge wastewater on or adjacent to the property other than storm water or into a sanitary sewer system?

__ Yes __ No __ Don't Know

Please describe:

18. Do you have knowledge of any documented environmental violations or environmental liens associated with the site?

__ Yes __ No __ Don't Know

Please describe:

19. Do you have knowledge of any environmental issues or information regarding properties adjacent to the site?

__ Yes _X No __ Don't Know

Please describe:

20. Are you aware of any other past activities or events or have you made any observations that you feel might be useful to this study?

__ Yes _X_ No __ Don't Know

Please describe:

___

21. Do you have knowledge of any other people who may have additional knowledge of activities at the site?

_X_ Yes __ No __ Don't Know

Please provide names:
Jim Lewis & Wes Hunsted – LAP
Harvey Smith - igloos

22. Do you have knowledge of any documents that may provide additional useful information on potential impacts to the environment at the site? Examples: Environmental assessment reports, audits, permits, AST/UST registrations, MSDSs, community right-to-know plans, hydrogeologic reports, notices or other correspondence relating to past or current violations of environmental laws, SPCCs, hazardous waste generator notices, etc.

__ Yes __ No __ Don't Know

Please provide names:

Additional Information:

Appendices redacted.

Appendices redacted.

APPENDIX G

1985 Chromium Release Documents

FY 90

IN ANSWER REPLY TO: 89-1-151

MASON CHAMBERLAIN INC. MCI

Mason Chamberlain Inc.

NSTL Base, Mississippi 39529-7099
(601) 467-8600

January 24, 1989

THROUGH: Administrative Contracting Officer
Contract No. DAAA09-86-Z-0010
Mississippi Army Ammunition Plant
Stennis Space Center, Mississippi 39529-7000

ATTENTION: SMCMS-EN

TO: Mississippi Department of Natural Resources
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209
ATTN: Mr. Larry Hamil

SUBJECT: Leak of Chrome Waste Water
Tank 451

Dear Mr. Hamil:

On January 12, 1989, notification of potential subsurface contamination at the Industrial Waste Treatment Facility (IWTF), involving the Chrome Waste Water Tank #451, was provided. Initial investigation tended to confirm that little to no subsurface contamination had occurred. Sampling, however, was immediately initiated at specific well points surrounding the tank area, to assess chrome content. After two sampling events, only one well (#6), showed chrome content near 0.05 ppm. Sampling is continuing on a weekly basis. A previous agreement as identified in the attached correspondence (Attachment #1), established 0.05 ppm chrome as the acceptable contamination limit.

Examination of the area immediately under tank #451 was excavated by removal of a ten-foot diameter section of the bottom plate. The upper layer of sand immediately under the tank, showed varing concentrations of chrome, and thus, was removed for off-site disposal. The layer of gravel under the sand and just above the clay subsurface was analyzed and washed for removal of chrome. The gravel will be returned to the excavation followed by newly purchased sand before repair of the tank bottom. No attempt will be made to penetrate the clay layer lest integrity be jeopardized. Within the Mobilization Project, all major waste tanks in use at the IWTF will either be double bottomed or mounted on a concrete pedestal. Completion is predicated on weather and construction schedules which will minimize treatment impacts. In no event should this exceed July 1, 1989.

MASON CHAMBERLAIN INC.
MCI

Attached please find a summary of analytical data taken to assess impact and to track subsurface contamination.

As previously noted, the Mobilization Project is intended to correct operational deficiencies and to enable broader flexibility in responding to upsets in the waste treatment. It will also provide the additional capability to inspect the integrity of all tanks on a periodic basis. It is currently proposed to empty each tank for inspection on a semi-annual basis.

The above information and the attachments are in response to the telephone conversations between yourself and members of both the Army and Mason Chamberlain Inc. environmental staffs.

If additional information is required, the point of contact is Mr. W. J. Hunstad, telephone (601)467-8640.

Sincerely,

MASON CHAMBERLAIN INC.

Original Signed By:
RICHARD AUGER

Richard Auger
President

Attachment #1
Attachment #2

Attachment #1

85-1-233

DEPARTMENT OF THE ARMY
MISSISSIPPI ARMY AMMUNITION PLANT
PICAYUNE, MISSISSIPPI 39466-5000

REPLY TO ATTENTION OF:

February 11, 1985

ENGINEERING DIVISION	
ROUTING/DISPOSITION/ACTION DUE	
A DIVISION MANAGER	
ENGINEERING SUPPORT	
PLANT ENGINEERING	
INDUSTRIAL ENGINEERING	
✓ CHEMICAL & ENVIRONMENTAL	
✓ MAINTENANCE	INFO.
	*
FILE	
REMARKS: * FEB 12 MEETING PASSED —	

SMCMS-EN

SUBJECT: IWTF Spill Cleanup Meeting, February 11, 1985

Mr. J. E. Cummings
Mason Chamberlain Inc.
Post Office Box 4000
Picayune, Mississippi 39466

Dear Mr. Cummings:

Subject meeting was conducted for the purpose of holding discussions concerning the contractual arrangement with Thompson Engineering for the cleanup of the IWTF spill incident of January 14, 1985. The following were in attendance:

Mr. Jack Cummings	- MCI
Mr. Bruce Campbell	- MCI
Mr. Dave Towle	- MCI
Mr. Al Hammond	- MCI
Mr. Troy Wilson	- MCI
Mr. Dick Wassman	- MCI
Mr. Rodger Madison	- COR
Captain Aaron Cobb	- COR
Mr. Dana Matherly	- COR
Mr. Ray Leibelsperger	- COR
Mrs. Ann McClintock	- COR

Results of subject meeting were as follows:

a. Proposed contract with Thompson Engineering is inadequate as written. Expanded verbage is necessary to clearly define Phase I and Phase II Scopes of Work.

b. Phase I Scope of Work to be limited to $180,000 and to be definitized with respect to work accomplished to date and projected work. Phase I Scope of Work to consist of engineering services performed to date by Thompson Engineering, remaining engineering services consisting of Geotechnical/Hydrogeological/Environmental/Analytical Chemistry services and continued monitoring through March 8, 1985, and completion of engineering documentation and final report. Final report to consist of engineering solution to total cleanup of spill area as required to satisfy regulatory requirements.

RECEIVED
FEB 13 1985
C.E.C. DEPARTMENT

RECEIVED
MASON CHAMBERLAIN INC.
ENGINEERING DIVISION
DATE 2-12-85

c. Present criteria for cleanup effectiveness shall consist of reduction of groundwater-chrome level to 0.05 ppm, as indicated by Mr. Bill Barnett of the State of Mississippi during the January 29, 1985 meeting. In the event criteria changes, recovery program will be modified as required.

d. Phase I efforts will not consist of recovery except as is necessary and incidental to engineering study effort.

e. Phase II efforts shall consist of recovery and monitoring efforts per se. Contract shall include language to cover Phase II as an option to be exercised upon the discretion of MSAAP. Phase II Scope of Work shall be so structural that incorporation of recommended recovery wells, sample monitoring, analytical chemistry, and engineering analysis of results and any and all other work may be separately performed by MSAAP if so desired without prejudice to the agreement of Thompson Engineering to continue with the remaining work efforts as directed by MSAAP.

f. MCI shall obtain from Thompson Engineering by meeting on February 12, 1985 the following:

(1) Complete cost expended to date.

(2) Cost estimate for installation of proposed Phase II well-point system with time/materials breakout in sufficient detail as to allow MCI to perform analysis of degree of fair and reasonableness.

(3) Planned schedule for incorporation of well-point system.

(4) Completion date for Phase I recommendation report. March 8, 1985 will be used as overall completion date for Phase I with report provided as early as possible before March 8, 1985.

g. Reported costs of haul-away resulting from spill incident were $300,000. Separately, costs of freeze damage haul-away were $80,000 to date. MCI requested that government provide concurrence rather than ratification for this procurement due to the emergency condition in effect at the time.

It is expected that above activities will proceed as described. If your understandings from this meeting are in conflict with the above, request this office be notified in writing no later than February 15, 1985.

Sincerely,

Aaron L. Cobb
Captain, Ordnance Corps
Contracting Officer's Representative

Attachment #2

ANALYTICAL DATA
LEAK OF CHROME WASTEWATER TANK 451
JANUARY 6,1989

INITIAL ANALYSIS - TANK 451 CONTENTS (ppm) - Jan 6

pH	Al	Zn	Ni	Fe	Cu	Cr
2.5	.25	12.5	1.3	4.23	4.0	63.0

TANK CONTENTS AT TIME OF NOTE OF SPILL

2.9	.31	11.0	1.1	3.99	5.8	45.0

TANK CONTENTS AFTER TRANSFER TO TANK 101(452) - JAN 7

12.2	1.1	10.2	1.0	6.5	6.4	45.0

WELL POINT SAMPLE ANALYSES FOR CHROME CONTENT (ppm) - JAN 10

	#1	#2	#3	#4	#5	#6	#7	#8	#9
Cr	.00	.01	.01	.11	.02	.30	.30	.01	.01

WELL POINT SAMPLE ANALYSES FOR CHROME CONTENT (ppm) - JAN 16

	#1	#2	#3	#4	#5	#6	#7	#8	#9
Cr	.01	.01	dry	.01	.02	.04	.01	.01	.01

	#11	#12	#13	#14
Cr	0.0	.01	.01	0.0

200-1a FY 90

IN ANSWER REPLY TO: 89-2-079

MASON CHAMBERLAIN INC.
MCI

Mason Chamberlain Inc.

NSTL Base, Mississippi 39529-7099
(601) 467-8600

MAR 09 1989

March 9, 1989

THROUGH: Administrative Contracting Officer
Contract No. DAAA09-88-G-0005
Mississippi Army Ammunition Plant
Stennis Space Center, Mississippi 39529-7000

ATTENTION: SMCMS-EN

TO: Mississippi Bureau of Pollution Control
Department of Natural Resources
P. O. Box 10385
Jackson, Mississippi 39209
Attention: Mr. Larry Hamil

SUBJECT: Leak of Chrome Waste Water Tank #451, January 1989

REFERENCE: A) Your letter dated February 6, 1989,
Subject: NPDES Permit No. MS0040797,
Response to Letter 89-1-151

B) ACO letter dated February 13, 1989,
Subject: Leak of Chrome Waste Water Tank 451

Dear Sir:

The following information is provided as requested by the referenced letter, concerning the subject leak.

ITEM #1

The upper 6" sand layer removed from directly below the tank was disposed of off-site at Chemical Waste Management's Emile, Alabama facility. The quantity of sand disposed of was approximately 4 cubic yards.

Attached are soil testing results obtained from numerous borings taken adjacent to the Industrial Waste Holding Tank area.

MASON CHAMBERLAIN INC.
MCI

Administrative Contracting Officer
Mississippi Army Ammunition Plant

ITEM #3

Two additional samples were collected from well point #6. The results were as follows:

	PH	TOTAL Cr
February 23, 1989	8.62	0.0 ppm
March 1, 1989	6.65	0.01 ppm

ITEM #4

Semi-annual inspections of all wastewater tanks will be conducted. The completion of the present modification to industrial waste will greatly enhance our ability to do so.

All wastewaters stored at the head of the treatment system are either contained by tanks which are double bottomed or they are positioned on solid concrete foundations. The double bottomed tanks have two steel bottoms, separated by an area filled with gravel. This area is drained through openings to the exterior of the tank. Both types of installations provide positive leak detection.

If further discussion is necessary, point of contact is Mr. W. J. Hunstad, telephone number (601)467-8640.

Sincerely,

MASON CHAMBERLAIN INC.

Original Signed By:
RICHARD AUGER

Richard Auger
President

Attachment

INTEROFFICE

1010-85-009

MASON CHAMBERLAIN INC.

Date .... January 15, 1985 ....

From R. B. Campbell Location

To J. E. Cummings Location

Subject Failure of Chrome Rinse Tank in Industrial Waste Treatment Plant (Chromium Rinse Water Tank No. 451)

At approximately 9:00 AM this date notification was received from Mr. Dave Towle of the failure of Tank #451 (chrome rinse water tank) in the Industrial Waste Treatment Plant. This 30,000 gallon rinse tank suffered failure at approximately 11:00 AM yesterday, January 14, 1985. Upon discovery of failure, the tank was immediately drained into the containment area to appraise the damage and allow Maintenance to gather materials for repair. Maintenance was notified and the repair was scheduled to commence at 8:00 AM on January 15.

The amount of waste drained from the tank into the containment area was approximately 20,000 gallons. Upon start of activities this morning at 7:30 AM it was discovered that approximately half of the material had leaked from the containment area into the ground. It is assumed that the leak was caused by the very corrosive nature of the material etching into the numerous cracks in the floor of the containment pit. This is an assumption at this time, and when the pit is drained and cleaned an assessment of the leak cause will be made. Because of the leak in the containment area, we are transferring the remaining material to another holding tank with the utmost urgency. Maintenance repairs have been stopped until cleanup activities are complete.

It is estimated at this time that 10 lbs. of chrome, plus or minus 15%, has been introduced into the ground below the containment area. Samples from the drainage ditch east of the containment area were taken this morning and are within acceptable limits. We are in the process of locating a core drilling service, and samples will be taken as soon as possible.

This incident is reportable in regulations contained in 40 CFR 300.63(b) to the NRC 8004248802 and under AR 200-1 to Headquarters DA(DAEN-2CE), Autovon 224-1163.

It is difficult to estimate at what point in time the actual leak from the containment area commenced, consequently, the 24-hour reporting time cannot be established; however, it is felt that we must report the incident before COB this day.

Memo
R. B. Campbell to Mr. Cummings
January 15, 1985
Page Two

The situation was discussed in detail with LTC Bregard at 10:00 AM this date, and he was advised of the actions we are taking. I committed that I would keep both he and Dana Matherly posted on developments as they occur. I shall also continue to keep you informed of all activities associated with this incident.

RBCampbell
R. B. Campbell
Division Manager-Engineering

mld

cc: Dave Towle

Box File

DATE	OFFICE	INITIAL
Action	EN	
Concur	EN	
Concur		
Concur		
Info.		
Info.		
Info.		
Info.		
M & R		
Comments		

1512-01
Spills & Spill Reporting

January 17, 1986

SMCMS-EN

SUBJECT: Chromium Rinse Water Spill (CRW)
January 14, 1986

State of Mississippi
Mississippi Department of
Natural Resources
Bureau of Pollution Control
P.O. Box 10285
ATTN: Larry Hamill
Jackson, Mississippi 39209

Dear Mr. Hamill:

The enclosed DARCOM Telephonic Notification of Pollution Incident Report, January 14, 1986, subject as above, is forwarded for your action.

This is a follow-up letter to the telephone conversation of January 16, 1986 between Ray Leibelsperger, this office, and Mr. Larry Hamill in regards to a Chromium Rinse Water Spill (CRW) on January 14, 1986.

Approximately 40-50 gallons of chromium rinse waste water (CRW) overflowed from Tank 502 at the Industrial Waste Treatment Facility with 10-15 gallons reaching the drainage system.

A visual inspection was performed along the drainage ditch in the immediate location and downstream of the involved outfall. No degredation to the environment was noticed. The chromium level was 157.5 PPM at the tank, and the PH was 2.41.

Tank 502 is being used to process CRW in a work-around operation due to a failure of the normal treatment tank. At the time of the spill the CRW transfer pumps were not tied in to the automatic shutoff of the high level indicator of Tank 502. On January 15, this tie-in was made to prevent future spill events of this type at this location.

Point of contact is Ray Leibelsperger, Commercial (601) 467-8928.

Sincerely,

R. W. Bregard
Lieutenant Colonel, Ordnance Corps
Commanding

Enclosure

TO: STATE
ATTN: LARRY HAMILL

This is a follow-up letter to phone conversation between Mr. Larry Hamill and myself on 16 JAN 86 in regards to a chromium rinse water spill (NPDES) on 14 JAN 86.

On 14 January ~~1986~~ Approximately 40-50 gallons of chromium rinse wastewater (CRW) overflowed from Tank 502 at the Industrial Waste Treatment Facility with 10-15 gallons reaching the drainage system.*

A Tank 502 is being used to process CRW in a work-around operation due to a failure of the normal treatment tank. At the time of the spill the CRW transfer pumps were not tied in to the automatic shutoff of the high level indicator of Tank 502. On 15 January this tie-in was made to prevent future spill events of this type at this location.

P.O.C. is Ray [illegible] SMCMS-EN 467-8995.

* A visual inspection was performed along the drainage ditch in the immediate location and downstream of the involved outfall. No degradation to the environment was noticed. The chromium level was 157.5 PPM at the tank, and the PH was 2.41.

LTC Bregard

TELEPHONIC NOTIFICATION OF POLLUTION INCIDENT
(ALL TIMES ARE LOCAL TIMES)

DATE/TIME REPORT RECEIVED

1. INSTALLATION

2. INSTALLATION COMMANDER

3. PERSON REPORTING INCIDENT (Include Phone No. and Ext)

4. PERSON RECEIVING REPORT (Include Office and Ext)

5. INCIDENT DISCOVERY DATE AND TIME

NATURE OF INCIDENT

6. TYPE AND AMOUNT OF MAT AND SOURCE

7. SEVERITY
☐ MINOR ☐ REPORTABLE
☐ MEDIUM
☐ MAJOR ☐ NON REPORTABLE

8. PERSONNEL INJURIES/PROPERTY LOSS/ OTHER FACTORS

9. CAUSE

10. EQUIP/FAC INVOLVED (Location and Specific area)

11. DURATION/MAGNITUDE OF POLLUTION PRODUCED/RELEASED

a. SOURCE OF RELEASE BEEN STOPPED. ☐ YES ☐ NO

b. RELEASED MATERIAL BEEN RETAINED. ☐ YES ☐ NO

c. REACH INTO NAVIGABLE WATERS. ☐ YES ☐ NO

d. NAME OF RECEIVING STREAM OR WATERS.

e. PASS THE INSTALLATION BOUNDARY. ☐ YES ☐ NO

f. NPDES PERMIT POINTS INVOLVED. ☐ YES ☐ NO SPECIFY.

g. SAMPLE BEING TAKEN FOR LEGAL RECORD. ☐ YES ☐ NO

12. DAMAGE/IMPACT ON SURROUNDINGS (Ground water, wildlife, etc.)

13. REMEDIAL ACTION TAKEN

14. REMEDIAL ACTION PLANNED

15. DATE OF REMEDIAL ACTION COMPLETION (est or actual)

16. NOTIFICATIONS

a. REGIONAL EPA ☐ YES ☐ NO WHEN?

b. STATE ☐ YES ☐ NO ☐ WHEN?

c. COAST GUARD OR NATIONAL RESPONSE CENTER (800-424-8802) ☐ YES ☐ NO WHEN?

d. NEXT HIGHER HQ ☐ AMCCOM ☐ AMC ☐ YES ☐ NO WHEN?

17. REACTION BY NEWS MEDIA/PUBLIC

18. DOLLAR VALUE OF MATERIAL SPILLED

19. TOTAL COST CLEANUP ACTIVITIES (Est or Actual)

DISTRIBUTION ☐ AMSMC-[illegible] ☐ AMSMC-IN ☐ AMSMC-[illegible] [illegible] prepared by other than
☐ [illegible] ☐ AMSMC-[illegible] ☐ [illegible]

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
Bureau of Pollution Control
P.O. Box 10385
Jackson, Mississippi 39289-0385
(601) 961-5171

March 22, 1989

Stephen C. Zakrzewski, LTC, USA
Commander
Mississippi Army Ammunition Plant
Attention: SMCMS-EN
Stennis Space Center, Mississippi 39529-7000

Dear Sir:

Re: NPDES Permit No. MS0040797
Response to Letter 89-2-079

The referenced transmittal with attachments dated March 9, 1989 has been received and reviewed. The information provided satisfactorily responds to our written inquiry of February 6, 1989.

Based upon the analytical and testing results submitted, the contamination which resulted from the leak at Wastewater Tank 451, has been adequately removed. Corrective actions to preclude future recurrences is sufficient as well. Based upon the thoroughness of these measures, it will be difficult to accept any cause for a like occurrence in the future as being due to other than human oversight, which would subject such an event to enforcement action.

The attention and response this matter received is appreciated and is considered resolved.

Sincerely,

Larry Hamil

Larry Hamil
Industrial Wastewater Control Branch

LH:dfj

DATE	OFFICE	INITIAL
ACTION	EN	[illegible]
CONCUR	EN	[illegible]
[illegible]	CO	
INFO.		
R & R		
Comments		

LEWIS/dmw 200-1a
disk file name: chrome

February 13, 1989

SMCMS-EN

SUBJECT: Leak of Chrome Waste Water Tank 451

Mr. Richard Auger
President
Mason Chamberlain Inc.
Stennis Space Center, Mississippi 39529-7099

Dear Mr. Auger:

The enclosed letter, Mississippi Department of Natural Resources, Bureau of Pollution Control, February 6, 1989, is forwarded for your action.

Please note that well point sample results must be furnished to the Bureau of Pollution Control not later than March 10, 1989.

Point of contact is Mr. Frank Lewis, extension 8923.

Sincerely,

Stephen C. Zakrzewski
Lieutenant Colonel, U.S. Army
Administrative Contracting Officer

Enclosure

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
Bureau of Pollution Control
P. O. Box 10385
Jackson, Mississippi 39209
(601) 961-5171

February 6, 1989

EN

FEB 13 1989

Stephen C. Zakrzewski, LTC, USA
Commander
Mississippi Army Ammunition Plant
P. O. Box 7000
ATTN: SMCMS-EN
Stennis Space Center, Mississippi 39529-7000

Dear Sir:

Re: NPDES Permit No. MS0040797
Response to Letter 89-1-151

We are in receipt of written notice from Mason Chamberlain, Inc. dated January 25, 1989, regarding a leak which had been detected in Chrome Wastewater Tank #451.

In order to complete our records of this event, the following additional information is requested:

1. Please identify the off-site location utilized for disposal of the upper sand layer which exhibited varying chrome concentrations and, the quantity of soil disposed of in this manner;

2. A permeability test should be conducted of the clay layer which is used as a liner for this storage tank area. The results of a hydraulic conductivity test from a core sample should be submitted, including the thickness of the clay liner that is in place. If there is no access to the clay underneath the tank in question, a representative, alternate location may be assayed;

3. Two additional samples should be collected from well point #6 during the next thirty (30) days and analyzed for chromium for final verification. These results should be submitted no later than March 10, 1989; and

4. Implementation of the proposal to perform semi-annual inspections of all wastewater tanks for continued integrity is strongly urged. Failure to adopt and carry out a policy of this essence, will result in more stringent requirements following any recurrence of leakage in the future.

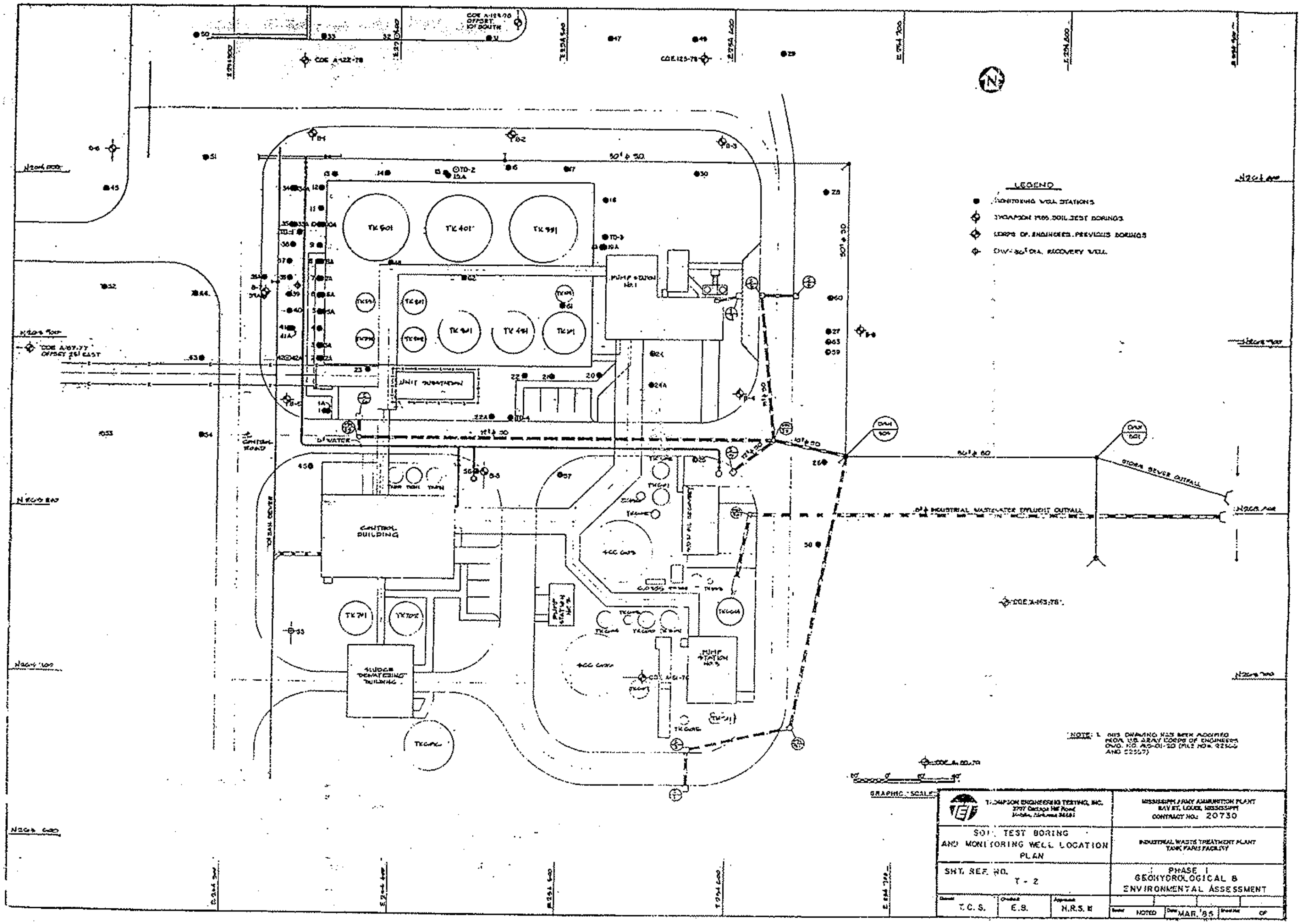
If further discussion of any condition specified above is preferred, do not hesitate to contact our office at 961-5171.

Sincerely,

Larry Hamil

Larry Hamil
Industrial Wastewater Control Branch

LH:els


LEGEND
MONITORING WELL STATIONS
THOMPSON ENG. SOIL TEST BORINGS
CORPS OF ENGINEERS PREVIOUS BORINGS
TK 501
TK 401
TK 391
PUMP STATION NO. 1
UNIT SUBSTATION
CONTROL BUILDING
SLUDGE "DEWATERING" BUILDING
PUMP STATION NO. 3
STORM SEWER OUTFALL
INDUSTRIAL WASTEWATER EFFLUENT OUTFALL
CENTRAL ROAD
GRAPHIC SCALE
NOTE: 1. THIS DRAWING HAS BEEN MODIFIED FROM U.S. ARMY CORPS OF ENGINEERS DWG. NO. AS-01-20
THOMPSON ENGINEERING TESTING, INC.
MISSISSIPPI ARMY AMMUNITION PLANT
BAY ST. LOUIS, MISSISSIPPI
CONTRACT NO. 20730
SOIL TEST BORING AND MONITORING WELL LOCATION PLAN
INDUSTRIAL WASTE TREATMENT PLANT TANK FARM FACILITY
SHT. REF. NO. T-2
PHASE I
GEOHYDROLOGICAL &
ENVIRONMENTAL ASSESSMENT
T.C.S.
E.S.
H.R.S.
NOTED
MAR. '85

EarthCon

EarthCon
Earth Consulting Group, Inc.

September 27, 2004

Mr. Wayne Gouguet
Mason Technologies Inc.
Building 9100
Stennis Space Center, Mississippi 39529-7099

Re: Mississippi Army Ammunition Plant
Industrial Wastewater Treatment Plant Closure Plan

Dear Mr. Gouguet:

Earth Consulting Group, Inc. (EarthCon) is pleased to submit the attached Closure Plan for the Mississippi Army Ammunition Plant (MSAAP) Wastewater Treatment Plant located at the Stennis Space Center, Mississippi. The Closure Plan was reviewed by the Mississippi Department of Environmental Quality (MDEQ) in draft form. The MDEQ review letter, dated September 20, 2004, addressed the requirements for advanced notice (90 days prior to field activities), a schedule of field activities, and reporting of analytical results. A copy of the MDEQ review letter is attached.

EarthCon compiled the following Rough Order of Magnitude (ROM) cost estimate for the plant closure:

Monitoring Well Abandonment

Drilling contractor	$	73,000.00
Contract administration	$	7,000.00
EarthCon oversight labor	$	12,000.00
EarthCon report preparation	$	10,000.00
EarthCon direct expenses	$	3,000.00
Subtotal:	**$**	**105,000.00**

4110 Westside Drive
Tupelo, Mississippi 38801
(662) 840-3728 Fax: (662) 844-9666

110 Weisenberger Road
Post Office Box 1246
Madison, Mississippi 39130
(601) 853-2134 Fax: (601) 856-3978
Toll Free: (877) 389-6476

14231 Seaway Road, Suite E8
Post Office Box 2276
Gulfport, Mississippi 39505-2276
(228) 822-2424 Fax: (228) 822-2323
Toll Free: (866) 42EARTH

Wastewater Treatment Plant Closure

Plant Closure contractor	$1,250,000.00
Contract administration	$ 125,000.00
Analytical laboratory	$ 60,000.00
Laboratory contract administration	$ 6,000.00
EarthCon oversight labor	$ 60,000.00
EarthCon report preparation	$ 25,000.00
EarthCon direct expenses	$ 11,000.00
Subtotal:	**$1,537,000.00**
Contingency (9.6%)	**$ 158,000.00**
Total:	**$1,800,000.00**

EarthCon appreciates this opportunity to provide environmental consulting services to Mason Technologies Inc. Please feel free to contact me, toll free, at (877) 389-6476 if you have any questions regarding this information.

Sincerely,
Earth Consulting Group, Inc.

John E. Malanchak

John E. Malanchak, R.P.G.
Project Manager

Attachments

STATE OF MISSISSIPPI

HALEY BARBOUR

GOVERNOR

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY

CHARLES H. CHISOLM, EXECUTIVE DIRECTOR

September 20, 2004

Mr. Wayne Gouguet
Mississippi Army Ammunition Plant
Building 9100
Stennis Space Center, Mississippi 39529

Dear Mr. Gouguet:

Re: Mason Technologies
MS Army Ammunition Plant
NPDES Permit No. MS0040797
Industrial Outfall Closure
Hancock County, Mississippi

Our office has reviewed the closure plan submitted for the above referenced project. Please be aware that this plan does not meet the closure requirements as outlined in our NPDES Regulations (WPC-1), which states the following:

> When issuing a State or NPDES permit pursuant to the State law and this regulation, the Permit Board shall require submittal of a Closure Plan no later than 90 days prior to abandonment and permanent closure of the premises. The Closure Plan shall address how and when all manufactured products, by-products, raw materials, stored chemicals, and solid and liquid waste and residues will be removed from the premises so that no potential environmental hazard to the waters of the State will be presented.

While the submitted report did denote how the materials would be removed, it did not denote when they would be removed. Once it has been determined when this outfall is scheduled to be removed, a revised closure plan should be submitted to our office for our review.

In addition, please note the following comments:

1. The closure plan indicates that TCLP's would be performed on wastes to determine if the wastes could be disposed of as a non-hazardous solid waste or as a hazardous waste and that you would contact our office if it appeared that some of the wastes could not be disposed of as a non-hazardous solid waste. Please note that your revised closure plan should include either a copy of the TCLP results and information on when, how, and where these items would be disposed of or a schedule for conducting the TCLP analysis, submitting the results, thereof, and information on when, how and where these items would be disposed of.

2. In regards to the decontamination of the tanks and piping, we understand that you anticipate storing the liquid wastes in some of your tanks and then disposing the liquid wastes in accordance with your NPDES permit. We noted in your closure plan that the liquid wastes would be analyzed and then "discharged if the analytical results meet the MDEQ Water Quality Criteria." Your analytical results should be forwarded to our office prior to discharge, and our office should be given an opportunity to comment on the disposal of these liquid wastes prior to discharge. These results should be reviewed to determine if the results are in compliance with your NPDES permit for the parameters in your NPDES permit; for the parameters that are not in your NPDES permit, it must be determined if those results are in compliance with our State water quality standards. If it is not possible to transmit these results to our office prior to discharge, please explain why this is not possible.

We also take this opportunity to remind you that elimination of this outfall could also require modification of the permit conditions for your domestic wastewater outfall, if you intend to attempt to transport the wastewaters currently treated by the industrial outfall to the domestic outfall for future discharges, as your representatives had earlier mentioned.

If you have any questions concerning this matter, please contact me at (601) 961-5620.

Sincerely,

Greg Burgess, P.E.
Environmental Permits Division

cc: ~~Mr. John Malanchak, Earth Consulting Group~~ ← **This Copy For**
Mr. Pradip Bhowal, EPD

EarthCon

STENNIS SPACE CENTER
MISSISSIPPI ARMY AMMUNITION PLANT
INDUSTRIAL WASTEWATER
TREATMENT PLANT
CLOSURE PLAN

PREPARED ON BEHALF OF:
MASON TECHNOLOGIES INC.
BUILDING 9100
STENNIS SPACE CENTER, MISSISSIPPI
39529-7099

PREPARED BY:
EARTH CONSULTING GROUP, INC.
P. O. BOX 1246
MADISON, MISSISSIPPI 39130

JUNE 28 , 2004

EarthCon

STENNIS SPACE CENTER
MISSISSIPPI ARMY AMMUNITION PLANT
INDUSTRIAL WASTEWATER
TREATMENT PLANT
CLOSURE PLAN

Presented on behalf of:
MASON TECHNOLOGIES INC.
BUILDING 9100
STENNIS SPACE CENTER, MISSISSIPPI
39529-7099

Prepared by:
EARTH CONSULTING GROUP, INC.
P. O. BOX 1246
MADISON, MISSISSIPPI 39130

MICHAEL J. BRADY
REGISTERED PROFESSIONAL
ENGINEER

(seal)
9-27-04
Registration No. 12402
State of Mississippi

John E. Malanchak R.P.G.
Project Manager

Michael J. Brady, P.E.
Senior Engineer

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1.0 INTRODUCTION

1.1 Background

Earth Consulting Group, Inc. (EarthCon) is pleased to present the following facility closure plan for the Industrial Wastewater Treatment Plant, associated with the former Mississippi Army Ammunition Plant (MSAAP), and located on the grounds of the National Aeronautical and Space Administration (NASA) John C. Stennis Space Center, approximately 3.5 miles southeast of Santa Rosa, Hancock County, Mississippi. The facility is situated in the Southwest ¼ of Section 33, Township 7 South, Range 16 West, at Latitude 30°23'25" North, Longitude 89°36'44" West. The site location is depicted on Figure 1 - Site Location Map. The subject facility was designed and operated to treat wastewater from the MSAAP facility, which operated from 1980 through 1991. No explosive materials or residues were processed through this facility. Since the ordinance facility closure, the wastewater treatment plant has been maintained in a ready status, and is utilized for treatment of accumulated rainwater, boiler blowdown, and miscellaneous oily waste streams.

This facility closure plan presents the general procedures and specifications for the decontamination and decommissioning of the wastewater treatment plant facility, including, but not limited to tankage, piping, process pumps and equipment, buildings, stormwater sumps and drainage systems, and site utilities. The facility closure plan was developed from information provided by Mason Technologies, Inc. and onsite inspections of the facility.

1.2 Scope of Work and Objectives

The recommended procedures for decontaminating and decommissioning the wastewater treatment plant facilities were developed from plans and drawings of the facility supplied to EarthCon, two (2) site visits, and one (1) preliminary meeting with potential contractors. The scope of work for the facility closure plan includes:

- Evaluating options for decontaminating and decommissioning the tanks, piping, pumps and process equipment, buildings, site stormwater sumps and drainage systems, and site utilities;
- Developing testing procedures and reporting requirements which will facilitate a clean closure of the facility under the guidelines of the National Pollution Discharge

Elimination System (NPDES), as administered by the Mississippi Department of Environmental Quality (MDEQ); and

Once the Closure Plan has been reviewed and approved, and project funding has been secured, EarthCon will complete the following tasks:

- Preparing the scope of work and bid documents for facility closure by a qualified contractor;
- Preparing general plans for a post-closure stormwater drainage system;
- Obtaining approval of the facility closure plan by MDEQ;
- Providing engineering oversight and documentation of the facility decontamination and decommissioning;
- Classifying and providing oversight for the removal and disposal of solid and liquid materials which may exist as residual wastes from former plant operation, be generated in the decontamination procedures, or occur as stormwater drainage over the project duration;
- Preparing a final report which documents the completion of facility decontamination and decommissioning.

The objectives of this closure plan include:

- Minimizing the risk of exposure to hazardous or toxic materials by decontaminating the wastewater treatment system vessels, piping and equipment, and removing the facility from service (laid-away status);
- Eliminating the potential for a release of contaminants to surface waters;
- Eliminating the need for monitoring stormwater drainage;
- Documenting the facility closure in accordance with NPDES guidelines and requirements, and
- Minimizing or eliminating the need for operating personnel and/or equipment.
- Modify the facility NPDES permit to exclude the industrial wastewater treatment facility from NPDES permit monitoring requirements.

1.3 Rationale for Closure Procedures

The rationale for developing the facility closure plan was based on information provided by Mason Technologies, Inc., a review of the facility plans and process diagrams, an evaluation of the options available for treatment and/or disposal of the residual and decontamination derived wastes, and a review of the sampling design and procedures sections of the U.S. Environmental Protection Agency, Region 4, *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual*, dated November 2001. The general plan of the former wastewater treatment facility is presented in Figure 2 - Base Map. The general layout of the various buildings and pipe racks are depicted in Figure 3 - Buildings and Pipe Racks.

The constituents of concern were identified and grouped into two (2) main categories:

- materials utilized in metal fabrication, including chromium rinse water, acid/alkali rinse water, soluble oil coolants, insoluble oils and greases, acid wastes, and alkaline wastes, which were process waste streams through the wastewater treatment plant; and

- chemicals utilized for wastewater treatment, which include 93% sulfuric acid, 25% sodium hydroxide (caustic), 5% hydrated lime, ferrous sulfate, sodium bisulfite, phosphoric acid, and ammonium nitrate.

The recommended procedures for decontamination of the tanks, piping, and process equipment were developed to neutralize, precipitate, and/or immobilize the hazardous characteristics of the constituents of concern, while minimizing the generation of contact wastes, which could become hazardous by contact. Therefore, appropriate treatment or pre-treatment measures which would render the residual waste materials non-hazardous were prescribed. Provisions for the treatment of accumulated rainwater, which could have potentially contacted contaminated surfaces prior to the facility decontamination, was also taken into account. A temporary water treatment system will be maintained until all other tanks, sumps, and equipment have been decontaminated and decommissioned. The tanks which will be reserved for this system, and the schematic flow of the temporary treatment train, are shown in Figure 4 - Temporary Water Treatment System. Consideration was also given to the status of the facility, which has been utilized primarily in batch mode for treating accumulated rainwater for the last 13 years, since the ordinance plant was deactivated in 1991.

2.0 SYSTEM COMPONENTS

The complex nature of the wastewater treatment facility, which was designed to process and treat multiple waste streams with different physical and chemical characteristics, required that the entire system be categorized into basic components for the development of appropriate decontamination and decommissioning procedures. A general description of each component category is presented in this section.

2.1 Tanks

A total of 49 tanks were identified from the process flowsheets and facility drawings. Several of these "tanks" are actually process equipment units which have containment characteristics (thickeners, laminar flow plate separator, sand filters, filter presses with sumps, reagent metering systems), which will be treated as tanks for decontamination purposes. The tank capacities range from approximately 200 gallons to 140,000 gallons. A spreadsheet, which summarizes the capacities, dimensions, and other salient information for each tank, is included as Appendix A. All of the major tanks are open-top steel tanks, and have been regularly painted (inside and out) with epoxy paint. The tanks are generally in good condition, and have been continually maintained. Most of the tanks contain rainwater in varying quantities, and may contain residual sludge or sediment. Rainwater is periodically pumped from the tanks and sumps to the primary holding tanks (Nos. 351, 401, and 402), and is batch processed for discharge under the facility NPDES permit. For planning purposes, it may be assumed that the tanks will be drained, and the accumulated rainwater treated and discharged by the plant operator, prior to beginning the facility closure project. It may also be assumed that rainfall during the closure project will average 5% of the tank capacities per month into the tanks, and an equal quantity within the tank containment areas. The total estimated capacity of the tanks is approximately 152,000 cubic feet, or 1,137,000 gallons. A planning figure of 100,000 gallons of rainwater per month (tankage and containment) may be used for estimating the quantity of water which will be generated and required treatment and disposal. A plan map identifying the tanks which are to be decontaminated and decommissioned is included as Figure 5 - Tanks to be Abandoned.

2.2 Piping

The majority of the piping for influent and process water is fiberglass reinforced plastic (FRP), ranging from approximately three (3) to six (6) inches in diameter. Industrial and potable water was distributed through mild steel piping. Reagent piping system materials included PVC, mild steel, stainless steel, and FRP. Most of the reagent and water supply piping ranges from one (1) inch to three (3) inches in diameter. Steam and caustic piping systems are reportedly insulated with non-asbestos insulation. The total estimated footage of piping to be decontaminated and decommissioned is approximately 24,500 linear feet, with individual piping system runs ranging from approximately 50 to 2,000 feet. A summary of the discrete piping systems is included as a spreadsheet in Appendix B - Piping System Inventory Spreadsheet. Plan drawings of typical reagent piping system arrangements are included as Figures 6 - 10.

2.3 Process Equipment

The process equipment has been identified and is listed with specific tanks or piping systems, with exception of the major process units, which are discussed individually. Equipment components, which are included with the tanks or piping, will be decontaminated and decommissioned as integral parts of the tanks and/or piping systems, rather than individual units.

2.3.1 Pumps, Rakes, Mixers, Valves, Etc. (Associated with Piping or Tanks)

Approximately 50 pumps, 28 mixers, two (2) rake systems, numerous valves, and two (2) aeration blowers were identified as components of the wastewater treatment process, or for distribution of utility water and reagents. The fluid transfer equipment varies from low volume reagent feeders to 700 gallons per minute pumps. The specific pump applications and sizes, as well as mixers, rakes, and other equipment are noted on the process flowsheets P-2 and P-3, which are included as Appendix C. The pumps, mixers, rakes, and valves, are to be flushed and rinsed or pressure washed and rinsed as part of the associated piping systems or tanks. The pumps, mixers, rakes, etc. will be left in-place, and electrical power to the equipment deactivated as part of the decommissioning activities.

2.3.2 Sand Filters

Process units 606 and 6012 are 12 feet by 12 feet steel containments, approximately 10 (ten) feet deep, with approximately eight (8) feet of filter sand media in each containment. The filter media will require waste characterization, removal, and disposal, prior to decontaminating and decommissioning the units. Based on sampling and characterization results, it is anticipated that this material will be classified as non-hazardous solid waste.

2.3.3 Parallel Plate Separator

Process unit 355, located on the north side of Pump Station No. 1, is a parallel plate solids separator. The unit is approximately five (5) feet wide by ten (10) feet long, with a wedge-shaped sump beneath the parallel plates. This unit has been previously decontaminated, but contains approximately 2,000 gallons of water, and may contain residual solids. As with the tanks, this unit must be drained, pressure washed, and rinsed to decontaminate the unit. Drainage will be facilitated by removing the bottom of the unit, or creating an access/drainage port at the bottom of the separator sump.

2.3.4 Filter Presses

Process units 701 and 702 include plate and frame type filter presses, formerly utilized for dewatering sludge to generate solid waste for disposal. These units are located on the second floor of the Sludge Dewatering Building, and have hoppers/chutes below the presses to direct the dewatered sludge into containers on the first floor. Due to the nature of the sludge dewatering operation, these units may require more extensive decontamination. Each plate and frame filter press occupies a footprint approximately three (3) feet wide by eight (8) feet long, and stands approximately four (4) feet high above the second floor grating.

2.3.5 Reagent Feeding Systems

There are ten (10) reagent feeding systems, with six (6) systems located in the Control Building, and four (4) systems located in Pump Station No. 1. The systems range from small, drum-fed metering pumps, to large, plant-wide distribution systems for lime, caustic, and sulfuric acid. Each system will require appropriate purging with a solution that will neutralize or purge hazardous chemicals/characteristics, followed by adequate rinsing with industrial water to yield a rinse sample which meets the direct discharge criteria for surface waters, as published by the MDEQ *Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*, Effective June 27, 2003. A copy of these standards is included as Appendix D - MDEQ Water Quality Criteria. These reagent systems are listed in Appendix A as 800 series tanks, and in Appendix B near the bottom of the spreadsheet.

2.4 Buildings

There are five (5) buildings at the facility which house the electrical controls, reagent systems, pumps, filter presses, and provide storage for supplies and equipment. The facility operator will remove all spare parts, consumable materials, containers, pallets, and miscellaneous materials prior to the decontamination/ decommissioning of the facility. The contractor will remove all chemicals, batteries, oil and greases, etc. from the working areas of the buildings (excluding offices and/or records storage areas). The pumps, motors, piping, and mixing tanks are to be drained, decontaminated, and power to the equipment deactivated. All above ground piping will be removed after decontamination. After all chemicals and materials have been removed and the equipment decontaminated, the building walls, floors, sumps, and drains will be cleaned of surficial residue. Storage areas, reagent tanks, lined drainage ditches, and other activity areas immediately associated with each building will be included as part of the building.

2.4.1 Control Building

The control building is approximately 50 feet wide by 80 feet long. A 20 feet wide by 80 feet long concrete apron is located on the north side of the control building, which is utilized for reagent mixing tanks and containerized waste storage. This building houses the electrical control system, steam boiler, reagent feeding systems, former laboratory, and storage areas. Of particular note, is the back-up electrical power supply, which consists of several racks of lead-acid batteries. These batteries will require proper disposal. The contents of each reagent tank will require testing and appropriate neutralization, prior to discharging or disposal of the contents. After each reagent distribution system has been neutralized, cleaned, and rinsed, any equipment, piping, and/or tanks which were not an integral part of one of the reagent distribution systems will be decontaminated, tested, and deactivated. All tanks and pumps are to be drained, with the lowest ports of the tanks left open. Electrical power to all equipment is to be terminated. Piping connections to each tank and pump are to be disconnected, and the piping removed. All utilities to the building are to be deactivated. The floors, walls, exteriors of pumps, equipment bases, drainage ditches, and sumps are to be cleaned of debris and surficial residue. All wash and rinse water from the decontamination and rinsing operations will be contained and pumped or hauled to tanks 401 and/or 402 for treatment and disposal. Any sludge, debris, or residues will be containerized, tested, and properly manifested for disposal. Existing drainage ditches and/or sumps will have the gratings removed and pressure washed; sediment and water will be removed from the ditches and sumps; and the ditches and sumps will be pressure washed and rinsed to remove surficial residue. The drains, ditches, and sumps in this building are to be filled with clean sand and capped with concrete.

2.4.2 Sludge Dewatering Building

The sludge dewatering building is approximately 40 feet wide by 45 feet long, and is two (2) stories high. Decontamination and decommissioning of the sludge dewatering building and equipment will require a modified procedure from the other buildings and equipment. After tanks 701, 702, and 6016 have been decontaminated and drained, all piping associated with the sludge dewatering system will be removed in approximate ten (10) foot long sections, placed on saw horses in a contained decontamination pad, and decontaminated by pressure washing and rinsing. Decontamination wash water and rinse water will be contained, any oily sludge or floating material removed by sorbent pads, and the water collected and transported to tanks 401 or 402 for treatment. Power to the sludge dewatering building will be deactivated. The process equipment, internal structural framing, upper floor gratings, and walls will be pressure washed and rinsed to remove surficial residue, starting from the ceiling and working down. Temporary framing (2-inch by 6-inch lumber) will be placed across all entries, and plastic sheeting will be placed on the floor of the building and taped approximately two (2) feet up the walls to contain and direct all wash water from the upper floor and equipment to a low point for capture and transfer to a holding tank or truck, and transport to tanks 401 or 402 for subsequent treatment. Floating sludge or oily residue will be removed by sorbent materials for characterization and proper disposal. The equipment, exposed structure, walls, and upper floor will be cleaned of visible residue. After decontamination of the walls is completed, the plastic sheeting and the temporary framing used for containment will be removed and properly disposed. The lower floor, bottom two (2) feet of the walls, and any drainage ditches and sumps will be pressure washed to remove surficial residue.

2.4.3 Pump Stations No. 1, No. 2, and No. 3

The three (3) pump stations will be the last facilities to be decontaminated and decommissioned. After all of the reagent and process water piping systems, tanks, sumps, and containment areas have been decontaminated and decommissioned, the pump stations will be deactivated. The piping will be disconnected from the pumps and reagent feeders and removed. The pumps and reagent tanks will then be drained. The exteriors of the pumps, equipment bases, walls, floors, and the reagent feeder systems will be pressure washed and rinsed to remove any surficial residue. The ditch and sump gratings will be removed and pressure washed; water and/or sediment will be removed from the sumps and ditches; and the sumps and ditches will be pressure washed and rinsed to remove surficial residue. The drains, ditches, and sumps in this building are to be filled with clean sand and capped with concrete. The electrical power and water supply lines to the three (3) pump stations will be deactivated.

2.4.4 Unit Substation

Permanent deactivation of the unit substation will be contingent on developing a gravity drainage system for the containment area sumps. If gravity drainage is not feasible, the substation will remain active, to supply power to necessary automated sump pumps. In either case, the unit substation will be deactivated at the close of decontamination activities, and the exterior of the equipment, as well as the containment area floor, will be pressure washed to remove any surficial residue. After decontamination, the substation may be re-activated as necessary.

2.5 Containment Area Drainage

Surface water drainage at the facility is controlled in three (3) discrete containment areas:

1. Holding Area - the north half of the facility, including the holding tanks, Pump Station No. 1, and clarifier 357 area;

2. Process Area - this includes the control building, reagent mixing and containerized waste areas, and the sludge dewatering facilities; and
3. Sand filter Area - this containment area includes Pump Stations No. 2 and No. 3, the sand filtration equipment, clarifiers 608 and 609, and various process tankage.

After the tanks, equipment, and buildings have been decontaminated and decommissioned, and the piping removed, the drainage ditches, sumps, and containment structures for the three (3) containment areas will be cleaned of residual sediment and pressure washed to remove surficial residue. The sand filter containment area will require modifications to the berm to facilitate stormwater drainage to existing storm drains along adjacent roadways. The process area will require that a portion of the berm be removed to facilitate stormwater drainage, or that a culvert be installed at the lowest point of the contained area. Because the holding area is equipped with drains and a sump, which were formerly discharged to a holding tank for processing, the holding area will require modifications to the current drainage system. An initial examination of the storm drains indicated that gravity flow from the area sump to the existing storm drain may not be feasible. The potential for a gravity drainage system needs to be evaluated, including a comprehensive survey of elevations and an evaluation of the receiving drainage ditch hydrology. The flow rate required to handle a 12-inch rainfall over a 24-hour period for the holding area is estimated at 350 gallons per minute. Alternatives to a gravity drainage system include:

- Installing an automated high volume sump pump, with piping to the nearest storm drain;
- Piping the sump to an existing pump, installing automatic controls, and piping the pump discharge to an existing storm drain;
- Salvaging the tanks, equipment, structural steel, and Pump Station No. 1, then filling the containment area with soil to the berm height, and vegetating the surface to establish a natural drainage pattern.

Evaluation of the alternatives is recommended, with a decision on final site drainage to be incorporated as Appendix E - Stormwater Drainage System Specifications.

3.0 CLOSURE PLAN

The overall facility closure plan includes decontamination and decommissioning of all tanks, process equipment, and buildings, and the decontamination and removal of all piping. Sampling and analysis of the decontaminated facility components will be an integral part of the procedures. When decommissioning is completed, a NPDES permit will no longer be required for the industrial wastewater treatment facility, and a clean closure of the facility will be achieved when no potential sources of contamination remain, which would exceed the MDEQ Water Quality Criteria for outfall 001, as presented in Appendix D. Consistent with this objective, the recommended method of testing the decontaminated tanks, equipment, and containment structures, which could be contacted by rainwater is to collect a rinse sample over a representative surface area of each type of cleaned surface, analyze the sample for appropriate constituents of concern, and evaluate the analytical results against the MDEQ Water Quality Criteria.

A portion of the tanks has been previously decontaminated, or has been out of service for many years. These vessels may be tested prior to decontamination procedures to determine if further decontamination is required. Many of the piping systems were not exposed to process waste streams, and can be decontaminated by neutralizing reactive reagents, and field verifying the neutralization of potential residual chemicals to a non-hazardous pH range of six (6) to nine (9) Standard Units (SU), prior to removal and disposal. Wherever possible, residual sediment, sludge, and water, as well as decontamination derived wastewater will be contained, treated on-site, tested, and disposed of as non-hazardous material, or discharged in compliance with the facility NPDES permit.

3.1 Storage and Process Tanks

Decontamination procedures for the storage and process related tanks were developed to remove residual contaminants, which may have been introduced during operation of the ammunition plant, and to render the hazardous characteristics of residual materials non-hazardous, so they might be disposed of as non-hazardous waste. Since 1991, the wastewater treatment plant tanks have been maintained in a ready state for reactivation, and have been utilized in a batch mode to process accumulated rainwater. Most of the tanks are open top, fabricated steel, with protective epoxy painted surfaces. Accumulated rainwater in the tanks will be sampled and tested, to obtain baseline water quality data. After testing, the accumulated rainwater will be drained from all of the tanks, and will be treated and discharged, prior to starting the decontamination and decommissioning project. Based on the analytical results, some of the tanks may not require further decontamination. Rainwater and decontamination water, which accumulates in the tanks during the project, will be transferred to a series of tanks which will be utilized for temporary treatment and discharge. Decontamination will generally consist of high pressure washing, followed by rinsing with potable quality water. Appropriate cleaning additives may be utilized to handle residues and staining. Confirmation rinse samples will be collected and analyzed for appropriate constituents after the tanks have been decontaminated. In general, mixers, rakes, level controls, and other equipment associated with individual tanks, will be decontaminated as part of the tank, and left in-place. After decontamination has been completed and satisfactory closure analyses received, the tanks will be decommissioned by removing the connected piping. After completion of the decontamination and confirmatory testing, the lowest port on each tank will be left open to facilitate the drainage of rainwater.

3.1.1 Decommissioning Sequence

Decontamination and decommissioning will begin with the reagent tanks and piping systems. This will include tanks 811, 812 821, 822, 831, and 851, which are located at the control building, and tanks 852A, 852B, 853, and 871, which are located at Pump Station No. 1. These tanks range in capacity from approximately 200 to 8,500 gallons. Residual contents will be drained and transferred to tank 401 and/or 402. The tanks will be neutralized with an appropriate weak buffered acid or base, washed with a pressure washer, rinsed, and the pH checked to confirm a value between six (6) and nine (9) SU. The pumps and piping will be disconnected, the piping removed, and the tanks decommissioned by opening the lowest access port in the tank. The reagent tanks may be utilized for mixing and storage of neutralizing solutions (weak buffered acid and/or weak buffered base) which may be circulated through the reagent distribution piping systems. After neutralizing and rinsing the reagent piping systems, the reagent piping will also be removed, as the matching tanks are removed from service.

The process tanks, which will be reserved for treating water generated from decontamination procedures, and rainwater, which may accumulate during the decontamination and decommissioning process, will be tanks 401, 402, and 607 through 6014. All remaining process tanks and equipment will be decontaminated, tested, and decommissioned, generally following numerical order. The temporary treatment system tanks will be utilized for batch treatment of the decontamination water and rainwater to MDEQ Surface Water Standards, and to the permit limits for the facility NPDES permit. The facility operator will perform the testing and treatment of the water generated during facility decontamination. After all other facility components have been decontaminated and decommissioned, the temporary treatment system will be emptied, decontaminated, and decommissioned, following the same procedures as outlined for the previously decommissioned tanks. The contractor will be required to transport and properly dispose of decontamination water, sand from the sand filter (6012), and residue generated during the decontamination of the temporary treatment system tanks, piping, and equipment.

3.1.2 Decontamination Procedure

The tanks will be decontaminated using a high pressure washer, utilizing a non-foaming detergent. The pipe rack and structural steel associated with each tank will be pressure washed first, followed by the outside of the tank. The inside of each tank will be treated as a confined space, with the contractor documenting the testing of the atmosphere inside of the tank, and providing appropriate respiratory protection of any workers entering the tank. The inside of each tank will be pressure washed with a non-foaming detergent solution to remove any residues and surficial residue. After the detergent wash, the tank will be pressure rinsed with potable quality water, allowed to dry, and a rinse sample will be obtained for analytical clearance testing.

3.1.3 Clean Closure Testing Procedure

Rinse samples will be collected by attaching a sheet of polyethylene measuring approximately three (3) feet square to the inside of a tank wall on the north side, or where there is any visible discoloration. A metallic aluminum foil tape will be used to fasten the top edge of the polyethylene sheet to the tank wall, approximately two (2) feet above the tank bottom. The bottom of the polyethylene sheet will be folded to form a conical funnel, and the sample container will be placed below the funnel to collect the sample. A polytetrafluoroethylene (PTFE, Teflon®) rinse bottle, filled with deionized, demineralized water, will be utilized to spray an area of approximately 10 square feet, immediately above the polyethylene sheeting. The rinse water will be allowed to run down the tank wall, into the polyethylene funnel, and into the sampling container. The rinse bottle will be moved across, and up and down the tank wall, with the nozzle approximately six (6) inches from the surface. The field characteristics of the rinse sample (color, odor, suspended particles, etc.) will be noted on a field log form, and the sample will be tested for pH, placed on ice, and transported to the analytical laboratory under proper chain of custody for analysis. An equipment blank will be obtained for each ten (10) samples, to characterize any constituents which might be introduced by the rinse bottle, deionized - demineralized water, polyethylene sheeting, tape, or sample container. One (1) duplicate sample will be collected for each ten (10) samples. The rinse samples will be analyzed for pH in the field, Polycyclic Aromatic Hydrocarbons (PAHs), and Priority Pollutant Metals, as appropriate, in the laboratory. The clearance standard will be the MDEQ Water Quality Criteria, included as Appendix D. The required clearance tests for each tank are listed in Appendix A - Tank Inventory Spreadsheet. Should a tank fail the clearance test, a more rigorous decontamination procedure will be implemented for the specific tank to remove or chemically immobilize the contaminant(s) of concern. The estimated number of confirmation rinse samples for the tanks is estimated to be 41, with a contingency for four (4) re-samples. Four (4) rinse samples will require laboratory analysis for priority pollutant metals, 18 rinse samples will require laboratory analysis for PAHs, and 19 rinse samples will require laboratory analyses for both PAHs and priority pollutant metals. An additional 12 QA/QC samples will be required (four [4] trip blanks, four [4] equipment blanks, and four duplicates, which will be analyzed for both PAHs and priority pollutant metals).

3.1.4 Decommissioning Procedure

After each tank has been decontaminated and the clearance sample approved, the piping will be disconnected from the outside of the tank, and the lowest pipe connection will be left open to facilitate drainage of subsequent rainwater. After all of the tanks within a containment area have been decontaminated and decommissioned, the containment floor, drains, and sumps will be decontaminated and tested to confirm that all runoff water meets the MDEQ Water Quality Criteria without further treatment.

3.2 Piping Systems

Prior to decontaminating the piping systems, a series of representative samples of the piping may be collected from piping runs, which can be isolated from the main piping segment. These samples will be transported to the analytical laboratory, and analyzed for priority pollutant metals and PAHs, using the Toxicity Characteristic Leachate Procedure (TCLP) extraction. If the representative sample analyses meet the non-hazardous solid waste acceptance criteria, the piping segments which they represent will be removed and transported to a non-hazardous waste disposal facility without further decontamination. If field decontamination is required, the decontamination and decommissioning of the piping systems will generally follow the same sequence as the tanks. The piping will be decontaminated prior to decontaminating the tanks. The existing pumps may be utilized to flush the piping, or the piping may be removed in sections and flushed by pressure washing, or by other acceptable means. After the piping systems have been decontaminated, representative samples will be collected for appropriate TCLP testing, and the piping disposed of in accordance with applicable laws and regulations. Potable water, industrial water, and steam distribution lines may be removed without decontamination. Acid, lime, and caustic distribution lines must be neutralized with a buffered, weak acid or base, then rinsed, and the pH checked for a range of six (6) to nine (9) SU before being removed. Polymer piping, oily waste piping, and combined waste piping will require detergent purging, rinsing, and testing for PAHs. Chromium rinse, acid or alkali rinse, flue gas desulfurization, combined waste, and boiler blowdown piping will require analysis for priority pollutant metals and field pH. After being flushed and rinsed in-place, or removed and pressure washed and rinsed, a representative rinse sample will be collected for each specific piping run described in the Appendix B - Piping System Inventory Spreadsheet. Each sample will be analyzed in the field for pH, and the sample will be preserved on ice, transported to the analytical laboratory under proper chain of custody with the required quality assurance/quality control (QA/QC) samples, and analyzed for the appropriate constituents of concern. Should any of the constituents of concern fail to meet the solid waste acceptance criteria for non-hazardous waste, the section of piping represented by the sample(s) will be further decontaminated by a procedure which will address the constituents of concern.

3.2.1 Decommissioning Sequence

The first piping systems to be decommissioned and removed will be the reagent distribution piping systems. The steam distribution piping can be removed at the same time as the reagent lines. After the reagent lines have been purged, checked for a pH range of six (6) to nine (9), and removed, the influent lines from the former ammunition plant to the wastewater treatment plant (waste/process stream nos. 1-10) can be cut, capped, and removed from the point where they enter the treatment plant area (near the unit substation) to the holding tanks. Most of this piping is fiberglass reinforced plastic, and can be cut into short lengths for decontamination with a pressure washer. At the discretion of the contractor, the piping can be purged and rinsed in-place, prior to removal, as an alternative to pressure washing in sections. The volume of purge and rinse solutions may be greater with in-place purging and rinsing than with pressure washing. Piping must be cleaned to non-hazardous waste acceptance standards. Finally, waste/process stream nos. 11-34 can be removed prior to tank decontamination, or in sequence with the tanks. If the contractor chooses to remove and pressure wash the piping, the piping runs to and from the pump stations can be removed and decontaminated by the contractor. If the contractor chooses to purge and rinse the piping systems in-place, the piping runs to and from the pump stations must be decontaminated and tested prior to decommissioning and removal.

3.2.2 Decontamination Procedure

The contractor may choose to decontaminate the piping systems, which do not meet non-hazardous waste acceptance criteria with Toxicity Characteristic Leachate Procedure (TCLP) analytical results, by pumping a detergent solution through the piping segment, then rinsing the segment with potable quality water, and draining the segment, prior to clearance sampling. An alternative procedure would be removing the piping in short sections, and decontaminating the pipe with a pressure washer, followed by a potable water rinse. The rinsed pipe must meet non-hazardous waste acceptance criteria. If an analytical parameter fails to meet the non-hazardous waste criteria, a more rigorous decontamination procedure will be followed to decontaminate the piping segment, and a sample will be collected after the second phase of decontamination.

3.2.3 Clean Closure Testing Procedure

The first sampling procedure will be to cut a representative section of pipe from a segment, wrap the pipe sample in aluminum foil, or place it in a Zip Lock® type bag, and transport it to the analytical laboratory for analysis for the appropriate PAH and/or priority pollutant metals by the TCLP procedure. If the analytical results of the TCLP testing are adequate to meet non-hazardous waste acceptance criteria, then no further decontamination will be required, and the piping may be removed. If the TCLP analyses do not meet non-hazardous waste acceptance criteria, then the post-decontamination sample procedure will be to collect a potable water rinse sample, either from the in-place piping, or from a representative section of piping which has been decontaminated by high pressure washing and rinsing. The estimated number of TCLP samples is 34, with an additional 10 QA/QC samples. The number of rinse samples anticipated is 12, with an additional 8 QA/QC samples.

3.2.4 Decommissioning Procedure

Decommissioning of the piping systems will consist of cutting the pipe into short sections for removal, removing the piping from its point of origin to its destination(s), and properly disposing of the pipe and fittings.

3.3 Process Equipment

The decontamination procedure for process equipment will generally follow the procedure for tank decontamination, or in the case of equipment which is part of a piping system, may follow the procedure for piping system decontamination. The process equipment will be left in-place as installed, unless removal of the equipment will expedite or facilitate more thorough decontamination.

3.3.1 Pumps, Rakes, Mixers, Valves, Etc. (Associated with Piping or Tanks)

Pumps and valves are generally tied in with piping systems, and can be decontaminated with the piping segments in-place, or if the piping is removed for pressure washing, the associated pumps and/or valves can be similarly pressure washed in-place, or at a decontamination pad. Rakes, mixers, separator plates, and other components of fixed process equipment or tanks can be pressure washed with a detergent solution to remove any residual sediment, sludge, or constituents of concern. Equipment associated with a tank will be decontaminated to the same standard as the tank, and the clearance rinse sample for the tank will be representative of the associated equipment.

3.3.2 Sand Filters

Units 606 and 6012 are square steel vessel, approximately 12 feet by 12 feet, with approximately eight (8) feet of filter sand in each vessel. The sand will be removed from the containments, and transported to a permitted disposal facility. The steel vessels will be pressure washed to remove surficial residue, and rinsed with potable quality water. Subsequent to cleaning the containments, a rinse sample will be collected from each vessel.

3.3.3 Parallel Plate Separator

Unit 355 will be drained of water and residual sediment, and the parallel plates removed from the unit. The parallel plates will be pressure washed over a decontamination pad, and placed in the control room storage area. The bottom of the separator sump will be removed, and the separator pressure washed with a detergent solution, rinsed with potable quality water, and allowed to dry. A rinse sample will be collected for clearance, using a procedure similar to that which was developed for tanks.

3.3.4 Filter Presses

Filter press units 701 and 702 are located on the second floor of the sludge dewatering building, with sumps/chutes located below the filter presses to direct the dewatered sludge into containers on the first floor. These units, and the area surrounding them, are coated with a residual oily sludge. The units and surrounding areas will be decontaminated by pressure washing with detergent solution to remove the residual sludge and surficial residue. The plates will be separated and pressure washed. The filter fabric will be removed from the plates and disposed of at a permitted disposal site after proper sampling and characterization for acceptance as non-hazardous solid waste. Clearance rinse testing of the filter presses will not be required.

3.3.5 Reagent Feeding Systems

The reagent feeding systems for organic polymers will be purged by pumping a detergent solution through the system, draining the detergent solution from each distribution system discharge point, then rinsing the system and each discharge point with potable quality water. A rinse sample will be collected from each polymer system and analyzed for PAHs. If the PAH constituent values are within the solid waste acceptance criteria, the piping may be removed and properly disposed. The reagent feeding systems for acids and caustic/lime systems will be flushed with a buffered low pH or high pH solution, then with potable quality water, draining the system from each system discharge point. The rinse water will be tested for pH, and when the pH value is within a range of six (6) to nine (9), the piping system may be removed and properly disposed.

3.4 Temporary Water Treatment System

The process tanks, which will be reserved for treating water generated from decontamination procedures, and rainwater which may accumulate during the closure activities, will be tanks 401, 402, 601, 602, 603, 606, 6013, and 6014. Existing piping and pumps may be utilized for transferring water between tanks, or temporary hoses and pumps maybe utilized, at the contractor's discretion. All water, which is stored in tanks 401 and 402, will be tested after all other tanks and piping have been decontaminated, or when the tanks are more than 80% full. After testing for pH, PAHs, and priority pollutant metals, the required chemicals will be added to tanks 401 and 402 to treat the water in batch mode. After treatment, the water will be retested, and discharged if the analytical results meet the MDEQ Water Quality Criteria. If subsequent treatment is required, tanks 601, 602, 603, 606, 6013, and 6014 may be utilized for mixing, settling, or other functions. After all other tanks, buildings, equipment, drains, sumps, and containment areas have been decontaminated, the remaining water in the temporary treatment system will be treated and discharged, and the temporary system tanks decontaminated, tested, and decommissioned. Decontamination water and residual materials, which are generated through the closure of the temporary treatment system, will be collected by vacuum truck and transported to a permitted treatment facility for disposal.

3.5 Buildings

The interior of the five (5) buildings will be pressure washed with a non-foaming detergent solution, followed by a potable quality water rinse. Additionally, any internal containments, drains, and sumps will also be cleaned in the same manner. The building interiors will have all residual sediment, sludge, and surficial residue removed. This includes steel structures for walkways, pipe racks, and any equipment not directly associated with piping systems or tanks. Offices, records storage areas, and non-chemical contact areas will not require decontamination, but will be cleaned of trash, debris, and litter. Sinks, lavatories, and sanitary facilities will be cleaned, drained, and the utilities disconnected. Visual clearance will be adequate for the buildings. All chemicals, lubricants, empty containers, maintenance supplies, cleaning supplies, rubbish, debris, and trash will be removed and properly disposed. Any valves, pumps, mixers, etc. which are removed, decontaminated, but not transported for disposal, will be stored in the covered area, formerly used for containerized waste storage, at the control building.

3.6 Containment Areas

All ditches, sumps, concrete slabs, concrete or steel containment structures, and concrete tank slabs will be cleaned of residual sediment and/or sludge, pressure washed with a non-foaming detergent solution, and rinsed with potable quality water. A rinse sample will be collected from each containment area, representative of rainwater contacting equipment, concrete slabs, ditches, and sumps. An acceptable alternative for drainage from the holding tank area containment will be determined from the alternatives, and a set of specifications inserted as Appendix E - Stormwater Drainage System Specifications. Stormwater drainage in the Sludge Dewatering Area containment and Sand Filter Area containment are equipped with storm drains.

3.7 Disposal of Closure Generated Wastes

Wastewater generated from pressure washing, purging of piping, and rinsing, will be transported from temporary sumps, decontamination pads, and tanks to tanks 401 and/or 402 for batch treatment to MDEQ Water Quality Criteria standards, after which the treated water will be discharged in accordance with the existing NPDES permit. Residual sludge, sediment, and oily residue generated during the decontamination procedure will be stored in containers, characterized as solid waste, and transported to an appropriate permitted disposal facility. Contact water from decontamination of oily waste areas will be vacuumed from the temporary holding containment and transported to a permitted wastewater treatment facility as contact water. The estimated quantities of wastewater, sludge, and sediment to be generated during decontamination activities are:

- pressure washing with non-foaming detergent solution: . . . . 70,000 gallons
- pressure rinsing with potable quality water . . . . 70,000 gallons
- residual oily sludge (with sorbent materials - as solids) . . . . 6 - 55 gallon drums
- sediment from tank bottoms, process equipment, ditches, sumps . . . . 60 cubic yards
- sand from sand filters . . . . 85 cubic yards
- pipe to be removed and transported to a permitted disposal site . . . . . 24,500 linear feet
- trash, debris, containers, decontamination supplies, etc. . . . . 6 - 7 cubic yard loads
- batteries from back-up power system . . . . 100 at 35 pounds each.

3.7.1 Existing Water Inventory

The accumulated standing water in the tanks, sumps, and containment areas will be recovered, treated, and discharged within 30 days prior to decontamination/decommissioning activities. Assuming an average six (6) inches of rainfall per month, and allowing for a month prior to activities, as much as 100,000 gallons of rainwater could accumulate prior to starting the project, which would fill one (1) of the temporary treatment tanks (401 or 402).

3.7.2 Water Generated from Decontamination Operations

The estimating basis for the volume of water needed to wash and rinse all of the tanks, buildings, equipment, and structures was two (2) pressure washers, operating at 3.5 gallons per minute, 250 minutes per day, 5 days per week, for 16 weeks, which yields 140,000 gallons. It is assumed 50% of the total gallons are non-foaming detergent wash water, and 50% are potable quality rinse water.

3.7.3 Rainwater Generated During Decontamination/Decommissioning

Based on the assumption of four (4) months on-site, the estimated total rainwater which may require treatment and discharge could reach 500,000 to 600,000 gallons, and require three (3) to four (4) batch treatment and discharge sequences.

3.7.4 Sludge Generated During Decontamination/Decommissioning

The estimated quantity of sludge and sediment which might be generated during the project was based on an assumed layer one (1) inch thick, covering 50% of the surface area to be decontaminated. This calculation yielded approximately 60 cubic yards, or 100 tons.

4.0 REPORTING

At the conclusion of decontamination/decommissioning activities, EarthCon will prepare a closure report which summarizes the activities, presents the analytical data, documents the clean closure of the facility, and certifies compliance with applicable regulations. The closure report will be submitted to Mason Technologies, Inc. for review and distribution.

5.0 SCHEDULE

The anticipated duration of the project is estimated as follows:

Proposed Task	Anticipated Duration
Develop Contract Bid Document	3 weeks
Contractor Bid Request, Site Walk, and Selection	4 weeks
Contractor Selection to Mobilization	4 weeks
Mobilization, Deployment, & Familiarization	2 weeks
Decontamination/Decommissioning of Reagent Systems	1 week
Decontamination/Decommissioning of Piping	4 weeks
Decontamination/Decommissioning of Tanks	5 weeks
Decontamination/Decommissioning of Buildings	2 weeks
Decontamination/Decommissioning of Containments	2 weeks
Installation/Construction of Post-Closure Drainage System	undefined
Preparation of Closure Report	4 weeks

The above schedule indicates that the projected time to execute the field work is approximately 16 weeks, or four (4) months, with completion of the closure report 30 days after the field work is completed. The installation of a post-closure drainage option for the holding tank area is not included in the above time schedule, since some options could be performed simultaneously with the decontamination/decommissioning activities, and other options will require additional time to complete in a sequential manner.

6.0 CONTINGENCIES

The recommended procedures for decontaminating and decommissioning the wastewater treatment plant facilities were developed on the basis of the plans and drawings of the facility supplied to EarthCon, two (2) site visits, and one (1) preliminary meeting with contractors. Factors which involve some variability include:

- The effectiveness of the recommended decontamination procedures;
- Variance in actual quantities compared to estimated quantities;
- Weather; and
- Changes in the scope of work.

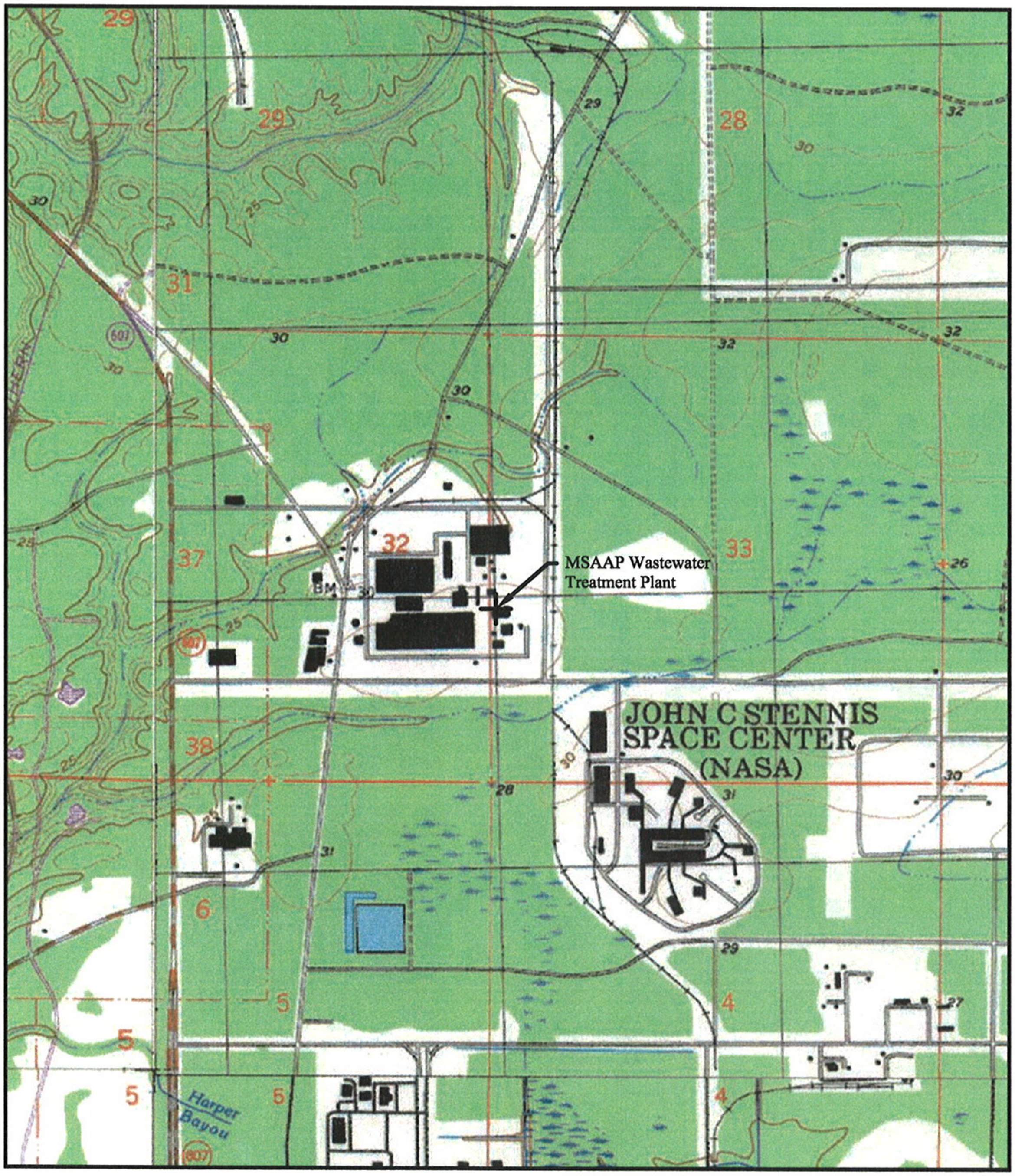
The contractors will take these factors into account when preparing bids, and will be required to make a thorough site inspection prior to bidding, in order to minimize the contingencies which must be incorporated into their bids. Evaluation of the alternatives for post-closure drainage of the holding tank area will be completed prior to issuing the bid request, and the preferred option incorporated in the Closure Plan as Appendix E - Stormwater Drainage System Specifications. Weather represents an unpredictable variable, due to the seasonal risk of hurricane storm impacts, which could generate excessive rainfall, or shut the project down. Such unforeseeable events would justify and require a change order to deal with the magnitude of impact to the project.

7.0 HEALTH AND SAFETY PLAN

The selected contractor will be required to prepare a comprehensive Health and Safety Plan which recognizes the site specific risks and hazards associated with the decontamination and decommissioning of the facility. The selected contractor will name a Site Safety Officer for the duration of the project, who will be responsible for the on-site orientation of personnel; compliance with applicable state and federal regulations regarding worker training, health and safety, and documentation of compliance with the aforementioned regulations. The selected contractor will furnish documentation of current OSHA 40 CFR 1910.120 training and annual medical surveillance for each person employed on this project, and will maintain copies of all required documentation on-site for review. The selected contractor will be responsible for compliance with the Health and Safety Plan by any subcontractors who are utilized on the project by the contractor. The Health and Safety Plan will be prepared by the selected contractor and submitted to EarthCon and Mason Technologies, Inc. for review within 15 calendar days after contractor selection.

FIGURES

Figure 1
Site Location Map



Latitude: 30° 23' 25" N
Longitude: 89° 36' 44" W

Hancock County

SOURCE: USGS 7.5' MAP - DEAD TIGER CREEK QUADRANGLE - 1996

Earth Consulting Group, Inc.

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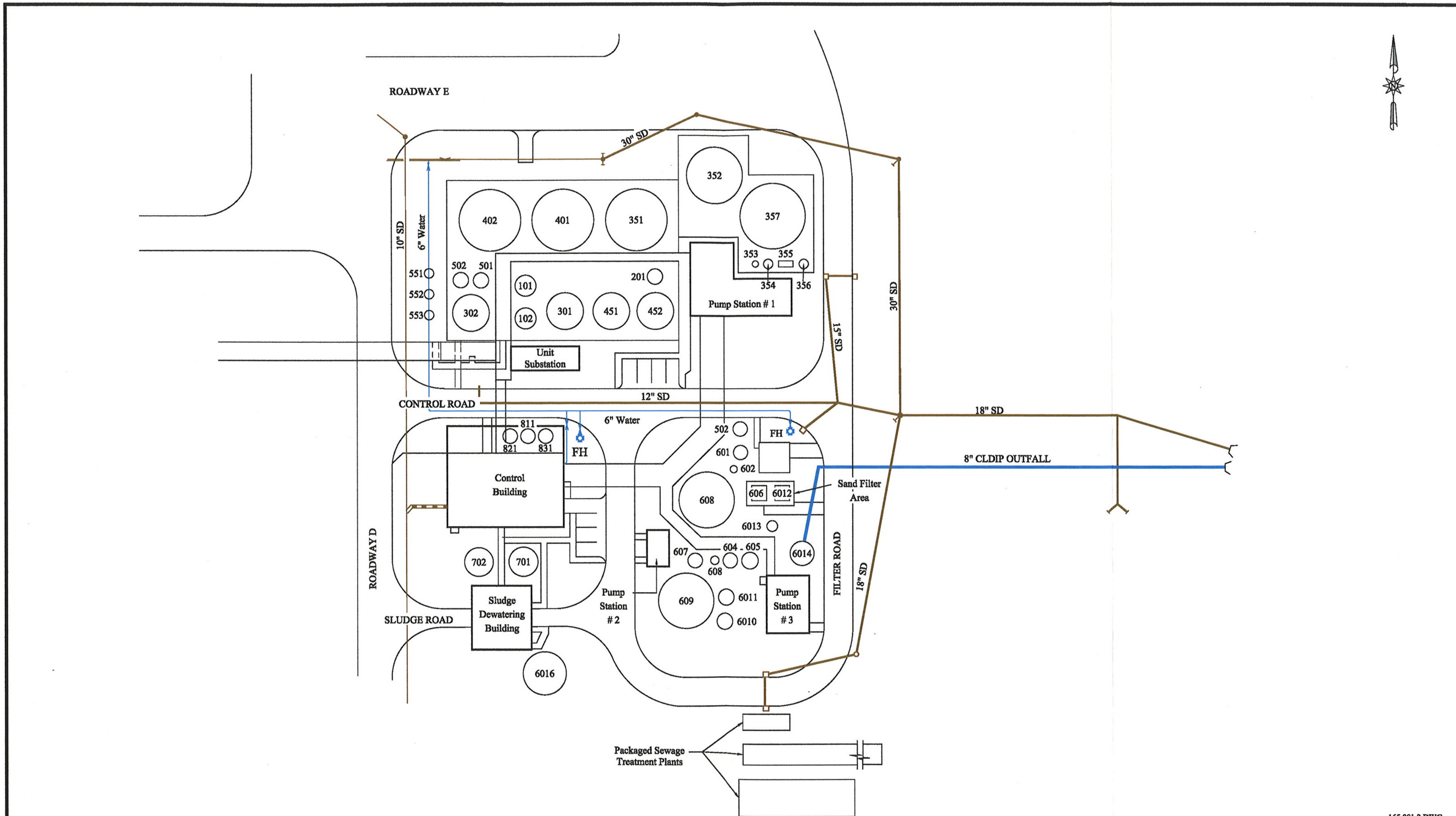
DRAWN BY:	CHECKED BY:	SCALE:	DATE:	PROJECT NO:
Glen Ivey	Mike Brady	1" = 2000'	06/08/04	M165.001

PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: SITE LOCATION MAP

FIGURE 1

Figure 2
Base Map



LEGEND:

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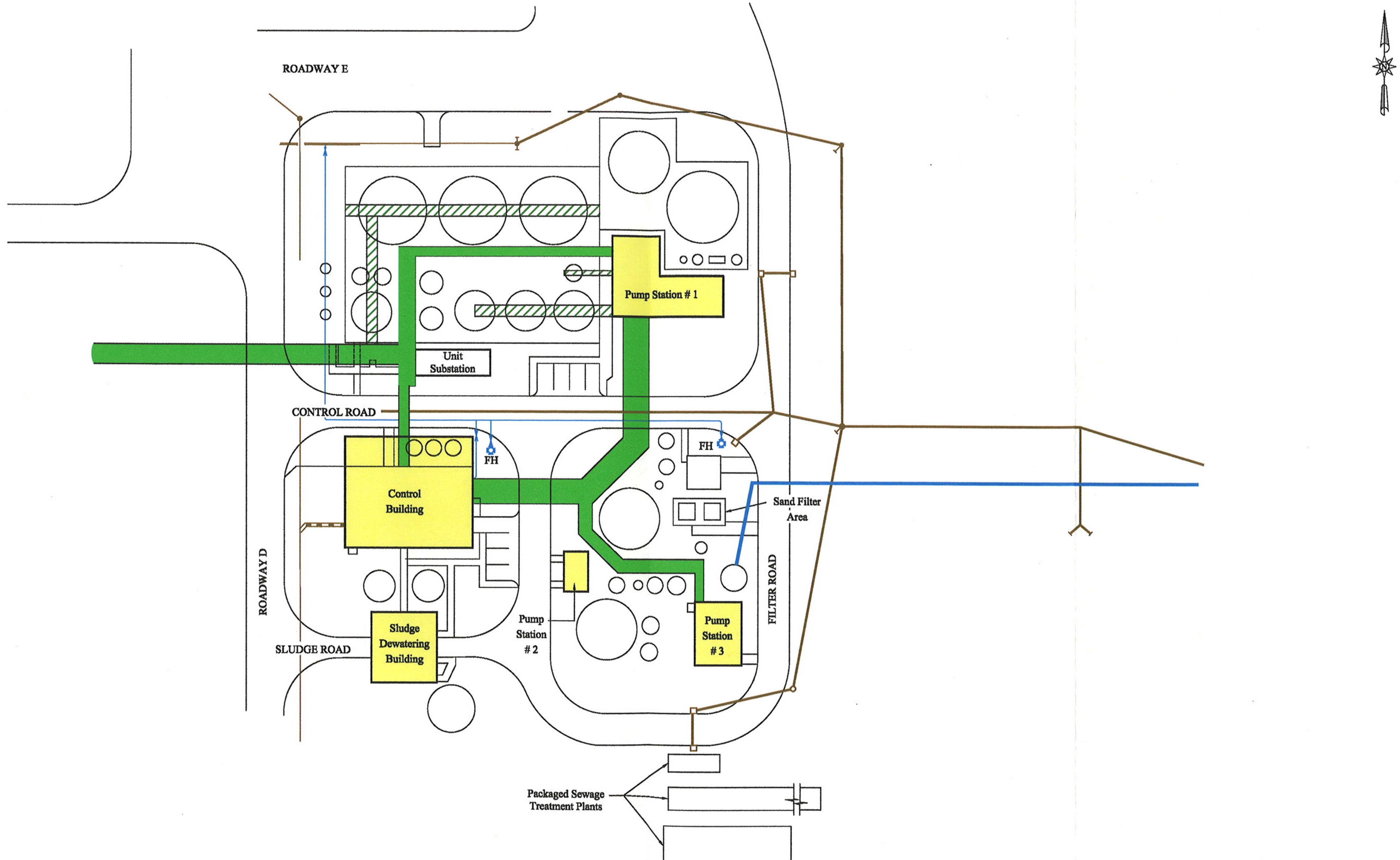
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi				
TITLE: BASE MAP				FIGURE 2

Figure 3
Buildings and Pipe Racks



165.001 3.DWG

LEGEND:

- Buildings
- Walkways
- Pipe Racks

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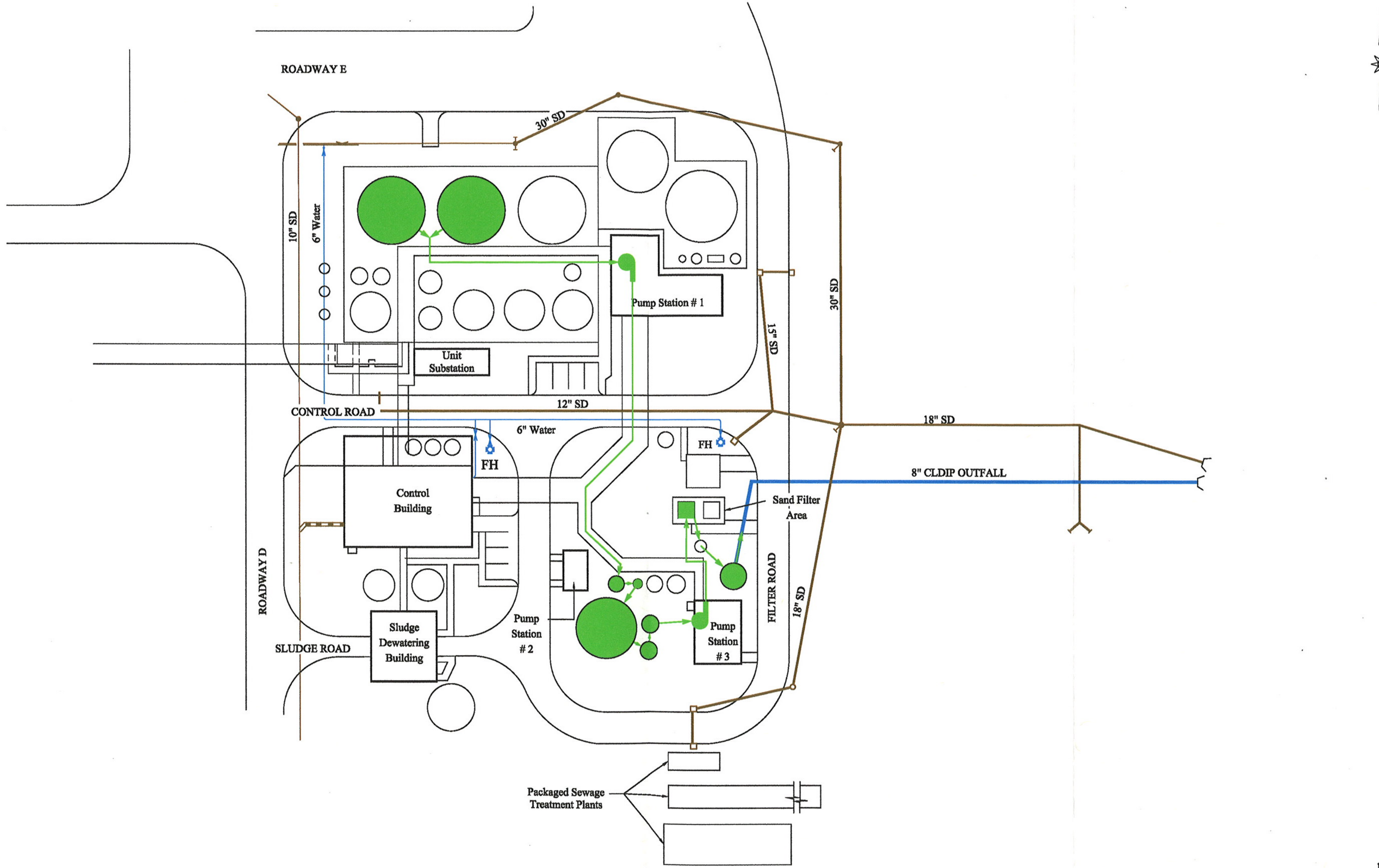
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: BUILDINGS AND PIPE RACKS

FIGURE 3

Figure 4
Temporary Water Treatment System



165.001 4.DWG

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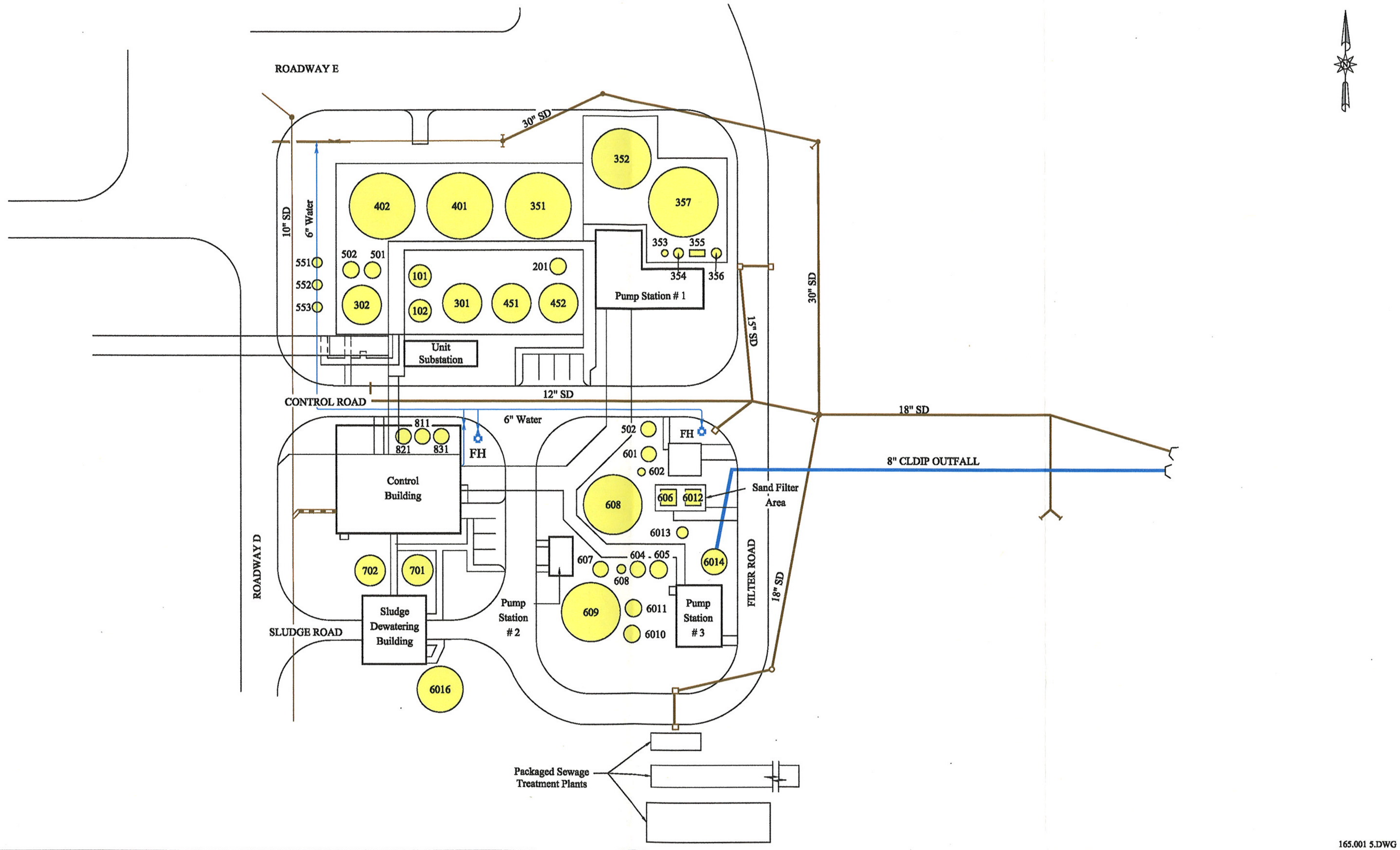
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: TEMPORARY WATER TREATMENT SYSTEM

FIGURE 4

Figure 5
Tanks to be Abandoned



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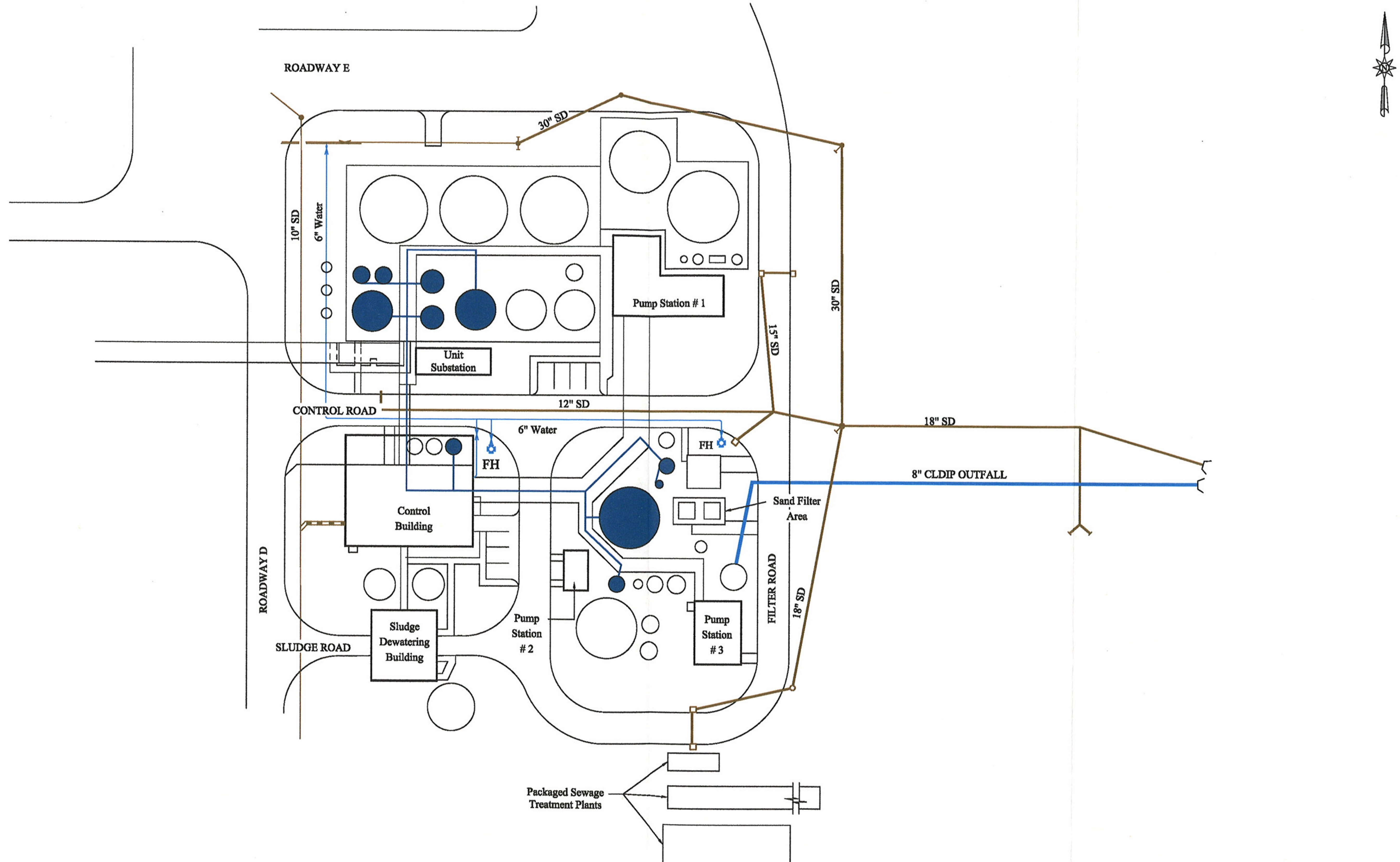
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: TANKS TO BE ABANDONED

FIGURE 5

Figure 6
Lime Distribution System



165.001 6.DWG

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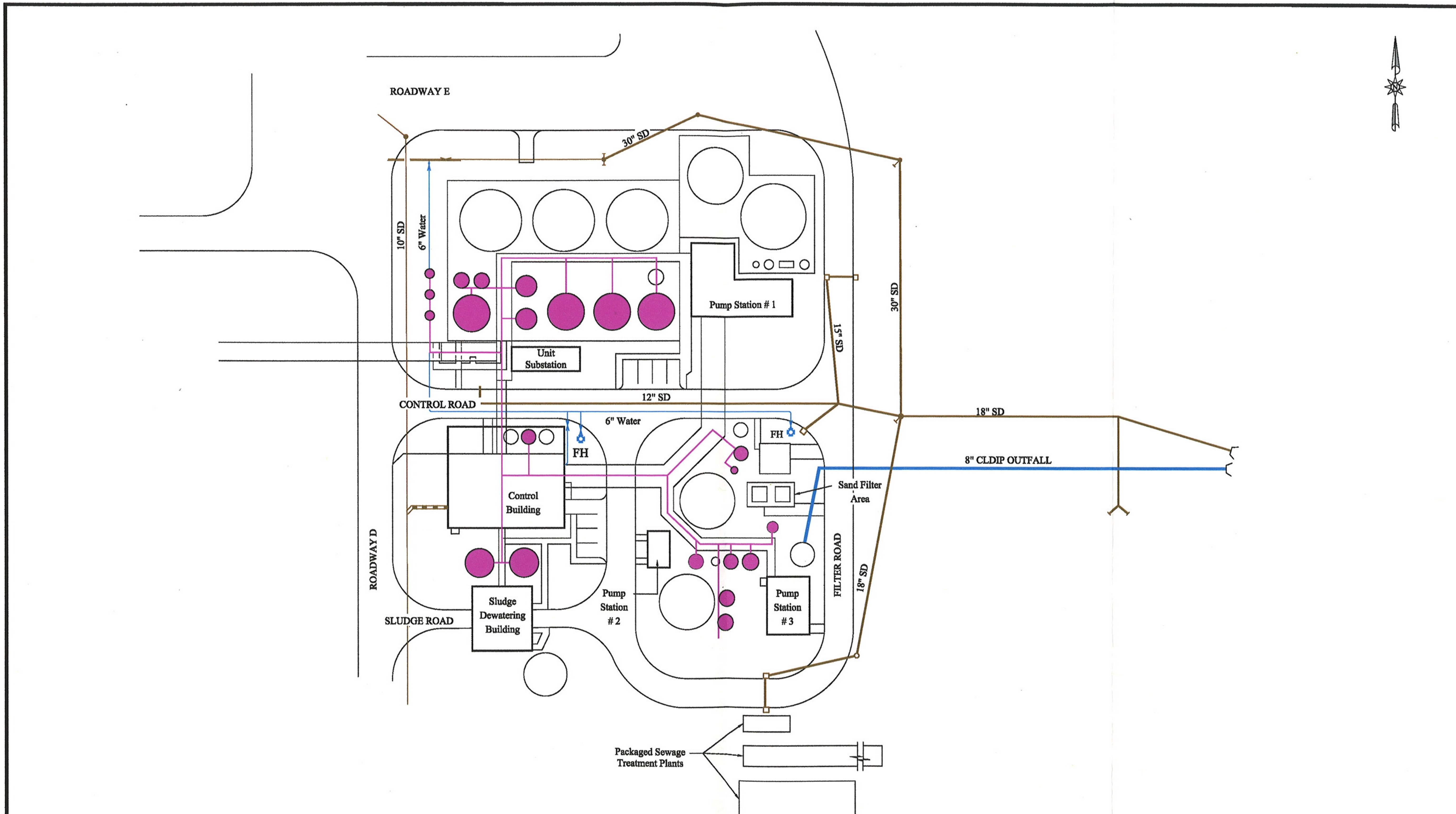
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: LIME DISTRIBUTION SYSTEM

FIGURE 6

Figure 7
Caustic Distribution System



165.001 7.DWG

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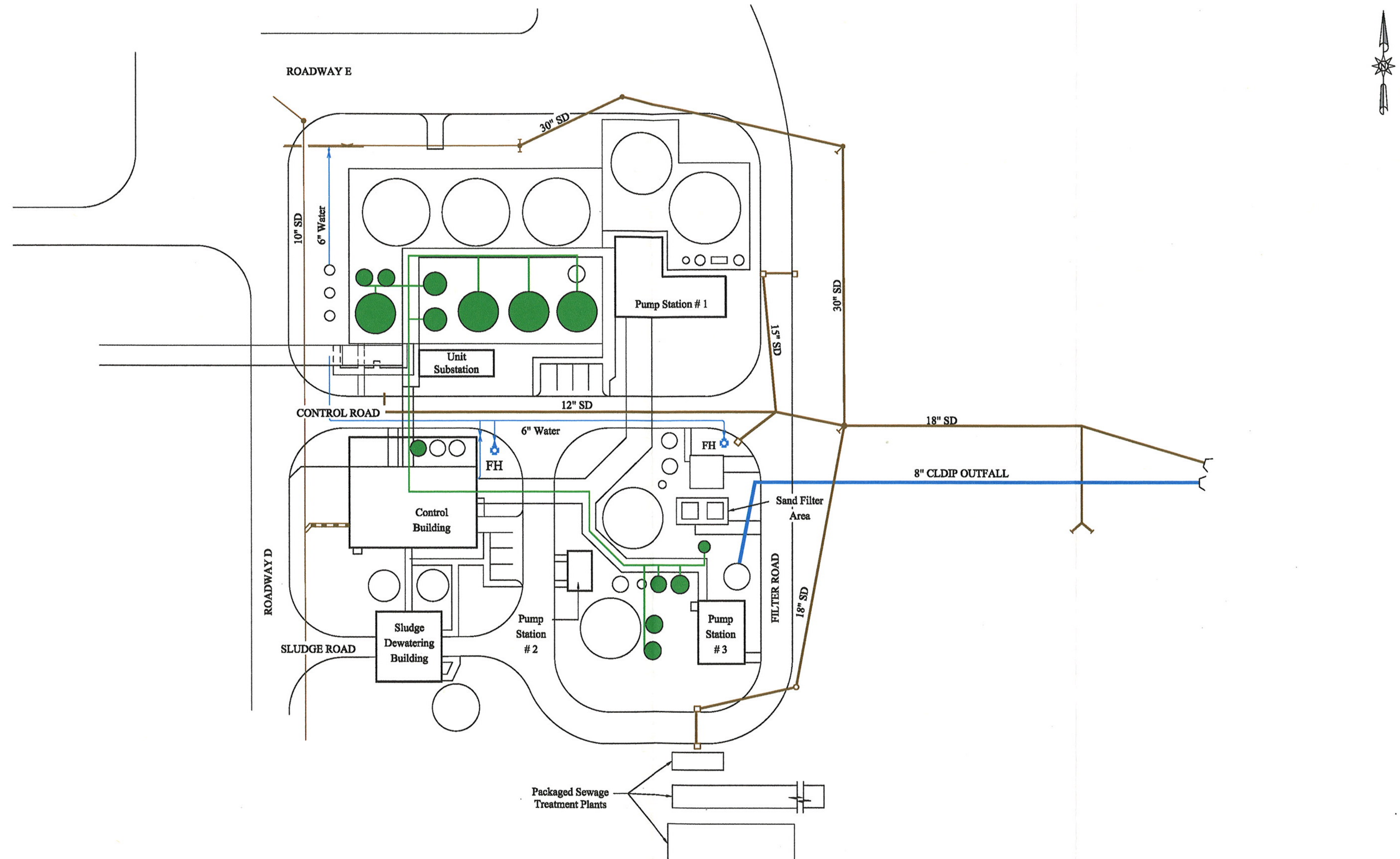
PROJECT: Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi

TITLE: CAUSTIC DISTRIBUTION SYSTEM

FIGURE 7

Figure 8
Sulfuric Acid Distribution System



165.001 8.DWG

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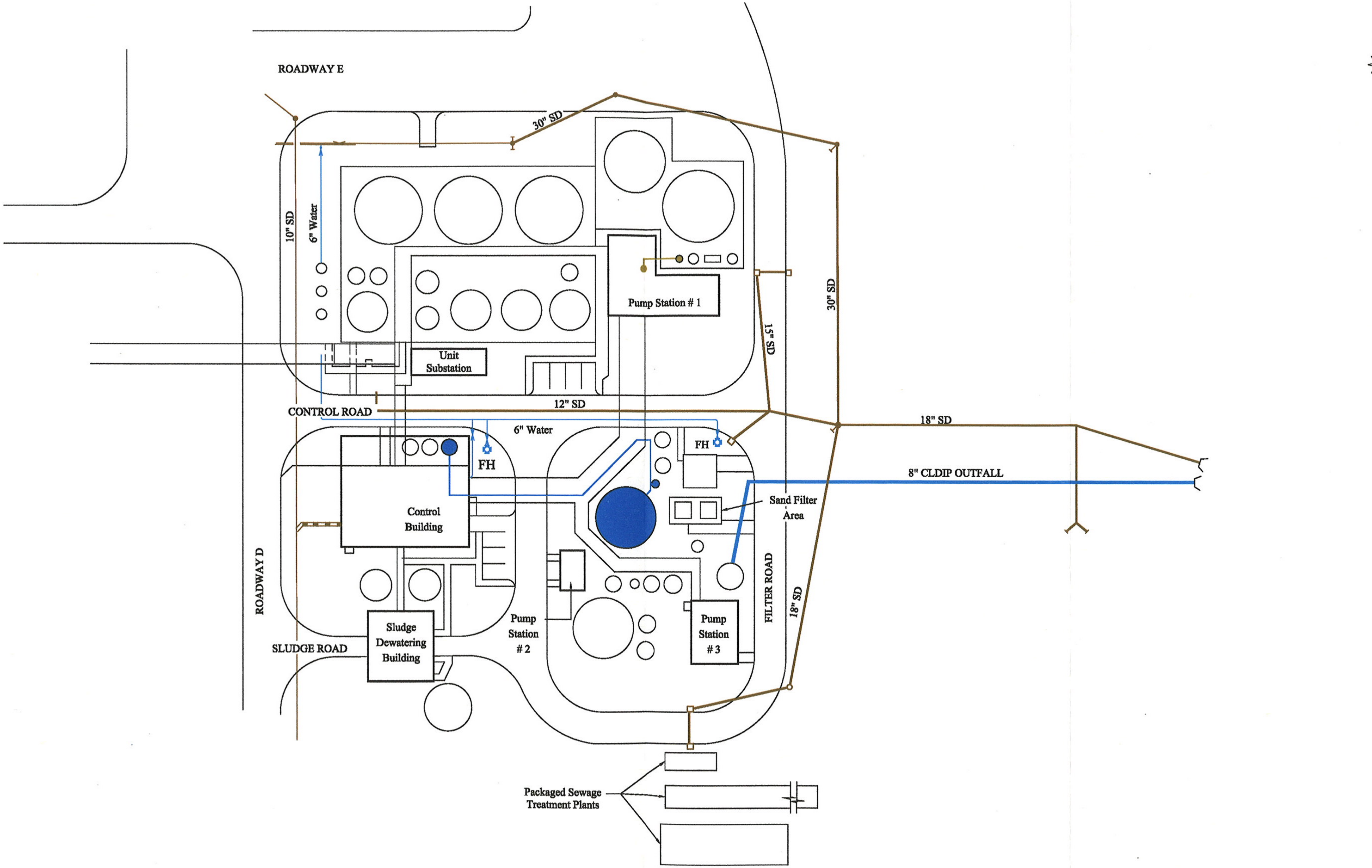
PROJECT:	Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi			
TITLE:	SULFURIC ACID DISTRIBUTION SYSTEM			FIGURE 8

Figure 9
Polymer Distribution System



165.001 9.DWG

EarthCon

LEGEND:

- 853 to 353
- 851 to 602,608

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PROJECT:	Mason Technologies, Inc - MSAAP Wastewater Treatment Plant - Stennis, Mississippi			
TITLE:	POLYMER DISTRIBUTION SYSTEM			FIGURE 9

APPENDICES

Appendix A
Tank Inventory Spreadsheet

Stennis Space Center
Mason Technologies, Inc.
Mississippi Army Ammunition Plant - Water Treatment Plant
Tank Inventory
Specifications for Facility Closure

Tank Number	Capacity (Gallons)	Capacity (Cu Ft)	Diameter (Ft)	Height (Ft)	Surface Area (Sq Ft)	Tank Location	Tank Function	Installed Equipment	Solution(s) /Materials Contained	Potential Contaminants	Required Decon	Required Clearance	Associated Piping In	Associated Piping Out
101	13,000	1,738	15	10	648	Holding Area	Holding/pH	Mixer, Pump	Alkaline Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	AOL#10, Acid, Caustic, & Lime	to 303, or 351 and/or 352
102	13,000	1,738	15	10	648	Holding Area	Holding/pH	Mixer, Pump	Alkaline Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	AOL#10, Acid, Caustic, & Lime	to 303, or 351 and/or 352
201	7,000	936	10	12	456	Holding Area	Holding	Pump	Acid Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	AOL#20	to 401 and/or 402
301	36,000	4,813	25	10	1,276	Holding Area	Holding	Mixer, Pump	Soluble Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	SOW#12, SOW#30, acid, caustic	oil to 701 and/or 702, water to 401 and/or 402
302	36,000	4,813	25	10	1,276	Holding Area	Holding	Mixer, Pump	Soluble Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	SOW#12, SOW#30, acid, caustic	ol to 701 and/or 702, water to 401 and/or 402
303	500	67	4	6	88	357 Area, PS-1	Holding	Undefined	Soluble Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 301 and/or 302	oil to 701 and/or 702, water to 401 and/or 402
351	100,000	13,370	43	10	2,803	Holding Area	Holding	Mixer, Pump	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 101, 102, 301, 302, 551, 552, 553, NOW#35	oil to 701 and/or 702, water to 353
352	89,000	11,899	38	10	2,328	357 Area	Holding	Mixer, Pump	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 101, 102, 301, 302, 551, 552, 553, NOW#35	oil to 701 and/or 702, water to 353
353	1,600	214	5	10	177	357 Area	Mixing	Mixer	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 351 and/or 352	to 354
354	2,000	267	6	10	217	357 Area	Flocculation	Mixer	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 354	to 355
355	2,000	267	5'x10'	10	1,300	357 Area	Parallel Pl. Sep.	Sludge Pump	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 354	oil to 701 and/or 702, water to 401 and/or 402
356	1,600	214	6	10	217	357 Area	Holding/pH	Sludge Pump	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 355	water to 357, solids to 701 and/or 702
357	140,000	18,718	51	10	3,645	357 Area	COD	Rake Motor, Sludge Pump, Blower	Non-Det. Oily Waste	pH, PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	from 356	water to 401 and/or 402, solids to 701 and/or 702
401 *	100,000	13,370	43	10	2,803	Holding Area	Holding/pH	Mixer, Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam *	Rinse Sample - pH, PAHs, Metals	AAR#40, from 201, 303, 355, 451 and/or 452, 551, 552, 553, 501 and/or 502, COP#56, BBO#57, tank drain lines, area sumps	to 601 and/or 607
402 *	100,000	13,370	43	10	2,803	Holding Area	Holding/pH	Mixer, 2 Pumps	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam *	Rinse Sample - pH, PAHs, Metals	AAR#40, from 201, 303, 355, 451 and/or 452, 551, 552, 553, 501 and/or 502, COP#56, BBO#57, tank drain lines, area sumps	to 601 and/or 607
451 *	30,000	4,011	23	10	1,138	Holding Area	Holding	Mixer, Pump	Chromium Rinse	Metals (esp Cr)	Remove Sludge, Det. Steam *	Rinse Sample - pH, Metals	CRR#45, PMP, acid	to 401 and/or 402
452 *	30,000	4,011	23	10	1,138	Holding Area	Holding	Mixer, Pump	Chromium Rinse	Metals (esp Cr)	Remove Sludge, Det. Steam *	Rinse Sample - pH, Metals	CRR#45, PMP, acid	to 401 and/or 402
501	7,500	1,003	11	11	475	Holding Area	Holding	Mixer, Pump, Blower, Steam	Flue Gas Desulferization	Heavy Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, Metals	FGD#50, acid, caustic	to 401 and/or 402
502	7,500	1,003	11	11	475	Holding Area	Holding	Mixer, Pump, Blower, Steam	Flue Gas Desulferization	Heavy Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, Metals	FGD#50, acid, caustic	to 401 and/or 402
551	2,000	267	8	6	201	Holding area	Reagent holding	Pump in & out	Acid phosphate solution	pH	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	COW#55	to 401 and/or 402
552	2,000	267	8	6	201	Holding Area	Holding	Mixer, Pump	Containerized Oily Waste	PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	COW#55	to 401/and/or 402
553	2,000	267	8	6	201	Holding Area	Holding	Mixer, Pump	Containerized Oily Waste	PAHs	Remove Sludge, Det. Steam	Rinse Sample - pH & PAHs	COW#55	to 401/and/or 402
601 *	5,400	722	12	8	415	Sand Filter Area	pH	Mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam *	Rinse Sample - pH, PAHs, Metals	CBW#25 from 401, 501, 502, 551, 552, 553 , caustic	CBW#26 to 602
602 *	1,600	214	5	10	177	Sand Filter Area	pH	Mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam *	Rinse Sample - pH, PAHs, Metals	CBW#26 from 601, lime, polymer	CBW#27 to 603
603 *	110,000	14,707	38	13	2,686	Sand Filter Area	Clarifier	Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam *	Rinse Sample - pH, PAHs, Metals	CBW#27 from 602	CBW#28 to 604; SL#34 to 701 and/or 702
604	7,000	936	10	12	456	Process Area	pH	Mixer, Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#28 from 603, acid, caustic	CBW#29 to 605
605	7,000	936	10	12	456	Process Area	pH	Mixer, Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#29 from 604, acid, caustic, polymer	CBW#30 to 606 or 401 and/or 402
606	3,500	468	12'x12'	10	700	Sand Filter Area	Sand Filter	Pump in, Sump, Pump	All waste streams	pH, PAHs, Metals	Remove Sand, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#30 from 605	to 6013
607	5,400	722	10	10	393	Process Area	pH	Mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#25 from 402, 501, 502, 551, 552, 553 , caustic	CBW#26 to 608
608	1,600	214	5	10	177	Process Area	pH	Mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#26 from 607, lime, polymer	CBW#27 to 609
609	110,000	14,707	38	13	2,686	Process Area	Clarifier	Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#27 from 608	CBW#28 to 6010; SL#34 to 701 and/or 702
6010	5,700	762	10	10	393	Process Area	pH	Mixer, Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#28 from 609, acid, caustic	CBW#29 to 6011
6011	7,000	936	10	12	456	Process Area	pH	Mixer, Pump	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#29 from 6010, acid, caustic, polymer	CBW#30 to 6012 or 401 and/or 402
6012	3,500	468	12'x12'	5	700	Sand Filter Area	Sand Filter	Pump in, Sump, Pump	All waste streams	pH, PAHs, Metals	Remove Sand, Det. Steam	Rinse Sample - pH, PAHs, Metals	CBW#30 from 6011	to 6013
6013	2,800	374	7	10	258	Sand Filter Area	pH	Mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	from 606, 6012, acid, caustic	to 6014
6014	18,000	2,407	14	16	858	Sand Filter Area	Monitor&Sample	2 Pumps, Parshall Flume	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	from 6013	to effluent discharge or 401 and/or 402
6016	50,000	6,685	31	10	1,729	Sludge Dewatering Bldg	Holding	mixer	All waste streams	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	from filter presses	to 401 and/or 402
701	27,000	3,610	21	10	1,006	Sludge Dewatering Bldg	Holding	~~Plate Washer~~	Oily Sludge	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	from 301, 302, 303, 355, 603, 609	water to sump to 401 and/or 402
702	27,000	3,610	21	10	1,006	Sludge Dewatering Bldg	Holding	Pump in, Filter Press, Sump, Pump	Oily Sludge	pH, PAHs, Metals	Remove Sludge, Det. Steam	Rinse Sample - pH, PAHs, Metals	from 301, 302, 303, 355, 603, 609	water to sump to 401 and/or 402
811	6,000	802	10	10	393	Control Bldg	Reagent	Mixer, Pump	Sodium Hydroxide	High pH	Flush w/ buffered low pH soln.	Rinse sample - pH	water and sodium hydroxide	25% solution to 812 day tank
812	200	27	4	4	63	Control Bldg	Reagent	2 Pumps	Caustic Day Tank	High pH	Flush w/ buffered low pH soln.	Rinse sample - pH	from 811	distribution
821	6,000	802	10	10	393	Control Bldg	Reagent	Pump	Sulfuric Acid (93%)	Low pH	Flush w/ buffered high pH soln.	Rinse sample - pH	water and 93% sulfuric acid	to 822 day tank
822	500	67	4	6	88	Control Bldg	Reagent	3 Pumps	Acid Day Tank	Low pH	Flush w/ buffered high pH soln.	Rinse sample - pH	from 821	distribution
831	8,500	1,136	10	16	581	Control Bldg	Reagent	Mixer, 2 Pumps	5% Hydrated Lime	High pH	Flush w/ buffered low pH soln.	Rinse sample - pH	water and lime	distribution
851	Chem blend/feed system	polymer blending system fed from drum-no tank				Control Bldg	Reagent	2 Pumps	Polymer	Organic	Flush w/ Detergent soln.	Rinse sample - pH, PAHs	direct feed from reagent product drum-conc form	to 602 and 608
852A	Chem blend/feed system	polymer blending system fed from drum-no tank				Pump house 1	Reagent	Undefined	Phosphoric acid	Low pH	Flush w/ buffered high pH soln.	Rinse sample - pH	direct feed from reagent product drum-conc form	to 356
852B	Chem blend/feed system	polymer blending system fed from drum-no tank				Pump house 1	Reagent	Undefined	Ammonium nitrate	High pH	Flush with buffered low pH soln	Rinse sample - pH	direct feed from reagent product drum-conc form	to 356
853	Chem blend/feed system	polymer blending system fed from drum-no tank				Pump house 1	Reagent	Undefined	Polymer	Organic	Flush w/ Detergent soln.	Rinse sample - pH, PAHs	direct feed from reagent product drum-conc form	to 353
871	500	67	4	6	88	Pump house 1	Reagent	2 Pumps	Ferrous Sulfate	Low pH	Flush w/ buffered high pH soln.	Rinse sample - pH	water and ferrous sulfate	to 353

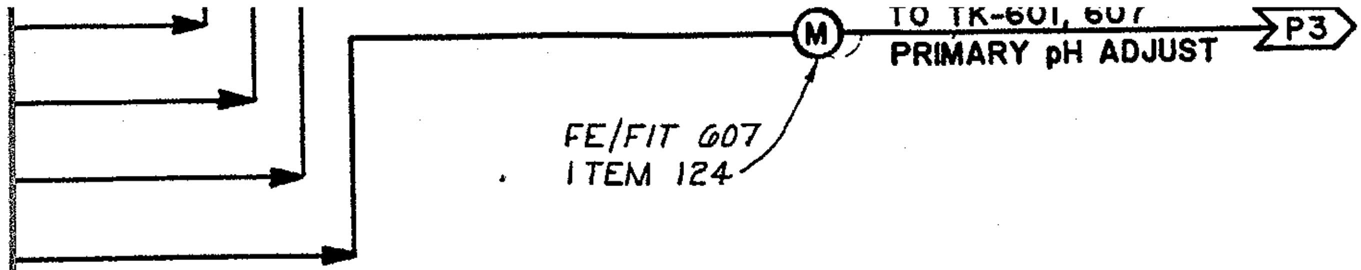
* Note: Preliminary rinse samples for these tanks will require hexavalent chromium testing. If clear, no further measures for hexavalent chromium will be necessary. If present, conversion to trivalent chromium will be required using a low pH rinse, followed by a buffered hydroxide rinse at 8.0 -9.5 pH.
Only reagent which were added by pump/piping system are shown. Manually added reagents were omitted from this table.

Appendix B
Piping System Inventory Spreadsheet

Stennis Space Center
Mason Technologies Inc.
Mississippi Army Ammunition Plant - Water Treatment Plant
Piping System Inventory
Specifications for Facility Closure

Waste/Process Stream Description	Stream No.	Stream Name	From	To	pH (Std. Units)	Probable Contaminants	Estimated Piping Length (feet)	Action Required	Decontamination Procedure	Confirmation Testing Procedure
Alkaline Oily Waste Influent (AOW#10)	1	AOW	Plant	101, 102	9 - 11	High pH, PAHs, Metals	100	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Acid Waste Influent (ACW#20)	2	ACW	Plant	201	0 - 3	Low pH, PAHs, Metals	250	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Soluble Oily Waste Influent (SOW#30)	3	SOW	Plant	301, 302	7 - 9	PAHs, Metals	150	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Non-Detergent Oily Waste Influent (NOW#35)	4	NOW	Plant	351, 352	6 - 9	PAHs, Metals	350	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Acid/Alkali Rinse Influent (AAR#40)	5	AAR	Plant & COW	401, 402	0 - 9	Low pH, Metals	200	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Chromium Rinse Influent (CRR#45)	6	CRR	Plant & PMP	451, 452	2 - 7	Low pH, Metals	250	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Flue Gas Desulfurization Influent (FGD#50)	7	FGD	Plant	501, 502	10 - 11	High pH, Metals	150	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Containerized Wastes Influent (COW#55)	8	COW	Plant	551, 552, 553	0 - 12	PAHs, Metals	150	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Coal Pond Influent (COP#56)	9	COP	Plant	401, 402	2 - 3	Low pH	200	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Boiler Blowdown Influent (BBD#57)	10	BBD	Plant	401, 402	6 - 8	Metals	200	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	11	AOW	101, 102	351, 352	2 - 12	Low pH, PAHs, Metals	350	Cut & cap, decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Undefined	12	SOW	551,552,553	301, 302	2 - 12	Low pH, PAHs, Metals	300	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Undefined	13	OIL	551,552,553	701	6 - 8	PAHs, Metals	300	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	14	SOW	301, 302	351, 352	2 - 12	PAHs, Metals	250	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	15	SLUDGE	301, 302	702	2 - 12	PAHs, Metals	350	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	16	NOW	351, 352	353	2 - 12	PAHs, Metals	200	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	17	CRR	451, 452	401, 402	2 - 3	Low pH, Metals	350	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	18	FGD	501, 502	601, 607	10 - 11	Metals	400	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	19	COW	551, 552, 553	701, 702	0 - 12	PAHs, Metals	300	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	20	CBW	301, 302, 303, 355	701	2 - 3	Low pH, PAHs, Metals	750	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	21	CBW	301, 302	702	6 - 12	PAHs, Metals	300	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	22	CBW	701, 702	Filter Presses	6 - 12	PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	23	CBW	701, 702	Sump	6 - 12	PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	24	CBW	Filter Presses	Sump	6 - 12	PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	25	CBW	401, 402	601, 607	2 - 3	Low pH, PAHs, Metals	400	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	26	CBW	601, 607	602, 608	10 - 12	Low pH, PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	27	CBW	602, 608	603, 609	10 - 12	Low pH, PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	28	CBW	603, 609	604, 6010	10 - 12	Low pH, PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	29	CBW	604, 6010	605, 6011	3 - 12	Low pH, PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	30	CBW	605, 6011	606, 6012	8 - 12	Low pH, PAHs, Metals	300	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	31	CBW	6014	DISCHARGE	7 - 9	Low pH, PAHs, Metals	100	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	32	CBW	6014	401, 402	7 - 9	Low pH, PAHs, Metals	600	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	33	CBW	606, 6012 SUMP	401, 402	8 - 12	Low pH, PAHs, Metals	600	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Process water	34	SLUDGE	603, 609 SLUDGE	701, 702	8 - 12	Low pH, PAHs, Metals	700	Decontaminate, remove	Detergent flush, water flush	Flush water pH, PAH & metals analyses
Sulfuric Acid	Reagent	A	821	Distribution	0 - 2	Low pH	750	Decontaminate, remove	Buffered caustic flush, water flush	Flush water pH test
Caustic (Sodium Hydroxide)	Reagent	B	811	Distribution	12 - 14	High pH	1,000	Decontaminate, remove	Buffered acid flush, water flush	Flush water pH test
851 Polymer	Reagent	P	851	602, 608	6 - 9	PAHs	250	Decontaminate, remove	Detergent flush, water flush	Flush water PAH analysis
853 Polymer	Reagent	P	853	353	6 - 9	PAHs	50	Decontaminate, remove	Detergent flush, water flush	Flush water PAH analysis
Ferrous Sulfate	Reagent	FS	871	353	3 - 7	Low pH	50	Decontaminate, remove	Buffered caustic flush, water flush	Flush water pH test
Sodium Bisulfite	Reagent	SBS	Manual	451, 452	1 - 3	Low pH	0	None	None	None
Lime	Reagent	L	831	Distribution	9 - 12	High pH	600	Decontaminate, remove	Buffered acid flush, water flush	Flush water pH test
Phosphoric Acid	Reagent	PH	852A	356	1 - 3	Low pH	100	Decontaminate, remove	Buffered caustic flush, water flush	Flush water pH test
Ammonium Nitrate	Reagent	NH	852B	356	3 - 7	Low pH	100	Decontaminate, remove	Buffered caustic flush, water flush	Flush water pH test
Potable Water	Utility	PW	Distribution	Distribution	6 - 8	None	2,000	Remove	None	None
Industrial Water	Utility	CW	Distribution	Distribution	6 - 8	None	2,000	Remove	None	None

Appendix C
Facility Process Flowsheets P-2 and P-3



LEGEND:

- (A) ACID
- (B) CAUSTIC
- (P) POLYMER
- (FS) FERROUS SULFATE
- (SBS) SODIUM BISULFITE
- (L) LIME
- (PH) PHOSPHORIC ACID
- (NH) AMMONIUM NITRATE
- (C) POWDERED ACTIVATED CARBON

BM (BULK-MANUAL)

Rec'd. 5/20/88 DJ

ISSUED BY:
Waldemar S. Nelson & Co., Inc.
APPROVED FOR CONSTRUCTION
MAY 19 1988

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE NEW ORLEANS, LA.

P-2

DATE	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL / SPECIFICATION	ITEM NO

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DECIMAL ±.010
ANGULAR ±2°
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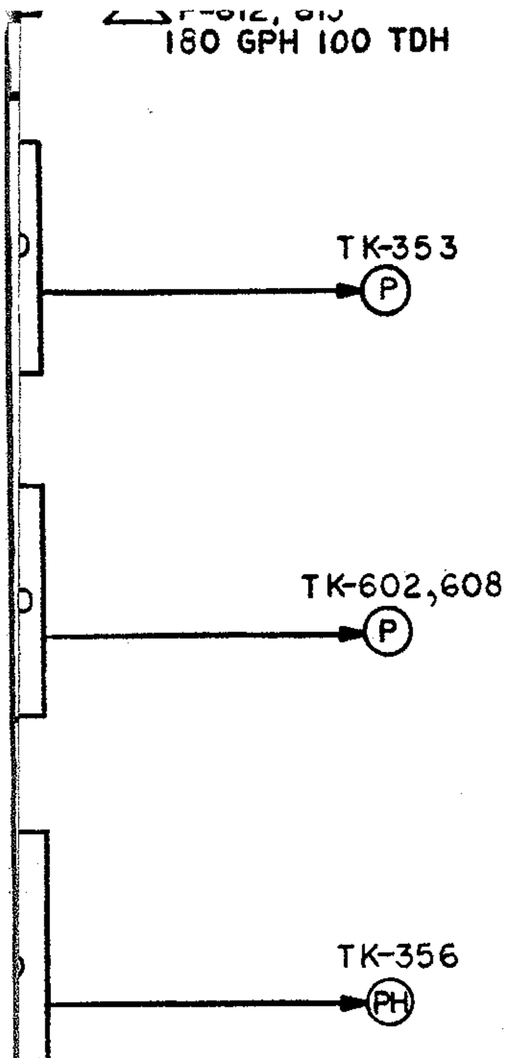
TREATMENT
FINISH
SIMILAR TO | ACT WT | CALC WT

CONTRACT NO | DATE
DRAWN
CHECK
DESIGN
STRESS/STRUCTURE
MATERIALS
PRODUCTION
DESIGN ACTIVITY APPD.
CUSTOMER

MASON CHAMBERLAIN INC.
MISSISSIPPI ARMY AMMUNITION PLANT

TITLE MOBILIZATION PROGRAM
PROCESS FLOWSHEET
INDUSTRIAL WASTE TREATMENT FACILITY

DRWG SIZE F | PROJ NO 5160-166 | DRWG NO 9148-MP 0000-001
W P NO
SCALE —— | RELEASE DATE 5/20/88 | SHEET 2/20 | REV. A



Rec'd. 5/20/88 DJ

ISSUED BY:
Waldemar S. Nelson & Co., Inc.
APPROVED FOR CONSTRUCTION

MAY 19 1988

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
1200 ST. CHARLES AVE NEW ORLEANS, LA.

DATE	SCALE	JOB NO	DRAWING NO
		875	

P-3

DATE	QTY REQD	CODE IDENT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL / SPECIFICATION	ITEM NO

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UNLESS SPECIFIED OTHERWISE
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DECIMAL ±.010
ANGULAR ±2°
DO NOT SCALE DRAWING
TREATMENT
FINISH
SIMILAR TO
ACT WT
CALC WT

USED ON
APPLICATION

CONTRACT NO
DRAWN
CHECK
DESIGN
STRESS/STRUCTURE
MATERIALS
PRODUCTION
DESIGN ACTIVITY APPD.
CUSTOMER
DATE

MASON CHAMBERLAIN INC.
MISSISSIPPI ARMY AMMUNITION PLANT

TITLE MOBILIZATION PROGRAM
PROCESS FLOWSHEET
INDUSTRIAL WASTE TREATMENT FACILITY

DRWG SIZE F
PROJ NO 5160-166
WP NO
DRWG NO 9148-MP 0000-001
SCALE ——
RELEASE DATE 5/20/88
SHEET 3 / 20
REV. A

Appendix D
MDEQ Water Quality Criteria

MISSISSIPPI COMMISSION ON ENVIRONMENTAL QUALITY
REGULATION WPC-2:
WATER QUALITY CRITERIA FOR INTRASTATE, INTERSTATE AND COASTAL WATERS

Adopted by Mississippi Commission on Environmental Quality: October 24, 2002
Approved by EPA: June 27, 2003 (Effective Date)

MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF POLLUTION CONTROL
P. O. BOX 10385
JACKSON, MISSISSIPPI 39289-0385

WATER QUALITY CRITERIA FOR INTRASTATE, INTERSTATE AND COASTAL WATERS STATE OF MISSISSIPPI

SECTION I

1. Antidegradation : The policy inherent in the standards shall be to protect water quality existing at the time these water quality standards were adopted and to upgrade or enhance water quality within the State of Mississippi. Waters whose existing quality is better than the established standards will be maintained at high quality unless the Commission finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In no event, however, may degradation of water quality interfere with or become injurious to existing instream water uses. Further, in no case will water quality be degraded below (or above) the base levels set forth in these standards for the protection of the beneficial uses described herein. In addition, the State will assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control. Where the Commission determines that high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected. For the purposes of this section, existing uses are defined as those uses actually attained in the waterbody on or after November 28, 1975, whether or not they are included in the Water Quality Criteria.

2. Sampling and Assessment : The limiting values of water quality herein described shall be measured by the Commission in waters under consideration as determined by good environmental engineering and scientific practice and after consultation with affected parties. Samples shall be taken from points so distributed over the seasons of the year, time of day and area and depth of the waters being studied as to permit a realistic assessment of water quality. Samples shall be analyzed in accordance with methodology specifed in 40 CFR 136 and with the latest edition of Standard Methods for the Examination of Water and Wastewater or other methods acceptable to the Commission.

3. Designated Use Attainability : Certain waters of the State may not fall within desired or prescribed limitations as outlined. In such instances the Commission may authorize exceptions to these limits, under the following conditions:

A. The existing designated use is not attainable because of natural background conditions; or

B. the existing designated use is not attainable because of irretrievable man-induced conditions; or

C. the application of effluent limitations for existing sources is more stringent than those required pursuant to Section 301(b)(2)(A) and (B) of the Federal Water Pollution Control Act of 1972, as amended, in order to attain the existing designated use, would result in substantial and widespread adverse economic and social impact.

In no case shall it be permissible to deposit or introduce materials into waters of the State that will cause impairment of the reasonable or legitimate use of said waters.

4. Natural Conditions : Natural conditions are defined as background water quality conditions due only to non-anthropogenic sources. The criteria herein apply specifically with regard to substances attributed to sources (discharges, nonpoint sources or instream activities) as opposed to natural phenomena. Waters may naturally have characteristics outside the limits established by these criteria. Therefore, naturally occurring conditions that fail to meet criteria should not be interpreted as violations of these criteria.

5. New Criteria : In view of the fact that industry is continuing to produce new materials whose characteristics and effects are unknown at this time or for which incomplete national criteria have been established, for the purposes of setting water quality standards or permit limits on a case-by-case basis, such materials shall be evaluated on their merits as information becomes available to the Commission. Sources of information shall include, but not be limited to, the latest edition of *Quality Criteria for Water* , prepared by the Environmental Protection Agency pursuant to Section 304(a) of the Federal Clean Water Act.

6. Applicable Flow : All criteria contained herein shall apply to all stages of stream flow greater than or equal to the 7-day, 10-year minimum flow in unregulated, natural streams, and the legally guaranteed minimum flow in regulated streams, unless otherwise provided in these regulations. This requirement shall not be interpreted to permit any unusual waste discharges during periods of lower flow. Notwithstanding the above, a stream flow equal to the 7-day, 2-year minimum flow in unregulated natural streams shall be utilized in establishing permit limitations for storm water permits. In cases in which either (1) the data is indefinite or inconclusive, or (2) the 7-day, 2-year minimum flow and/or the 7-day, 10-year minimum flow are inappropriate because of the hydrology of the area, other appropriate State and federal agencies will be consulted in establishing the applicable stream flow.

7. Mississippi River : The Mississippi River is classified for Fish and Wildlife use, but with the following additions to the criteria stated herein:

Mineral Constituents : Not to exceed the following concentrations at any time:

From Mississippi-Tennessee border to Vicksburg
Chlorides 60 mg/L
Sulfates 150 mg/L
T.D.S. 425 mg/L

From Vicksburg south to the Mississippi-Louisiana border
Chlorides 75 mg/L
Sulfates 120 mg/L
T.D.S. 400 mg/L

8. Mixing Zones : It is recognized that limited areas of mixing are sometimes unavoidable; however, mixing zones shall not be used as a substitute for waste treatment. Mixing zones constitute an area whereby physical mixing of a wastewater effluent with a receiving water body occurs. Application of mixing zones shall be made on a case-by-case basis and shall only occur in cases involving large surface water bodies in which a long distance or large area is required for the wastewater to completely mix with the receiving water body.
The location of a mixing zone shall not significantly alter the designated uses of the receiving water outside its established boundary. Adequate zones of passage for the migration and free movement of fish and other aquatic biota shall be maintained. Toxicity and human health concerns within the mixing zone shall be addressed as specified in the *Environmental Protection Agency Technical Support Document for Water Quality-Based Toxics Control* (EPA-505/2-90-001, March 1991) and amendments thereof. Under no circumstances shall mixing zones overlap or cover tributaries, nursery locations, locations of threatened or endangered species, or other ecologically sensitive areas.

SECTION II. MINIMUM CONDITIONS APPLICABLE TO ALL WATERS:

1. Waters shall be free from substances attributable to municipal, industrial, agricultural or other discharges that will settle to form putrescent or otherwise objectionable sludge deposits.

2. Waters shall be free from floating debris, oil, scum, and other floating materials attributable to municipal, industrial, agricultural or other discharges in amounts sufficient to be unsightly or deleterious.

3. Waters shall be free from materials attributable to municipal, industrial, agricultural or other discharges producing color, odor, taste, total suspended or dissolved solids, sediment, turbidity, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation or to aquatic life and wildlife or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated use. Except as prohibited in Section I, Paragraph 8 above, the turbidity outside the limits of a 750-foot mixing zone shall not exceed the background turbidity at the time of discharge by more than 50 Nephelometric Turbidity Units (NTU). Exemptions to the turbidity standard may be granted under the following circumstances:

A. in cases of emergency to protect the public health and welfare

B. for environmental restoration projects which will result in reasonable and temporary deviations and which have been reviewed and approved by the Department. [Remains under EPA review as of June 27, 2003.]

4. Waters shall be free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations that are toxic or harmful to humans, animals or aquatic life. Specific requirements for toxicity are found in Section II.10.

5. Municipal wastes, industrial wastes, or other wastes shall receive effective treatment or control in accordance with Section 301, 306 and 307 of the Federal Clean Water Act. A degree of treatment greater than defined in these sections may be required when necessary to protect legitimate water uses.

6. Designated Use Classifications : A waterbody classified as Public Water Supply, Recreation, or Shellfish Harvesting shall meet not only the criteria to support its respective use classification, but also shall meet the Fish and Wildlife criteria in order to support aquatic life.

7. Dissolved Oxygen : Dissolved oxygen concentrations shall be maintained at a daily average of not less than 5.0 mg/L with an instantaneous minimum of not less than 4.0 mg/L.

When possible, samples should be taken from ambient sites according to the following guidelines:

For waters that are not thermally stratified, such as unstratified lakes, lakes during turnover, streams, and rivers:
At mid-depth if the total water column depth is ten (10) feet or less.
At five (5) feet from the water surface if the total water column depth is greater than 10 feet.

For waters that are thermally stratified such as lakes, estuaries, and impounded streams:
At mid-depth of the epilimnion if the epilimnion depth is 10 feet or less.
At 5 feet from the water surface if the epilimnion depth is greater than 10 feet.

8. pH : The normal pH of the waters shall be 6.0 to 9.0 and shall not be caused to vary more than 1.0 unit within this range. Variations may be allowed on a case-by-case basis if the Commission determines that there will be no detrimental effect on the stream's designated uses as a result of the greater pH change. In blackwater streams and in those watersheds with highly acidic soils, the pH may be lower than 6.0 due to natural conditions.

9. Temperature: The maximum water temperature shall not exceed 90 E F (32.2E C) in streams, lakes and reservoirs, except that in the Tennessee River the temperature shall not exceed 86E F (30 E C). In addition, the discharge of any heated waters into a stream, lake or reservoir shall not raise temperatures more than 5 E F (2.8E C) above natural background temperatures.

In lakes and reservoirs there shall be no withdrawals from or discharge of heated waters to the hypolimnion unless it can be shown that such discharge will be beneficial to water quality. In all waters the normal daily and seasonal temperature variations that were present before the addition of artificial heat shall be maintained. The maximum water temperature shall not exceed 90 E F (32.2E C) in coastal or estuarine waters. In addition, the discharge of any heated waste into any coastal or estuarine waters shall not raise temperatures more than 4E F (2.2 E C) above natural during the period October through May nor more than 1.5 E F (0.8 E C) above natural background temperature during the period June through September.
When ambient water temperatures naturally exceed 90 E F (or 86E F in the Tennessee River), the discharge temperature of heated water must not exceed the ambient water temperature.
There shall be no thermal block to the migration of aquatic organisms. Requirements for zones of passage as referenced in Section I.8 shall apply. In addition to the general requirements of Section I.2, the temperature shall be measured at a depth of five feet in waters 10 feet or greater in depth; and for those waters less than 10 feet in depth, temperature criteria will be applied at mid-depth.

10. Toxic Substances:

A. Aquatic Life and Human Health Standards

1. Aquatic Life - The concentration of toxic substances shall not result in chronic or acute toxicity or impairment of the uses of aquatic life. Any levels in excess of these values will be considered to result in chronic or acute toxicity, or the impairment of the uses of aquatic life. Regardless of direct measurements of chronic or acute toxicity, the concentrations of toxic substances shall not exceed the chronic or acute values, except as provided for in Sections 10.F(1) and 10.F(2).

2. Human Health - The concentration of toxic substances shall not exceed the level necessary to protect human health through exposure routes of fish (and shellfish) tissue consumption, water consumption, or other routes identified as appropriate for the waterbody.

B. Numeric criteria for all waters are established herein for certain toxic pollutants for which the Environmental Protection Agency (EPA) has published national criteria for the protection of aquatic life and human health pursuant to Section 304(a) of the Federal Clean Water Act in addition to chlorine and ammonia. The pollutants are listed in Table 1 and are expressed as the dissolved phase of the parameter.

C. Ammonia toxicity shall be evaluated according to EPA guidelines published in *1999 Update of Ambient Water Quality Criteria for Ammonia* ; EPA document number EPA-822-R-99-014 or *Ambient Water Quality Criteria for Ammonia (Saltwater) - 1989* ; EPA document number 440/5-88-004. This material related to ammonia toxicity is hereby incorporated by reference including any subsequent amendments and editions.

D. Definitions : When applying acute or chronic toxicity or human health criteria, the following definitions shall apply:

1. 7Q10 is the seven-day average low stream flow with a ten-year occurrence period.

2. Mean Annual Flow is the total of daily mean flows for the full period of record divided by the total days for the period of record.

E. Application of Numerical Criteria :

1. When evaluating human health effects all waters must comply with the Organisms Only criteria except for waters classified as Public Water Supply and all stream segments within fifty (50) stream miles upstream of a drinking water intake. Stream segments that are classified as Public Water Supply or are within fifty (50) miles upstream of a drinking water intake shall comply with the Water and Organisms criteria.

2. When applying toxicity or human health criteria the following stream flows shall be used:

Acute Toxicity - 7Q10
Chronic Toxicity - 7Q10
Human Health - Mean Annual Flow

3. Criteria for certain metals may be modified on a site-specific basis when a water effect ratio (WER) is conducted in accordance with VI.C.2.a. of *Mississippi Wastewater Regulations for National Pollutant Discharge Elimination System (NPDES) Permits, Underground Injection Control (UIC) Permits, State Permits, Water Quality Based Effluent Limitations and Water Quality Certification* . In these instances, the criterion for the specific metal in the affected waterbody shall be equal to the criteria concentrations calculated using the following equations: CMC = WER * Acute and CCC = WER * Chronic.

Where:
CCC = Criteria Continuous Concentration
CMC = Criteria Maximum Concentration
WER = Water Effects Ratio for a Specific Pollutant
Acute = Acute Criteria from Table 1
Chronic = Chronic Criteria from Table 1

When a WER has not been conducted, the criteria listed in Table 1 of this regulation shall apply as the value of the WER is presumed to equal one in the absence of data to indicate otherwise.

F. Discharge Specific Criteria:

1. Existing Discharges

a. The Commission may establish discharger specific alternative criteria for existing discharges if all of the following conditions are satisfied:

i. Discharge existed prior to December 1, 1988.

ii. Discharger performs acute and/or chronic bioassays and instream biological assessments and other evaluations as deemed appropriate by the Commission.

iii. The designated use of the waters is maintained.

b. All discharger specific alternative criteria will be subject to Mississippi public participation requirements for revisions to water quality standards and will be subject to review by the U. S. Environmental Protection Agency.

2. New Source Discharges

a. The Commission may establish discharger specific criteria for new source discharges if the discharger can demonstrate that established Water Quality Criteria is based on conditions not applicable to Mississippi such as, but not limited to, the use of species not indigenous to Mississippi.

b. All discharger specific alternative criteria will be subject to Mississippi public participation requirements for revisions to water quality standards and will be subject to review by the U. S. Environmental Protection Agency.

G. Toxic and Human Health Parameters for which no Numeric Criteria have been Established:

1. For those toxic and human health parameters for which no numeric criteria have been established, the Commission shall determine limitations using available references which shall include, but not be limited to, *Quality Criteria for Water* (Section 304(a)), Federal regulations under Section 307 of the Clean Water Act, and Federal regulations under Section 1412 of the Public Health Service Act as amended by the Safe Drinking Act (Pub. 93-523).

2. Definitions:

a. The not to be exceeded value for criteria published in 1980 or the one-hour average value for criteria published in 1985 or later shall be used as an acute toxicity number for calculating effluent limitations, establishing Total Maximum Daily Loads (TMDLs), or reviewing ambient water quality data.

b. The 24-hour average for criteria published in 1980 or the four-day average for criteria published in 1985 or later shall be used as a chronic toxicity number for calculating effluent limitations, establishing TMDLs, or reviewing ambient water quality data.

c. If metals concentrations for criteria are hardness-dependent, the chronic and acute concentrations shall be based on 50 mg/L hardness if the ambient hardness is less than or equal to 50 mg/L. Concentrations shall be based on the actual mixed stream hardness if it is greater than 50 mg/L.

d. If separate criteria are given for fresh and salt waters, they shall be applied as appropriate.

e. For non-carcinogens, these concentrations will be determined using a Reference Dose (RfD) as published by the U. S. Environmental Protection Agency pursuant to Section 304(a) of the Federal Water Pollution Act as amended unless a more recent RfD is issued by the U. S. Environmental Protection Agency as listed in the Integrated Risk Information System (IRIS) file, in which case the more recent value will be used. Water quality standards or criteria used to calculate water quality-based effluent limitations (and for all other purposes of water quality criteria under Section 303(c) of the Clean Water Act) to protect human health through the different exposure routes are determined as follows:

i. Fish tissue consumption:

WQS = (RfD) x Body Weight/(FCR x BCF)
where:
WQS = water quality standard or criterion;
RfD = reference dose;
FCR = fish consumption rate (6.5 gm/person-day);
BCF = bioconcentration factor.
BCF values are based on U. S. Environmental Protection Agency publications pursuant to Section 304(a) of the Clean Water Act. FCR values are average consumption rates for a 70 Kg adult for a lifetime of the population; alternative FCR values may be used when it is considered necessary to protect localized populations which may be consuming fish at a higher rate.

ii. Water consumption and fish tissue consumption:

WQS = (RfD) x Body Weight/(WCR + (FCR x BCF))

where:
WQS = water quality;
RfD = reference dose;
FCR = fish consumption rate (6.5 gm/person-day);
BCF = bioconcentration factor;
WCR = water consumption rate (assumed to be 2 liters per day for adults).
The equations listed in this subparagraph will be used to develop water criteria or standards on a case-by-case basis for toxic substances that are not presently included in the water quality standards. Alternative FCR values may be used when it is considered necessary to protect localized populations that may be consuming fish at a higher rate.

f. For carcinogens, the concentrations of toxic substances will not result in unacceptable health risk and will be based on a Carcinogenic Potency Factor (CPF). An unacceptable health risk for cancer will be considered to be more than one additional case of cancer per one million people exposed (10 -6 risk level). The CPF is a measure of the cancer-causing potency of a substance estimated by the upper 95 percent confidence limit of the slope of a straight line calculated by the Linearized Multistage Model according to the U. S. Environmental Protection Agency Guidelines (FR 51(185): 33992-34003, and FR 45(231 Part V): 79318-79379). Water quality standards or criteria used to calculate water quality-based effluent limitations (and for all other purposes of water quality criteria under Section 303(c) of the Clean Water Act) to protect human health through the different exposure routes are determined as follows:

i. Fish tissue consumption:

WQS = (Risk) x Body Weight/(CPF x (FCR x BCF))

where:
WQS = water quality standard or criterion;
Risk = risk factor (10^{-6});
CPF = cancer potency factor;
FCR = fish consumption rate (6.5 gm/person-day);
BCF = bioconcentration factor.
BCF values are based on U. S. Environmental Protection Agency publications pursuant to Section 304(a) of the Clean Water Act. FCR values are average consumption rates for a 70 kg adult for a lifetime of the population; alternative FCR values may be used when it is considered necessary to protect localized populations which may be consuming fish at a higher rate.

ii. Water consumption (including a correction for fish consumption):

WQS = Risk x Body Weight/(CPF x (WCR + (FCR x BCF)))

where:
WQS = water quality standard or criterion;
Risk = risk factor (10^{-6});
CPF = cancer potency factor;
FCR = fish consumption rate (6.5 gm/person-day);
BCF = bioconcentration factor;
WCR = water consumption rate (assumed to be 2 liters per day for adults).
The equations listed in this subparagraph will be used to develop water criteria or standards on a case-by-case basis for toxic substances that are not presently included in the water quality standards. Alternative FCR values may be used when it is considered necessary to protect localized populations that may be consuming fish at a higher rate.

TABLE 1
Numeric Criteria for All Waters Units are micrograms per liter (µg/L)

Parameter	Fresh Water		Salt Water		Human Health	
	Acute	Chronic	Acute	Chronic	Organisms Only	Water & Organisms
Aldrin	3.0		1.3		0.00014	0.00013
Ammonia	g	g	g	g		
Arsenic (III), Total Dissolved	340f	150f	69	36		
Arsenic, Total Dissolved					24 i	0.078 i
Cadmium, Total Dissolved	1.74 b,f	0.62 b,f	43	9.3	168	5
Chlordane	2.4	0.0043	0.09	0.004	0.0022	0.0021
Chlorine	19	11	13	7.5		
Chromium (Hex), Total Dissolved	16 f	11 f	1100	50	1470	98
Chromium (III), Total Dissolved	323 b,f	42 b,f			140468	100
Copper, Total Dissolved	7.0 b,f	5.0 b,f	4.8	3.1	1000	1000
Cyanide	22.0h	5.2h	1.0h	1.0h	220000	200
4,4 DDT	1.1	0.001	0.13	0.001	0.00059	0.00059
Dieldrin	0.24	0.056	0.71	0.0019	0.000144	0.000135
2,3,7,8 TCDD					1.0 ppqd	1.0 ppqd
Endosulfan	0.22j	0.056 j	0.034 j	0.0087 j	240 k	110 k
Endrin	0.086	0.036	0.037	0.0023	0.814	0.76
Heptachlor	0.52	0.0038	0.053	0.0036	0.000214	0.000208
Hexachlorocyclohexane(Lindane)	0.95	0.08	0.16		0.0625	0.0186
Lead, Total Dissolved	30 b,f	1.18 b,f	210	8.1		15
Mercury (II), Total Dissolved	2.1f	0.012	1.8	0.025		
Mercury					0.153	0.151
Nickel, Total Dissolved	260 b,f	29 b,f	75	8.3	4584	607
			167 e	18.5 e		
Phenol	300	102	300	58	300	300
Pentachlorophenol	8.7 c	6.7 c	13 c	7.9 c	8.2	0.28
PCB 1242	0.2	0.014	1.0	0.03		

PCB 1254	0.2	0.014	1.0	0.03		
PCB 1221	0.2	0.014	1.0	0.03		
PCB 1232	0.2	0.014	1.0	0.03		
PCB 1248	0.2	0.014	1.0	0.03		
PCB 1260	0.2	0.014	1.0	0.03		
PCB 1016	0.2	0.014	1.0	0.03		
Total PCB					0.00035	0.00035
Selenium, Total Dissolved	11.8 [a,f]	4.6 [f]	290 [f]	71 [f]	3365	50
Silver, Total Dissolved	1.05 [b,f]		1.9			100
Toxaphene	0.73	0.0002	0.21	0.0002	0.00075	0.00073
Zinc, Total Dissolved	65 [b,f]	65 [b,f]	90	81	5000	5000

a = The CMC = 1/[(f1/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 F g/L and 12.83 F g/L. The value in the table is calculated assuming a worst case scenario in which all selenium is present as selenate.

b = Hardness dependent parameter. All criteria are as indicated at hardness of 50 mg/L as CaCO3 . If hardness exceeds 50 mg/L as CaCO 3 , then criteria is equal to result of hardness based equations as found in *Quality Criteria for Water*.

c = Criteria for pentachlorophenol are based on a pH dependent equation as found in *Quality Criteria for Water* . Values listed are for a pH of 7.0 s.u.

d = Criteria for 2,3,7,8 TCDD based on a risk factor of one in one hundred thousand (10^{-5}).

e = Site specific criteria for Mississippi Sound.

f = Parameter subject to water effects ratio equations where "CMC = WER * Acute" and "CCC = WER * Chronic".

g = Ammonia criteria are dependent on pH, temperature and/or salinity. See Section II.10.C.

h = Expressed as F g free cyanide (as CN)/L.

i = Refers to the inorganic form only.

j = Applies to the sum of a and b isomers.

k = Applies to individual isomers of Endosulfan including a, b , and Endosulfan Sulfate.

SECTION III. SPECIFIC WATER QUALITY CRITERIA:

1. <u>PUBLIC WATER SUPPLY</u>:

Water in this classification is for use as a source of raw water supply for drinking and food processing purposes. The water treatment process shall be approved by the Mississippi State Department of Health. The raw water supply shall be such that after the approved treatment process, it will satisfy the regulations established pursuant to Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act (Pub. L. 93-523). Waters that meet the Public Water Supply criteria shall also be suitable for secondary contact recreation. Secondary contact recreation is defined as incidental contact with the water during activities such as wading, fishing and boating, that are not likely to result in full body immersion. In considering the acceptability of a proposed site for disposal of bacterially-related wastewater in or near waters with this classification, the Permit Board shall consider the relative proximity of the discharge to water supply intakes.

A. Bacteria : For the months of May through October, when water contact recreation activities may be expected to occur, fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of five (5) samples taken over a 30-day period with no less than twelve (12) hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than ten percent (10%) of the time.

For the months of November through April, when incidental recreational contact is not likely, fecal coliform shall not exceed 2000/100 ml as a geometric mean (either MPN or MF count) based on at least five samples taken over a 30-day period with no less than twelve (12) hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000/100 ml more than ten percent (10%) of the time.

B. Chlorides (Cl) : There shall be no substances added which will cause the chloride content to exceed 230 mg/L in freshwater streams.

C. Specific Conductance : There shall be no substances added to increase the conductivity above 500 micromhos/cm for freshwater streams.

D. Dissolved Solids : There shall be no substances added to the waters that will cause the dissolved solids to exceed 500 mg/L for freshwater streams.

E. Threshold Odor : There shall be no substances added which will cause the threshold odor number to exceed 24 (at 60E C) as a daily average.

F. Radioactive Substances : There shall be no radioactive substances added to the waters which will cause the gross beta activity (in the known absence of Strontium-90 and alpha emitters) to exceed 1000 picocuries per liter at any time.

G. Specific Chemical Constituents : In addition to the provisions in Section II.4. and 10., the following concentrations (dissolved) shall not be exceeded at any time:

Constituent Concentration (mg/L)
Barium 2.0
Fluoride 2.0
Lead 0.015
Nitrate (as N) 10.0

2. SHELLFISH HARVESTING

Waters classified for this use are for propagation and harvesting shellfish for sale or use as a food product. These waters shall meet the requirements set forth in the latest edition of the National Shellfish Sanitation Program, Manual of Operations, Part I, Sanitation of Shellfish Growing Areas , as published by the U. S. Public Health Service. Waters that meet the Shellfish Harvesting Area Criteria shall also be suitable for recreational purposes. In considering the acceptability of a proposed site for disposal of bacterially-related wastewater in or near waters with this classification, the Permit Board shall consider the relative proximity of the discharge to shellfish harvesting beds.

A. Bacteria : The median fecal coliform MPN (Most Probable Number) of the water shall not exceed 14 per 100 ml, and not more than ten percent (10%) of the samples shall ordinarily exceed an MPN of 43 per 100 ml in those portions or areas most probably exposed to fecal contamination during most unfavorable hydrographic and pollutional conditions.

3. RECREATION:

Waters in this classification are to be suitable for recreational purposes, including such water contact activities as swimming and water skiing. In considering the acceptability of a proposed site for disposal of bacterially-related wastewater in or near waters with this classification, the Permit Board shall consider the relative proximity of the discharge to areas of actual water contact activity.

A. Bacteria : Fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of five (5) samples taken over a 30-day period with no less than twelve (12) hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than ten percent (10%) of the time.

B. Specific Conductance : There shall be no substances added to increase the conductivity above 1000 micromhos/cm for freshwater streams.

C. Dissolved Solids : There shall be no substances added to the water to cause the dissolved solids to exceed 750 mg/L as a monthly average value, nor exceed 1500 mg/L at any time for freshwater streams.

4. FISH AND WILDLIFE:

Waters in this classification are intended for fishing and for propagation of fish, aquatic life, and wildlife. Waters that meet the Fish and Wildlife Criteria shall also be suitable for secondary contact recreation. Secondary contact recreation is defined as incidental contact with the water during activities such as wading, fishing and boating, that are not likely to result in full body immersion.

A. Bacteria : For the months of May through October, when water contact recreation activities may be expected to occur, fecal coliform shall not exceed a geometric mean of 200 per 100 ml based on a minimum of five (5) samples taken over a 30-day period with no less than twelve (12) hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than ten percent (10%) of the time.

For the months of November through April, when incidental recreational contact is not likely, fecal coliform shall not exceed a geometric mean of 2000 per100 ml based on a minimum of five (5) samples taken over a 30-day period with no less than twelve (12) hours between individual samples, nor shall the samples examined during a 30-day period exceed 4000/100 ml more than ten percent (10%) of the time.

B. Specific Conductance : There shall be no substances added to increase the conductivity above 1000 micromhos/cm for freshwater streams.

C. Dissolved Solids : There shall be no substances added to the waters to cause the dissolved solids to exceed 750 mg/L as a monthly average value, nor exceed 1500 mg/L at any time for freshwater streams.

5. EPHEMERAL STREAM:

Waters in this classification do not support a fisheries resource and are not usable for human consumption or aquatic life. Ephemeral streams normally are natural watercourses, including natural watercourses that have been modified by channelization or manmade drainage ditches, that without the influent of point source discharges flow only in direct response to precipitation or irrigation return-water discharge in the immediate vicinity and whose channels are normally above the groundwater table. These streams may contain a transient population of aquatic life during the portion of the year when there is suitable habitat for fish survival. Normally, aquatic habitat in these streams is not adequate to support a reproductive cycle for fish and other aquatic life. Wetlands are excluded from this classification.
Waters in this classification shall be protective of wildlife and humans that may come in contact with the waters. Waters contained in ephemeral streams shall also allow maintenance of the standards applicable to all downstream waters.

A. Provisions 1,2,3 and 5 of Section II (Minimum Conditions Applicable to All Waters) are applicable except as they relate to fish and other aquatic life. All aspects of provisions 4 and 10 of Section II concerning toxicity will apply to ephemeral streams, except for domestic or compatible domestic wastewater discharges which will be required to meet toxicity requirements in downstream waters not classified as ephemeral. Alternative methods may be utilized to determine the potential toxic effect of ammonia. Acutely toxic conditions are prohibited under any circumstances in waters in this classification.

B. Dissolved Oxygen : The dissolved oxygen shall be maintained at an appropriate level to avoid nuisance conditions.

C. Bacteria : The Permit Board may assign bacterial criteria where the probability of a public health hazard or other circumstances so warrant.

D. Definitions:

1. Fisheries resources is defined as any waterbody which has a viable gamefish population as documented by the Mississippi Department of Wildlife Conservation or has sufficient flow or physical characteristics to support the fishing use during times other than periods of flow after precipitation events or irrigation return water discharge.

2. "Not usable for human consumption or aquatic life" means that sufficient flow or physical characteristics are not available to support these uses.

3. "Flow only in response to precipitation or irrigation return water" means that without the influence of point source discharges the stream will be dry unless there has been recent rainfall or a discharge of irrigation return water.

4. "Protective of wildlife and humans that may come in contact with the waters" means that toxic pollutants shall not be discharged in concentrations that will endanger wildlife or humans.

5. "Nuisance conditions" means objectionable odors or aesthetic conditions that may generate complaints from the public.

Recommendations for assignment of the Ephemeral Stream classification shall be made to the Commission on Environmental Quality by the Permit Board after appropriate demonstration of physical and hydrological data. The Ephemeral Stream classification shall not be assigned where environmental circumstances are such that a nuisance or hazardous condition would result or public health is likely to be threatened. Alternate discharge points shall be investigated before the Ephemeral Stream classification is considered.

SECTION IV. DESIGNATED USES IN STATE WATERS:

All of the State waters not specifically listed below shall be classified as Fish and Wildlife. State waters carrying other classifications are:

COASTAL BASIN

click here to view map

Waters	From	To	Classification
Back Bay of Biloxi	Popps Ferry Bridge	Biloxi Bay	Recreation
Bangs Lake	Headwaters	Miss. Sound	Shellfish Harvesting
Bayou Cumbest	Headwaters	Miss. Sound	Shellfish Harvesting
Big Lake	Bernard Bayou	Popps Ferry Bridge	Recreation
Biloxi Bay	Headwaters U.S. Hwy 90 Bridge	Miss. Sound	Shellfish Harvesting
Davis Bayou	Headwaters	Biloxi Bay	Shellfish Harvesting
Graveline Bay	Headwaters	Graveline Bayou	Shellfish Harvesting
Graveline Bayou	Graveline Bay	Miss. Sound	Shellfish Harvesting
Jourdan River	Confluence of Bacon Bayou and Catahoula Creek	St. Louis Bay	Recreation
Mallini Bayou	St. Louis Bay	St. Louis Bay	Shellfish Harvesting
Miss. Sound	Contiguous	Miss. Coastline	Recreation
Old Fort Bayou	Bayou Talla	Biloxi Bay	Recreation
Pass Christian Reef-off Henderson Point	Miss. Sound		Shellfish Harvesting
St. Louis Bay	Harrison-Hancock Counties		Shellfish Harvesting
Tchoutacabouffa River	Headwaters	Back Bay of Biloxi	Recreation
Tuxachanie Creek	Headwaters	Tchoutacabouffa River	Recreation
Wolf River	Ms. Hwy. 26	St. Louis Bay	Recreation

BIG BLACK RIVER BASIN

click here to view map

All waters in the Big Black Basin are classified Fish and Wildlife.

NORTH INDEPENDENT STREAMS BASIN

click here to view map

Waters	From	To	Classification
Bowden Sand Ditch (East Lagoon)	Ashland	Tubby Creek	Ephemeral
Drennan Sand Ditch (NW Lagoon)	Ashland	Robinson Bottom	Ephemeral
Horn Lake	DeSoto County		Recreation
Tubby Creek	Mile 5.2	Mile 2.8	Ephemeral

PASCAGOULA RIVER BASIN

click here to view map

Waters	From	To	Classification
Archusa Reservoir	Clarke County		Recreation
Beaverdam Creek	Headwaters Perry-Forrest Counties	Black Creek	Recreation
Black Creek	Highway 11	Pascagoula River	Recreation
Bonita Reservoir	Lauderdale County		Public Water Supply
Bowie Creek	Ms. Hwy. 589	Bowie River	Recreation
Bowie River	Bowie Creek	Interstate 59	Recreation
Chickasawhay River	Stonewall Ms.	Hwy. 84	Recreation
Chunky River	U.S. Hwy. 80	Chickasawhay River	Recreation
Clarke State Park	Clarke County		Recreation
Dry Creek Lake Site #3	W/S SCS	Covington County	Recreation
Escatawpa River	Mile 10	Pascagoula River	Fish and Wildlife1
Flint Creek Reservoir	Stone County		Public Water Supply & Recreation
Lake Bogue Homa	Jones County		Recreation
Lake Claude Bennett	Jasper County		Recreation
Lake Geiger	Forrest County		Recreation
Lake Marathon	Smith County		Recreation
Lake Mike Conner	Covington County		Recreation
Lake Perry	Perry County		Recreation
Lake Ross Barnett	Smith County		Recreation
Lake Shongela	Smith County		Recreation
Lakeland Park Lake	Wayne County		Recreation
Long Creek Reservoir	Lauderdale County		Public Water Supply
Okatibbee Reservoir	Lauderdale County		Public Water Supply & Recreation
Okatoma Creek	Seminary (MS Hwy 590)	Bowie River	Recreation
Pascagoula River	6 Mi. North of MS Hwy 26 George County	Smear Bayou Jackson County	Recreation
Red Creek	U.S. Hwy. 49	Big Black Creek	Recreation
Tallahala Creek	1 Mi. N. of Hwy.15	Tallahoma Creek	Fish and Wildlife2
Turkey Fork Reservoir	Greene County		Recreation

1 The following dissolved oxygen standard is applicable: The dissolved oxygen shall not be less than 3.0 mg/L.

2 The following dissolved oxygen standard is applicable: The dissolved oxygen shall not be less than 3.5 mg/L at flows greater than or equal to the 7-day, 10-year low flow.

3 Remains under EPA review as of June 27, 2003.

PEARL RIVER BASIN

click here to view map

Waters	From	To	Classification
Barnett Reservoir	River Bend	Township Line between T7N & T8N	Public Water Supply
Barnett Reservoir	Township Line between T7N & T8N	Reservoir Dam	Public Water Supply & Recreation
Bogue Chitto River	Ms. Hwy. 570	MS/LA State Line	Recreation
Lake Columbia	Marion County		Recreation
Lake Dixie Springs	Pike County		Recreation

Magees Creek	U.S. Hwy. 98	Bogue Chitto River	Recreation
Pearl River	Barnett Reservoir	City of Jackson Water Intake	Public Water Supply
Pearl River	Byram Bridge	Miss. Sound	Recreation
Strong River	U.S. Hwy. 49	Pearl River	Recreation
Shadow Lake	Roosevelt State Park Scott County		Recreation
Simpson County Legion Lake	Simpson County		Recreation
Warrior Branch	Lake	Warrior Creek	Ephemeral

SOUTH INDEPENDENT STREAMS BASIN

click here to view map

Waters	From	To	Classification
Bayou Pierre	Headwaters	Mississippi River	Recreation
Clear Springs Lake	Franklin County		Recreation
East Fork Amite River	MS Hwy 584	MS/LA State Line	Recreation
Homochitto River	U.S. Hwy 84	U.S. Hwy 98	Recreation
Little Bayou Pierre	Headwaters	Bayou Pierre	Recreation
Percy Quinn State Park Lake	Pike County		Recreation
Unnamed Drainage Ditch (Westside Heights)	Woodville	Bayou Sara	
West Fork Amite River	MS Hwy 24	MS/LA State Line	Recreation

TENNESSEE RIVER BASIN

click here to view map

Waters	From	To	Classification
Tennessee River	MS – AL State Line	MS – TN State Line	Public Water Supply

TOMBIGBEE RIVER BASIN

click here to view map

Waters	From	To	Classification
Aberdeen Lake Tenn-Tom Waterway	Mile 355.5 Normal Pool Elev. 190.0	Mile 364.3	Recreation
Bay Springs Lake Tenn-Tom Waterway	Mile 410.0 Normal Pool Elev. 414.0	Mile 419.0	Recreation
Canal Section Pool "C" Tenn-Tom Waterway	Mile 389.0 Normal Pool Elev. 270.0	Mile 396.4	Recreation
Chiwapa Reservoir	Pontotoc County		Recreation
Choctaw Lake	Choctaw County		Recreation
Columbus Lake Tenn-Tom Waterway	Mile 332.9 Normal Pool Elev. 163.0	Mile 355.5	Recreation
Davis Lake	Chickasaw County		Recreation
Lake Lamar	Bruce Lee County		Recreation
Lake Lowndes	Lowndes County		Recreation
Lake Monroe	Monroe County		Recreation
Lake Tom Bailey	Lauderdale County		Recreation
Luxapalila Creek	MS – AL State Line	Highway 50	Public Water Supply
Oktibbeha County Lake	Oktibbeha County		Recreation
Tombigbee State Park Reservoir	Lee County		Recreation
Yellow Creek	MS – AL State Line	Luxapalila Creek	Public Water Supply

YAZOO RIVER BASIN

click here to view map

Waters	From	To	Classification

Arkabutla Reservoir	DeSoto-Tate Counties		Recreation
Canal #12	Delta City	Big Sunflower River	Ephemeral
Chewalla Reservoir	Marshall County		Recreation
Drainage Ditch #3	Rosedale	Lane Bayou	Ephemeral
Enid Reservoir	Panola-Lafayette-Yalobusha Counties		Recreation
Grenada Reservoir	Grenada County		Recreation
Lake Dumas	Tippah County		Recreation
Lake Washington	Washington County		Recreation
Little Tallahatchie River	Sardis Reservoir	U.S. Hwy. 51	Recreation
Moon Lake	Coahoma County		Recreation
Nunnally Creek	Holly Springs	Pigeon Roost Creek	Ephemeral
Sardis Reservoir	Panola-Lafayette Counties		Recreation
Straight Bayou Drainage Main Ditch "A"	Louise	Dowling Bayou	Ephemeral
Tillatoba Lake	Yalobusha County		Recreation
Unnamed Drainage Canal	Anguilla	Big Sunflower River	Ephemeral
Unnamed Drainage Canal	Town of Arcola	Black Bayou	Ephemeral
Unnamed Drainage Canal	Town of Beulah	Leban Bayou	Ephemeral
Unnamed Drainage Canal	Bobo	Annis Brake	Ephemeral
Unnamed Drainage Canal	Crenshaw	David Bayou	Ephemeral
Unnamed Drainage Canal	Farm Fresh Catfish	Black Bayou	Ephemeral
Unnamed Drainage Canal	Farrell	Overcup Slough	Ephemeral
Unnamed Drainage Canal	Holly Springs (Lagoon A)	Nunnally Creek	Ephemeral
Unnamed Drainage Canal	Holly Springs (Lagoon #1)	Nunnally Creek	Ephemeral
Unnamed Drainage Canal	Holly Springs (Lagoon #3)	Big Spring Creek	Ephemeral
Unnamed Drainage Canal	Lambert	Muddy Bayou	Ephemeral
Unnamed Drainage Canal	Leland	Black Bayou	Ephemeral
Unnamed Drainage Canal	Lurand	Big Sunflower River	Ephemeral
Unnamed Drainage Canal	Rolling Fork (East Lagoon)	Little Sunflower River	Ephemeral
Unnamed Drainage Canal	Rolling Fork (West Lagoon)	Indian Bayou	Ephemeral
Unnamed Drainage Canal	Ruleville	Quiver River	Ephemeral
Unnamed Drainage Canal	Shaw	Porter Bayou	Ephemeral
Unnamed Drainage Canal	Shelby	Mound Bayou	Ephemeral
Unnamed Drainage Canal	Simmons Farm Raised Catfish (Yazoo County)	Lake George	Ephemeral
Unnamed Drainage Canal	Sledge	David Bayou	Ephemeral
Unnamed Drainage Canal	Town of Tunica	Whiteoak Bayou	Ephemeral
Unnamed Drainage Canal	Winstonville	Mound Bayou	Ephemeral
Wall Doxey State Park Reservoir (Spring Lake)	Marshall County	Marshall County	Recreation

Appendix E
Stormwater Drainage System Specifications

(Note: Specifications will be developed as part of the final bid request)

Appendix F
Contractor Bid Sheet

BID SHEET FOR DECONTAMINATION/DECOMMISSIONING

FACILITY: **MSAAP Wastewater Treatment Plant** **Stennis Space Center, Mississippi**

ITEM	DESCRIPTION	UNIT PRICE	QUANTITY	TOTALS
1.	Mobilization & Demobilization	$________	1 Lump Sum	$________
2.	Decontaminate and Decommission 49 Tanks	$________	1 Lump Sum	$________
3.	Decontaminate and Remove Piping	$________/LF	x 24,500 LF	$________
4.	Decontaminate and Decommission Five (5) Buildings	$________/Bldg	x 5 Each	$________
5.	Treat and Discharge Decontamination/Rain Water	$________/Gal.	x 600,000 Gal.	$________
6.	Transport and Dispose of Pipe	$________/LF	x 24,500 LF	$________
7.	Transport and Dispose of Sludge and Sediment	$________/CY	x _____ CY	$________
8.	Transport and Dispose of Trash and Debris	$________/CY	x 60 CY	$________
9.	Decontaminate Containment Areas, Ditches, Sumps	$________/Area	x 3 Each	$________
10.	Construct Post-closure Stormwater Drainage System (See Appendix E for Specifications)	$________	1 Lump Sum	$________

Taxes, if applicable $________

TOTAL ESTIMATED COST $________

ESTIMATED TIME TO COMPLETE: ____ Wks

Contingency: Unforeseeable Weather Delays $_______/Week (Change Order)

Authorized Signature: ________________________ Title: ______________

Company: ________________________ Date: ______________

Street Address: ________________________

City / State / Zip Code: ________________________

Mailing Address: ________________________

City / State / Zip Code: ________________________

Appendices redacted.

The ECP was completed by an environmental professional as defined by USEPA's All Appropriate Inquiry (AAI) final ruling (40 CFR Part 312). The AAI final ruling defines an environmental professional as an individual who has the following qualifications:

- Current Professional Engineer's or Professional Geologist's license or registration from a state, tribe, or U.S. territory and have the equivalent of three (3) years of full-time relevant experience; or
- Licensed or certified by the federal government, a state, tribe, or U.S. territory to perform environmental inquiries as defined in 40 CFR 312.21 and have the equivalent of three (3) years of full-time relevant experience; or
- A Baccalaureate or higher degree from an accredited institution of higher education in science or engineering and the equivalent of five (5) years of full-time relevant experience; or
- Has the equivalent of ten (10) years of full-time relevant experience.

The final AAI rule defines "relevant experience" as participation in the performance of environmental site assessments that may include environmental analyses, investigations, and remediation which involve the understanding of surface and subsurface environmental conditions and the processes used to evaluate these conditions and for which professional judgment was used to develop opinions regarding conditions indicative of releases or threatened releases to the subject property. Environmental professional qualifications for MSAAP are presented in **Table J-1**.

TABLE J-1
ENVIRONMENTAL PROFESSIONAL QUALIFICATIONS

Name	Role	Certifications	Education	Years Experience
Steve Cox	Program Manager	Certified Hazardous Materials Manager (CHMM)	BA Chemistry BA Biology	25
Craig Johnson	Project Manager	CHMM OSHA 40 Hr	BS Chemistry	14
Jeff Zaleski	Task Manager and Visual Site Inspection Team Leader	Environmental Compliance Assessment System Training, First Aid/CPR	BS Public Relations, Journalism	16
Sue Volkmer	Visual Site Inspection Team Member	OSHA 40 Hour AHERA Asbestos Training USEPA LBP Training	BS Animal Science DVM	14
Kimberly High	Visual Site Inspection Team Member	OSHA 40 Hour OSHA 8 Hour Site Supervisor LPS Training	BS Geology	5
David Berger	Visual Site Inspection Team Member	Cert. Groundwater Professional OSHA 40 Hour OSHA 8 Hour Site Supervisor AHERA Asbestos Training USEPA LBP Training	BS Geology	9