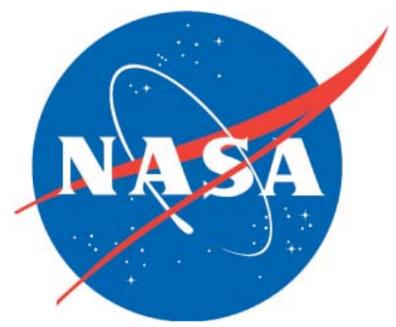
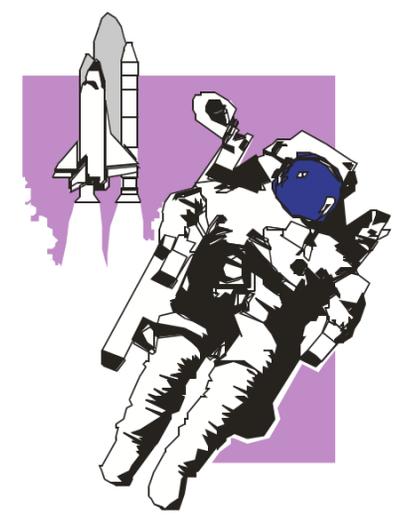


FINAL Appendix A to the FFA Site Management Plan, FY 2012

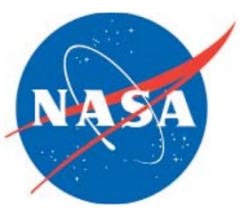


**National Aeronautics and Space Administration
George C. Marshall Space Flight Center**

**Huntsville, Alabama
EPA ID# 1800013863**

May 2012

**FINAL
Appendix A to the FFA
Site Management Plan, FY 2012**



**National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama
EPA ID # 1800013863**

May 2012

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Final

Appendix A to the FFA

Site Management Plan, FY 2012

Prepared for

National Aeronautics and Space Administration

George C. Marshall Space Flight Center

Huntsville, Alabama
EPA ID# AL 1800013863

May 2012

Professional Engineer's Certification

I certify that this document was prepared by me or under my direct control and personal supervision, based on knowledge and information in general accordance with commonly accepted standards of practice. This certification is not a guaranty or warranty, either expressed or implied.

Jason Glasgow

23648

Jason K. Glasgow, P.E.

AL Registration Number

Jason Glasgow
4/3/12

Date

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Acronyms and Abbreviations

ADEM	Alabama Department of Environmental Management
APM	Alternate project manager
ARBCA	Alabama risk-based corrective action
AST	Aboveground storage tank
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylene
CCED	Clean Closure Equivalency Demonstration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of concern
CRP	Community Relations Plan
CTC	Carbon tetrachloride
°F	Degrees Fahrenheit
DA	U.S. Department of Army
DCE	Dichloroethene
DI	Deionized water
EEOH	Environmental Engineering and Occupational Health Office
EPA	U.S. Environmental Protection Agency
FFA	Federal Facilities Agreement
FFS	Focused Feasibility Study
FR	<i>Federal Register</i>
FS	Feasibility study
ft	Feet
FY	Fiscal year
HSB	Huntsville Spring Branch
IROD	Interim Record of Decision
IWTB	Industrial waste treatment basin
IWTF	Industrial waste treatment facility
LWD	Liquid waste disposal
LN ₂	Liquid nitrogen
LOX	Liquid oxygen
LSA	Limited site assessment
LUC	Land use control
µg/L	Micrograms per liter
mgd	Million gallons per day
MOA	Memorandum of Agreement
MSFC	Marshall Space Flight Center
NaOH	Sodium hydroxide
NASA	National Aeronautics and Space Administration
NFA	No further action
NFI	No further investigation
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
OU	Operable unit
OWS	Oil/water separator
PAH	Polynuclear aromatic hydrocarbon
PCA	Perchloroethane
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene (perchloroethene)

PM	Project manager
PP	Proposed plan
psi	Pound per square inch
PVC	Polyvinyl chloride
PVR	Performance verification report
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
ROD	Record of Decision
RP	Rocket propellant
RSA	Redstone Arsenal
SA	Source area
SE	Southeast
SMP	Site Management Plan
TBD	To be determined
TCE	Trichloroethene
TCLME	Trichloromethane
TCRA	Time-critical removal action
torr	1 millimeter mercury
UST	Underground storage tank
VC	Vinyl chloride
VOC	Volatile organic compound
VSI	Visual site inspection
WNWR	Wheeler National Wildlife Refuge

SECTION 1

Introduction

This section describes the regulatory background and purpose of this *Site Management Plan* (SMP) and a brief account of the site history and regulatory background of the National Aeronautics and Space Administration's (NASA's) Marshall Space Flight Center (MSFC). This SMP was developed per the guidelines established in the Federal Facilities Agreement (FFA), primarily Section 21. This document is the thirteenth SMP update since publication of the original plan in September 1994.

1.1 Purpose

The purpose of this SMP is to outline NASA's strategy for achieving the objectives of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation and remediation program and to establish a timeline for each operable unit (OU) for achieving these objectives. The immediate goal of this strategy is to protect public health and the environment; the end goal is to clean up and close out sites under NASA's responsibility in as cost-effective and timely a manner as possible. This program evaluates the potential for past releases of hazardous wastes and constituents to the environment from potential sites of contamination at this facility and implements remedial actions when necessary. The intent of the SMP is to provide the following:

- A list and summary of OUs
- Prioritization and rationale for the OUs
- A list of sites with status changes
- A list of guidance documents that will be used to develop and review CERCLA documents
- Activities and schedules for work planned through the Record of Decision (ROD), including the submittal schedule for program documents
- Activities and schedules for post-ROD activities at the appropriate OUs

Subsequent updates to this SMP will be submitted periodically, if needed, under separate cover. However, the schedules provided in the current SMP (Fiscal Year [FY] 2012) will remain in effect until the SMP is updated. The SMP's next draft annual update is scheduled to be submitted to the Agencies by October 2012. Schedules are provided in [Section 3](#) of this updated SMP and will be in effect once a three-party agreement on the schedules is obtained among the U.S. Environmental Protection Agency (EPA), the Alabama Department of Environmental Management (ADEM), and NASA.

1.2 Facility Background

1.2.1 Site History

MSFC is located within Redstone Arsenal (RSA) on a site previously occupied by the U.S. Department of Army (DA). The RSA area, which shares a common boundary with MSFC, originally was established to produce conventional and chemical munitions for use during World War II. From 1942 to 1945, DA operations were used to manufacture raw materials for toxic agents and incendiary materials, and to assemble, store, and ship the final products. Onsite waste disposal activities included the disposal of construction debris, drums, and chemical munitions, and open burning of combustible materials. After the war, RSA became a center for the receipt, storage, and demilitarization of Allied and German chemical agents.

In 1949, RSA's mission changed to research and development of rocketry and guided missile systems. In 1960, civilian rocketry and missile activities were transferred to NASA's MSFC. Since then, the area known as MSFC has been used to develop, test, and manufacture space vehicles and components.

The DA granted irrevocable use and occupancy of the lands and facilities known as MSFC to NASA for a term of 99 years beginning on July 1, 1960, and ending on June 30, 2059. The DA granted NASA full control and responsibility for MSFC land and facilities; however, the DA retained access rights to all major utility lines, railroad tracks, and main roads for the purposes of operating, maintaining, modifying, and extending the utilities, railroad tracks, and roads.

MSFC is NASA's principal propulsion development center. NASA uses a state of the art propulsion laboratory for developing and testing the newest propulsion system innovations at MSFC. Its scientists, engineers, and support personnel also play a major role in managing experiments conducted on the International Space Station, the Space Launch System, and the microgravity laboratory. In addition, operations conducted at MSFC will be a significant contributor to several of NASA's future programs, as well as research on a variety of space science applications.

1.2.2 Regulatory History

NASA is a large-quantity generator of hazardous wastes for temporary storage at MSFC in accordance with the Resource Conservation and Recovery Act (RCRA). NASA submitted a post-closure permit under RCRA for three former surface impoundments at MSFC associated with the past treatment of metal plating wastes. This application has been deferred in accordance with the FFA. NASA's EPA identification number for generating hazardous waste at MSFC is AL 1800013863.

NASA submitted a Part B RCRA permit application for post-closure operations at the former Industrial Waste Treatment Facility (IWTF) to EPA and ADEM on August 1, 1991. NASA was awaiting permit application approval and subsequent issuance of the permit and its associated Hazardous and Solid Waste Amendments RCRA Facility Investigation (RFI) requirements when NASA was notified of its incorporation onto the National Priorities List (NPL) under the CERCLA program.

EPA added RSA (U.S. DA/NASA) to the NPL by publication in the *Federal Register* (FR), 59 FR 27989, on May 31, 1994. MSFC is included in the area of RSA listed on the NPL. ADEM deferred the permit (in accordance with the FFA) pending the successful completion of actions at the former IWTF under CERCLA. ADEM also has requested that a Clean Closure Equivalency Demonstration (CCED) be submitted under CERCLA for OU-9. NASA elected to submit the CCED as a secondary CERCLA document for the three OU-9 sites for which permitting under RCRA was submitted. ADEM has reviewed the CCED and provided NASA with comments. NASA has collected additional characterization samples at OU-9 to address comments received by EPA and ADEM, and has provided the data to the agencies. NASA will update the CCED with the additional characterization data, per the OU-9 schedule in [Section 3](#).

1.2.3 History of the Site Listings

In 1985, NASA undertook initial environmental compliance audits of MSFC facilities in response to CERCLA legislation. The initial audit (conducted by Deleuw, Cather, and Company) identified five potential CERCLA sites at MSFC. A second audit identified 30 sites of possible environmental significance (Harmon Engineering Associates, Inc., 1988). A preliminary assessment/site investigation of the 30 candidate CERCLA sites (including sample collection at 19 of the sites) was reported in February 1989 (Harmon Engineering Associates, Inc., 1989).

In June 1989, EPA performed a visual site inspection (VSI), which formed the basis of a RCRA Facility Assessment (RFA) for MSFC (EPA/A. T. Kearney, July 1989). This assessment used the results of NASA's PA and identified 77 sites of possible environmental significance.

The DA performed an RFA to evaluate the sites of potential environmental significance located on RSA property (Geraghty and Miller, Inc., February 1991). This RFA identified 11 additional MSFC sites requiring investigation. NASA identified 7 more sites requiring further investigation, bringing the total number of sites to be addressed at MSFC to 95. EPA removed 15 sites from consideration, because they were believed to have had no effect on the environment. A Memorandum of Agreement (MOA) between NASA and the DA transferred 13 of these sites to the responsibility of the DA. The total number of sites to be addressed by NASA was then 67. One additional site (RSA-141) is within MSFC's boundaries. This site is the responsibility of the DA and was not included in the original 95 sites. This site is listed in the FFA Appendix B as a DA-responsible site.

During 1996, MSFC-080 was removed from the list of sites because adjacent underground storage tanks (USTs) were removed as part of the ADEM UST program. This UST removal is documented in the ADEM *UST Closure Site Assessment Report*, ADEM Tank I.D. No. 23347 (Technical Micronics Control, July 1996). Therefore, MSFC-080 was not investigated during the Remedial Investigation (RI) field activities.

As a result of confirmation sampling, NASA submitted an *Expanded Site Inspection Report at MSFC OU-10 Final* (June 1998) and created OU-10, which included 22 sites that NASA recommended be considered for no further action (NFA). However, after further review of these 22 sites, NASA has acquired additional information about the operations conducted at the sites and has deleted OU-10 from the program and placed the sites in other OUs on the basis of geographical location.

In May 2000, NASA requested that 2 sites that previously had been transferred to the DA be returned to MSFC. The addition of these 2 sites brought the total number sites to be addressed by NASA to 69.

In 2002, MSFC-086 was transferred to the ADEM Storage Tank program. In mid-2003, NASA requested from the DA that the responsibility for another site, MSFC-D, be transferred to NASA. MSFC-D is included in the OU-12 discussions in this SMP. Also during this timeframe, EPA and ADEM concurred with NASA's suggestion to add five new sites to the CERCLA program. These sites make up the surface locations where activities and releases contributed to the groundwater contamination (OU-3). With these 6 sites added in 2003, the total number of sites to be addressed by NASA was 74.

Also, in 2004, an evaluation of the industrial sewer (OU-2, MSFC-052) data and historical activities led to a breakout of the MSFC-052 site and some associated OU re-assignments. The portion of MSFC-052 located in OU-12 has been designated as MSFC-052a and is included in OU-12. The section of the industrial sewer east of the MSFC boundary has been designated as MSFC-052e and will be addressed by the DA. MSFC-052b is the section of the industrial sewer associated with DA-responsible site MSFC-034. MSFC-052c is the section of the industrial sewer associated with site MSFC-094. MSFC-052d is the section of the industrial sewer associated with an area of groundwater upwelling; the remediation activities (plugging or removal) will be addressed as part of OU-2 and the groundwater addressed as part of OU-3. With the two new sewer areas (excluding the portion that is on the DA property and the portion of MSFC-034), there were 76 sites in NASA's program.

During 2007, two CERCLA sites (MSFC-057 and MSFC-C) were transferred to the ADEM UST program. MSFC-057 and MSFC-C are located at the MSFC gas station located at the intersection of Martin and Saturn Roads. MSFC-057 is the loading area for tanker trucks to park and fill the gasoline tanks and MSFC-C is the containment area for Aboveground Storage Tank (AST) 4636. These sites were transferred based on the CERCLA petroleum exclusion (Section 101 [14]). The number of CERCLA sites currently in the program is 74.

1.2.4 Changes to the Operable Unit Designations

The investigation of the CERCLA-governed sites appropriately grouped into OUs has proceeded under the CERCLA process (RI, feasibility study [FS], proposed plan [PP], ROD, remedial design, and remedial action) since 1994.

Under the initial OU designations, the groundwater investigation was split into three OUs (OUs-3, 4, and 1) based on the geographic areas of the site and anticipated groundwater flow directions. The OUs were identified as OU-3: Northwest Area Groundwater, OU-4: Northeast Area Groundwater, and OU-1: East and West Test Areas (which included surface media, along with groundwater). During the development of the surface media RI report, it was decided to separate the groundwater beneath OU-1 into another OU, OU-11. Subsequently, during the development of the draft groundwater RI report in 1999, the decision was made to combine the groundwater into one OU. This decision was documented in a letter sent to the regulatory agencies in late 1999. The groundwater investigation for the entire site is now being covered under OU-3: Groundwater.

The surface media investigations (soil, surface water, and sediment) previously were split into 10 OUs (OUs-1, 2, 5, 6, 7, 8, 9, 10, 12, and 13) based on either the geographic areas of the sites or the common activities associated with a group of sites (such as tanks and waste accumulation areas). During NASA's recent historical searches, it became evident that for many of the sites, it would be best to re-group them by geographic areas. Portions of OU-2 have

been re-grouped in OUs-3, 5, and 12 and DA-responsible OUs. The sites in OUs-7 and 10 were placed in either OU-8 (Petroleum Sites) or in one of the geographic-based OUs-1, 5, 6, or 13.

1.3 Management Approach

This subsection describes the program goals established by NASA and the management structure responsible for implementing these goals. Also included is a general discussion of the work breakdown and routine reporting that will occur during program implementation.

1.3.1 Goals and Objectives

The goals for this program will be used as a benchmark to judge the overall success of the CERCLA program at MSFC and to guide the decision-making process. The goals are as follows:

- Investigate and eliminate or mitigate risks to human health and the environment
- Satisfy the public
- Use public funds responsibly
- Meet regulatory requirements
- Minimize adverse effects on NASA's mission

1.3.2 Management Structure

NASA has appointed a project manager (PM) and an alternate project manager (APM) for this CERCLA program. These individuals are as follows:

PM

Mr. Brian Roberson

AS10/Environmental Engineering and Occupational Health Office (EEOH)

APM

Mr. Edward H. Kiessling

Manager, AS10/EEOH

The PM and APM will be responsible on a daily basis for overseeing the proper implementation of work, including communications, progress updates, reports, comments, and other correspondence concerning the CERCLA activities. Correspondence will be conducted between the NASA PM and APM and their counterparts at EPA and ADEM. The EPA PM for this CERCLA program is:

PM

Ms. Leigh Lattimore

EPA Region 4 Federal Facilities Branch

The ADEM PM for this CERCLA program is:

PM

Ms. Sarah Gill

ADEM Land Division

A Community Involvement Program was developed and will continue to be implemented throughout the duration of the CERCLA program. The objective of this program is to communicate actions and issues involving CERCLA activities at MSFC to employees and community members, who will be encouraged to comment and provide input to decisions. A *Community Relations Plan* (CRP) (NASA, December 1995; updated January 2004) serves as a work plan for NASA's Community Involvement Program. Activities identified in detail in the CRP, and that might be undertaken during the course of the CERCLA program, include the following:

- Establishing information repositories and administrative records
- Producing periodic newsletters and public notices
- Conducting public information sessions (as requested by the public)

- Holding employee briefings (as needed)
- Providing public tours (as needed)

NASA has established five repositories to make documents and document lists available so that the public can become educated about the CERCLA program at MSFC. The repositories are in locations that provide NASA employees, DA employees, and the surrounding communities of Triana, Madison, and Huntsville with easy access to the documents. [Table 1-1](#) lists the repositories.

NASA's Community Involvement Program is conducted in accordance with the requirements identified in EPA's publication, *Community Relations in Superfund: A Handbook*, (EPA, 1992) and other appropriate guidance. The program is consistent with the letter and spirit of Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations."

1.3.3 Work Breakdown and Reporting

The work for the program has been delineated in accordance with EPA guidance and the FFA. The EPA guidance documents, as well as other relevant guidelines including ADEM requirements, that the parties anticipate will be used to evaluate the submissions under the FFA are listed in [Appendix A](#). Progress reports will be prepared and submitted, at a minimum, on a quarterly basis. However, NASA will continue to prepare progress reports on a monthly basis. These progress reports will describe the work completed during the month in implementing the terms of this SMP. The progress reports also will identify and briefly describe the activities scheduled to be performed during the upcoming month.

The SMP will be updated periodically as needed, but no less frequently than annually. The updates will reflect revisions to the status of sites, OU groupings, and schedules that are agreed upon by all of the parties to the FFA.

TABLE 1-1
Information Repository Locations
NASA MSFC Site Management Plan

NASA Government and Community Relations Office

MSFC/Building 4200 First Floor

MSFC, AL 35812

Contact: Ms. Tina M. Palacios
(256) 544-5866

Hours: M-F: 8:00 a.m. – 4:30 p.m.

Redstone Scientific Information Center

Rocketry Room 113

Building 4484

Redstone Arsenal, AL 35989

Contact: Ms. Gloria Miller
(256) 842-8434

Hours: M - Th: 7:00 a.m. – 5:00 p.m.
F: 7:00 a.m. – 4:00 p.m.

Huntsville/Madison County Public Library

Reference Department

915 Monroe Street

Huntsville, AL 35801

Contact: Ms. Mary Moore
(256) 532-5969

Hours: M-Th: 9:00 a.m. – 9:00 p.m.
F-Sat: 9:00 a.m. – 5:00 p.m.
Sun: 1:00 p.m. – 5:00 p.m.

Triana Public Library

280 Zierdt Road

Triana, AL 35758

Contact: Ms. Blanch Orr
(256) 772-3677

Hours: M- W: 2:00-7:00pm
T-Th 3:00 – 8:30 p.m.
Friday: 2:00 – 5:00 p.m.
Saturday: Closed
Sunday: Closed

Madison Branch Huntsville/Madison County Library *

130 Plaza Blvd.

Madison, AL 35758

Contact: Ms. Sarah Sledge
(256) 461-0046

Hours: M – Th: 9:00 a.m. – 8:00 p.m.
F, Sat: 9:00 a.m. – 5:00 p.m.
Sunday: 1:00 p.m. – 5:00 p.m.

Note:

* This repository contains only a list of the documents that can be reviewed at the other repositories.

SECTION 2

Operable Units

This section provides a description of each OU, the locations of the sites within each OU, and the status of the CERCLA process for each OU (including actions taken and documents submitted). The prioritization of the OUs also is presented at the end of this section. [Section 4](#) lists the sites within an OU that have a CERCLA status change.

2.1 Overview of the Operable Units

[Section 1](#) describes the OUs defined by NASA under the CERCLA program. The groundwater OUs-4 and 11 were combined into OU-3: Groundwater. The sites in OUs-7 and 10 were reorganized into either OU-8 or one of the geographically based OUs-1, 5, 12, or 13. Some portions of OU-2 were reorganized into OUs-3, 5, 12, and 13 and the DA-responsible OUs. [Table 2-1](#) lists the sites requiring investigation within the OUs and the DA-responsible sites, [Table 2-2](#) lists the sites that were transferred to another OU, and [Figure 2-1](#) shows the locations of the sites currently being investigated. The OUs are as follows:

- OU-1: East and West Test Areas
- OU-2: Industrial Sewer System
- OU-3: Groundwater (formerly Northwest Area Groundwater)
- OU-4: Deleted; combined with OU-3 (formerly Northeast Area Groundwater)
- OU-5: Building 4760 Area Activities
- OU-6: Northeast Areas
- OU-7: Deleted; combined with OUs-1, 5, 6, or 13
- OU-8: Petroleum Sites
- OU-9: Former IWTF
- OU-10: Deleted; combined with OUs-1, 5, 6, or 13
- OU-11: Deleted; combined with OU-3 (formerly East and West Test Areas–Groundwater)
- OU-12: MSFC-055/065 Former Stauffer Chemical Plant
- OU-13: Central Area

A few sites are co-located with DA CERCLA sites within the boundaries of MSFC. The sites are as follows:

- MSFC-081 and 083—Co-located with DA site MSFC-027
- MSFC-052b and 029—Co-located with DA site MSFC-034
- MSFC-052—Co-located with DA site MSFC-053
- MSFC-090—Co-located with DA Site RSA-141

The property used by MSFC was provided to NASA by the DA through an agreement signed on March 15, 1960, in which the DA granted irrevocable use and occupancy of the lands and facilities thereon for a term of 99 years. Therefore, some sites within the MSFC boundaries are the result of former DA operations. The DA will be responsible for the assessment of some of these sites, per the MOA between NASA and the DA, which was entered into by both parties on December 20, 1994, and amended on April 18, 2002. The “DA Responsible Sites” grouping is composed of sites that were included in the 1994 NPL listing as being NASA’s responsibility, but that will be handled by the DA under an MOA between NASA and the DA.

This SMP ([Table 2-1](#)) lists all of the sites and the respective responsible party (DA or NASA) including current site reassignments (NASA has accepted responsibility for MSFC-D, MSFC-065, and MSFC-055; DA has accepted responsibility for MSFC-087 and MSFC-052e). NASA is working with the DA to document the site exchanges that have occurred to date. However, in the future, the MOA between NASA and the DA (Appendix C of the FFA) might be updated.

TABLE 2-1
List of Sites and Associated Operable Units (Sorted by OU)
NASA MSFC Site Management Plan

Site Designation	Description	Operable Unit ¹
MSFC-004	Deluge Pond–West Test Area	OU-1: East and West Test Areas
MSFC-005	Holding Pond–Test Complex 300 Area	OU-1: East and West Test Areas
MSFC-006	Disposal Pond 4586	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-007	Holding/Disposal Pond–Cold Calibration Test Stand Site	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-008	Old Holding Pond Area–Test Complex 500	OU-1: East and West Test Areas
MSFC-009	Liquid Waste Pond (SE)–East Test Area	OU-1: East and West Test Areas
MSFC-010	Liquid Waste Pond (NC)–East Test Area	OU-1: East and West Test Areas
MSFC-012	Detention Pond for Building 4572	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-042	Waste Oil Trap for Fuel Oil Tanks	OU-1: East and West Test Areas (moved from OU-8: Petroleum Sites)
MSFC-056	Fuel Oil Loading Area for Tanks at Pump Station 4673	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-061	Surface Drainage System for Disposal Pond 4586	OU-1: East and West Test Areas
MSFC-062	Uncontained Drainage Pathways–North Section of East Test Area	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-063	Uncontained Drainage Pathways–SE Section of East Test Area	OU-1: East and West Test Areas
MSFC-064	Buried Pipeline at Building 4572	OU-1: East and West Test Areas
MSFC-069	Drainage Accumulation Areas near Building 4530	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-073	Construction/Rubble Fill in MSFC East Test Area	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-078	NASA Storage Area south of the MSFC West Test Area	OU-1: East and West Test Areas
MSFC-079	Drainage and Retention Pond for Building 4564	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-B	Containment Area for Old Storable Propellant Building 4688	OU-1: East and West Test Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-052*	Industrial Wastewater Sewer Pipeline (excluding MSFC-052a, MSFC-052c, MSFC-052d, and MSFC-052e)	OU-2: Industrial Sewer
MSFC-052b*	Portion of Industrial Sewer within MSFC-034	OU-2: Industrial Sewer
MSFC-052d	Portion of the Industrial Sewer between MH-32 and MH-32D and between MH-1158 and Gemini Road)	OU-3: Groundwater
MSFC-014	Satellite Waste Accumulation Area for Buildings 4760 and 4707	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-015	Satellite Waste Accumulation Area for Building 4707-A	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)

TABLE 2-1
List of Sites and Associated Operable Units (Sorted by OU)
NASA MSFC Site Management Plan

Site Designation	Description	Operable Unit ¹
MSFC-016	Satellite Waste Accumulation Area for Building 4707-B	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-019	Former Satellite Waste Accumulation Area for Building 4755	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation) Sites
MSFC-020	Satellite Waste Accumulation Area for Building 4755	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-021	Satellite Waste Accumulation Area for Building 4744	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-036**	Sump in South Addition of Building 4708	OU-5: Building 4760 Area Activities
MSFC-037	Building 4767 Holding Tanks	OU-5: Building 4760 Area Activities (moved from OU-10: Confirmation Sampling Sites)
MSFC-054	Site of Former Beryllium Metal Machining Facility	OU-5: Building 4760 Area Activities (moved from OU-10: Confirmation Sampling Sites)
MSFC-076	Product Storage/Waste Accumulation Area at Building 4707	OU-5: Building 4760 Area Activities (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-088	Building 4760 Ventilation Trench	OU-5: Building 4760 Area Activities
MSFC-089**	Cyanide Waste Tank at Building 4760	OU-5: Building 4760 Area Activities
MSFC-094/ MSFC-052c	Building 4705 West Clean Room and North Satellite Waste Accumulation Area (including the Industrial Sewer west of Building 4705 and north of MH-105N)	OU-5: Building 4760 Area Activities
MSFC-029*	Photograph Lab Satellite Waste Accumulation Area	OU-6: Northeast Areas (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-066	Building 4347 Surface Drainage	OU-6: Northeast Areas
MSFC-070	Vehicle Wash Rack and Oil/Water Separator	OU-6: Northeast Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-075	Product Storage/Waste Accumulation Area near Building 4677	OU-6: Northeast Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-081*	Paint Spray Booth at the M-1 Storage Area	OU-6: Northeast Areas
MSFC-083*	Groundskeeper/Future Area 4348	OU-6: Northeast Areas
MSFC-084	Auto Paint Shop 4480	OU-6: Northeast Areas
MSFC-085	Paint Shop 4682	OU-6: Northeast Areas (moved from OU-10: Confirmation Sampling Sites)
MSFC-093	Building 4487 Sump Area	OU-6: Northeast Areas
MSFC-F	Storage Area West of Building 4650	OU-6: Northeast Areas
MSFC-033	Satellite Waste Accumulation Area for Building 4815	OU-8: Petroleum Sites (moved from OU-7: Satellite Waste Accumulation Sites)
MSFC-038	Building 4656 Oil Trap and Drainage Area	OU-8: Petroleum Sites
MSFC-041	Waste Anderol Storage Tank for Building 4744	OU-8: Petroleum Sites
MSFC-043	Waste Oil Trap for Building 4816	OU-8: Petroleum Sites
MSFC-058	Waste Anderol UST and Unloading Area for Building 4747	OU-8: Petroleum Sites

TABLE 2-1
List of Sites and Associated Operable Units (Sorted by OU)
NASA MSFC Site Management Plan

Site Designation	Description	Operable Unit ¹
MSFC-059	Waste Anderol UST and Unloading Area for Building 4647	OU-8: Petroleum Sites
MSFC-068	Building 4815 Surface Drainage	OU-8: Petroleum Sites
MSFC-092	Building 4435 Former Taxi and Bus Refueling Area	OU-8: Petroleum Sites
MSFC-044	Industrial Waste Treatment Basin	OU-9: Former IWTF
MSFC-045	Concentrate Receiving Tank	OU-9: Former IWTF
MSFC-046	Transfer Tank	OU-9: Former IWTF
MSFC-047	Hydrostatic Dump Lagoon	OU-9: Former IWTF
MSFC-048	Mix Tank	OU-9: Former IWTF
MSFC-049	East Ultimate Lagoon	OU-9: Former IWTF
MSFC-050	West Ultimate Lagoon	OU-9: Former IWTF
MSFC-A	Caustic Storage Tank	OU-9: Former IWTF
MSFC-022	Satellite Waste Accumulation Area for Buildings 4241 and 4244	OU-12: Former Stauffer Chemical Plant
MSFC-052a	Portion of Industrial Sewer North of MSFC-034	OU-12: Former Stauffer Chemical Plant
MSFC-055	Site of Former Stauffer Chemical Company Plant	OU-12: Former Stauffer Chemical Plant
MSFC-065	Building 4241 Surface Drainage	OU-12: Former Stauffer Chemical Plant
MSFC-D	Containment Area for Tanks 4234 A, B, and C (pending updated MOA between NASA and DA)	OU-12: Former Stauffer Chemical Plant
MSFC-E	Buildings 4241 and 4244 Product Storage Area	OU-12: Former Stauffer Chemical Plant
MSFC-001	Driller's Mud Disposal Site	OU-13: Central Area (moved from OU-10: Confirmation Sampling Sites)
MSFC-013	Old Soil/Rubble Dump Site	OU-13: Central Area (moved from OU-10: Confirmation Sampling Sites)
MSFC-031	Hazardous Waste Container Storage Area	OU-13: Central Area (moved from OU-10: Confirmation Sampling Sites)
MSFC-067	Building 4618 Surface Drainage	OU-13: Central Area (moved from OU-6: Northeast Areas)
MSFC-090*	Building 4653 Components Support Building	OU-13: Central Area
MSFC-091	Building 4638 Maintenance Shop	OU-13: Central Area
MSFC-002**	Inactive Abandoned Drum Disposal Site	DA Responsible Sites
MSFC-003	Inactive Old Bone Yard Disposal Site	DA Responsible Sites
MSFC-027*	Inactive Waste Accumulation Area	DA Responsible Sites
MSFC-034*	Former Chemical Production Area	DA Responsible Sites
MSFC-035	Inactive Sump/Tiled Drain Field-East Test Area	DA Responsible Sites

TABLE 2-1
List of Sites and Associated Operable Units (Sorted by OU)
NASA MSFC Site Management Plan

Site Designation	Description	Operable Unit ¹
MSFC-052e	Portion of Industrial Sewer East of Eastern MSFC/RSA Boundary (in the process of being transferred to DA)	DA Responsible Sites
MSFC-053	Former Propellant Storage Area and Test Stand Site	DA Responsible Sites
MSFC-060**	Inactive Deluge Water Drainage System	DA Responsible Sites
MSFC-074**	Inactive Disposal Site	DA Responsible Sites
MSFC-077**	Inactive Open Burning/Disposal Pits	DA Responsible Sites
MSFC-082**	Inactive Chemical Munitions Demilitarization / Disposal Trenches	DA Responsible Sites
MSFC-087**	Cyanide Waste Site at 4768	DA Responsible Sites
RSA-141*	4.2-inch Mortar Disposal Site, Building 4656	DA Responsible Sites

Notes:

OU = Operable unit
 NASA = National Aeronautics and Space Administration
 MSFC = Marshall Space Flight Center
 SE = Southeast
 NC = North-central
 UST = Underground storage tank
 IWTF = Industrial waste treatment facility
 MOA = Memorandum of Agreement
 RSA = Redstone Arsenal
 DA = Department of Army
 MH = Manhole

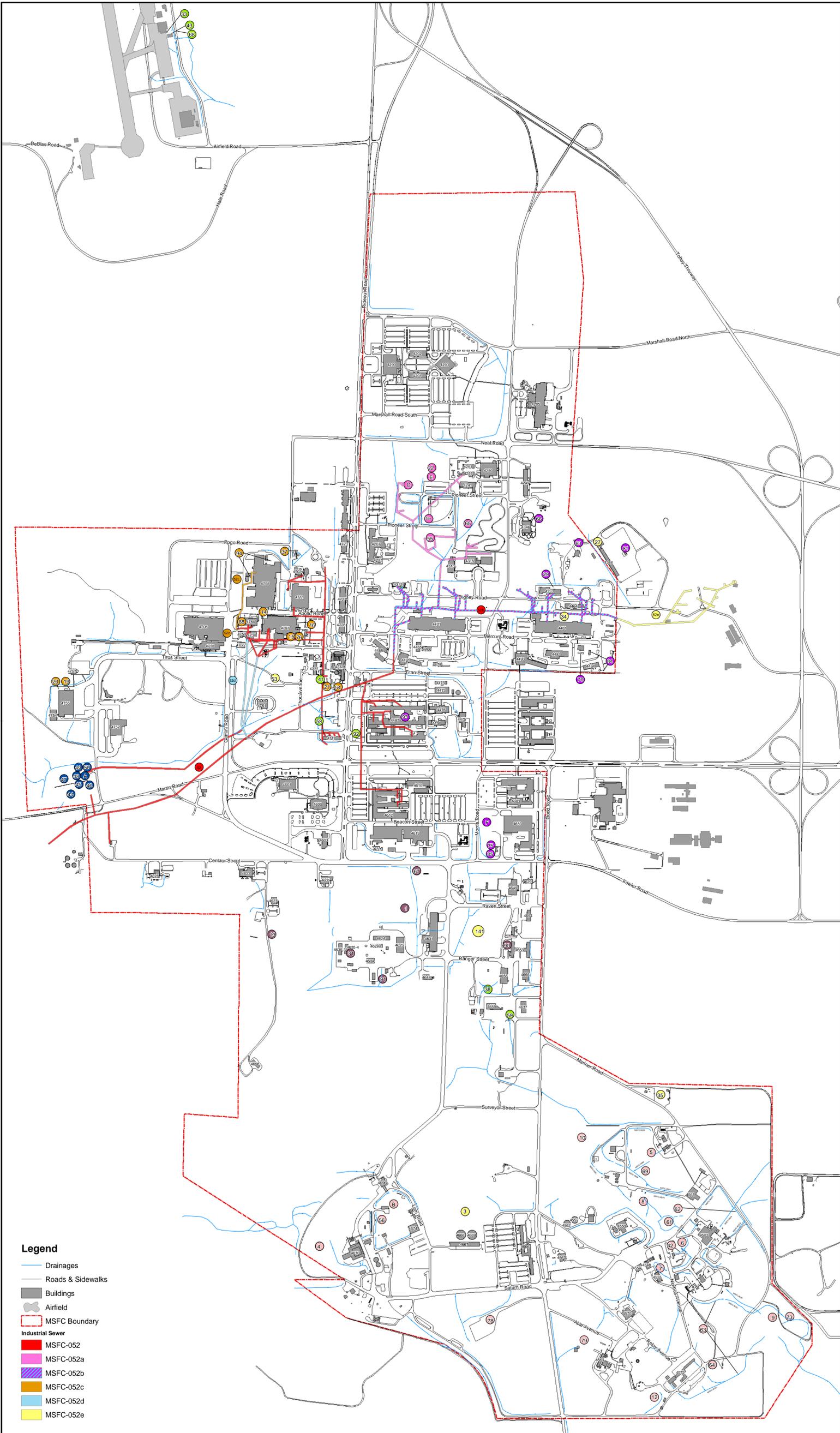
* Denotes that this MSFC site is co-located with one or more DA-responsible sites (or vice versa).

** Denotes change in CERCLA status to either No Further Investigation or No Further Action

¹ Groundwater beneath the sites is addressed in OU-3, with the exception of the OU-9 sites. The OU-9 investigation included groundwater beneath the sites. Former groundwater OUs-4 and 11 have been combined into OU-3.

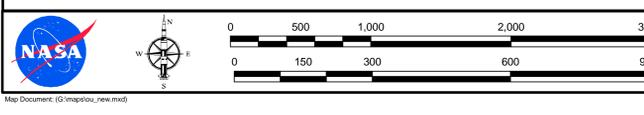
TABLE 2-2
Operable Unit Site Reorganization
NASA MSFC Site Management Plan

Site Designation	Former Operable Unit	Current Operable Unit
MSFC-006	10	1
MSFC-007	10	1
MSFC-012	10	1
MSFC-042	8	1
MSFC-056	10	1
MSFC-062	10	1
MSFC-069	10	1
MSFC-073	10	1
MSFC-079	10	1
MSFC-B	10	1
MSFC-014	7	5
MSFC-015	7	5
MSFC-016	7	5
MSFC-019	7	5
MSFC-020	7	5
MSFC-021	7	5
MSFC-037	10	5
MSFC-054	10	5
MSFC-076	7	5
MSFC-029	7	6
MSFC-070	10	6
MSFC-075	10	6
MSFC-085	10	6
MSFC-033	7	8
MSFC-001	10	13
MSFC-013	10	13
MSFC-031	10	13
MSFC-067	6	13



- Legend**
- Drainages
 - Roads & Sidewalks
 - Buildings
 - Airfield
 - MSFC Boundary
 - Industrial Sewer**
 - MSFC-052
 - MSFC-052a
 - MSFC-052b
 - MSFC-052c
 - MSFC-052d
 - MSFC-052e

- OPERABLE UNITS**
- OU-1: East and West Test Areas**
 - MSFC-004. Deluge Pond - West Test Area
 - MSFC-005. Holding Pond - Test Complex 300 Area
 - MSFC-006. Disposal Pond 4586
 - MSFC-007. Holding/Disposal Pond - Cold Calibration Test Stand Site
 - MSFC-008. Old Holding Pond Area - Test Complex 500
 - MSFC-009. Liquid Waste Disposal Pond (SE) - East Test Area
 - MSFC-010. Liquid Waste Disposal Pond (NC) - East Test Area
 - MSFC-012. Detention Pond for Building 4572
 - MSFC-042. Waste Oil Trap for Fuel Oil Tanks
 - MSFC-056. Fuel Oil Loading Area for Tanks at Pump Station 4673
 - MSFC-061. Surface Drainage System for Disposal Pond 4586
 - MSFC-062. Uncontained Liquid Waste Pathways - N. Section of E. Test Area
 - MSFC-063. Uncontained Liquid Waste Pathways - SE Section of E. Test Area
 - MSFC-064. Buried Pipeline at Building 4572
 - MSFC-069. Drainage Accumulation Areas near Building 4530
 - MSFC-073. Construction/Rubble Fill in MSFC East Test Area
 - MSFC-078. NASA Storage Area South of MSFC West Test Area
 - MSFC-079. Drainage and Retention Pond for Building 4564
 - MSFC-B. Containment Area for Old Storable Propellant Building 4688
 - OU-2: Industrial Sewer System**
 - MSFC-052. Industrial Wastewater Sewer Pipeline
 - MSFC-052b. Portion of Industrial Sewer within MSFC-034
 - OU-3: Groundwater**
 - Sitewide Groundwater
 - MSFC-052a. Portion of the industrial sewer between MH-32 and MH-32D and between MH-1158 and Gemini Road)
 - OU-5: Building 4760 Related Activities**
 - MSFC-014. Satellite Waste Accumulation Area for Building 4760 and 4707
 - MSFC-015. Satellite Waste Accumulation Area for Building 4707-A
 - MSFC-016. Satellite Waste Accumulation Area for Building 4707-B
 - MSFC-019. Former Satellite Waste Accumulation Area for Building 4755
 - MSFC-020. Satellite Waste Accumulation Area for Building 4755
 - MSFC-021. Satellite Waste Accumulation Area for Building 4744
 - MSFC-037. Building 4767 Holding Tanks
 - MSFC-054. Site of Former Beryllium Metal Machining Facility
 - MSFC-076. Product Storage/Waste Accumulation Area at Bldg 4707
 - MSFC-088. Ventilation Trench Building 4760
 - MSFC-094. Building 4705 West Clean Room and North Satellite Accumulation Area
 - MSFC-052c. Portion of Industrial Sewer West of Building 4705
 - OU-6: Northeast Areas**
 - MSFC-029. Photograph Lab Satellite Waste Accumulation Area
 - MSFC-066. Building 4347 Surface Drainage
 - MSFC-070. Vehicle Wash Rack and Oil/Water Separator
 - MSFC-075. Product Storage/Waste Accumulation Area near Bldg 4677
 - MSFC-081. Paint Spray Booth at the M-1 Storage Area
 - MSFC-083. Grounds Keeper & Future Area 4348
 - MSFC-084. Auto Paint Shop 4480
 - MSFC-085. Paint Shop 4652
 - MSFC-093. Building 4487 Sump Area
 - MSFC-F. Storage Area West of Building 4650
 - OU-8: Petroleum Related Sites**
 - MSFC-033. Satellite Waste Accumulation Area for Building 4815
 - MSFC-038. Building 4656 Oil Trap and Drainage Area
 - MSFC-041. Waste Anderson Storage Tank - Building 4744
 - MSFC-043. Waste Oil Trap for Building 4816
 - MSFC-055. Waste Anderson LST and Unloading Area - Building 4747
 - MSFC-059. Waste Anderson LST and Unloading Area - Building 4647
 - MSFC-068. Building 4815 Surface Drainage
 - MSFC-092. Building 4435 Former Taxi and Bus Refueling Area
 - OU-9: Former Wastewater Treatment Plant**
 - MSFC-044. Industrial Waste Treatment Basin
 - MSFC-045. Concentrate Receiving Tank
 - MSFC-046. Transfer Tank
 - MSFC-047. Hydrostatic Dump Lagoon
 - MSFC-048. ML Tank
 - MSFC-049. East Ultimate Lagoon
 - MSFC-050. West Ultimate Lagoon
 - MSFC-A. Caustic Storage Tank
 - OU-12:**
 - MSFC-022. Satellite Waste Accumulation Area for Buildings 4241 and 4244
 - MSFC-028a. Portion of Industrial Sewer North of MSFC-034
 - MSFC-055. Site of Former Stauffer Chemical Company Plant
 - MSFC-065. Building 4241 Surface Drainage
 - MSFC-D. Containment Area for Tanks 4234 A, B, and C
 - MSFC-E. Buildings 4241 and 4244 Product Storage Area
 - OU-13:**
 - MSFC-001. Driller's Mud Disposal Site
 - MSFC-013. Old Seal/Rubble Dump Site
 - MSFC-031. Hazardous Waste Container Storage Area
 - MSFC-067. Building 4618 Surface Drainage
 - MSFC-090. Building 4653 Component Support Building
 - MSFC-091. Building 4638 Maintenance Shop
 - Department of Army (DA) Responsible Sites**
 - MSFC-003. Old Bone Yard Site
 - MSFC-027. M-1 Waste Accumulation Area
 - MSFC-034. Sump in the North-Central Part of Building 4481
 - MSFC-035. Sump and Drain Field
 - MSFC-052a. Portion of Industrial Sewer East of MSFC Property
 - MSFC-053. Site of Old Propellant Storage Area and Test Stand Site
 - RSA-141. Mustard Shell Disposal Site



24-JAN-2011
Drawn By:
D. Scott Stevens

Figure 2-1
CERCLA Site Location Map
NASA MSFC Site Management Plan

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NASA has completed another facility-wide file review and conducted personnel interviews concerning historical activities and processes conducted at MSFC that may be of environmental significance. The historical search activities were completed as of September 2004, including the file review, site inspections, and personnel interviews for each building (current and demolished) at MSFC. This information was provided as appendixes in the appropriate OU work plans. NASA also has developed site condition summaries that include the findings of the processes conducted at MSFC in a presentation format with the associated figures.

This facility-wide historical search resulted in a Limited Site Assessment (LSA) being conducted and/or the identification of new CERCLA sites, or an expansion of the scope of the RI at current sites. The LSA sampling effort has been completed and NASA currently is evaluating the data for OUs 1, 5, 6, and 13 (the other surface media RI Reports have been completed that included LSA investigations). If the sampling indicates that a release has occurred in the area of investigation, that area will be carried forward in the RI efforts, per the investigation approaches described in the *Sitewide RI/FS Work Plan* (NASA, April 2010).

2.2 OU-1: East and West Test Areas

OU-1 consists of the surface media at sites in the vicinity of the East and West Test Areas in the southern portion of MSFC. [Table 2-3](#) lists the sites included in this OU. Groundwater beneath this area is being addressed under OU-3.

These sites were grouped into an OU because of their proximity, similar functions, the need to coordinate project activities with test stand operations, and the proximity of environmental receptors near the test areas. The East and West Test Areas have been used for engine and component testing since the early 1960s. Each site is described in the following subsections, along with each site's anticipated path forward in the CERCLA process. The proposed path forward for OU-1 is as follows:

- Finalize the RI Report
- Prepare and submit the FS for OU-1
- Prepare and submit the PP for OU-1
- Hold a public comment period
- Address public comments as appropriate in the ROD
- Prepare and obtain agency approval of an OU-1 ROD
- Submit the remedial action schedule, if needed
- Implement the remedial action, if needed

A time-critical removal action (TCRA) was implemented for the utility trenches associated with the test stands in OU-1. The TCRA served to mitigate the potential migration of polychlorinated biphenyl-(PCB) and lead-contaminated sediment in the utility trenches to the receiving surface water drainage systems. The source(s) of PCBs and lead to the utility trenches are not known for certain, but are believed to be residuals from the paint used at the test stands. A final remedial action report has been completed that documents the removal and disposal of the sediments collected from the trenches.

TABLE 2-3
OU-1: East and West Test Areas
NASA MSFC Site Management Plan

Site No.	Site Name
MSFC-004	Deluge Pond–West Test Area
MSFC-005	Holding Pond–Test Complex 300 Area
MSFC-006	Disposal Pond 4586
MSFC-007	Holding/Disposal Pond–Cold Calibration Test Stand Site
MSFC-008	Old Holding Pond Area–Test Complex 500
MSFC-009	Liquid Waste Pond (Southeast [SE])–East Test Area
MSFC-010	Liquid Waste Pond (North-Central [NC])–East Test Area
MSFC-012	Detention Pond for Building 4572
MSFC-042	Waste Oil Trap for Fuel Oil Tanks
MSFC-056	Fuel Oil Loading Area for Tanks at Pump Station 4673
MSFC-061	Surface Drainage System for Disposal Pond 4586
MSFC-062	Uncontained Drainage Pathways–North Section of East Test Area
MSFC-063	Uncontained Drainage Pathways–SE Section of East Test Area
MSFC-064	Buried Pipeline at Building 4572
MSFC-069	Drainage Accumulation Areas near Building 4530
MSFC-073	Construction/Rubble Fill in MSFC East Test Area
MSFC-078	NASA Storage Area south of MSFC West Test Area
MSFC-079	Drainage and Retention Pond for Building 4564
MSFC-B	Containment Area for Old Storable Propellant Building 4688

2.2.1 MSFC-004: Deluge Pond–West Test Area

The West Test Area consists of two test stands—the Saturn Test Stand (no active testing) and the mothballed F-1 Test Stand. The pond (MSFC-004) for the two test stands detains deluge water from engine testing, cooling water, unburned kerosene-based rocket fuels (Rocket Propellant 1 [RP-1]), and past solvent washings (trichloroethene [TCE]) from degreasing operations. The test stands also were equipped with a hydraulic system. The pond, of approximately 4 acres with an average depth of about 3 feet (ft), was constructed during 1963. The pond’s construction was of native soil; water exits through a National Pollutant Discharge Elimination System (NPDES)-permitted outfall. Groundwater from dewatering operations conducted at Buildings 4670 and 4696 discharges to the pond. Buildings 4670 and 4696 discharge 1.5 and 0.5 million gallons per day (mgd), respectively. Samples collected of the water indicate that it contains about 200 micrograms per liter (µg/L) of TCE. The groundwater beneath this area was designated as Source Area (SA) 6 in OU-3. An interim action was performed on the sediments in MSFC-004 in May 1997, during which the pond sediments were stabilized with lime and a liner was installed. The CERCLA driver for the pond liner installation was the detection of metals at levels above the protection criteria for aquatic life. The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, based on the existing data, that an unacceptable risk is present because of the activities conducted at MSFC-004. The CERCLA process will be followed and the risk reduced to an acceptable level, either through land use controls (LUCs) or through the implementation of a remedial action. In addition, the pond will be inspected periodically to evaluate whether the integrity of the liner has been compromised.

Status

Surface Media OU: 1
Groundwater OU: 3 (SA-6)
Site Size: 4 acres

Contaminants of Potential Concern

Lead and PCBs

Media of Concern

Surface soil, subsurface soil, sediment, and surface water

Completed CERCLA Phase

Historical Search
Work Plan Addendum, Field Investigation and an interim action

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design and remedial action

2.2.2 MSFC-005: Holding Pond–Test Complex 300 Area

MSFC-005 is a pond that supports the testing operations at Building 4530 in Test Complex 300; it is 40 ft by 40 ft and averages 6 ft in depth. The pond, constructed of native soil, has received discharges from rocket engine testing operations since 1964. The water discharged over land surface for an unknown time period, and then ran through a buried pipeline to MSFC-069. The water then flows to pond MSFC-010, where it exits and is channeled to the northwest, combining with other streams to form a sinking stream. The primary chemicals used during the testing operations conducted at Test Complex 300 include RP-1, TCE, hydraulic fluids, and hydrazine. Currently, the pond receives non-contact cooling water and condensate water from testing operations. The groundwater beneath this area was designated as SA-2 in OU-3.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It is anticipated, from the available information, that some future evaluations and possibly LUCs or remediation may be required to address some contaminants of concern (COCs) that were identified at the site. Future evaluations to assess risks to potential ecological receptors will be conducted as part of the FS.

Status

Surface Media OU: 1
Groundwater OU: 3 (SA-2)
Site Size: 40 ft by 40 ft by 6 ft deep

Contaminants of Potential Concern

PCBs and PAHs

Media of Concern

Surface soil, subsurface soil, sediment, and surface water

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.3 MSFC-006: Disposal Pond 4586

Former Pond 4586, located west of the Components Test Laboratory (Building 4583), was constructed by the DA in 1957 as the Components Test Lab earthen holding pond. The pond is approximately 100 ft by 100 ft and about 4 ft deep. Historical NASA engineering drawings show the drainage system from the test cell facilities in Building 4583 to the earthen pond, which ultimately discharged to the Liquid Waste Disposal (LWD) Pond (MSFC-009). Open concrete trenches from the test cells on the northwestern side of Building 4583 channel water to the eastern side of the pond. The liquids discharge from the pond along the southern side and enter an earthen ditch (MSFC-063). The liquids flow in a southerly direction past MSFC-042, beneath Test Stand 116, and ultimately to the LWD pond, MSFC-009. MSFC-006 was filled with soil during the mid-1970s. The primary chemicals used during the testing of scale-model rocket engines conducted at Building 4583 included RP-1 and TCE. The groundwater beneath this area was designated as SA-3 in OU-3.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. Aroclor-1254, BaP, and dibenz(a,h)anthracene were identified as COCs in surface soil and total soil at Surrogate Site A. According to the data collected, further remedial actions or LUCs will be required at MSFC-006. The CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3 (SA-3)
Site Size: 100 ft by 100 ft by 4 ft deep

Contaminants of Potential Concern

PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.4 MSFC-007: Disposal Pond 4586 Holding/Disposal Pond–Cold Calibration Test Stand Site

Pond 4593 (MSFC-007), a transient pond located in the Cold Calibration Test Area east of Building 4588, was constructed by the DA in 1959. The Cold Calibration Test Stand holding pond, constructed of concrete, is about 70 ft by 100 ft and averages about 10 ft deep. This pond was investigated during the confirmatory sampling effort in the early 1990s and during the CERCLA effort in the late 1990s. The discharge from the pond is through an earthen ditch; it flows beneath Nimbus Avenue, where it becomes MSFC-063, which ultimately flows into the LWD pond (MSFC-009). The primary chemicals used during the testing activities include RP-1, hydraulic fluid, and TCE.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-007. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-007, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3 (SA-3)
Site Size: 70 ft by 100 ft by 10 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.5 MSFC-008: Old Holding Pond Area–Test Complex 500

MSFC-008 is a pond that supports the testing conducted at Building 4522. The pond, about 0.3 acre and averaging 4 ft deep, was constructed of native soils in 1964. It has been dry since about 1996. The primary chemicals used at Test Complex 500 include TCE, diesel fuel, hydraulic fluid, and hydrazine. This holding pond drains to a ditch (MSFC-069) that is connected to MSFC-010, which is another holding pond north of Test Stand 500. The water exiting MSFC-010 travels west under Dodd Road. The discharge water from MSFC-010 ultimately sinks into the ground before reaching the wetlands of the Wheeler National Wildlife Refuge (WNWR).

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It is anticipated, on the basis of the available information, that some future evaluations and possibly LUCs or remediation may be required to address some COCs that were identified at the site. Future evaluations to assess risks to potential ecological receptors will be conducted as part of the FS.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 0.3 acre and 4 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.6 MSFC-009: Liquid Waste Pond (Southeast [SE])–East Test Area

MSFC-009 (Pond 4579) currently receives non-contact cooling water. The pond, approximately 300 ft by 250 ft and averaging about 4 ft deep, is constructed from native soil. MSFC-009 was constructed in 1954 as the LWD Reservoir (holding pond), which received wastewaters from various test stands and facilities in the East Test Area. The primary chemicals used at the test stands that drained to this pond are RP-1, TCE, hydraulic fluid, and transformer oil. The pond was associated with other structures, including Building 4576–the LWD Collection Tank; Building 4577–the LWD Sand Filter; and Building 4578–the LWD Underground Tanks. The facility was expanded in 1959, at which time the facilities listed above were combined with the enlarged MSFC-009 facility. The facility was transferred to NASA in 1960 and continued its function as the LWD Reservoir, with a 44,213-gallon capacity. The pond receives waste from CERCLA sites MSFC-064 and MSFC-063. The discharge of the pond is equipped with an oil/water separator (OWS). There is an NPDES-permitted discharge point downstream of the pond. The flow channels down a ditch that discharges into the backwater of Huntsville Spring Branch (HSB).

At MSFC-009, PCBs were detected in the sediment and fish tissue samples collected from the pond. The PCB levels detected in the fish were an ecological risk driver for MSFC-009. In 1998, it was recommended that contaminated fish be removed from the site and/or that the sediment to be removed to eliminate the pathway for further fish contamination. The source of PCBs to the ditch included transformer oils used at Building 4572 to perform structural tests on the Space Shuttle Solid Rocket Motor segments, and possibly swingarm testing conducted in the area, which used hydraulic oil. Because NASA no longer uses oils containing PCBs, these primary sources have been eliminated. A *Focused Feasibility Study* (FFS) (NASA, August 1998) recommended containment of the sediment (through stabilization lining of the pond) and fish removal. The fish removal was conducted in July 2000; the performance verification report (PVR) was submitted in August 2001. The sediment conditioning and pond liner action were not conducted due to uncertainties regarding the cleanup effectiveness, because potential PCB-contaminated surface soils near the pond could be washed into the pond and re-contaminate the sediments. Therefore, periodic sampling of the fish was planned to evaluate the need for future fish removals. The most recent periodic fish sampling occurred in July 2003.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that a remedial action will be taken on the pond sediments and surrounding soil at MSFC-009.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 300 ft by 250 ft by 4 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil, subsurface soil, sediment, and surface water

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation
Interim Action

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.7 MSFC-010: Liquid Waste Pond (SE)–East Test Area

MSFC-010 is a pond that ultimately receives the drainage from testing operations conducted in Test Complexes 300 and 500 (MSFC-005 and MSFC-008) via MSFC-069. There are no NASA operations that have been directly associated with the pond; its purpose is solely to detain water from the two test complexes. The chemicals used at Test Complexes 300 and 500 include RP-1, diesel fuel, hydraulic fluids, TCE, and hydrazine. The pond, constructed of native soils, is about 0.5 acre and averages about 4 ft in depth. The chemicals that the pond receives include primarily RP-1, diesel fuel, TCE, and hydrazine.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. Future evaluations to assess risks from metals and VOCs in sediment to potential ecological receptors will be conducted as part of the FS.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 0.5 acre and 4 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil, subsurface soil, sediment, and surface water

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP and ROD

2.2.8 MSFC-012: Detention Pond for Building 4572

MSFC-012, a detention pond for the activities conducted at Building 4572 (test stand), is constructed of native soil and is approximately 100 ft by 120 ft and averages 2 ft in depth. The test stand (Building 4572) was constructed in 1951 by the DA; the pond probably was constructed within the same timeframe. If a rocket engine or stage test needed to be terminated, the fuel (RP-1) to the test article would cease flowing and the remaining fuel in the pipeline would be re-directed to this pond via the RP-1 dump line. According to personnel interviews, the pond was never used to hold RP-1 from testing activities.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-012. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-012, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 100 ft by 120 ft and
2 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface
soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field
Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.9 MSFC-042: Waste Oil Trap for Fuel Oil Tanks

MSFC-042 is east of Building 4596 in the East Test Area. It is a concrete oil trap or sump that probably was used to handle liquid nitrogen (LN2) blowdown operations while the area was used to store LN2. The concrete oil trap or sump was installed in 1957. The material discharged to this sump is unknown, but probably is LN2 blowdown.

The unit has a 540-gallon capacity, with dimensions of 6 ft by 3 ft and 4 ft deep. The sump is connected to a 4-ft-diameter iron pipe that extends in an eastern direction to a natural, unmaintained, clay-lined ditch approximately 5 ft wide and 5 ft deep. The ditch drains to MSFC-063. There is a lip on the edge of the sump, indicating that there was once a grate on top of the sump. The sump is no longer used and currently contains dirt, weeds, and iron oxide grit from recent nearby painting operations.

Also in the area around this sump is Building 4596, which was built in 1957 and used to house boilers. The boilers were dismantled in the mid-1980s. There were two diesel ASTs, installed in 1957, on the eastern side of this building. For one of these tanks, the dimensions of the tank and the date when it was removed are not known; the other, which has a 7,500-gallon capacity and is 20 ft long and 8 ft in diameter, is in place, but has been emptied and is not used. There also was a liquid oxygen (LOX) and nitrogen ready area (seen on the 1954 aerial) that contained six storage tanks. A laydown area seen on the 1978 aerial was nearby. Painting operations have been conducted in this area; iron oxide grit from paint removal operations was noted during a recent visit to this site.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-042. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-042, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

Metals and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.10 MSFC-056: Fuel Oil Loading Area for Tanks at Pump Station 4673

MSFC-056 is a fuel loading area that supported testing in the West Test Area. Building 4673 was constructed by NASA in 1965 as the RP-1 Fuel Storage Tank facility to support the testing programs at the Saturn Test Stand (Building 4670). The facility consisted of two approximately 150,000-gallon (totaling 312,000 gallons) ASTs for RP-1 fuel storage. These tanks have been demolished.

These tanks were refilled by railcars, which docked at the spur located on the hill to the east, near Building 4688. This former railroad spur ran from a central line running north-south along Saturn Road adjacent to and east of Buildings 4693, 4694, 4696, and 4688. Hook-ups for RP-1 transfer from the railcars exist (still intact at present) from the northeastern corner of Building 4688 extending southward to the spur termination. RP-1 fuel was then piped from the railcar westward to the RP-1 Storage Tanks (Building 4673) via underground pipelines. The supply of RP-1 via this method (railcar) ended with the last test engine tests performed at the associated test stands, Buildings 4670 and 4696, in 1969. It was estimated that approximately 3 million gallons of RP-1 fuel were brought in by rail for testing at Building 4696, and approximately 2.8 million gallons of RP-1 fuel were brought in by rail for testing at Building 4670. After the late 1960s, RP-1 was trucked into the West Test Area and received at the unloading station east of the RP-1 tanks.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-056. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-056, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 2.5 acres

Contaminants of Potential Concern

Metals and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.11 MSFC-061: Surface Drainage System for Disposal Pond 4586

MSFC-061 is a shallow drainage ditch that originates at MSFC-006 and channels water to MSFC-008. The ditch is about 600 ft long and averages about 2 ft in depth. The channel becomes poorly defined in a wooded area north of MSFC-006 and the water appears to “fan out” toward MSFC-008. The ditch is used to channel storm water runoff from this area of MSFC. However, according to test area engineers, the ditch also could serve as an alternate discharge point for the water detained in MSFC-006. The chemicals that were used, which flowed into MSFC-006, included RP-1 and TCE.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. Aroclor-1254, BaP, and dibenz(a,h)anthracene were identified as COCs in surface soil and total soil at Surrogate Site A, located primarily over MSFC-006. On the basis of the data, further remedial actions or LUCs will be required at MSFC-061. The CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 600 ft

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.12 MSFC-062: Uncontained Drainage Pathways–North Section of East Test Area

MSFC-062 has been subdivided into three sections: MSFC-062A, MSFC-062B, and MSFC-062C. MSFC-062A and MSFC-062B are storm water ditches that channel flow to MSFC-069B. MSFC-062A is on the western side of the main blockhouse (Building 4561) and MSFC-062A1 runs parallel to the main portion of MSFC-062A. MSFC-062B flows from the northwestern side of the Test Complex 300 blockhouse (Building 4520) that channels flow to MSFC-069B. MSFC-062C includes two storm water ditches (MSFC-062C1 and MSFC-062C2) located northeast of Building 4583 that channel storm water offsite. None of the ditches associated with MSFC-062 are used for process water, only for storm water.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-062. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-062, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: The drainageways are various lengths

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.13 MSFC-063: Uncontained Drainage Pathways–SE Section of East Test Area

MSFC-063 is a series of drainage ditches in the southeastern portion of the East Test Area. The ditches have been subdivided into four areas: MSFC-063A, MSFC-063B, MSFC-063C, and MSFC-063D. MSFC-063A is a concrete ditch that channels process water from test cell activities on the northeastern side of Building 4583 into a wooded area. MSFC-063B is an earthen ditch that channels process water from Test Complex 116 to MSFC-009. MSFC-063C also is located at Test Complex 116 and is an earthen ditch that channels storm water around MSFC-009 to its NPDES-permitted outfall ditch. MSFC-063D is an earthen ditch that is partially paved with concrete at the location where process water from Building 4572 is channeled into MSFC-009.

At MSFC-063A, an Interim Action for a portion of the drainageway that contained a buildup of PCB-containing sediments was recommended. The *Surface Media Interim Actions within MSFC OU-1 at Sites MSFC-009 and 063, Focused Feasibility Study* (NASA, August 1998) recommended the removal of the sediment in the concrete portion of the drainage pathway. Because of the small volume of sediment, the straightforward remediation approach, the potential for the sediment to wash out of the contained drainage pathway, and EPA's programmatic direction to protect the environment, the sediment removal and disposal were completed in November 1998. The PVR was submitted in August 2001 and has been approved by ADEM.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. A remedial action is warranted at MSFC-063D because of the PAHs and PCBs detected in the sediment. An action also might be warranted for MSFC-063B1 and B2 because of PCB detections in the ditches.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: The drainageways are various lengths

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.14 MSFC-064: Buried Pipeline at Building 4572

This site is a 24-inch vitrified clay liquid waste pipeline that extends from Building 4514 southeast toward the northern side of Building 4572. The pipeline then turns northeast and the water flows through a collection tank and sand filter and finally discharges into MSFC-009, the LWD Pond. The pipeline ranges in depth from 20 ft near Building 4514 to ground surface at the discharge point, and its total length is about 2,050 ft. This pipeline transfers water related to test stand activities, which primarily included TCE. The quantity of flow through the pipe is unknown.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It is anticipated, on the basis of the available information, that the contents of the pipeline will need to be removed and either an LUC or remedial action for surface soil will be required.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 2,050 ft

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.2.15 MSFC-069: Drainage Accumulation Areas near Building 4530

MSFC-069 is a series of drainage ditches located in TCs-300 and 500. The series was divided into three different sections, labeled MSFC-069A, MSFC-069B, and MSFC-069C. MSFC-069A is a storm water ditch that originates on the western side of the TC-300 blockhouse (Building 4530) and flows into MSFC-069B. MSFC-069B originates at the outlet of MSFC-008 (TC-500 pond) and collects water from a sump that dewateres a cable tray and flow from MSFC-005 (TC-300 pond) and flows into MSFC-010. The final section of ditch (MSFC-069C) originates along the western side of TC-500 at Building 4524 and channels flow from the testing operations (mainly condensate water) into MSFC-010. All of the ditches are about 1 to 1 ½ ft deep.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. MSFC-069B was sampled in 1993; the data indicated that the surface water and sediment did not pose an unacceptable risk. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-069, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: Drainages are various lengths

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil, subsurface soil, surface water, and sediment

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.16 MSFC-073: Construction and Rubble Fill in MSFC East Test Area

MSFC-073 is a concrete and rubble fill in the East Test Area of about 3.8 acres. The site was used to dispose of rubble during the early 1960s. The discharge from MSFC-009 meanders through the site and channels water off-facility and ultimately into HSB. The origin of the concrete and rubble is unknown. Samples were collected from the MSFC-009 discharge ditch and from the border of MSFC-073. The data were evaluated and indicated that the site does not pose an unacceptable risk.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-073. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-073, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 3.8 acres

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.17 MSFC-078: NASA Storage Area South of the MSFC West Test Area

MSFC-078 is a storage area south of the West Test Area of about 2 acres. The area was used to store large rocket parts in support of testing operations. Items that were stored include piping, Saturn V boosters, control panels, and other miscellaneous test hardware.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-078. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-078, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 2 acres

Contaminants of Potential Concern

Metals

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.18 MSFC-079: Drainage and Retention Pond for Building 4564

Building 4564 was operated during the 1960s and was used to test the H-1 engine, which used both RP-1 and LOX. Therefore, the testing conducted at the stand required the use of RP-1, TCE, and a hydraulic system. Discharges from the stand were collected in an earthen holding pond, which is CERCLA Site MSFC-079, about 40 ft by 40 ft and 3 ft deep. Liquid discharges enter the pond along its southeastern side and exit on the northwestern portion. The liquid then flows along an earthen ditch toward Dodd Road and then south to HSB.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-079. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-079, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 40 ft by 40 ft and 3 ft deep

Contaminants of Potential Concern

VOCs, metals, PCBs, and SVOCs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.2.19 MSFC-B: Containment Area for Old Storable Propellant Building 4688

Building 4688 was constructed in approximately 1954 and functioned as the Propellant Drum Storage Area in 1954, and as the Aniline-Furfuryl Drum Storage from 1957 through 1968. Currently, the facility functions as a storage building for miscellaneous equipment. The building has three drains that exit to a ditch on the northern side of the building. The ditch is about 200 ft long and channels releases that may have occurred from the building to MSFC-004. Samples collected at this site indicated the presence of PCBs, but a risk assessment indicated that they do not pose a risk.

The Agencies currently are reviewing the Draft Final OU-1 RI Report. It currently is anticipated, on the basis of the existing data, an unacceptable risk is present because of the activities conducted at MSFC-B. The CERCLA process will be followed and the risk will be reduced to an acceptable level, either through LUCs or through the implementation of a remedial action.

Status

Surface Media OU: 1
Groundwater OU: 3
Site Size: 200 ft

Contaminants of Potential Concern

PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.3 OU-2: Industrial Sewer System

OU-2 is composed of one site (MSFC-052) and includes the industrial sewer system—sediment in the pipeline, unsaturated subsurface soils in the vicinity of the industrial sewer system, and the surface media at the sewer outfall to Indian Creek. The entire industrial sewer includes approximately 35,000 ft of buried pipe under the north-central industrial portion of MSFC and the outfall ditch. The portion of the sewer designated as MSFC-052 is about 18,000 ft long. The DA installed the sewer in the 1940s to accommodate the munitions manufacturing processes during World War II (WWII). In 1960, NASA began manufacturing rocket components and the industrial sewer accommodated these processes, as well.

In July 2003, NASA presented a Site Condition Summary for OU-2 to the Agencies. The portion of MSFC-052 located north of the interface of MSFC-034 and OU-12 (beginning at an unnumbered manhole north of Building 4471) was redesignated as MSFC-052a and included in OU-12. Three other sections of the industrial sewer also were re-designated (MSFC-052b, 052c, and 052d) in a manner that allows for a concurrent investigation with a co-located CERCLA site. Therefore, the subsurface soil data collected at a CERCLA site that is co-located with the industrial sewer will be combined with the industrial sewer subsurface soil data and evaluated as one site, rather than being evaluated as two separate, co-located sites from the same geographic area. In addition, the DA has agreed to accept responsibility for the portion of the sewer that is on its property east of the NASA and RSA boundary (MSFC-052e). **Table 2-4** lists the sections of the industrial sewer and the OUs with which they are associated.

Figure 2-1 shows the extent of the industrial sewer system and the areas that are associated with other OUs. The industrial sewer was identified as its own OU because the remediation of the industrial sewer, if needed, probably would involve a single technology or technique. Groundwater beneath the industrial sewer is addressed under OU-3.

A time-critical removal action and an emergency removal action have been performed at the outfall of MSFC-052. NASA removed the PCB-contaminated sediment from the outfall ditch in accordance with the *Action Memorandum, Time-critical Removal Action, Operable Unit 2, Outfall Ditch* (NASA, December 1999). The completion of the time-critical removal action has reduced the potential for PCB bioaccumulation in the food chain from the outfall ditch sediments. During the 2002 semiannual sampling of the sediment behind the pipeline outfall weir, NASA detected elevated PCB concentrations in the sediments in the industrial sewer pipe. Additional sediment samples were collected in the manholes along the main trunk line of the industrial sewer. PCBs were found in the sediments from the manholes near the outfall ditch. As a result of these sampling data, NASA notified the Agencies that it would complete an emergency removal action to remove the sediments in the pipe and at the outfall. This action was conducted at the end of May and the beginning of June 2003. Currently, the Agencies are reviewing the final version of the OU-2 FS.

Status

Surface Media OU: 2
Groundwater OU: 3
Site Size: 18,000 ft

Contaminants of Potential Concern

VOCs, SVOCs, metals, PCBs, pesticides, cyanide

Media of Concern

Surface soil, subsurface soil, and sediment in pipeline

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation
RI Report

Current CERCLA Phase

Feasibility Study

Anticipated Future CERCLA Phase

PP, ROD, remedial design, and remedial action

TABLE 2-4
OU-2: Industrial Sewer System
NASA MSFC Site Management Plan

Site No.	Site Name
MSFC-052	Industrial Wastewater Sewer Pipeline (excluding MSFC-052a, 052b, 052c, 052d, and 052e)
MSFC-052a	Portion of Industrial Sewer north of MSFC-034 (OU-12)
MSFC-052b	Portion of Industrial Sewer within MSFC-034, between MH-8 and MH-26
MSFC-052c	Portion of Industrial Sewer west of Building 4705 and north of MH-105N (OU-5)
MSFC-052d	Portion of Industrial Sewer between MH-32 and MH-32D and between MH-1158 and Gemini Road (OU-3)

Notes:
MSFC = Marshall Space Flight Center
OU = Operable unit
MH = Manhole
RSA = Redstone Arsenal
NASA = National Aeronautics and Space Administration
DA = Department of the DA

2.4 OU-3: Groundwater

The groundwater investigation originally was divided into three OUs (OUs-3, 4, and 1) based on the geographic areas of the site and anticipated groundwater flow directions. The OUs were identified as OU-3: Northwest Area Groundwater, OU-4: Northeast Area Groundwater, and OU-1: East and West Test Areas Groundwater. Subsequently, the groundwater beneath the East and West Test Area was identified as its own OU (OU-11) on the basis of the field data collected from the test areas. However, in 1999, a decision was made to combine the groundwater into one OU. This decision was documented in a letter to the regulatory Agencies in late 1999. The groundwater investigation for the entire site is now being addressed under OU-3: Groundwater. In addition, a portion of the soils beneath the industrial sewer (MSFC-052d) showed volatile organic compound (VOC) contamination at a depth that is equal to the groundwater elevation. The data collected to date show an upwelling of bedrock groundwater in that area, and it is believed that the contamination is due to the bedrock groundwater. It is being investigated as part of OU-3.

A revised Draft OU-3 RI Report (January 2010) indicates the presence of 5 major contaminated groundwater plume areas in the OU. [Figure 2-2](#) identifies 15 locations where contaminant releases from former site activities are believed to have resulted in the major “hot spot” areas (or areas of highest contaminant levels) in the upper intervals of the groundwater system.

The land surface areas believed to have contributed to these “hot spots” also have been identified and assigned site numbers (when one did not exist), and were placed in the appropriate OU. [Table 2-5](#) lists these “hot spots,” associated land surface sites, and corresponding site or OU numbers.

NASA has worked with RSA to revise the conceptual site model for MSFC and has completed a supplemental RI related to the groundwater system beneath MSFC. The supplemental investigations included characterization of the bedrock components of the groundwater system.

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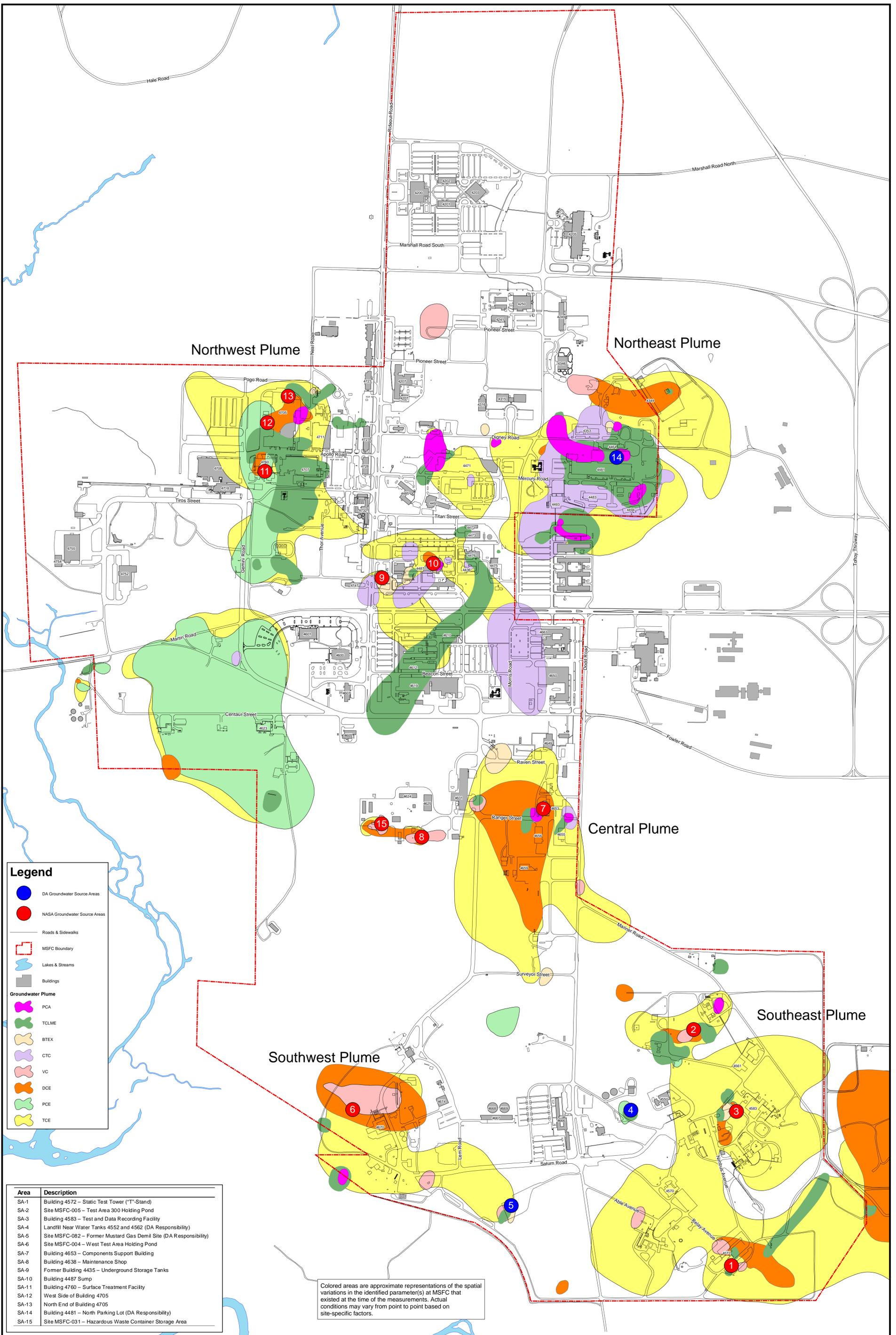
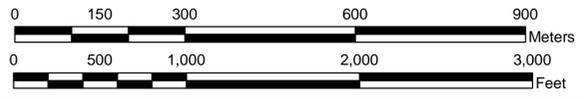


Figure 2-2
Residuum Groundwater "Hot Spots"
NASA MSFC Site Management Plan



25-FEB-2010
Drawn By:
D. Scott Stevens

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TABLE 2-5
OU-3: Groundwater Source Areas
NASA MSFC Site Management Plan

"Hot Spot" No.	Location	Site and OU
SA-1	Building 4572—Static Test Tower ("T"-Stand)	MSFC-063, OU-1
SA-2	Site MSFC-005—Test Area 300 Holding Pond	MSFC-005, OU-1
SA-3	Building 4583—Test and Data Recording Facility	MSFC-006, OU-1
SA-4	Landfill near Water Tanks 4552 and 4562	MSFC-003E, DA
SA-5	Site MSFC-078—Gillespie Flats Boneyard	MSFC-082, DA
SA-6	Site MSFC-004—West Test Area Holding Pond	MSFC-004, OU-1
SA-7	Building 4653—Components Support Building	MSFC-090, OU-13
SA-8	Building 4638—Maintenance Shop	MSFC-091, OU-13
SA-9	Former Building 4435—Underground Storage Tanks	MSFC-092, OU-8
SA-10	Building 4487 Sump	MSFC-093, OU-6
SA-11	Building 4760—Surface Treatment Facility	MSFC-088, OU-5
SA-12	West side of Building 4705	MSFC-094, OU-5
SA-13	North end of Building 4705	MSFC-094, OU-5
SA-14	Building 4481—North Parking Lot	MSFC-034, DA
SA-15	Site MSFC-031—Hazardous Waste Container Storage Area	MSFC-031, OU-13

Notes:

OU = Operable unit

SA = Source area

DA = Department of Army

MSFC = Marshall Space Flight Center

CERCLA responsibility for groundwater SAs-4, 5, and 14 will be negotiated during the development of an updated Memorandum of Agreement between the DA and NASA prior to submittal of the OU-3 FS.

NASA has completed an LUC Proposed Plan and an Interim Record of Decision (IROD). The IROD provides for LUC for the groundwater beneath MSFC until a final ROD for OU-3 is in place. The objective of the LUC IROD is to provide restrictions on groundwater beneath MSFC, such as potable use to limit exposures, but also to allow for controlled access as needed for activities such as maintenance, dewatering, and geothermal applications. NASA has an approved LUC Remedial Design document for OU-3 at MSFC. Pursuant to the requirements of this document, NASA will submit an annual report documenting the inspection of the OU-3 LUCs and note the status and updates to the controls that might be warranted.

NASA has completed treatability studies to evaluate selected *in-situ* technologies for their ability to destroy or control groundwater contamination in the residuum portion of the groundwater system. Both laboratory bench-scale and field pilot-scale testing have been completed to assess *in-situ* chemical (peroxide-based) oxidation and reduction (zero-valent iron injection) technologies in specific areas of the facility. In addition, NASA has completed an *in-situ* thermal treatment interim action at SA-13.

NASA has finalized a work plan for an enhanced bioremediation pilot test. The work plan addressed pilot tests in two areas of MSFC, one with a dissolved groundwater plume consisting of primarily carbon tetrachloride (CTC) and a second area with a dissolved groundwater plume consisting primarily of tetrachloroethene (PCE). The wells have been installed in the treatment areas and bench-scale testing has been completed for the soil and groundwater collected from the CTC plume. NASA completed the substrate injections and subsequent data collection for the first pilot test area in the northwest plume, where the groundwater contains PCE and TCE. NASA has developed a report describing the results of the pilot test. NASA plans to conduct the substrate injections in the CTC pilot test area during late 2011 or 2012.

NASA plans to conduct a series of additional interim actions to remediate contamination within the groundwater SAs. Currently, an IROD is in the approval process for SA-2, for which the selected remedy is zero-valent iron injections. NASA has grouped the remaining source areas together on the basis of anticipated available funding for future CERCLA documentation and remedial actions, as follows:

- SAs-6, 8, 9, 12
- SAs-10 and 15
- SA-11
- SAs-3 and 13
- SA-1
- SA-7

Section 3 includes the schedules for each of the SA groupings.

The Saturn (Building 4670) and F-1 stands (Building 4696), located in the West Test Area, have basements in which approximately 1-½ and ½ million gallons of groundwater, respectively, enter on an average daily basis. NASA installed sumps for continuously dewatering the basements approximately 30 years ago, and dewatering operations have remained fairly continuous since that time. NASA discovered that the groundwater, which discharged directly to MSFC-004 and eventually to the WNWR, was contaminated with TCE along with its breakdown products; therefore, NASA decided to pursue an interim action to treat the groundwater. An FFS was developed to evaluate the treatment alternatives for the groundwater, and the results of the FFS were summarized for the public in a PP. An air stripper was installed and became operational in 1997 to treat the groundwater before the pond discharge. In addition, an interim ROD was developed by NASA and EPA, but was never signed by EPA. In September 2002, EPA notified NASA of EPA's non-concurrence with the interim ROD. Upon notification of EPA's determination that this action was not necessary for CERCLA, NASA began to shut down the air stripper in June 2003 by turning off the

blower and re-routing the incoming groundwater from the basements of Buildings 4670 and 4696 to the pond on August 28, 2003. NASA will no longer operate this facility.

The proposed path forward for OU-3 is as follows:

- Continue conducting semiannual sampling at groundwater and surface water monitoring locations and reporting the monitoring results annually
- Prepare and submit a final RI Report once comments are received from the Agencies on the Draft Final RI Report
- Complete the CERCLA process for the Source Area groupings (RI/FFS, PP, IROD, RD)
- Perform Interim Actions
- Prepare and submit the OU-3 FS
- Prepare and submit a PP for OU-3
- Hold a public comment period
- Address public comments as appropriate in an ROD or revised PP
- Prepare and obtain agency approval of an OU-3 ROD
- Submit the remedial action schedule
- Implement the remedial action

2.5 OU-5: Building 4760 Area Activities

OU-5 is composed of the sites in the northwestern areas of MSFC, known as the 4700 Area. These sites handle similar wastes. [Table 2-6](#) lists the sites that make up this OU, and [Figure 2-1](#) shows their approximate locations at the facility.

OU-5 includes sites grouped together because of their geographic proximity and common potential for contamination. The intent was to group together those sites that present similar investigative and possible remediation challenges. This OU includes soil, sediment, and sludge (sampled as sediment). Groundwater beneath these sites is addressed in OU-3.

The path forward for the OU-5 activities includes the following steps:

- Finalize the OU-5 RI Report
- Prepare and submit the OU-5 FS
- Prepare and submit a PP for OU-5
- Hold a public comment period
- Address public comments as appropriate in an ROD or revised PP
- Prepare and obtain approval of an OU-5 ROD
- Submit the remedial action schedule, if needed
- Implement the remedial action, if needed

TABLE 2-6

OU-5: Building 4760 Area Activities

NASA MSFC Site Management Plan

Site No.	Site Name
MSFC-014	Satellite Waste Accumulation Area for Buildings 4760 and 4707
MSFC-015	Satellite Waste Accumulation Area for Building 4707-A
MSFC-016	Satellite Waste Accumulation Area for Building 4707-B
MSFC-019	Former Satellite Waste Accumulation Area for Building 4755
MSFC-020	Satellite Waste Accumulation Area for Building 4755
MSFC-021	Satellite Waste Accumulation Area for Building 4744
MSFC-036*	Sump in South Addition of Building 4708
MSFC-037	Building 4767 Holding Tanks
MSFC-054	Site of Former Beryllium Metal Machining Facility
MSFC-076	Product Storage and Waste Accumulation Area at Building 4707
MSFC-088	Building 4760 Ventilation Trench
MSFC-089*	Cyanide Waste Tank at Building 4760
MSFC-094/ MSFC-052c	Building 4705 West Clean Room and North Satellite Waste Accumulation Area (including the industrial sewer west of Building 4705 and north of MH-105N)

Notes:

MSFC = Marshall space Flight Center

MH = Manhole

*This site status has been changed to No Further Investigation via administrative letter.

2.5.1 MSFC-014, 015, 016, and 076: Satellite Waste Accumulation Areas for Building 4707

The DA constructed Building 4707 in 1952 and used it for missile program activities. The Hydrostatic Test Facility was added to Building 4707 in 1962 and was used for the assembly, cleaning, hydrostatic (pressurized) testing, and for the inspection of Saturn fuel and LOX tanks, which were manufactured in the pre-existing Building 4707 (adjoining). These four sites in OU-5 were satellite waste accumulation areas that primarily supported the hydrostatic test facility. The sites primarily stored empty containers for the chemicals used in the building.

According to the various literature sources, Building 4707 historically housed shops including a machine shop, the Hydrostatic Test Tower, assembly hangers, a transformer area, a tools room, an equipment room, and various laboratories. NASA records dated 1969 indicate that Building 4707 was equipped with a clean room. The chemicals used to support the cleaning operations in Building 4707 included the following:

- TCE (New) Storage
- TCE (Used) Storage
- Alkaline Cleaner Turco 4215
- Deoxidizer Turco Smut-Go
- Conversion Coating Iridite 14.2
- Detergent (12-gallon tank)
- Deionized (DI) Water Storage

Building 4707 was equipped with a Paint Spray Booth that was housed in a southern extension of the building. The paint booth was equipped with floor drains and clean-outs that connected to the 8-inch industrial sewer line. The paint booth also was equipped with a water curtain. The paint booth has been converted to “dry” operations.

Activated in 1977, the Solid Rocket Booster–Thermal Protective Coating Development Facility occupies 5,000 square ft in the West High Bay of Building 4707. The SRB sprayable ablator facility supports advanced ablator materials and process development and has been used specifically in the development of the lightweight sprayable ablator applied to areas of the solid rocket structure tanks. The solvents housed in the Solvent and Resin Storage Area and used in the mixers in the Processing Area included a 55-gallon tank of PCE and a 55-gallon tank of methylene chloride. In addition, the mixers had a recirculating system to recover spent solvents, but also had a waste system, as well. The Spray Foam Facility also had a Drum Storage Enclosure located outside along the southern wall of the main Building 4707, near the northeastern corner of the smaller extension of Building 4707 to the south of the main building (MSFC-076).

NASA currently is responding to Agency comments on the Final OU-5 RI Report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at these four sites.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: 4 acres

Contaminants of Potential Concern

PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.5.2 MSFC-019 and 020: Satellite Waste Accumulation Areas for Building 4755

NASA constructed Building 4755 in 1964 and has used it for several different purposes:

- S-IC assembly station
- S-IC-IB refurbishing station
- F-1 engine modification area
- Quality weighing of S-II-D
- Quality finding of the center of gravity of the S-II-D
- Provision of a high-bay area for the Centaur stage

NASA engineering drawings from the late 1960s indicate that Building 4755 housed a Clean Room along the central portion of its eastern side. In addition, the Apollo Telescope Mount Clean Room, located along the western wall of Building 4755, was installed in the facility at that time. In addition, technologies to reclaim human fluids such as sweat and urine and to treat them for use as drinking water in space are being developed in this building. The waste generated in this building primarily includes ammonia, sulfuric acid, and brine solutions. MSFC-019 and 020 are located on the northern side of the building and were satellite waste accumulation areas that supported the operations in the building by storing drums of brine and ammonia solutions.

NASA currently is responding to Agency comments on the Final OU-5 RI Report. The field investigation indicated that a ditch, which channels water from a storm drainage system south of Building 4755, contains PCBs that may pose a risk. It is anticipated that the PCB-contaminated soil will have to be removed and disposed in an approved landfill.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

Metals, PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.5.3 MSFC-021: Satellite Waste Accumulation Area for Building 4744

Building 4744 has functioned as the Compressed Air Facilities, which produces low-pressure compressed air, since 1966. The Wind Tunnel Compressor has been in Building 4744 since 1959 and consists of a 500-pound-per-square-inch-gauge piston compressor, which discharges through a dryer into a 6,000-cubic-foot receiving vessel in the adjacent building. The facility primarily services the Trisonic Wind Tunnel in Building 4732, with secondary service to Building 4755. In addition, the Shop Air Compressor, activated in 1984, services the entire 4,700-area with 125-pound-per-square-inch (psi), oil-and-moisture-free air. This building was demolished in late 2003. MSFC-021 was a satellite waste accumulation area for this building and stored drums of compressor oil for the piston compressor.

NASA currently is responding to Agency comments on the Final OU-5 RI Report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-021.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: 70 ft by 70 ft

Contaminants of Potential Concern

Arsenic, PAHs, and PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.5.4 MSFC-036: Sump in South Addition of Building 4708

MSFC-036 is an active sump in the basement of Building 4708 that has been operational since 1960. Flow into the unit, which is approximately 4 ft by 4 ft by 8 ft deep, is through two pipes approximately 2 inches in diameter. The sump is served by two pumps that discharge to the sanitary sewer system. The sump was connected to laboratory sinks in Building 4708 when it was first installed. It was suspected that the site had mercury waste disposed in it, according to a former employee who was interviewed by Harmon Engineering in the 1980s, who had worked in the building.

Currently, flow from the floor drains and bathroom sinks located inside the building enters the sump. The quantity of liquids entering the sump, as well as the date when flow from the laboratory sinks to the sump was terminated, is unknown. There are no reported releases from this waste management unit and the sampling performed at the site confirms that no release occurred. In August 2002, NASA submitted an administrative letter documenting the findings at MSFC-036 to EPA and ADEM, in which a status of no further investigation (NFI) was requested for the site. EPA and ADEM concurred with the letter; the site does not warrant any further investigation.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: 4 ft by 4 ft by 8 ft deep

Contaminants of Potential Concern

Mercury

Media of Concern

Subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

No further investigation

Anticipated Future CERCLA Phase

No further investigation

2.5.5 MSFC-037: Building 4767 Holding Tanks

This unit, located east of Neal Road near the intersection with Pogo Road, consists of two non-operational, in-ground, covered holding tanks. According to site plan maps, the approximately 50,000-gallon tanks (total volume) were constructed in 1965. The tanks were used as small neutral buoyancy tanks and then to form explosives used on the Apollo Space Craft hatch for use in the case of an emergency.

MSFC-037 is adjacent to the old Heat Treatment Facility (Building 4767) that now houses the Hazardous Spray Coating Facility. The Silicone Spray Development Facility occupies 400 square ft located in Room 2 of Building 4767. The facility, activated in 1981, is capable of performing research and development processing of high-temperature, silicone-based ablatives. The facility is explosion proof and designed for use with flammable solvents. It is equipped with a water wash spray booth used to entrap airborne flammable and toxic wastes generated during spraying operations, stainless-steel lay-up tables, chemical fume hood, pump to supply spray gun, two built-in solvent storage cabinets, and other related equipment such as mixers, pressure pots, spray guns, spray nozzles, hoses, and measuring devices.

Building 4767 houses the High Temperature Heat Treating Furnace along the northern side of Room 1. Activated in 1965, the facility consists of an electric high vacuum furnace with a working chamber 30 inches in diameter and 48 inches high, capable of temperature ranges from 0 to 2,200 degrees Fahrenheit (°F) and vacuum up to 10^{-5} torr (1 millimeter mercury). The high vacuum furnace, called an Abar (Abar-Ipsen), was used for heat-treating metals. According to a NASA personnel interview, Argon was used in the process of heat treating the metals.

NASA currently is responding to Agency comments on the Final OU-5 RI Report. It currently is anticipated, on the basis of the existing data, that no further investigation or remedial actions will be required at MSFC-037. However, if the data collected indicate that an unacceptable risk is present because of the activities conducted at MSFC-037, the CERCLA process will be followed and the risk will be reduced to an acceptable level, either through institutional controls or through the implementation of a remedial action.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: Two tanks,
50,000-gallon total capacity

Contaminants of Potential Concern

VOCs

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.5.6 MSFC-054: Site of Former Beryllium Metal Machining Facility

The DA constructed former Building 4741 in 1943 southwest of the intersection of Rideout Road and Titan Street. Building 4741 functioned as a Beryllium Facility, in which raw stock beryllium was cut, drilled, and shaped into guidance components (primarily gyroscopes). By 1959, Building 4741 was referred to as the Gyro Shop. Beryllium dust, generated in the building during machining operations, was handled through a ventilation system. The ventilation system carried beryllium dust to a collection unit outside of the building on the western side. In addition, the metals scraps were collected on the western side of the building in a drum.

Building 4741 was transferred to NASA in 1960 and functioned as the Propellant Laboratory, which performed the Astrionics Division's beryllium machining and fabricating of printed circuit components. A building schematic indicates that during this time, the building contained a Balance Room, Gear Room, and six laboratories.

A NASA engineering drawing from 1964 indicates that Building 4741 contained a Chemical Treatment Room adjacent to (west of) an Encapsulation Machine Room. The drawing shows that the Chemical Treatment Room was designed with four depressed areas in the flooring equipped with numerous floor drains, hub drains, and clean-outs, which were all connected to the industrial sewer.

A 1967 photograph reviewed in 2008 indicated a relatively small drum storage area off the southwest corner of the former Building 4741. The drums are depicted in both horizontal and vertical positions.

NASA currently is responding to Agency comments on the Final OU-5 RI Report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-054.

Status

Surface Media OU: 5
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

Arsenic, PAHs, and PCBs

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design,
and remedial action

2.5.7 MSFC-088 and 089: Building 4760 Ventilation Trench and Cyanide Waste Tank

Building 4760 was constructed in the late 1950s (1957 to 1959) as the Surface Treatment Facility Building for metal surface treatment and chemical plating activities.

2.5.7.1 Surface Treatment

The surface treatment area is equipped with the following lines for metals cleaning:

- Aluminum Line
- Steel Line
- Chemical Milling Line

The Aluminum Line (north line) is located along the northern wall, the Steel Line (middle line) in the central area, and the Chemical Milling Line (south line) along the southern wall of the building.

The Surface Treatment Shop used a series of 17 tanks equipped with overhead cranes to perform various surface treatments including cleaning for painting, cleaning for resistance welding, chromate conversion coating, pickling, passivating, deoxidizing, decrusting, and phosphating. Two vapor degreasers (one 24 ft long by 6 ft wide by 10.5 ft deep and the other 20 ft long by 5 ft wide by 7.5 ft deep) remove greases and oils before surface treatment. At its maximum operating capacity during the 1960s, the building operations required the use of about 500 gallons of PCE per month.

2.5.7.2 Metals Plating Shop

The Plating Facility consists of a general plating shop, buffing room, and rectifier room used in performing electroplating of chrome, copper, bright nickel, cadmium, and gold; types I, II, and III anodizing and dyeing of aluminum; electropolishing of stainless-steel and copper alloys; black oxide coating of stainless steel, copper alloys, and mild steels; and bright dipping and electrocleaning of various metals and alloys. The facility uses a series of 90 tanks that vary in size from 14 inches to 7 ft long, from 14 inches to 4.5 ft wide, and from 12 inches to 4 ft deep, equipped with special linings and capabilities for heating, cooling, and agitation of process solutions.

The facility also is equipped with two vapor degreasers, one with 29-inch by 47-inch by 31-inch-deep dimensions and the other with dimensions of 6 ft by 2.5 ft by 4 ft deep. The larger degreaser has a 43.6-gallon PCE capacity, with a 33-gallon-per-month usage rate.

2.5.7.3 Painting Facility

The Painting Facility, activated in 1960, is located in the western portion of Building 4760 and occupies an area of 2,850 square ft. The 240-square-foot spray booth is used as a multipurpose paint area, while the larger 1,300-square-foot spray area performs large parts painting requiring clean room conditions. The Class 100K clean room occupies 814 square ft located in the southern part of the shop and is used primarily for thermal control paint application. Also located in this area is an 80-square-foot, walk-in bake oven used to cure high-temperature paints. Other facility equipment includes eight stencil machines for parts identification and sign manufacturing, an airless spray gun used for painting large parts, and a paint shaker. A separate storage shed (Building 4756) located south of Building 4760 stores daily-use items including paints, solvents, thinners, and primers.

Status

Surface Media OU: 5
Groundwater OU: 3 (SA-11)
Site Size: 250 ft by 100 ft

Contaminants of Potential Concern

Metals and VOCs

Media of Concern

Subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation NFI for MSFC-089

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.5.7.4 Wastewater Treatment Activities

During the 1950s and through the late 1960s, the waste from the previously described Building 4760 operations was discharged to the industrial sewer. During late 1960s, wastewater flows from the surface treatment facility and plating shop were directed to the former IWTF. The IWTF currently is OU-9 in the NASA CERCLA program. The pipeline that transported the waste to the IWTF was connected directly to Building 4760 and separate from the main industrial sewer. This pipeline was characterized as part of the OU-2 investigation. After the mid-1980s, the wastewater was treated inside Building 4760 until 1998, and the discharge was included in an NPDES permit. Since 1998, the wastewater from Building 4760 has been treated in a batch process in Building 4761, with the discharge regulated under a State Indirect Discharge permit. The pipeline that connects Buildings 4760 and 4761 is not associated with the industrial sewer.

2.5.7.5 MSFC-088 and 089

The concrete ventilation trenches (MSFC-088) in Building 4760 originally were intended to convey air pulled from the top of the cleaning and plating baths to the atmosphere. The trenches are sloped to drain from the central portion of Building 4760 toward the south. Along the southern edge of the building, the trenches contain sumps that overflow to manholes connected to the industrial sewer (MSFC-052). The concrete in the base of the sumps has degraded so that the underlying soil is exposed.

The cylindrical, 520-gallon cyanide waste tank (MSFC-089) was installed in 1971 and currently is non-operational and empty. The tank is 8 ft tall and 3 ft in diameter, and is supported by a 4-ft by 4-ft, 1-ft-9-inch-thick concrete pad. The tank is beneath the pavement south of Building 4760 in a concrete containment structure. The contents have been disposed as hazardous waste. The quantity of waste stored and frequency of tank content disposals while it was active are unknown. There are no records of releases from this tank. In August 2002, NASA submitted an administrative letter documenting the findings at MSFC-089 to EPA and ADEM, requesting a status of NFI for the site. EPA and ADEM concurred with the letter. Further investigations that might need to be conducted in the area of MSFC-089 will be completed as part of the MSFC-088 investigation.

Currently, the data collected to date indicate that a vadose zone PCE plume exists in the southern parking lot of Building 4760 and possibly beneath the building. In addition to the vadose zone PCE plume, the groundwater also contains CVOCs and is designated as SA-11. It is likely that the plume originates from beneath the building; however, operational constraints and the presence of copious utilities restrict collection from beneath the building. An interim action for subsurface soil contamination detected beneath MSFC-088 was in the pre-implementation stages during the 2000 to 2002 timeframe. Soil vapor extraction with pneumatic fracturing and hot air injection is the recommended interim action at MSFC-088 to reduce the concentrations of PCE and TCE. Additional information regarding the implementation of this alternative is provided in the *Final Interim Remedial Action Plan MSFC-088 and 089* (NASA, June 2000). However, NASA decided to postpone the action until the OU-5 field investigation is completed. (Note that since that plan was written, MSFC-088 and 089 have been separated, and MSFC-089 is no longer part of the action being taken at MSFC-088.) NASA currently is responding to Agency comments on the Final OU-5 RI Report.

The anticipated future remedial action at MSFC-088 (SA-11) will address the vadose zone PCE contamination detected in the soil. It is believed that the PCE is originating from beneath the building; currently, it is prohibitive to collect samples from underneath the building. Additional characterization will be required before a remedial action is implemented; the schedule for the supplemental sampling work will depend on NASA's plans for Building 4760. In addition, a VOC groundwater plume that contains PCE from upgradient areas of the facility extends beneath the site (and SA-11); its interaction with the soil PCE contamination (if any) beneath the building will need to be evaluated before the remedial action is selected.

2.5.8 MSFC-094 and 052c: Building 4705 West Clean Room and North Satellite Waste Accumulation Area (including the Industrial Sewer West of Building 4705 and North of MH-105N)

MSFC-094 includes the tube cleaning area on the western side of Building 4705 and the industrial sewer that is beneath this area. The second area also identified as part of MSFC-094 is a former drum storage area on the northern side of the building. MSFC-052c is the portion of the industrial sewer located in MSFC-094.

2.5.8.1 Western Side of Building 4705

The western side of Building 4705 is paved and there are various storm drains and sewer manholes. A 500-gallon TCE tank and a 12,000-gallon DI water tank are located on the western side of Building 4705 in this area. Facilities inside Building 4705 adjacent to the source area include a solvent storage and recovery room and a clean room with a tube cleaning area.

Both TCE and PCE have been used in the tube cleaning area located in the western part of Building 4705 since its construction in 1960. The current solvent storage and recovery room was formerly the TCE room, which contained two TCE tanks (one for new TCE and one for used TCE) and associated pumps for circulating the TCE to the tube cleaning area. It is not known if used TCE from this room was contained for disposal or discharged to the industrial sewer. This room currently is used for the storage and recovery of trichlorofluoromethane (Freon).

Both the tube cleaning area and the former TCE room have floor drains that probably received incidental spills and other discharges of solvents. Floor drains in these two areas discharge to a sump located in Room E-8 on the western side of Building 4705. This sump discharges to the industrial sewer on the western side of the building.

PCE-contaminated condensate from a fume hood over the PCE vapor degreaser formerly was discharged to the storm sewer. From 1960 to 1986, condensate from this fume hood was piped to an underground condensate cooling pit on the western side of Building 4705 at the northern end of the DI water tank. Overflow from the condensate pit discharged to the storm sewer on the western side of the building. In 1986, a condensate return system was installed for the fume hood to stop the discharge of PCE to the storm sewer. The condensate pit was left in place, but all lines entering the pit were capped. In addition, two laboratory sinks in the tube cleaning area discharge to the storm sewer on the western side of Building 4705. NASA has re-routed these sink discharges to the sanitary sewer.

A significant amount of hydrogeologic, subsurface, and groundwater data has been collected beneath this part of the MSFC-094 area, as part of the former *in-situ* treatability studies for the SA-12 source area. TCE and Freon were the primary constituents detected in the subsurface on the western side of the building.

2.5.8.2 Northern Side of Building 4705

A concrete pad north of Building 4705 is connected to the building by a concrete walkway. An abandoned paint shop (Building 4703) also is located in this area. According to NASA personnel at MSFC, the concrete pad on the northern side of the building was a former waste storage area. Wastes, including solvents and oil, formerly were stored in drums on this pad.

Building 4703, constructed in 1954, is a former spray paint booth used by the DA to paint missiles assembled in Buildings 4705 and 4706. According to MSFC personnel, the booth has been inactive for more than 30 years. In addition, MSFC personnel indicated that the manufactured missiles probably were cleaned with TCE in the paint booth before painting. The paint booth formerly had two water treatment towers. A sump in the floor in the

Status

Surface Media OU: 5
Groundwater OU: 3 (SA-12 and SA-13)
Site Size: 1 acre

Contaminants of Potential Concern

PAHs and PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

center of the booth collected wastewaters generated in the booth. Air circulated through the sump to the water wash towers through an air vent. The circulated air carried the water in the sump to the water washing equipment located in the towers. Each tower had a water reservoir in the base to collect the water after it passed through the water washing equipment. Engineering drawings of the water wash towers show that they functioned similarly to an air stripper, which indicates that their purpose may have been to remove volatile organics from wastewater generated in the paint booth.

It is anticipated that an action will be needed for the COCs present in the soils (surface media) such as PCBs and BaP at Building 4705. In addition, the area, including soils, will be remediated for VOC contamination as part of the OU-3 investigation, because a groundwater SA exists beneath the site.

2.6 OU-6: Northeast Areas

OU-6 includes soil, sediment, and surface water at 10 sites north of the test areas and east of Rideout Road. Groundwater from these sites is being addressed under OU-3. [Table 2-7](#) lists the sites in this OU.

TABLE 2-7
OU-6: Northeast Areas
NASA MSFC Site Management Plan

Site No.	Site Name
MSFC-029	Photograph Lab Satellite Waste Accumulation Area
MSFC-066	Building 4347 Surface Drainage
MSFC-070	Vehicle Wash Rack and Oil/Water Separator
MSFC-075	Product Storage/Waste Accumulation Area near Building 4677
MSFC-081	Paint Spray Booth at the M-1 Storage Area
MSFC-083	Groundskeeper/Future Area 4348
MSFC-084	Auto Paint Shop 4480
MSFC-085	Paint Shop 4682
MSFC-093	Building 4487 Sump Area
MSFC-F	Storage Area West of Building 4650

Note:
MSFC = Marshall Space Flight Center

The CERCLA sites in OU-6 have been grouped together because of their geographic proximity to provide a more comprehensive and consolidated approach to remediation. The proposed path forward for OU-6 is as follows:

- Finalize an RI Report
- Prepare and submit the OU-6 FS
- Prepare and submit a revised PP for OU-6
- Hold a public comment period
- Address public comments as appropriate in the ROD
- Prepare and obtain agency approval of an OU-6 ROD
- Submit the remedial action schedule, if needed
- Implement the remedial action, if needed

2.6.1 MSFC-029: Photograph Laboratory Satellite Waste Accumulation Area

Building 4353, constructed in 1941, is northeast of the intersection of Morris Road and Digney Road. The building is co-located with MSFC-034 (DA-responsible site) and MSFC-052b, and was used to generate ethylene, which is a raw material for the manufacturing of mustard. Ethylene is manufactured by vaporizing ethyl alcohol and then compressing it to 35 psi, cooling it, and drying it. Fuel oil was used in the process to vaporize the ethyl alcohol. Ethyl alcohol and fuel oil were received either by rail or from the bulk storage area that was located in the current M-1 yard. Each ethylene generation building had two underground fuel oil tanks and four ethyl alcohol tanks. The building was equipped with floor drains and trenches that drained condensate into the industrial sewer.

The building was transferred to NASA in 1960. MSFC-029 is a satellite waste accumulation area for the photographic laboratory. The unit is located outside the photography laboratory near the northern side of Building 4353. The surface at the former waste storage area is paved with asphalt, which extends 45 ft to the north. Surface runoff flows north to a grassy area, then to a grassy, clay-lined ditch in which water flows to the east, then to a culvert that flows south beneath the building. Storm water runoff from north of this area also flows into the ditch. The drainage ditch is joined by other ditches that lead from MSFC-066 and 083. The building was extended and the outdoor waste accumulation area is now located with the building. The wastes managed indoors consist of waste fixer solution and acetic acid, waste sodium dichromate, sulfuric acid, ammonium thiosulfate, and perchloroethane.

The previous samples collected at MSFC-029 indicate that PAHs exceed the criteria in the ditch. The parking lot at Building 4353 was paved just before the sample collection effort, which probably is the reason for the elevated PAHs.

NASA currently is responding to Agency comments on the Draft Final OU-6 RI Report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-029.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 50 ft by 100 ft

Contaminants of Potential Concern

Metals and VOCs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.2 MSFC-066: Building 4347 Surface Drainage

Building 4347 is an observatory that has two clay-lined drainage swales approximately 2 ft wide and 2 ft deep. The wet weather swales are on the eastern and western sides of the building. The two ditches combine on the southeastern side of the building and flow south into two depressions, both of which are native clay and connected in series. The depressions are approximately 100 ft in diameter and 3 to 5 ft deep. Storm water flows from the basin through a concrete pipe and into a second drainageway. The water then flows south near the groundskeeper area (MSFC-083) and into a ditch near MSFC-029, then flows south through a buried culvert under the photographic laboratory. A few metals and PAHs detected south of MSFC-083 probably are from that area.

NASA constructed Building 4347 in 1969 as the Telescope Mount facility. The telescopes used for solar observations were located in the dome at the top of the Building 4347 tower. Before the construction of the Telescope Mount facility, Building 4347 was used as a test stand facility in the early- to mid-1960s. Historical photographs discovered in 2008 show activities at the Building 4347 tower in 1964. There is no further information available about the type, frequency, or material involved in the test operations at this building. The equipment and observations made in this building since it has functioned as the Telescope Mount facility do not entail the use of chemicals. Previous investigations at MSFC-066 did not detect chemicals at concentrations that would prohibit unrestricted use of this area of MSFC except in the southernmost reach of the site, which probably is associated with the MSFC-083 activities. PAHs were detected in the ditch at concentrations that exceeded the residential risk criteria, but not the industrial criteria.

NASA currently is responding to Agency comments on the Draft Final OU-6 RI Report. It is anticipated that NASA either will conduct a remedial action at MSFC-066 to clean up the soil to residential standards or will implement LUCs at the site.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 1 acre

Contaminants of Potential Concern

Metals and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.3 MSFC-070: Vehicle Wash Rack and Oil/Water Separator

This unit, an OWS associated with a vehicle wash rack, has been operational since the early 1960s. The wash rack, approximately 75 ft long by 15 ft wide with 4 inches of concrete curbing on the northern and southern sides, is located south of Building 4482 on Solar Circle. The concrete OWS is 2.5 ft by 2.5 ft and 4 ft deep with a metal top. The OWS received wastewater from vehicle and machine part cleaning operations at the vehicle maintenance shop. The wastewater contains oil and grease, and may contain other hazardous constituents such as solvents.

The four drains in the wash rack all are connected to an 8-inch vitrified clay pipe that runs northwest for approximately 100 ft to the OWS. Water then leaves the OWS and continues to the sanitary sewer. Originally, the water flowed directly into the storm sewer and then daylighted at drainage ditch DSN007. According to aerial photographs and an interview with a long-term employee, the OWS was added in the late 1970s. In the mid-1990s, the OWS was re-piped to flow into the sanitary sewer. The only structure tied into the OWS is the wash rack. In the initial samples collected at this site, Aroclor-1260 and BaP were identified as COCs. It is anticipated that a remedial action or LUCs will be required at this site.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

VOCs, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.4 MSFC-075 and 085: Product Storage and Waste Accumulation Area near Building 4677 and Paint Shop 4682

MSFC-075 is an active product and waste storage area. The unit, located near the geographic center of the arsenal near Building 4677, consists of a fenced area approximately 50 ft by 50 ft. Barrels of propylene glycol currently are managed there. Past use may have included the storage of waste paint and solvents, waste paint cans, and contained asbestos.

MSFC-085 lies directly south of MSFC-075 at Building 4682. This unit is a storage area for waste paint and solvents. Building 4682 contains flammable chemical products (paints and solvents), as indicated by the National Fire Protection Association. A small shed south of Building 4682 is used to store herbicides and pesticides. During a VSI in the mid-1990s, blasting grit was observed on the ground over part of the area.

The drums located in the two sites are stored on wooden pallets underlain with concrete or gravel. Surface water from the sites appears to flow toward the north and the west. A storm drain is located on the northwestern corner of the area. The samples collected at the site to date do not indicate the presence of chemicals at levels that would pose a risk.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

VOCs, SVOCs, metals, herbicides, and pesticides

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field Investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.6.5 MSFC-081: Paint Spray Booth at the M-1 Storage Area

MSFC-081 is an active sandblasting and paint spray booth located in the M-1 Storage Area near Observatory Road. The frequency of sandblasting events is unknown. The concrete pad and metal building used for sand blasting operations are approximately 50 ft by 50 ft. The M-1 yard where MSFC-081 is located is approximately 6.8 acres. Sandblasting residue (“black beauty,” an iron oxide grit) was observed on the concrete around the paint spray booth. The area surrounding the booth is covered with a compacted aggregate base. Storm water runoff will flow north, west, and south, discharging into a grassy ditch that is clay lined, 30 ft wide, and 6 ft deep. The drainageway is dry except during rain events. Flow in the ditch is in a southeastern direction, where it eventually exits MSFC property. The northern, eastern, and southern sides of the M-1 Storage Area are heavily wooded.

Aerial photographs taken in May 1943 and in February 1956 reveal eight bermed storage tanks where the M-1 Storage Area currently is located. The tanks stored fuel oil and ethanol used to make ethylene by the DA during WWII. These tanks are included as part of the DA’s CERCLA investigation of MSFC-029. A March 1959 aerial photograph shows the M-1 Storage Area as it exists currently. The area around the sand blasting booth and storm water runoff ditch has been sampled. The risk assessment developed using the environmental data collected at MSFC-081 in the Draft Final OU-6 RI Report did not identify any COCs. Therefore, no further investigation of the surface media is recommended for MSFC-081.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size:
M-1 Yard: 6.8 acres
Metal building/concrete pad:
50 ft by 50 ft

Contaminants of Potential Concern

VOCs and metals

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.6.6 MSFC-083: Groundskeeper and Future Area 4348

The current groundskeeper area, located north of Digney Road and east of Morris Road, is a storage area for equipment and chemicals for grounds maintenance. Waste oil from equipment maintenance is stored indoors at Building 4348, along with pesticides. Herbicides are stored in a small (10-ft by 10-ft) building on the southwestern corner of Building 4348. Sidewalk de-icer is stored in a pole barn on the northern side of the site.

Small batches of pesticides (1 to 5 gallons) are dispensed over a sink inside Building 4348 into hand-carried containers. However, larger batches of pesticides and herbicides (more than 20 gallons) are mixed daily over an outdoor covered sink that discharges to the RSA sanitary sewer system. The pesticide batches are then dispensed into 25-, 50-, and 300-gallon containers on trailers. Tractors pull the trailers, and the pesticides are distributed onto fields and grassy areas throughout MSFC. During heavy pesticide and herbicide usage (spring and summer), approximately 300 gallons of pesticides and herbicides are stored in the area. During the fall and winter, fewer than 100 gallons of pesticides and herbicides are present at the facility.

Storm water runoff from the site apparently flows south into the future storage area, eastward into a drainage ditch (now a buried pipe), or northward into an open ditch (MSFC-066). The future area is a fenced, graveled area currently called the "Special Purpose Equipment Pool." The area stores heavy equipment, trailers, and construction equipment. Storm water runoff from this area appears to flow south into an east-west aligned ditch north of Building 4353.

Building 4319 was a small storage shed in the southern portion of the fenced area. A 1967 historical photograph, discovered in 2008, shows drums staged around the building. The contents of the drums are unknown, but they probably contained material used in the operations at Building 4348.

Aerial photographs taken in May 1943 and February 1956 reveal three bermed storage tanks in the vicinity of the groundskeeper and future storage area. The tanks stored fuel oil and ethanol used to make ethylene by the DA during WWII. These tanks are included as part of the DA's CERCLA investigation of MSFC-029 (co-located with MSFC-083 and MSFC-081). A March 1959 aerial photograph delineates the groundskeeper area as it exists to date. The initial samples collected at the site showed low-level detections of PAHs and PCBs, which may require a remedial action.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 150 ft by 100 ft

Contaminants of Potential Concern

SVOCs, PCBs, pesticides, and herbicides

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.7 MSFC-084: Auto Paint Shop 4480

MSFC-084 is an indoor auto paint shop located in Building 4480 east of Morris Road and south of Mercury Road. The building is equipped with supplied air for the workers to use during painting operations. The filtered exhaust vents are located on the roof of the building. A 2-ft-wide, 6-inch-deep concrete channel is located along the northern and western sides of the building. The channel contains grass and weeds and apparently overflows toward the south into a small grassy area located in the south parking lot. Storm water overflow from the concrete channel migrates southeast across the pavement and onto the grass lawn. This area, approximately 225 ft long by 25 ft wide, is the most susceptible to contamination because it receives storm water runoff from the paved areas. Currently, 55-gallon drums of waste paint cans, paint, and solvents are stored in the building. However, past practices at the paint shop included the storage of the drums on the asphalt pad on the western side of the building adjacent to the doors. One 55-gallon drum of waste solvent is filled every 6 months, including paint thinners, reducers, and retarders. On average, 90 gallons of paint and 20 gallons of solvents are stored at the site.

The initial samples collected at this site have identified BaP as a COC. It is anticipated that a remedial action or LUCs will be required at this site.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 225 ft by 25 ft

Contaminants of Potential Concern

VOCs, SVOCs, and metals

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.8 MSFC-093: Building 4487 Sump Area

This potential source area is located between the B and C wings of Building 4487 (Astrionics Laboratory), northeast of the intersection of Martin Road and Rideout Road. The DA constructed this building in 1954. Asphalt covers this area and surface drainage is to the south. A sump approximately 4 ft by 4 ft by 5 ft deep and a diesel-powered generator are located in the area. Historical photographs from the 1960s show drums stored near the north wing of Building 4487. The contents of these drums were unknown, but they probably were associated with laboratories in Building 4487. Current facilities inside Building 4487 that are adjacent to this area are the laser optics laboratory, the electronics laboratory, and the electrical integration laboratory. There is a loading dock along the outside of the laser optics laboratory. TCE has been detected in the groundwater adjacent to the sump at concentrations indicating that the sump is a source. TCE was used in Building 4487, but not near the location of the sump.

The floor drains and sinks in laboratories and other operations in the building are connected to the industrial sewer. The significant laboratory activities that may have contributed to the industrial sewer included an Inertial Sensor and Stabilizer Development facility, Microelectronic Development and Repair Shop, Space Shuttle Main Engine Hardware Simulation Laboratory, and a Battery Service Area.

NASA currently is responding to Agency comments on the Draft Final OU-6 RI Report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-093.

Status

Surface Media OU: 6

Groundwater OU: 3

Site Size: 4 ft by 4 ft by 5 ft deep

Contaminants of Potential Concern

VOCs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search

Work Plan Addendum

Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.6.9 MSFC-F: Storage Area West of Building 4650

MSFC-F is an equipment storage yard located west of Building 4650 near the intersection of Fowler Road and Morris Road. The yard is a half-paved and half-gravel area underlain with compacted gravel and clay. The western side of the storage pad consists of a 5-ft-wide grassy area that extends in a north-south direction adjacent to the western fence line. Storm water apparently flows west off the gravel pad onto the grassy area. The storm water then appears to flow south in the grass and exits the southwestern corner of the storage area. The southwestern corner of this grassy area is eroded. The storm water continues to flow in a southwesterly direction after exiting the site to a ditch connected to MSFC-067. The storage area has been used as a laydown area for large metal parts such as pipes and equipment to move these large metal items. During the 1980s, a few paint cans were observed in the area, but they were sealed. According to personnel who work in the building, the storage area has not been used to store chemicals used in the shops in the building. For informational purposes, the shops located in the building are described in the following text.

Building 4650 primarily is used as a machine shop for the base maintenance contractor. The Support Shop Facilities housed in Building 4650 included the Machine Shop, Shop Fabrication, and Field Fabrication, each 22,000 square ft in area. The Machine Shop is equipped with various machining devices including boring mills, small precision drilling machines, surface grinders, shapers, saws, and a 20-ton overhead crane. In addition, the Shop Fabrication and Erection area contains types of welding, metal forming, and pipefitting operations. Facility equipment includes gasoline welding machines; sigma, submerged arc, short arc, plasma arc, and portable heliarc cutting machines; metal rolling and shearing machines; press brakes; beveling and nibbling machines; power saws; and a 3-ton overhead crane. The Field Fabrication and Erection Area is devoted to large fabrication and assembly. The facility is equipped with a 40-foot-high bay area, a 25-ton overhead crane, two 10-ton cranes, and tie-down fixtures for welding. Machining equipment includes power punching and abrasive cut-off machines, a power hacksaw, oxygen and acetylene cutting equipment, electric welding equipment, portable air compressor, and pneumatic tools. Mobile equipment includes large tractors and trailers with 100-ton capacities, as well as mobile cranes from 10- to 30-ton capacities.

Other laboratories in the building include the Instrumentation Development Laboratory, Electronics Laboratory, Flow and Level Laboratory, Instrument Design Laboratory, Pressure and Thrust Laboratory, Temperature and Physics Laboratory, Force Laboratory, Flow Meter and Load Line Calibration Facility, and a Measuring Instrumentation Laboratory, Acoustics. Tests were not conducted in these laboratories; however, the instrumentation used throughout MSFC was repaired or calibrated in these laboratories.

Samples have been collected throughout this storage yard at MSFC-F. The results do not indicate that a chemical release has occurred from this area.

Status

Surface Media OU: 6
Groundwater OU: 3
Site Size: 1.5 acres

Contaminants of Potential Concern

Metals

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase FS, PP, and ROD

2.7 OU-7: Satellite Waste Accumulation Areas

This OU has been deleted. All sites have been moved to OUs-1, 5, 6, 8, or 13.

2.8 OU-8: Petroleum Sites

OU-8 is composed of sites where petroleum-based waste was managed, mainly compressor oil or fuel oil. [Table 2-8](#) lists the sites contained in this grouping. Groundwater associated with this OU is addressed under OU-3, except for three sites located at the RSA Airfield (MSFC-033, -043 and -068).

TABLE 2-8
OU-8: Petroleum Sites
NASA MSFC Site Management Plan

Site No.	Site Names
MSFC-033	Satellite Waste Accumulation Area for Building 4815
MSFC-038	Building 4656 Oil Trap and Drainage Area
MSFC-041	Waste Anderol Storage Tank for Building 4744
MSFC-043	Waste Oil Trap for Building 4816
MSFC-058	Waste Anderol UST and Unloading Area for Building 4747
MSFC-059	Waste Anderol UST and Unloading Area for Building 4647
MSFC-068	Building 4815 Surface Drainage
MSFC-092	Building 4435 Former Taxi and Bus Refueling Area

Notes:
MSFC = Marshall Space Flight Center
UST = Underground storage tank

The sites in this OU are grouped together as a single OU because contaminants, if found, are likely to be similar. MSFC-042 was moved to OU-1 because of its geographic location and other OU-1 sites that were connected to this site via drainageways. The proposed path forward for OU-8 is as follows:

- Obtain agency approval of an OU-8 ROD
- Submit the remedial action schedule
- Implement the remedial action

2.8.1 MSFC-033: Satellite Waste Accumulation Area for Building 4815

MSFC-033 serves as a waste accumulation area for wastes generated at the NASA Maintenance Supply Operations at RSA Airfield Buildings 4815, 4816, and 4817. The unit has been in operation for approximately 10 to 15 years and is located on the eastern side of Building 4815. MSFC-033 consists of an approximate 3-foot by 16-foot concrete apron. Wastes are collected and transferred to the MSFC Hazardous Waste Container Storage Area before offsite disposal.

Wastes include JP-4 fuel, mineral spirits, EMC-13 cleaner, Formula 512M mixture, and sandblast residue (including metals). No releases were identified in the available file material. However, during the VSI, some light staining was observed on the nearby grass. During a March 1995 site visit, there were no apparent stains on the concrete pad or the nearby grass. A secondary containment unit (clam shell) with a locking valve for drainage was used to support drums stored at the unit. The storm water runoff pathway appears to be along a concrete 3- to 5-inch curb on the eastern side of the apron. The curb is sloped toward the south and forms a confluence with the drainage associated with MSFC-043. Storm water from this confluence flows toward the east to MSFC-068.

The samples collected at MSFC-033 indicated that PAHs and Aroclor-1254 detected at the site would prohibit unrestricted land use, but the risk showed that industrial risk standards were met. During early 2010, the DA extended the hangar at the RSA airfield, and the new foundation is located in the former area of MSFC-033. The DA has developed a sampling plan to evaluate the soils beneath and in the vicinity of MSFC-033. The Agencies currently are reviewing the sampling results.

Status

Surface Media OU: 8
Site Size: 3 ft by 16 ft

Contaminants of Potential Concern

VOCs, metals, PAHs, and PCBs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.2 MSFC-038: Building 4656 Oil Trap and Drainage Area

Building 4656 was built in 1965 as the Hydraulic Equipment Test Facility. Oil is used in the building. Two sumps collect compressor drainage and other oil discharges. Trenches throughout the building are pipe and conduit trenches; they are not used to collect water or other liquids from within the building and are generally dry. The oil currently is piped via aboveground piping to an AST on the southern side of the building. The tank was installed in 1995 after ADEM developed the storage tank program. Furthermore, the AST has been used to store hydraulic oil, which does not contain any CERCLA constituents (in 1995 when the tank was installed); therefore, it was excluded from the CERCLA program. Two USTs were on the eastern side of the building—one was a diesel product tank and the other was a used oil tank. There also was an OWS on the southwestern corner of the building. This former OWS was the original MSFC-038.

The former 250-gallon OWS was operational from the mid-1970s to 1994. It was not completely underground—a portion of the 3-foot-diameter OWS was exposed on the side of a drainage ditch. The OWS was removed (along with the associated piping) under the ADEM UST Program in 1995. A drainage is oriented in a north-south direction on the western side of the building past the former OWS. The upper reaches of the drainage received the storm water from the building roof drains; the lower reaches received the water from the former OWS and also could have received some spills or overflows.

On the eastern side of the building were a previously mentioned product UST and a used oil UST. The product tank, installed in 1965, contained diesel fuel for the building's boilers; it is not part of the CERCLA program because of the petroleum exclusion rule. The 6-ft-long, 2-ft-diameter, used oil UST was installed in 1972 and closed in 1994 under the ADEM UST program. Some of the piping was left in place. The used oil tank, estimated to be 140 gallons, was used to store used hydraulic oil. The tank was located 3 ft below ground surface (bgs).

On the basis of sample data collected for this site and the results of the risk assessment in the RI Report, it is anticipated that no actions will be needed at this site under CERCLA.

Status

Surface Media OU: 8
Groundwater OU: 3
Site Size: 0.5 acre

Contaminants of Potential Concern

VOCs, Metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

ROD 5-year review

2.8.3 MSFC-041: Waste Anderol Storage Tank for Building 4744

Air compressors were located in Building 4744. Between 1960 and 2002, oil compressor blowdown (waste anderol) was generated from this process and collected in a trench. The blowdown was discharged to the industrial sewer until 1981. In 1981, the blowdown was piped to a new 10,000-gallon AST (the original MSFC-041). The AST is 35 ft long and 8 ft in diameter. The industrial sewer runs beneath to the west of the 10,000-gallon AST at about an 8- to 10-ft depth. The waste anderol was shipped from this AST for offsite disposal. A centrifuge was added inside the building in 1986 or 1987; the water was separated and sent to the sanitary sewer, and the oil continued to be piped to the AST. For a short time, the oil was re-used in the process in the building; from 1987 until the mid-1990s, the oil was again shipped offsite for disposal. Secondary containment (approximately 47 ft long, 20 ft wide, and 3 ft deep) was added to the AST in 1988. A skid-mounted OWS system with secondary containment was added to the AST in the mid-1990s; the water was separated and sent to the sanitary sewer, and the oil continued to be piped to the AST. The OWS is 5.25 ft by 6.25 ft by 9.41 ft, with a narrow bottom. The total capacity of the OWS is 1,190 gallons; of that amount, it can hold 280 gallons of oil.

The activities in Building 4744 ceased during 2002. The building structure was demolished in 2004 (the concrete slab remains in place). The AST and piping were not removed. Since 2002, the AST has been used for oil transferred to it by tanker truck from Building 4607. The oil is shipped offsite for disposal.

A natural, unmaintained clay-lined drainageway, approximately 2 ft wide and 2 ft deep, is located on the eastern side of the tank. The water in the drainageway flows south underneath a road that leads to Building 4744. The water then flows west and offsite. Storm water in the surrounding area flows south into the drainageway. This drainageway also is adjacent to MSFC-021 (OU-5).

PAHs and PCBs were detected in the drainageway located at the site and were the primary risk drivers at the site, as described in the final OU-8 RI Report. A remedial action is planned for MSFC-041 to meet the residential risk criteria.

Status

Surface Media OU: 8
Groundwater OU: 3
Site Size: 1 acre

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil, subsurface soil, sediment, and surface water

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.4 MSFC-043: Waste Oil Trap for Building 4816

MSFC-043 is a former waste oil trap and separator that was in operation from the late 1960s until 1996. It was located on the southern side of Building 4817 (office building owned by the DA) at the RSA Airfield. NASA no longer occupies any of the buildings at the RSA Airfield.

The former waste oil trap and separator consisted of a vertical pipe that was about 3 ft in diameter and had a 50-gallon capacity. It captured overflow spills of JP-4 until 1995 and JP-8 from 1995 to 1996, and also included underground drain line piping. It was removed in 1996 with the associated tanks and drainline and was closed under the ADEM UST Program (Tank IDs 23346 and 23374). The tanks were installed during 1969 and were about 61 ft by 10 ft. Storm water flow from MSFC-043 is toward the east. The water flows across Hale Road to a surface drainage ditch and into MSFC-068.

There is an underground pipe from the corner of Building 4815 (Aircraft Hangar) near MSFC-033 that leads to MSFC-068 via a second pipe. This pipeline contained the chemicals that were used to clean floors and aircraft parts, along with general floor washdown water. This OWS, installed in 1992, has been properly maintained and serviced.

Sampling at MSFC-043 has been completed and the data have been evaluated in an RI Report. The samples collected at MSFC-043 indicated that the PAHs detected at the site would prohibit unrestricted land use, but the risk showed that industrial risk standards were met. During the summer of 2010, an emergency removal action was completed in a ditch at MSFC-043 to prevent storm water from backing up and entering an adjacent building, along with the suspended sediment. NASA has developed a removal action report to document the removal action.

Status

Surface Media OU: 8
Site Size: 50-gallon OWS

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.5 MSFC-058: Waste Anderol UST and Unloading Area for Building 4747

Building 4747 was a compressed air facility built in 1951. Oils that have been used in the operation include Gulf Harmony 59 (1969 to 1978), Pydraul 115E (1978 to 1981), and anderol (1981 to 2001). Sumps in the building collected the blowdown and condensate from compressor operations; these sumps have been filled with concrete.

MSFC-058 is an active unloading area containing a 2,000-gallon, steel UST for the anderol oil. The UST has been in operation since 1970 and is located on the northwestern side of Building 4747. It is 9 ft long by 6-½ ft wide, and the top of the tank is located about 4-½ ft bgs. The UST currently is not used. It was cleaned and filled in place with flowable fill in 1997.

The unloading area is a 3-inch-thick concrete platform approximately 3 ft by 3 ft. The unloading area is surrounded by an asphalt parking area. The parking area is sloped toward the north, and storm water flows into a small depression at the pavement's edge. The concrete depression transports the water approximately 84 ft west to a grassed drainageway, which transports the water north and then to a main drainage ditch for the northwestern portion of MSFC that leads offsite toward Indian Creek.

The UST stored waste anderol from the compressor facility in Building 4747. In the past, waste pydraul, a heavier compressor oil, was managed at this unit. The unloading area serves as a transfer point from the UST to tanker trucks for offsite disposal or reuse.

Also on the northern side of Building 4747 is underground piping for the sanitary sewer, the industrial sewer (MSFC-052), and the anderol UST. The sewer pipelines are about 13 to 15 ft below the ground, and the anderol pipeline is less than 5 ft below the ground. All of the pipelines run parallel to each other along the northern side of the building. There are several locations where the pipelines enter the building.

The building compressor blowdown discharged to the sanitary sewer from 1951 to 1958, to the industrial sewer from 1958 to 1970, and to the anderol UST from 1970 to 1997. The exception is from 1981 to 1997, when the blowdown was pumped out of the tank and transferred via tanker truck to MSFC-041 for either offsite disposal or treatment.

On the southern side of the building, there were once two electrical transformers and a cooling tower. Discharges from both of these had to enter a drainageway that runs westerly along the south of the building and then turns northerly along the western side of the building. This drainageway meets up with the grassed drainageway that transports MSFC-058 releases west and then offsite.

Sampling at MSFC-058 has been completed and the data have been evaluated in an RI Report. PCBs were the main contaminant detected at the site. It also is suspected that this site is responsible for the PCBs that have been detected in the outfall ditch at OU-2. NASA will perform a remedial action at this site to address the risks, which primarily are posed by PCB-contaminated soil.

Status

Surface Media OU: 8
Groundwater OU: 3
Site Size: 2 acres

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.6 MSFC-059: Waste Anderol UST and Unloading Area for Building 4647

Building 4647 was a compressed air facility built in 1966 and demolished in 2003. The building structure is gone, but the slab remains. Oils that have been used in the operation were Gulf Harmony 59 (1969 to 1978), Pydraul 115E (1978 to 1981), and anderol (1981 to 2002). Trenches in the building collected the compressor blowdown and concentrate.

MSFC-059, located adjacent to the eastern side of Building 4647, is a waste UST and unloading area that has been in operation since 1970. The steel UST has an approximate 4,000-gallon volume and is 11 ft long with a 10-foot diameter. The top of the UST is located 3 ft bgs. Waste oil was taken from the UST to MSFC-041 for offsite disposal. The exception to this was the period from 1975 to 1981—it is unclear where the removed oil was taken for disposal during this time. The UST currently is not in use and is empty in place.

Storm water from the area flows over grassy terrain toward the east to a natural, unmaintained clay-lined, 1-foot-wide, 1-foot-deep drainageway. The drainageway then transports the water south. The UST unloading area is located to the west of this drainageway on a 3-inch-thick concrete platform approximately 3 ft by 3 ft. This area serves as a transfer point from the UST to tank trucks for disposal or reuse.

On the southern side of Building 4647 is an underground compressor blowdown pipe that was installed in 1965. The pipeline depth ranges from 1 to 3 ft. The blowdown was discharged to a nearby drainageway and sinking stream. In 1975, a grease trap was installed about halfway down the length of the pipeline.

Also on the southern side of Building 4647 were a portable aboveground 500-gallon tank and 55-gallon drums used for temporary storage of the compressor blowdown. These containers and tank were used when the onsite tanker truck was broken down.

Hardware (nuts, bolts, etc.) storage sheds also are located to the southwest of the building. Activities that could have released chemicals to the environment were not conducted in these sheds.

The field investigation has been completed for this site and the data have been evaluated in the final OU-8 RI Report. PCBs were detected at the end of the compressor blow down pipe at depth. NASA will perform a remedial action at this site to address the risks, which primarily are posed by PCB-contaminated soil.

Status

Surface Media OU: 8
Groundwater OU: 3
Site Size: 2.5 acres

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
Data evaluation

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.7 MSFC-068: Building 4815 Surface Drainage

MSFC-068 is an earthen drainageway located east of Building 4815 and the satellite waste accumulation area for Building 4815 (MSFC-033) at the RSA Airfield. The dates of use of this site are unknown, but the unit was in existence in the 1960s. This surface drainage system extends southeast, where it meets a large channel that extends southwest and ultimately discharges into a tributary of Indian Creek. The unit is approximately 3 ft wide by 3 ft deep. An aerial photograph dated February 1950 delineates the drainage pathway adjacent to Hale Road.

The unit accumulates surface drainage from runoff in the vicinity of the RSA Airfield, the satellite waste accumulation area for MSFC-033, a waste oil trap (MSFC-043), and two fuel USTs (previously removed). Surface runoff from these sources may contain waste oil and fuel. Although no releases were identified in the available file material, dark stains were observed on the bottom of the drainage area during the 1980s.

The field investigation has been completed for this site and the data have been evaluated in the final OU-8 RI Report. A remedial action will be performed in the future in a section of ditch to achieve unrestricted land use at MSFC-068.

Status

Surface Media OU: 8
Site Size: 1,500 ft

Contaminants of Potential Concern

VOCs, metals, PCBs, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

Remedial design and remedial action

2.8.8 MSFC-092: Building 4435 Former Taxi and Bus Refueling Area

MSFC-092 consists of an oil and grease storage building, gasoline USTs, a wash rack, and a pump station for dispensing fuels. The DA constructed it in 1951 as the Sedan Motor Pool. NASA used the facility in the 1960s and 1970s as a taxi and bus refueling station.

This site had one 1,000-gallon and two 750-gallon USTs. The facility was demolished in 1978, when the 1,000-gallon UST and one of the 750-gallon USTs were removed. No environmental investigation or formal closure of these tanks was conducted. The northernmost 750-gallon UST was emptied and left in place because of its proximity to a cooling tower (which has since been removed). In 1994, the tank was removed and a closure assessment for this tank was conducted under the ADEM UST Program. On the basis of the Tank Closure Assessment for Tank 4487, a total of 11 soil samples (1 from the pit bottom and each wall, 3 from the trench, and 3 from the stockpile) were collected and analyzed. The analytical results of the soil samples indicate that no risk exists at the site, per the Alabama risk-based corrective action (ARBCA) evaluation. The site was recommended for no further investigations or corrective actions in 1994; ADEM issued a concurrence letter dated April 12, 1994. The additional soil sampling efforts conducted at MSFC-092 under the SA-9 effort also support the conclusion that the vadose zone soils at the site showed no contamination.

The area is now an asphalt parking lot at the western end of Building 4487. The foundation of the vehicle wash rack is still present at the site. Additionally, a former cooling tower housing foundation and brick walls that were part of the heating, ventilating, and air conditioning system in Building 4487 are still present. The area was paved at the time that the previously listed former facilities were in use.

The industrial sewer (MSFC-052) runs north-south just to the east of this area. The sewer serves Building 4487. At MSFC-092, a storm drain was found during a walk-through at the site adjacent to the wash rack. This drain probably is connected to the industrial sewer.

The field investigation has been completed for MSFC-092 and the results have been evaluated in the OU-8 RI Report. On the basis of the current data, it appears that an action will be implemented at this site because of the benzene, toluene, ethyl benzene, and xylene detected in the groundwater (SA-9) as part of OU-3. The risk assessment developed using the data collected from soil samples did not show a residential or industrial risk at MSFC-092.

Status

Surface Media OU: 8
Groundwater OU: 3
Site Size: 200 ft by 70 ft

Contaminants of Potential Concern

VOCs and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan
Field investigation
RI Report

Current CERCLA Phase

ROD

Anticipated Future CERCLA Phase

ROD 5-year review

2.9 OU-9: Former Industrial Waste Treatment Facility

OU-9 consists of eight sites associated with the former IWTF. [Table 2-9](#) lists the sites contained in this grouping. Groundwater beneath OU-9 is included in this OU.

TABLE 2-9
OU-9: Former Industrial Waste Treatment Facility Sites
NASA MSFC Site Management Plan

Site No.	Site Names
MSFC-044	Industrial Wastewater Treatment Basin
MSFC-045	Concentrate Receiving Tank
MSFC-046	Transfer Tank
MSFC-047	Hydrostatic Dump Lagoon
MSFC-048	Mix Tank
MSFC-049	East Ultimate Lagoon
MSFC-050	West Ultimate Lagoon
MSFC-A	Caustic Storage Tank

Notes:
IWTF = Industrial Waste Treatment Facility
MSFC = Marshall Space Flight Center

The first phase of the IWTF was constructed in the 1960s. This phase included only the Industrial Waste Treatment Basin (IWTB), which received flows from the industrial sewer. The second phase of the IWTF was constructed in the late 1960s or early 1970s. This phase included the remainder of the IWTF (ultimate lagoons, hydrostatic dump lagoon, concentrate-receiving tank, caustic storage tank, transfer tank, and mix tank). This portion of the IWTF was constructed to treat the plating waste from Building 4760.

Three of the units in this OU were closed under RCRA, and a post-closure permit had been applied for to address the groundwater monitoring required for these closed units. This permit has been deferred, in accordance with the FFA, and OU-9 currently is being investigated under CERLCA. NASA has reviewed comments submitted by EPA and ADEM on the ROD and CCED. NASA has collected additional samples in OU-9 to address Agency comments and has submitted a CCED that the Agencies currently are reviewing.

2.9.1 MSFC-044: Industrial Wastewater Treatment Basin

The IWTB (MSFC-044) was operational from 1969 to 1989. The earthen basin was approximately 350 ft by 150 ft and 6 ft deep. The design capacity of the basin was 0.25 mgd. The basin contained three baffles that divided it into four approximately equal cells. The unit originally received clarified water from Building 4760, condensate from the steam evaporator, and flow from the industrial sewer. The IWTB served as an equalization basin in the industrial wastewater treatment system prior to 1985. The flow during this time was approximately 0.15 mgd. After the second phase of construction of the IWTB was completed, the IWTB received only the flow from the industrial sewer. Sodium hydroxide (NaOH) was added to the wastewater to aid in metals precipitation. As a result, metal hydroxide sludges accumulated to a depth of 6 to 8 inches in the bottom of the basin. The liquid from the basin was disposed through an NPDES-permitted outfall on the southwestern side of the basin. The sludges were drummed and disposed at a proper disposal facility.

MSFC-044 was closed in accordance with RCRA regulations and certified as closed in January 1990. This closure currently is being reviewed with respect to the CCED process that will be integrated into NASA's CERCLA program in accordance with the direction provided by the Tier II team in response to the Tier I elevation of this issue. This closure is described in the *Post-closure Permit Application for the Ultimate Lagoons and IWTB* (Harmon Engineering Associates, 1988b).

Existing foundations and structures within the site, as well as the underground piping, were removed before backfilling. A clay cap was placed over the backfill to provide a low-permeability barrier to infiltration. A French drain system was installed along the northern side of MSFC-044 to channel water westward, away from the surface impoundments.

The site was protected from erosion by grassing. A layer of topsoil was placed over the cap and seeded with common Bermuda grass seed. Lime, fertilizer, and mulch also were used to promote grass establishment.

The sampling performed after the closure activities were completed under CERCLA showed detections of PCBs; however, the risk assessment indicated that the site does not pose a risk.

Status

Surface Media OU: 9
Groundwater OU: 9
Site Size: 350 ft by 150 ft and
6 ft deep

Contaminants of Potential Concern

Metals and PCBs

Media of Concern

Subsurface soil and
groundwater

Completed CERCLA Phase

Historical Search, Work Plan,
RI Report, PP, and ROD

Current CERCLA Phase

ROD 5-year review

Anticipated Future

Documentation

Update CCED

2.9.2 MSFC-045 and 046: Concentrate Receiving Tank and Transfer Tank

The concentrate-receiving tank (MSFC-045) is located in the southwestern part of the facility, north of the IWTB (MSFC-044). The tank is approximately 35 ft by 35 ft and 4 to 8 ft deep, with a capacity of 100,000 gallons. It is polyvinyl chloride (PVC) lined and supported by a concrete slab. It was equipped with a level controller and pH sensor. The tank is covered by a roof that provides a 2-ft open space around the unit. The unit was operational from 1969 to 1984, when it collected wastewater from operations in Building 4760 via a 6-inch pipe. The unit received flows from the Building 4760 plating baths, which consisted of pickling and plating liquors, drag-out, and dilute rinse waters. In this unit, wastewater was treated by neutralization and precipitation using NaOH from the caustic storage tank (MSFC-A). The metal hydroxide water slurry was thickened by a dewatering operation that included the use of a steam evaporator. The dewatered sludge was transferred to the ultimate lagoons (MSFC-049 and 050), and the condensate from the steam evaporator was discharged into the IWTB.

The transfer tank (MSFC-046) is a non-operational, in-ground concrete tank that was operational from 1969 to 1984. The transfer tank is approximately 28 ft by 28 ft and 3 to 6 ft deep, and is located in the southwestern part of the facility and north of the IWTB (MSFC-044). The tank has a 5,000-gallon capacity and was equipped with a level controller. The tank received the neutralized wastewater from the concentrate-receiving tank and transferred it to the Evaporator Building. Some metal hydroxide sludge accumulated in this tank. The resulting metal hydroxide sludge from the concentrate-receiving tank (MSFC-045) and transfer tank was routed to the East and West Ultimate Lagoons.

The sampling performed after the closure activities were completed under CERCLA and the risk assessment showed that the site does not pose a risk.

Status

Surface Media OU: 9

Groundwater OU: 9

Site Size:

MSFC-045—35 ft by 35 ft and 4 ft deep

MSFC-046—28 ft by 28 ft and 3 ft deep

Contaminants of Potential Concern

Metals and PCBs

Media of Concern

Subsurface soil and groundwater

Completed CERCLA Phase

Historical Search, Work Plan, RI Report, PP, and ROD

Current CERCLA Phase

ROD 5-year review

2.9.3 MSFC-047 and 048: Hydrostatic Dump Lagoon and Mix Tank

The hydrostatic dump lagoon (MSFC-047) is a non-operational, clay-lined settling lagoon. The unit is approximately 160 ft by 50 ft and 5 ft deep, with a capacity of approximately 1 million gallons. The rinse water and spray paint booth wastewater from Building 4760 were discharged to the mix tank, where the pH was adjusted before the contents were discharged into this unit. In addition, hydrostatic testing waters from Building 4705 were piped to the unit.

The water in the unit was allowed to evaporate and was not discharged to any receiving streams or other treatment units, according to personnel who operated the IWTF, as well as some drawings of the site. However, some drawings show an outlet on the western side of the lagoon.

The concrete mix tank (MSFC-048) is a non-operational tank located on the northeastern corner of the hydrostatic dump lagoon (MSFC-047). The tank is 26 ft by 24 ft and 5 ft deep, and has a 10,000-gallon capacity. After the plating wastes were transferred to the IWTF from Building 4760, industrial rinse water was used to clean out the plating waste residue in the pipes. This unit received the rinse water, along with waste associated with the spray paint booth located in Building 4760. The rinse water was treated with NaOH from the caustic storage tank (MSFC-A) to adjust the pH to a range of 7.0 to 7.5. The water was then discharged into the hydrostatic dump lagoon.

The sampling performed after the closure activities were completed under CERCLA and the risk assessment showed that the site does not pose a risk.

Status

Surface Media OU: 9

Groundwater OU: 9

Site Size:

MSFC-047—160 ft by 50 ft and 5 ft deep

MSFC-048—26 ft by 24 ft and 5 ft deep

Contaminants of Potential Concern

Metals and PCBs

Media of Concern

Subsurface soil and groundwater

Completed CERCLA Phase

Historical Search, Work Plan, RI Report, PP, and ROD

Current CERCLA Phase

ROD 5-year review

2.9.4 MSFC-049 and 050: East and West Ultimate Lagoon

The East Ultimate Lagoon (MSFC-049) was constructed in 1967 and remained in operation until 1975. The lagoon liner was constructed of 4-inch-thick concrete with an impervious, chemical-resistant Hypalon liner bonded to its surface. The rectangular lagoon bottom was 30 ft by 83 ft, and the walls sloped outward toward the top of the basin, which was 123 ft by 70 ft.

The West Ultimate Lagoon (MSFC-050) was in operation between 1972 and 1979. The unit had a PVC liner supported by a soil and sand underliner and a drain system that collected leachate. A roof covering the unit reduced the entrance of rainwater. The rectangular lagoon bottom was 30 ft by 68 ft, and the walls sloped outward toward the top of the basin, which was 99 ft by 61 ft.

The combined usable storage volume of the East and West Ultimate Lagoons was approximately 400,000 gallons. The units were used for dewatering and long-term storage of metal hydroxide sludge and other waste (F006) generated from the wastewater treatment system.

MSFC-049 and MSFC-050 were closed in accordance with RCRA regulations and certified as closed in January 1990. This closure currently is being reviewed with respect to the CCED process that will be integrated into NASA's CERCLA program in accordance with the direction provided by the Tier II team in response to the Tier I elevation of this issue. These closures are described in the *Post-closure Permit Application for the Ultimate Lagoons and IWTB* (Harmon Engineering Associates, 1988).

Existing foundations and structures within the sites, as well as the underground piping, were removed before backfilling. All standing water and sludges were removed and drummed for offsite disposal. Demolished material was broken into small pieces and placed in the lagoons as fill material. The remaining excavation was backfilled with a high clay content, low-permeability soil. A clay cap was placed over the backfill to provide a low-permeability barrier to infiltration.

The site was protected from erosion by grassing. A layer of topsoil was placed over the cap and seeded with common Bermuda grass seed. Lime, fertilizer, and mulch also were used to promote grass establishment.

The sampling performed after the closure activities were completed under CERCLA and the risk assessment showed that the site does not pose a risk.

Status

Surface Media OU: 9
Groundwater OU: 9
Site Size:
MSFC-049—123 ft by 70 ft
MSFC-050—99 ft by 61 ft

Contaminants of Potential Concern

Metals and PCBs

Media of Concern

Subsurface soil and groundwater

Completed CERCLA Phase

Historical Search, Work Plan, RI Report, PP, and ROD

Current CERCLA Phase

ROD 5-year review

Anticipated Future Documentation

Update CCED

2.9.5 MSFC-A: Caustic Storage Tank

The storage tank (MSFC-A) was a caustic UST used from 1969 to 1984. Although not operational, the tank is still in place. This underground, galvanized steel tank is 4 ft in diameter and approximately 10 to 12 ft long. The unit was equipped with a control valve to regulate the inflow of caustic solution to the concentrate-receiving tank (MSFC-045).

The sampling performed after the closure activities were completed under CERCLA and the risk assessment showed that the site does not pose a risk.

Status

Surface Media OU: 9
Groundwater OU: 9
Site Size: 4 ft diameter, 12 ft long

Contaminants of Potential Concern

Metals

Media of Concern

Subsurface soil and groundwater

Completed CERCLA Phase

Historical Search, Work Plan, RI Report, PP, and ROD

Current CERCLA Phase

ROD 5-year review

2.10 OU-10: Confirmation Sampling Sites

This OU has been deleted. All sites have been moved to OUs-1, 5, 6, 8, or 13.

2.11 OU-11: Groundwater Beneath the Test Areas (OU-1)

This OU has been deleted and groundwater is being investigated as OU-3.

2.12 OU-12: Former Stauffer Chemical Plant

OU-12 consists of sites MSFC-022, 052a, 055, 065, D, and E. They are located adjacent to each other in the northern portion of MSFC near the eastern border. The OU is bounded by Digney Road on the south, Morris Road on the east, Neal Road on the north, and Building 4207 on the west. [Table 2-10](#) lists the sites that make up this OU.

TABLE 2-10
OU-12: Former Stauffer Chemical Plant
NASA MSFC Site Management Plan

Site No.	Site Names
MSFC-022	Satellite Waste Accumulation Area for Buildings 4241 and 4244
MSFC-052a	Portion of Industrial Sewer North of MSFC-034
MSFC-055	Site of the Former Stauffer Chemical Company Plant
MSFC-065	Building 4241 Surface Drainage
MSFC-D	Containment Area for Tanks 4234 A, B, and C
MSFC-E	Buildings 4241 and 4244 Product Storage Area

Note:
MSFC = Marshall Space Flight Center

These sites were grouped into an OU because of their locations and proximity. The sites in OU-12 consist of a former building, a nearby drainage ditch, a satellite waste accumulation area, and a product storage area. Under CERCLA, the sites in this OU were originally the DA's responsibility. However, the responsibility for the sites in this OU was transferred to NASA. This transfer has been documented in the NASA and DA MOA. The proposed path forward for OU-12 is as follows:

- Resolve the dispute regarding the ARARs table of the Final OU-12 ROD
- Finalize the Remedial Design Document
- Implement the remedial action

2.12.1 MSFC-022 and MSFC-E: Satellite Waste Accumulation Area for Buildings 4241 and 4244

MSFC-022 is a non-operational satellite waste accumulation area for Buildings 4241 and 4244. The unit began operation in 1984, but activities have since been relocated to the M-I Waste Accumulation Area (MSFC-027). This unit was approximately 400 ft west of Buildings 4241 and 4244 and consisted of a covered asphalt and gravel area surrounded by a chain-link fence. The total area of the unit was approximately 20 ft by 20 ft. Chlorinated solvents, compressor oil, waste Freon, product oil, and miscellaneous debris and paint cans were stored at this unit. Staining was observed in and around the area of the asphalt and gravel pavement during the VSI, and two drums of waste oil were observed outside the fenced area. No staining was noted during a 1992 walkover inspection.

MSFC-E is a product storage area west of Buildings 4241 and 4244 and south of the associated MSFC-022. Product oil in drums was observed on steel saddles at this area during the VSI. The area was in operation during the 1960s, but is now non-operational. During the VSI, the area appeared to have had spillage throughout the gravel-covered ground. According to a 1991 Geraghty and Miller report, the area also was used as a storage yard for the maintenance contractor. An aerial photograph shows a gasoline tank buried a few inches into native soil; staining on the ground indicates that spills occurred in the area around the tank.

In addition, MSFC-022 and MSFC-E included two No. 6 fuel oil tanks that served Building 4241. Railroad cars would unload the fuel oil at a pump station on the southern side of the area and pump the fuel to the storage tanks. The fuel oil was used in Building 4241 to generate the heat required to boil off the water portion of a sodium hydroxide mixture that was a by-product of the chlorine manufacturing process. The area also was used as a Laydown Area, as seen in the 1965 and 1978 aerial photographs, and encompassed the two sites. It appears that the area was covered with gravel as the foundation.

A remedial action will be necessary at the site on the basis of the data in the final OU-12 RI Report. NASA has proposed to remediate OU-12 to residential levels, and there are two areas within MSFC-022/E that will require surface soil remediation and two areas that will require subsurface soil remediation.

Status

Surface Media OU: 12
Groundwater OU: 3
Site Size: 3.5 acres

Contaminants of Potential Concern

PAHs

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field investigation
RI Report
FS
PP

Current CERCLA Phase

ROD, Remedial Design

Anticipated Future CERCLA Phase

Remedial action

2.12.2 MSFC-052a: Portion of Industrial Sewer North of MSFC-034

MSFC-052a is the portion of the industrial sewer located within the boundaries of OU-12. Waste from Buildings 4244, 4241, storage tanks, caustic production area (MSFC-D and associated building), Stauffer Chemical, and the salt production process entered this section of the sewer. The sewer depth ranges from about 7 to 13 ft bgs and the pipe diameter ranges from 6 to 10 inches. The condition of the pipe varies from fair to poor. It currently is not being used, but there are water flows, probably from storm water entering the pipe. A portion of MSFC-052a was removed in 2000 during the construction of the Wellness Center and a second portion was removed in 2009 during the construction of the softball field. NASA has submitted a Removal Action Report to document the removal of the portion beneath the softball field. The remainder of the pipeline identified as MSFC-052a currently remains in place.

The data collected at this site were evaluated in the Final OU-12 RI Report (NASA, 2008). On the basis of the RI Report results, NASA will remove the industrial sewer pipeline and grout the manholes.

Status

Surface Media OU: 12

Groundwater OU: 3

Site Size: 2,500 ft

Contaminants of Potential Concern

PAHs, PCBs, VOCs, pesticides, herbicides, and metals

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search

Work Plan Addendum

Field investigation

RI Report

FS

PP

Current CERCLA Phase

ROD, Remedial Design

Anticipated Future CERCLA Phase

Remedial action

2.12.3 MSFC-055: Site of the Former Stauffer Chemical Plant

MSFC-055 is the main portion of OU-12 in which chlorine gas was generated by the electrolysis of salt in a mercury arc rectifier. The chlorine plants were constructed at RSA to provide chlorine for the manufacture of mustard. MSFC-055 has been divided into the following seven areas for investigative purposes:

- Main Area
- Laydown Area and Southern Interface
- Northeast Area, Salt Area, and Transformer Areas
- Fusion Building and Potential Sodium Hydroxide Area

The process began in the salt area (eastern portion of OU-12), where sodium hydroxide was brought in by rail car and stored in tanks. The salt was then transferred to the main area (central portion of OU-12), where the electrolysis process took place in the presence of mercury in the mercury arc rectifier (Building 4212). This process requires a large amount of electricity and two large transformer banks were located along the eastern area of OU-12 that supplied the power necessary to operate the mercury arc rectifier. One of the transformers was located in the Northeast Area, but no other processes are known to have taken place in this area of OU-12.

Chlorine gas was generated in the process and a waste sodium hydroxide solution was transferred to tanks that are located at MSFC-D. This solution consisted of 50-percent sodium hydroxide. The 50-percent sodium hydroxide solution was transferred to the caustic evaporator unit located in the Fusion Building (Building 4241) and Potential Sodium Hydroxide Area. The fusion plant consisted of 11 pots fired by fuel oil (stored at MSFC-022 and MSFC-E) for cooking the 50-percent caustic to solid caustic.

The mustard manufacturing process (MSFC-034, DA-responsible site) was located just to the south of OU-12. This area was noted as large black areas in the historical aerial photographs. The material in the photographs is unknown, but is believed to be pallets of empty shells. They seem to have been stored in the open fields north of the railroad tracks before being filled at MSFC-034. The Chlorine Plant products were fed to the mustard reactor buildings. The products from the mustard reactor buildings were then fed to the packaging buildings and filled into the empty shells and containers (Buildings 4471 and 4481). The process flowed from north to south for each step of the process. On the basis of the process layout, chemical warfare material would not have been located in this area. This area was named the Southern Interface Area and Laydown Area.

Remedial actions to achieve residential risk criteria will be conducted at MSFC-055. The remedial action selected was removal and disposal, which is planned for the various areas within MSFC-055 as follows:

- Main Area—One area of surface soil and two areas of subsurface soil
- Laydown Area and Southern Interface—One area of surface soil
- Northeast Area, Salt Area, and Transformer Areas—One area of surface soil
- Fusion Building and Potential Sodium Hydroxide Area—No remedial action planned

Status

Surface Media OU: 12
Groundwater OU: 3
Site Size: 32 acres

Contaminants of Potential Concern

PAHs PCBs, and metals

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field investigation
RI Report
FS
PP

Current CERCLA Phase

ROD, Remedial Design

Anticipated Future CERCLA Phase

Remedial action

2.12.4 MSFC-065: Building 4241 Surface Drainage

MSFC-065 is located to the northeast of the Former Stauffer Chemical Plant and overlaps a few areas of the MSFC-055 site previously described. MSFC-065 is located south of Building 4241 in the northern section of MSFC. This open drainage ditch extends southwest approximately 2,400 ft, where it enters an underground channel with related buried shallow drainage pathways. Surface water and storm water drainage from around Building 4241 enters the ditch, where it is routed southwest, then underground, and ultimately discharged into an unnamed creek that connects to Indian Creek. Building 4241 was used for pesticide storage. To date, there have been no known or suspected releases; however, the potential exists that pesticides could have entered MSFC-065 from Building 4241.

The data collected from MSFC-065 indicate that a release, primarily of PAHs, has occurred to MSFC-065. Additional chemicals above the screening criteria also have been detected in the soil in the ditch. On the basis of the results of the final OU-12 RI Report, a remedial action will be necessary for MSFC-065 that will achieve the residential risk criteria. NASA will remove and dispose of the sediment in a CERCLA-approved landfill.

Status

Surface Media OU: 12
Groundwater OU: 3
Site Size: 2,400 ft

Contaminants of Potential Concern

PAHs, PCBs, and metals

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field investigation
RI Report
FS
PP

Current CERCLA Phase

ROD, Remedial Design

Anticipated Future CERCLA Phase

Remedial action

2.12.5 MSFC-D: Containment Area for Tanks 4234 A, B, and C

These tanks were associated with former Building 232. Piping to and from these tanks was overhead. The tanks originally stored 50-percent caustic solution from the Main Area via the day-tanks at Building 232 during their use by the DA, and were converted to fuel oil tanks by NASA. Historical records show that in 1978 (sometime after the caustic process was shut down), NASA constructed an earthen berm around the tanks. The caustic solution stored in these tanks was transferred to the fusion building (Building 4241).

In 1988, the tanks stored diesel fuel. At some point after 1988, a 20,000-gallon diesel fuel spill was reported. The berm was in place, but the spill reportedly reached a drainageway (not specified) near the tanks. The date of this release is not documented. The tanks were removed in 1993. No closure for the tanks was completed. During the tank removal, a pipe in the southwestern area of the tanks was located; it apparently discharged to the drainageway west of the tanks. As-built drawings of the tanks show that the industrial sewer was connected to the tanks on the northeastern part of each tank. As-built drawings also show a loading station south of Tank 234 B at the railroad track. Fifty-percent caustic solution was loaded into the railcars for movement offsite.

A remedial action will be conducted in five areas within MSFC-D. NASA will remove and dispose of the surface soil in a CERCLA-approved landfill.

Status

Surface Media OU: 12
Groundwater OU: 3
Site Size: 3.5 acres

Contaminants of Potential Concern

PCBs, PAHs, and metals

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical Search
Work Plan Addendum
Field investigation
RI Report
FS
PP

Current CERCLA Phase

ROD, Remedial Design

Anticipated Future CERCLA Phase

Remedial action

2.13 OU-13: Central Area

OU-13 is located in the center of MSFC; [Table 2-11](#) lists the sites that make up this OU.

TABLE 2-11
OU-13: Central Area
NASA MSFC Site Management Plan

Site No.	Site Names
MSFC-001	Driller's Mud Disposal Site
MSFC-013	Old Soil/Rubble Dump Site
MSFC-031	Hazardous Waste Container Storage Area
MSFC-057	Unleaded Gasoline Loading Area for Tanks 4632, 4633, and 4636
MSFC-067	Building 4618 Surface Drainage
MSFC-090	Building 4653 Components Support Building
MSFC-091	Building 4638 Maintenance Shop

Note:
MSFC = Marshall Space Flight Center

These sites were grouped into an OU because of their locations and proximity. The sites in OU-13 consist of support buildings with various chemical usage, two containment and loading areas for tanks, hazardous waste storage area, and two disposal sites. The proposed path forward for OU-13 is as follows:

- Revise and finalize an RI
- Prepare and submit an FS
- Submit the PP for OU-13
- Hold public comment period
- Address public comments as appropriate in the ROD or revised PP
- Prepare and obtain agency approval of an OU-13 ROD
- Submit the remedial action schedule, if needed
- Implement the remedial action, if needed

2.13.1 MSFC-001: Driller's Mud Disposal Site

Beginning in 1965 and continuing until 1980, operations at the load test annex in Building 4619 involved the disposal of more than 1 million gallons of dichromate water, which were piped from the middle of the building to a lagoon approximately 1,000 ft south of the building (Industrial Waste Study, 1966). The lagoon, an unlined holding pond with about an 800,000-gallon capacity, was constructed about October 1965. The pond has a valved outlet as a means to regulate the discharge of waste into a nearby ditch, which flows into the WNWR northwest of the West Test Area. The test water contained up to 200 parts per million of sodium dichromate. The test water used at this location was industrial water rather than DI water, which was used at the dichromate testing in Buildings 4707 and 4550. A test at this location required dumping 220,000 gallons of dichromate test water in November 1965. In January 1966, another 220,000 gallons of test water were dumped into the holding pond. Additional water discharges were scheduled and probably occurred, but the exact amount of water involved is unknown. The unit was active until 1980, when 235,000 gallons of barite-based driller's mud were poured into the pond to close the unit. The source of this mud was Building 4699 in the West Test Area (OU-1), where structural testing is performed.

This site formerly was located in OU-10; a site condition summary was presented to the Agencies in August 2004. This site currently is in OU-13.

NASA has submitted the Draft Final OU-13 RI Report and currently is waiting to receive Agency comments on the report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-001.

Status

Surface Media OU: 13
Groundwater OU: 3
Site Size: 800,000 gallons

Contaminants of Potential Concern

Metals

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design,
and remedial action

2.13.2 MSFC-013: Old Soil and Rubble Dump Site

This unit is a 1- to 2-acre construction debris disposal area containing gravel, soils, asphalt, bricks, and concrete. It is located approximately 50 ft west of the Old Moonscape area along an unpaved road running south from Centaur Street. There is no evidence of hazardous waste at this unit. A 1992 walkover found the area west of the road to be under construction, but the area east of the road contained construction rubble. It is not known where the rubble fill originated.

This site formerly was located in OU-10; a site condition summary was presented to the agencies in August 2004. This site currently is in OU-13.

The risk assessment developed using the environmental data collected at MSFC-013 in the draft OU-13 RI Report did not identify any COCs. Therefore, no further investigation of the surface media is recommended for MSFC-013.

Status

Surface Media OU: 13

Groundwater OU: 3

Site Size: 1 acre

Contaminants of Potential Concern

None

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical search

Work Plan

Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, and ROD

2.13.3 MSFC-031: Hazardous Waste Container Storage Area

This unit is the temporary container storage area for hazardous wastes generated at MSFC. The unit has been in operation as a waste storage facility since 1985 and is located on a 7-acre fenced area in the south-central portion of the facility at the western end of Ranger Street. Five large structures are housed onsite. Building 4640 is used for offices and Building 4635-1 just northwest of Building 4640, houses five large bays. Four of the bays each hold a 2,000-gallon storage tank for storage of caustic waste. Waste oil is stored in a large tank to the west of this area.

Building 4635-2, a small covered area, is used to store ignitable (D001) wastes. The area is approximately 25 ft by 25 ft. Smaller areas were observed on the concrete paved area where waste batteries, used drums, and waste containers are stored. Waste soil from the UST program also is stored in this area. The soil is placed on the concrete area and covered by plastic sheeting. Most of the area for storage is paved. There also are two 6-bay storage areas (Buildings 4635-3 and 4635-4) within this area. The entire area is surrounded by a chain-link fence. There are several sumps and two USTs in the area. Wastes are accumulated and temporarily stored in the fenced area (less than 90 days) from active waste satellite accumulation areas throughout the facility. Acid, ammonium hydroxide, and waste corrosive liquids are stored in aboveground tanks with secondary containment. Trichloroethane, ignitables, and corrosives are stored in drums.

The unit is surrounded by a drainage system that discharges into a nearby creek. During the VSI, an area in the north-central portion of the site was observed to have stains on the concrete and asphalt mix pavement surrounding the unit. More than one hundred 55-gallon drums are stored in this area. It also was noted during the VSI that several of the drums had oil residues on them, and oily stains were observed on the ground and on the pallets beneath the drums.

During the 1960s, this area was used to test the swing arms and hold-down bars for the Saturn V rocket. The Ground Support Equipment Test Facility is a complex of diverse equipment and structures including wind machines, vehicle simulators, and Saturn V hold-down bars and swing arms within an area of 10 paved acres. The four wind machines (aircraft propeller-driven engines) were used for wind simulation, while the eight vehicle random motion simulators were used to duplicate Saturn V lift-off acceleration. The test positions of the Swing Arms used a significant amount of hydraulic oil (mill spec. #5606). Each test position was equipped with hydraulic simulators to simulate the vertical and horizontal forces during lift-off. The hydraulic simulators were supplied with hydraulic oil through pipelines in concrete trenches that were covered with metal grating extending from a centralized pump house (Building 4645). The hold-down bars were controlled pneumatically and did not require the use of any chemicals during testing.

This site formerly was located in OU-10; a site condition summary was presented to the agencies in August 2004. This site currently is in OU-13. A TCE groundwater “hot spot” was identified during the OU-13 field investigation. The “hot spot” has been designated at SA-15 and included in OU-3.

NASA has submitted the Draft Final OU-13 RI Report and currently is waiting to receive Agency comments on the report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-031.

Status

Surface Media OU: 13
Groundwater OU: 3
Site Size: 7 acres

Contaminants of Potential Concern

PAHs and PCBs

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.13.4 MSFC-057 and MSFC-C: Unleaded Gasoline Loading Area for Tanks 4632, 4633, and 4636 and Containment Area for Tank 4636

MSFC-057 is an active fuel-loading area that has been in use since 1965 when the gasoline station at Building 4611 was constructed. The unit is located on the northeastern side of Building 4611, along Saturn Road. The area, approximately 10 ft by 20 ft, is used as a transfer station from fuel tanker trucks to Tanks 4632, 4633, and 4636. These tanks serve the pump station at Building 4611.

MSFC-C is a bermed area designed to contain spills from a 15,000-gallon tank (Tank 4636) containing unleaded fuel. In previous years, the tank contained aviation gasoline. Any overflow from the bermed area would have flowed into a nearby stream (NPDES DSN 004) and eventually into Indian Creek. During the VSI, stains were visible on the ground surface.

This site formerly was located in OU-10; a site condition summary was presented to the agencies in August 2004. This site currently is in OU-13. MSFC-057 and MSFC-C have been transferred to the ADEM storage tank program per the CERCLA petroleum exclusion rule.

Status

Surface Media OU: 13
Groundwater OU: 3
Site Size: 100 ft by 150 ft

Contaminants of Potential Concern

VOCs and PAHs

Media of Concern

Surface and subsurface soil

Completed CERCLA Phase

Historical search
Work Plan
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

NFI

2.13.5 MSFC-067: Building 4618 Surface Drainage

MSFC-067 is an earthen surface drainage area that probably has existed since the 1960s. Water flows east in the ditch located on the southern side of Building 4618. The water flows under Fowler Road through a culvert toward the south. MSFC-067 is approximately 10 ft wide, and its grassy, clay-lined banks are 10 ft high. Surface water continuously flows in the ditch toward the WNWR. Water in the ditch averages 1 to 3 ft deep and supports minnows and algae. Downstream, adjacent to the western side of Building 4648, a depression that is 5 ft in diameter and approximately 3 ft deep supports fish 3 to 5 inches long. There are no apparent stains or vegetative stress along the banks or bottom of MSFC-067.

Along its southern to southwestern route, the unit accumulates surface runoff from the adjacent areas and directs it to the southwest. According to the *Preliminary Assessment and Site Inspection* (Harmon Engineering Associates, 1988), in 1974 or 1975, a spill of hydraulic fluid occurred south of Building 4619, in the immediate vicinity of Building 4618, around two hydraulic fluid storage tanks. Reportedly, the spill was cleaned up with absorbent material and the contaminated soil was removed and disposed offsite. Samples collected in the ditch at the location of the spill show elevated levels of PAHs.

The risk assessment developed using the environmental data collected at MSFC-067 in the draft OU-13 RI Report did not identify any COCs. Therefore, no further investigation of the surface media is recommended for MSFC-067.

Status

Surface Media OU: 13

Groundwater OU: 3

Site Size: 2,500 ft

Contaminants of Potential Concern

PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search activities

Work Plan

Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.13.6 MSFC-090: Building 4653 Components Support Building

Building 4653 is located in the central portion of MSFC, northwest of the intersection of Dodd Road and Ranger Street. The eastern half of the “H”-shaped building was constructed by NASA in 1962 as the Components Support Building. The western half of the building was constructed later at an unknown date. The building currently contains machine shops and a high-pressure test facility for testing valves. One CERCLA site, RSA-141, is located west of the building. RSA-141 is a former mustard disposal site that is under investigation by the DA.

TCE formerly was used for degreasing in the eastern wing of Building 4653. Two degreasing rooms were located in the central portion of the east wing. TCE degreasers were still present in the rooms in July 1998; however, they were not in operation. The former degreaser rooms currently are used to store the drums of cleaning chemicals used in the trichlorofluoromethane parts cleaner in the building.

The cleaning rooms serviced the former turbopump shop, which was located in the southern portion of the east wing, and the former valve laboratory, which was located in the central portion of the east wing. The turbopump shop was used to maintain the turbopumps from rocket engines tested in the test areas. After engine tests, the turbopumps were sent to Building 4653 for cleaning and maintenance. The valve laboratory was used for fabrication, maintenance, and repair of custom valves and fittings for rocket engines. The former turbopump shop and valve laboratory currently is used to fabricate small parts.

The northern portion of the east wing of Building 4653 was a former clean room and tube cleaning area. The Vapor Degreaser was plumbed to a 55-gallon drum located immediately outside the southeastern side of the building. Both TCE and trichlorofluoromethane were used in the tube cleaning area. The clean room was used until the early 1980s. The area of the former clean room and tube cleaning area is only used now to store small parts fabricated in the building.

Both degreasing rooms and the tube cleaning area formerly had floor drains. The floor drains were connected to a sewer pipe that runs west from the east wing of the building and daylights in the adjacent field west of the building (RSA-141). According to contractor personnel, two sumps located on the northern side of the building are associated with this pipe. TCE and other spent solvents probably were discharged from the degreasers and floor drains to the pipeline as a means of disposal. The floor drains in the degreaser rooms were visible, but had been sealed with cement.

The west wing of Building 4653 houses a machine shop and test cells for high-pressure valve testing. According to the personnel interviewed, no solvents have been used or stored in the west wing of the building.

NASA has submitted the Draft Final OU-13 RI Report and currently is waiting to receive Agency comments on the report. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-090.

Status

Surface Media OU: 13
Groundwater OU: 3 (SA-7)
Site Size: 0.5 acre

Contaminants of Potential Concern

VOCs and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search activities
RI Report
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.13.7 MSFC-091: Building 4638 Maintenance Shop

Building 4638 is located in the central portion of MSFC, south of Ranger Road and west of Saturn Road. The building is a former maintenance shop and formerly housed a solar-powered, missile-grade air system. The building currently is used as a maintenance facility. One CERCLA site, MSFC-067, is located in the vicinity of the building. MSFC-067 is a drainage pathway located approximately 150 ft south of the building. This area was used in the 1960s to develop the swing arm that held rockets in place on the launch pads.

Building 4638 has a covered outdoor storage area on the southeastern corner of the building. During the July 1998 PA field work, the storage area was empty, and no information could be located regarding the chemicals that were stored at Building 4638. Ring-shaped rust stains observed on the concrete floor indicate that drums formerly were stored there. Other stains indicative of potential spills also were observed on the floor of the storage area. The storage area has a concrete containment structure. A floor drain in the southeastern corner of the containment is connected to a PVC pipe that discharges to an adjacent drainage ditch. An oily sheen was observed on standing water in this ditch during the PA field work. The drainage ditch flows south and discharges to the MSFC-067 drainage pathway.

The asphalt parking area east of the building contains various abandoned concrete foundations and trenches. According to MSFC personnel, the concrete pad housed aircraft propeller engines that were part of the Swing Arm Test Facility. The propellers were used to simulate wind conditions that the swing arm would encounter on the launch pad.

NASA has submitted the Draft Final OU-13 RI Report and currently is waiting to receive Agency comments on the document. It currently is anticipated, on the basis of the existing data, that LUCs or remedial actions will be required at MSFC-091.

Status

Surface Media OU: 13
Groundwater OU: 3 (SA-8)
Site Size: 0.5 acre

Contaminants of Potential Concern

VOCs, metals, and PAHs

Media of Concern

Surface soil and subsurface soil

Completed CERCLA Phase

Historical search activities
Work Plan Addendum
Field investigation

Current CERCLA Phase

RI Report

Anticipated Future CERCLA Phase

FS, PP, ROD, remedial design, and remedial action

2.14 Operable Unit Prioritization

NASA has prioritized the OUs for investigation and action purposes, based on a qualitative assessment of potential exposures to hazards for human and ecological receptors that the OUs pose. Currently, industrial facility workers and environmental receptors might be exposed to contaminated soils, sediments, surface water, and groundwater, while offsite receptors may be exposed to contaminated groundwater discharged to surrounding surface water bodies. Because of the potential for changes in future land use, human receptors (assuming a residential scenario) and ecological receptors might be exposed to contaminated onsite soil, sediment, surface water, and groundwater in the future. The CERCLA activities at the defined OUs were sequenced so that work on the highest priority OU would begin first and work on the lowest priority OU would begin last or would be “worked in” between submittals of the higher priority OUs.

The prioritization process uses a subset of the overall program goals. The application of the program goals to the prioritization process includes the following:

- Risk to Human Health and the Environment. OUs with the projected higher risks are considered highest priority, and therefore, are given a higher score.
- Public Acceptance. Level of concern by community and employees. Higher scores are given to OUs about which the public has expressed concerns.
- Regulatory Concerns. OUs with the most regulatory program effects are considered a higher priority. For example, OUs that potentially involve multiple regulatory concerns are scored higher than OUs that involve only one concern.
- Potential Effects on NASA’s Mission. OUs with the probability of having the fewest effects on NASA’s mission activities are given a lower score, and OUs expected to have the greatest effects are considered higher priority for this decision.
- Reduce NASA’s Liability. OUs with the potential for being removed from the CERCLA program more quickly, thus more readily affording implementation of actions or providing a higher degree (qualitatively) of risk reduction, are a priority. This group can include OUs with little or no action required to meet unrestricted future use risk criteria.

Table 2-12 lists the OUs, the prioritization criteria, and a given “weight” assigned by NASA to each criterion. Each criterion was given a score from 1 through 5. The summary score for each OU was obtained by summation of the scores, multiplied by their respective “weights”; the higher the score, the higher the ranking. The summation of the scores provided an overall ranking that served as the basis for prioritization (highest score = highest priority).

Given this analysis, the ranking of the OUs requiring further action from highest priority to lowest priority is as follows:

- 1: OU-12 MSFC-055 and 065
- 2: OU-5 Building 4760 Activities
- 3: OU-3 Groundwater
- 4: OU-1 East and West Test Areas
- 5: OU-2 Industrial Sewer
- 6: OU-8 Petroleum Sites
- 7: OU-6 Northeast Areas
- 8: OU-13 Central Area
- 9: OU-9 Former IWTF

TABLE 2-12
Operable Unit Prioritization
NASA MSFC Site Management Plan

Operable Unit		Criteria					Summary Score
		Risk to Human Health/ Environment (5)	Public Acceptance (4)	Reduce NASA Liability (3)	Regulatory Concerns (2)	Potential Mission Effects (1)	
OU-1	East and West Test Areas	3	1	2	3	5	36
OU-2	Industrial Sewer	2	2	3	3	2	35
OU-3	Groundwater	3	3	3	4	1	45
OU-5	Building 4760 Area Activities	3	2	3	4	5	45
OU-6	Northeast Areas	2	1	1	2	1	22
OU-8	Petroleum Sites	3	1	2	4	1	34
OU-9	Former IWTF	0	0	0	1	1	3
OU-12	MSFC-055/065	2	5	3	5	5	54
OU-13	Central Area	2	1	1	2	1	22

Notes:
 NASA = National Aeronautics and Space Administration
 OU = Operable Unit
 MSFC = Marshall Space Flight Center
 IWTF = Industrial waste treatment facility

The summary score for each OU was obtained by summation of the scores, multiplied by their respective "weights" shown in parentheses beside each category.

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SECTION 3

Schedule

This section lists ([Table 3-1](#)) the enforceable deadlines and target dates for the MSFC CERCLA program work planned for each OU. [Table 3-1](#) provides the enforceable deadlines chronologically. The schedule, provided in [Table 3-1](#), includes the agency enforceable deadlines for deliverables for the current FY, and FY+1, which correlates through September 2011. The schedules for each OU through the ROD are provided in Gantt Charts in [Appendix B](#).

TABLE 3-1
Agency Enforceable and Target Deadlines for FY and FY+1
NASA MSFC Site Management Plan

FY	OU	Submittal	Date
2012	Quarterly Meeting	FY2012 Third Quarter Meeting	05/14/12
2012	OU-3/SA-6, 8, 9, 12	Draft RI/FFS Report	06/04/12
2012	OU-6	Final OU-6 RI Report	07/06/12
2012	Site-wide	Draft Five Year Review	07/23/12
2012	OU-9	Draft Final OU-9 CCED	07/30/12
2012	OU-2	Draft OU-2 Proposed Plan	08/06/12
2012	OU-8	Draft Final OU-8 Record of Decision	08/13/12
2012	Quarterly Meeting	FY2012 Fourth Quarter Meeting	08/13/12
2012	Site-wide	Draft Final Site-wide RI/FS Work Plan	09/03/12
2012	OU-5	Draft Final OU-5 Feasibility Study	09/05/12
2012	OU-3/SA-Bio	Draft Final Pilot Study Report	09/17/12
2012	OU-13	Draft OU-13 Feasibility Study	09/19/12
2013	SMP	Draft Site Management Plan FY 2013	10/01/12
2013	OU-3/SA-2	Draft Final SA-2 Interim Record of Decision	10/02/12
2013	OU-1	Draft OU-1 Feasibility Study	10/08/12
2013	Quarterly Meeting	FY2013 First Quarter Meeting	11/05/12
2013	OU-3/SA-6, 8, 9, 12	Draft Final RI/FFS Report	11/28/12
2013	SMP	Draft Final Site Management Plan FY 2013	11/28/12
2013	OU-6	Draft OU-6 Feasibility Study	12/03/12
2013	OU-8	OU-8 Remedial Action Schedule	12/10/12
2013	Budget	Share Budget Guideline with Agencies FY 2013	01/07/13
2013	OU-3/SA-2	Remedial Action Schedule	02/01/13
2013	OU-2	Draft Final OU-2 Proposed Plan	02/01/13
2013	OU-5	Draft OU-5 Proposed Plan	02/01/13

TABLE 3-1
Agency Enforceable and Target Deadlines for FY and FY+1
NASA MSFC Site Management Plan

FY	OU	Submittal	Date
2013	Quarterly Meeting	FY2013 Second Quarter Meeting	02/04/13
2013	Site-wide	Draft Final Five Year Review	03/06/13
2013	OU-13	Draft Final OU-13 Feasibility Study	03/08/13
2013	OU-1	Draft Final OU-1 Feasibility Study	04/05/13
2013	OU-3/SA-6, 8, 9, 12	Draft Proposed Plan	04/26/13
2013	Quarterly Meeting	FY2013 Third Quarter Meeting	05/06/13
2013	OU-6	Draft Final OU-6 Feasibility Study	05/31/13
2013	OU-3/SA-10 and 15	Draft RI/FFS Report	06/03/13
2013	OU-5	Draft Final OU-5 Proposed Plan	07/30/13
2013	OU-2	Draft OU-2 Record of Decision	08/02/13
2013	Quarterly Meeting	FY2013 Fourth Quarter Meeting	08/05/13
2013	OU-13	Draft OU-13 Proposed Plan	08/19/13
2013	OU-1	Draft OU-1 Proposed Plan	09/03/13

Notes:

Bold text denotes a primary document.

ESD = Explanation of significant differences

FY = Fiscal year

OU = Operable unit

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SECTION 4

Sites with CERCLA Status Change

Table 4-1 lists the sites and responsibility for cleanup under CERCLA per the NASA and DA MOA. **Table 4-2** lists the sites that have a modified status due to an NFI decision. **Table 4-3** details the sites that have satisfied the requirements of the CERCLA program and are included in a decision document. **Table 4-4** lists the petroleum sites that have been transferred to the ADEM UST Program via CERCLA’s petroleum exclusion.

TABLE 4-1
DA-responsible Sites
NASA MSFC Site Management Plan

Site Designation	Description	Effective Date
MSFC-002	Inactive Abandoned Drum Disposal Site	December 2004
MSFC-003	Inactive Old Bone Yard Disposal Site	December 2004
MSFC-027	Inactive Waste Accumulation Area	December 2004
MSFC-034	Former Chemical Production Area	December 2004
MSFC-035	Inactive Sump/Tiled Drain Field—East Test Area	December 2004
MSFC-052e	Portion of Industrial Sewer east of eastern MSFC/RSA Boundary (in the process of being transferred to DA)	February 2005
MSFC-053	Former Propellant Storage Area and Test Stand Site	December 2004
MSFC-060	Inactive Deluge Water Drainage System	December 2004
MSFC-074	Inactive Disposal Site	December 2004
MSFC-077	Inactive Open Burning and Disposal Pits	December 2004
MSFC-082	Inactive Chemical Munitions Demilitarization and Disposal Trenches	December 2004
MSFC-087*	Cyanide Disposal Pit	February 2005
RSA-141	4.2-inch Mortar Disposal Site, Building 4653	December 2004

Notes:
 * MSFC-087 investigation included with MSFC-002
 DA = Department of Army
 RSA = Redstone Arsenal
 MSFC = Marshall Space Flight Center

TABLE 4-2
Sites Determined to Require No Further Investigation
NASA MSFC Site Management Plan

Site Designation	Site Name	NFI Concurrence Date
OU-5: Building 4760 Activities		
MSFC-036	Sump in South Addition of Building 4708	November 2003
MSFC-080	Satellite Waste Fuel Accumulation Area East of the Redstone DA Airfield	June 1999
MSFC-089	Building 4760 Cyanide Waste Tank	July 2005

Notes:
NFI = No further investigation
EPA = U.S. Environmental Protection Agency
OU = Operable unit
MSFC = Marshall Space Flight Center

TABLE 4-3
Sites Achieving Decision Document Status
NASA MSFC Site Management Plan

Site Designation	Site Name	Action/ Effective Date
OU-9: Former IWTF		NFA ROD / September 19, 2000
MSFC-044	Industrial Wastewater Treatment Basin	
MSFC-045	Concentrate Receiving Tank	
MSFC-046	Transfer Tank	
MSFC-047	Hydrostatic Dump Lagoon	
MSFC-048	Mix Tank	
MSFC-049	East Ultimate Lagoon	
MSFC-050	West Ultimate Lagoon	
MSFC-A	Caustic Storage Tank	

Notes:
IWTF = Industrial waste treatment facility
NFA = No further action
ROD = Record of Decision
OU = Operable unit
MSFC = Marshall Space Flight Center

TABLE 4-4
Sites Transferred to ADEM Storage Tank Program
NASA MSFC Site Management Plan

Site Designation	Site Name	Effective Date
OU-10: Confirmatory Sampling Sites		
MSFC-086	Hydraulic Waste Oil Area 4618	December 20, 2002
OU-13: Central Area		
MSFC-057	Unleaded Gasoline Loading Area for Tanks 4632, 4633, and 4636	March 5, 2007
MSFC-C	Containment Area for Tank 4636	March 5, 2007

Notes:
OU = Operable unit
MSFC = Marshall Space Flight Center

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SECTION 5

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Appendix A

Guidance Documents

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APPENDIX A

Guidance Documents

This appendix provides a list of the guidance documents that EPA and ADEM intend to use to evaluate submissions identified in this SMP.

Alabama Department of Environmental Management. April 2008-Revision 2. *Alabama Risk-based Corrective Action Guidance Manual*.

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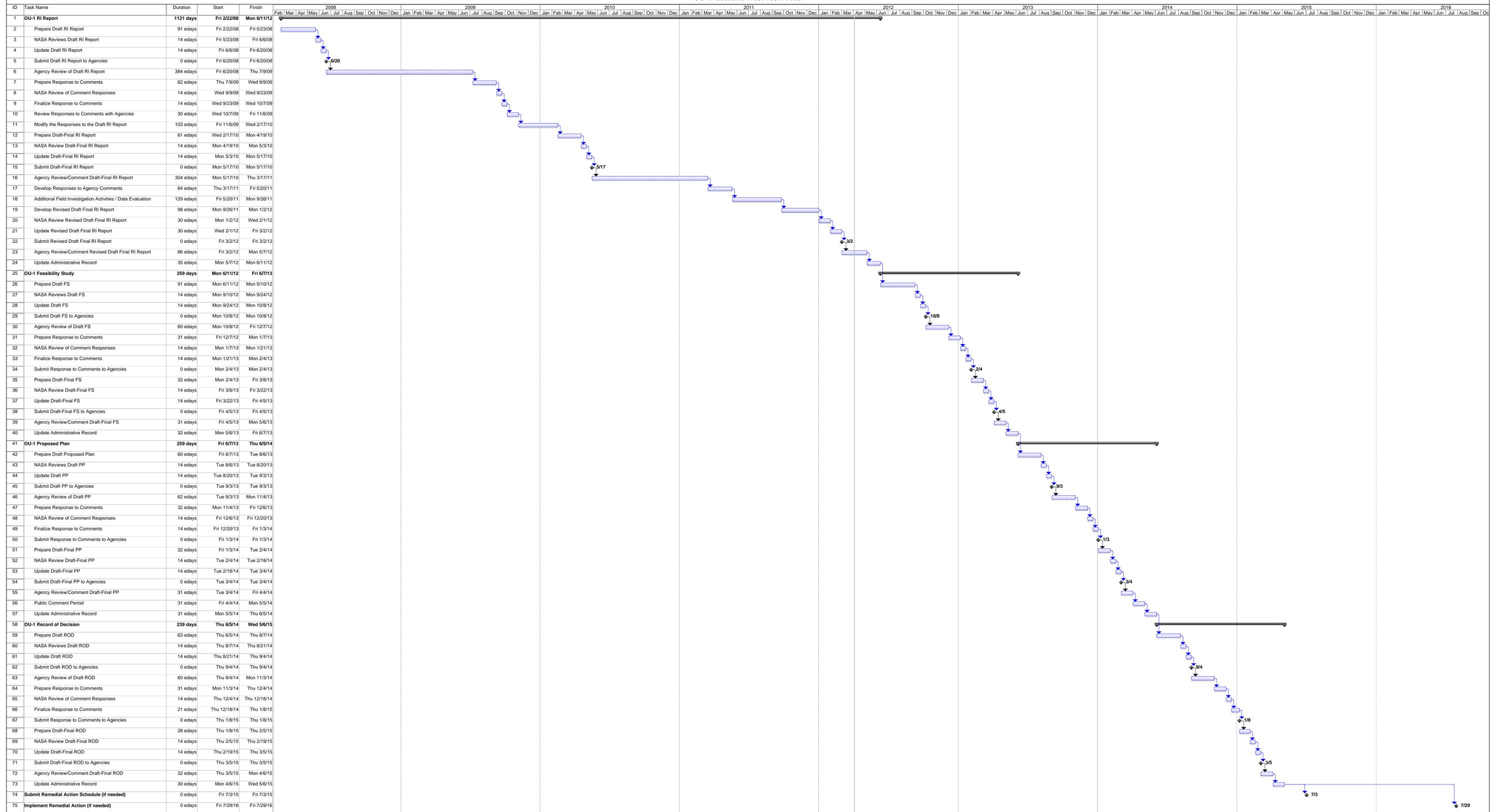
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Appendix B

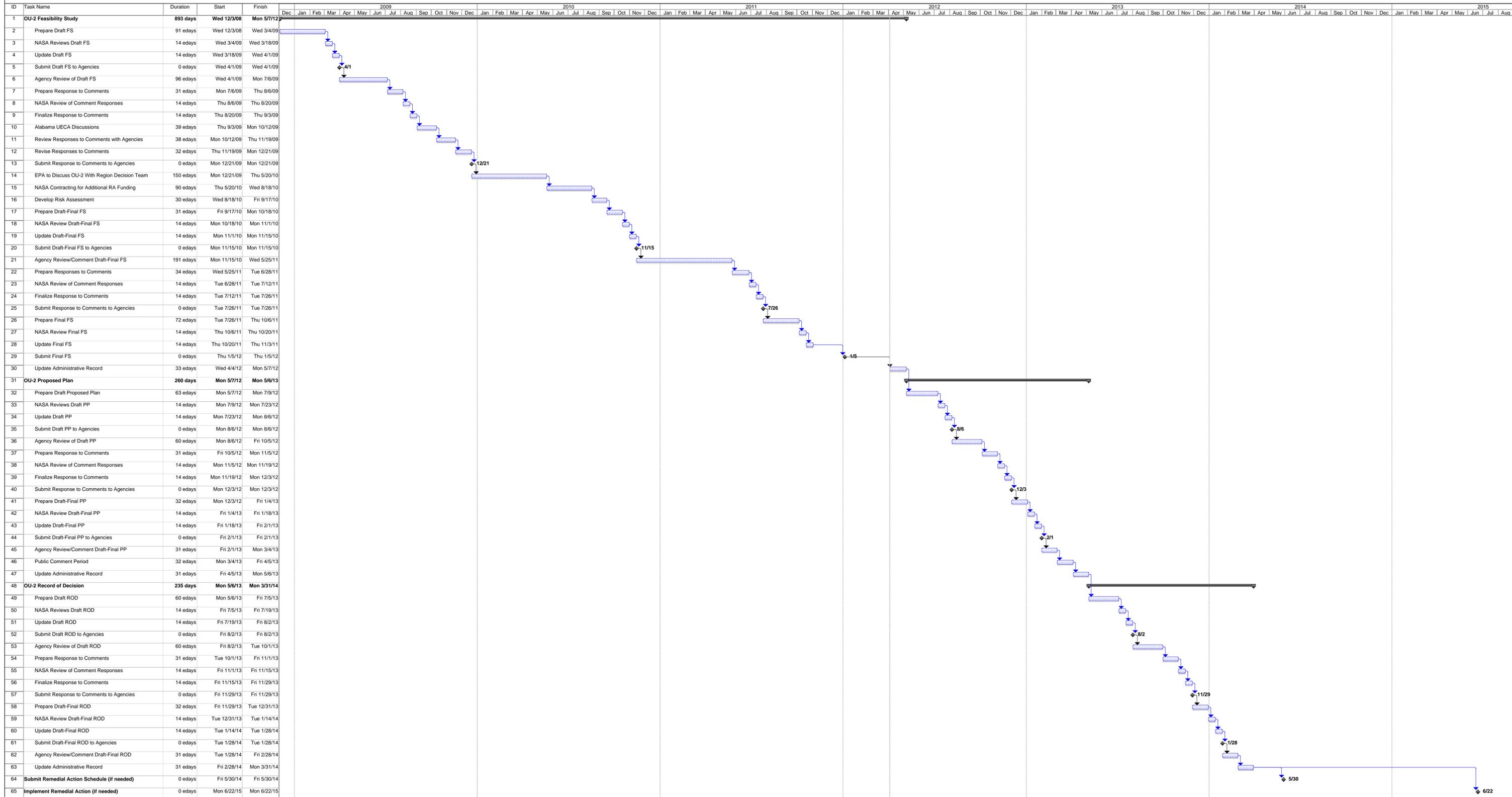
Operable Unit Schedules

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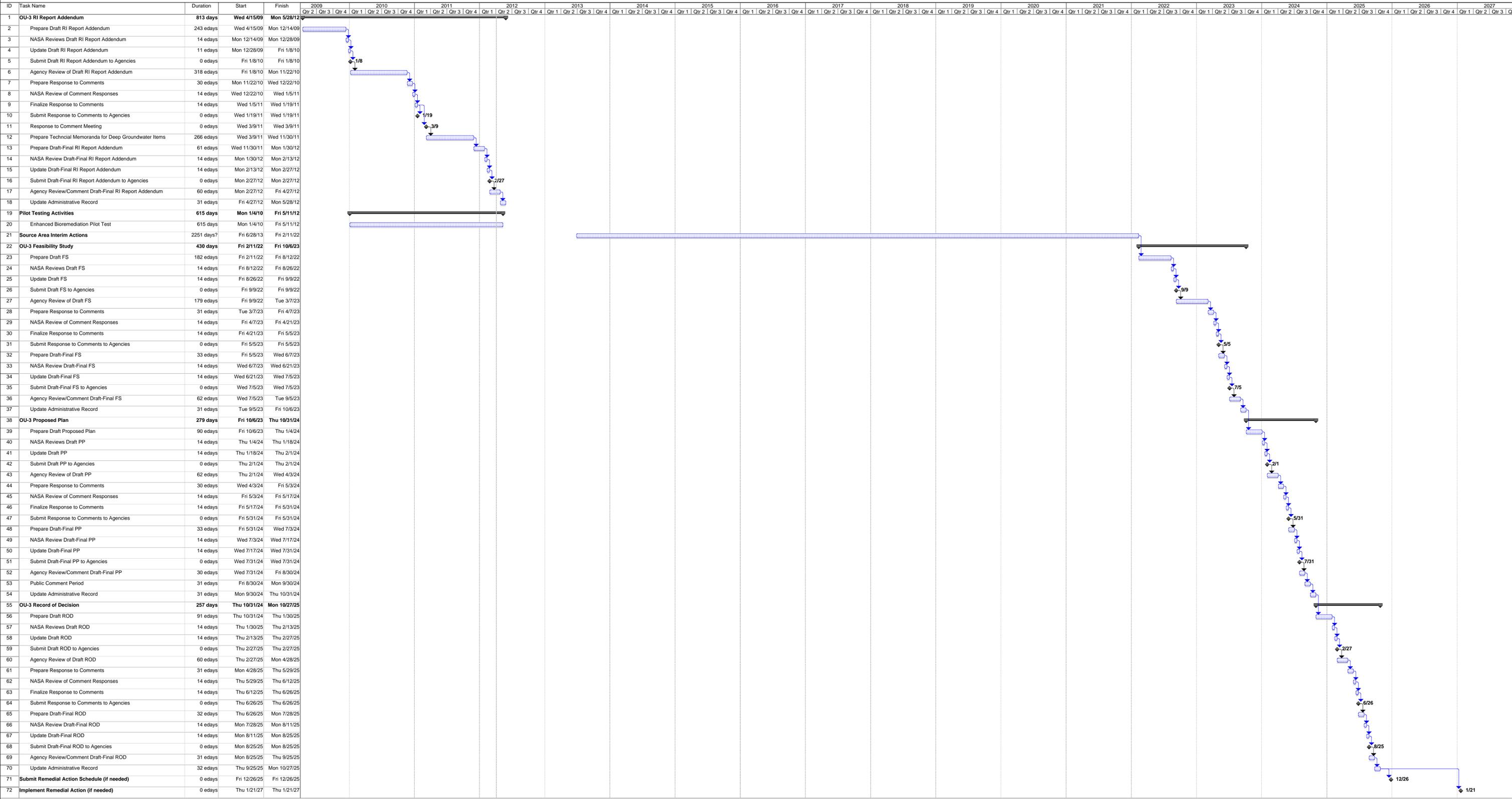
OU-1: East and West Test Areas



OU-2: Industrial Sewer



OU-3: Groundwater

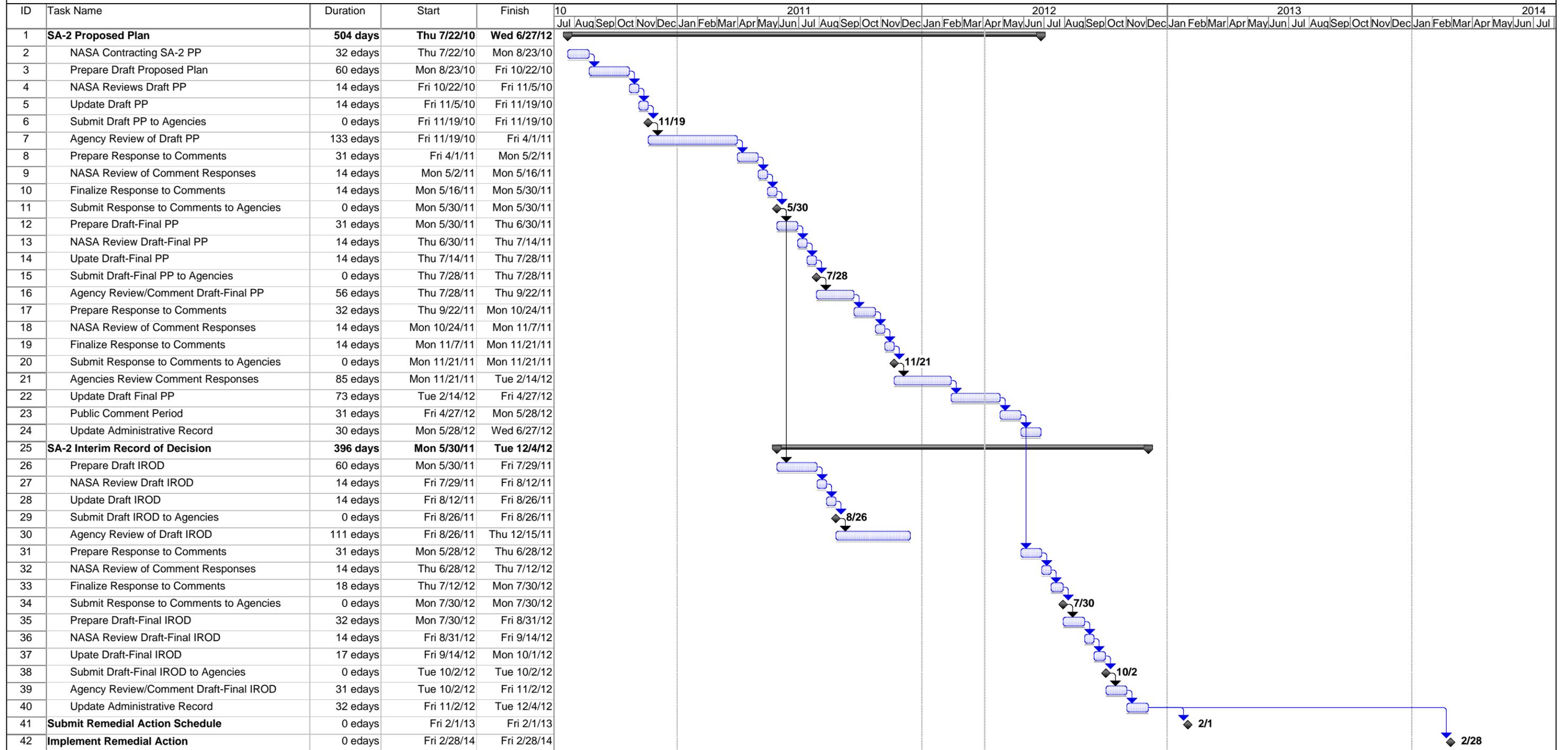


OU-3: In-Situ Enhanced Bioremediation Pilot Test

ID	Task Name	Duration	Start	Finish	2010				2011				2012			
					Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	Pilot Test Implementation	315 days	Mon 1/4/10	Mon 3/21/11												
2	Inject Substrate into Pilot Test Cells	60 edays	Mon 1/4/10	Fri 3/5/10												
3	Monitor Groundwater in Pilot Test Cell Locations	367 edays	Fri 3/5/10	Mon 3/7/11												
4	Collect Post Pilot Test Samples	14 edays	Mon 3/7/11	Mon 3/21/11												
5	Pilot Test Study Report	434 days	Mon 3/21/11	Fri 11/16/12												
6	Prepare Draft Pilot Test Report	121 edays	Mon 3/21/11	Wed 7/20/11												
7	NASA Reviews Draft Pilot Test Report	14 edays	Wed 7/20/11	Wed 8/3/11												
8	Update Draft Pilot Test Report	14 edays	Wed 8/3/11	Wed 8/17/11												
9	Submit Draft Pilot Study Report to Agencies	0 edays	Wed 8/17/11	Wed 8/17/11												
10	Agency Review of Draft Pilot Study Report	61 edays	Wed 8/17/11	Mon 10/17/11												
11	Prepare Response to Comments	220 edays	Mon 10/17/11	Thu 5/24/12												
12	NASA Review of Comment Responses	14 edays	Thu 5/24/12	Thu 6/7/12												
13	Finalize Response to Comments	14 edays	Thu 6/7/12	Thu 6/21/12												
14	Submit Response to Comments to Agencies	0 edays	Thu 6/21/12	Thu 6/21/12												
15	Prepare Draft-Final Pilot Study Report to Agencies	60 edays	Thu 6/21/12	Mon 8/20/12												
16	NASA Review Draft-Final Pilot Study Report	14 edays	Mon 8/20/12	Mon 9/3/12												
17	Update Draft-Final Pilot Study Report	14 edays	Mon 9/3/12	Mon 9/17/12												
18	Submit Draft-Final Pilot Study Report	0 edays	Mon 9/17/12	Mon 9/17/12												
19	Agency Review/Comment Draft-Final Pilot Study Report	30 edays	Mon 9/17/12	Wed 10/17/12												
20	Update Administrative Record	30 edays	Wed 10/17/12	Fri 11/16/12												

Date: Mon 3/26/12	Task		Milestone		External Tasks	
	Split		Summary		External Milestone	
	Progress		Project Summary		Deadline	

OU-3: SA-2 In-Situ Chemical Reduction Interim Remedial Action



Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

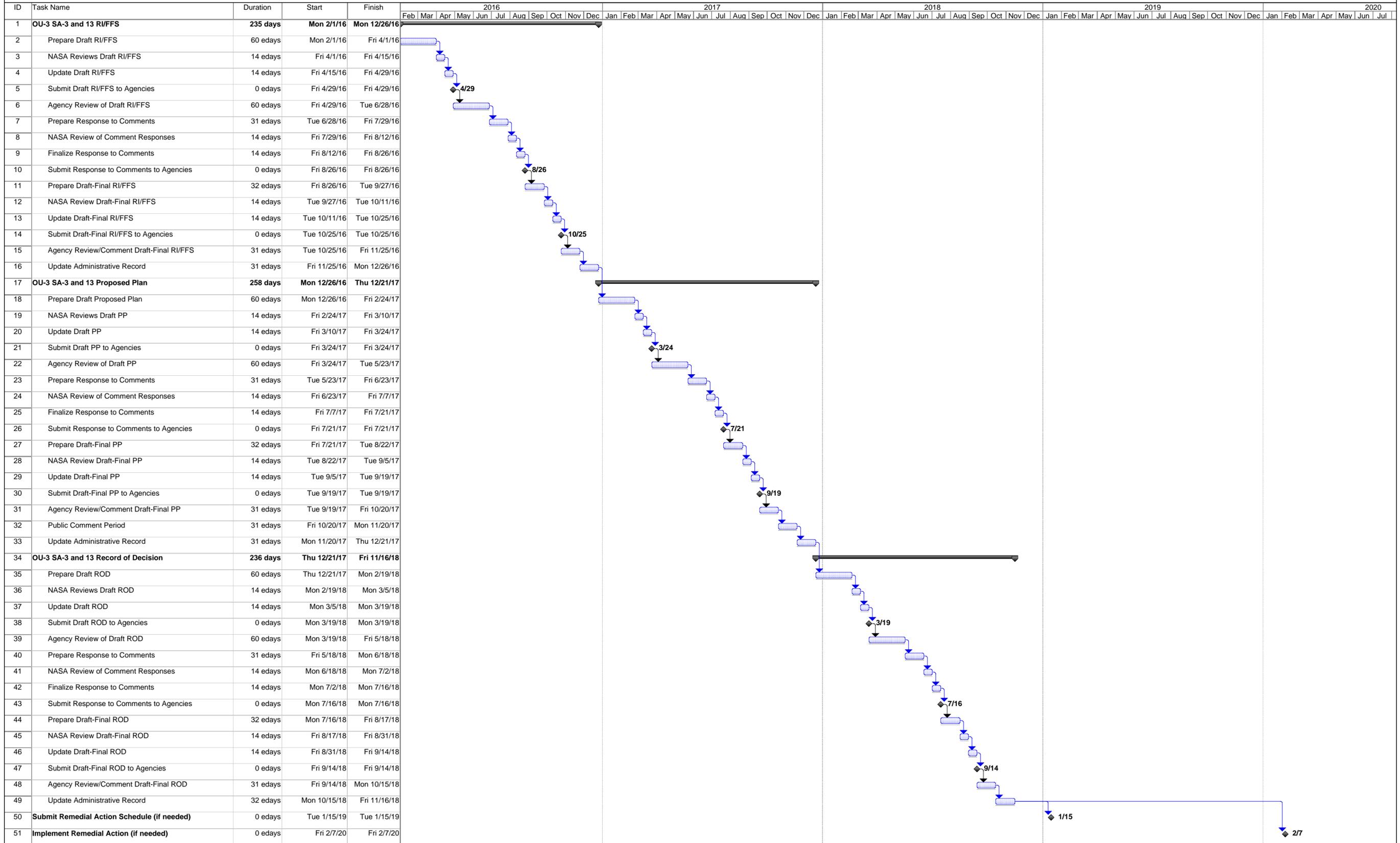
OU-3: Source Area 1



Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline
 Split Milestone Project Summary External Milestone

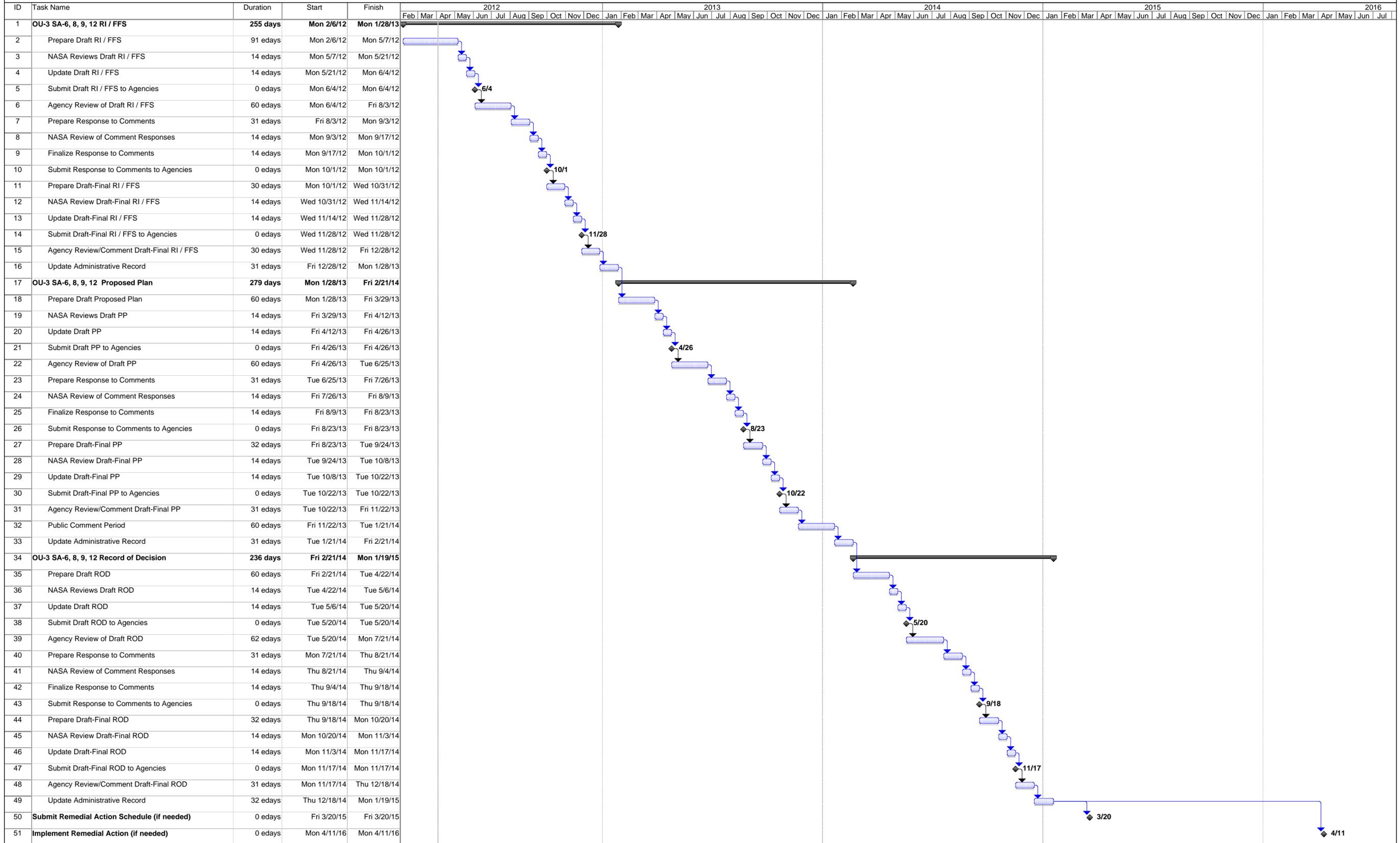
OU-3: Source Areas 3 and 13



Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline
Split Milestone Project Summary External Milestone

OU-3: Source Areas 6, 8, 9, and 12

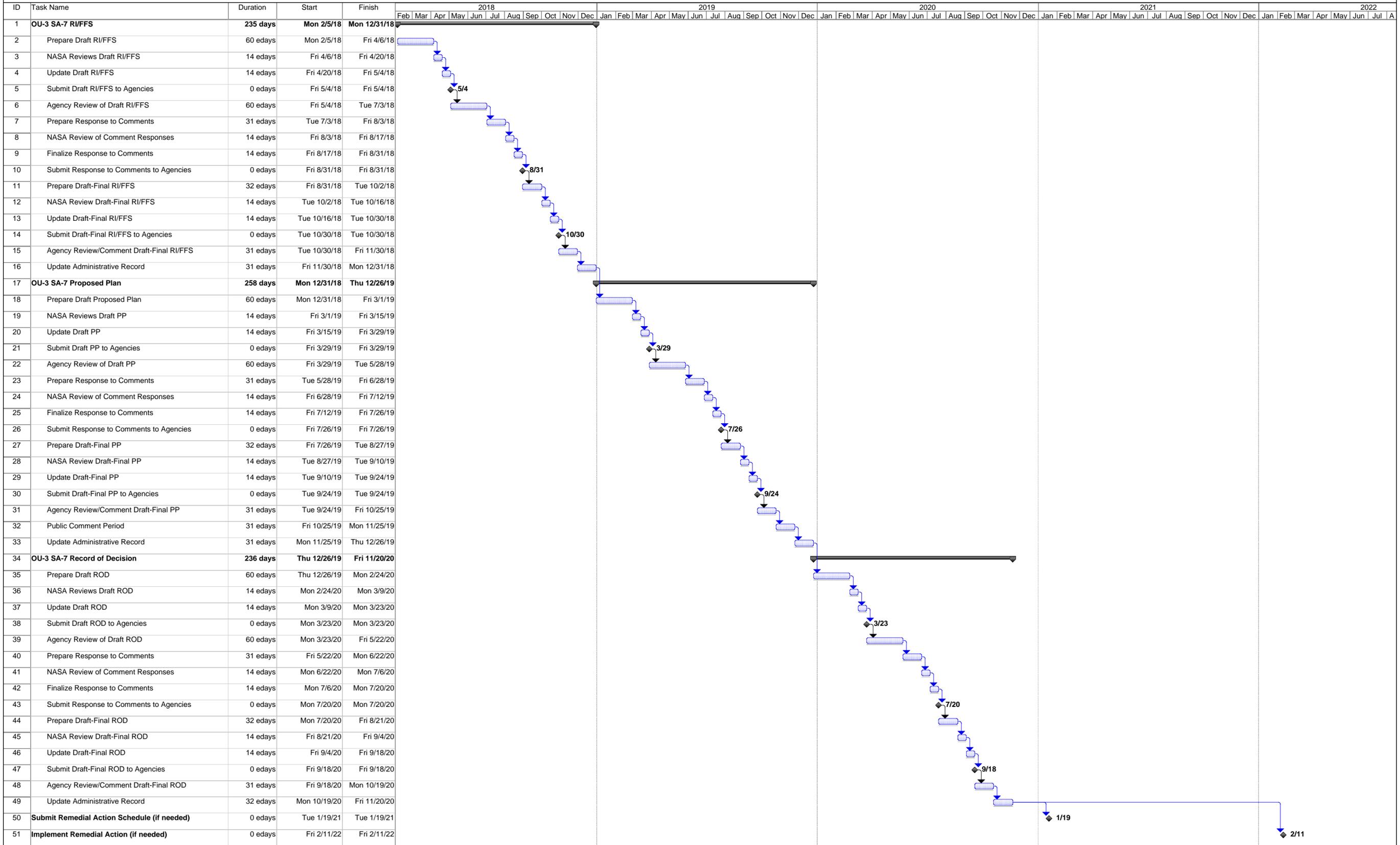


Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline

Split Milestone Project Summary External Milestone

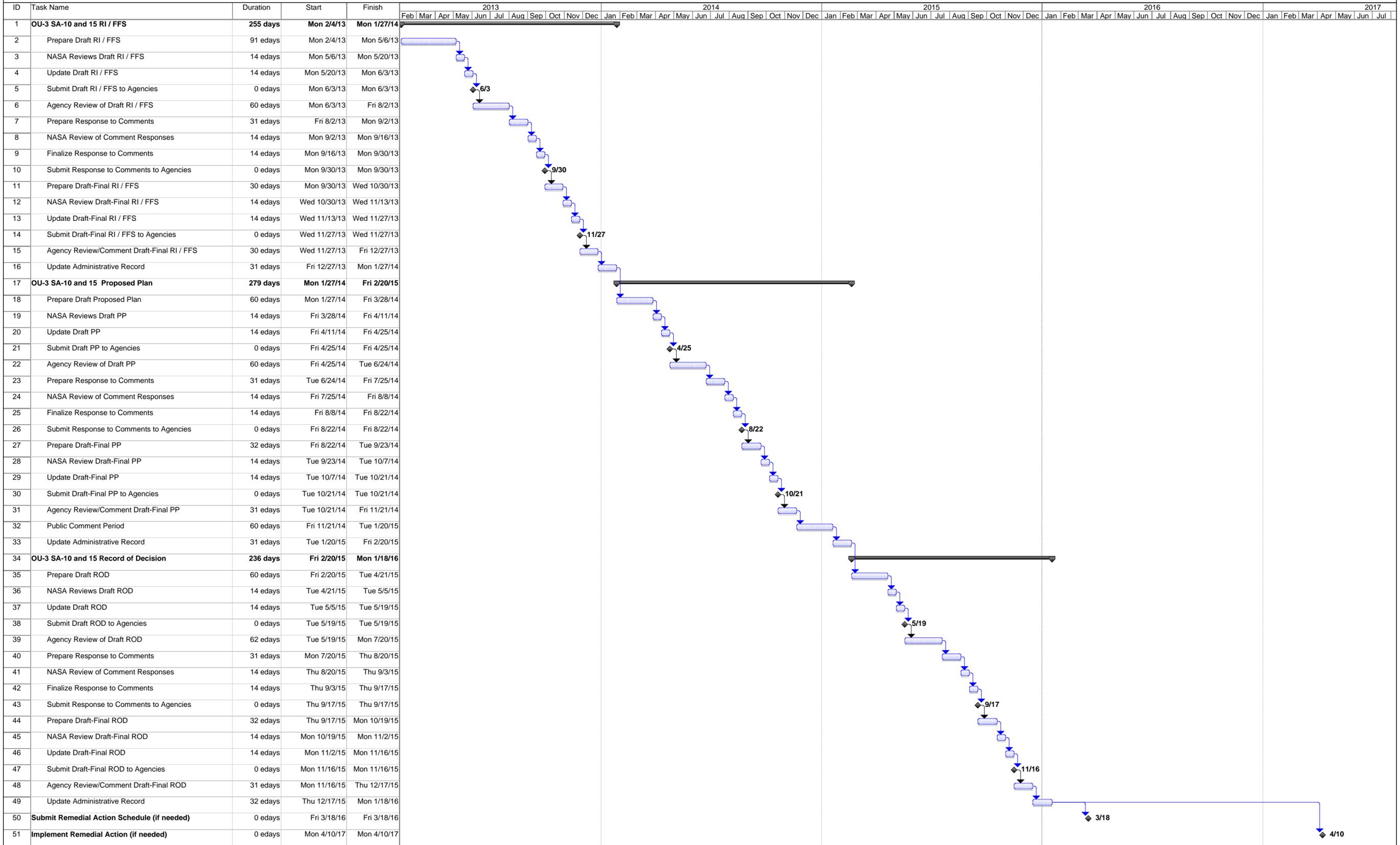
OU-3: Source Area 7



Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline Split Milestone Project Summary External Milestone

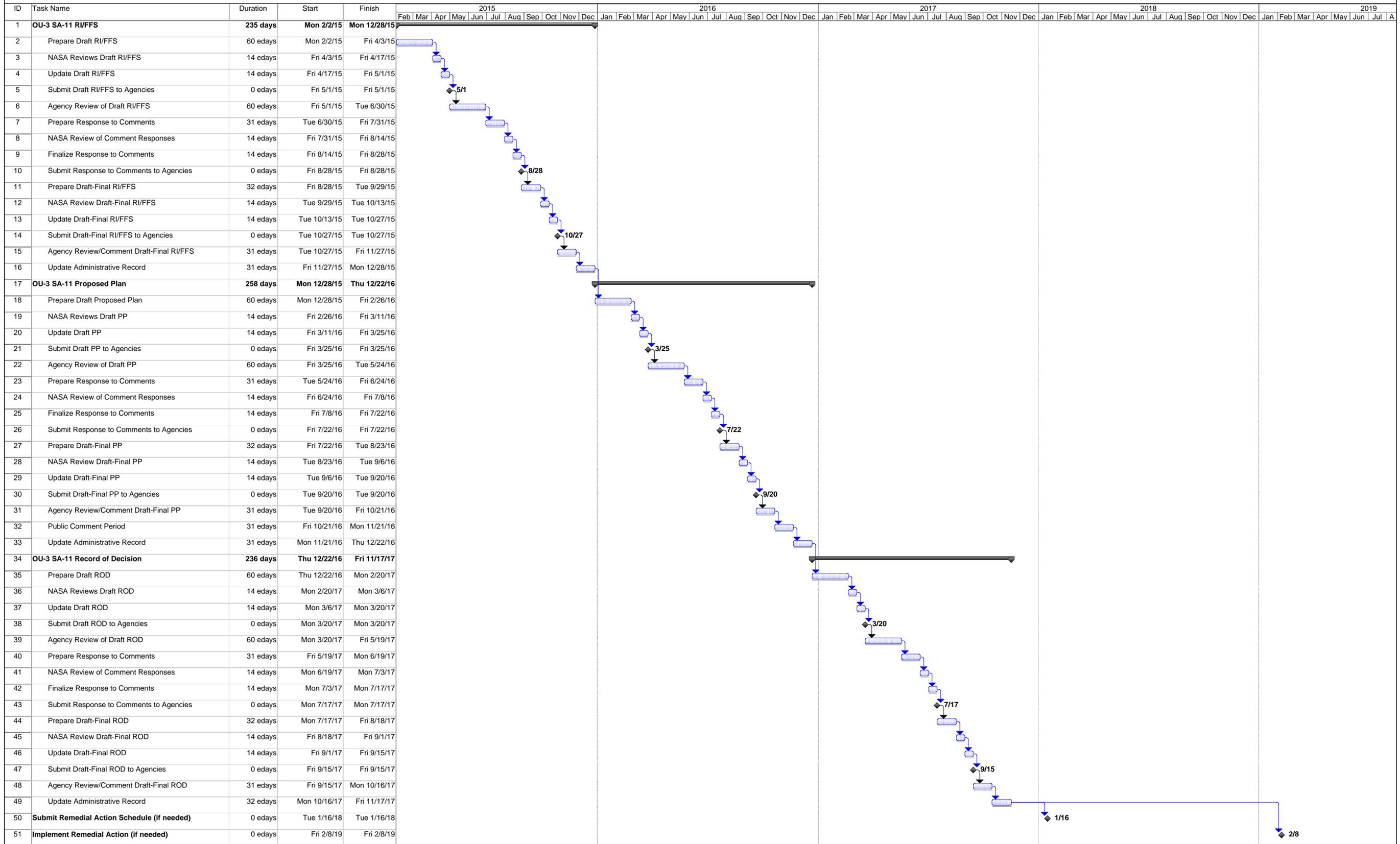
OU-3: Source Areas 10 and 15



Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline
Split Milestone Project Summary External Milestone

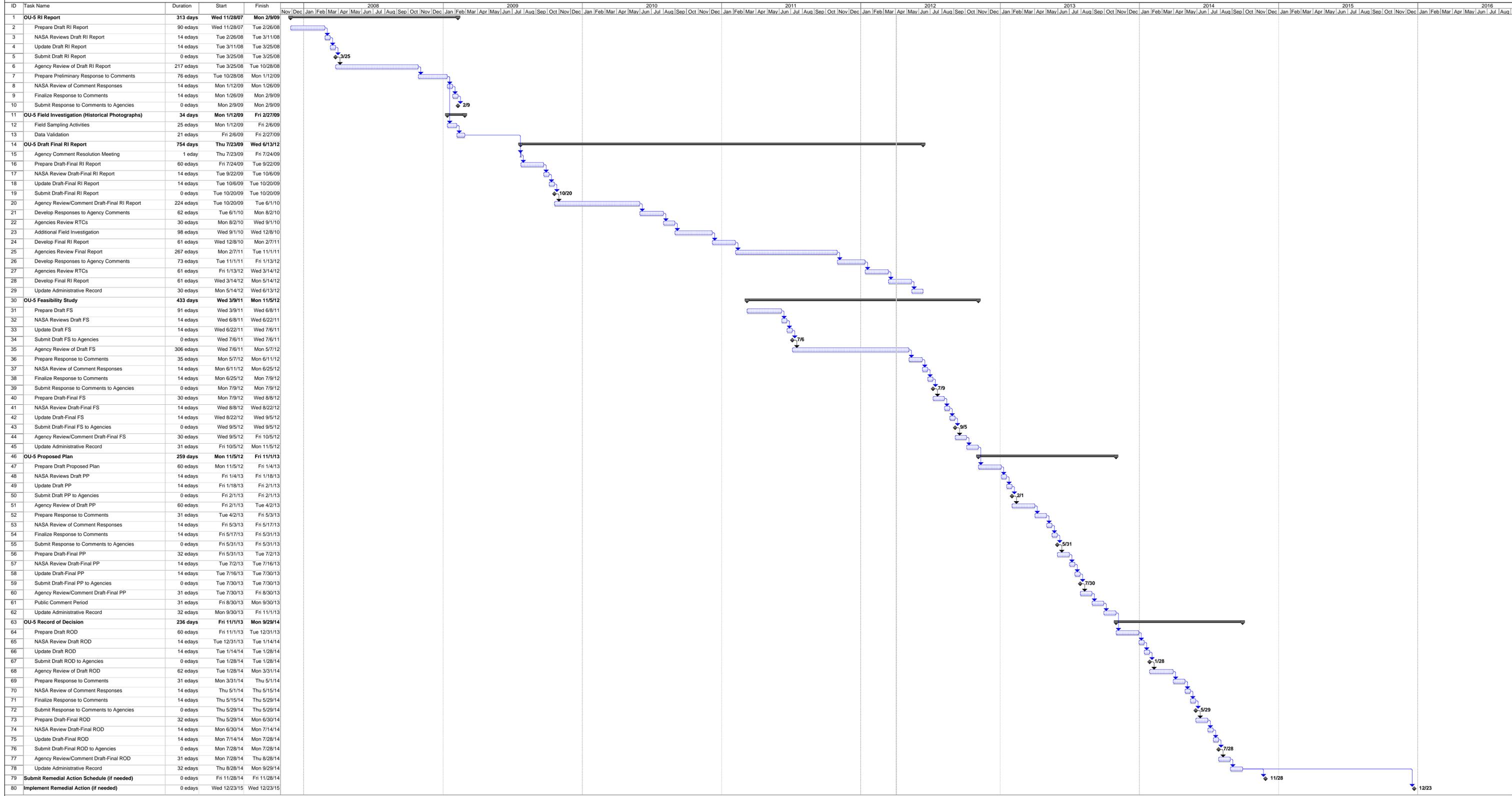
OU-3: Source Area 11



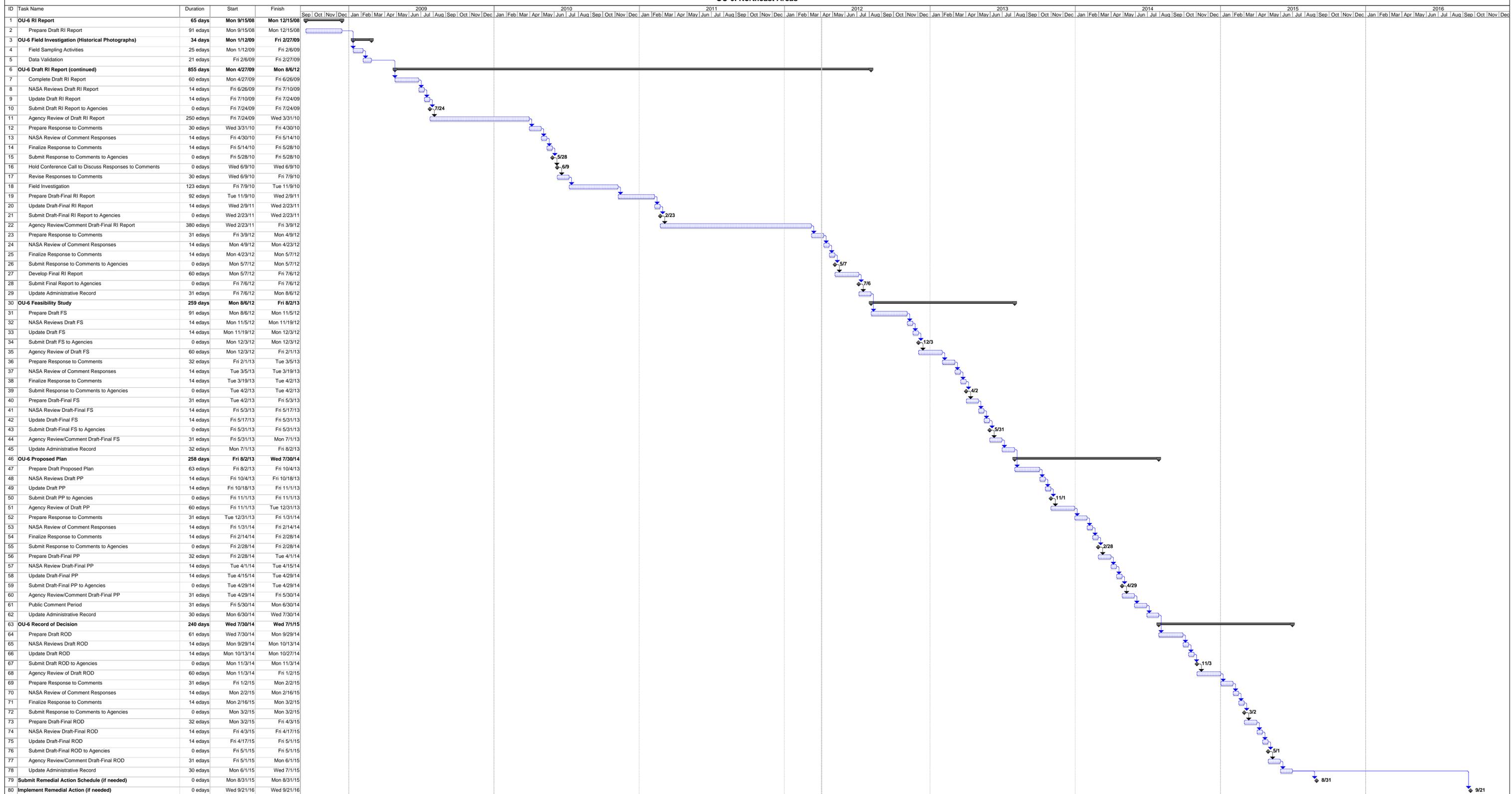
Date: Tue 4/3/12

Task Progress Summary External Tasks Deadline
 Split Milestone Project Summary External Milestone

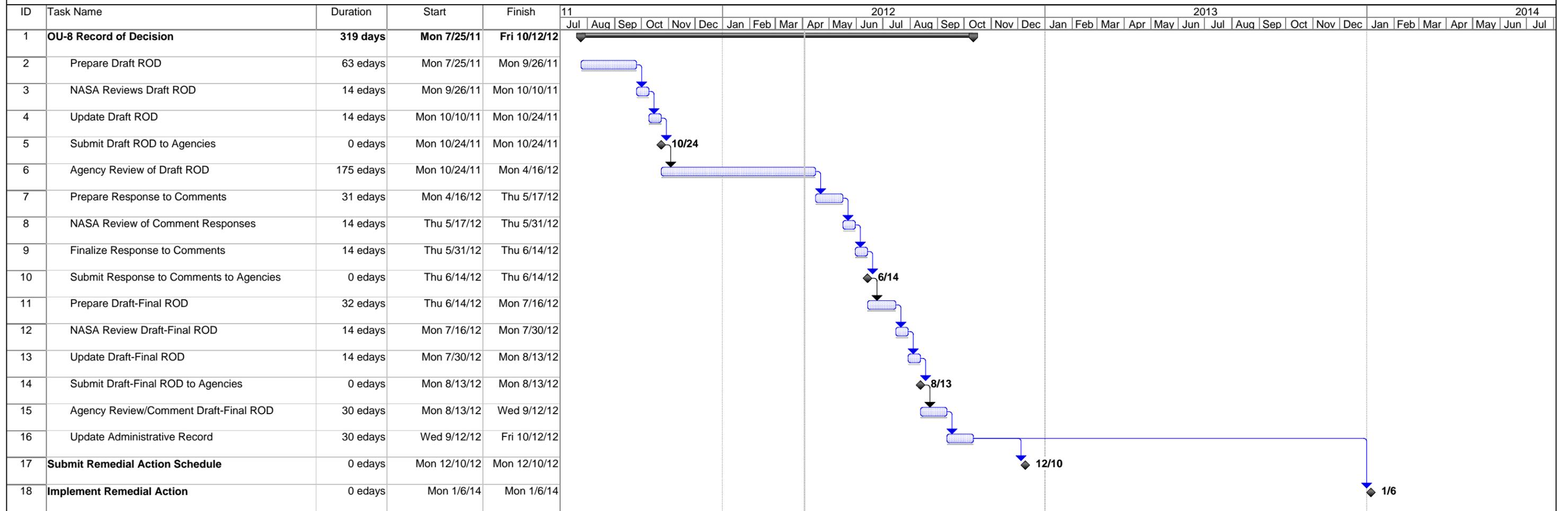
OU-5: Northwest Area Activities



OU-6: Northeast Areas



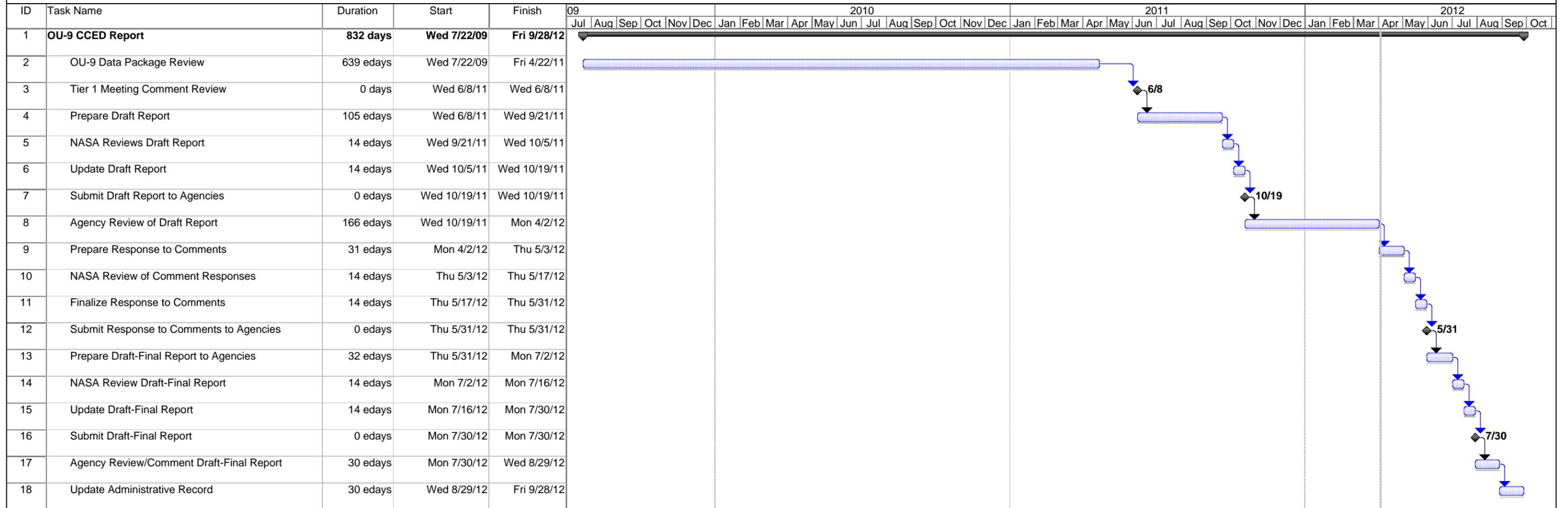
OU-8: Petroleum Sites



Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

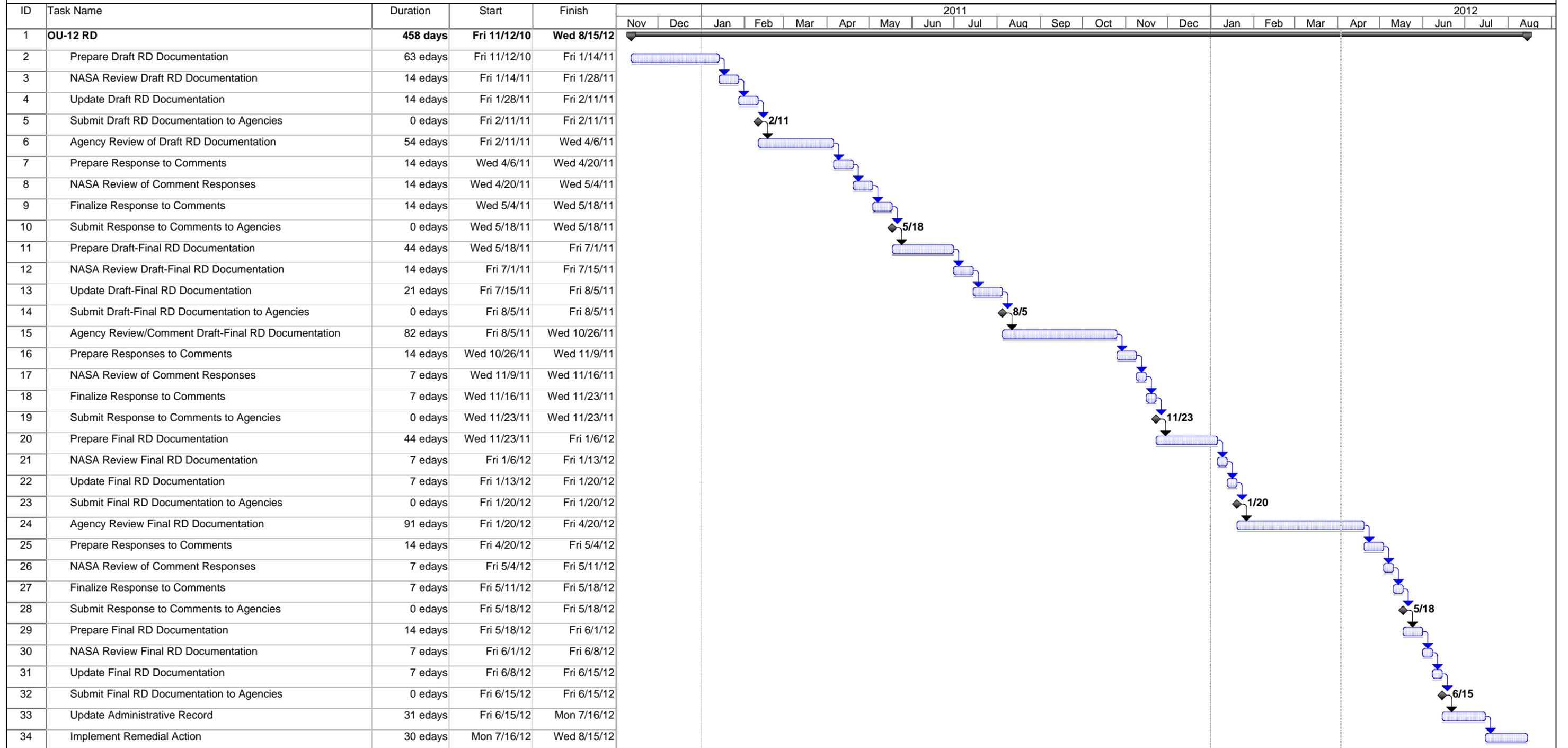
OU-9: Former Industrial Waste Treatment Facility



Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

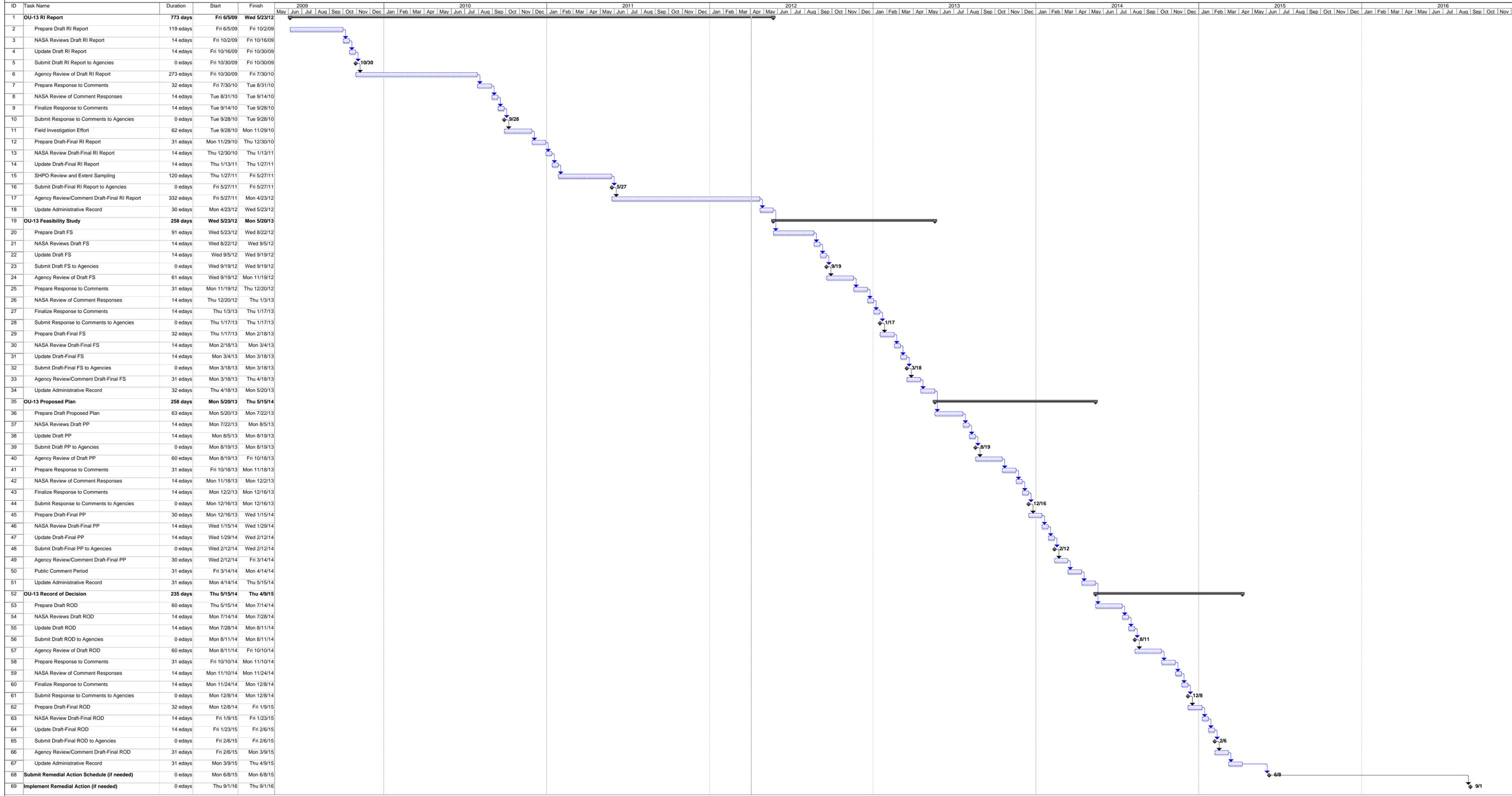
OU-12: MSFC-055/065 Former Stauffer Chemical Plant



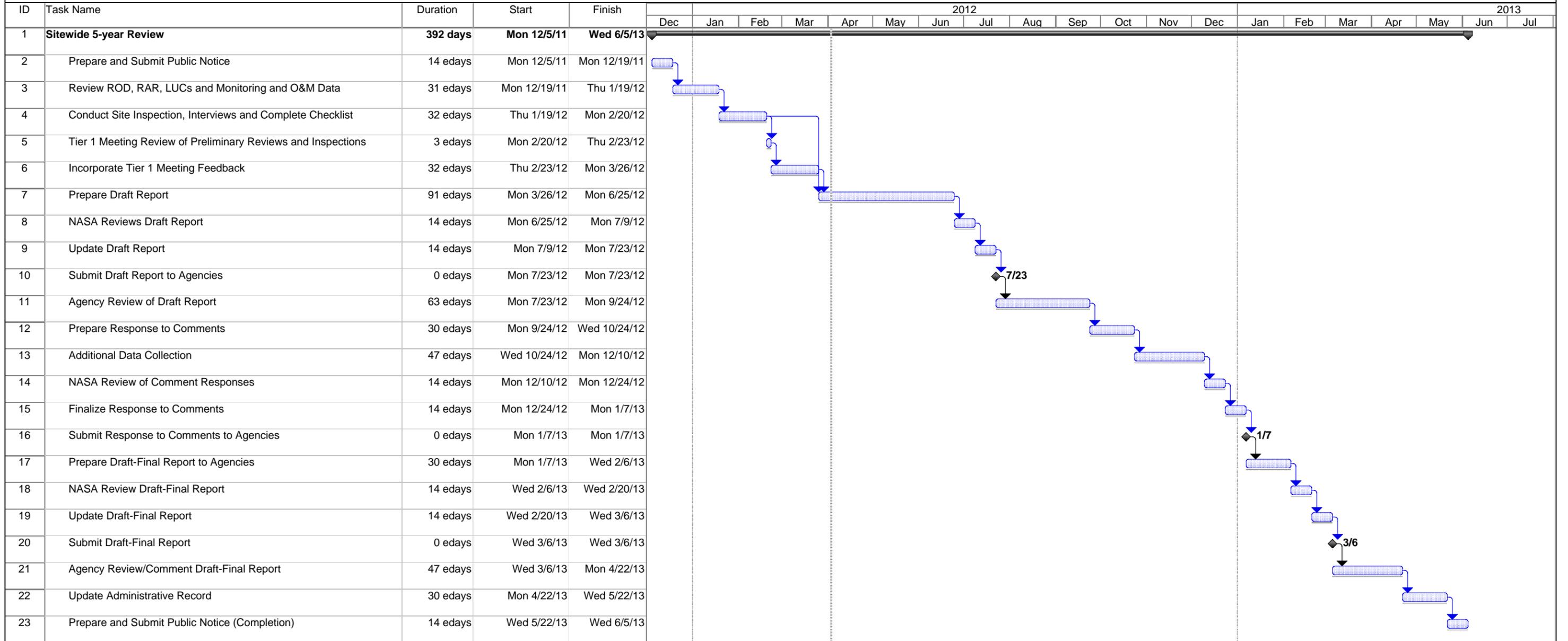
Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

OU-13: Central Area Sites



Sitewide: Five Year Review



Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

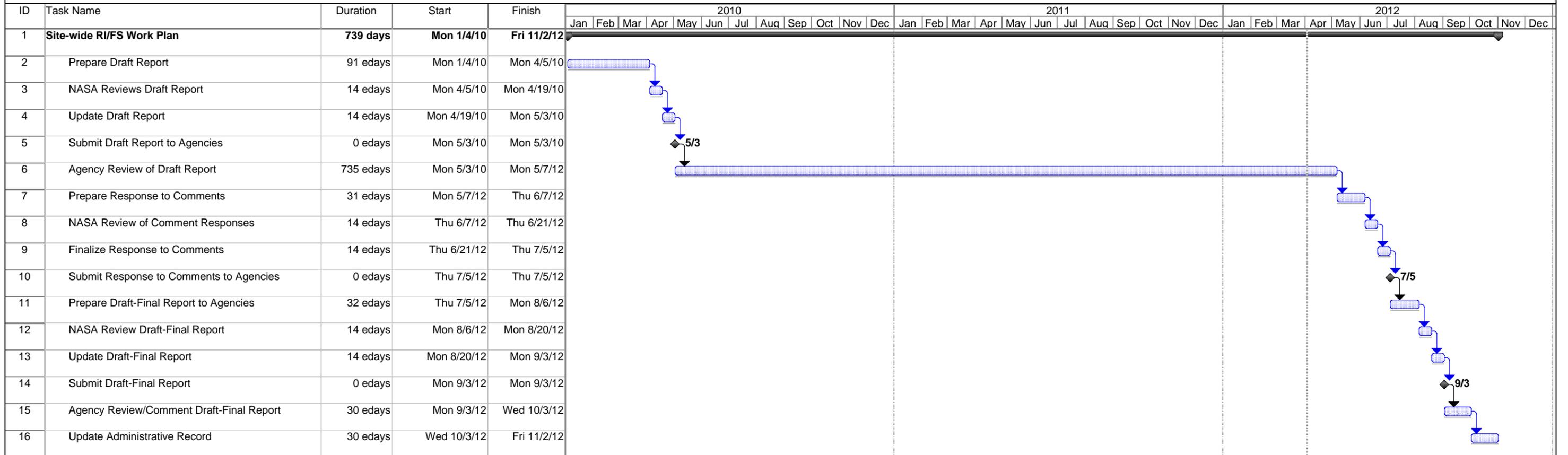
Site Management Plan Update

ID	Task Name	Duration	Start	Finish	2011												2012												2013												2014						
					Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul					
1	Update Site Management Plan FY2012	227 days	Wed 6/29/11	Fri 5/11/12																																											
2	Prepare Draft Site Management Plan (SMP)	68 edays	Wed 6/29/11	Mon 9/5/11																																											
3	NASA Reviews Draft SMP	14 edays	Mon 9/5/11	Mon 9/19/11																																											
4	Update Draft SMP	14 edays	Mon 9/19/11	Mon 10/3/11																																											
5	Submit Draft SMP to Agencies	0 edays	Mon 10/3/11	Mon 10/3/11																																											
6	Agency Review of Draft SMP	67 edays	Mon 10/3/11	Fri 12/9/11																																											
7	Prepare Draft-Final SMP	14 edays	Fri 12/9/11	Fri 12/23/11																																											
8	NASA Review Draft-Final SMP	7 edays	Fri 12/23/11	Fri 12/30/11																																											
9	Update Draft-Final SMP	7 edays	Fri 12/30/11	Fri 1/6/12																																											
10	Submit Draft-Final SMP to Agencies	0 edays	Fri 1/6/12	Fri 1/6/12																																											
11	Agency Review Draft Final SMP	68 edays	Fri 1/6/12	Wed 3/14/12																																											
12	Prepare Final SMP	14 edays	Wed 3/14/12	Wed 3/28/12																																											
13	NASA Review Final SMP	7 edays	Wed 3/28/12	Wed 4/4/12																																											
14	Update Final SMP	7 edays	Wed 4/4/12	Wed 4/11/12																																											
15	Submit Final SMP to Agencies	0 edays	Wed 4/11/12	Wed 4/11/12																																											
16	Update Administrative Record	30 edays	Wed 4/11/12	Fri 5/11/12																																											
17	Update Site Management Plan FY2013	152 days	Thu 6/28/12	Mon 1/28/13																																											
18	Prepare Draft Site Management Plan (SMP)	67 edays	Thu 6/28/12	Mon 9/3/12																																											
19	NASA Reviews Draft SMP	14 edays	Mon 9/3/12	Mon 9/17/12																																											
20	Update Draft SMP	14 edays	Mon 9/17/12	Mon 10/1/12																																											
21	Submit Draft SMP to Agencies	0 edays	Mon 10/1/12	Mon 10/1/12																																											
22	Agency Review of Draft SMP	30 edays	Mon 10/1/12	Wed 10/31/12																																											
23	Prepare Draft-Final SMP	14 edays	Wed 10/31/12	Wed 11/14/12																																											
24	NASA Review Draft-Final SMP	7 edays	Wed 11/14/12	Wed 11/21/12																																											
25	Update Draft-Final SMP	7 edays	Wed 11/21/12	Wed 11/28/12																																											
26	Submit Draft-Final SMP to Agencies	0 edays	Wed 11/28/12	Wed 11/28/12																																											
27	Finalize SMP	30 edays	Wed 11/28/12	Fri 12/28/12																																											
28	Submit Final SMP	0 edays	Fri 12/28/12	Fri 12/28/12																																											
29	Update Administrative Record	31 edays	Fri 12/28/12	Mon 1/28/13																																											
30	Update Site Management Plan FY2014	151 days	Fri 7/5/13	Mon 2/3/14																																											
31	Prepare Draft Site Management Plan (SMP)	66 edays	Fri 7/5/13	Mon 9/9/13																																											
32	NASA Reviews Draft SMP	14 edays	Mon 9/9/13	Mon 9/23/13																																											
33	Update Draft SMP	14 edays	Mon 9/23/13	Mon 10/7/13																																											
34	Submit Draft SMP to Agencies	0 edays	Mon 10/7/13	Mon 10/7/13																																											
35	Agency Review of Draft SMP	30 edays	Mon 10/7/13	Wed 11/6/13																																											
36	Prepare Draft-Final SMP	14 edays	Wed 11/6/13	Wed 11/20/13																																											
37	NASA Review Draft-Final SMP	7 edays	Wed 11/20/13	Wed 11/27/13																																											
38	Update Draft-Final SMP	7 edays	Wed 11/27/13	Wed 12/4/13																																											
39	Submit Draft-Final SMP to Agencies	0 edays	Wed 12/4/13	Wed 12/4/13																																											
40	Finalize SMP	30 edays	Wed 12/4/13	Fri 1/3/14																																											
41	Submit Final SMP	0 edays	Fri 1/3/14	Fri 1/3/14																																											
42	Update Administrative Record	31 edays	Fri 1/3/14	Mon 2/3/14																																											

Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

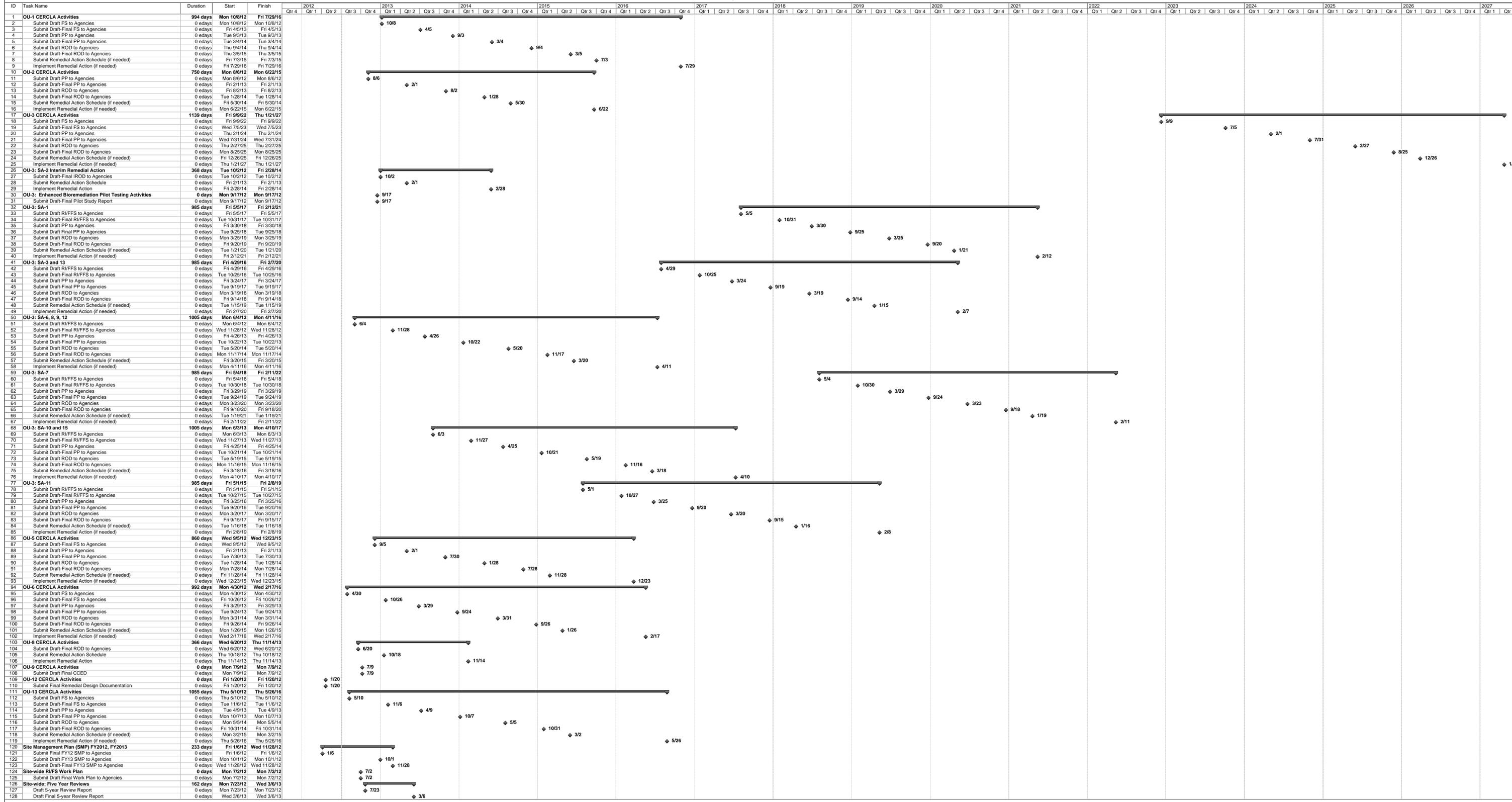
Site-Wide Remedial Investigation / Feasibility Study Work Plan



Date: Tue 4/3/12

Task		Progress		Summary		External Tasks		Deadline	
Split		Milestone		Project Summary		External Milestone			

NASA MSFC CERCLA Program Primary Document Submittal Schedule



Appendix C Transmittal Letters and Responses to Comments

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Final

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 26, 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Brian Roberson
Environmental Engineering Department/AD10
National Aeronautics and Space Administration
George C. Marshall Space Flight Center
(Attn: AD10/Brian Roberson)
Building 4249/Code AS10
Marshall Space Flight Center, Alabama 35812

Dear Mr. Roberson:

EPA has completed the review of the Final Appendix A to the FFA Site Management Plan, FY 2012 dated April 2012 and agrees with it as written. The document accurately reflects discussions and decisions made by the NASA MSFC Environmental Clean-up Team. Therefore, EPA approves the document. In support of communication and consistency on cross-program issues at this National Priorities List facility, EPA has courtesy-copied Ms. Terry de la Paz (Redstone Arsenal) and Mr. Philip Stroud (Alabama Department of Environmental Management) on this correspondence.

Please do not hesitate to contact me at 404/562-8768 or lattimore.leigh@epa.gov if you have any questions about this correspondence.

Sincerely,

Leigh Lattimore

Leigh N. Lattimore
Remedial Project Manager
Federal Facilities Branch
Superfund Division

Digitally signed by Leigh Lattimore
DN: cn=Leigh Lattimore, o=FFB,
Superfund, email=lattimore.leigh@epa.gov,
c=US
Date: 2012.04.26 15:10:32 -04'00'

cc: Sarah Gill, ADEM
Philip Stroud, ADEM (Electronic)
Terry de la Paz, Redstone Arsenal
Jim Ashworth, TechLaw (Electronic)
Michelle Thornton, EPA (Electronic)

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LANCE R. LEFLEUR
DIRECTOR



ROBERT J. BENTLEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

May 1, 2012

CERTIFIED MAIL # 91 7108 2133 3935 0329 3783

Mr. Brian Roberson
Remedial Project Manager
George C. Marshall Space Flight Center
Environmental Engineering Dpt/AS10 - Building 4249
Marshall Space Flight Center (MSFC), Alabama 35812

Re: **ADEM Concurrence:** *Final Appendix A to the FFA Site Management Plan FY 2012*, dated April 10th, 2012.
EPA ID: AL1800013863

Dear Mr. Roberson:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the referenced *Final Appendix A to the FFA SMP FY 2012*. Based on this review, it appears that Marshall Space Flight Center (MSFC) has adequately addressed ADEM's comments (letter dated March 9th, 2012) on the *Draft-Final Appendix A to the FFA SMP FY 2012*. Therefore, the Department concurs with the *Final Appendix A to the FFA SMP FY 2012* and has no further comments.

If you have any questions regarding this correspondence, please contact Sarah Gill at (334) 271-7734 or via e-mail at sgill@adem.state.al.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen A. Cobb".

Stephen A. Cobb, Chief
Governmental Hazardous Waste Branch
Land Division

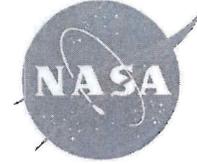
SAC/JW/SAG

cc: Leigh Lattimore/EPA



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National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812



April 10, 2012

Reply to Attn of: AS10 (48-12)

Ms. Leigh Lattimore
EPA Remedial Project Manager

Ms. Sarah Gill
ADEM Project Manager

Subject: Final Appendix A to the FFA Site Management Plan, FY2012

Dear Ms. Lattimore and Ms. Gill:

Enclosed are one hard copy and one CD of the *Final Appendix A to the FFA Site Management Plan, FY2012 (NASA, 2012)* for the United States Environmental Protection Agency and one hard copy and one CD for the Alabama Department of Environmental Management. A hard copy along with one CD of the document have also been mailed to Tech Law, to the attention of Mr. Jim Ashworth, for his review.

If you have any questions or concerns, please feel free to call me at 256-544-0858.

Sincerely,

A handwritten signature in cursive script that reads "Brian Roberson".

Brian Roberson
Environmental Engineering and Health Office

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Draft Final

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National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

January 5, 2012

Reply to Attn of: AS10 (20-12)

Leigh Lattimore
Remedial Project Manager
Environmental Protection Agency

Sarah Gill
Project Manager
Alabama Department of Environmental Management

Subject: Draft Final Appendix A to the FFA Site Management Plan, FY2012

Ms. Lattimore and Ms. Gill

Enclosed are one hard copy and two CDs of the *Draft Final Appendix A to the FFA Site Management Plan, FY2012 (NASA, 2012)* for the Alabama Department of Environmental Management and one hard copy and one CD for the United States Environmental Protection Agency. A hard copy of the document along with one CD, have also been mailed to Tech Law to the attention of Mr. Jim Ashworth for his review. The document was updated on the basis of comments received on the draft version and the Tier 1 conference call held on 19 October 2011.

If you have any questions or concerns, please feel free to call me at 256-544-0858.

Sincerely,

A handwritten signature in blue ink that reads "Brian Roberson".

Brian Roberson
Environmental Engineering and Occupational Health Office
cc: AS10 File 8406

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Draft Final FY 2012 Site Management Plan; Responses to Agency Comments

NASA submitted the *Draft Final Appendix A to the FFA, Site Management Plan, FY 2012* to EPA and ADEM on January 5, 2012, for review and comment. The responses to comments submitted by the agencies are provided below.

EPA Comment Responses

Specific Comments

1. **Section 2.14, Operable Unit Prioritization, Page 2-85**

EPA would like the ratings for Regulatory Concerns be changed for OU-6, Northeast Areas from 1 to 2 and for OU-8, Petroleum Areas, from 2 to 4.

Response: The ratings for Regulatory Concerns in Table 2-12 will be updated for OU-6 and OU-8, and the Summary Score values for OU-6 and OU-8 will be revised to 22 and 34, respectively.

2. **Table 3-1, Agency Enforceable and Target Deadlines for FY and FY+1, Pages 3-2 to 3-3**

The dates of submission for the documents need to be checked against the Appendix B, Operable Unit Schedules dates. For example, the OU-5 Draft Final Proposed Plan is listed as being submitted on December 12, 2012 but in the Draft Final SMP it lists the date of submission on June 25, 2013.

Response: The dates of submission for the documents in Table 3-1 will be revised to be consistent with the Operable Unit Schedules provided in Appendix B.

3. **Appendix B, Operable Unit Schedule, OU-1: East and West Test Areas**

According to the schedule for OU-1: East and West Test Areas, the agencies only have 31 days to review the Draft Final RI Report. It is requested that Agencies have longer since new information has been included into the Report.

Response: The Operable Unit Schedule for OU-1 will be revised in Appendix B to include additional Agency review time for the Draft Final OU-1 RI Report.

ADEM Comment Responses

1. **Page 2-9, Section 2.2, OU-1: East and West Test Areas:** In the last sentence, please change 'draft final' to 'final', since the removal action report has been finalized.

Response: The term "draft final" will be changed to "final" in the last sentence of Section 2.2.

2. **Page 2-12, Section 2.2.2 MSFC-005: Holding Pond-Test Area Complex 300:** The text states that LUCs or remedial action may be required at this site; however, the summary box only lists the CERCLA phases through the ROD. In the summary box, please add 'remedial design' and 'remedial action' to the list of anticipated future CERCLA phases.

Response: The terms “remedial design” and “remedial action” will be added to the list of anticipated future CERCLA phases for the MSFC-005: Holding Pond-Test Complex 300.

3. **Page 2-52, Section 2.6.3 MSFC-070 Vehicle Wash Rack and Oil/Water Separator:** ADEM Comment #3 on the Draft 2012 SMP was not completely addressed.

The original comment was: The last sentence states “Previous sample results indicate that the OWS did not release any chemicals.” However, in the OU-6 RI Report, Aroclor-1260 and BaP were identified as COCs in total soil for the residential receptor in the MSFC-070/MSFC-084 Area. The Aroclor-1260 risk exceedance was based on the detection in sample SB06-078, which was collected next to the MSFC-070 OWS. Please revise this section to reflect the fact that Aroclor-1260 is a COC for MSFC-070.

In response, MSFC added PCBs to the list of COPCs in the summary box; however, the last sentence still states “Previous sample results indicate that the OWS did not release any chemicals.” Please revise the text to address the fact that PCBs were detected in the vicinity of the OWS.

Response: The last sentence of Section 2.6.3 will be deleted in the final version of the document.

4. **Page 2-55, Section 2.6.6 MSFC-083: Groundskeeper and Future Area 4348:** The text states that PCBs were detected at this site; therefore, please add PCBs to the list of COPCs in the summary box.

Response: PCBs will be added to the list of COPCs in the summary box.

5. **Pages 2-56 to 2-58, MSFC-084, MSFC-093, and MSFC-F:** The section numbers are missing from the headings for these three sites. Please revise these pages to include the section numbers.

Response: The appropriate section numbers (2.6.7, 2.6.8, and 2.6.9) will be added to the headings for these three sites.

6. **Pages 2-60 to 2-67, Section 2.8 OU-8 Petroleum Sites:** ADEM Comment #4 on the Draft 2012 SMP was not addressed.

The original comment was: Update the ‘Current CERCLA Phase’ for the OU-8 sites from ‘Public Comment Period’ to ‘ROD’.

The summary boxes still list the public comment period as the current CERCLA phase. Please revise the summary boxes for Sections 2.8.1 through 2.8.8 to reflect the current CERCLA phase.

Response: The summary boxes for Sections 2.8.1 through 2.8.8 will be updated to identify the current CERCLA Phase as “ROD.”

7. **Appendix B Operable Unit Schedules; SA-2 In-Situ Chemical Reduction Interim Remedial Action:** The schedule indicates that the public comment period is currently ongoing; however, ADEM has not seen the Final PP for Public Comment. Please clarify whether the dates given in the schedule are correct and revise, if appropriate

Response: The dates for the Final PP for Public Comment for SA-2 will be revised in Appendix B.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

March 14, 2012

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Brian Roberson
Environmental Engineering Department/AD10
National Aeronautics and Space Administration
George C. Marshall Space Flight Center
(Attn: AD10/Brian Roberson)
Building 4249/Code AS10
Marshall Space Flight Center, Alabama 35812

Dear Mr. Roberson:

EPA has completed the review of the Draft Final Appendix A to the FFA Site Management Plan, FY 2012, January 2012. The comments are provided as an enclosure. EPA recommends that NASA MSFC develop draft responses to regulatory agency comments for discussion and resolution among the members of the NASA MSFC Environmental Clean-up Team prior to document revision. In support of communication and consistency on cross-program issues at this National Priorities List facility, EPA has courtesy-copied Ms. Terry de la Paz (Redstone Arsenal) and Mr. Philip Stroud (Alabama Department of Environmental Management) on this correspondence.

Please do not hesitate to contact me at 404/562-8768 or Lattimore.leigh@epa.gov if you have any questions about this correspondence.

Sincerely,

Leigh Lattimore

Leigh N. Lattimore
Remedial Project Manager
Federal Facilities Branch
Superfund Division

Digitally signed by Leigh Lattimore
DN: cn=Leigh Lattimore, o=FFB,
Superfund, email=lattimore.leigh@epa.gov,
c=US
Date: 2012.03.14 15:13:42 -04'00'

Internet Address (URL) = <http://www.epa.gov>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

cc: Sarah Gill, ADEM
Philip Stroud, ADEM (Electronic)
Terry de la Paz, Redstone Arsenal
Jim Ashworth, TechLaw (Electronic)
Michelle Thornton, EPA (Electronic)

**Environmental Protection Agency (EPA) Region 4
Comments on:
Draft Final Appendix A to the FFA
Site Management Plan, FY 2012
NASA Marshall Space Flight Center
EPA ID AL1800013863
Huntsville, Madison County, AL**

I. Specific Comments

1. Section 2.14, Operable Unit Prioritization, Page 2-85

EPA would like the ratings for Regulatory Concerns be changed for OU-6, Northeast Areas from 1 to 2 and for OU-8, Petroleum Areas, from 2 to 4.

2. Table 3-1, Agency Enforceable and Target Deadlines for FY and FY+1, Pages 3-2 to 3-3

The dates of submission for the documents need to be checked against the Appendix B, Operable Unit Schedules dates. For example, the OU-5 Draft Final Proposed Plan is listed as being submitted on December 12, 2012 but in the Draft Final SMP it lists the date of submission on June 25, 2013.

3. Appendix B, Operable Unit Schedule, OU-1: East and West Test Areas

According to the schedule for OU-1: East and West Test Areas, the agencies only have 31 days to review the Draft Final RI Report. It is requested that Agencies have longer since new information has been included into the Report.

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LANCE R. LEFLEUR
DIRECTOR



Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

ROBERT J. BENTLEY
GOVERNOR

March 9, 2012

CERTIFIED MAIL # 91 7108 2133 3935 0329 0249

Mr. Brian Roberson
Remedial Project Manager
George C. Marshall Space Flight Center
Environmental Engineering Dpt/AS10 - Building 4249
Marshall Space Flight Center (MSFC), Alabama 35812

Re: **ADEM Review Comments: Draft-Final Appendix A to the FFA Site Management Plan, FY 2012**, dated January 2012.
EPA ID: AL1800013863

Dear Mr. Roberson:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the referenced Appendix A to the FFA Site Management Plan, FY 2012 and has generated the enclosed comments. Please respond to the Department's comments and submit appropriate revisions to the Report within 60 days from the date of receipt of this letter. If you have any questions regarding this correspondence, please contact Sarah Gill at (334) 271-7734 or via e-mail at sgill@adem.state.al.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen A. Cobb".

Stephen A. Cobb, Chief
Governmental Hazardous Waste Branch
Land Division

Enclosure

SAC/JW/SAG

cc: Leigh Lattimore/EPA

Birmingham Branch
110 Vulcan Road
Birmingham, AL 35209-4702
(205) 942-6168
(205) 941-1603 (FAX)

Decatur Branch
2715 Sandlin Road, S. W.
Decatur, AL 35603-1333
(256) 353-1713
(256) 340-9359 (FAX)



Mobile Branch
2204 Perimeter Road
Mobile, AL 36615-1131
(251) 450-3400
(251) 479-2593 (FAX)

Mobile-Coastal
4171 Commanders Drive
Mobile, AL 36615-1421
(251) 432-6533
(251) 432-6598 (FAX)

Mr. Brian Roberson
March 9, 2012
Page 2 of 3

***ADEM Review Comments:
Draft-Final Appendix A to the FFA Site Management Plan, FY 2012
Dated January 2012***

1. **Page 2-9, Section 2.2, OU-1: East and West Test Areas:** In the last sentence, please change '*draft final*' to '*final*', since the removal action report has been finalized.
2. **Page 2-12, Section 2.2.2 MSFC-005: Holding Pond-Test Area Complex 300:** The text states that LUCs or remedial action may be required at this site; however, the summary box only lists the CERCLA phases through the ROD. In the summary box, please add 'remedial design' and 'remedial action' to the list of anticipated future CERCLA phases.
3. **Page 2-52, Section 2.6.3 MSFC-070 Vehicle Wash Rack and Oil/Water Separator:** ADEM Comment #3 on the Draft 2012 SMP was not completely addressed.

The original comment was: The last sentence states "*Previous sample results indicate that the OWS did not release any chemicals.*" However, in the OU-6 RI Report, Aroclor-1260 and BaP were identified as COCs in total soil for the residential receptor in the MSFC-070/MSFC-084 Area. The Aroclor-1260 risk exceedance was based on the detection in sample SB06-078, which was collected next to the MSFC-070 OWS. Please revise this section to reflect the fact that Aroclor-1260 is a COC for MSFC-070.

In response, MSFC added PCBs to the list of COPCs in the summary box; however, the last sentence still states "*Previous sample results indicate that the OWS did not release any chemicals.*" Please revise the text to address the fact that PCBs were detected in the vicinity of the OWS.

4. **Page 2-55, Section 2.6.6 MSFC-083: Groundskeeper and Future Area 4348:** The text states that PCBs were detected at this site; therefore, please add PCBs to the list of COPCs in the summary box.
5. **Pages 2-56 to 2-58, MSFC-084, MSFC-093, and MSFC-F:** The section numbers are missing from the headings for these three sites. Please revise these pages to include the section numbers.
6. **Pages 2-60 to 2-67, Section 2.8 OU-8 Petroleum Sites:** ADEM Comment #4 on the Draft 2012 SMP was not addressed.

The original comment was: Update the 'Current CERCLA Phase' for the OU-8 sites from 'Public Comment Period' to 'ROD'.

Mr. Brian Roberson
March 9, 2012
Page 3 of 3

The summary boxes still list the public comment period as the current CERCLA phase. Please revise the summary boxes for Sections 2.8.1 through 2.8.8 to reflect the current CERCLA phase.

7. **Appendix B Operable Unit Schedules; SA-2 In-Situ Chemical Reduction Interim Remedial Action:** The schedule indicates that the public comment period is currently ongoing; however, ADEM has not seen the Final PP for Public Comment. Please clarify whether the dates given in the schedule are correct and revise, if appropriate

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Draft

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National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Marshall Space Flight Center, AL 35812

September 30, 2011

Reply to Attn of: AS10 (172-11)

Leigh Lattimore
Remedial Project Manager
Environmental Protection Agency

Sarah Gill
Project Manager
Alabama Department of Environmental Management

Subject: Draft Appendix A to the FFA Site Management Plan, FY2012

Ms. Lattimore and Ms. Gill

Enclosed are one hard copy and two CDs of the *Draft Appendix A to the FFA Site Management Plan, FY2012 (NASA, 2011)* for the Alabama Department of Environmental Management and one hard copy and one CD for the United States Environmental Protection Agency. A hard copy of the document along with one CD, have also been mailed to Tech Law to the attention of Mr. Jim Ashworth for his review.

As discussed in recent Tier 1 meetings, NASA has grouped the Operable Unit (OU) 3 Source Areas (SA) on the basis of the anticipated funding that will be available in the future to perform interim actions. The SA groupings are listed in the OU-3 description in Section 2 of the report. The schedules for the OU-3 SA interim actions are provided in Appendix B in addition to the overall schedule for OU-3.

If you have any questions or concerns, please feel free to call me at 256-544-0858.

Sincerely,

A handwritten signature in blue ink that reads "Brian Roberson".

Brian Roberson
Environmental Engineering and Occupational Health Office
cc: AS10 File 8406

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Draft FY 2012 Site Management Plan; Responses to Agency Comments

NASA submitted the *Draft Appendix A to the FFA Site Management Plan, FY 2012* to EPA and ADEM on September 30, 2011, for review and comment. The responses to comments submitted by the agencies are provided in the following text.

EPA Comment Responses

General Comments

1. In the Draft Appendix A to the FFA Site Management Plan, FY 2012 dated October 2011 (Draft SMP), the text under the “Anticipated Future CERCLA Phase” does not match what is listed in the discussions of the different CERCLA sites. For example, the text in Section 2.2.1 under “Anticipated Future CERCLA Phase” states “FS, PP, ROD, and long term monitoring of liner”. However, in the discussion of Section 2.2.1, MSFC-004: Deluge Pond-West Test Area, the text states, “The CERCLA process will be followed and the risk reduced to an acceptable level, either through land use controls (LUCs) or through the implementation of a remedial action.” The text under the “Anticipated Future CERCLA Phase” should mirror the CERCLA process discussion. Please revise this example and check all the other subsection to make sure the “Anticipated Future CERCLA Phase” reflects what is discussed in the subsections.

Response: *The text under the “Anticipated Future CERCLA Phase” will be reviewed and updated to reflect what is discussed in each specific subsection.*

Specific Comments

1. **Section 2.2.3, MSFC-006: Disposal Pond 4586, Page 2-13**

The first sentence of the last paragraph of this section states, “The Agencies currently are reviewing the draft final version of the OU-1 RI Report.” This statement is incorrect and should be revised. This comment applies to Sections 2.2.4 through 2.2.19. The text should state that NASA is currently collecting additional data based on ADEM and EPA comments and will resubmit the Draft Final RI Report.

Response: *The statement, “The Agencies currently are reviewing the draft final version of the OU-1 RI Report.” will be revised to the following:*

“NASA currently is developing a revised Draft Final RI Report.” in the appropriate OU-1 subsections.

2. **Section 2.3, OU-2: Industrial Sewer System, Page 2-29**

The last sentence of the section states, “Currently, NASA is developing a risk assessment for the sediments inside the pipeline, which will be included in the draft final version of the OU-2 FS.” This statement is incorrect and needs to be revised.

Response: *The statement will be revised read as follows:*

“Currently, NASA is developing the final version of the OU-2 FS.”

3. **Section 2.4, OU-3: Groundwater, Page 2-30**

The last sentence of the third paragraph states, “Supplemental RI investigations will be conducted that address the distribution of the contamination in the deeper portions of the groundwater system.” Is this

statement accurate? If so, when are the supplemental RI investigations planning on taking place? If it is an incorrect statement please revise the Draft SMP.

Response: *The field investigations for the OU-3 RI are complete and no supplemental investigations are planned. This statement will be revised in next version of the SMP.*

4. **Section 2.4, OU-3: Groundwater, Page 2-34**

The proposed path forward for OU-3 list “Prepare and submit the OU-3 FS.” However, it is unclear how one FS will address all the source areas as well as all the groundwater plumes, and incorporate an appropriate remedial action for the final groundwater remedy.

Response: *The path forward bullets will be revised to include completing the CERCLA process for the Source Area groupings that are discussed in Section 2.4. The top five bullets in the last portion of Section 2.4 will be replaced with the following bullets:*

- *Continue to conduct semiannual sampling at groundwater and surface water monitoring locations and reporting the monitoring results annually.*
- *Prepare and submit a draft final RI Report.*
- *Complete the CERCLA process for the Source Area groupings (RI/FFS, PP, IROD, RD).*
- *Perform Interim Actions.*
- *Prepare and submit the OU-3 FS.*

5. **Section 2.5.1, MSFC-014, 015, 016, and 076: Satellite Waste Accumulation Areas for Building 4707, Page 2-36**

The first sentence of the last paragraph states, “NASA currently is responding to Agency comments on the draft final RI Report.” This statement has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-5 subsections.

Response: *The statement, “NASA currently is responding to Agency comments on the draft final RI Report.” will be revised to read as follows:*

“NASA currently is responding to Agency comments on the Final OU-5 RI Report.” in the appropriate OU-5 subsections.

6. **Section 2.6.1, MSFC-029: Photograph Laboratory Satellite Waste Accumulation Area, Page 2-47**

The first sentence of the last paragraph on Page 2-47 has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-6 subsections.

Response: *The text in Sections 2.6.1 through 2.6.9 will be revised to state:*

“NASA has submitted the OU-6 Draft Final RI Report and currently is waiting to receive Agency comments on the report.”

7. **Section 2.8, OU-8: Petroleum Sites, Page 2-56**

The proposed path forward for OU-8 lists hold a public comment period; however, this already took place. Please remove the bullet.

Response: *The proposed path forward will be revised and the bullet discussing the public comment period will be deleted.*

8. **Section 2.13.1, MSFC-001: Driller’s Mud Disposal Site, Page 2-78**

The first sentence of the last paragraph on Page 2-78 has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-13 subsections.

Response: *The text in Sections 2.13.1 through 2.13.7 will be revised to state:
“NASA has submitted the OU-13 Draft Final RI Report and currently is waiting to receive Agency comments on the report.”*

9. **Section 2.14, Operable Unit Prioritization, Page 2-85**

It is unclear how OU-8 is ranked 6th of the OUs requiring further action especially since OU-8 has identified principal threat waste at MSFC-059. Table 2-12, Operable Unit Prioritization, needs to be re-evaluated.

Response: *The table will be updated based on conversations among NASA and Agencies. The following changes will be made to Table 2-12 and new total values will be calculated:*

OU-8 HH = 3

OU-9 HH = 0

OU-3 Groundwater Regulatory Concerns = 4

OU-13 Regulator Concerns = 2

10. **Table 3-1, Agency Enforceable and Target Deadlines for FY and FY+1, Pages 3-2 to 3-3**

The submittal “OU-3/SA-3, 6, 9, 8, 12 Draft RI/FFS Report” does not match what is found in Appendix B, Operable Unit Schedules. It should be changed to “OU-3/SA-6, 8, 9, 12”.

Response: *The term “OU-3/SA-3, 6, 9, 8, 12” in Table 3-1 will be revised to “OU-3/SA-6, 8, 9, 12” to be consistent with Appendix B.*

ADEM Comment Responses

1. **Page 1-3, Section 1.2.3 History of the Site Listings:** In the last sentence of the next to last paragraph of this section, please change “...there are 76 sites in NASA’s program” to “...there were 76 sites in NASA’s program”, since the number of sites prior to 2007 is being discussed.

Response: *The text in the last sentence of the next to last paragraph in Section 1.2.3 will be replaced with: “...there were 76 sites in NASA’s program.”*

2. **Section 2 Operable Units:** There are several site descriptions where the text indicates that that LUCs or remediation will likely be required; however, the summary box only lists the future CERCLA phases through the ROD. In the following sections, in the summary boxes, please add ‘remedial design’ and ‘remedial action’ to the steps listed under “*Anticipated Future CERCLA Phase*”.

- Section 2.2.5 MSFC-008 Old Holding Pond Area-Test Complex 500
- Section 2.2.14 MSFC-064 Buried Pipeline at Building 4572
- Section 2.2.19 MSFC-B Containment Area for Old Storable Propellant Building 4688
- Section 2.5.1 MSFC-014, 015, 016, and 076 Satellite Waste Accumulation Areas for Building 4707
- Section 2.5.3 MSFC-021 Satellite Waste Accumulation Area for Building 4744
- Section 2.5.6 MSFC-054 Site of Former Beryllium Metal Machining Facility
- Section 2.6.8 MSFC-093 Building 4487 Sump Area
- Section 2.13.1 MSFC-001 Driller’s Mud Disposal Site
- Section 2.13.3 MSFC-031 Hazardous Waste Container Storage Area
- Section 2.13.7 MSFC-091 Building 4638 Maintenance Shop

Response: *The terms “remedial design” and “remedial action” will be added to the summary boxes for the referenced subsections.*

3. **Pages 2-10 to 2-28, Section 2.2 OU-1 East and West Test Areas:** In the text describing each of the different sites, the statement “*The Agencies currently are reviewing the draft final version of the OU-1 RI Report*” should be updated to “*NASA is currently preparing a revised draft final version of the OU-1 RI Report.*”

Response: *Please see the response to EPA Specific Comment 1.*

4. **Page 2-49, Section 2.6.3 MSFC-070 Vehicle Wash Rack and Oil/Water Separator:** The last sentence states “*Previous sample results indicate that the OWS did not release any chemicals.*” However, in the OU-6 RI Report, Aroclor-1260 and BaP were identified as COCs in total soil for the residential receptor in the MSFC-070/MSFC-084 Area. The Aroclor-1260 risk exceedance was based on the detection in sample SB06-078, which was collected next to the MSFC-070 OWS. Please revise this section to reflect the fact that Aroclor-1260 is a COC for MSFC-070.

Response: *The text in Section 2.6.3 will be revised to reflect that Aroclor-1260 is a COC for MSFC-070.*

5. **Pages 2-57 to 2-64, Section 2.8 OU-8 Petroleum Sites:** Update the ‘Current CERCLA Phase’ for the OU-8 sites from ‘Public Comment Period’ to ‘ROD’.

Response: *Please see the response to EPA Specific Comment 7.*

6. **Page 2-57, Section 2.8.1 MSFC-033 Satellite Waste Accumulation Area for Building 4815:** Please update the last sentence from “*The Agencies are currently reviewing the final version of the sampling plan*” to “*The Agencies are currently reviewing the sampling results.*”

Response: *The last sentence of Section 2.8.1 will be replaced with the following text:
“The Agencies currently are reviewing the sampling results.”*

7. **Page 2-65, Section 2.9 OU-9 Former Industrial Waste Treatment Facility:** Please update the last sentence to note that a CCED has been submitted.

Response: *The last sentence of Section 2.9 will be replaced with the following text:
“NASA has collected additional samples in OU-9 to address Agency comments and submitted a CCED that the Agencies currently are reviewing.”*

8. **Page 2-71, Section 2.12 OU-12 Former Stauffer Chemical Plant:** The first paragraph refers to OU-12 as being bound to the north by Pioneer Street and to the west by Building 4307. However, Pioneer Street bisects OU-12, while Neal Road bounds OU-12 to the north, and Building 4207 (not 4307) bounds OU-12 to the west. Please revise the text accordingly.

Response: *The third sentence in the first paragraph of Section 2.12 will be replaced with the following text:
“This OU is bounded by Digney Road on the south, Morris Road on the east, Neal Road on the north, and Building 4207 on the west.”*

9. **Page 2-72, Section 2.12.1 MSFC-022 and MSFC-E Satellite Waste Accumulation Area for Buildings 4241 and 4244:** The last sentence states that two areas of surface soil and one area of subsurface soil will require remediation. However, in the Draft-Final OU-12 RD this was changed to two areas of surface soil and two areas of subsurface soil. Please update Section 2.12.1 accordingly.

Response: *The last sentence in the last paragraph of Section 2.12.1 will be replaced with the following text:
“NASA has proposed to remediate OU-12 to residential levels. There are two areas within MSFC-022/E that will require surface soil remediation and two areas that will require subsurface soil remediation.”*

10. **Page 2-74, Section 2.12.3 MSFC-055 Site of the Former Stauffer Chemical Plant:** The second bullet point states that two areas of surface soil will require remediation in the Laydown Area and Southern Interface. However, the Draft-Final OU-12 RD states that only one area of surface soil will require remediation in the Laydown Area and Southern Interface. Please revise Section 2.12.3 accordingly.

Response: *The second bullet in the last paragraph will be replaced with the following text:
“Laydown Area and Southern Interface—One area of surface soil.”*

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4**

**61 Forsyth Street SW
Atlanta, Georgia 30303-3104**

October 20, 2011

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

4SF-FFB

Mr. Brian Roberson
Environmental Engineering Department/AD10
National Aeronautics and Space Administration
George C. Marshall Space Flight Center
(Attn: AD10/Brian Roberson)
Building 4249/Code AS10
Marshall Space Flight Center, Alabama 35812

Dear Mr. Roberson:

EPA has completed the review of Appendix A to the FFA Site Management Plan, FY 2012, October 2011. The comments are provided as an enclosure. EPA recommends that NASA MSFC develop draft responses to regulatory agency comments for discussion and resolution among the members of the NASA MSFC Environmental Clean-up Team prior to document revision. EPA also recommends that this document go straight to a final version. In support of communication and consistency on cross-program issues at this National Priorities List facility, EPA has courtesy-copied Ms. Terry de la Paz (Redstone Arsenal) and Mr. Philip Stroud (Alabama Department of Environmental Management) on this correspondence.

Please do not hesitate to contact me at 404/562-8768 or Lattimore.leigh@epa.gov if you have any questions about this correspondence.

Sincerely,

Leigh Lattimore

Digitally signed by Leigh Lattimore
DN: cn=Leigh Lattimore, o=ous#FFB, Superfund,
email=lattimore.leigh@epa.gov, c=US
Date: 2011.10.20 08:47:46 -0400

Leigh N. Lattimore
Remedial Project Manager
Federal Facilities Branch
Superfund Division

cc: Sarah Gill, ADEM
Philip Stroud, ADEM (Electronic)
Terry de la Paz, Redstone Arsenal
Jim Ashworth, TechLaw (Electronic)
Michelle Thornton, EPA (Electronic)

Environmental Protection Agency (EPA) Region 4

Comments on:

**Draft Appendix A to the FFA
Site Management Plan, FY 2012
NASA Marshall Space Flight Center
EPA ID AL1800013863
Huntsville, Madison County, AL**

I. General Comments

1. In the Draft Appendix A to the FFA Site Management Plan, FY 2012 dated October 2011 (Draft SMP), the text under the “Anticipated Future CERCLA Phase” does not match what is listed in the discussions of the different CERCLA sites. For example, the text in Section 2.2.1 under “Anticipated Future CERCLA Phase” states “FS, PP, ROD, and long term monitoring of liner”. However, in the discussion of Section 2.2.1, MSFC-004: Deluge Pond-West Test Area, the text states, “The CERCLA process will be followed and the risk reduced to an acceptable level, either through land use controls (LUCs) or through the implementation of a remedial action.” The text under the “Anticipated Future CERCLA Phase” should mirror the CERCLA process discussion. Please revise this example and check all the other subsection to make sure the “Anticipated Future CERCLA Phase” reflects what is discussed in the subsections.

II. Specific Comments

1. Section 2.2.3, MSFC-006: Disposal Pond 4586, Page 2-13

The first sentence of the last paragraph of this section states, “The Agencies currently are reviewing the draft final version of the OU-1 RI Report.” This statement is incorrect and should be revised. This comment applies to Sections 2.2.4 through 2.2.19. The text should state that NASA is currently collecting additional data based on ADEM and EPA comments and will resubmit the Draft Final RI Report.

2. Section 2.3, OU-2: Industrial Sewer System, Page 2-29

The last sentence of the section states, “Currently, NASA is developing a risk assessment for the sediments inside the pipeline, which will be included in the draft final version of the OU-2 FS.” This statement is incorrect and needs to be revised.

3. Section 2.4, OU-3: Groundwater, Page 2-30

The last sentence of the third paragraph states, “Supplemental RI investigations will be conducted that address the distribution of the contamination in the deeper portions of the groundwater system.” Is this statement accurate? If so, when are the supplemental RI investigations planning on taking place? If it is an incorrect statement please revise the Draft SMP.

4. **Section 2.4, OU-3: Groundwater, Page 2-34**

The proposed path forward for OU-3 list “Prepare and submit the OU-3 FS.” However, it is unclear how one FS will address all the source areas as well as all the groundwater plumes, and incorporate an appropriate remedial action for the final groundwater remedy.

5. **Section 2.5.1, MSFC-014, 015, 016, and 076: Satellite Waste Accumulation Areas for Building 4707, Page 2-36**

The first sentence of the last paragraph states, “NASA currently is responding to Agency comments on the draft final RI Report.” This statement has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-5 subsections.

6. **Section 2.6.1, MSFC-029: Photograph Laboratory Satellite Waste Accumulation Area, Page 2-47**

The first sentence of the last paragraph on Page 2-47 has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-6 subsections.

7. **Section 2.8, OU-8: Petroleum Sites, Page 2-56**

The proposed path forward for OU-8 lists hold a public comment period; however, this already took place. Please remove the bullet.

8. **Section 2.13.1, MSFC-001: Driller’s Mud Disposal Site, Page 2-78**

The first sentence of the last paragraph on Page 2-78 has not been updated since the Final Appendix A to the FFA, Site Management Plan, FY 2011 dated April 2011 but needs to be. Revise this statement along with similar statements made in the other OU-13 subsections.

9. **Section 2.14, Operable Unit Prioritization, Page 2-85**

It is unclear how OU-8 is ranked 6th of the OUs requiring further action especially since OU-8 has identified principal threat waste at MSFC-059. Table 2-12, Operable Unit Prioritization, needs to be re-evaluated.

10. **Table 3-1, Agency Enforceable and Target Deadlines for FY and FY+1, Pages 3-2 to 3-3**

The submittal “OU-3/SA-3, 6, 9, 8, 12 Draft RI/FFS Report” does not match what is

found in Appendix B, Operable Unit Schedules. It should be changed to “OU-3/SA-6, 8, 9, 12”.

LANCE R. LEFLEUR
DIRECTOR



ROBERT J. BENTLEY
GOVERNOR

Alabama Department of Environmental Management
adem.alabama.gov

1400 Coliseum Blvd. 36110-2400 ■ Post Office Box 301463
Montgomery, Alabama 36130-1463
(334) 271-7700 ■ FAX (334) 271-7950

December 9, 2011

CERTIFIED MAIL #

Mr. Brian Roberson
Remedial Project Manager
George C. Marshall Space Flight Center
Environmental Engineering Dpt/AS10 - Building 4249
Marshall Space Flight Center (MSFC), Alabama 35812

Re: **ADEM Review Comments: Draft Appendix A to the FFA Site Management Plan, FY 2012**, dated October 2011.
EPA ID: AL1800013863

Dear Mr. Roberson:

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed the referenced Appendix A to the FFA Site Management Plan, FY 2012 and has generated the enclosed comments. Please respond to the Department's comments and submit appropriate revisions to the Report within 60 days from the date of receipt of this letter. If you have any questions regarding this correspondence, please contact Sarah Gill at (334) 271-7734 or via e-mail at sgill@adem.state.al.us.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen A. Cobb". The signature is fluid and cursive, with the first name "Stephen" being the most prominent.

Stephen A. Cobb, Chief
Governmental Hazardous Waste Branch
Land Division

Enclosure

SAC/JW/SAG

cc: Leigh Lattimore/EPA
Craig Benedikt/EPA

ADEM Review Comments:
Draft Appendix A to the FFA Site Management Plan, FY 2012
Dated October 2011

1. **Page 1-3, Section 1.2.3 History of the Site Listings:** In the last sentence of the next to last paragraph of this section, please change “...*there are 76 sites in NASA’s program*” to “...*there were 76 sites in NASA’s program*”, since the number of sites prior to 2007 is being discussed.

2. **Section 2 Operable Units:** There are several site descriptions where the text indicates that that LUCs or remediation will likely be required; however, the summary box only lists the future CERCLA phases through the ROD. In the following sections, in the summary boxes, please add ‘remedial design’ and ‘remedial action’ to the steps listed under “*Anticipated Future CERCLA Phase*”.
 - Section 2.2.5 MSFC-008 Old Holding Pond Area-Test Complex 500
 - Section 2.2.14 MSFC-064 Buried Pipeline at Building 4572
 - Section 2.2.19 MSFC-B Containment Area for Old Storable Propellant Building 4688
 - Section 2.5.1 MSFC-014, 015, 016, and 076 Satellite Waste Accumulation Areas for Building 4707
 - Section 2.5.3 MSFC-021 Satellite Waste Accumulation Area for Building 4744
 - Section 2.5.6 MSFC-054 Site of Former Beryllium Metal Machining Facility
 - Section 2.6.8 MSFC-093 Building 4487 Sump Area
 - Section 2.13.1 MSFC-001 Driller’s Mud Disposal Site
 - Section 2.13.3 MSFC-031 Hazardous Waste Container Storage Area
 - Section 2.13.7 MSFC-091 Building 4638 Maintenance Shop

3. **Pages 2-10 to 2-28, Section 2.2 OU-1 East and West Test Areas:** In the text describing each of the different sites, the statement “*The Agencies currently are reviewing the draft final version of the OU-1 RI Report*” should be updated to “*NASA is currently preparing a revised draft final version of the OU-1 RI Report.*”

4. **Page 2-49, Section 2.6.3 MSFC-070 Vehicle Wash Rack and Oil/Water Separator:** The last sentence states “*Previous sample results indicate that the OWS did not release any chemicals.*” However, in the OU-6 RI Report, Aroclor-1260 and BaP were identified as COCs in total soil for the residential receptor in the MSFC-070/MSFC-084 Area. The Aroclor-1260 risk exceedance was based on the detection in sample SB06-078, which was collected next to the MSFC-070 OWS. Please revise this section to reflect the fact that Aroclor-1260 is a COC for MSFC-070.

5. **Pages 2-57 to 2-64, Section 2.8 OU-8 Petroleum Sites:** Update the ‘Current CERCLA Phase’ for the OU-8 sites from ‘Public Comment Period’ to ‘ROD’.
6. **Page 2-57, Section 2.8.1 MSFC-033 Satellite Waste Accumulation Area for Building 4815:** Please update the last sentence from “*The Agencies are currently reviewing the final version of the sampling plan*” to “*The Agencies are currently reviewing the sampling results.*”
7. **Page 2-65, Section 2.9 OU-9 Former Industrial Waste Treatment Facility:** Please update the last sentence to note that a CCED has been submitted.
8. **Page 2-71, Section 2.12 OU-12 Former Stauffer Chemical Plant:** The first paragraph refers to OU-12 as being bound to the north by Pioneer Street and to the west by Building 4307. However, Pioneer Street bisects OU-12, while Neal Road bounds OU-12 to the north, and Building 4207 (not 4307) bounds OU-12 to the west. Please revise the text accordingly.
9. **Page 2-72, Section 2.12.1 MSFC-022 and MSFC-E Satellite Waste Accumulation Area for Buildings 4241 and 4244:** The last sentence states that two areas of surface soil and one area of subsurface soil will require remediation. However, in the Draft-Final OU-12 RD this was changed to two areas of surface soil and two areas of subsurface soil. Please update Section 2.12.1 accordingly.
10. **Page 2-74, Section 2.12.3 MSFC-055 Site of the Former Stauffer Chemical Plant:** The second bullet point states that two areas of surface soil will require remediation in the Laydown Area and Southern Interface. However, the Draft-Final OU-12 RD states that only one area of surface soil will require remediation in the Laydown Area and Southern Interface. Please revise Section 2.12.3 accordingly.

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