

**FY2016**

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

# Table of Contents

Statement Of Purpose.....	1
Acronyms.....	2
Installation Information.....	4
5-Year / Periodic Review Summary.....	6
Land Use Control (LUC) Summary.....	7
Cleanup Program Summary.....	8
Installation Restoration Program.....	10
IRP Summary.....	11
IRP Contamination Assessment.....	13
IRP Previous Studies.....	15
Installation Restoration Program Site Descriptions.....	22
FTIR-02 ABANDONED SANITARY LANDFILL 2.....	23
FTIR-04 ABANDONED SANITARY LANDFILL 4.....	24
FTIR-06 TROOP LANDFILL DISPOSAL SITE.....	25
Installation Restoration Program Site Closeout (No Further Action) Sites Summary.....	26
IRP Schedule.....	28
Installation Restoration Program Milestones.....	28
IRP Schedule Chart.....	31
Military Munitions Response Program.....	32
MMRP Summary.....	33
MMRP Contamination Assessment.....	34
MMRP Previous Studies.....	35
Military Munitions Response Program Site Descriptions.....	36
FTIR-001-R-01 COMBAT ENGINEER'S RANGE OB/OD AREA.....	37
FTIR-002-R-01 BOMBING RANGE 1.....	38
FTIR-003-R-01 GALCIT AND ORDCIT PROJECTS AREA.....	39
FTIR-005-R-01 CLOSE COMBAT COURSE.....	41
FTIR-007-R-01 PISTOL RANGE.....	42
FTIR-008-R-01 HAND GRENADE RANGE.....	43
FTIR-012-R-01 CARBINE TRANSITION RANGE.....	44

# Table of Contents

FTIR-013-R-01 COMBAT RANGE 1.....	45
FTIR-016-R-01 Range D.....	46
<b>Military Munitions Response Program Site Closeout (No Further Action) Sites Summary.....</b>	<b>47</b>
<b>MMRP Schedule.....</b>	<b>48</b>
Military Munitions Response Program Milestones.....	48
MMRP Schedule Chart.....	49
<b>Compliance Restoration.....</b>	<b>50</b>
CR Summary.....	51
CR Contamination Assessment.....	52
CR Previous Studies.....	53
<b>Compliance Restoration Site Descriptions.....</b>	<b>54</b>
CCDW-05 Thunderdome FSS DW-5.....	55
CCFTIR-01 INACTIVE/ ACTIVE LANDFILL.....	56
CCFTIR-02 Waste Water Treatment Facility.....	57
CCFTIR-044 Transportation Motor Pool.....	58
<b>Compliance Restoration Site Closeout (No Further Action) Sites Summary.....</b>	<b>59</b>
<b>CR Schedule.....</b>	<b>60</b>
Compliance Restoration Milestones.....	60
CR Schedule Chart.....	61

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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

AEDB-CC	Army Environmental Database - Compliance-related Cleanup
AEDB-R	Army Environmental Database - Restoration
ASP	Ammo Supply Point
ASR	Archive Search Report
Caltech	California Institute of Technology
CAO	Cleanup and Abatement Order
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIWMB	California Integrated Waste Management Board
CPCMP	Closure/Post-Closure Maintenance Plan
CR	Compliance Restoration
CRWQCB	California Regional Water Quality Control Board
CTT	Closed, Transferred or Transferring
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DMM	Discarded Military Munitions
DPW	Directorate of Public Works
DTC	Desert Training Center
DTSC	Department of Toxic Substances Control, Region IV
EFS	Engineering Feasibility Study
FORSCOM	Forces Command
FRA	Final Removal Action
FSS	Field Storage Site
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
LF	Landfill
LTM	Long-Term Management
MAAR	Mojave Anti-Aircraft Range
MC	Munitions Constituents
MEC	Munitions and Explosives of Concern
mgd	million gallons domestic sewage per day
mm	millimeter
MMRP	Military Munitions Response Program
MR	Munitions Response
MRS	Munitions Response Site

## Acronyms

MRSPP	Munitions Response Site Prioritization Protocol
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
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
PCB	polychlorinated biphenyls
POL	Petroleum, Oil and Lubricants
RA(C)	Remedial Action (Construction)
RAB	Restoration Advisory Board
RC	Response Complete
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RDX	cyclotrimethylenetrinitramine
RFI	RCRA Facility Investigation
RI	Remedial Investigation
RIP	Remedy-in-Place
ROD	Record of Decision
RRSE	Relative Risk Site Evaluation
SI	Site Inspection
SVE	Soil Vapor Extraction
SVOC	Semi-volatile Organic Compounds
SWAT	Solid Waste Assessment Test
SWMU	Solid Waste Management Unit
TAPP	Technical Assistance for Public Participation
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
UXO	Unexploded Ordnance
VOC	Volatile Organic Hydrocarbons
WWTF	Wastewater Treatment Facility

# 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

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## 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
Complete	201310	201509	2015

## Last Completed 5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
DD for FTIR-06, Troop Landfill	FTIR-06
Land Use Control Plan & EE/CA	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
RA for FTIR-02, Abandoned LF 2	FTIR-02
RA for FTIR-04, Abandoned LF 4	FTIR-04

**Results** Complete

**Actions** Complete

**Plans** Complete

### Recommendations and Implementation Plans:

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## 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/Resource Conservation and Recovery Act (RCRA) facility assessments (RFI) 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

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## 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):** 204709

# 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 (SWMU). 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 (PA) 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 RCRA Part B permit application requirements. The assessment recommended that groundwater monitoring be conducted at FTIR-01 and FTIR-02 and that 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 long-term management (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

1979	Title	Author	Date
	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 Quarter 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 - Closure Report Fort Irwin Abandoned Landfill Sites FTIR-04 (W/2 CDS)	Montgomery Watson	JUL-2002
Final - 2002 Semiannual (Jul-Oct) Groundwater Monitoring Report Abandoned Landfills	Tetra Tech EMI	JUL-2002
Final - Remedial Investigation Work Plan 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 2003) Groundwater Monitoring Report Abandoned Landfills National 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 Quarter (Jul 2003) 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 2003) 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	Montgomery Watson	MAR-2005
	Final - Annual 2004 Groundwater Report Active Landfill	Tetra Tech EMI	MAR-2005
	Final - Remedial Investigation Report at Fort Irwin Installation Site 27 (FTIR-27)	Tetra Tech EMI	JUL-2005
	Final - Semiannual (Jan & Apr/05) Groundwater Monitoring Report Abandoned Landfills National Training Center	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 Management Plan	Tetra Tech EMI	DEC-2005
2006	Final - Semiannual (Jul & Oct/05) Groundwater Monitoring Report Abandoned Landfills	Tetra Tech EMI	JAN-2006
	Well Installation Summary Report FTIR-02	Tetra Tech EMI	MAR-2006
	Final - Annual 2005 Groundwater Monitoring Report Abandoned Landfills	Tetra Tech EMI	MAR-2006
	Final - Work Plan FTIR-11 Monitoring Well Installation	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
	FTIR-11 Monitoring Well Installation Summary Report	Tetra Tech EMI	SEP-2006

## IRP Previous Studies

2006	Title	Author	Date
	1st Five-year Review Report for FTIR-02 and FTIR-04	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 Groundwater & Soil Gas Monitoring Report, 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 Groundwater & Soil Gas Monitoring Report, Active and Abandoned Landfills	Tetra Tech EMI	JUL-2007
	Final Soil Investigation and GWM Report for FTIR-011	Tetra Tech EMI	AUG-2007
	Quarterly Monitoring Data for FTIR-01 - July 2007 Event	Tetra Tech EMI	SEP-2007
	E-files for Semiannual Performance Inspections for Sept 2006 and May 2007	Tetra Tech EMI	DEC-2007
2008	Quarterly Monitoring Data for Landfill Area - January 2008 Event	Tetra Tech EMI	MAR-2008
	Final 2007 Annual Groundwater and Soil Gas Monitoring Report , Active and Abandoned Landfills	Tetra Tech EMI	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	Tetra Tech EM Inc.	JUN-2009

## IRP Previous Studies

2009	Title	Author	Date
	County, California		
	Semi-Annual 2009 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, April Quarterly Monitoring Event, National Training Center, Fort Irwin, California - Final	Tetra Tech EMI	JUL-2009
	Final Groundwater Monitoring Report Bldg 830 (FTIR-11), National Training Center, Fort Irwin, California	Tetra Tech EMI	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 EMI	OCT-2009
	Groundwater and Soil Gas Well Inspection Results and Recommendations, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California	Tetra Tech EMI	OCT-2009
	Semiannual 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 Semiannual 2009 Groundwater and Soil Gas Monitoring Report Oct 2009 Quarterly Monitoring Event, National Training Center Fort Irwin, Ft. Irwin, California	USACE - Sacramento	JAN-2010
	Final Semiannual Groundwater and Soil Gas Monitoring Report, 1st and 2nd Quarters 2010, Active and Abandoned Landfill Areas, National Training Center Fort Irwin, Ft. Irwin, California	USACE - Sacramento	JUL-2010
	Quarterly 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 Cleanup Sites, National Training Center Fort Irwin, Fort Irwin, California	Tetra Tech EMI	FEB-2011
	Final 2nd Semiannual 2010 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California	USACE - Sacramento	MAY-2011
	Final Semiannual Groundwater and Soil Gas Monitoring Report, 1st and 2nd Quarter 2011, Active and Abandoned Landfill Areas, National Training Center, Fort 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 Semiannual and Annual Groundwater and Soil Gas Monitoring Report Including Five-Year Compliance Sampling, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California	USACE - Sacramento	APR-2012
	Final Wastewater Treatment Facility, Groundwater	MWH Americas, Inc	MAY-2012

## IRP Previous Studies

2012	Title	Author	Date
	Investigation Report, Fort Irwin, National Training Center		
	1st Semiannual Groundwater and Soil Gas Monitoring Report, 1st and 2nd Quarters 2012, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California	USACE - Sacramento	OCT-2012
2013			
	2nd Semiannual and Annual 2012, Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Fort Irwin, California	USACE - Sacramento	MAR-2013
2014			
	2nd Semiannual and Annual 2013 Groundwater and Soil Gas Monitoring Report, Active and Abandoned Landfill Areas, National Training Center, Fort 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-Pirnie JV, LLC	DEC-2014



**NATIONAL TRAINING CENTER AND FORT IRWIN**  
**Installation Restoration Program**  
**Site Descriptions**

Site ID: FTIR-02

## 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.....	204709

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 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 to 6 feet deep. The spoil piles are 2 to 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 & CRWQCB letters dated 04/29/04 and 06/25/02.
FTIR-08	AVAWATZ VALLEY DISPOSAL SITE	199906	DTSC & CRWQCB 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 & CRWQCB 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 CRWQCB 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 CRWQCB 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 CRWQCB 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 CRWQCB 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

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)

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))

### 1993

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

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)

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

RA(C) (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

## IRP Schedule

	RANGE HQ, FTIR-41 - COMBAT ENGINEERS RANGE OB/OD SITE)
<b>1996</b>	
RI/FS	(FTIR-29 - GASOLINE UST (BUILDING 384))
<b>1997</b>	
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))
<b>1998</b>	
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)
<b>1999</b>	
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)
<b>2001</b>	
RI/FS	(FTIR-28 - WASTE OIL UST (SOUTH LOOP, LANGFORD LK))
RFA	(Irwin_PBC - PBC site)
<b>2003</b>	
RI/FS	(FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ)
RFI/CMS	(Irwin_PBC - PBC site)
<b>2004</b>	
IRA	(FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE))
<b>2005</b>	
RA(C)	(FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ)
CMI(C)	(Irwin_PBC - PBC site)
RD	(FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ)
RI/FS	(FTIR-07 - LUCKY FUSE IMPACT DISPOSAL AREA, FTIR-27 - BUNKER FUEL UST (NORTHWEST OF A AVENUE))
<b>2006</b>	
LTM	(FTIR-38 - GOLDSTONE LAKE MORTAR/SMALL ARMS RANGE, FTIR-40 - MOJAVE ANTI-AIRCRAFT RANGE HQ)
<b>2007</b>	
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
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Final RA(C) Completion Date: 200509

Schedule for Next Five-Year Review: N/A

Estimated Completion Date of IRP at Installation (including LTM phase): 204709

## NATIONAL TRAINING CENTER AND FORT IRWIN IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-02	ABANDONED SANITARY LANDFILL 2	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-04	ABANDONED SANITARY LANDFILL 4	LTM						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
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):** 204709/204709

**Date of MMRP completion including Long Term Management (LTM):** 204709

# 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 MC.

The US Army's inventory of closed, transferred, or transferring (CTT) military ranges and sites identified 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 (40 CFR 300) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), 42 US Code 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 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 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 are planned. 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 will be conducted, as required. Land use controls (LUC) until land use changes require further remedial actions.

FTIR-007-R-01: Surface clearance and anomaly removal are planned. RD and soil removal (to include off-site transportation and waste disposal) will be conducted, 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 will be conducted, as required. LUCs until land use changes require further remedial actions.

FTIR-013-R-01: Surface clearance and anomaly removal will be conducted, as required. LUCs until land use changes require further remedial actions.

FTIR-016-R-01: Surface clearance and anomaly removal will be conducted, 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 Memorandum	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

**MRSPP 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.....	204703
IRA.....	201111.....	202007

**RIP Date:** N/A

**RC Date:** 204703

## SITE DESCRIPTION

The Engineer's Combat Range OB/OD Area is about 1,520 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 May 2009.

At one time, OB/OD areas within this range were identified as site FTIR-041 in the Environmental Restoration, Army (ER,A) 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

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200206.....	200305
SI.....	200606.....	200908
RI/FS.....	201503.....	204703
IRA.....	201503.....	202007

**RIP Date:** N/A  
**RC Date:** 204703

**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 90mm 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 NFA 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 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.....	204709
IRA.....	201111.....	201907

**RIP Date:** N/A

**RC Date:** 204709

**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 ER,A 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 lake bed 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

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200206.....	200305
SI.....	200606.....	200908
RI/FS.....	200910.....	204703
IRA.....	201111.....	202007
<b>RIP Date:</b>	N/A	
<b>RC Date:</b>	204709	

**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 onsite.

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

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200206.....	200305
SI.....	200606.....	200908
RI/FS.....	200910.....	204709
IRA.....	201111.....	202007

**RIP Date:** N/A

**RC Date:** 204709

**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

<b>Phases</b>	<b>Start</b>	<b>End</b>
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

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	200206.....	200305
SI.....	200606.....	200908
RI/FS.....	200910.....	204709
IRA.....	201111.....	202007

**RIP Date:** N/A

**RC Date:** 204709

**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 Munitions Response Site (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.....	204709
IRA.....	201111.....	202007

**RIP Date:** N/A

**RC Date:** 204709

**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.



**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.....	204709
IRA.....	201111.....	202007

**RIP Date:** N/A

**RC Date:** 204709

**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 90mm 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 interim site evaluation accomplished (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
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Final RA(C) Completion Date:

Schedule for Next Five-Year Review: N/A

Estimated Completion Date of MMRP at Installation (including LTM phase): 204709

## NATIONAL TRAINING CENTER AND FORT IRWIN MMRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-001-R-01	COMBAT ENGINEER'S RANGE OB/OD AREA	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-002-R-01	BOMBING RANGE 1	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-003-R-01	GALCIT AND ORDCIT PROJECTS AREA	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-005-R-01	CLOSE COMBAT COURSE	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-007-R-01	PISTOL RANGE	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-008-R-01	HAND GRENADE RANGE	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-012-R-01	CARBINE TRANSITION RANGE	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
FTIR-013-R-01	COMBAT RANGE 1	RI/FS						
		IRA						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
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
CCFTIR-044	Transportation Motor Pool	IRA	UXO CLEARANCE	2016

### 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 MMRP have been migrated from Army Environmental Database - Compliance-related Cleanup (AEDB-CC) and given the naming convention of other Munitions Response (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

At site 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

	<b>Title</b>	<b>Author</b>	<b>Date</b>
<b>2009</b>	Final Closure Plan Addendum 2, Fort Irwin Compliance Cleanup 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 Cleanup Sites, National Training Center, Fort Irwin, California	Tetra Tech EM Inc.	AUG-2009
<b>2011</b>	Final Closure Report, Fort Irwin Compliance Cleanup Sites, HWMU Building Sites: 367, 612, 614, 626, 639, National Training Center Fort Irwin, San Bernardino County, California	Tetra Tech EM Inc.	MAR-2011
<b>2012</b>	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 Field Storage Site (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, 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 as motor oil, 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. Human health screening values were based on California human health screening levels 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 an 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 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 are 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 (SVE)], and LTM 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 (EFS)/corrective action plan (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 offloading materials in POL land farm 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.]

The RI/FS phase is currently underway. Future phases will be added in once more information is available. The CTC at this time includes costs required for a SVE pilot study and monitoring.

**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

<b>Phases</b>	<b>Start</b>	<b>End</b>
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 Fifth 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 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.

**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

<b>Phases</b>	<b>Start</b>	<b>End</b>
PA.....	201108.....	201112
SI.....	201201.....	201210
RI/FS.....	201212.....	201709
IRA.....	201403.....	201609

**RIP Date:** N/A

**RC Date:** 201709

**SITE DESCRIPTION**

The Transportation Motor Pool 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 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 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			

## CR Schedule

**Date of CR Inception:** 199109

### **Past Phase Completion Milestones**

#### **1992**

SI (CCFTIR-01 - INACTIVE/ ACTIVE LANDFILL)

PA (CCFTIR-01 - INACTIVE/ ACTIVE LANDFILL)

#### **2004**

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

#### **2010**

PA (CCFTIR-02 - Waste Water Treatment Facility)

#### **2012**

PA (CCFTIR-044 - Transportation Motor Pool)

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

#### **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:** N/A

**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	FY17	FY18	FY19	FY20	FY21	FY22+
CCDW-05	Thunderdome FSS DW-5	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFTIR-01	INACTIVE/ ACTIVE LANDFILL	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFTIR-02	Waste Water Treatment Facility	RI/FS						
SITE ID	SITE NAME	PHASE	FY17	FY18	FY19	FY20	FY21	FY22+
CCFTIR-044	Transportation Motor Pool	RI/FS						



## 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

