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DALLAS, TX 75202-2733



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

REGION 6

1445 ROSS AVENUE, SUITE 1200

**Date of Inspection:** September 24-28, 2012      **EPA ID Number:** NM2750211235

**Facility Name:** US Army White Sands Missile Range

**Physical Location:** White Sands Missile Range, New Mexico 88002-5000

**Facility Contact:** Benito Avalos (Installation Restoration Program Manager): 575-678-5359

**Type of Ownership:**  Federal    State    County    Municipal    Private/Commercial

**Inspection Participants (name and phone number)**

**EPA Inspector:** Paul D. James, P.G., 214-665-6445      **Initials (3):** PDJ

**Facility Representative(s): (name and phone number)**

- Benito Avalos (Installation Restoration Program Manager), 575-678-5359
- Jose Gallegos (Environmental Director Chief), 505-678-1007
- Rustin Baca (Environmental Contractor for WSMR)

**Facility Description:** White Sands Missile Range (WSMR) is a U.S. Army Development Test Command (DTC) installation. It was first established July 9, 1945 as White Sands Proving Grounds and renamed to the current moniker on May 1, 1958. WSMR now functions as a large complex of test ranges, launch sites, impact areas, instrumentation sites and support facilities required to develop and test tactical and strategic weapons and weapons systems. WSMR is designated as a National Range (NR) whose mission is the support of missile development and test programs for the Army, Navy, Air Force, NASA, other government agencies, and foreign allies. Thousands of missile firings, airdrops, and static tests have been conducted as part of this mission. The installation is home to the Trinity Site, where the first nuclear weapon was tested in 1945.

The installation is roughly rectangular in shape and is approximately 100 miles long and 25 to 40 miles wide with a land area of approximately 3,200 sq mi (2,048,000 acres).

**Generator Status:**  LQG (>1000kg/mo)    SQG (100kg/mo to 1000kg/mo)  
 CESQG (<100kg/mo)    TSDF

**Inspection Type:**  EPA Lead    State Lead    CSE    CEI    CDI  
 Sampling    Multi-Media    Other: Corrective Action

**Reason for Evaluation:**    (01) Follow up    (02) Case Development  
 (03) Sampling    (04) Citizen Complaint

- (07) General
- (16) CAV
- (63) US/Mexico
- (65) CAV-US/Mexico

**Summary of Inspection:** On September 24 through September 28, 2012, EPA inspected the facility to evaluate the environmental condition of the site. Since a RCRA corrective action inspection has never been conducted at WSMR by the EPA, the course of the inspection was a broad base approach for the majority of the facility's SWMUs and AOCs defined in their permit. Several concerns were noted during the inspection as defined in the attached report.

**Checklists Completed:** None

**Inspected by:** Paul D. James, P.G. 

**Date:** 1/22/2013

**Peer Reviewed by:** William Mansfield 

**Date:** 1/22/2013

# **RCRA Corrective Action Inspection Report**

## **US Army White Sands Missile Range**

White Sands Missile Range, New Mexico 88002-5000

(EPA ID Number: NM2750211235)

### **Introduction**

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I, Paul James of the U.S. Environmental Protection Agency (EPA), was tasked to conduct a Resource Conservation & Recovery Act (RCRA) Corrective Action Inspection at White Sands Missile Range (WSMR) located in southern New Mexico on September 24 through September 28, 2012. The purpose of my inspection was to observe and review the facility's corrective action as defined in their 2009 Hazardous Waste Facility Permit regulated under RCRA and the New Mexico Hazardous Waste Act. For this inspection, New Mexico Environment Department (NMED) declined to accompany the EPA.

I arrived at the WSMR's south gate on Route 213 (Range Road 1) the afternoon of September 24, 2012. There, I met with Mr. Benito Avalos who escorted me past security and then to the Environmental Building on the Main Post.

At the Environmental Building, I conducted an entrance meeting with the following facility representatives:

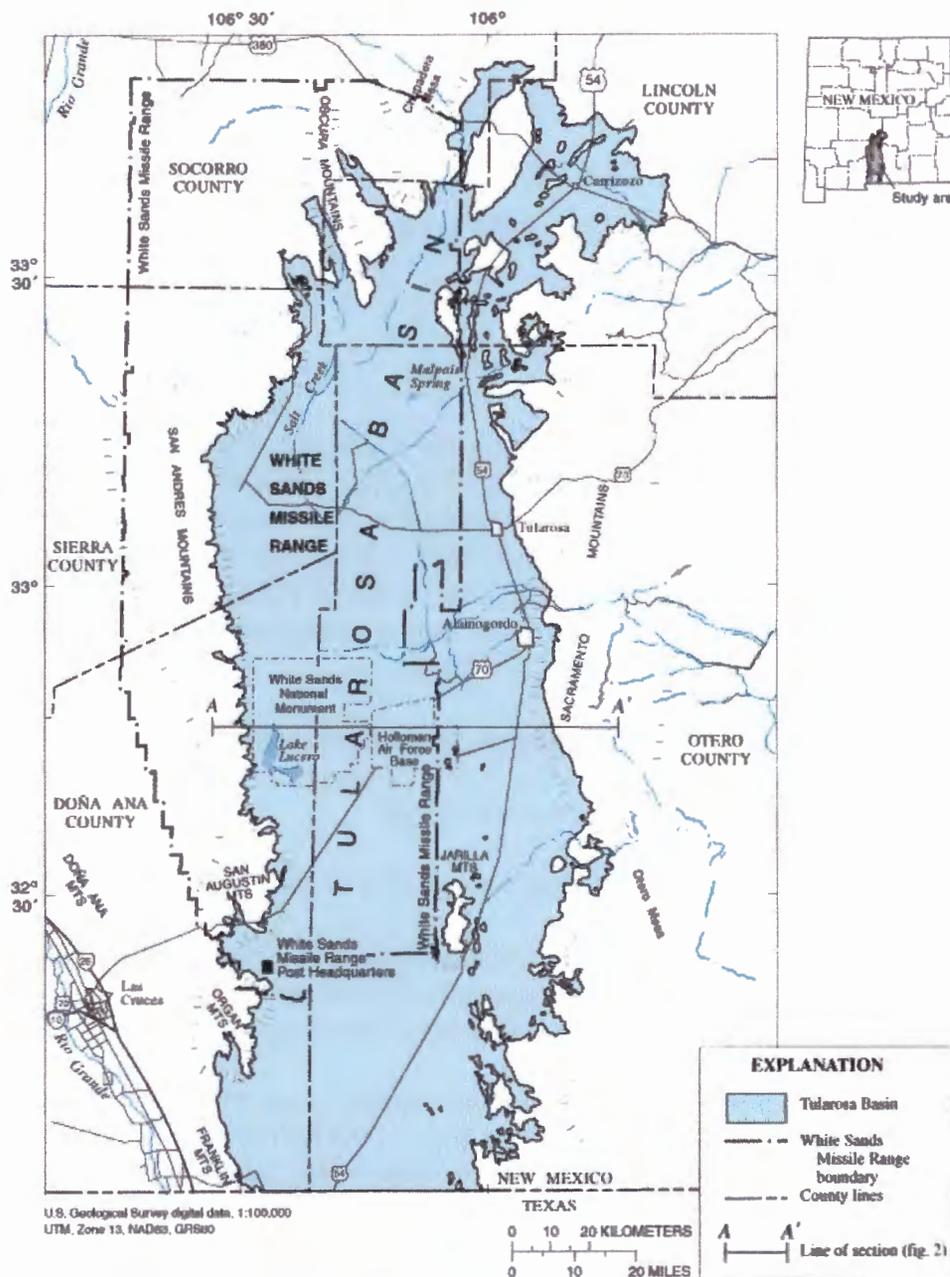
1. Mr. Benito Avalos (Installation Restoration Program Manager)
2. Mr. Jose Gallegos (Environmental Director Chief)
3. Mr. Rustin Baca (Environmental Contractor for WSMR)

I presented my credentials to the representatives and explained to them the purpose of the inspection. I handed Mr. Avalos a copy of the RCRA Section 3007 that explains EPA's authority to conduct the inspection. Additionally, I explained WSMR's right to claim confidential business information (CBI). No CBI was claimed during the inspection; however all photographs collected during the inspection had to be reviewed and authorized for release by the US Army. All inspection photographs were released and are presented in Appendix A.

During the meeting, I confirmed with Mr. Avalos that there were 146 Solid Waste Management Units (SWMU) and 32 Areas of Concern (AOC) that are defined in the 2009/10 Hazardous Waste Facility Permit (permit), of which three SWMUs and eight AOCs are corrective action complete. There are currently two environmental contractors, The Shaw Group, Inc. and ARCADIS, tasked to close out the majority of the units by 2014. According to Mr. Avalos, the remaining SWMUs and AOCs will be addressed under a new upcoming contract.

History and Location:

White Sands Missile Range (WSMR) is a U.S. Army Development Test Command (DTC) installation. It was first established July 9, 1945 as White Sands Proving Grounds and renamed to the current name on May 1, 1958. WSMR now functions as a large complex of test ranges, launch sites, impact areas, instrumentation sites and support facilities required to develop and test tactical and strategic weapons and weapons systems. WSMR is designated as a National Range (NR) whose mission is the support of missile development and test programs for the Army, Navy, Air Force, NASA, other government agencies, and foreign allies. Thousands of missile firings, airdrops, and static tests have been conducted as part of this mission. The installation is home to the Trinity Site, where the first nuclear weapon was tested in 1945.



The installation is roughly rectangular in shape and is approximately 100 miles long and 25 to 40 miles wide with a land area of approximately 3,200 sq mi (2,048,000 acres). Most of the installation is situated within the Tularosa Basin of south-central New Mexico; with areas along the western and northwestern boundary extending into the Jornada del Muerto Basin. WSMR is located in Doña Ana, Socorro, Lincoln, Otero, and Sierra Counties, New Mexico. The headquarters (Main Post) area of WSMR is located at the southwestern corner of the installation,

approximately 27 miles (mi) east-northeast of Las Cruces, New Mexico and 45 mi north of El Paso, Texas. WSMR's headquarters and most installation support activities are located at the Main Post area. WSMR is partially bordered on the east by Holloman Air Force Base (AFB) and on the south by Fort Bliss Military Reservation. US Highway 70 crosses WSMR from east to west and serves as the main access to the Main Post area. There are no other populated areas located within the boundaries of the installation.

In support of the installation's mission various waste management practices were implemented including land burial (i.e. disposal trenches and landfills), container and tank storage of fuels and chemicals, septic field and sanitary sewer discharges, and open burning/open detonation (OP/OD) of reactive wastes (e.g. munitions and explosive constituents).

#### Geology and Hydrogeology:

WSMR lies within the Mexican Highland Section of the Basin and Range Province. The geology of WSMR consists predominantly of the Tularosa Basin and the surrounding mountain ranges. The San Andres, San Augustin, and the Oscura Mountains border the Tularosa Basin on the west while the Sacramento Mountains form the eastern border. The average elevation of the Tularosa Basin is 4,000 feet above mean sea level. The majority of WSMR property, including most of the test facilities, is located within the Tularosa Basin. The Tularosa Basin contains thick sequences of Tertiary and Quaternary age alluvial and bolson fill deposits. These sediments, more than 5,000 feet thick in some areas, consist mainly of silt, sand, gypsum, and clay weathered from the surrounding mountains. Surface features consist of flat sandy areas, sand dunes, basalt flows, and playas.

The WSMR Main Post obtains its potable water supply from an aquifer located in the upper bolson deposits. The majority of ground water recharge to this aquifer occurs through the coarse, unconsolidated Tertiary/Quaternary alluvial fan deposits and arroyos along the eastern flank of the Organ, San Augustin, and San Andres Mountains. To the east ground water becomes more mineralized, primarily with sulfate and chloride. Ground water flow direction is generally toward the center of the Tularosa Basin. The aquifer at the Hazardous Test Area and former OB/OD units is largely contained in granite bedrock.

#### Regulatory History:

From 1989 to 1996, the EPA served as the lead regulatory agency with the NMED providing review for all work proposed by WSMR. In January 1996, the EPA relinquished HSWA regulatory authority to the NMED. The NMED is currently the lead regulatory agency with the EPA providing oversight and supplementary assistance.

WSMR submitted a RCRA Part A permit application in 1980 and a Part A Permit was issued by the EPA in 1984. WSMR applied for a RCRA Part B permit in 1984. As required by the Part B Permit application, a RFA was performed on the WSMR for EPA Region 6 by A. T. Kearney, Inc. (August 1988). The RFA identified 138 SWMUs and 26 AOCs at WSMR. The results of this RFA were used by the EPA to prepare the HSWA corrective action module of the RCRA Part B permit. The EPA approved and issued the permit to WSMR on Sept. 29, 1989. A subsequent Class I permit modification added one additional SWMU to the permit for a total of

139 SWMUs and 26 AOCs. Ninety-three SWMUs were included in the HSWA permit and required to go through the RCRA Facility Investigation process. These 93 SWMUs were divided into four groups, Appendix I - 18 SWMUs, Appendix II - 18 SWMUs, Appendix III - 40 SWMUs, and Appendix IV - 17 SWMUs. At the completion of Phase I of the RCRA Facility Investigation (1992) WSMR submitted a Class III Permit Modification listing 38 SWMUs to be removed from the corrective action process based on field and analytical results which indicate little or no contamination exist at these sites. EPA reviewed the Phase RFI report and the Class III Permit Modification and determined that 24 of the 38 SWMUs required no further investigation and could be delisted or removed from WSMRs corrective action permit.

On November 29, 1995, the EPA issued a notice of decision removing the twenty-four (24) SWMUs from WSMRs HSWA permit (effective December 29, 1995). Phase II and III RFI's were continued at remaining SWMUs in accordance with approved work plans. Additionally, Interim Measures were initiated at the HELSTF Cleaning Facility (HCF) SWMU 154 to stabilize a 100,000 gallon LNAPL (diesel fuel) plume that was identified.

The NMED was authorized to implement the HWMA on January 1, 1996. As part of the Annual Unit Audit for 1999, NMED re-evaluated various units, reinstating many of the twenty-four SWMUs removed in the earlier Class III Permit Modification.

In June 1999, WSMR submitted to NMED its Part A Permit Renewal Application for WSMR. The Part A Permit Application listed one storage facility (Hazardous Waste Storage Facility (HWSF)); one OB/OD unit; and one post-closure care unit (Temperature Test Facility (TTF)). WSMR had submitted amended Part A Permit Applications since the initial submission to update current activities and units status. In June 1999, WSMR also submitted its Part B Permit Renewal Application for operation of the HWSF as a storage unit. On June 11, 2007, NMED issued a draft permit for public comment. After review and consideration of comments received and continued settlement negotiations with WSMR, NMED released a Final Order (No. HWB 08-35 (P)) issuing the Permit with an effective date of January 8, 2010. The Permit includes a total of 146 SWMUs, inclusive of the 41 HWMUs summarized (and grouped) below, and 32 AOCs. Tables from Appendix 4 of the Permit summarizing these SWMUs and AOCs are included in Attachment B. The RCRA permitted and regulated units are as follows:

1. Hazardous Waste Storage Facility (HWSF): This is the sole operating unit at WSMR and is used for hazardous waste container storage. It consists of five metal structures located within a fenced area and is located approximately 8 miles east of the Main Post.
2. Hazardous Test Area - Open Burning/Open Detonation: The Open Burning/Open Detonation (OB/OD) is situated on the westernmost edge of the Hazardous Test Area (HTA), located 10 miles north of the Main Post on the eastern slopes of the San Andres Mountains. The OB/OD consisted of two open detonation pits and an open burn pan. Since 1972, the OB/OD was used for demolition of primary explosives, secondary explosives, propellants, explosives ingredients in propellants, propellant compositions, powders, and smokes. The detonation pits and the burn pan were certified closed in 2003.

3. Tula Peak Munitions Burial Site and Incinerator: The Tula Peak burial sites are located near the eastern boundary of WSMR, approximately 0.25 miles east of Holloman Air Force Base Road 9. There are four burial pits within 75 feet of each other. Cluster bomb units (CBUs) and other small ordnance were placed in the incinerator and then the debris was buried as part of the ordnance disposal procedure.
4. Red Rio Bombing Range Landfills: The Red Rio Bombing Range encompasses 29,500 acres near the northeast boundary of WSMR. Two areas were reportedly used for munitions burial from 1963 to 1987. The units reportedly received dummy projectiles dropped during practice at the Red Rio Range. The projectiles were placed in an open pit, detonated and burned. The residue was buried with fill and a new pit was excavated. At least five pits were created and filled.
5. Oscura Bombing Range Disposal Pits: The Oscura Bombing Range encompasses approximately 26,400 acres. The munitions burial pits are located four miles west of Range Road 9 and four miles north of Range Road 12 and are accessed via an unimproved road. The pits are trench-like with approximate dimensions of 50 feet by 15 feet and approximately 12 feet deep; however, the pits vary in size. Explosives were placed in the pits, where they were detonated and burned. After burning, the debris was covered with fill. The disposal operation was conducted in shifts until the pit was filled. At least five pits were utilized for burial.
6. Rhodes Canyon Landfill: Rhodes Canyon Landfill is located at the intersection of Range Road 6 and Range Road 7 in Otero County. Closure activities are complete. Post closure activities are being conducted under an approved Corrective Measures Implementation (CMI) Workplan.
7. HELSTF Landfills (SWMUs 38 and 39): These landfills are located east of the HELSTF-Laser System Test Center in the southern section of WSMR. Both Landfills were in operation from the early 1960's to 1989. The landfills are two unlined trenches that reportedly received non-hazardous construction wastes.
8. Former Main Post Landfill #3 at Scrap Yard: Former Main Post Landfill #3 at Scrap Yard is located in the southern portion of the Main Post. The site reportedly operated from 1965 to 1982. The northern portion of the landfill was fenced and used as the WSMR scrap metal accumulation point until 2000.
9. Former Oscura Range Center Landfill (SWMU 158): This landfill is located 0.5 miles south of Oscura Range Center. Waste was removed in 1998. Closure activities are complete.
10. Nuclear Effects Reactor Facility Ponds #1 and #2 (SWMUs 160 and 161): The Nuclear Effects Reactor Facility is located 3 miles south of the Main Post, just northwest of the WSMR El Paso gate. Pond #1 was known to receive waste water from floor drains, sinks, and toilets in Building 21225. The waste water stream reportedly included human waste and laboratory waste. Pond #2 received waste water from Building 21235. Both ponds have been closed.

11. Former Acid Neutralization Unit at HWSF (SWMU 89): The former acid tank is located 8 miles east of the Main Post area at the HWSF. The tank consisted of an open-topped reinforced concrete tank that was used to evaporate liquid chemical wastes generated at photographic laboratories. The unit was occasionally used to store damaged transformers containing PCBs.
12. Former STP Percolations Ditches (SWMU 82): This SWMU consists of two excavated soil ditches located immediately east of the WSMR Sewage Treatment Plant (STP) and approximately 2 miles east of the Main Post. The ditches were used from 1958 to 1986 as discharge trenches for STP effluent.
13. HELSTF Cleaning Facility Sump (SWMU 142): The sump is located at the HELSTF Cleaning Facility (HCF), Building 26131. The unit is located in the Pre-Clean Room of the HCF and has been active since 1983.
14. Liquid Propellant Evaporation/Neutralization Pits (SWMUs 92 through 100): This site consists of ten earthen pits located 2 miles east of the Main Post area in the Liquid Propellant Storage Area. The pits were constructed in 1953 and intended to provide secondary containment for the storage area. The pits are unlined and used for containment of Inhibited Red Fuming Nitric Acid (IRFNA), liquid propellants, monomethyl hydrazine, unsymmetrical dimethyl hydrazine, and petroleum/oils/lubricants.

#### Recent Permit Activities Of Note:

WSMR has petitioned NMED for Class III Permit modification to the change the status of the following SWMUs from Corrective Action Required to Corrective Action Complete (SWMUs 19, 47, 48, 63, 64, 108, 157, 158, 159, 164, 167, 168 and 198). A public notice was issued and a 60-day comment period began on January 24, 2011.

#### Investigations:

From 1988 to the present, WSMR has performed numerous investigations of SWMUs and AOCs, ground water monitoring, interim measures and corrective actions in accordance with the Permit. A list of relevant reports and documents related to the environmental investigation and remediation of WSMR and compiled by USAEC are provided in Attachment C.

#### Corrective Action Inspection

During my corrective action inspection, my key facility persons were Mr. Benito Avalos (Installation Restoration Program Manager) and Mr. Rustin Baca (Environmental Contractor for WSMR). I also met briefly with Ms. Ashley Miller (General Engineer for Water) and her supervisor, Ms. Susan Van Horn (Environmental Compliance Branch Chief).

Corrective Action Facility Tour

During the corrective action facility tour, photographs were taken and are presented in Appendix A. Many areas were inspected during the three day facility tour, but due to logistics and limited time, not all areas were observed. The following areas were observed:

Table 1  
List of SWMU and AOC at WSMR

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
SWMU 1	X	4-1	Floor Drain System for Building 1621
SWMU 2	X	4-1	Bleach and Fixer Collection Containers
SWMU 3	X	4-1	Bleach and Fixer Collection Containers
SWMU 4	X	4-1	Bleach and Fixer Collection Containers
SWMU 5	X	4-1	Bleach and Fixer Collection Containers
SWMU 6	X	4-1	Bleach and Fixer Collection Containers
SWMU 7	X	4-1	Silver Recovery Unit Tailing Tank
SWMU 8	X	4-1	Waste Oil Tank & Sump at Building 1794
SWMU 10		4-1	Wash Pad, Drains, & Sump at Building 1778
SWMU 12	X	4-1	Wash Ramp, Drains, Sump, & Oil/Waste Separator @ Building 1778
SWMU 14	X	4-1	Used Battery Accumulation Area at Main Post
SWMU 16		4-1	Heavy Equipment Wash Pad & Drain at Building 1736
SWMU 17		4-1	Waste Underground Injection Pipe
SWMU 18		Not listed	Waste Accumulation Area Next to Building 1753
SWMU 19		4-1	Steam Wash Pad & Oil/water Separator @ Building 1753
SWMU 21		4-1	Main Post Former Fire Fighting Training Area & Pit
SWMU 22		4-1	Main Post Former Fire Fighting Training Area Waste Pile
SWMU 23		4-1	Hazardous Waste Tank at HELSTF
SWMU 24		4-1	Hazardous Waste Tank at HELSTF
SWMU 25		4-1	Hazardous Waste Tank at HELSTF
SWMU 26		4-1	Vapor Recovery Unit @ HELSTF
SWMU 27	X	4-1	Sanitary Treatment Impoundment at HELSTF
SWMU 31	X	4-1	Chemical Waste Tank
SWMU 32	X	4-1	Chemical Waste Tank
SWMU 33	X	4-1	Fluorspar Tank
SWMU 34	X	4-1	Fluorspar Tank
SWMU 35		4-1	Ethylene Glycol Tank at HELSTF
SWMU 36		4-1	Ethylene Glycol Tank at HELSTF
SWMU 37		4-1	Waste Oil Accumulation Area at Building 26121 at HELSTF
SWMU 38	X	4-4	HELSTF Landfill

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
SWMU 39	X	4-4	HELSTF Landfill
SWMU 40		4-1	Waste Oil Accumulation Drum
SWMU 41		4-4	Oscura Munitions Landfill
SWMU 42		4-4	Oscura Munitions Landfill
SWMU 43		4-4	Oscura Munitions Landfill
SWMU 44		4-4	Oscura Munitions Landfill
SWMU 45		4-4	Oscura Munitions Landfill
SWMU 46		4-4	Oscura Munitions Landfill
SWMU 47		4-1	Former North Oscura Peak Landfill
SWMU 48		4-1	Former North Oscura Peak Landfills
SWMU 50		4-4	Red Rio North Landfill
SWMU 55	X	4-4	Open Burn Pit at the OB/OD
SWMU 56	X	4-4	Open Detonation Pit at the OB/OD
SWMU 56A	X	4-4	Open Detonation Pit at the OB/OD
SWMU 57	X	4-4	Tula Peak Burial Sites
SWMU 61	X	4-4	Tula Peak Incinerator
SWMU 62		4-1	Former STP Imhoff Tank
SWMU 63		4-1	Former Main Post Landfill 1A
SWMU 64		4-1	Former Main Post Landfill 2A
SWMU 65	X	4-4	Former Main Post Landfill #3 at Scrap Yard
SWMU 66	X	4-1	Main Post Sewage Treatment Plant Subsurface Influent Line
SWMU 67	X	4-1	Main Post Sewage Treatment Plant (STP) Bar Screen and Grinder
SWMU 68	X	4-1	North Primary Clarifiers at the STP
SWMU 69	X	4-1	South Primary Clarifiers at the STP
SWMU 79		4-1	Sludge Beds at the STP
SWMU 80		4-1	STP Sludge Waste Pile Main Post
SWMU 81	X	4-1	Boiler at the STP
SWMU 82	X	4-4	Former STP Ditches
SWMU 84	X	4-1	Effluent Pipeline at the STP
SWMU 85		4-1	STP Discharge at Playa Lake
SWMU 86	X	4-1	Sanitary Landfill at the Main Post
SWMU 87	X	4-1	Construction Landfill
SWMU 88	X	4-4	Container Storage Area
SWMU 89	X	4-4	Former Acid Neutralization Unit at the Hazardous Waste Storage Facility
SWMU 90	X	4-4	Evaporation Tank at Building 22895
SWMU 91		4-4	Hazardous Waste Landfill
SWMU 92A	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 92B	X	4-4	Liquid Propellant Evaporation – Neutralization Pit 2

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
SWMU 93	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 94	X	4-4	Liquid Propellant Evaporation – Neutralization Pit 4
SWMU 95	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 96	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 97	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 98	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 99	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 100	X	4-4	Liquid Propellant Evaporation Neutralization Pits
SWMU 101		4-4	Acid Neutralization Pit
SWMU 102		4-1	Burn Pan
SWMU 103		4-1	Scrap Metal Yard
SWMU 104	X	4-4	Temperature Test Facility
SWMU 105	X	4-4	New Evaporation Tank at TTF
SWMU 106	X	4-4	Discharge Pipe at TTF
SWMU 107	X	4-1	Storage Tank at Temperature Test Facility (TTF)
SWMU 108	X	4-1	Vapor Extraction Well at TTF
SWMU 109	X	4-1	Drum Storage Area (Splash Pan) at TTF
SWMU 110	X	4-1	Methylene Chloride Catchment System at TTF
SWMU 111	X	4-1	Methylene Chloride Separation System at TTF
SWMU 112	X	4-1	Methylene Chloride Separation System at TTF
SWMU 113	X	4-1	Salt Water Evaporation Tanks at TTF
SWMU 114	X	4-4	Rhodes Canyon Landfill
SWMU 115	X	4-4	Rhodes Canyon Landfill
SWMU 116	X	4-1	Rhodes Subgrade Asphalt Tanks
SWMU 119	X	4-1	Stallion Range Landfill
SWMU 120	X	4-1	Former Stallion Center Landfill
SWMU 121		4-1	Stallion Asphalt Tank
SWMU 122		4-1	Stallion Asphalt Tank
SWMU 123		4-1	Stallion Asphalt Tank
SWMU 124		4-1	Waste Oil Storage Tank @ Stallion
SWMU 125		4-1	Veterinary Clinic @ McAfee Clinic Incinerators
SWMU 126		4-1	Veterinary Clinic @ McAfee Clinic Incinerators
SWMU 127		4-1	Autoclave at McAfee Clinic
SWMU 128		4-1	Silver Recovery System Tailing Tank
SWMU 129		4-1	Cyanide Treatment Unit at Building 1512
SWMU 130		4-1	Former Spent Developer Storage Tank / Acetic Acid Spill Containment Tank
SWMU 131		4-1	Former Spent Developer Storage Tank / Acetic Acid Spill Containment Tank
SWMU 132	X	4-1	Orogrande Waste Stabilization Pond

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
SWMU 133		4-1	NOMTS Machine Shop Accumulation Area
SWMU 134		4-1	NOMTS Outdoor Accumulation Area
SWMU 135		4-1	Paint Shop Accumulation Area
SWMU 136		4-1	Paint Shop Spray Booth
SWMU 137		4-1	Paint Shop Sump
SWMU 138		4-1	Waste Accumulation Area @ RATSCAT
SWMU 139		4-3	No corresponding SWMU unit assigned to this number.
SWMU 140	X	4-1	LC-37 Paint Dump
SWMU 141	X	4-1	Equipment Storage Area
SWMU 142	X	4-4	HELSTF Cleaning Facility Sump
SWMU 143	X	4-1	HELSTF Storage Yard Chromium Spill Site
SWMU 144	X	4-1	HELSTF Laser System Test Center Wastewater Discharge Pond
SWMU 145	X	4-1	HELSTF Test Cell Lagoons
SWMU 146		4-1	HELSTF STP Dry Pond
SWMU 147		4-1	Decontamination Pad & Underground Holding Tank
SWMU 148	X	4-1	Former MAR Waste Stabilization Pond
SWMU 149		4-1	Maintenance Building Septic System
SWMU 150		4-1	MAR Dump Site
SWMU 151		4-1	Trailer Area Septic System
SWMU 152		4-1	Property and Supply Building Septic System
SWMU 153	X	4-1	Vandal Burial Site
SWMU 154	X	4-1	HELSTF Systematic Diesel Spill Site
SWMU 155		4-4	Red Rio South Landfill
SWMU 156		4-1	Former Golf Course Pesticide Storage Shed @ Building T-1348
SWMU 157		4-1	Former Oscura Range Center Landfill-A
SWMU 158		4-4	Former Oscura Range Landfill
SWMU 159		4-1	Former Oscura Range Center Landfill-C
SWMU 160		4-4	Nuclear Effects Reactor Facility Pond #1
SWMU 161		4-4	Nuclear Effects Reactor Facility Pond #2
SWMU 162	X	4-1	Stallion Range Center Former Fire Fighting Training Area
SWMU 163		4-1	Abandoned Disposal Trench @ New Commissary
SWMU 164	X	4-1	AMRAD Facility
SWMU 165		4-1	LC-34 Contaminated Soils @ Buildings 23104 & 23106
SWMU 166		4-1	Denver
SWMU 167		4-1	Malpais
SWMU 168		4-1	Lance Missile Impact @ White Sands National Monument
SWMU 197	X	4-1	HELSTF Technical Support Area
SWMU 198	X	4-1	LC-38 Diesel Fuel Oil Release
SWMU 199		4-1	Hardin Ranch First Site
SWMU 200		4-1	Hardin Ranch Second Site

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
SWMU 201		4-1	RAM (Facility 6002) Site
SWMU 202		4-1	Dead Horse Instrumentation Site
SWMU 203		4-1	Oscura (Facility 31795) Communication Site
SWMU 204		4-1	Harriet (Facility 34600) Instrumentation Site
SWMU 205		4-1	SE-70 (Facility S-31427) Instrumentation Site
SWMU 206		4-1	Atom (Facility S-33151) First Site
SWMU 207		4-1	Atom (Facility S-33151) Second Site
SWMU 208		4-1	SE-50 (Facility 29055) Instrumentation Site
SWMU 209		4-1	EC-50 (Facility 29085) Instrumentation Site
SWMU 210		4-1	Minnow (Facility S-31132) Instrumentation Site
SWMU 211		4-1	Cowan Instrumentation Site
SWMU 212		4-1	NM-70 (Facility S-31620) Instrumentation Site
SWMU 213		4-1	Gran Jean (Facility S-34050) Instrumentation Site
SWMU 214		4-1	NE-50 (Facility 29090) Instrumentation Site
SWMU 215		4-1	Missile Graveyard
SWMU 216		4-1	UST at Timing Station, Building 20710, LC-32 (Uncle Site)
SWMU 217		4-1	AAFES Gas Station at Building 270
SWMU 218		4-1	LC-38-Building 23626
SWMU 219		4-3	Hawk Facility, Building 204548 at LC-38
SWMU 219	X		Main Post POL AST Release Site
SWMU 220		4-3	Rhodes Canyon Range Center POL Station, Building 30725-1&2
AOC A	X	4-1	Sink & Drain System @ Building 1621
AOC AA		4-1	Alamogordo Bombing Range
AOC AB		4-1	Sewage Lagoon
AOC AC		4-1	Condron Field
AOC AD		4-1	Main Cantonment Area
AOC AE		4-1	Red Rio Bombing Range
AOC AF		4-1	Oscura Bombing Range
AOC AG		4-1	Main Post Skeet Range
AOC B		4-1	Battery Accumulation Area @ North Oscura
AOC C		4-3	Areas Where heavy pesticides and/or herbicides were used
AOC D		4-1	Drum Storage Area @ STP
AOC E		4-1	Pesticide Storage Area
AOC F		4-3	Methane Vent (Flare) at STP
AOC G		4-1	Brine (MeCl) Storage Tank
AOC H, I, J, K, & L		4-1	Methylene Chloride Tanks (five tanks)
AOC M		4-3	Exploded / Unexploded Low Level Radioactive Ordnance
AOC N		4-3	Process Spills at HELSTF
AOC O		4-3	Miscellaneous Areas ID'd by Aerial Photos

Unit ID Number	Inspected during Facility Tour	Tables From 2009 Permit	Unit Description
AOC P		4-1	Chemistry Laboratory Drains at Building 1530
AOC Q		4-3	HELSTF Lab Drains
AOC S		4-1	Septic Tanks with Leach Fields
AOC T		4-3	Collection Lines to the STP
AOC U		4-3	Miscellaneous Spills
AOC V		4-1	HELSTF Pressure Recovery System
AOC W	X	4-1	Davies Tank
AOC X		4-1	Stallion Range Desalinization/Sewage Lagoons
AOC Y		4-1	Stormwater Drainage Ditches
AOC Z		4-1	Abandoned Underground Storage Tank

Key: 4-1 = SWMUs and AOCs that require corrective action as defined in the permit.  
 4-2 = SWMUs and AOCs that corrective action is complete with controls. None listed in the permit.  
 4-3 = SWMUs and AOCs that corrective action is complete without controls as defined in the permit.  
 4-4 = Hazardous Waste Management Units as defined in the permit.

Under RCRA, several concerns were noted during the facility tour, and are described in the conclusion section of this report and nearly all are displayed in Appendix A, Inspection Photo Log.

## Records Review

During the entrance interview and site inspection, I requested a list of documents for review. The documents I requested for review included the following:

1. Summary of Wells Drilled by White Sands Missile Range from June 1962 to January 1965, 1968
2. Drilling, Construction, and Testing of Water-Supply Wells 21 and 22, 1978
3. RCRA Facility Assessment Report, 1988
4. Phase-I RCRA Facility Investigation Report, 1992
5. Phase-II RCRA Facility Investigation Report, 1994
6. 1996 List of SWMU, 1996
7. Solid Waste Management Unit (SWMU) Inventory Report, 1997
8. Closeout Report for SWMUs 82 & 83 - Sewage Treatment Plant Former Drainage Ditches, 1997
9. Site Characterization Report for The Former Sewage Treatment Plant (STP) Percolation Ditches, 1999

10. WSMR Annual Unit Audit, 1999
11. Submittal Of RCRA Documents And Correspondence, 2000
12. Installation Action Plan For White Sands Missile Range, 2000
13. Annual Unit Audit for 1999, 2000
14. Annual Unit Audit Revision, 1999
15. Review of Annual Unit Audit for 1999, 2000
16. Final Settlement Agreement, 2000
17. Rhodes Canyon Landfill Corrective Measures Implementation Work Plan WSMR-14; SWMU 114 & 115, 2003
18. TO #50, Hazardous Waste Permit Review, 2008
19. RCRA Hazardous Waste Facility Permit, 2009
20. Revised Phase III RCRA Facility Investigation (RFI) Report - HELSTF Sites - Second Revision, 2010
21. Notice Of Disapproval: Revised Phase III RCRA Facility Investigation Report - Former Main Post Landfill No.3 (Scrap Yard) CCWS-76, SWMU 65, 2010
22. Closure And Post-Closure Care Plan - SWMUs 55, 56, and 56A, Open Burn/Open Detonation Units at Hazardous Test Area Site, 2011
23. RCRA Clean Closure Report for Tula Peak Ordnance Disposal Site, 2011
24. Closure Plan for Former High Energy Laser Systems Test Facility (HELSTF) Construction Landfills, SWMUs 38 & 39, 2011
25. Notice of Disapproval: RCRA Closure Plan For The Former HELSTF Construction Landfills, SWMUS 38 & 39, 2011
26. Final Closure Plan for SWMU 82, Former Sewage Treatment Plant Percolation Ditches, 2011
27. Notice Of Disapproval Closure Plan, Main Post Landfill 3, SWMU 65, 2011
28. Notice Of Disapproval: Closure And Post -Closure Care Plan SWMUs 55, 56, And 56a, Open Burn/Open Detonation Units At Hazardous Test Area Site, 2011
29. 2011 Semi-Annual Sludge Approval Request, 2011
30. Results of The July 2011 Wastewater Effluent Sampling, 2011
31. Seven Day Spill Report to NMED Groundwater Bureau for Incident # 8831 Reported 02 December 2011 for the POL Stallion Oil/Water Separator Spill, 2011
32. Seven Day Spill Report to NMED Groundwater Bureau for Stallion Range Center Fueling Facility Spill, 2011
33. Patriot Diesel Spill Range Road 7 Analytical Results Set 1, 2012
34. Patriot Diesel Spill Range Road 7 Analytical Results Set 2, 2012

35. Notice of Disapproval: Revised Phase III RCRA Facility Investigation Report - HELSTF Sites, Second Revision (August 2010), 2012
36. Notice of Disapproval: RCRA Clean Closure Report - Tula Peak Ordnance Disposal Site, 2012
37. Approval of Revised Sludge Disposal Management Plan, 2012
38. SWMU Comprehensive Table, 2012
39. Aerial photograph of Main Post Sewage Treatment Plant (STP)
40. Schematic drawing of Main Post Sewage Treatment Plant (STP)

The records and documents listed above are stored in the Environmental Building on the Main Post (photo nos. 35 and 36). A review of these documents was conducted, and I confirmed that the facility was a LQG/TSDF. During the file review and subsequent discussions with Mr. Avalos, Mr. Baca and Ms. Miller, several concerns were noted and are described in the conclusion section of this report.

### **Exit Briefing**

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I conducted an exit briefing with Mr. Avalos and Mr. Baca. During the exit briefing I outlined my observations concerning the inspection. During the briefing, it was decided that Mr. Avalos would receive EPA's inspection reports on behalf of WSMR. Since there was a hardware-problem in transferring the necessary files to a compact disc, Mr. Avalos assured me he would get the problem fixed, and send me the files along with the inspection photographs (after Army clearance) via post.

### **Conclusion**

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The following are my concerns noted during the RCRA corrective action inspection conducted on September 24 through September 28, 2012:

1. **Concern under RCRA Corrective Action:** Orogrande Camp Waste Stabilization Pond (surface impoundment) is in WSMR permit as SWMU 132, yet it is managed by Ft. Bliss under their permit as SWMU-25B (photo nos. 1, 2 and 3). The surface impoundment is located 18 miles east of the Main Post on Range Road 2 near the Fort Bliss' Orogrande Range Camp. The impoundment is irregularly-shaped, with dimensions of 600 feet by 320 feet by 500 feet by 520 feet. A 12-inch diameter pipe from Ft Bliss' property crossed under the property fence and enters into the waste pond (photo nos. 1 and 2). According to Mr. Avalos and the Phase I RFI, constituents expected to be present at SWMU include those which might be associated with sanitary waste water. Results of the Fort Bliss' RFI soil sample analyses include:
  - a. Total Petroleum Hydrocarbon (TPH) concentrations (in a localized area) up to 7,550 mg/kg;
  - b. Eight metals, generally at non-critical levels, but elevated in the area of high TPH levels; and

- c. Six organic compounds (DEHP, chlordane, DDT, DDD, DDE and dieldrin) generally at trace concentrations, well below action levels, but somewhat elevated in the area of high TPH readings.

Mr. Avalos believes that WSMR never used the impoundments and Ft. Bliss has always managed it. It is believed that a work plan for closure was submitted by WSMR to NMED, but the containment berm was reworked (photo no. 2), giving evidence for future use. Mr. Avalos was going to further investigate the issues.

**Issues:** (1) The SWMU is listed under two different permits from two different facilities; (2) Evidence of the berm being reworked, suggests that the surface impoundment is going to be used again, however the integrity/age of the liner is unknown; and (3) Based on the RFI, previous soil samples shows exceedances, therefore I consider further evaluation may be required to determine the extent of contamination before closure or reuse.

2. **Concern under RCRA Compliance/Corrective Action:** Main Post Sewage Treatment Plant (STP) (photo no. 30) discharges to Davies Tank (AOC W) (photo nos. 33 and 34) within the Tularosa Basin, and therefore does not discharge to the Waters of the United States. Because of this circumstance, it was decided that a NPDES Permit under the Clean Water Act does not apply, and consequently all STP units handling wastewater and/or sludges are considered to be regulated under RCRA. The STP consists of STP Bar Screen and Grinder (SWMU 67), North Primary Clarifiers (SWMU 68), South Primary Clarifiers (SWMU 69), Sludge Beds (SWMU 79), and STP Boiler (SWMU 81).

Based on the ESA, the STP has been operating since 1958 to present. The unit conveys sewage and wastewater from the Post Area to the STP. RFI investigations report TPHs and heavy metals contamination at the STP facility. Past waste management practices at WSMR have resulted in documented releases of hazardous constituents (metals, cyanides, and toluene) to the STP. At least one incident caused the STP to be shut down for several days. Though current waste management practices at WSMR have emphasized proper disposal of laboratory chemicals and wastes from operational activities, but no routine testing or assessments are done to ensure that hazardous constituents/wastes do not reach the STP.

WSMR does not maintain a separate wastewater treatment system for process wastewaters. Based on the ESA, the STP has received wastewater from industrial sources such as the former Photography Facility, boiler blow down, deionizer regenerant brines, laboratories, paint spray booths, steam cleaning facilities, and vehicle wash racks. The potential exists for ongoing releases to the STP which are unregulated under NPDES. For these reasons, the units at the STP have been treated as Solid Waste Management Units.

**Issues:** Since in the past and possibly in the present, industrial wastewater with hazardous constituents is being treated at the STP and the treated wastewater is being discharged to Davies Tank. Prior to discharging to Davies tank, wastewater was discharged to the two former STP Ditches (SWMU-82 and SWMU-83) and the former STP Playa Lake (SWMU- 85), which all contained hazardous constituents associated with treated wastewater. Based on this information, I considered the following:

- (1) Under 42 USC § 6939e(b), it is unlawful to introduce into a federally owned treatment works (FOTW) any pollutant that is a hazardous waste [Note: the STP operates as a FOTW but does not meet its entire definition];
- (2) Davies Tank should be listed as a SWMU and not an AOC;

- (3) An investigation should be conducted of past and present industrial waste/wastewater releases into the sewer lines with follow-up routine inspections; and
  - (4) Routine assessments along with analytical sampling should be conducted on the pre-treated and post-treated wastewater.
3. **Concern under RCRA Corrective Action:** Former sanitary landfill No.3 (SWMU 65), located in the southeast area of the Post, was in operation from 1965 to 1982, and is the present location of a scrap metal yard (photo no. 43). The landfill was closed because of its proximity to the freshwater aquifer utilized by the Main Post and the Nuclear Effects Directorate.

Based on the RFI Phase I and Phase II, the unit is described as a sanitary landfill where only "inert materials" were disposed. Details are not available on the size or shape of the landfill, the types of waste which were managed, where the waste was generated or the volumes of waste which were disposed. No historical information was available on the design, construction and operating procedures used at this unit.

**Issue:** During my inspection, I noted an area fenced in with barbed wire (approximately 15 yards by 20 yards) with a faded sign stating, "KEEP OUT, HAZARDOUS AREA, AUTHORIZED ACCESS ONLY" (photo no. 44). This area was west-southwest of the fenced in scrap yard, and believed be close to or within the boundary of SWMU 65, but uncertain. When reviewing the RFA, RFI Phase I and RFI Phase II, there were no discussions related to this defined area.

4. **Concern under RCRA Corrective Action:** According to the RFA, the Vandal Burial Site (a.k.a. Talos and Tarter Terrier Site, SWMU-153) at the Open Burn/Open Detonation Area (OB/OD) is believed to have been activated in the mid 1950s for the burial of missile and rocket parts. During a site visit (1988), the unit was found to have been extensively excavated. Exposed missile parts and scrap metal were observed in the fill area. In February 1991, during the field investigations for Phase I of the RFI, the area had been regraded. The unit was excavated in 1995. Scrap metal was taken to the scrap yard, unexploded ordinances were detonated in place and construction debris was taken to the Main Post landfill.

**Issue:** During my inspection, I noted a potential former UXO Pit that was fenced in with a sign stating, "DANGER EXPLOSIVES, PELIGRO EXPLOSIVOS" (photo no. 46). According to a map in the permit application, this area does not appear to be part of Vandal Burial Site (SWMU-153) and lies west and adjacent to the SWMU. My question to the facility: Why was this area not part of the SWMU, and was this area addressed during the removal/remedial action? Since Mr. Avalos was not present during this portion of the inspection, he was going to address my questions after further review. When reviewing the RFA, RFI Phase I and RFI Phase II, there were no discussions related to this defined area.

5. **Concern under New Mexico PST Program:** The Main Post POL (Petroleum, Oil and Lubricants), located on the east side of Wesson Street and south of Aberdeen Avenue, has two secondary containments that contain three POL ASTs each. During the inspection, multiple cracks were noted in both secondary containments (photo nos. 23-27). Some cracks went through the entire wall structure, rendering it useless for containment.

**Issue:** Due to the extensive number and size of cracks in various areas of the POL's secondary containments, this became a concern to me under *NMAC 20.5.5.10 (E) and (F): Operation, Maintenance, Repair and Replacement of Secondary Containment for ASTs*.

6. **Concerns under New Mexico PST Program:** Rhodes Canyon POL, located about 50 miles north of the Main Post at Rhodes Canyon Range Center., has two secondary containments that contain one POL AST each. During the inspection, I noted stained soil and concrete with strong diesel like odor adjacent to sump vault (photo no. 51), and stained soil adjacent to secondary containment discharge pipe with strong kerosene like odor (photo no. 52).

**Issue:** Due to the evidence of spill releases outside secondary containment, this became a concern to me under (1) *NMAC 20.5.5.8: Operation and Maintenance of Storage Tank Systems*, (2) *NMAC 20.5.5.12: Operation, Repair and Maintenance of Vaults*, and (3) *NMAC 20.5.5.14: Operation and Maintenance of Spill and Overfill Prevention*.

7. **Concerns under New Mexico PST Program:** Stallion Range POL, located about 100 miles north of the Main Post at the Stallion Range Center, has secondary containment that contains four POL ASTs. During the inspection, I noted stained soil and concrete with strong petroleum like odor adjacent to sump vault (photo nos. 57 and 58). The leak appeared to have taken place below grade, between the concrete vault wall and the steel vault wall. Since this area was excavated, it appeared repairs were ongoing.

**Issue:** Due to the evidence of spill release outside secondary containment, this became a concern to me under (1) *NMAC 20.5.5.8: Operation and Maintenance of Storage Tank Systems*, (2) *NMAC 20.5.5.12: Operation, Repair and Maintenance of Vaults*, and (3) *NMAC 20.5.5.14: Operation and Maintenance of Spill and Overfill Prevention*.

**APPENDICES**

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- A RCRA Corrective Action Inspection Photo Log
- B Aerial Photograph and Schematic drawing of Main Post Sewage Treatment Plant



APPENDIX A

RCRA CORRECTIVE ACTION  
INSPECTION PHOTOGRAPHS



Photo No.: 1

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 09:24 Direction: West

Description: WSMR - SWMU 132 / Orogrande Waste Stabilization Pond: Managed by Ft. Bliss as SWMU-25B, even though it is on WSMR's property and is also in WSMR permit as SWMU 132. Broken steel pipe is coming from Fort Bliss water treatment plant, and the containment berm is being reworked.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 2

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 09:26 Direction: Southwest

Description: WSMR - SWMU 132 / Orogrande Waste Stabilization Pond: Managed by Ft. Bliss as SWMU-25B, even though it is on WSMR's property and is also in WSMR permit as SWMU 132. Broken steel pipe is coming from Fort Bliss water treatment plant, and the containment berm is being reworked.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No

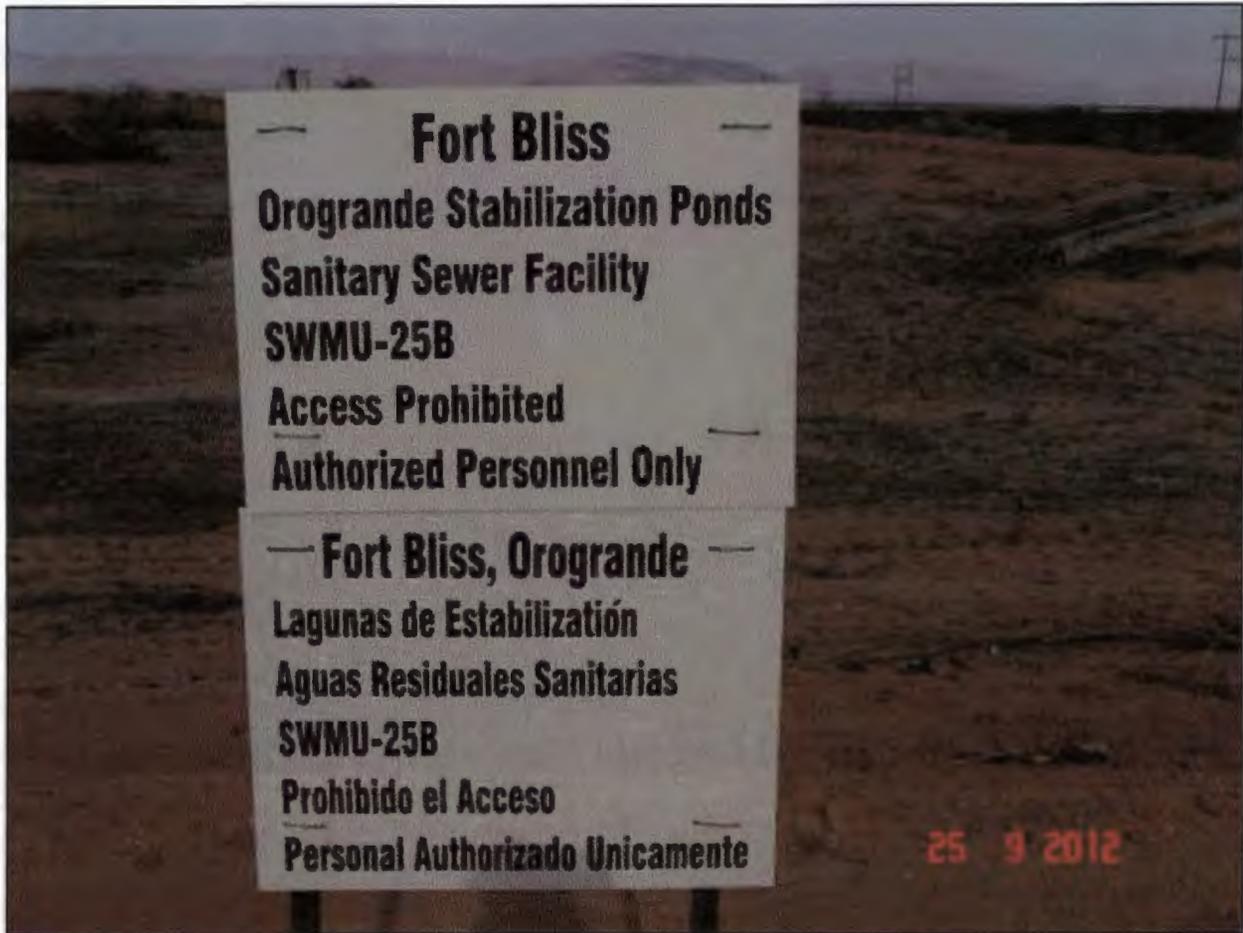


Photo No.: 3

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 09:27 Direction: West

Description: WSMR - SWMU 132 / Orogrande Waste Stabilization Pond: Managed by Ft. Bliss as SWMU-25B, even though it is on WSMR's property and is also in WSMR permit as SWMU 132. Broken steel pipe is coming from Fort Bliss water treatment plant, and the containment berm is being reworked.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 4

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 09:47 Direction: South

Description: WSMR - SWMU 164 / AMRAD Facility – Former diesel UST. Tank has been filled with cement in place due to the adjacent support structures. Corrective Action is required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 5

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 09:49 Direction: East

Description: WSMR - SWMU 164 / AMRAD Facility – Former diesel UST. Tank has been filled with cement in place due to the adjacent support structures. Corrective Action is required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 6

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 10:37 Direction: Southeast

Description: WSMR - SWMU 140 / LC-37 Paint Dump – Exact location of former pit is not clear. Corrective action is required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 7

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 10:51 Direction: East

Description: WSMR - SWMU 89 Former Acid Neutralization Unit (left of building) and SWMU 90 Evaporation Tank (at Building 22895), located at the Hazardous Waste Storage Facility. Closure plan submitted for SWMU-89 and Clean Closure submitted for SWMU-90.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 8

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 10:55 Direction: Southwest

Description: WSMR – Purge water IDW Drums from monitoring wells associated with SWMU 89 - Former Acid Neutralization Unit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 9

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 11:28 Direction: Southeast

Description: WSMR – SWMUs 92A, 92B, 93-100 / Liquid Propellant Evaporation Neutralization Pits. Corrective action is required. According to State, more field work is required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 10

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 11:50 Direction: Southwest

Description: WSMR – SWMU 104: Temperature Test Facility, SWMU 105: New Evaporation Tank, SWMU 106: Discharge Pipe, SWMU 107: Storage Tank, SWMU 108: Vapor Extraction Well, SWMU 109: Drum Storage Area (Splash Pan), SWMU 110: Methylene Chloride Catchment System, SWMU 111: Methylene Chloride Separation System, SWMU 112: Methylene Chloride Separation System, and SWMU 113: Salt Water Evaporation Tanks . Only SWMU 108 received CAC.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 11

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 11:50 Direction: Southeast

Description: WSMR – SWMU 104: Temperature Test Facility, SWMU 105: New Evaporation Tank, SWMU 106: Discharge Pipe, SWMU 107: Storage Tank, SWMU 108: Vapor Extraction Well, SWMU 109: Drum Storage Area (Splash Pan), SWMU 110: Methylene Chloride Catchment System, SWMU 111: Methylene Chloride Separation System, SWMU 112: Methylene Chloride Separation System, and SWMU 113: Salt Water Evaporation Tanks . Only SWMU 108 received CAC.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 12

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 13:47 Direction: Northwest

Description: WSMR - SWMU 197 / HELSTF Technical Support Area- Gasoline spill site. Corrective action is required. Status report rejected by State.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 13

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 14:20 Direction: Southwest

Description: WSMR - SWMU 154 / HELSTF Systematic Diesel Spill Site. Pump and treat SVE system is currently offline. Corrective action is still ongoing.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 14

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 14:33 Direction: North

Description: WSMR - SWMU 142 / HELSTF Cleaning Facility Sump (inside building) concerning solvent spills and SWMU 147 / Decontamination Pad & Underground Holding Tank (outside of building).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 15

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 14:51 Direction: Southeast

Description: WSMR - SWMU 27 / Sanitary Treatment Impoundment at HELSTF (East impoundment).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 16

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 14:52 Direction: South

Description: WSMR - SWMU 27 / Sanitary Treatment Impoundment at HELSTF (West impoundment).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 17

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:06 Direction: South

Description: WSMR - SWMU 33 / Fluorspar Tank (1 of 2) at HELSTF  
Corrective action is required as defined in the permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 18

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:07 Direction: North

Description: WSMR - SWMU 31 and SWMU 32 / Location of former Chemical Waste Tanks  
Corrective action is required as defined in the permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 19

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:07 Direction: South

Description: WSMR - SWMU 33 / Fluorspar Tank (2 of 2) at HELSTF .  
Corrective action is required as defined in the permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 20

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:14 Direction: East

Description: WSMR - SWMU 38: HELSTF Landfill (south) and SWMU 39: HELSTF Landfill (north). Unlined landfills used from approx. 1960 to 1989. Corrective action is required as defined in the permit. Under permit, will be managed "like" a RCRA C landfill.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No

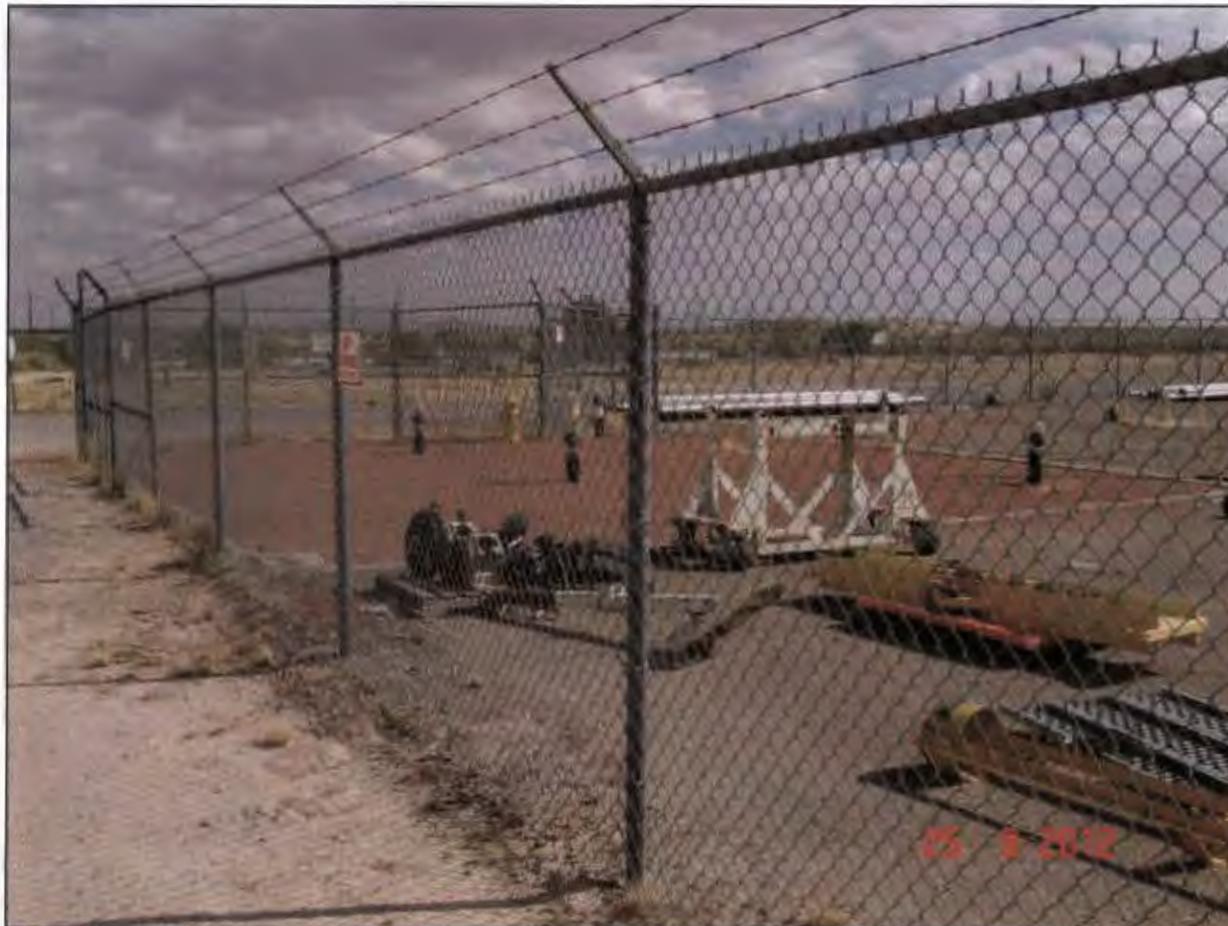


Photo No.: 21

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:19 Direction: Southeast

Description: WSMR - SWMU 143 / HELSTF Storage Yard Chromium Spill Site located in the east corner of yard. Corrective action complete and waiting for State approval.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 22

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 15:21 Direction: Southeast

Description: WSMR - SWMU 141: Equipment Storage Area and SWMU 148: Former MAR Waste Stabilization Pond. Note SWMU 143: HELSTF Storage Yard Chromium Spill Site in far left background.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 23

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:08 Direction: Down

Description: WSMR – Main Post POL on east side of Wesson Street (Cracks noted in the secondary containment of the 25,000 gallon tank farm)

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 24

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:08 Direction: Down

Description: WSMR – Main Post POL on east side of Wesson Street (Cracks noted in the secondary containment of the 25,000 gallon tank farm)

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 25

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:09 Direction: Down

Description: WSMR – Main Post POL on east side of Wesson Street (Cracks noted in the secondary containment of the 25,000 gallon tank farm)

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 26

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:09 Direction: Down

Description: WSMR – Main Post POL on east side of Wesson Street (Cracks noted in the secondary containment of the 25,000 gallon tank farm)

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 27

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:10 Direction: Down

Description: WSMR – Main Post POL on east side of Wesson Street (Cracks noted in the secondary containment of the 25,000 gallon tank farm)

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 28

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:13 Direction: Northwest

Description: WSMR – SWMU 219 / Main Post POL AST Release Site on west side of Wesson. State requiring more investigation work.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 29

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:30 Direction: East

Description: WSMR - Main Post Sewage Treatment Plant (STP) which consist of SWMU 67: STP Bar Screen and Grinder, SWMU 68: North Primary Clarifiers, SWMU 69: South Primary Clarifiers, SWMU 79: Sludge Beds, SWMU 81: STP Boiler

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 30

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:30 Direction: East

Description: WSMR - Main Post Sewage Treatment Plant (STP) which consist of SWMU 67: STP Bar Screen and Grinder, SWMU 68: North Primary Clarifiers, SWMU 69: South Primary Clarifiers, SWMU 79: Sludge Beds, SWMU 81: STP Boiler

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 31

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:38 Direction: East

Description: WSMR - SWMU 82 / Former STP Ditches.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 32

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 16:51 Direction: Southwest

Description: WSMR - SWMU 86: Sanitary Landfill at the Main Post and SWMU 87: Construction Landfill. Both are closed.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 33

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 17:09 Direction: East

Description: WSMR - AOC W / Davies Tank – This is where the Main Post Sewage Treatment Plant discharge to.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 34

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 25, 2012 / 17:10 Direction: East

Description: WSMR - AOC W / Davies Tank – This is where the Main Post Sewage Treatment Plant discharges to. Noted monitoring wells adjacent to AOC

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 35

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 09:47 Direction: South

Description: WSMR – RCRA documents in the library in the Environmental Building.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 36

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 09:47 Direction: West

Description: WSMR – Correspondence files in the library in the Environmental Building.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 37

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 15:25 Direction: Southeast

Description: WSMR - SWMU 14 / Used Battery Accumulation Area at Main Post

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 38

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 15:26 Direction: South

Description: WSMR - SWMU 12: Wash Ramp, Drains, Sump, and Oil/Waste Separator @ Building 1778. Note: SWMUs 12 & 13 were combined into SWMU 12. This area is also identified as WSMR-60.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 39

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 15:26 Direction: Southwest

Description: WSMR - SWMU 10 / Wash Pad, Drains, Oil/Water Separator Tank & Sump at Building 1778. Note: SWMUs 10 & 11 were combined into SWMU 10, Also identified as WSMR-74

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 40

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 26, 2012 / 15:28 Direction: Southeast

Description: WSMR – 90-Day storage Yard. Note: this area is not a SWMU/AOC

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 41

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 07:38 Direction: Southeast

Description: WSMR – Mountain Test Site – Note this is a historical area where V2 Rockets were tested after WW2. Not listed as a SWMU or AOC in permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 42

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 07:46 Direction: South

Description: WSMR – Building with likely asbestos siding. Mountain Test Site – Note this is a historical area where V2 Rockets were tested after WW2. Not listed as a SWMU or AOC in permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 43

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 07:55 Direction: North

Description: SWMU 65 / Former Main Post Landfill #3 at Scrap Yard

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 44

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 08:04 Direction: Southwest

Description: WSMR – “Hazardous Area” west of Former Main Post Landfill #3 at Scrap Yard  
Note: It is likely part of SWMU 65 listed in the permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 45

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 08:07 Direction: South

Description: WSMR – Old debris pile (5 yds x 5 yds) southwest of Former Main Post Landfill #3 at Scrap Yard. Note: It is likely part of SWMU 65 listed in the permit.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 46

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 09:03 Direction: West

Description: WSMR – Potential Former UXO Pit. According to map in the permit application, does not appear to be part of the SWMU-153

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 47

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 09:06 Direction: East

Description: WSMR - SWMU 153 / Vandal Burial Site at the OB/OD.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 48

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 09:08 Direction: North

Description: WSMR - SWMU 55 and SWMU 56 Open Burn Pits at the OB/OD. Post Closure Care Plan Required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 49

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 09:13 Direction: North

Description: WSMR - SWMU 55 and SWMU 56 Open Burn Pits at the OB/OD. Post Closure Care Plan Required.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 50

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 10:32 Direction: North

Description: WSMR – Spill response area adjacent to (east) Range Road 7. It is suspected that the generator was not properly attached and came loose and flipped off trailer/truck. It is suspected that most of the missing fuel (200 gallons) was leaked onto the ground. The fuel spillage stained an area of 35' X 5' which was excavated and placed in roll-off boxes.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 51

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 10:53 Direction: Northeast

Description: WSMR – Rhodes Canyon POL – Stained soil and concrete with strong diesel like odor adjacent to sump vault.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 52

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 10:54 Direction: East

Description: WSMR - WSMR – Rhodes Canyon POL – Stained soil adjacent to secondary containment discharge pipe with strong kerosene like odor.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 53

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 10:59 Direction: Northwest

Description: WSMR - SWMU 116 / Rhodes Subgrade Asphalt Tanks (removed). Note: SWMUs 116, 117, & 118 were combined into SWMU 116.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 54

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 11:03 Direction: Northeast

Description: WSMR - SWMU 114 AND swum 115 / Rhodes Canyon Landfill Closure complete. Post-closure Plan is included in the approved CMI Report.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 55

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 12:20 Direction: Northeast

Description: WSMR - SWMU 119 AND SWMU 120 / Stallion Range Landfill – Note: Fence needs repair. WSMR awaiting comments/approval on Revised RFI

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 56

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 12:27 Direction: Northeast

Description: WSMR - SWMU 119 AND SWMU 120 / Stallion Range Landfill – Note: Old monitoring well network that is no longer being used (noted in foreground). Replaced with newer wells (noted in background).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 57

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 12:34 Direction: Northwest

Description: WSMR – Stallion Range POL - Stained soil with strong petroleum like odor adjacent to sump vault that has containment problem(s).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 58

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 12:35 Direction: Southwest

Description: WSMR – Stallion Range POL - Stained soil with strong petroleum like odor adjacent to sump vault that has containment problem(s).

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No



Photo No.: 59

Site/Facility: WHITE SANDS MISSILE RANGE, NEW MEXICO

Date/Time: September 27, 2012 / 16:24 Direction: West

Description: WSMR - SWMU 57: Tula Peak Burial Sites and SWMU 61: Tula Peak Incinerator. Closure Report submitted to NMED.

Photographer: Rustin Baca (Environmental Contractor for WSMR)

Camera Make: SONY Model: DSC-F828 Color Representation: sRGB Flash: No

End of Photographic Log

Total Photographs Recorded: 59.

## APPENDIX B

# AERIAL PHOTOGRAPH AND SCHEMATIC DRAWING OF MAIN POST SEWAGE TREATMENT PLANT



