

National Aeronautics and
Space Administration
Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020



November 27, 2013

Reply to Attn of: RE-13-131

New Mexico Environment Department
Attn: Mr. John Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: NASA White Sands Test Facility (WSTF) 2013 Waste Minimization Plan

Enclosed is the 2013 Waste Minimization Plan as required by the WSTF Hazardous Waste Permit No. NM8800019434. Enclosure 1 provides a paper copy of the document. Enclosure 2 provides an electronic copy of the document on CD-ROM. This report has been prepared for fiscal year 2013. NASA tracks recycling and related waste activities on a federal fiscal year basis (October 1 to September 30). This approach maintains consistency with previous submittals and ensures a complete and accurate report.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, to the best of my knowledge and belief, is true, accurate, and complete. I am aware there are significant penalties for submitting false information including the possibility of fine and imprisonment for known violations.

If you have any questions or comments concerning this submittal, please contact Michael Jones of my staff at 575-524-5604.

A handwritten signature in blue ink that reads "Michael Jones for".

Radel Bunker-Farrar
Chief, Environmental Office

2 Enclosures

cc: (with enclosures)
Mr. Dan Comeau
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505



National Aeronautics and
Space Administration

Hazardous and Solid Waste Amendments (HSWA) Waste Minimization Plan

October 1, 2012 to September 30, 2013

NM8800019434
NASA Johnson Space Center White Sands Test Facility
12600 NASA Road Las Cruces, New Mexico 88012

NASA Johnson Space Center White Sands Test Facility
Hazardous and Solid Waste Amendments (HSWA)
Waste Minimization Plan

October 1, 2012 to September 30, 2013

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.



Radel Bunker-Farrah
Chief, NASA Environmental Office

November 27, 2013
Date

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List of Acronyms and Abbreviations

CSU	Container Storage Unit
EMP	Environmental Management Program
EMS	ISO 14001 Environmental Management System
EO	Executive Order
EPA	United States Environmental Protection Agency
FTU	Fuel Treatment Unit
FY	Fiscal year
HWSA	Hazardous and Solid Waste Amendments
ISO	International Organization for Standardization
NASA	National Aeronautics and Space Administration
NETS	NASA Environmental Tracking System
NMED	New Mexico Environment Department
NMRC	New Mexico Recycling Coalition
NPR	NASA procedural requirement
MDAL	Molecular Desorption Analysis Lab
MPITS	Mid-plume Interception and Treatment System
MSDS	Material safety data sheet
MW	Megawatt
P2	Pollution prevention
PFTS	Plume Front Treatment System
POTW	Publicly owned treatment works
RSA	Recycling and sustainable acquisition
SSPP	Strategic Sustainability Performance Plan
WSIT	WSTF Sustainability Initiative Team
WSTF	NASA Johnson Space Center White Sands Test Facility

1.0 Introduction

The New Mexico Environment Department (NMED) Hazardous Waste Permit (Permit), issued to the National Aeronautics and Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) became effective December 9, 2009. The Permit requires that WSTF institute a waste minimization program to reduce the volume and toxicity of hazardous wastes generated by the facility's operation, to the degree determined by NASA to be economically practicable.

2.0 Objectives and Scope

The Permit requires that WSTF submit a copy of the annual certified statement regarding the waste minimization program to NMED by December 1st for the previous 12-month period ending September 30. The reporting period included in this document is October 1, 2012 through September 30, 2013, or NASA fiscal year (FY) 2013.

The WSTF source reduction, recycling, and planning activities for this reporting period are addressed below. The Permit requirements are listed below with a response following each requirement.

3.0 Waste Minimization Program Plan Components (Permit-specified)

3.1 Policies and Programs

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any written policy or statement that outlines goals, objectives, and methods for source reduction and recycling of hazardous waste at the Facility.* This section includes descriptions of existing policies and ongoing programs that support waste minimization at WSTF.

3.1.1 Environmental Management System

NASA incorporated the International Organization for Standardization (ISO) 14001:2004 Environmental Management System (EMS) into the WSTF Management Policy. This action emphasizes the NASA commitment to reducing the consumption of natural resources while exhibiting environmental stewardship related to all site activities and procedures.

WSTF uses EMS procedures to evaluate the environmental aspects of site activities, products, and services to determine their environmental impacts. Environmental impacts of each aspect are ranked and those with significant impacts are established as "significant aspects." An Environmental Management Program (EMP) is established for each significant aspect. Each EMP will outline objectives and targets developed to lessen the environmental impact and reduce the consumption of natural resources at WSTF. Objectives and targets are to be met by completing tasks that may be directed toward regulatory compliance, pollution prevention, reduction in waste generation, increase in waste diversion, and resource conservation (materials, energy, water, and fuel).

The FY2013 significant aspects and associated EMPs were:

- Energy Efficiency and Water Conservation.
- Groundwater Contamination.
- Hazardous Materials Management.
- Sustainable Acquisition.

- Environmental Sustainability.

Objectives and accomplishments for each EMP are discussed below.

Energy Efficiency and Water Conservation

The objective of this EMP is to reduce site energy and water use according to federal requirements. The site Energy Manager reported the following accomplishments during FY2013:

- An agreement was formed with the National Renewable Energy Laboratory to conduct studies for potential renewable energy and energy efficient projects at WSTF.
- Electric and natural gas meters were installed in four buildings.
- The metering software was upgraded to solve some previous communication problems and to provide better access, reporting, and managing capabilities.
- Energy-saving light fixtures were installed in two buildings.
- Water conservation efforts are ongoing; including the installation of water-saving fixtures as facility restrooms are upgraded.
- Completed the Energy Monitoring and Control System scheduling report.

Groundwater Contamination

Two groundwater contamination remediation systems are in operation at WSTF. The objective of the Plume Front Treatment System (PFTS) is to control further migration of contaminated groundwater at the plume-front. The objective of the Mid-plume Interception and Treatment System (MPITS) is to intercept highly contaminated groundwater flowing through the Mid-plume constriction area toward the plume front.

- Both groundwater contamination remediation systems are operating in compliance with DP-1255 and the NMED Hazardous Waste Permit.

Hazardous Materials Management

- Version 8 of the Material Safety Data Sheet (MSDS) Online (MSDSonline^{®1}) continues to be used as an interactive tool to track chemical inventories accessible by all site personnel.

Sustainable Acquisition

The objective for the FY2013 Sustainable Acquisition EMP was to develop a procedure for sustainable acquisition (buying green products/materials) at WSTF. Targets involved establishing a committee of stakeholders, finalizing the draft guidance document, and presenting recommendations to management. The stakeholder committee that was established includes contractor purchasing, environmental, warehouse personnel, and a NASA Environmental representative. Once the NASA procedural requirement (NPR) for Sustainable Acquisition has been finalized, the equivalent WSTF document will be aligned with the NPR, presented to management, and finalized.

As a federal agency, NASA is required to reduce resource use by procuring products and services that have a lesser or reduced adverse effect on the environment when compared to competing products or

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services. This includes products that are made of recovered, recycled, biobased, renewable, non-ozone-depleting, or other environmentally preferable materials, or are energy efficient or water conserving. In addition, Environmental Department are in the approval queue for all contractor procurements. Products are reviewed for toxicity and, where possible, toxic products are replaced by less toxic alternatives.

Procedures are being developed that will continually increase the volume of green products purchased by the site. The following list includes procedures established to continually improve sustainable acquisition at WSTF:

- WSTF Environmental Department review contractor purchase requests to ensure compliance with federal requirements.
- Stakeholders meet bi-weekly to address issues and refine the “buy green” process.
- Site-wide “buy green” training of personnel is underway. Annual refresher training is required.

Environmental Sustainability

This EMP is managed by the WSTF Sustainability Initiative Team (WSIT). FY2013 objectives focused on raising employee awareness and encouraging employees to participate in WSTF’s continued evolution toward sustainability. WSIT activities during FY2013 included:

- Continuing a site-wide sustainability awareness program via site newsletters and emails, celebration of two annual events, and the WSIT SharePoint website.
- Supporting the sustainable acquisition process by providing training to requestors, approving purchase requests, and working with the procurement and warehouse personnel to identify alternative green products.
- Documenting WSTF sustainable actions and initiatives to show continual improvement.
- Implementing single-stream recycling at WSTF.

3.1.2 Sustainability at WSTF

WSTF management recognized that the depletion of natural resources threatened to significantly impact the environment at WSTF. As a result, sustainability was established as an EMS significant aspect and the WSTF Sustainability Initiative Team was launched in FY2005. NASA continues to support the WSIT efforts, including management of the sustainability EMP, via task order funding. WSIT evaluates and advises management in areas of environmental stewardship and sustainability, represents the WSTF community’s environmental conscience, gathers and disseminates information on the various aspects of sustainability, advocates for employees’ ideas, documents site sustainable actions, and provides a mechanism for implementing change.

Many WSTF programs fall under the umbrella of sustainability. Ongoing programs including Pollution Prevention (P2), Waste Management, and Recycling are administered by the WSTF Environmental Department in accordance with federal laws, executive orders, and NASA procedural requirements. Measures to reduce hazardous waste, minimize the use of toxic substances, reduce resource use, and improve environmental performance at WSTF have been successful and WSTF continues to evolve toward environmental sustainability.

With the 2009 promulgation of Executive Order (EO) 13514 “Federal Leadership in Environmental, Energy, and Economic Performance,” each federal agency was required to prepare and implement a Strategic Sustainability Performance Plan (SSPP). NASA adopted the sustainability goals set forth for

federal agencies in the EO and submitted the initial plan to the Office of Management and Budget in the summer of 2010. Progress is reported in annual updates. NASA submitted the 2013 SSPP in June 2013. SSPP goals include greenhouse gas reduction, high performance sustainable buildings and renovations, sustainable acquisition, water use efficiency and management, pollution prevention and waste reduction (including recycling), and electronics stewardship. WSIT provides support to WSTF stakeholders that are working toward the SSPP goals.

The Permit requires frequent review and characterization of waste streams. These activities have promoted a closer look at waste generation and minimization at WSTF; modification of the hazardous waste generation process, improvement of waste determinations, and generator attention to waste stream constituents and concentrations continue to reduce waste.

The WSTF Environmental Department maintains records of sustainable actions in the areas of hazardous and solid waste minimization, recycling, resource conservation, and environmental stewardship. Data from each FY are entered into the NASA Environmental Tracking System (NETS). NETS information is gathered for required NASA-wide reporting in the annual SSPP. NETS reporting information continues to be used on-site for tracking waste and minimization projects.

3.2 Training and Incentive Programs

The Permit specifies that the following be included in the Waste Minimization Program Plan: *Any employee training or incentive programs designed to identify and implement source reduction and recycling opportunities.*

EMS awareness training is included in the environmental briefing section of the new hire orientation. The material emphasizes sustainability, pollution prevention, continuous improvement, and compliance with environmental laws. “Environmental Compliance Awareness” training serves as a refresher for waste minimization and other environmental programs.

WSIT continues a sitewide awareness campaign to strengthen the sustainability culture at the site. WSIT provides information through various forms of communication, such as WSTF-Today emails, the WSIT SharePoint website, sustainability presentations, and posting articles in the two WSTF newsletters; the bi-weekly “Porcelain Press” and the monthly “What’s Going On at WSTF.” WSIT annually celebrates Earth Day (April 22nd) and America Recycles Day (November 15th) with site-wide awareness events.

“Buy green” training specific to the WSTF procurement systems has been developed and incorporated into the annual refresher training for all employees that order goods and services for the site. Employees are required to attend annual refresher trainings.

In addition to formal training sessions, WSTF management personally emphasizes the site objective of achieving environmental excellence and increasing awareness via frequent employee all-hands meetings. Topics such as environmental awareness, process reminders, site accomplishments, program visibility, and individual recognitions are shared using the site newsletter and posted bulletins.

3.3 Source Reduction and Recycling Measures

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Any source reduction and/or recycling measures implemented in the last five years or planned for the near future.*

WSTF continues to carry out a phased approach to sustainable acquisition; greening the warehouse one category at a time. NASA follows the federal green product requirements listed on the Green Products

Compilation at <http://www.sftool.gov/greenprocurement?CFID=93864&CFTOKEN=27375560>. Continually evolving, this site lists product categories (26 to date) and specifies biobased, energy saving, water conserving, and recycled/recovered content requirements for hundreds of products. Due to the impracticality and inefficiency of greening the thousands of warehouse stock items (items with green requirements) all at once, NASA elected to choose one or more product categories to focus on during the FY. The product category for FY2012 was cleaning products. The replacement of toxic cleaning products with cleaning products that contain biobased materials continued during FY2013 and the category of paper office products was added to the focus list. Where the green products do not meet project specifications or fall within budget, waivers are generated to document the justification for not purchasing the green product.

WSTF adopted single stream recycling in February of 2012 following the implementation of that service in the community. Site maintenance and operations employees were tasked with emptying recycling containers in the buildings once a week. They transferred the materials to two 25 cubic yard gable-topped containers, provided by the South Central Solid Waste Authority. The containers were emptied as necessary (approximately every six weeks).

WSTF expanded the recycling program and diverted more materials from the waste stream in FY2013. The new WSTF refuse contract now includes construction and demolition debris recycling (e.g., concrete, wood, gypsum board, plastic sheeting and certain plastic materials, and asphalt shingles). Single stream recycling is included in the new refuse contract (initiated 7/1/2013), in addition to cardboard, which was the only material recycled in the previous contract. The materials included in the “single stream” are: office paper, shiny paper (catalogs and magazines), telephone books, newspaper, paper board, paper bags, books and junk mail, clean plastics 1-7, and tin and aluminum cans. One or more 8-cy single stream recycling containers are now located outside buildings in each area. These containers are emptied once a month by the solid waste contractor and hauled to the county recycling facility.

Yard waste is transported to the city yard waste facility where it is composted. Concrete is hauled to the same facility where it is used for clean fill. WSTF tracks all recycling metrics for annual reporting purposes.

Specific source reduction and recycling measures for the current reporting period and future plans are presented in [Appendix A](#).

3.4 Operating Costs

The Permit specifies that the following information be included in the Waste Minimization Program Plan: *An itemized list of the dollar amounts of capital expenditures (plant and equipment) and operating costs devoted to source reduction and recycling of hazardous waste.*

Capital expenditures and operating costs associated with source reduction and recycling are not specifically tracked, however, activities initiated or continuing during the reporting period reflect significant investments and cost avoidances. For example, as part of the WSTF property management process, 14.7 tons (29,416) of electronic equipment (E-waste) and 213,940 lb. of scrap metal were recycled in FY2013. NASA also continued to fund the WSIT program. For FY2013, the WSIT allocated budget was approximately \$61,000. The recycling of non-hazardous materials has evolved from a grassroots effort into a successful program, and is due to the voluntary participation of WSTF employees.

3.5 Limiting Factors

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Factors that have prevented implementation of source reduction and/or recycling.*

NASA tests and evaluates spacecraft materials, components, and propulsion systems to enable the safe exploration and utilization of space. NASA test programs depend on federal funding, of which many projects are funded on a program-by-program basis. One-time, short-term, and inconsistent testing schedules generate dynamic and variable waste streams that are difficult to manage for source reduction and recycling. Customer/test requirements, military specifications, original equipment manufacturer specifications, and program timelines limit the use and feasibility of recycling test materials. During this period, WSTF provided support for space shuttle retirement efforts. Future NASA programs, National Defense System rocket engine testing, missile demilitarization, and decommissioning and decontamination of antiquated aerospace equipment will increase customer testing requirements and limit the feasibility of source reduction.

3.6 Information Sources

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *Sources of information on source reduction and/or recycling received at the facility (e.g., local government, trade associations, suppliers, etc.).*

The NASA Principal Center for Regulatory Risk Analysis and Communication reviews the federal register and issues emails with specific information pertaining to changing regulations. The reviews often necessitate that WSTF Environmental Department personnel develop white papers or perform regulatory reviews to evaluate impacts to WSTF operations.

WSIT personnel also participate in the NASA Recycling and Sustainable Acquisition (RSA) video conferences and WebEx presentations sponsored by the NASA RSA Principal Center. These venues facilitate the sharing of information about recycling, sustainability, and pollution prevention strategies between NASA centers. During this reporting period, WSIT members participated in a Glass Recycling Subcommittee sponsored by the South Central Solid Waste Authority.

One WSIT member participated in a free Recycling Education and Outreach Training provided by the New Mexico Recycling Coalition (NMRC). WSTF personnel also utilize online resources, including WebEx presentations, which continuously offer information related to source reduction and recycling. Source agencies include the NMED, the NMRC, Keep America Beautiful (America Recycles Day Initiative), the United States Environmental Protection Agency (EPA), Office of the Federal Environmental Executive, the United States Department of Agriculture, the General Services Administration, other NASA centers, and other Federal Agencies.

3.7 Additional Waste Minimization Efforts

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *An investigation of additional waste minimization efforts which could be implemented at the facility. This investigation shall analyze the potential for reducing the quantity and toxicity of each waste stream through production reformulation, recycling, and all other appropriate means. The analysis shall include an assessment of the technical feasibility, cost, and potential waste reduction for each option.*

WSTF procedures require periodic review of all WSTF waste streams. This evaluation includes generation process changes, contaminant concentrations, quantity variations, waste determinations, and

potential changes to minimize waste generation. Budget constraints paired with sustainable thinking have spurred creative and economic solutions for waste minimization.

The WSTF operational organizations continuously research equipment replacement, product replacement, and product conservation efforts. For example, the Propulsion Test Department is cold flow testing a distillation unit that will reduce non-volatile residue in its fuel conditioning process and maintain product integrity for reuse. The Component Services Department is working with an off-site contractor for rinse water reclamation and routing of the reject water from the reverse osmosis generation units to cooling towers or other operations. Rinse water from the gross cleaning process will also be recycled back into the de-ionization loop.

3.8 Hazardous Waste Matrix

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall submit a flow chart or matrix detailing all hazardous wastes it produces by quantity, type, and building/area.*

The Hazardous Waste Matrix ([Appendix B](#)) identifies the WSTF hazardous waste streams by number, waste name, generation building, area, and the generator's annual estimated quantity.

3.9 Limitations to Waste Reduction

The Permit specifies inclusion of the following in the Waste Minimization Program Plan: *The Permittee shall demonstrate the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes or available technology that would produce less hazardous waste.*

Testing at WSTF supports the federal aerospace industry. The wastes generated in association with this testing are derived from the following processes: engine firings; developmental research; equipment cleaning/repair; missile demilitarization; aerospace equipment decommissioning and decontamination; facility construction/maintenance; and computer and electrical support. These wastes are often dependent upon contractor test requirements, military specifications, program timelines, and additional conditions mandated by contracts.

Appendix A
Source Reduction and Recycling Tables

Table A-1 WSTF Hazardous Waste Source Reduction (Oct. 1, 2012 – Sept. 30, 2013)		
YEAR	SOURCE REDUCTION EFFORT	NET REDUCTION
2004 and beyond	Sixty groundwater wells continue to utilize dedicated low-flow sampling equipment that was approved by NMED. The technology allows continued use of current well structures, avoids drilling new wells, and minimizes generation of purge water (hazardous waste identified as investigation-derived waste).	36,000 gal per year
2009 and beyond	Electronics recycling (including toner cartridges) initiated through UNICOR.	29,416 lb.
2010 and beyond	Contamination control continued emptying cleaning tanks with corrosive solutions (Oakites) on a yearly schedule, rather than weekly (as previously done), with tank recharge as needed.	360 gal
2010 and beyond	Molecular Desorption Analysis Lab (MDAL) replaced organic solvents with HFE 7100 for the cleaning of collector plate used in Volatile Condensable Materials process.	3 to 5 gallons of hazardous waste organics (spent toluene, chloroform, ethanol) annually. Also 80 to 90% of the HFE 7100 goes to Component Services for cleanup and reuse.
2011 and beyond	Working to meet federal requirements for sustainable acquisition. Requirements include replacing ozone depleting substances with approved substitutes listed in the significant new alternatives policy: http://www.epa.gov/ozone/snap/lists/index.html	
2012	Component services transferred citric acid to Environmental Department. Material is being used to clean out scrubbers in Plume Front Treatment System.	113 kg (250 lb.)

Table A-2 WSTF Hazardous Waste Recycling (Oct. 1, 2012 – Sept. 30, 2013)

FISCAL YEAR	HAZARDOUS WASTE RECYCLED	NET REDUCTION
2013	Nickel-cadmium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	41 kg (90 lb.)
2013	Lithium batteries were collected and shipped off-site for recycling as universal waste rather than hazardous waste.	45 kg (99 lb.)
2013	Lead acid batteries were collected and shipped off-site for recycle as universal waste rather than hazardous waste.	1982 kg (4360 lb.)
2013	Spent Dry Cell Batteries (Alkaline) batteries are collected and shipped off-site for recycling as solid waste rather than hazardous or universal waste	263 kg (579 lb.)
2013	The Facilities Maintenance Group collects mercury containing lamps which are recycled as universal waste.	399 kg (878 lb.)
2013	Scrap metal was collected and shipped off site for recycle as scrap metal rather than hazardous waste	708 kg (1558 lb.)
2013	Mercury Containing Equipment.	15 kg (33 lb.)

Table A-3 WSTF Hazardous Waste Source Reduction/Recycling Future Plans

TIME FRAME	PLANNED SOURCE REDUCTION/RECYCLING	NET REDUCTION
In progress	NASA personnel have chosen the technology and are cold flow testing a distillation system that has the capability of maintaining propellants within the parameters required by NASA customer-driven specifications. The system will avoid the high cost of new propellant and monies required for labor, dilution, and disposal of potential hazardous waste.	TBD
Ongoing	NASA continues to be an integral support system for the space effort. WSTF support is critical in NASA's ability to test engines at simulated altitudes. The Propulsion Test Office will continue to test systems that use methanol, LOX, and other propellants instead of hydrazine(s) and nitrogen tetroxide in an effort to reduce the generation of highly toxic hazardous wastes.	TBD
Ongoing	The NASA Plume Front Treatment System continues to treat groundwater contaminated with TCE, PCE, Freon-113, Freon-11, and N-nitrosodimethylamine.	> 99.9 %
Ongoing	The NASA Mid-plume Groundwater Remediation System continues to treat groundwater contaminated with Freon-113, TCE, PCE, Freon-11, and N-nitrosodimethylamine.	> 99.9 %
In progress	Studies and initiatives for alternatives for the supply of electricity to run the NASA WSTF Groundwater Remediation Systems continue to be evaluated. The alternatives include wind, solar, and fuel cells.	TBD
In progress	The Chemistry Laboratory and Environmental Departments continue to investigate requirements and processes that involve waste minimization/elimination of the scrubber fluids from fume hoods in the labs.	TBD
In progress	NASA continues to evaluate the potential for additional precious metal recovery that will recover gold, platinum and palladium from Space Shuttle fuel cells.	TBD
In progress	Connecting with the City of Las Cruces Publicly Owned Treatment Works will enable NASA to significantly reduce waste, avoid sewage lagoon use, and allow elimination of the 200 Area Evaporation Tank Unit.	TBD

Appendix B
Hazardous Waste Matrix

Table B-1 WSTF Hazardous Waste Generation Matrix Off-Site Recycling and Treatment in FY2013	
Waste	Weight
Nickel cadmium batteries (cadmium D006) were recycled as universal waste – off-site. Stored in building 161 Container Storage Unit (CSU) (prior to shipment).	41 kg (90 lb.)
Lead acid batteries (D008) were recycled as universal waste – off-site. Stored in 150 drum storage facility (prior to shipment). Additionally, lead acid batteries are recycled by core exchange when new batteries are delivered by the vendor.	1,982 kg (4,360 lb.)
Lithium batteries (D003) deactivated as universal waste - off-site. Stored in building 161 CSU (prior to shipment).	45 kg (99 lb.)
Silver oxide batteries (D011) recycled as universal waste – off-site. Stored in building 161 CSU (prior to shipment).	<1 kg (2 lb.)
Mercury batteries (D009) recycled as universal waste – off-site. Stored in building 161 CSU (prior to shipment).	<1 kg (2 lb.)
Spent dry cell (alkaline) batteries (non dot regulated) recycled as solid waste – off-site. Stored in building 161 CSU (prior to shipment).	263 kg (579 lb.)
Scrap metal (non-DOT-regulated) recycled as scrap metal – off-site. Stored in building 161 CSU (prior to shipment).	708 kg (1558 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment				
CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
MERCURY/MERCURY CONTAMINATED REFUSE (D009) STABILIZED OFF-SITE BY Clean Harbors and Veolia STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) –WSTF shipped 17 kg (106 lb.) in FY2013				
102011118	Broken Fluorescent Lamp	121	M & O	1 kg (2 lb.)
60201319-99	Mercury Contaminated Debris	121	650	13 kg (29 lb.)
10201377-99	Mercury Contaminated Debris	121	M & O	3 kg (7 lb.)
X-RAY FILM AND FIXER SOLUTION (SILVER D011) INCINERATED OFF-SITE BY Clean Harbors and Veolia, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 25 kg in FY2013				
20-02-14	Waste X-Ray Fixer Solution	203	Met Lab	5 gals/25 kg (53 lb.)
WASTE PAINT AND ADHESIVE (D001, D002, D003, D005, D006, D007, D008, D009, D018, D035, D039, D040, F002 F003) INCINERATED OFF-SITE BY CLEAN HARBORS STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) - WSTF shipped 195 kg (429 lb.) off-site in FY2013.				
10-03-06	Off Spec Paints	Site	Facilities Construction/Maintenance	101 kg (222 lb.)
10-03-08	Waste Paint Related Materials	Site	Facilities Construction/Maintenance	47 kg (103 lb.)
10-20-43	Waste Aerosol Cans	site	Environmental Department	47 kg (103 lb.)
* CONTAMINATED OILS - VACUUM PUMP, REFRIGERATION, SLUDGE, AND MACHINE SHOP, (F001, F002, F003, F005, D002, D004, D005, D006, D007, D008, D009, D018, D035) INCINERATED OFF-SITE BY CLEAN HARBORS and Veolia, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 0 kg (0 lb.) of Contaminated Oil, in FY2013.				
CONTAMINATED DEBRIS (F001, F002, F003, F004, F005, D004, D005, D006, D007, D008, D011, D018, D022, D035, D040) INCINERATED OFF-SITE BY CLEAN HARBORS OR Veolia, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT)– WSTF shipped 1,107 kg (2,435 lb.) of Contaminated Debris in FY2013.				

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10-06-11	Contaminated Spill Dry	200	Mechanical Room	92 kg (203 lb.)
10-02-14	Oil Contaminated Soil	200	Hypervelocity	105 kg (231 lb.)
10-01-13	Contaminated Spill Dry	Site	Site	90 kg (198 lb.)
102012116	Gasoline Contaminated Debris	113	Fuel Pumps	18 kg (40 lb.)
20201240	Antifreeze and spill dry	100	200 Area	100 kg (222 lb.)
4020133-99	Hydraulic Oil Contaminated Spill Dry	400	T.S. 401	304 kg (669 lb.)
6020133-99	Petroleum Contaminated Soil and Debris	600	Well sites. (Environmental)	398 kg (876 lb.)
CONTAMINATED (FUEL) MATERIALS (P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS and Veolia STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 494 kg (1,086 lb.) of hydrazine(s) contaminated debris/materials in FY2013.				
20-01-25	Fuel Contaminated Debris	200	Clean Room	5 kg (11 lb.)
20-04-18	Fuel Contaminated Debris	200	Chemistry Lab	40 kg (88 lb.)
20-04-31	Fuel Contaminated Material	200	Chemistry Lab	5 kg (11 lb.)
20-04-03	UDMH-DETA	200	200 Area	3 kg (6 lb.)
20-04-108	Dilute Fuel Cont. Sample Vials	200	Chemistry Lab	10 kg (22 lb.)
30-01-08	Fuel Contaminated Soft Goods	301	Propulsion Test (300 Area)	1 kg (2 lb.)
40-01-08	Fuel Contaminated Debris	412	Propulsion Test (400 Area)	80 kg (176 lb.)
50-20-01	Fuel Contaminated Debris	500	Fuel Treatment Unit	3 kg (86 lb.)
80-02-09	Fuel Contaminated Debris	800	800 Area	0.8 kg (1.7 lb.)
50-20-04	GAC with Hydrazine	500	Fuel Treatment Unit	346 kg (746 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
CONTAMINATED (OXIDIZER) MATERIALS (P078, ORIGINALLY BUT HAVE BEEN ADGASSED), F001, F002, P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS and Veolia STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) - WSTF shipped 3,411 kg (7,504 lb.) of Oxidizer Contaminated Debris/Materials in FY2013.				
20-01-24	Oxidizer Contaminated Debris	200	Clean Room	24 kg (53 lb.)
20-04-16	Oxidizer Contaminated Debris	200	Chemistry Lab	39 kg (86 lb.)
20-04-56	Ox Drager Pac III Sensors	200	Chemistry Lab	5 kg (11 lb.)
30-01-02	P078 ADGAS Treatment (water)	300	300 Area	2,277 kg (5,009 lb.)
30-01-30	Oxidizer Contaminated Soft Goods	301	Propulsion Test (300 Area)	4 kg (9 lb.)
40-01-02	P078 ADGAS Treatment (water)	400	400 Area	981 kg (2,158 lb.)
40-01-28	Oxidizer Contaminated Soft Goods	400	400 Area Decon	2 kg (5 lb.)
80-02-03	P078 ADGAS Residual (water)	800	800 Area	51 kg (112 lb.)
80-02-08	Oxidizer Contaminated Soft Goods	800	Hazardous Fluids Test	3 kg (7 lb.)
80201209	IDW Contaminated Debris	800	HWDL	25 kg (54 lb.)
CONTAMINATED DEBRIS (F001, F002, F003, F004, F005, D004, D005, D006, D007, D008, D011, D018, D022, D035, D039, D040) INCINERATED OFF-SITE BY CLEAN HARBORS and Veolia, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT)- WSTF shipped 2,496 kg (5,491 lb.) of Contaminated Debris in FY2013.				
10-01-18	Contaminated Rags (Debris)	156	Facilities Heavy Equipment	137 kg (301 lb.)
10-02-09	Contaminated Debris	113	Facilities Machine Shop	719 kg (1,582 lb.)
10-03-04	Contaminated Debris (Rags)	158	Paint Shop	42 kg (93 lb.)
10-10-11	Contaminated Debris (Oily Rags)	151	GSA Garage	29 kg (64 lb.)
10-14-01	Contaminated Debris	153	M & O	20 kg (44 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
102012116	Gasoline Contaminated Debris	113	Fuel Pumps	18 kg (40 lb.)
20-01-60	Contaminated Debris/Filter Cartridges	200	Clean Room	11 kg (22 lb.)
20-02-22	Contaminated Debris	203	Metallurgy Lab	10 kg (22 lb.)
20-02-42	Metallographic Consumables	203	Metallurgy Lab	4 kg (9 lb.)
20-04-31	Waste Firebrick Material	200	Chemistry Lab	3 kg (7 lb.)
20-04-40	Contaminated Refuse	200	Chemistry Lab	15 kg (33 lb.)
20-04-115	Contaminated Debris	200	Component Services	1 kg (2 lb.)
20-04-119	Contaminated Debris	200	Chemistry Lab	8 kg (18 lb.)
20-06-09	Contaminated Debris	203	Chamber Lab	3 kg (7 lb.)
20-07-06	Contaminated Debris/Rags	200	Valve Shop	10 kg (22 lb.)
20201359-99	SCOG Testing Waste	200	200 Area	10 kg (22 lb.)
20201240	Antifreeze and spill dry	100	200 Area	100 kg (222 lb.)
20201360-99	SCOG Testing Waste	200	200 Area	96 kg (211 lb.)
20201361-99	SCOG Testing Waste	200	200 Area	186 kg (409 lb.)
27-01-23	Contaminated Debris	272	Hypervelocity	18 kg (392 lb.)
60-01-02	IDW Contaminated Debris	600	Sampling Wells (Sitewide)	35 kg (77 lb.)
60-04-05	IDW Contaminated Debris	600	Mid Plume	29 kg (64 lb.)
60-04-07	MPITS IDW Contaminated Filters	600	650 Plume Front	247 kg (543 lb.)
60-04-08	Bailing solids/liquids	600	600 Area	222 kg (490 lb.)
60-04-09	IDW Contaminated Liquid	600	Mid Plume	45 kg (100 lb.)
60-04-10	Contaminated Debris	600	Mid Plume	34 kg (75 lb.)
60201313-99	Carbon Media	600	600 Area	119 kg (262 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
60201317-99	IDW Contaminated Debris	600	600 Area	40 kg (88 lb.)
60201318-99	Biomass	600	600 Area	180 kg (396 lb.)
60201326-99	IDW Contaminated Debris	600	600 Area	19 kg (42 lb.)
80-02-74	Oily Contaminated Rags and Spill Dry	802	Hazardous Pressure Test Area (Shop)	10 kg (23 lb.)
80-04-09	Contaminated Debris	803	Prep Lab	23 kg (51 lb.)
80201322-99	Contaminated Ash	800	800 Area	53 kg (117 lb.)
<p align="center">ORGANIC SOLVENTS, CLEANERS, THINNERS (D001, D006, D008, D009, D018, D021, D022 D035, D039, D040, F001, F002 F003, F004, F005, U154, U188, U228, P082, P098) INCINERATED OFF-SITE BY CLEAN HARBORS or Veolia STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT)–WSTF shipped 2,397 kg (5,273 lb.) of Organic Solvents in FY2013.</p>				
10-01-07	Waste Fuels (Gasoline/Diesel)	156	Heavy Equipment	183 kg (403 lb.)
10-02-02	Spent Coolant	113	Machine Shop	1,792 kg (3,942 lb.)
20-04-02	Potassium Cyanide Bearing Waste	200	Chemistry Lab	13 kg (29 lb.)
20-04-04	Waste Organic Liquids	200	Chemistry Lab	4 kg (9 lb.)
20-04-12	Off Spec NDMA, DMN, Bromacil	200	Chemistry Lab	1 kg (2 lb.)
20-04-13	Off Spec Analytical Standards	200	Chemistry Lab	1 kg (2 lb.)
20-04-33	Coulometric Titration Waste	200	Chemistry Lab	3 kg (7 lb.)
20-04-53	Toluene/IPA	200	Chemistry Lab	3 kg (7 lb.)
20-04-100	E-85 Fuel Analysis Waste	200	Chemistry Lab	1 kg (2 lb.)
20-04-120	Spent Solvents	200	200 Area	5 kg (13 lb.)
20201249	Off Spec Chemicals	200	200 Area	2 kg (5 lb.)
20201366-99	Discarded Unused Chemicals	200	200 Area	1 kg (2.2 lb.)
20201269-99	Discarded Unused Chemicals	200	Photo Lab	44 kg (97 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
3020131-99	Discarded Unused Chemicals	200	200 NHB	20 kg (44 lb.)
30201213	Off Spec Lexsol	300	Propulsion Test	170 kg (374 lb.)
4020131-99	Spent solvent	400	400 Area Altitude Group	62 kg (136 lb.)
80-04-03	Waste Organic Standards	800	Materials Test	3 kg (7 lb.)
8020135-99	Off Spec Chemicals	800	800 Area	84 kg (185 lb.)
80201316-99	Discarded Product	800	800 Area	5 kg (11 lb.)
WASTE FUEL (P068, U098, U133) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN FUEL TREATMENT UNIT AT <10% –WSTF shipped 9,420 kg (20,724 lb.; 2,472 gallons) of water with Hydrazines from the Fuel Treatment Unit (FTU) in FY2013.				
5020131-99	Water with <2% Hydrazine	500	Fuel Treatment Unit	9,420 kg (20,724 lb.)
CORROSIVES (D002) INCINERATED OFF-SITE BY CLEAN HARBORS, STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) –WSTF shipped 1,262 kg (2,776 lb.) of Corrosives in FY2013.				
20-01-11	Spent Oakite 126	200	Clean Room	218 kg (480 lb.)
20-01-13	Spent Oakite Rustripper	200	Clean Room	109 kg (240 lb.)
20-01-38	Spent 5% Citric Acid	200	200 Area	93 kg (204 lb.)
20-01-44	Spent Oakite Deoxidizer SS Solution	200	Clean Room	234 kg (515 lb.)
20-01-50	Spent Oakite 31	200	Clean Room	495 kg (1,089 lb.)
20-01-57	Waste Passivation Solution	200	Clean Room	97 kg (212 lb.)
3020131-99	Off Spec Chemicals	200	200 NHB	12 kg (26 lb.)
3020133-99	Off Spec Chemicals	200	200 NHB	4 kg (9 lb.)
METAL BEARING WASTES (D002, D004, D005, D006, D007, D008, D009, D010, D011) OFF-SITE BY CLEAN HARBORS or Veolia STORED IN 90-DAY STORAGE UNIT (PRIOR TO SHIPMENT) – WSTF shipped 557 kg (1,225 lb.) of Metal Bearing Wastes in FY2013.				
10-12-01	Lead Contaminated Debris	161	Firing Range	5 kg (11 lb.)

Table B-2 WSTF Hazardous Waste Generation Matrix Off-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
10-02-18	Spent Metal Cutting Fluid	113	Machine Shop	203 kg (447 lb.)
20-01-18	Spent Brulin Detergent	200	Clean Room	348 kg (766 lb.)
20-02-27	Spent Metal Sludge	200	200 Area	1 kg (2.2 lb.)

Table B-3 FY2013 WSTF Hazardous Waste Generation Matrix On-Site Treatment

CURRENT WIWPS	WASTE NAME	BUILDING	GENERATING AREA	ANNUAL QUANTITY
CORROSIVES (D002, P078) DILUTED/ADGASSED AND TREATED IN EVAPORATION TANKS				
30-01-02, 30-01-04	Decon Water w/Oxidizer	301	Propulsion Test (Shuttle)	53 gals/200 kg (442 lb.)
40-01-02	ADGAS Treatment Residual (Water)	301	Propulsion Test Stand	244 gals/923 kg (2,036 lb.)
80-02-03	Oxidizer Decon Water	800	Hazardous Fluids Test Area	38 gals/143 kg (317 lb.)