

FY2015

NATIONAL TRAINING CENTER AND FORT IRWIN
Army Defense Environmental Restoration Program
Installation Action Plan

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Statement of Purpose

The purpose of the Installation Action Plan (IAP) is to outline the total multiyear cleanup program for an installation. The plan identifies environmental cleanup requirements at each site or area of concern, and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial actions.

In an effort to coordinate planning information between the restoration manager, the US Army Environmental Command (USAEC), the National Training Center (NTC) and Fort Irwin, the Installation Management Command (IMCOM) - West, the executing agencies, the regulatory agencies, and the public, an IAP was completed. The IAP is used to track requirements, schedules, and tentative budgets for all major Army installation cleanup programs.

All site-specific funding and schedule information has been prepared according to projected overall Army funding levels and is, therefore, subject to change.

Acronyms

| | |
|---------|--|
| AI | Active and Inactive |
| AEDB-CC | Army Environmental Database - Compliance-related Cleanup |
| AEDB-R | Army Environmental Database - Restoration |
| ASP | Ammo Supply Point |
| ASR | Archive Search Report |
| bgs | below ground surface |
| Caltech | California Institute of Technology |
| CAO | Cleanup and Abatement Order |
| CFR | Code of Federal Regulations |
| CIWMB | California Integrated Waste Management Board |
| CR | Compliance Restoration |
| CRWQCB | California Regional Water Quality Control Board |
| CTT | Closed, Transferred or Transferring |
| DMM | Discarded Military Munitions |
| DPW | Directorate of Public Works |
| DTC | Desert Training Center |
| DTSC | Department of Toxic Substances Control, Region IV |
| EFS/CAP | Engineering Feasibility Study/Corrective Action Plan |
| EOD | Explosives Ordnance Disposal |
| FORSCOM | Forces Command |
| FRA | Final Removal Action |
| FTIR | AEDB-R designation for Fort Irwin |
| FY | Fiscal Year |
| GALCIT | Graduate Aeronautical Laboratory, California Institute of Technology |
| GWM | Groundwater Monitoring |
| HQ | Headquarters |
| HRR | Historical Records Review |
| ID | Identification |
| IMCOM | Installation Management Command |
| IRA | Interim Remedial Action |
| IRP | Installation Restoration Program |
| ISEA | Interim Site Evaluation Accomplished |
| K | thousand |
| LF | Landfill |
| LTM | Long-Term Management |
| MAAR | Mojave Anti-Aircraft Range |
| MC | Munitions Constituents |
| mgd | million gallons domestic sewage per day |
| mm | millimeter |
| MMRP | Military Munitions Response Program |
| MR | Munitions Response |
| MRSPP | Munitions Response Site Prioritization Protocol |
| N/A | Not Applicable |
| NASA | National Aeronautics and Space Administration |
| NCP | National Oil and Hazardous Substances Pollution Contingency Plan |

Acronyms

| | |
|--------|---|
| NOV | Notice of Violation |
| NPL | National Priorities List |
| NTC | National Training Center |
| OB | Open Burning |
| OD | Open Detonation |
| ORDCIT | Ordnance, California Institute of Technology |
| PA | Preliminary Assessment |
| PBA | Performance Based Acquisition |
| PBC | Performance-Based Contract |
| POL | Petroleum, Oil and Lubricants |
| RA(C) | Remedial Action (Construction) |
| RC | Response Complete |
| RFA | RCRA Facility Assessment |
| RFI | RCRA Facility Investigation |
| RIP | Remedy-in-Place |
| ROD | Record of Decision |
| RRSE | Relative Risk Site Evaluation |
| SG | Soil Gas |
| SI | Site Inspection |
| SVOC | Semi-volatile Organic Compounds |
| SWAT | Solid Waste Assessment Test |
| SWMU | Solid Waste Management Unit |
| TAPP | Technical Assistance for Public Participation |
| TBD | To Be Determined |
| TPH | Total Petroleum Hydrocarbons |
| TRC | Technical Review Committee |
| USACE | US Army Corps of Engineers |
| USEPA | US Environmental Protection Agency |
| USGS | US Geologic Survey |
| UST | Underground Storage Tank |
| UTM | Universal Transverse Mercator |
| VOC | Volatile Organic Hydrocarbons |
| WWTP | Wastewater Treatment Plant |

Installation Information

Installation Locale

Installation Size (Acreage): 760000

City: Barstow

County: San Bernardino

State: California

Other Locale Information

NTC and Fort Irwin, which encompasses an area of about 760,000 acres in the Mojave Desert, is located 39 miles northeast of the city of Barstow in San Bernardino County, California.

Installation Mission

The current mission of NTC and Fort Irwin is to improve US Army unit readiness through a unique armored training experience for active Army units, to collect data on training exercises under near-battlefield conditions, and to evaluate the performance and effectiveness of the Army's organization, equipment, doctrine, and training.

Lead Organization

IMCOM

Lead Executing Agencies for Installation

US Army Corps of Engineers (USACE), Sacramento District

Regulator Participation

Federal

US Environmental Protection Agency (USEPA), Region IX

State

Mojave Desert Air Quality Management District

California Department of Fish and Game

Department of Resources Recycling and Recovery

Department of Toxic Substances Control, Region IV (DTSC)

California Regional Water Quality Control Board (CRWQCB), Lahontan Region

National Priorities List (NPL) Status

NATIONAL TRAINING CENTER AND FORT IRWIN is not on the NPL

Installation Restoration Advisory Board (RAB)/Technical Review Committee (TRC)/Technical Assistance for Public Participation (TAPP) Status

The community has expressed no sufficient, sustained interest in a RAB.

Installation Program Summaries

IRP

Primary Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Pesticides, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Affected Media of Concern: Groundwater, Soil

MMRP

Primary Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Affected Media of Concern: Groundwater, Soil

Installation Information

CR

Primary Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Other (Trihalomethane), Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Affected Media of Concern: Groundwater, Soil

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

| Status | Start Date | End Date | End FY |
|----------|------------|----------|--------|
| Complete | 200212 | 200712 | 2008 |
| Underway | 201310 | 201509 | 2015 |

Last Completed 5-Year / Periodic Review Details

| Associated ROD/DD Name | Sites |
|------------------------------------|------------------|
| IRA at FTIR-02 & 04, Abandoned LFs | FTIR-02, FTIR-04 |

Results Continue GW monitoring and annual landfill cap inspection for the site.

Actions Continue LTM at the site.

Plans Five-year reviews will continue.

Recommendations and Implementation Plans:

This a periodic review following internal Army draft guidance. It applies to the only two corrective action sites (abandoned landfills FTIR-02 and FTIR-04) at NTC with completed remedies and contamination left in place. Other corrective actions do not have completed remedies or do not have contamination left in place.

- Verify that the electronic and hard copy of the administrative records for all corrective action sites include all relevant documents and are accessible for future review; and document the critical steps of remedy selection, implementation, and closeout.
- Survey existing animal burrows on FTIR-02, FTIR-04 and FTIR-06 to quantify their number and depth to add strength to the assumption that two feet of soil cover is adequate to protect wildlife. Animal burrows were noted in site inspections, though not numerous and not estimated to be deep. It is not certain to a high degree of confidence that the burrows are less than 2 feet deep or do not impact the integrity of the cap.

Land Use Control (LUC) Summary

LUC Title: Fencing and Signage

Site(s): FTIR-001-R-01, FTIR-002-R-01, FTIR-003-R-01, FTIR-005-R-01, FTIR-007-R-01, FTIR-012-R-01, FTIR-013-R-01, FTIR-016-R-01

ROD/DD Title: Land Use Control Plan & EE/CA

Location of LUC

All MR sites

Land Use Restriction: Media specific restriction - Prohibit, or otherwise manage excavation, Media specific restriction - Prohibit, or otherwise manage excavation below a specified depth

Types of Engineering Controls: Fences, Signs

Types of Institutional Controls: Construction Permit, Dig Permits, Local Use ordinances, Restrictions on land use

Date in Place: 201601

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: State

Record of LUC: Master Plan or Equivalent

Documentation Date: 201601

LUC Enforcement: Annual Inspections

Contaminants: Unexploded Ordnance(UXO)

Additional Information

N/A

Cleanup Program Summary

Installation Historic Activity

NTC and Fort Irwin (also referred to as Fort Irwin) is located approximately 39 miles northeast of Barstow, California. It encompasses 760,000 acres in the Mojave Desert and is bounded on the west by the US Naval Weapons Center, China Lake, on the north by the Death Valley National Monument, and on the south and east by land under the jurisdiction of the US Bureau of Land Management.

The land within Fort Irwin's boundaries has three primary uses by the Army: ranges, maneuvers, and the cantonment. The ranges are used for military training including heavy mechanized vehicle maneuvers, gunnery training, and live fire exercises. Approximately 65 percent of Fort Irwin is designated as ranges. The cantonment area includes administrative facilities, family housing, troop housing, medical facilities, helipads, schools, recreational facilities, maintenance, warehouse and storage areas, hazardous waste storage, and other general facilities. The cantonment area is about 15,000 acres, which is less than two percent of the installation's total area. Approximately 37 square miles of Fort Irwin have been leased to the National Aeronautics and Space Administration (NASA). This area, known as Goldstone Deep Space Complex, is used for deep space radio antennae and satellite tracking systems. Approximately 350 square miles at the northern boundary of the installation are used by the US Air Force as a gunnery range (Leach Lake Air-to-air and Air-to-ground Range). The remaining land is designated as recreational, off limits for environmental and/or archaeological reasons, or nontrafficable.

On Aug. 8, 1940 President Franklin D. Roosevelt established the Mojave Anti-aircraft Range (MAAR). The War Department withdrew approximately 640,000 acres of land from public use to provide a range where training in the use of anti-aircraft weapons could be conducted without interruption.

In addition to use by the regular Army, the California Institute of Technology (Caltech) used the area around Goldstone Dry Lake to test weapons for the Navy (i.e., Project Mousetrap: testing of an anti-submarine weapon).

The Desert Training Center (DTC) was established in 1942 with General George S. Patton as the first commanding general. The DTC was located in both California and Arizona, encompassing a small portion of the present day Fort Irwin. The DTC operated for 13 months before the military could no longer afford to maintain it.

MAAR was renamed Camp Irwin on Nov. 4, 1942. The camp was named for Major General George Leroy Irwin, a World War I battle commander of the 57th Field Artillery.

Many famous units trained at Camp Irwin during World War II, including the Desert Commandos of North Africa fame. The camp also served as an internment site for prisoners of war.

In December 1944 with World War II nearing a successful completion, Camp Irwin was deactivated. Under executive order, President Franklin D. Roosevelt transferred jurisdiction of the lands to the US Department of the Interior.

On July 16, 1951 Camp Irwin was reactivated to serve as a training ground for troops involved in the Korean Conflict. Camp Irwin's size and location were important factors in its reactivation for tank training and large-scale war games. During this period, Camp Irwin was under the command of the US Sixth Army, headquartered at the Presidio of San Francisco, California. Units trained at Camp Irwin during this period included the 526th Ordnance Company, regimental tank companies of the 43rd Infantry Division, the 378th Ordnance Company, and the 53rd Transportation Company. The Armored Combat Training Center was also located here at that time.

On Aug. 1, 1961 the status of the installation was upgraded to a permanent installation. At this point, Camp Irwin was renamed Fort Irwin and the Armor and DTC was established there. Fort Irwin served as an armor and artillery firing DTC for various units of the active Army, the National Guard, and the Army Reserve in the Fifth and Sixth US Army areas.

In January 1971 as the Vietnam War was winding down, Fort Irwin was closed and placed on caretaker status under the control of Fort McArthur, California.

In 1972 Fort Irwin was turned over to the state of California. From 1972 to 1980, the installation was used as a training area for troops of the California Army National Guard.

In 1976 Major General Paul Gorman introduced the idea of having a large scale training area to simulate actual warfare. The Army needed a large area of land that was isolated from civilization. Fort Irwin, located in the Mojave Desert 35 miles from the closest town, fit the Army's criteria.

Cleanup Program Summary

Installation Historic Activity

In August 1979 Fort Irwin was selected as the site for the Army's NTC. In October 1980, the NTC was activated with the mission of improving Forces Command (FORSCOM) unit readiness through training by providing a unique atmosphere and environment for training at battalion force combined arms level. In July 1981, the active Army reactivated Fort Irwin under FORSCOM to support the NTC.

As part of Fort Irwin's mission to provide support for assigned, attached, tenant, and training units, units from all over the US come to Fort Irwin to participate in simulated war games.

The installation is currently working with the regulatory agencies to reconcile documents and fill any information gaps for the environmental programs.

Installation Program Cleanup Progress

IRP

Prior Year Progress: Quarterly groundwater sampling continued at FTIR-02 and FTIR-04. Cap and cover inspections were completed at FTIR-02 and FTIR-04.

Future Plan of Action: Quarterly groundwater sampling will continue at sites FTIR-02 and FTIR-04. Cap inspections will continue at FTIR-06.

MMRP

Prior Year Progress: Military Munitions Response Programs (MMRP) remedial investigation (RI) is in progress at all MMRP sites.

Future Plan of Action: The MMRP RI is in progress and will be followed by the FS.

CR

Prior Year Progress: RI/RFI's continued at sites CCFTIR-01, CCDW-05, CCFTIR-02, and CCFTIR-044.

Future Plan of Action: CCDW-05 RI will continue. CCFTIR-044, CCFTIR-02, and CCFTIR-01 investigations and interim remedial action (IRA) will continue.

**NATIONAL TRAINING CENTER AND FORT IRWIN
Army Defense Environmental Restoration Program
Installation Restoration Program**

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 44/41

Installation Site Types with Future and/or Underway Phases

3 Landfill
(FTIR-02, FTIR-04, FTIR-06)

Most Widespread Contaminants of Concern

Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC), Pesticides, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern

Groundwater, Soil

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

| Site ID | Site Name | Action | Remedy | FY |
|-----------|--|--------|---|------|
| FTIR-28 | WASTE OIL UST (SOUTH LOOP, LANGFORD LK) | IRA | WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS | 1989 |
| FTIR-29 | GASOLINE UST (BUILDING 384) | IRA | WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS | 1989 |
| FTIR-27 | BUNKER FUEL UST (NORTHWEST OF A AVENUE) | IRA | WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS | 1992 |
| FTIR-26 | GASOLINE UST(BUILDING 909) | FRA | WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS | 1993 |
| FTIR-27 | BUNKER FUEL UST (NORTHWEST OF A AVENUE) | IRA | WASTE REMOVAL - SOILS | 1996 |
| FTIR-02 | ABANDONED SANITARY LANDFILL 2 | IRA | FENCE OR OTHER SITE ACCESS CONTROL MEASURES | 1997 |
| FTIR-04 | ABANDONED SANITARY LANDFILL 4 | IRA | FENCE OR OTHER SITE ACCESS CONTROL MEASURES | 1997 |
| FTIR-11 | DRAINAGE PIT(BUILDING 830) | IRA | OTHER | 1997 |
| FTIR-35 | MOTORPOOL LUBRICATION PITS (BLDG621&650) | IRA | OTHER | 1997 |
| FTIR-03 | ABANDONED SURFACE DISPOSAL AREA | FRA | WASTE REMOVAL - DRUMS, TANKS, BULK CONTAINERS | 1998 |
| FTIR-02 | ABANDONED SANITARY LANDFILL 2 | FRA | CAPPING | 1999 |
| FTIR-02 | ABANDONED SANITARY LANDFILL 2 | FRA | DRAINAGE CONTROLS | 1999 |
| FTIR-04 | ABANDONED SANITARY LANDFILL 4 | FRA | DRAINAGE CONTROLS | 1999 |
| FTIR-04 | ABANDONED SANITARY LANDFILL 4 | FRA | CAPPING | 1999 |
| FTIR-06 | TROOP LANDFILL DISPOSAL SITE | FRA | FENCE OR OTHER SITE ACCESS CONTROL MEASURES | 1999 |
| FTIR-27 | BUNKER FUEL UST (NORTHWEST OF A AVENUE) | IRA | NATURAL ATTENUATION | 2004 |
| FTIR-38 | GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE | FRA | WASTE REMOVAL - SOILS | 2005 |
| FTIR-40 | MOJAVE ANTI-AIRCRAFT RANGE HQ | FRA | REMOVAL | 2005 |
| Irwin_PBC | PBC site | FRA | REMOVAL | 2005 |

IRP Summary

Duration of IRP

Date of IRP Inception: 198202

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 200709/199909

Date of IRP completion including Long Term Management (LTM): 204509

IRP Contamination Assessment

Contamination Assessment Overview

Since 1982 site investigations and groundwater monitoring at NTC and Fort Irwin have been conducted by Fort Irwin, the USAEC, the US Army Environmental Hygiene Agency, and the US Geological Survey (USGS) in various areas throughout the installation. The major contaminants of concern are metals, POLs, chlorinated solvents, dioxins, and explosives. A listing of the relevant environmental studies that have been performed to date can be found in the previous studies section of this document.

The installation assessment performed by the US Army Toxic and Hazardous Materials Agency (USATHAMA) in 1982 identified 31 potentially contaminated sites or solid waste management units (SWMUs). Of the 31 sites, eight landfill and disposal areas were identified. This assessment stated that only one landfill received small quantities of hazardous wastes (pesticide cans, pesticide-contaminated soil, asbestos, ammunition, and flares); however, preliminary assessments (PAs) performed from 1991 to 1993 found that most of the landfills received hazardous waste in one form or another. Any future action responsibilities for FTIR-34, Goldstone Former Echo Landfill, have been transferred to NASA.

The information regarding the materials disposed of at the Lucky Fuse Disposal Site (FTIR-07) and the Avawatz Valley Disposal Area (FTIR-08) is limited and somewhat contradictory. Most of the documentation does not differentiate between these two sites; however, these two areas combined reportedly received 13.6 metric tons of hazardous waste from Edwards Air Force Base and other sources. These sites also may have received 2.5 metric tons per month of waste materials containing explosives for an indeterminate amount of time ending no later than 1985. After extensive sampling, no significant contamination was found.

The assessment report indicated the majority of SWMUs required monitoring/sampling-analysis or corrective action in order to satisfy 40 Code of Federal Regulations (CFR) 264.101 for the Resource Conservation and Recovery Act (RCRA) Part B permit application requirements. The assessment recommended that groundwater monitoring be conducted at FTIR-01 and FTIR-02, and surface and subsurface soil samples be analyzed at FTIR-06, FTIR-07, FTIR-12, and FTIR-21 to FTIR-25F.

A Cleanup and Abatement Order (CAO) (CAO#86-19) was issued by the CRWQCB on June 24, 1986 for FTIR-11. In 1988, the CRWQCB issued a notice of violation (NOV) of CAO#86-19. At that time, soil contamination POL levels were determined to be above cleanup levels. Further investigation of this site was performed during the RI fieldwork in June 1996. This RI report was completed in 1999.

In 1988 the CRWQCB informed Fort Irwin that FTIR-07 was subject to the solid waste assessment test (SWAT) regulations and had been placed on the statewide list of sites. Fort Irwin petitioned to have this site removed from this list. The request was rejected, and an NOV was issued on May 11, 1989 because the SWAT proposal had not been submitted.

The proposal was prepared in 1990. In 1992, the CRWQCB notified the installation that the preparation of the 1990 SWAT proposal had corrected the 1989 NOV.

CAO#6-89-45 was issued on Feb. 21, 1989 for FTIR-20, the Abandoned Fire Fighting Training Facility. A notice of noncompliance with this CAO was issued on Dec. 20, 1994 for failure to provide groundwater monitoring reports. The CAO was rescinded on Nov. 28, 1995, and FTIR-20 was officially closed out by the state of California on May 3, 1996.

In August 1993 the federal facility compliance agreement was completed between the installation and the USEPA. This agreement required investigation at FTIR-22 (Trinity Range), FTIR-11 [Drainage Pit (Building 830)], and FTIR-20 (Abandoned Fire Fighting Training Facility).

Forty-four sites are currently listed in the Army Environmental Database - Restoration (AEDB-R) for NTC and Fort Irwin; only three sites are still active and are all in LTM. FTIR-21, the New Fire Fighting Training Facility, was never constructed. FTIR-37 was combined with FTIR-14 due to geographical location. FTIR-25A was combined with FTIR-07 due to geographical location and similar disposal activities. FTIR-42 was combined with FTIR-41 due to geographical location and similar disposal activities. As a result, FTIR-21, FTIR-25A, FTIR-37, and FTIR-42 have been deleted from AEDB-R. FTIR-01 was closed and reopened as a Compliance Restoration (CR) site, CCFTIR-01.

Groundwater contamination was detected at these active sites: FTIR-02, FTIR-04, and FTIR-11. Groundwater is currently being monitored at two of the sites; FTIR-11 is waiting for the completion (including the signatures) of a DD for no further action (NFA). Based on sampling conducted to date, FTIR-06, FTIR-07, FTIR-08, FTIR-18, FTIR-25E, FTIR-32, FTIR-38, FTIR-39, and FTIR-41 pose no threat to groundwater. Under current land uses, preliminary human health risk assessments indicate that FTIR-02, FTIR-04, FTIR-06, FTIR-07, FTIR-08, FTIR-11, FTIR-18, FTIR-25E, FTIR-32, FTIR-39, and FTIR-41 are within regulatory guidelines, so do not pose a risk to human health.

IRP Contamination Assessment

Contamination Assessment Overview

Landfills FTIR-02 and FTIR-04 received additional soil cover in 1999 to meet cover guidelines. FTIR-38/40 had a soil removal action in 2005 to reduce the risk of lead toxicity to the Mojave ground squirrel and burrowing owl.

Cleanup Exit Strategy

Long-term monitoring operations will continue at sites FTIR-02, FTIR-04, and FTIR-06. Cap maintenance, inspections, and groundwater monitoring will continue until the LTM phase is complete.

IRP Previous Studies

| Year | Title | Author | Date |
|------|--|---|----------|
| 1979 | Geotechnical Investigation for Class II-1 Waste Disposal Site | Leighton & Associates, Inc. | JAN-1979 |
| 1981 | Desert Tortoise Biological Assessment for Current Mission at NTC | Installation | JAN-1981 |
| 1982 | Installation Assessment of Fort Irwin, CA | Environmental Science and Engineering Inc. | JAN-1982 |
| 1985 | Endangered and Sensitive Species Survey and Deficiency Tabulation | Lee and Ro Consulting | JAN-1985 |
| 1986 | Investigation of Soil Contamination at Building 909 (FTIR-26) | Almgren & Koptionak, Inc. | JAN-1986 |
| | Investigation of Soil Contamination at Building 830 (FTIR-35) | Almgren & Koptionak, Inc. | JAN-1986 |
| | Preliminary Site Investigation - Oxidation Ponds, Fort Irwin Wastewater Treatment Plant | Brown & Caldwell | JAN-1986 |
| 1987 | Preliminary Site Investigation - Sanitary Landfill | Brown & Caldwell | JAN-1987 |
| | Investigation of Soil Contamination at the Troop Landfill Disposal Site | Almgren & Koptionak, Inc. | JAN-1987 |
| | Investigation of Soil Contamination at the Lucky Fuse Disposal Site | Almgren & Koptionak, Inc. | JAN-1987 |
| | Investigation of Soil Contamination at the Avawatz Valley Disposal Site | Almgren & Koptionak, Inc. | JAN-1987 |
| 1990 | Soil Contamination Investigation at Drainage Pit near Building 830 (FTIR-11) | Greiner, Inc. | JAN-1990 |
| | Remedial Investigation Drainage Pit at Building 830 (FTIR-11) | Greiner, Inc. | JAN-1990 |
| | Soil Contamination Investigation, Fire Fighting Training Facility (FTIR-20) | Geotechnical Professionals Inc. | JAN-1990 |
| | Solid Waste Quality Assessment Test (SWAT), Project #11789, Lucky Fuse Disposal Site (FTIR-07) | Environmental Profiles Compliance Engineering | JAN-1990 |
| 1993 | Groundwater Monitoring Wells Analysis | Mittelhauser Corporation | JUN-1993 |
| | Groundwater Monitoring Wells Analysis | Mittelhauser Corporation | SEP-1993 |
| 1994 | Site Investigation Report for the Fire Fighting Training Facility FFTIR-20) | USACE Sacramento | JAN-1994 |
| | Abandoned Landfills, Quarterly Monitoring Well Sampling Report | Ecology & Environment | SEP-1994 |
| 1995 | Abandoned Landfills, Quarterly Monitoring Well Sampling Report | Ecology & Environment | MAR-1995 |
| | Abandoned Landfills, Quarterly Monitoring Well Sampling Report | Ecology & Environment | JUN-1995 |
| 1997 | | | |

IRP Previous Studies

| Year | Title | Author | Date |
|-------------|---|--------------------------|----------|
| 1997 | Soil Sample Collection at Wash Rack 641 (FTIR-15) | OHM Remediation Services | JAN-1997 |
| | Remedial Action Plan for Fort Irwin's Abandoned Landfills (FTIR-02, 04) | Montgomery Watson | JAN-1997 |
| | Groundwater Hydrology and Water Quality of Irwin Basin | USGS | JAN-1997 |
| 1999 | Supplemental Remedial Investigation for Lucky Fuse Site | Installation | JAN-1999 |
| | Remedial Investigation for Avawatz Valley Disposal Site and Site Inspection for OB/OD Volume I-V | Montgomery Watson | JAN-1999 |
| | Final Draft - Groundwater Investigation Report Site FTIR-11 Bldg 830 | Geofon | DEC-1999 |
| 2000 | Hydrogeological Characterization Study of the FTIR-01 Area | Montgomery Watson | JAN-2000 |
| | Final Remedial Action Plan for Site FTIR-18 Abandoned Sewage Oxidation Ponds | Montgomery Watson | JUN-2000 |
| | Final - Remedial Action Plan for Site FTIR-12 Waste Electrolyte Pits | Montgomery Watson | JUN-2000 |
| | Final - Remedial Action Plan for Site FTIR-16 PCB Transformer Storage Facility | Montgomery Watson | JUN-2000 |
| | Apr/00 Semiannual Groundwater Monitoring Report / Abandoned Landfills | Dames & Moore | JUL-2000 |
| | Final - Workplan Verification Sampling IRP Sites FTIR-27 and FTIR-28 | USACE | AUG-2000 |
| | Final - Hydrogeologic Characterization Study of the Site FTIR-01 Area - W/Compact | Montgomery Watson | AUG-2000 |
| | Final - Remedial Plan for Site FTIR-36 Former Mobilization & Training Equipment Sites (MATES) Compound Disposal Site | Montgomery Watson | FEB-2001 |
| 2001 | Final - Remedial Action Plan for Site FTIR-35 Motor Pool Lubrication Pits | Montgomery Watson | FEB-2001 |
| | Final - Remedial Action Plan for Site FTIR-33 Field Support Site | Montgomery Watson | FEB-2001 |
| | Final - Remedial Action Plan for Site FTIR-19 Weed Hospital Pathological Waste Incinerator Room | Montgomery Watson | FEB-2001 |
| | Final - Remedial Investigation for Sites FTIR-32A & FTIR-39 | Montgomery Watson | MAY-2001 |
| | Final - Closure Plan Temporary Soil Transfer Yard | Montgomery Watson | MAY-2001 |
| | Final - Supplemental Remedial Investigation for Avawatz Valley Disposal Site (FTIR-08) June 01 | Montgomery Watson | JUN-2001 |
| | Final - Supplemental Remedial Investigation for Lucky Fuse Site (FTIR-07) | Montgomery Watson | JUN-2001 |
| | Addendum to the Final - Remedial Investigation Avawatz Valley Disposal Site (FTIR-08) & Site Inspection for Avawatz Dry Lake OB/OD Site (FIR-25E) | Montgomery Watson | JUL-2001 |
| | Addendum to the Final - Remedial Investigation FTIR-08, FTIR-22 & Site Inspection for FIR-25E, Final Site Inspection for Sites FTIR-22 & FTIR-41 | Montgomery Watson | JUL-2001 |
| | 2002 | | |

IRP Previous Studies

2002

| Title | Author | Date |
|--|-------------------|----------|
| Final - 4th Qtr 2001 Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | FEB-2002 |
| Ft Irwin - Final - 2001 Annual Groundwater Monitoring Report Abandoned Landfills - March 2002 | Tetra Tech EMI | MAR-2002 |
| Final - General Health & Safety Plan | Tetra Tech EMI | MAY-2002 |
| Final - Closure Certification Report Abandoned Landfill Sites FTIR-02 & FTIR-04 | Montgomery Watson | MAY-2002 |
| Final - 2002 Semiannual (Jul-Oct) Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JUL-2002 |
| Final - Closure Report Ft Irwin Abandoned Landfill Sites FTIR-04 (W/2 CDS) | Montgomery Watson | JUL-2002 |
| Final - Remedial Investigation Workplan FTIR-001 | Tetra Tech EMI | AUG-2002 |
| Addenda to the Final - Remedial Investigation for Site FTIR-08 & FTIR-22 & Site Inspection for Site FTIR-25E & to the Final SI | Montgomery Watson | AUG-2002 |
| Final RI Work Plan for FTIR-01 | Tetra Tech EMI | AUG-2002 |

2003

| | | |
|--|-------------------|----------|
| Final - Semiannual (Oct 2002) Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JAN-2003 |
| Final - Remedial Investigation / Feasibility Study for Sites FTIR-38 & FTIR-40 Vol II | Montgomery Watson | FEB-2003 |
| Final - Remedial Investigation / Feasibility Study for Sites FTIR-38 & FTIR-40 Vol I | Montgomery Watson | FEB-2003 |
| Final - Annual 2002 Groundwater Report Abandoned Landfills | Tetra Tech EMI | MAR-2003 |
| Final - General Health & Safety Plan Revised | Tetra Tech EMI | JUN-2003 |
| Final - Semiannual (Jan & Apr/03) Groundwater Monitoring Report Abandoned Landfills Natl Training Center | Tetra Tech EMI | JUL-2003 |
| Final RI Work Plan for FTIR-27 | Tetra Tech EMI | OCT-2003 |
| Site Specific Health & Safety Plan / FTIR-27 (Addendum D) | Tetra Tech EMI | OCT-2003 |
| Site Specific Health & Safety Plan / FTIR-001 (Addendum D) | Tetra Tech EMI | OCT-2003 |
| Final - 3rd Qtr (Jul / 03) Groundwater & Soil Gas Monitoring Report Active & Abandoned Landfill National Training Center | Tetra Tech EMI | NOV-2003 |
| Results for Additional Rounds of Sampling of the Monitoring Well at Site FTIR-11 | Tetra Tech EMI | DEC-2003 |

2004

| | | |
|---|-------------------|----------|
| Final - Semiannual (Jul & Oct / 03) Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JAN-2004 |
| Draft - Soil Investigation & Groundwater Monitoring Report BLDG 830 (FTIR-11) | Tetra Tech EMI | FEB-2004 |
| Final - Annual 2003 Groundwater Report Abandonment Landfills National Training Center | Tetra Tech EMI | MAR-2004 |
| Final - Semiannual (Jan & Apr) 2004 Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JUL-2004 |
| Decision Document FTIR-39 Goldstone Rocket Testing Range | Montgomery Watson | JUL-2004 |

IRP Previous Studies

| 2004 | Title | Author | Date |
|------|--|-------------------|----------|
| | Decision Document FTIR-32A (Lower Goat Mountain Landfill) FTIR-32A (Upper Goat Mountain Diesel Spill) FTIR-32B (Upper Goat Mountain) | Montgomery Watson | JUL-2004 |
| | Decision Document FTIR-28 Tank 136 Site | Montgomery Watson | JUL-2004 |
| | Decision Document FTIR-25E Avawatz Valley Dry Lake Open Burn / Open Detonation (OB/ OD) Site | Montgomery Watson | JUL-2004 |
| | Decision Document FTIR-22 259th Trinity Range Open Burn / Open Detonation (OB/ OD) Site | Montgomery Watson | JUL-2004 |
| | Decision Document FTIR-08 Avawatz Valley Disposal Site | Montgomery Watson | JUL-2004 |
| | Evaluation of Soil & Groundwater Sampling Results from FTIR-11 National Training Center | Tetra Tech EMI | AUG-2004 |
| | Draft - Remedial Investigation of Groundwater at Ft Irwin Installation Restoration Site 01 (FTIR-01) | Tetra Tech EMI | SEP-2004 |
| 2005 | Final - Semiannual (Jul - Oct) 2004 Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JAN-2005 |
| | Final - Annual 2004 Groundwater Monitoring Report Abandonment Landfills | Tetra Tech EMI | MAR-2005 |
| | Final - Decision Document FTIR-07, FTIR-08, FTIR-22, FTIR-25E, FTIR-32, FTIR-39 (CD) | Montgomery Watson | MAR-2005 |
| | Final - Annual 2004 Groundwater Report Active Landfill | Tetra Tech EMI | MAR-2005 |
| | Final - Remedial Investigation Report at Ft Irwin Installation Site 27 (FTIR-27) (CD) | Tetra Tech EMI | JUL-2005 |
| | Final - Semiannual (Jan & Apr/05) Groundwater Monitoring Report Abandoned Landfills National Training Center (W/CD) | Tetra Tech EMI | JUL-2005 |
| | Remedial Action Workplan for Northern Region Contracting Center FTIR-38 Goldstone Lake Mortar / Small Arms | MKM Engineers | AUG-2005 |
| | Final - 3rd Qtr (July) 05 Groundwater & Soil Gas Monitoring Report Active & Abandoned Landfill (FTIR-01) | Tetra Tech EMI | NOV-2005 |
| | Final - Basewide Chemical Data Quality Mgmt Plan | Tetra Tech EMI | DEC-2005 |
| 2006 | Final - Semiannual (Jul & Oct/05) Groundwater Monitoring Report Abandoned Landfills (W / CD) | Tetra Tech EMI | JAN-2006 |
| | Well Installation Summary Report FTIR-02 | Tetra Tech EMI | MAR-2006 |
| | Final - Workplan FTIR-11 Monitoring Well Installation | Tetra Tech EMI | MAR-2006 |
| | Final - Annual 2005 Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | MAR-2006 |
| | Final - Remedial Action Report for FTIR-38 Goldstone Lake Mortar / Small Arms Range & FTIR-40 Mojave Antiaircraft Range | MKM Engineers | MAR-2006 |
| | Final FTIR-27 Decision Document | Tetra Tech EMI | APR-2006 |
| | Final FTIR-36 & 40 Decision Document | MKM Engineers | APR-2006 |
| | Final - Semiannual (Jan & Apr) 2006 Groundwater Monitoring Report Abandoned Landfills | Tetra Tech EMI | JUL-2006 |
| | 1st 5-yr Review Report for FTIR-02 and FTIR-04 | Tetra Tech EMI | SEP-2006 |

IRP Previous Studies

| 2006 | Title | Author | Date |
|------|--|--------------------|----------|
| | FTIR-11 Monitoring Well Installation Summary Report | Tetra Tech EMI | SEP-2006 |
| | Semi-Annual Inspection for FTIR-02 & FTIR-04 | Tetra Tech EMI | OCT-2006 |
| | Fort Irwin Landfills (FTIR-02 & FTIR-04) Drainage Improvements, Project Completion Report | Montgomery Watson | OCT-2006 |
| 2007 | Final - Semiannual (July & Oct) 2006 GW & Soil Gas Monitoring Rpt, Active & Abandoned Landfills | Tetra Tech EMI | JAN-2007 |
| | January 2007 Monitoring Well Sampling Analysis Data Summary, FTIR-11 | Tetra Tech EMI | MAR-2007 |
| | Final Semiannual (Jan and April) 2007 GW & Soil Gas Monitoring Report, Active and Abandoned Landfills | TtEMI | JUL-2007 |
| | Final Soil Investigation and GWM Report for FTIR-011 | TtEMI | AUG-2007 |
| | Quarterly Monitoring Data for FTIR-01 - July 2007 Event | TtEMI | SEP-2007 |
| | E-files for Semiannual Performance Inspections for Sept 2006 and May 2007 | TtEMI | DEC-2007 |
| 2008 | Quarterly Monitoring Data for Landfill Area - January 2008 Event | TtEMI | MAR-2008 |
| | Final 2007 Annual GW and SG Monitoring Rpt , Active and Abandoned Landfills | TtEMI | MAR-2008 |
| | Letter Summary Report, FTIR-11 (Bldg 830), 2nd Quarter (Jan 30, 2008) GWM Results for MW-05 | USACE | MAR-2008 |
| | Remedial Investigation / Feasibility Study for Groundwater at FTIR-01 | Tetra Tech EMI | AUG-2008 |
| | Final Partial Closure and Post Closure Maintenance Plan for FTIR-01 Landfill Cells | Tetra Tech EMI | AUG-2008 |
| | Quarterly Monitoring Data for Landfill Area - July 2008 Event | Tetra Tech EMI | SEP-2008 |
| | Final Interim Partial Closure Cover Design Package FTIR-01 Landfill Cells | Tetra Tech EMI | DEC-2008 |
| 2009 | Monitoring Data for FTIR-11 - October 2008 Event | Tetra Tech EMI | JAN-2009 |
| | Final Semiannual Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill, July and October 2008 Quarterly Event | Tetra Tech EMI | JAN-2009 |
| | Final Semiannual Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill, July and October 2008 Quarterly Event | Tetra Tech EMI | FEB-2009 |
| | Annual 2008 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California - Final | Tetra Tech EM Inc. | MAR-2009 |
| | Semi-annual Performance Inspection Report, Sites FTIR-02 and FTIR-04 Landfills , Fort Irwin National Training Center, Fort Irwin, California - 02 April 2009 | USACE - Sacramento | APR-2009 |
| | Final Closure Plan Addendum 2, Fort Irwin Compliance Clean-Up Sites, HWMU Building Sites: 367, 612, 626, 630, 639, 646, 680, 681, 703, 830, 840, 873 and 879, National Training Center Fort Irwin, San Bernardino County, California | Tetra Tech EM Inc. | JUN-2009 |
| | Semi-Annual 2009 Groundwater and Soil Gas | Tetra Tech EM Inc. | JUL-2009 |

IRP Previous Studies

| 2009 | Title | Author | Date |
|------|---|--------------------|----------|
| | Monitoring Report, Active and Abandoned Landfill Areas, April QTRLY Monitoring Event, National Training Center, Fort Irwin, California - Final | | |
| | Final Groundwater Monitoring Report Bldge 830 (FTIR-11), National Training Center, Fort Irwin, California | Tetra Tech EM Inc. | SEP-2009 |
| | FTIR-01 Landfill Cover Soil Characterization Evaluation of Existing Soil Cover and Borrow Source Testing, National Training Center, Fort Irwin, California | Tetra Tech EM Inc. | OCT-2009 |
| | Groundwater and Soil Gas Well Inspection Results and Recommendations, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California | Tetra Tech EM Inc. | OCT-2009 |
| | Semi-annual Performance Inspection Report, Sites FTIR-02 and FTIR-04 Landfills , Fort Irwin National Training Center, Fort Irwin, California - 18 August 2009, Final | USACE - Sacramento | NOV-2009 |
| 2010 | Final Semi-Annual 2009 Groundwater and Soil Gas Monitoring Report Oct 2009 QTRLY Monitoring Event, National Training Center Fort Irwin, Ft. Irwin, California | USACE - Sacramento | JAN-2010 |
| | Final Semi Annual Groundwater and Soil Gas Monitoring Report, 1st and 2nd QTRs 2010, Active and Abandoned Landfill Areas, National Training Center Fort Irwin, Ft. Irwin, California | USACE - Sacramento | JUL-2010 |
| | QTRLY Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, July 2010 Monitoring Event, National Training Center Fort Irwin, Ft. Irwin, California | USACE - Sacramento | SEP-2010 |
| | Final Work Plan for Installation and Sampling of Soil Gas Monitoring wells, Fort Irwin Class III Sanitary Landfill, U.S. Army National Training Center (NTC), Fort Irwin, California | Cabrera Services | NOV-2010 |
| 2011 | Site Inspection Report - Final, Fort Irwin Compliance Clean-up Sites, National Training Center Fort Irwin, Fort Irwin, California | Tetra Tech EM Inc. | FEB-2011 |
| | Final 2nd Semi Annual 2010 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | USACE - Sacramento | MAY-2011 |
| | Final Semi Annual Groundwater and Soil Gas Monitoring Report, 1st and 2nd QTRs 2011, Active and Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | USACE - Sacramento | JUN-2011 |
| | Final Soil Gas Sampling Well Summary Report, Fort Irwin Class III Sanitary Landfill, U.S. Army National Training Center (NTC), Fort Irwin, California | Cabrera Services | JUN-2011 |
| 2012 | Final 2nd Semi Annual and Annual Groundwater and Soil Gas Monitoring Report Including Five-Year Compliance Sampling, Active and Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | USACE - Sacramento | APR-2012 |
| | Final Wastewater Treatment Facility, Groundwater Investigation Report, Fort Irwin, National Training Center | MWH Americas, Inc | MAY-2012 |
| | 1st Semi Annual Groundwater and Soil Gas Monitoring Report, 1st and 2nd QTRS 2012, Active and | USACE - Sacramento | OCT-2012 |

IRP Previous Studies

| | Title | Author | Date |
|-------------|--|---------------------|-------------|
| 2012 | Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | | |
| 2013 | 2nd Semi Annual and Annual 2012, Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | USACE - Sacramento | MAR-2013 |
| 2014 | 2nd Semi Annual and Annual 2013 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Ft. Irwin, California | USACE - Sacramento | MAY-2014 |
| | Final Supplemental Site Inspection Report, Military Munitions Response Program, National Training Center and Fort Irwin, San Bernardino County, California, Pistol Range (FTIR-007-R-01), Hand Grenade Range (FTIR-008-R-01) | Pika-Pirmie JV, LLC | DEC-2014 |

NATIONAL TRAINING CENTER AND FORT IRWIN
Installation Restoration Program
Site Descriptions

Site Name: ABANDONED SANITARY LANDFILL 2

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Metals, Pesticides, Volatiles (VOC)

Media of Concern: Groundwater, Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 199101..... | 199201 |
| SI..... | 199101..... | 199201 |
| RI/FS..... | 199209..... | 199706 |
| RD..... | 199707..... | 199903 |
| IRA..... | 199706..... | 199707 |
| RA(C)..... | 199903..... | 199909 |
| LTM..... | 199910..... | 204509 |

RIP Date: N/A

RC Date: 199909

SITE DESCRIPTION

FTIR-02 comprises approximately 16 acres located northwest of the active sanitary landfill (FTIR-01). From 1940 to 1945 the site was operated as a land disposal and open burning (OB) facility. The site is divided into two separate areas, A and B). FTIR-02-A consists of a circular bermed feature in the eastern portion of FTIR-02. FTIR-02-B is a series of trenches oriented in a northeast to southwest direction in the southwestern portion of the site.

The types of debris disposed of at these two areas are similar and consist of burned material, broken glass, metal, charred wood, and ashes. Approximately 4.4 acres of the landfill have less than 2 feet of cover over its contents.

In accordance with the requirements of the 1999 Closure/Post-Closure Maintenance Plan (CPCMP), groundwater monitoring and cover inspection are performed semiannually. A settlement survey is required every five years.

CLEANUP/EXIT STRATEGY

Cap maintenance, cap repairs, and groundwater monitoring will continue.

Site ID: FTIR-04

Site Name: ABANDONED SANITARY LANDFILL 4

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Munitions constituents (MC), Pesticides, Petroleum, Oil and Lubricants (POL), Volatiles (VOC)

Media of Concern: Groundwater, Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 199101..... | 199201 |
| SI..... | 199101..... | 199201 |
| RI/FS..... | 199201..... | 199706 |
| RD..... | 199707..... | 199903 |
| IRA..... | 199706..... | 199707 |
| RA(C)..... | 199905..... | 199909 |
| LTM..... | 199910..... | 204509 |

RIP Date: N/A

RC Date: 199909

SITE DESCRIPTION

This 20-acre site is located immediately west of the inactive landfill (CCFTIR-01). From 1950 to 1980, it was operated as a land disposal and OB facility. It consists of a northeastern bulk disposal area and a western trench area. The types of debris found in the western trenches consisted of household rubbish, construction debris, and miscellaneous equipment parts. In the northeastern burial area, construction material with some household debris and evidence of burning were found. Approximately 13 acres of FTIR-04 have less than 2 feet of cover.

In accordance with the requirements of the 1999 CPCMP, groundwater monitoring and cover inspection are performed semiannually. A settlement survey is required every five years.

CLEANUP/EXIT STRATEGY

Cap maintenance, cap repairs, and groundwater monitoring will continue.

Site ID: FTIR-06

Site Name: TROOP LANDFILL DISPOSAL SITE

STATUS

Regulatory Driver: CERCLA

RRSE: LOW

Contaminants of Concern: Metals, Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 199101..... | 199201 |
| SI..... | 199101..... | 199201 |
| RI/FS..... | 199309..... | 199810 |
| RD..... | 199811..... | 199903 |
| RA(C)..... | 199903..... | 199906 |
| LTM..... | 201210..... | 204509 |

RIP Date: N/A

RC Date: 199908

SITE DESCRIPTION

This site was used for solid waste disposal and possibly for OB/open detonation (OD) activities. It is located 17.5 miles from the cantonment area at Universe Transverse Mercator (UTM) grid coordinates NK5012, and is approximately 2.3 acres in size. The exact dates of operation are unknown. The most recent documentation indicates that the landfill has not been used since 1980.

The main part of the landfill is a 300-foot long by 120-foot wide rectangular area of disturbed soil. A fence consisting of razor wire and CYBOR (non-metallic) stakes was installed in 1999. Within the fenced area, there is a pit running north to south and several spoil piles. The pit is 120 feet long by 15 feet wide and 5-6 feet deep. The spoil piles are 2-6 feet high, and are home to several types of animals including kit fox and whip tail lizards. In agreeing to site closure, the state of California provided written comments saying the soil piles are prime habitat and should be disturbed as little as possible. They also directed the Army to maintain signs and barriers to protect wildlife habitat from vehicles and training activities.

CLEANUP/EXIT STRATEGY

Cap maintenance and cap repairs are planned.

Site Closeout (No Further Action) Summary

| Site ID | Site Name | NFA Date | Documentation |
|----------|--|----------|---|
| FTIR-01 | INACTIVE/ ACTIVE LANDFILL | 200703 | This site was administratively closed in AEDB-R and moved to AEDB-CC. When DERA eligibility increased the site was transferred back to AEDB-R as CR site CCFRIR-01. |
| FTIR-03 | ABANDONED SURFACE DISPOSAL AREA | 199803 | Removal action completed in accordance with the 1997 Decision Document. |
| FTIR-05 | SUSPECTED ABANDONED LANDFILL | 199201 | SI, January 1992, study complete, no cleanup required. |
| FTIR-07 | LUCKY FUSE IMPACT DISPOSAL AREA | 200509 | DTSC & RWQCB letters dated 04/29/04 and 06/25/02. |
| FTIR-08 | AVAWATZ VALLEY DISPOSAL SITE | 199906 | DTSC & RWQCB letters dated 09/11/03 and 06/28/02. |
| FTIR-09 | DDT/LEAD-BASED PAINT DISPOSAL | 199301 | Site could not be located. |
| FTIR-10 | PESTICIDE MIXING AREA | 199610 | |
| FTIR-11 | DRAINAGE PIT(BUILDING 830) | 201010 | |
| FTIR-12 | WASTE ELECTROLYTE DISPOSAL PITS | 199809 | RAP, 6/1/00 |
| FTIR-13 | HW STORAGE FACILITY (BUILDING 703) | 199501 | This is an active site, and therefore not eligible for DERA |
| FTIR-14 | HW TEMPORARY STORAGE FACILITY (BLDG 630) | 199501 | This is an active site, and therefore not eligible for DERA |
| FTIR-15 | HW TEMP STORAGE FACILITY (BLDG 641) | 199706 | This is an active site, and therefore not eligible for DERA |
| FTIR-16 | PCB TRANSFORMER STORAGE AREA | 199809 | RAP, 6/1/00 |
| FTIR-17 | SEWAGE TREATMENT PLANT | 199501 | This is an active site, and therefore not eligible for DERA |
| FTIR-18 | ABANDONED SEWAGE OXIDATION PONDS | 199901 | RAP, 6/1/00 |
| FTIR-19 | PATHOLOGICAL WASTE INCINERATOR | 199809 | DTSC & RWQCB letters dated 10/07/02 and 06/10/02. |
| FTIR-20 | ABANDONED FIRE FIGHTER TRAINING FACILITY | 199705 | |
| FTIR-22 | TRINITY RANGE | 199809 | DTSC letter dated 05/01/03. |
| FTIR-23 | LUCKY FUSE IMPACT AREA OD SITE | 199201 | This is an active site, and therefore not eligible for DERA |
| FTIR-24 | CAS 6 OD SITE (NK345305) | 199201 | This is an active site, and therefore not eligible for DERA |
| FTIR-25B | ABANDONED OD SITE(LEACH LAKE RANGE) | 199301 | This is an active site, and therefore not eligible for DERA |
| FTIR-25C | ABANDONED OD SITE(GARY OWEN IMPACT AREA) | 199301 | This is an active site, and therefore not eligible for DERA |
| FTIR-25D | ABANDONED OD SITE (LANGFORD IMPACT AREA) | 199301 | This is an active site, and therefore not |

Site Closeout (No Further Action) Summary

| Site ID | Site Name | NFA Date | Documentation |
|-----------|--|----------|---|
| | | | eligible for DERA |
| FTIR-25E | ABANDONED OD SITE(AVAWATZ DRY LAKE AREA) | 199809 | DTSC letter dated 07/06/06. |
| FTIR-25F | ABANDONED OD SITE(NELSON IMPACT AREA) | 199301 | This is an active site, and therefore not eligible for DERA |
| FTIR-26 | GASOLINE UST(BUILDING 909) | 199305 | |
| FTIR-27 | BUNKER FUEL UST (NORTHWEST OF A AVENUE) | 200602 | DTSC and RWQCB letters dated 09/08/04 and 04/12/06. |
| FTIR-28 | WASTE OIL UST (SOUTH LOOP, LANGFORD LK) | 200108 | RWQCB letter dated 04/04/02. |
| FTIR-29 | GASOLINE UST (BUILDING 384) | 199512 | |
| FTIR-30 | WASHRACK HOLDING POND, 2/11TH MOTORPOOL | 199501 | This is an active site, and therefore not eligible for DERA |
| FTIR-31 | STORAGE TANKS, WASTE OIL | 199301 | |
| FTIR-32 | GOAT MOUNTAIN LANDFILLS | 199809 | DTSC and RWQCB letters 05/01/03 and 06/06/02. |
| FTIR-33 | FIELD SUPPORT SITE | 199809 | Letter from DTSC dated 06 Nov 1998 concurring with NFA in SI. |
| FTIR-34 | GOLDSTONE FORMER ECHO STATION LANDFILL | 199809 | |
| FTIR-35 | MOTORPOOL LUBRICATION PITS (BLDG621&650) | 199809 | DTSC and RWQCB letters dated 05/01/01 and 04/23/02. |
| FTIR-36 | MATES COMPOUND DISPOSAL SITE | 199809 | Letter from DTSC dated 06 Nov 1998 concurring with NFA in SI. |
| FTIR-38 | GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE | 200609 | DTSC letter dated 04/25/06. |
| FTIR-39 | GOLDSTONE LAKE ROCKET TESTING RANGE | 199809 | Letter from RWQCB on June 2002 saying NFA for the site. |
| FTIR-40 | MOJAVE ANTI-AIRCRAFT RANGE HQ | 200609 | DTSC letter dated 04/25/06. |
| FTIR-41 | COMBAT ENGINEERS RANGE OB/OD SITE | 199809 | MEC related items are being addressed under MMRP site FTIR-005-R-01. |
| Irwin_PBC | PBC site | 200509 | All funding under the site was received and thus the site was closed. |

IRP Schedule

Date of IRP Inception: 198202

Past Phase Completion Milestones

1983

PA (FTIR-28 - WASTE OIL UST (SOUTH LOOP, LANGFORD LK), FTIR-29 - GASOLINE UST (BUILDING 384))

1989

IRA (FTIR-28 - WASTE OIL UST (SOUTH LOOP, LANGFORD LK), FTIR-29 - GASOLINE UST (BUILDING 384))

1992

SI (FTIR-01 - INACTIVE/ ACTIVE LANDFILL, FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-03 - ABANDONED SURFACE DISPOSAL AREA, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-05 - SUSPECTED ABANDONED LANDFILL, FTIR-06 - TROOP LANDFILL DISPOSAL SITE, FTIR-20 - ABANDONED FIRE FIGHTER TRAINING FACILITY, FTIR-22 - TRINITY RANGE, FTIR-23 - LUCKY FUSE IMPACT AREA OD SITE, FTIR-24 - CAS 6 OD SITE (NK345305), FTIR-26 - GASOLINE UST(BUILDING 909), FTIR-35 - MOTORPOOL LUBRICATION PITS (BLDG621&650))

PA (FTIR-01 - INACTIVE/ ACTIVE LANDFILL, FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-03 - ABANDONED SURFACE DISPOSAL AREA, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-05 - SUSPECTED ABANDONED LANDFILL, FTIR-06 - TROOP LANDFILL DISPOSAL SITE, FTIR-20 - ABANDONED FIRE FIGHTER TRAINING FACILITY, FTIR-22 - TRINITY RANGE, FTIR-23 - LUCKY FUSE IMPACT AREA OD SITE, FTIR-24 - CAS 6 OD SITE (NK345305), FTIR-26 - GASOLINE UST(BUILDING 909), FTIR-35 - MOTORPOOL LUBRICATION PITS (BLDG621&650), FTIR-36 - MATES COMPOUND DISPOSAL SITE)

1993

RI/FS (FTIR-26 - GASOLINE UST(BUILDING 909))

RD (FTIR-26 - GASOLINE UST(BUILDING 909))

PA (FTIR-07 - LUCKY FUSE IMPACT DISPOSAL AREA, FTIR-08 - AVAWATZ VALLEY DISPOSAL SITE, FTIR-09 - DDT/LEAD-BASED PAINT DISPOSAL, FTIR-10 - PESTICIDE MIXING AREA, FTIR-11 - DRAINAGE PIT(BUILDING 830), FTIR-12 - WASTE ELECTROLYTE DISPOSAL PITS, FTIR-13 - HW STORAGE FACILITY (BUILDING 703), FTIR-14 - HW TEMPORARY STORAGE FACILITY (BLDG 630), FTIR-15 - HW TEMP STORAGE FACILITY (BLDG 641), FTIR-16 - PCB TRANSFORMER STORAGE AREA, FTIR-17 - SEWAGE TREATMENT PLANT, FTIR-18 - ABANDONED SEWAGE OXIDATION PONDS, FTIR-19 - PATHOLOGICAL WASTE INCINERATOR, FTIR-25B - ABANDONED OD SITE(LEACH LAKE RANGE), FTIR-25C - ABANDONED OD SITE(GARY OWEN IMPACT AREA), FTIR-25D - ABANDONED OD SITE (LANGFORD IMPACT AREA), FTIR-25E - ABANDONED OD SITE(AVAWATZ DRY LAKE AREA), FTIR-25F - ABANDONED OD SITE(NELSON IMPACT AREA), FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE), FTIR-30 - WASHRACK HOLDING POND, 2/11TH MOTORPOOL, FTIR-31 - STORAGE TANKS, WASTE OIL, FTIR-32 - GOAT MOUNTAIN LANDFILLS, FTIR-33 - FIELD SUPPORT SITE, FTIR-34 - GOLDSTONE FORMER ECHO STATION LANDFILL, FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-39 - GOLDSTONE LAKE ROCKET TESTING RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ, FTIR-41 - COMBAT ENGINEERS RANGE OB/OD SITE)

SI (FTIR-07 - LUCKY FUSE IMPACT DISPOSAL AREA, FTIR-08 - AVAWATZ VALLEY DISPOSAL SITE, FTIR-09 - DDT/LEAD-BASED PAINT DISPOSAL, FTIR-10 - PESTICIDE MIXING AREA, FTIR-11 - DRAINAGE PIT(BUILDING 830), FTIR-12 - WASTE ELECTROLYTE DISPOSAL PITS, FTIR-13 - HW STORAGE FACILITY (BUILDING 703), FTIR-14 - HW TEMPORARY STORAGE FACILITY (BLDG 630), FTIR-15 - HW TEMP STORAGE FACILITY (BLDG 641), FTIR-16 - PCB TRANSFORMER STORAGE AREA, FTIR-17 - SEWAGE TREATMENT PLANT, FTIR-18 - ABANDONED SEWAGE OXIDATION PONDS, FTIR-19 - PATHOLOGICAL WASTE INCINERATOR, FTIR-25B - ABANDONED OD SITE(LEACH LAKE RANGE), FTIR-25C - ABANDONED OD SITE(GARY OWEN IMPACT AREA), FTIR-25D - ABANDONED OD SITE (LANGFORD IMPACT AREA), FTIR-25E - ABANDONED OD SITE(AVAWATZ DRY LAKE AREA), FTIR-25F - ABANDONED OD SITE(NELSON IMPACT AREA), FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE), FTIR-28 - WASTE OIL UST (SOUTH LOOP, LANGFORD LK), FTIR-29 - GASOLINE UST (BUILDING 384), FTIR-30 - WASHRACK HOLDING POND, 2/11TH MOTORPOOL, FTIR-31 - STORAGE TANKS, WASTE OIL, FTIR-32 - GOAT MOUNTAIN LANDFILLS, FTIR-33 - FIELD SUPPORT SITE, FTIR-34 - GOLDSTONE FORMER ECHO STATION LANDFILL, FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-39 - GOLDSTONE LAKE ROCKET TESTING RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ, FTIR-41 - COMBAT ENGINEERS RANGE OB/OD SITE)

IRP Schedule

| | |
|-------------|--|
| RA(C) | (FTIR-26 - GASOLINE UST(BUILDING 909)) |
| 1996 | |
| RI/FS | (FTIR-29 - GASOLINE UST (BUILDING 384)) |
| 1997 | |
| RI/FS | (FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-03 - ABANDONED SURFACE DISPOSAL AREA, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-10 - PESTICIDE MIXING AREA, FTIR-15 - HW TEMP STORAGE FACILITY (BLDG 641), FTIR-20 - ABANDONED FIRE FIGHTER TRAINING FACILITY) |
| RD | (FTIR-03 - ABANDONED SURFACE DISPOSAL AREA) |
| IRA | (FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-11 - DRAINAGE PIT(BUILDING 830), FTIR-35 - MOTORPOOL LUBRICATION PITS (BLDG621&650)) |
| 1998 | |
| RI/FS | (FTIR-12 - WASTE ELECTROLYTE DISPOSAL PITS, FTIR-16 - PCB TRANSFORMER STORAGE AREA, FTIR-18 - ABANDONED SEWAGE OXIDATION PONDS, FTIR-19 - PATHOLOGICAL WASTE INCINERATOR, FTIR-22 - TRINITY RANGE, FTIR-25E - ABANDONED OD SITE(AVAWATZ DRY LAKE AREA), FTIR-32 - GOAT MOUNTAIN LANDFILLS, FTIR-33 - FIELD SUPPORT SITE, FTIR-34 - GOLDSTONE FORMER ECHO STATION LANDFILL, FTIR-35 - MOTORPOOL LUBRICATION PITS (BLDG621&650), FTIR-39 - GOLDSTONE LAKE ROCKET TESTING RANGE, FTIR-41 - COMBAT ENGINEERS RANGE OB/OD SITE) |
| RA(C) | (FTIR-03 - ABANDONED SURFACE DISPOSAL AREA) |
| SI | (FTIR-36 - MATES COMPOUND DISPOSAL SITE) |
| 1999 | |
| RI/FS | (FTIR-06 - TROOP LANDFILL DISPOSAL SITE, FTIR-08 - AVAWATZ VALLEY DISPOSAL SITE) |
| RD | (FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-06 - TROOP LANDFILL DISPOSAL SITE) |
| RA(C) | (FTIR-02 - ABANDONED SANITARY LANDFILL 2, FTIR-04 - ABANDONED SANITARY LANDFILL 4, FTIR-06 - TROOP LANDFILL DISPOSAL SITE) |
| 2001 | |
| RFA | (Irwin_PBC - PBC site) |
| RI/FS | (FTIR-28 - WASTE OIL UST (SOUTH LOOP, LANGFORD LK)) |
| 2003 | |
| RI/FS | (FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ) |
| RFI/CMS | (Irwin_PBC - PBC site) |
| 2004 | |
| IRA | (FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE)) |
| 2005 | |
| RI/FS | (FTIR-07 - LUCKY FUSE IMPACT DISPOSAL AREA, FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE)) |
| CMI(C) | (Irwin_PBC - PBC site) |
| RD | (FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ) |
| RA(C) | (FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ) |
| 2006 | |
| LTM | (FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ) |
| 2007 | |
| RI/FS | (FTIR-01 - INACTIVE/ ACTIVE LANDFILL, FTIR-11 - DRAINAGE PIT(BUILDING 830)) |

IRP Schedule

2011

LTM (FTIR-11 - DRAINAGE PIT(BUILDING 830))

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

| Site ID | Site Name | ROD/DD Title | ROD/DD Date |
|---------|-----------|--------------|-------------|
|---------|-----------|--------------|-------------|

Final RA(C) Completion Date: 200509

Schedule for Next Five-Year Review: 2015

Estimated Completion Date of IRP at Installation (including LTM phase): 204509

NATIONAL TRAINING CENTER AND FORT IRWIN IRP Schedule

= phase underway

| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
|---------|-------------------------------|-------|------|------|------|------|------|-------|
| FTIR-02 | ABANDONED SANITARY LANDFILL 2 | LTM | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-04 | ABANDONED SANITARY LANDFILL 4 | LTM | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-06 | TROOP LANDFILL DISPOSAL SITE | LTM | | | | | | |

NATIONAL TRAINING CENTER AND FORT IRWIN
Army Defense Environmental Restoration Program
Military Munitions Response Program

MMRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 16/7

Installation Site Types with Future and/or Underway Phases

- 3 Firing Range
(FTIR-003-R-01, FTIR-008-R-01, FTIR-016-R-01)
- 1 Open Burn
(FTIR-001-R-01)
- 4 Small Arms Range
(FTIR-005-R-01, FTIR-007-R-01, FTIR-012-R-01, FTIR-013-R-01)
- 1 Unexploded Munitions/Ordnance
(FTIR-002-R-01)

Most Widespread Contaminants of Concern

Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern

Groundwater, Soil

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

| Site ID | Site Name | Action | Remedy | FY |
|---------------|--------------------|--------|---------------|------|
| FTIR-007-R-01 | PISTOL RANGE | IRA | UXO CLEARANCE | 2013 |
| FTIR-008-R-01 | HAND GRENADE RANGE | IRA | UXO CLEARANCE | 2013 |

Duration of MMRP

Date of MMRP Inception 200206

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202010/202010

Date of MMRP completion including Long Term Management (LTM): 202007

MMRP Contamination Assessment

Contamination Assessment Overview

The Department of Defense (DoD) has established the MMRP under the Defense Environmental Restoration Program (DERP) to address DoD sites with munitions and explosives of concern (MEC) including UXO, discarded military munitions (DMM), and munitions constituents (MC).

The US Army's inventory of closed, transferred, or transferring (CTT) military ranges and sites identified sites eligible for action under the MMRP at Fort Irwin. The MMRP-eligible sites include other than operational ranges where UXO, DMM, and MC are known or suspected. Properties classified as operational ranges are not eligible and, therefore, are excluded from the MMRP.

The MMRP began in the late-1990s as a result of key drivers such as processes outlined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR 300) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 US Code (USC) 9605, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499.

The process began with three phases of range inventories. Phase I consisted of installations completing an initial data call. USAEC managed the implementation of Phase II and Phase III of the MMRP inventory.

The Phase II inventory dealt with active and inactive (A/I) range considerations. Phase III involved the CTT range inventory conducted in 2002. Included were extensive mapping, data collection for upload to the Army range inventory database, an assessment on explosives safety risk using the risk assessment code (RAC) methodology for CTT ranges or sites with UXO or DMM identified in the inventory, and the determination of which sites on the inventory potentially qualify for the MMRP. The Phase III CTT inventory identified 14 sites at Fort Irwin eligible for action under the MMRP. The final historical records review (HRR) identified one new site that is eligible for the MMRP and determined that two of the sites found during the CTT inventory are not eligible for the active MMRP. Based on the site inspection (SI) results, five sites were determined to require NFA.

Cleanup Exit Strategy

FTIR-001-R-01: surface clearance and anomaly removal. Remedial design (RD) and soil removal (to include off-site transportation and waste disposal) as required. LUCs until land use changes require further remedial actions. FTIR-003-R-01: for MEC, a site characterization and removal assessment are planned. A MEC removal, MEC institutional controls, and monitoring are likely to follow. FTIR-005-R-01: surface clearance and anomaly removal as required. LUCs until land use changes require further remedial actions. FTIR-007-R-01: surface clearance and anomaly removal. RD and soil removal (to include off-site transportation and waste disposal) as required. LUCs until land use changes require further remedial actions. FTIR-008-R-01: current site remedial services should lead to an NFA determination. FTIR-012-R-01: surface clearance and anomaly removal as required. LUCs until land use changes require further remedial actions. FTIR-013-R-01: surface clearance and anomaly removal as required. LUCs until land use changes require further remedial actions. FTIR-016-R-01: surface clearance and anomaly removal as required. LUCs until land use changes require further remedial actions.

MMRP Previous Studies

| Year | Title | Author | Date |
|------|--|---------------------|----------|
| 2002 | Closed, Transferred, and Transferring Range/Site Inventory Phase 3 Report | TechLaw | AUG-2002 |
| 2007 | Final Historical Records Review | FPM Group, Ltd. | OCT-2007 |
| 2009 | SI Report | FPM Group, Ltd. | AUG-2009 |
| 2012 | Final Work Plan, Munitions Response Program, Supplemental Site Inspection, National Training Center, San Bernardino County, California | Pika-Pirnie JV, LLC | DEC-2012 |
| 2014 | Final Work Plan, Munitions Response Program, Remedial Investigation, National Training Center and Fort Irwin, San Bernardino County, California | Pika-Pirnie JV, LLC | JAN-2014 |
| | Final Addendum to Community Involvement Plan, Military Munitions Response Program, National Training Center and Fort Irwin, San Bernardino County, California Pika-Pirnie, JV, LLC | Pika-Pirnie JV, LLC | MAR-2014 |
| | Final Waste Management Plan, Military Munitions Response Program, Remedial Investigation, National Training Center and Fort Irwin, San Bernadino County, California - June 2014 | Pika-Pirnie JV, LLC | JUN-2014 |
| | Final Supplemental Site Inspection Report, Military Munitions Response Program, National Training Center and Fort Irwin, San Bernardino County, California Pistol Range (FTIR-007-R-01) Hand Grenade Range (FTIR-008-R-01) Note: Replaced Revised Final Action Amemorandum | Pika-Pirnie JV, LLC | DEC-2014 |
| 2015 | Explosives Site Plan, Amendment 1, Military Munitions Response Program, Remedial Investigation, Pistol Range MRS FTIR-007-R-01, Carbine Transition Range MRS FTIR-012-R-01, Combat Range 1 MRS FTIR-013-R-01, National Training Center and Fort Irwin, San Bernardino County, California | Pika-Pirnie JV, LLC | FEB-2015 |

NATIONAL TRAINING CENTER AND FORT IRWIN
Military Munitions Response Program
Site Descriptions

Site ID: FTIR-001-R-01

Site Name: COMBAT ENGINEER'S RANGE OB/OD AREA

STATUS

Regulatory Driver: CERCLA

MRSP Score: 03

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC)

Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A

RC Date: 202007

SITE DESCRIPTION

The Engineer's Combat Range OB/OD Area is about 1520 acres in size and is located within the non-active/inactive area, west of the cantonment. Approximately half of the former range is located on the Goldstone Deep Space Complex. Goldstone Road bounds the property to the north. There are no buildings on the site. The cantonment area is just over 1 mile away, and there are schools, residences, office buildings, restaurants, and shops within a 2 mile radius. Based on interpretations of aerial photographs, a 1999 archives search report (ASR) indicates the two areas of the OB/OD area are divided by a strip of operational range. The western portion is located on the northern edge of the site and lies on the boundary separating the operational and nonoperational range property; it consists of two trenches, several circular craters, six structures, excavation sites, and graded pads. The second area described in the ASR is located in the southern portion of the OB/OD area and is characterized as a demolition area.

The western portion of the range located outside the Goldstone Deep Space Complex is currently part of a recreational area located behind the equestrian center and contains a Boy Scout camp recreation area. The portion of the Combat Engineer's Range OB/OD area located within the Goldstone Deep Space Complex remains undeveloped and access to this area is controlled. MEC hazards may also remain in both the surface and subsurface in the portion of the former range that overlaps the Goldstone Deep Space Complex. Portions of this range were surface cleared (including removal of live items) in 1999, 2000, 2001, 2007, and in May 2009.

At one time, OB/OD areas within this range were identified as site FTIR-041 in the Environmental Restoration, Army program and listed as response complete (RC) in 1998. Historical records indicate that excess mortar and rocket ammunition, small arms ammunition, rocket propellants, and explosive components (fuses, boosters, and bursters) may have been burned and/or detonated at the OB/OD area between the 1950s and 1981.

The OB/OD area also overlaps a former close combat range. The close combat range begins within the OB/OD area and extends south beyond the OB/OD area.

The 2009 SI recommended further investigation for MEC and MC at this site. Munitions debris was observed during the visual survey and three soil sample results exceeded the screening criteria [one for lead, one for iron, and one for cyclotrimethylenetrinitramine (RDX)].

The RI is underway.

CLEANUP/EXIT STRATEGY

The cleanup/exit strategy for the site will be decided when the investigation is complete. LUCs will be employed as part of an IRA until land use changes or until a requirement for further remedial action occurs.

Site ID: FTIR-002-R-01
Site Name: BOMBING RANGE 1

STATUS

Regulatory Driver: CERCLA
MRSPP Score: Evaluation pending

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 201503..... | 201803 |
| IRA..... | 201503..... | 202007 |

RIP Date: N/A
RC Date: 202007

SITE DESCRIPTION

This closed range, located within the cantonment area and consisting of approximately 338 acres was depicted on a 1945 map titled "Demobilization Study, Vicinity and Range Map." The 1945 map indicates that 100-pound practice bombs were used, and a 1948 map notes that this range was cleared by a bomb and shell disposal team (the only known UXO response at this site). However in 2015, excavation in the area uncovered 1940s to 1960s-era UXO items including a bazooka training round, an 81 millimeter (mm) live white phosphorous round, and a live 90 mm mortar. The site's beginning date was estimated based on the first time troops were stationed at Fort Irwin in 1942, and the end date was estimated as 1944 when Fort Irwin was deactivated; however, the range may also have been used in the 1950s and 1960s when Fort Irwin was reactivated to support troop training for the Korean and Vietnam wars. The range is located within the operational area: most of FTIR-01 (active/inactive landfill) and the future landfill expansion area, part of FTIR-04 (Abandoned Sanitary Landfill 4), and CCFTIR-02 (Wastewater Treatment Facility) lie within the boundary of Bombing Range 1.

The 2009 MMRP SI recommended no further actions at this site because it was erroneously annotated in the document as MMRP ineligible due to its partial location in what the contractor misinterpreted as active training area. Despite this, the maps in the 2009 SI do correctly show the site being located solely in nonoperational area.

CLEANUP/EXIT STRATEGY

The RI/FS phase is underway. Future actions include an RI, FS, proposed plan, DD and LUCs.

Site ID: FTIR-003-R-01

Site Name: GALCIT AND ORDCIT PROJECTS AREA

STATUS

Regulatory Driver: CERCLA
MRSPP Score: 03
 Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)
 Media of Concern: Groundwater, Soil

| Phases | Start | End |
|------------------|-------------|--------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 201907 |
| RIP Date: | N/A | |
| RC Date: | 201910 | |

SITE DESCRIPTION

The Graduate Aeronautical Laboratory, California Institute of Technology (GALCIT) and Ordnance, California Institute of Technology (ORDCIT) Projects Area is depicted on a May 1945 map of Camp Irwin and is estimated to be 17,371 acres in size. The site was used during the 1940s and 1950s, and much of the area remains undeveloped. This site is located in the western half of Fort Irwin and is a portion of the property known as the Goldstone Deep Space Complex that has been leased to NASA since 1958; it includes Goldstone Lake. The small portion outside of NASA's lease is within the operational area. Buildings, a large antenna, and an airstrip have been constructed on the property. This site consists of the Goldstone Lake Rocket Testing Range and the Goldstone Lake Mortar/Small Arms Range.

Smaller areas next to the dry lake underwent some remediation in the Environmental Restoration, Army program as sites FTIR-38 Goldstone Lake Mortar/Small Arms Range, FTIR-39 Goldstone Lake Rocket Testing Range, and FTIR-40 Mojave Anti-aircraft Range Headquarters (HQ). These sites were listed as RC in September 2006 under the Installation Restoration Program (IRP).

Goldstone Lake Rocket Testing Range is located at the southern end of Goldstone Lake. According to historical reports, Goldstone Lake Rocket Testing Range was used by Caltech as a rocket testing area between 1941 and the end of World War II. Among the variety of rockets tested along Goldstone Lake were anti-submarine rockets, 4.5-inch barrage rockets, high-velocity aircraft rockets, spin-stabilized rockets, and British rockets. It was not unusual for approximately 100 rockets to be launched on a daily basis. The site contains three rocket engine test stands and observation facilities. Each rocket test stand has an area of about 1,000 square feet. Generally, the rockets were propelled from three firing points by a smokeless double-base powder called ballistite, which was composed of nitroglycerine and nitrocellulose. In addition to the stationary tests, rockets were fired over the lakebed from aircraft positioned on the ground and in the air. Preloaded rockets were transported to Goldstone Lake; no manufacturing took place on-site. Explosives were not allowed on the range during the rocket testing years; instead, the rocket heads were filled with plaster.

The Goldstone Lake Mortar/Small Arms Range fan begins east of Goldstone Lake and extends across the lake to the west, crossing Goldstone Lake Rocket Testing Range. According to an interview with the installation range officer, the site was used originally as a rifle and machine gun range between 1945 and the end of 1958. During an IRP site visit to the Goldstone Lake Mortar/Small Arms Range, many 0.50-caliber and 20mm slugs and casings and several mortar rounds were reportedly collected at this sub-site. One MEC item (an incendiary rocket warhead) was found at the site during the visual survey.

The start date is based on the fact that the range did not appear in aerial photographs taken in 1947. Based on the 2009 SI, further investigations for MEC and MC are planned at the site.

The RI is underway.

CLEANUP/EXIT STRATEGY

For MC, an RI/FS including groundwater monitoring wells will be performed. RD and soil removal to include off-site transportation

Site ID: FTIR-003-R-01
Site Name: GALCIT AND ORDCIT PROJECTS AREA

and waste disposal are likely to follow.

For MEC, a site characterization and removal assessment are planned. A MEC removal, MEC institutional controls, and monitoring are likely to follow.

Site ID: FTIR-005-R-01
Site Name: CLOSE COMBAT COURSE

STATUS

Regulatory Driver: CERCLA
MRSPP Score: Evaluation pending
Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)
Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A
RC Date: 202009

SITE DESCRIPTION

The Close Combat Course is located on the western boundary of the Fort Irwin Cantonment Area, overlaps the southern portion of the Combat Engineers Range OB/OD Area (FTIR-001-R-01) and extends south into the operational area. The property has been leased by NASA since December 1958, is estimated at 1,412 acres in size, and is undeveloped. This site is near a recreation area and Boy Scout camp used by Fort Irwin personnel. The nearest inhabited buildings are located on Fort Irwin's cantonment area approximately 4.5 miles from the former range.

This closed range was depicted on a 1945 demobilization study, vicinity and range map. The map was the only source of historical information regarding the range. In an interview, the installation ammunition manager stated that remnants of pop-up targets and bunkers are located at the site. There is a possibility that both surface and subsurface ordnance and explosives hazards remain. It is assumed that practice hand grenades and 0.22, 0.30, and 0.45 caliber small arms ammunition were the items most likely used on-site.

The beginning date was estimated based on the first time troops were stationed at Fort Irwin in 1942, and the end date was estimated as 1944 when Fort Irwin was deactivated. There are no known UXO responses at this site. The 2009 SI recommended further investigations for MEC and MC at this site. A MEC item (75mm high explosive shell) was observed during the visual survey.

The RI is underway.

CLEANUP/EXIT STRATEGY

Surface clearance and LUCs are the interim remedial actions proposed. LUCs will be employed until land use changes or until a requirement for further remedial action occurs.

Site ID: FTIR-007-R-01
Site Name: PISTOL RANGE

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 04

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A

RC Date: 202010

SITE DESCRIPTION

Located within the industrial portion of the cantonment, the Pistol Range was used for small arms training between the 1950s and 1983. The site consisted of approximately 20 firing points located 10, 15, and 25 meters from the target. Training at this range included the use of 0.22, 0.38, and 0.45 caliber munitions. Due to the proximity to a 40mm range, 40mm projectiles might also be found at the site. The range is located on the northeastern side of the present day cantonment area. Buildings have been constructed over parts of the former range. The size of this site has been estimated at 458 acres. There are no known response actions at this site. The 2009 SI recommended further investigations for MEC and MC at this site. A MEC item (90mm booster) was observed during the visual survey. A time-critical removal action occurred on 50 acres from August 2012 to September 2013 and closure was approved by the DTSC. The RI is underway.

CLEANUP/EXIT STRATEGY

Surface clearance and LUCs are the interim remedial actions proposed. RD and soil removal to include off-site transportation and waste disposal are expected, as required. LUCs will be employed until land use changes or until a requirement for further remedial action occurs.

Site ID: FTIR-008-R-01
Site Name: HAND GRENADE RANGE

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 04

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201809 |
| IRA..... | 201208..... | 201309 |

RIP Date: N/A

RC Date: 201910

SITE DESCRIPTION

This former range, estimated to cover 25.4 acres, is located in the northeastern portion of the present day cantonment area and is now part of the cantonment area. Buildings have been constructed on and around the property and it is currently the location of the 2nd Squadron HQ. Although the former range is open to anyone on base, buildings now cover most of the site. Construction at the site has been completed. Although hand grenades have been found in the area, they were found before the buildings were constructed at the site. Any remaining hand grenades are most likely located below the surface.

The only historical document located regarding the Hand Grenade Range was a map of the range. The range officer stated that the range was used from the 1950s or 1960s and was closed in 1984. The officer also noted that practice and live grenades were used at the former range and that one live grenade and several practice grenades had been found at the site. There have been no known UXO responses at this site. The 2009 SI recommended further investigations for MEC and MC at this site. No MEC was observed during the visual survey, and no sample results were recorded above screening criteria.

CLEANUP/EXIT STRATEGY

The current RI should lead to an NFA determination.

Site ID: FTIR-012-R-01
Site Name: CARBINE TRANSITION RANGE

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 05

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A

RC Date: 202010

SITE DESCRIPTION

This closed range, estimated at 324.1 acres, was depicted on a 1945 map titled "Demobilization Study, Vicinity and Range Map", and is located about 2 kilometers south of the cantonment area. The range fan extends from the north to the south, into the operational area. There have been no known response actions at this site. It is undeveloped except for an ammo supply point (ASP) that overlaps the MRS to the west. Historical information indicates the Carbine Transition Range was used from 1945 through 1984 for small arms training including 5.56mm, 7.62mm, and .30-caliber. No MEC was observed during the SI; however a variety of munitions debris including small arms casings (expended blanks), artillery fragments (105mm and 155mm), 250 pound bomb fragments, a 20mm cartridge casing, a slap flare, and other unidentifiable fragments were observed during the visual survey and indicates that the MRS was not used exclusively for small arms training. Because munitions debris (artillery and bomb fragments) is concentrated on the hill top in the MRS, the adjacent highland area is recommended for potential consideration under subsequent RI work. The expectation is that similar evidence of military munitions use may also exist on the adjacent hilltop. The 2009 SI recommended further investigations for MEC and MC at this site. The RI is underway.

CLEANUP/EXIT STRATEGY

Surface clearance and LUCs are the interim remedial actions proposed. LUCs will be employed until land use changes or until a requirement for further remedial action occurs.

Site ID: FTIR-013-R-01
Site Name: COMBAT RANGE 1

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 06

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A

RC Date: 202007

SITE DESCRIPTION

The Combat Range 1 MRS encompasses approximately 779 acres in mountainous terrain, and is located about 4 kilometers south of the cantonment area. With the exception of any portion of the site that overlaps an ASP area, the land is undeveloped. Historical information indicates Combat Range 1 was used from 1945 through 1969. The beginning date was estimated based on the first time troops were stationed at Fort Irwin in 1942, and the end date was estimated as 1944 when Fort Irwin was deactivated. Due to the overlap of several ranges, various munitions use is reported for this MRS, and may have included 90mm and 76mm tanks, .30-cal, 7.62mm, .45-cal, and .50-caliber small arms; 4.2-inch, 81mm, and 60mm mortars; and 106mm recoilless rifles. There have been no known response actions at this site. The 2009 SI recommended further investigations for MEC and MC at this site. MEC items (tear gas, riot grenades, artillery simulators, and unexpended small arms rounds) and munitions debris (smoke grenades and fuses) were observed during the visual survey. The RI is underway.

CLEANUP/EXIT STRATEGY

Surface clearance and LUCs are the interim remedial actions proposed. LUCs will be employed until land use changes or until a requirement for further remedial action occurs.

Site ID: FTIR-016-R-01
Site Name: Range D

STATUS

Regulatory Driver: CERCLA

MRSPP Score: 05

Contaminants of Concern: Munitions and explosives of concern (MEC), Munitions constituents (MC)

Media of Concern: Soil

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 200206..... | 200305 |
| SI..... | 200606..... | 200908 |
| RI/FS..... | 200910..... | 201803 |
| IRA..... | 201111..... | 202007 |

RIP Date: N/A

RC Date: 202010

SITE DESCRIPTION

Range D consists of 15.5 acres located approximately 10 kilometers northwest of the cantonment area. The range is within the NASA antenna station echo, but is otherwise undeveloped. The HRR revealed that the northwest corner of the Range D surface danger zone shown on the 1945 range map extends approximately 250 meters into the other-than-operational boundary of Fort Irwin. Training at the site is estimated to have occurred between 1942 and 1950 (range not shown on 1950 map). Observations made during the SI field survey indicated training occurred at the site, and findings of munitions debris (105mm round, scrap from an armor piercing round, and an expended 90mm projectile tracer element) at the site confirmed range usage. One soil sample exceeded the screening criteria for cadmium. The site is assumed to have been used for 40mm anti-mechanized training. MEC associated with the range is mainly 40mm projectiles, and munitions debris observed at the site included a 105-mm round, scrap from an armor piercing round, and an expended 90-mm projectile tracer element. The 2009 SI recommended further investigation at the site for both MEC and MC. The RI is underway.

CLEANUP/EXIT STRATEGY

Surface clearance and LUCs are the interim remedial actions proposed. LUCs will be employed until land use changes or until a requirement for further remedial action occurs.

Site Closeout (No Further Action) Summary

| Site ID | Site Name | NFA Date | Documentation |
|---------------|-------------------------------------|----------|---|
| FTIR-004-R-01 | SMALL ARMS RANGE | 200908 | Based on the SI (2009) results, the ISEA status was determined for the site and no future actions are expected at this time. The site is still used for training. |
| FTIR-006-R-01 | MOJAVE ANTI-AIRCRAFT RANGE HQ | 200803 | During the HRR (2007), IRP funded work removed contaminated soil from the site. No further action is needed at the site. |
| FTIR-009-R-01 | MINIATURE ANTI-AIRCRAFT RANGE NO. 1 | 200908 | Based on the SI (2009) results, the ISEA status was determined for the site and no future actions are expected at this time. |
| FTIR-010-R-01 | MINIATURE ANTI-AIRCRAFT RANGE NO. 2 | 200908 | Based on the SI (2009) results, the ISEA status was determined for the site and no future actions are expected at this time. |
| FTIR-011-R-01 | GOLDSTONE SUB CALIBER RANGE | 200908 | During the HRR (2007), it was determined that this site lies entirely within an operational range. |
| FTIR-015-R-01 | COMBAT RANGE 2 | 200908 | Based on the SI (2009) results, the ISEA status was determined for the site and no future actions are expected at this time. |
| PBA@MR Irwin | PBA@MR Irwin | 201210 | All funding for all CLINs awarded |

MMRP Schedule

Date of MMRP Inception 200206

Past Phase Completion Milestones

2003

PA (FTIR-001-R-01 - COMBAT ENGINEER'S RANGE OB/OD AREA, FTIR-002-R-01 - BOMBING RANGE 1, FTIR-003-R-01 - GALCIT AND ORDCIT PROJECTS AREA, FTIR-004-R-01 - SMALL ARMS RANGE, FTIR-005-R-01 - CLOSE COMBAT COURSE, FTIR-006-R-01 - MOJAVE ANTI-AIRCRAFT RANGE HQ, FTIR-007-R-01 - PISTOL RANGE, FTIR-008-R-01 - HAND GRENADE RANGE, FTIR-009-R-01 - MINIATURE ANTI-AIRCRAFT RANGE NO. 1, FTIR-010-R-01 - MINIATURE ANTI-AIRCRAFT RANGE NO. 2, FTIR-011-R-01 - GOLDSTONE SUB CALIBER RANGE, FTIR-012-R-01 - CARBINE TRANSITION RANGE, FTIR-013-R-01 - COMBAT RANGE 1, FTIR-015-R-01 - COMBAT RANGE 2, FTIR-016-R-01 - Range D, PBA@MR Irwin - PBA@MR Irwin)

2008

SI (FTIR-006-R-01 - MOJAVE ANTI-AIRCRAFT RANGE HQ)

2009

SI (FTIR-001-R-01 - COMBAT ENGINEER'S RANGE OB/OD AREA, FTIR-002-R-01 - BOMBING RANGE 1, FTIR-003-R-01 - GALCIT AND ORDCIT PROJECTS AREA, FTIR-004-R-01 - SMALL ARMS RANGE, FTIR-005-R-01 - CLOSE COMBAT COURSE, FTIR-007-R-01 - PISTOL RANGE, FTIR-008-R-01 - HAND GRENADE RANGE, FTIR-009-R-01 - MINIATURE ANTI-AIRCRAFT RANGE NO. 1, FTIR-010-R-01 - MINIATURE ANTI-AIRCRAFT RANGE NO. 2, FTIR-011-R-01 - GOLDSTONE SUB CALIBER RANGE, FTIR-012-R-01 - CARBINE TRANSITION RANGE, FTIR-013-R-01 - COMBAT RANGE 1, FTIR-015-R-01 - COMBAT RANGE 2, FTIR-016-R-01 - Range D)

2013

IRA (FTIR-008-R-01 - HAND GRENADE RANGE)

RI/FS (PBA@MR Irwin - PBA@MR Irwin)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates


| Site ID | Site Name | ROD/DD Title | ROD/DD Date |
|---------------|------------------------------------|-------------------------------|-------------|
| FTIR-012-R-01 | CARBINE TRANSITION RANGE | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-013-R-01 | COMBAT RANGE 1 | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-003-R-01 | GALCIT AND ORDCIT PROJECTS AREA | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-016-R-01 | Range D | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-005-R-01 | CLOSE COMBAT COURSE | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-007-R-01 | PISTOL RANGE | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-002-R-01 | BOMBING RANGE 1 | Land Use Control Plan & EE/CA | 20150731 |
| FTIR-001-R-01 | COMBAT ENGINEER'S RANGE OB/OD AREA | Land Use Control Plan & EE/CA | 20150731 |

Final RA(C) Completion Date:

Schedule for Next Five-Year Review: 2015

Estimated Completion Date of MMRP at Installation (including LTM phase): 202007

NATIONAL TRAINING CENTER AND FORT IRWIN MMRP Schedule

 = phase underway

| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
|---------------|---------------------------------------|-------|------|------|------|------|------|-------|
| FTIR-001-R-01 | COMBAT ENGINEER'S RANGE OB/OD AREA | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-002-R-01 | BOMBING RANGE 1 | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-003-R-01 | GALCIT AND ORDCIT PROJECTS AREA | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-005-R-01 | CLOSE COMBAT COURSE | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-007-R-01 | PISTOL RANGE | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-008-R-01 | HAND GRENADE RANGE | RI/FS | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-012-R-01 | CARBINE TRANSITION RANGE | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-013-R-01 | COMBAT RANGE 1 | RI/FS | | | | | | |
| | | IRA | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| FTIR-016-R-01 | Range D | RI/FS | | | | | | |
| | | IRA | | | | | | |

**NATIONAL TRAINING CENTER AND FORT IRWIN
Army Defense Environmental Restoration Program
Compliance Restoration**

CR Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 4/0

Installation Site Types with Future and/or Underway Phases

- 2 Landfill
(CCFTIR-01, CCFTIR-044)
- 1 Surface Disposal Area
(CCDW-05)
- 1 Waste Treatment Plant
(CCFTIR-02)

Most Widespread Contaminants of Concern

Metals, Munitions and explosives of concern (MEC), Other (Trihalomethane), Petroleum, Oil and Lubricants (POL), Polychlorinated Biphenyls (PCB), Semi-volatiles (SVOC)

Media of Concern

Groundwater, Soil

Completed Remedial Actions (Interim Remedial Actions/ Final Remedial Actions (IRA/FRA))

| Site ID | Site Name | Action | Remedy | FY |
|---------|-----------|--------|--------|----|
| N/A | | | | |

Duration of CR

Date of CR Inception: 199109

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 202006/202006

Date of CR completion including Long Term Management (LTM): 202006

CR Contamination Assessment

Contamination Assessment Overview

Environmental restoration activities include the IRP and MMRP. On Dec. 29, 2008, the Office of the Deputy Under Secretary of Defense for Installations and Environment issued an interim policy for DERP eligibility that rescinded the 1986 eligibility date for the IRP and the 2002 eligibility date for the MMRP. This made many sites previously addressed in the Army's Compliance-related Cleanup (CC) Program eligible for the DERP. Sites that are now eligible for the Munitions Response (MR) program have been migrated from Army Environmental Database - Compliance-related Cleanup (AEDB-CC) and given the naming convention of other MR sites. The newly eligible non-MR type sites are considered to be Installation Restoration (IR) sites; however, the newly eligible sites are being coded as CR in AEDB-R to distinguish them from the original IR sites and IR Metrics.

CCDW-05's contamination is due to fueling operations. CCFTIR-01's contamination is due to the past and current operation of a landfill. CCFTIR-02 is undergoing an investigative order to investigate the waste water treatment plant. CCFTIR-044's contamination is due to buried items.

Cleanup Exit Strategy

CCDW05, The RI should demonstrate no risk at the site and allow an NFA determination. For CCFTIR-01 the RFI will be completed, and landfill closure requirements are expected to include installation and maintenance of an engineered cap. When the investigative order for CCFTIR-02 is closed, the work under the IRP will end for this site. For CCFTIR-44 the current RI will be completed along with any necessary remedial actions.

CR Previous Studies

| | Title | Author | Date |
|-------------|---|--------------------|-------------|
| 2009 | Final Closure Plan Addendum 2, Fort Irwin Compliance Clean-up Sites 646, 680, 681, 703, 830, 840, 873 and 879, National Training Center Fort Irwin, San Bernardino County, California | Tetra Tech EM Inc. | JUN-2009 |
| | Building 630 Closure Report, Fort Irwin Compliance Clean-Up Sites, National Training Center, Fort Irwin, California | Tetra Tech EM Inc. | AUG-2009 |
| 2011 | Final Closure Report, Fort Irwin Compliance Clean-Up Sites, HWMU Building Sites: 367, 612, 614, 626, 639, National Training Center Fort Irwin, San Bernardino County, California | Tetra Tech EM Inc. | MAR-2011 |
| 2012 | Draft Work Plan: Multi-Site RCRA Facility Investigation, Site Investigation, and Closure, Fort Irwin National Training Center Fort Irwin, California | MWH Americas, Inc | MAY-2012 |

NATIONAL TRAINING CENTER AND FORT IRWIN
Compliance Restoration
Site Descriptions

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Metals, Polychlorinated Biphenyls (PCB)

Media of Concern: Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 200310..... | 200409 |
| SI..... | 200710..... | 201209 |
| RI/FS..... | 201210..... | 201711 |

RIP Date: N/A

RC Date: 201711

SITE DESCRIPTION

The Thunderdome FSS is located approximately 20 miles northeast of the cantonment area. The FSS is a semi-developed area with several permanent and semi permanent structures. The area is used for equipment and supply storage and staging in support of range training activities. The specific area of interest at this site is the easternmost portion of the yard, which may have been impacted by potential spills from aboveground storage tanks on a concrete pad or from fueling a generator (no longer present) in a decommissioned generator shed. An SI was conducted at the Thunderdome FSS in 2010. The focus of the SI was the concrete pad and generator shed and potential spills associated with the pad and fueling of the generator. No staining was evident on the concrete pad, and no hydrocarbon staining or odors were evident in soil surrounding the pad. Soil samples were taken at the most likely locations for diesel fuel spills: the side nearest the generator shed, and the likely dispensing point next to the concrete pad. Low concentrations of total petroleum hydrocarbons (TPH), including TPH as diesel (TPH-d), TPH as motor oil (TPH-mo), PCBs, and several metals above background levels were detected, but all detected constituents were below screening criteria for human health. However, cadmium, lead, zinc, and PCBs were detected above the ecological benchmarks in samples collected at 1.5 to 2.0 feet below ground surface (bgs). Human health screening values were based on CHHSLs and USEPA regional screening levels for industrial soil, and ecological benchmarks that were used as screening levels were from various sources. Based on these results, the Army agreed to further investigate PCBs, cadmium, lead, and zinc in surface soil samples. The agreed follow-on action provides for a RI with a risk assessment.

CLEANUP/EXIT STRATEGY

The RI should demonstrate no risk at the site and allow for an NFA determination.

Site ID: CCFTIR-01

Site Name: INACTIVE/ ACTIVE LANDFILL

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Metals, Munitions and explosives of concern (MEC), Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC), Volatiles (VOC)

Media of Concern: Groundwater, Soil

| Phases | Start | End |
|------------|-------------|--------|
| PA..... | 199109..... | 199209 |
| SI..... | 199109..... | 199209 |
| RI/FS..... | 199708..... | 202006 |

RIP Date: N/A

RC Date: 202006

SITE DESCRIPTION

This site is located east of the main cantonment area on the south side of Sanitary Fill Road and consists of a 36-acre northern inactive disposal area used from the late-1940s to the 1980s, an 18-acre active disposal area located in the southern part of the site and used from 1993 to the present, and a 7-acre POL-contaminated soil disposal pile located east of the inactive disposal area. The inactive disposal area is commonly referred to as the Inactive Landfill while the active disposal area is known as the Active Landfill. Historical records have not been located for the inactive disposal area, but geophysical surveys indicate UXO and other magnetic anomalies are a concern in the northern portion of CCFTIR-01. Available records document that no hazardous waste has been disposed of in the active disposal area. A new, lined disposal cell 8 acres in size was opened for disposal in 2001.

Both the Inactive and Active Landfills are under a single RCRA subtitle D permit and often referred to jointly as the permitted landfill. Although the site has been funded and managed under the CC program as site CCFTIR-01 since fiscal year (FY)09, current and future costs are now divided between programs: installation of a landfill cap in the inactive area will be funded through a Directorate of Public Works (DPW) account, and groundwater/soil gas monitoring, operation of the probable remedy (limited soil vapor extraction or SVE), and ILTM will be funded through the IRP. LTM will consist of semiannual to annual groundwater monitoring and quarterly to semiannual soil gas monitoring.

As a result of previously detected VOCs in groundwater, the inactive portion of the permitted landfill (CCFTIR-01) is undergoing evaluation monitoring and development of an engineering feasibility study/corrective action plan (EFS/CAP) pursuant to Title 27 of the California Code of Regulations. The requirements for evaluation monitoring and associated corrective action planning for CCFTIR-01 are conducted in accordance with legal and regulatory requirements. Both the DTSC and the Lahontan Regional Water Quality Control Board oversee the CCFTIR-01 EFS/CAP events and submittals.

Additional requirements for CCFTIR-01 are contained in the California Integrated Waste Management Board (CIWMB) Solid Waste Facilities Permit No. 36 AA 0068 and include the monitoring of the active landfill area with regard to load checking and documentation for vehicles off-loading materials in POL landfarm area. These events are being conducted under separate programs and the direct oversight of Fort Irwin. [Note: The CIWMB was abolished on Jan. 1, 2010 and all responsibilities were transferred to the California Department of Resources, Recycling and Recovery.]

Monitoring data collected from FTIR-02 and FTIR-04 (IRP sites) are combined with CCFTIR-01 monitoring data to generate one semiannual report and one combined semiannual/annual report each year. An RI is underway at the site.

CLEANUP/EXIT STRATEGY

Closure requirements are expected to include installation and maintenance of an engineered cap and inspections as part of the LTM.

Site ID: CCFTIR-02

Site Name: Waste Water Treatment Facility

STATUS

Regulatory Driver: CWA

Contaminants of Concern: Other (trihalomethanes (chlornation byproduct))

Media of Concern: Groundwater

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 201001..... | 201001 |
| RI/FS..... | 201301..... | 201806 |

RIP Date: N/A

RC Date: 201806

SITE DESCRIPTION

The Waste Water Treatment Facility (WWTF) is located on 5th Street on the eastern side of Irwin Basin. The facility is designed to collect and treat an average of 2.0 million gallons domestic sewage per day (mgd) with a peak flow of 4.0 mgd. The facility consists of the following unit processes: headworks, aeration basin (oxidation ditch), secondary clarifiers, chlorine contact tank, effluent ponds, sludge drying beds, the tertiary treatment plant, and the irrigation pump station. The treated effluent flows to a series of percolation ponds. The first pond in the series is a 4.9-acre outfall/percolation pond. From this percolation pond, water can be pumped to a 22-acre evaporation pond. Alternatively, the effluent flows through a conveyance pipe to a series of three storage ponds.

The WWTF operates under the regulatory purview of the Lohantan Regional Water Quality Control Board. The control board issued an investigative order (Number R6V-2010-0030) in 2010 based on noncompliance with Waste Discharge Identification [WDID] No. 6B360703001 (discharge to groundwater).

This facility along with landfills FTIR-01/CCFTIR-01 and CCFTIR-04 is located within the same general area of the Fort Irwin Basin. When the investigative order is closed, the work under the IRP will end for this site.

CLEANUP/EXIT STRATEGY

When the investigative order is closed, the work under the IRP will end for this site.

Site ID: CCFTIR-044
Site Name: Transportation Motor Pool

STATUS

Regulatory Driver: CERCLA

Contaminants of Concern: Munitions and explosives of concern (MEC), Petroleum, Oil and Lubricants (POL), Semi-volatiles (SVOC)

Media of Concern: Soil

| Phases | Start | End |
|---------------|--------------|------------|
| PA..... | 201108..... | 201112 |
| SI..... | 201201..... | 201210 |
| RI/FS..... | 201212..... | 201609 |
| IRA..... | 201403..... | 201609 |

RIP Date: N/A

RC Date: 201609

SITE DESCRIPTION

The Transportation Motor Pool Yard site is located within the parking lot at Building 866. The primary site is a burial area discovered during excavation activities on July 19, 2011. While grading the Transportation Motor Pool Yard the heavy equipment crew encountered a "buried debris field" containing 5-gallon POL containers, small arms ammunition, tracked vehicle parts, and other items. DPW Environmental Division was notified and responded by evacuating the building and mobilizing the hazardous waste services support contractor to begin excavation. As the excavation progressed, a 90mm anti-tank shell was encountered, at which time the excavation ceased. All recovered items were removed by explosives ordnance disposal (EOD) and disposed of appropriately. Buried items are believed to be from the Vietnam War era.

CLEANUP/EXIT STRATEGY

The RI will be completed, and performance of the necessary remedial actions will occur, if required.

Site Closeout (No Further Action) Summary

| Site ID | Site Name | NFA Date | Documentation |
|------------------------|-----------|----------|---------------|
| There are no NFA sites | | | |

Date of CR Inception: 199109

Past Phase Completion Milestones

1992

PA (CCFTIR-01 - INACTIVE/ ACTIVE LANDFILL)

SI (CCFTIR-01 - INACTIVE/ ACTIVE LANDFILL)

2004

PA (CCDW-05 - Thunderdome FSS DW-5)

2010

PA (CCFTIR-02 - Waste Water Treatment Facility)

2012

SI (CCDW-05 - Thunderdome FSS DW-5)

PA (CCFTIR-044 - Transportation Motor Pool)

2013

SI (CCFTIR-044 - Transportation Motor Pool)

Projected Phase Completion Milestones

See attached schedule

Projected Record of Decision (ROD)/Decision Document (DD) Approval Dates

To Be Determined

Final RA(C) Completion Date:

Schedule for Next Five-Year Review: 2015

Estimated Completion Date of CR at Installation (including LTM phase): 202006

NATIONAL TRAINING CENTER AND FORT IRWIN CR Schedule

= phase underway

| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
|------------|--------------------------------|-------|------|------|------|------|------|-------|
| CCDW-05 | Thunderdome FSS DW-5 | RI/FS | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| CCFTIR-01 | INACTIVE/ ACTIVE LANDFILL | RI/FS | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| CCFTIR-02 | Waste Water Treatment Facility | RI/FS | | | | | | |
| SITE ID | SITE NAME | PHASE | FY16 | FY17 | FY18 | FY19 | FY20 | FY21+ |
| CCFTIR-044 | Transportation Motor Pool | RI/FS | | | | | | |
| | | IRA | | | | | | |

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 201206

Restoration Advisory Board (RAB): No

Reason Not Established: The community has expressed no sufficient, sustained interest in a RAB.

Community Interest Solicited on: 201402

Efforts Taken to Determine Interest

Fort Irwin does not currently have a RAB or a TRC.

In December 1996, two articles on the IRP were published in local newspapers. One article was published in the post newspaper, The Tiefert Telegraph, and one was published in The Barstow Desert Dispatch. The articles encouraged anyone that was interested in forming a RAB or had questions regarding Fort Irwin's IRP to contact the installation. The installation did not receive any response from either article.

The installation has surveyed the surrounding community on several occasions (most recently in 2014).

Results

The installation has determined that there is currently no community interest in forming a RAB.

Follow-up Procedures

The installation plans to solicit for public interest again during FY16.

Additional Community Involvement Information

N/A

Administrative Record is located at

National Training Center Fort Irwin
Department of Public Works Admin Record/Repository
Building 4999
NTC-Fort Irwin, CA, 92310

760-380-5044

Information Repository is located at

Community Outreach Center
512 Barstow Rd
Barstow, CA 92311

760-256-5751

Current Technical Assistance for Public Participation (TAPP):N/A

TAPP Title: N/A

Potential TAPP: N/A

