

FY2012

WELDON SPRING TRAINING AREA
Army Defense Environmental Restoration Program
Installation Action Plan

Printed 24 January 2013

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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 (AOC), and proposes a comprehensive, installation-wide approach, along with the costs and schedules associated with conducting investigations and taking the necessary remedial action (RA).

In an effort to coordinate planning information between the restoration manager, the US Army Environmental Command (USAEC), the Weldon Spring Training Area (WSTA), Installation Management Command-Army Reserve Office (IMCOM-ARO), the regulatory agencies, the executing 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-R	Army Environmental Database-Restoration
AOC	Area of Concern
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
DD	Decision Document
FRA	Final Remedial Action
FY	Fiscal Year
HRS	Hazard Ranking System
IMCOM-ARO	Installation Management Command-Army Reserve Office
IRA	Interim Remedial Action
K	thousand
LTM	Long-Term Management
LUC	Land Use Control
N/A	Not Applicable
NFA	No Further Action
NPL	National Priorities List
OU	Operable Unit
PA	Preliminary Assessment
PBA	Performance-Based Acquisition
POL	Petroleum, Oil, and Lubricants
RA(C)	Remedial Action (Construction)
RA(O)	Remedial Action (Operation)
RAB	Restoration Advisory Board
RC	Response Complete
RD	Remedial Design
RIP	Remedy-in-Place
RRSE	Relative Risk Site Evaluation
RSC	Regional Support Command
SI	Site Inspection
TAPP	Technical Assistance for Public Participation
TBD	To Be Determined
TNT	Trinitrotoluene
TRC	Technical Review Committee
UST	Underground Storage Tank
WSOW	Weldon Spring Ordnance Works
WSTA	AEDB-R designation for Weldon Spring Training Area

Installation Information

Installation Locale

Installation Size (Acreage): 1655

City: Weldon Spring

County: Saint Charles

State: Missouri

Other Locale Information

The WSTA is located approximately 30 miles west of St. Louis. It is north of State Highway 94 and south of Highway D.

Installation Mission

The WSTA serves as a training area for the Army Reserve, the National Guard, and local law enforcement.

Lead Organization

Lead Executing Agencies for Installation

88th Regional Support Command (RSC)

Regulator Participation

Federal	US Environmental Protection Agency (USEPA), Region 7
State	Missouri Department of Natural Resources (MDNR)

National Priorities List (NPL) Status

A score of 58.6 was recorded on 01-FEB-90.

Date for RA(C) Completion: 200509

Date for NPL Deletion: TBD

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

RAB established 199701

Installation Program Summaries

IRP

Primary Contaminants of Concern: Explosives, Petroleum, Oil and Lubricants (POL)

Affected Media of Concern: Groundwater, Soil

5-Year / Periodic Review Summary

5-Year / Periodic Review Summary

Status	Start Date	End Date	End FY
Planned	201409	201409	2014

5-Year / Periodic Review Details

Associated ROD/DD Name	Sites
OU2 ROD	WSTA-001

Land Use Control (LUC) Summary

LUC Title: OU2 LUC

Site(s): WSTA-001

ROD/DD Title: OU2 ROD

Location of LUC

The LUC area encompasses the affected portions of WSTA, the August A. Busch Wildlife Area to the north and northeast of WSTA, and the Weldon Spring Conservation Area to the south and southeast of WSTA.

Land Use Restriction: Media specific restriction - Prohibit groundwater extraction that interferes with Remedial Action system,
Media specific restriction - prohibit use of groundwater for consumption or domestic purposes

Types of Engineering Controls: None

Types of Institutional Controls: Education programs, Notations in Master Plan, Restrictions on Groundwater Withdrawal,
Restrictions on land use

Date in Place: 200409

Modification Date: N/A

Date Terminated: N/A

Inspecting Organization: Other Army Entity

Record of LUC: Master Plan or Equivalent

Documentation Date: 200409

LUC Enforcement: 5 Year Reviews

Contaminants: NITROAROMATICS

Additional Information

N/A

Cleanup Program Summary

Installation Historic Activity

From 1941 to 1945 WSTA produced trinitrotoluene (TNT) and dinitrotoluene (DNT) to support war efforts. On Feb. 21, 1990 the facility was listed on the NPL and is being addressed under a three-party interagency agreement dated Aug. 8, 1991. Operable Unit (OU) 1 addressed contaminated soils and pipelines associated with the former ordnance works. Approximately 120,000 tons of contaminated material was addressed under OU1 and remediation activities were completed in July 2004. Remedial activities conducted for OU1 were conducted outside of the Installation Restoration Program (IRP).

The record of decision (ROD) for OU2, signed in September 2004, addresses groundwater issues. Monitored natural attenuation (MNA) was the selected remedy and is predicted to take up to 160 years in the areas of higher contaminant concentration. In 2005 a preliminary closeout report was signed by the USEPA.

In fall 2006, maintenance work conducted east of Building S-28 detected suspected contamination in the area. In the past, Building S-28 was a locomotive repair house and fueling point for diesel locomotives and vehicles. There were six underground storage tanks (USTs). Sampling conducted in 2007 confirmed the presence of residual contamination.

In September 2009, the building was demolished and additional contamination was found.

Installation Program Cleanup Progress

IRP

Prior Year Progress: Remedial action (operation) [RA(O)] of WSTA-001 continued in 2011 and a five-year review was completed in 2009. In FY10 additional delineation of the site was performed at WSTA-002 and it was determined RA was not required. Final Removal Site Evaluation report for WSTA-002 was approved by MDNR in FY12.

Future Plan of Action: RA(O) of WSTA-001 continues. Site Closure Documentation Report and Land Use Control Implementation Report for WSTA-002 to be completed. LTM to begin.

WELDON SPRING TRAINING AREA
Army Defense Environmental Restoration Program
Installation Restoration Program

IRP Summary

Installation Total Army Environmental Database-Restoration (AEDB-R) Sites/Closeout Sites Count: 2/0

Installation Site Types with Future and/or Underway Phases

- 1 Contaminated Ground Water
(WSTA-001)
- 1 Maintenance Yard
(WSTA-002)

Most Widespread Contaminants of Concern

Explosives, Petroleum, Oil and Lubricants (POL)

Media of Concern

Groundwater, Soil

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

Site ID	Site Name	Action	Remedy	FY
WSTA-001	Former TNT/DNT Production Area	FRA	NATURAL ATTENUATION	2005

Duration of IRP

Date of IRP Inception: 198801

Estimated Date for Remedy-In-Place (RIP)/Response Complete (RC): 201209/204109

Date of IRP completion including Long Term Management (LTM): 204209

IRP Contamination Assessment

Contamination Assessment Overview

The OU1 ROD was signed in 1996 and an explanation of significant difference (ESD) was signed in 2004. The latter addressed the remediation of contaminated soil and an underground pipeline. Soils were contaminated with TNT and DNT from the production of explosives during World War II.

The OU2 ROD, signed in 2004, addresses groundwater contaminated with TNT and DNT from the production of explosives during World War II.

In fall 2006 maintenance work conducted east of Building S-28 detected suspected contamination in the area. Sampling conducted in 2007 confirmed the presence of residual contamination. Additional delineation of the site was performed in FY09. Additional delineation of the extent of contamination was conducted during the fiscal year (FY)11 Site Evaluation, which included the installation of two permanent groundwater wells and sampling of the two new wells (MW-1, MW-2) and one existing well at the Site (MW-4035), along with soil sampling and analytical testing. A Site Risk Assessment was also completed in-house by US Army Corp of Engineers (USACE) in FY11 based on information from the Site Evaluation, and it was determined that a soils removal action was not necessary according to Missouri Risk-Based Corrective Action (MRBCA) objectives for industrial/commercial land-use. USACE completed an in-house Site Closure Documentation Report and Land Use Control Implementation Plan for the Site in FY12.

Cleanup Exit Strategy

The OU2 ROD (groundwater) for WSTA requires MNA until remedial goals have been met (estimated to occur by 2165). The current performance-based acquisition (PBA) will assess the progress of MNA and optimize the monitoring performed under RA(O) at WSTA-001.

Since some chemical compound concentrations in the soil exceed MRBCA residential-use criteria, LUCs and five-year reviews will be required at WSTA-002. Five-year reviews will be performed in conjunction with those for WSTA-001.

IRP Previous Studies

Year	Title	Author	Date
1987	Final Report: Field Investigation of Hazardous Wastes at Weldon Spring Training Area	Campbell Design Group	APR-1987
1991	Proceedings of the Geosciences Workshop for Operable Unit 1	MK-Ferguson Company	FEB-1991
	Shallow Groundwater Investigations at Weldon Spring Training Area, St. Charles County, Missouri	Missouri Department of Natural Resources Division of Geology and Land Survey	OCT-1991
	Quarterly Groundwater Monitoring for Operable Unit 2, First Report (Revised)	IT Corporation	NOV-1991
1993	Quarterly Groundwater Monitoring for Operable Unit 2, Fourth Report	IT Corporation	JAN-1993
	Geochemical Data for the Weldon Spring Training Area (Operable Unit 1) and Vicinity Property, St. Charles County, Missouri -- 1990-1992	U.S. Geological Survey	JAN-1993
1997	Baseline Risk Assessment for the Groundwater Operable Units at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring, Missouri	Argonne National Laboratory for US Department of Energy, et. al.	JUL-1997
	Remedial Investigation for the Groundwater Operable Units at the Chemical Plant Area and the Ordnance Works Area, Weldon Spring Site, Weldon Spring, Missouri	MK-Ferguson Company and Jacobs Engineering Group, Inc., and Argonne National Laboratory for US Department of Energy, et. al.	JUL-1997
1998	Feasibility Study for Remedial Action for the Groundwater Operable Units at the Chemical Pant Area and the Ordnance Works Area, Weldon Spring, Missouri	Argonne National Laboratory for US Department of Energy, et. al.	DEC-1998
1999	Update of the Initial Installation Assessment of Weldon Spring Training Area Operable Unit 1 (Revised draft)	IT Corporation	JAN-1999
	Supplemental Feasibility Study for Remedial Action for the Groundwater Operable Unit (OU2) at the Chemical Plant Area of the Weldon Spring Site	Argonne National Laboratory	JUN-1999
2001	Weldon Spring Site Environmental Report for Operable Unit 1 for Calendar Year 2000 (Rev. 0)	MK-Ferguson Company	JUL-2001
	DSMOA/CA Program for Operable Unit 2: Quarterly Report from the State of Missouri	Missouri Department of Natural Resources	OCT-2001
	Environmental Monitoring Plan for Operable Unit 2 (Rev. 9)	MK-Ferguson Company	DEC-2001
2002	Quality Control Plan: Performance of Groundwater Sampling Events for Operable Unit 2, Preparation of Quarterly Groundwater Monitoring Reports and Quality Control Summary Reports	US Army Corps of Engineers, Kansas City District	JAN-2002
	Work Plan for Groundwater Monitoring at the Former	US Army Corps of	JAN-2002

IRP Previous Studies

Year	Title	Author	Date
2002	Weldon Spring Ordnance Works, Operable Unit 2 (draft)	Engineers, Kansas City District	
	Federal Facility Agreement for Operable Unit 1: Quarterly Report, First Quarter, Fiscal Year 2002	MK-Ferguson Company	JAN-2002
2003	Supporting Evaluation for the Proposed Plan for Final Remedial Action for the Groundwater Operable Unit (OU2) at the Chemical Plant Area of the Weldon Spring Site	Unknown	AUG-2003
2004	Record of Decision for the Final Remedial Action for the Groundwater Operable Unit at the Chemical Plant Area of the Weldon Spring Site	US Dept. of Energy, Office of Legacy Management	JAN-2004
	Groundwater Monitoring Assessment Report, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri	US Army Corps of Engineers, Kansas City District	MAY-2004
	Supplemental Feasibility Study for Remedial Action for the Groundwater Operable Unit, Operable Unit 2, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri	US Army Corps of Engineers, Kansas City District	JUN-2004
	Proposed Plan for Remedial Action for the Groundwater Operable Unit, Operable Unit 2, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri	US Army Corps of Engineers, Kansas City District	JUN-2004
	Final Quality Control Summary Report for Operable Unit 1 (Rev. 2)	Pangea, Inc.	SEP-2004
	Final Remedial Action Report for Operable Unit 1 (Rev. 4)	Pangea, Inc.	SEP-2004
	Final Record of Decision for the Final Remedial Action for Operable Unit 2 Groundwater at the Former Weldon Spring Ordnance Works Site, Weldon Spring, Missouri	US Army Corps of Engineers, Kansas City District	SEP-2004
2005	Preliminary Close-Out Report, Weldon Spring Ordnance Plant, St. Charles County, Missouri	US Environmental Protection Agency, Region 7	AUG-2005
2009	Performance Monitoring Report 002 - Round RA-05 (August 2008), Operable Unit 2 - Groundwater, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri	ECC/Burns and McDonnell	APR-2009
	Final Remedial Design/Remedial Action Work Plan for the Final Remedial Action for the Groundwater Operable Unit, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri, Operable Unit 2: Groundwater	US Army Corps of Engineers, Kansas City District	JUN-2009
	Performance Monitoring Report 003 - Round RA-06 (April 2009), Operable Unit 2 - Groundwater, Former Weldon Spring Ordnance Works, Weldon Spring, Missouri	ECC/Burns and McDonnell	SEP-2009
	Five-Year Review Report, 2nd Five-Year Review for the Former Weldon Spring Ordnance Works for Operable Unit 1 - Soil and Pipeline and Operable Unit 2 - Groundwater	ECC/Burns and McDonnell	SEP-2009
2010			

IRP Previous Studies

	Title	Author	Date
2010	Supplemental Community Relations Plan	USACE, Kansas City District	JUL-2010
2011	Building S-28 Screening Risk Assessment	USACE, Kansas City District	MAY-2011
	Removal Site Evaluation Report - Bldg. S-28 Site, Weldon Spring Training Area	Tetra Tech EC, Inc.	NOV-2011

WELDON SPRING TRAINING AREA

Installation Restoration Program

Site Descriptions

Site ID: WSTA-001

Site Name: Former TNT/DNT Production Area

STATUS

Regulatory Driver: CERCLA

RRSE: MEDIUM

Contaminants of Concern: Explosives

Media of Concern: Groundwater

Phases	Start	End
PA.....	198801.....	198802
SI.....	198803.....	198804
RI/FS.....	199001.....	200410
RD.....	200410.....	200506
RA(C).....	200505.....	200509
RA(O).....	200509.....	204109

RIP Date: 200509

RC Date: 204109

SITE DESCRIPTION

Weldon Spring Ordnance Works (WSOW) is a 17,000 acre former TNT/DNT manufacturing plant which was operational from 1941 through 1945. After declaring most of the site excess to its mission, the US Army retained the contaminated production area of approximately 1,655 acres, which now makes up the WSTA. Fort Leonard Wood had been historically responsible for WSTA, but the property was transferred to the 89th Regional Readiness Command (RRC) in 2004. The area is used primarily as a training site for Army Reserve and Missouri National Guard units.

In February 1990 WSTA was part of the Weldon Spring Former Army Ordnance Works placed on the USEPA NPL of uncontrolled hazardous waste sites. The Army owns the WSTA and the US Department of Energy (DOE), Missouri Department of Conservation, Francis Howell School District and others now own other portions of the former WSOW site.

The remediation of WSOW, including WSTA, is governed by the Federal Facilities Agreement (Docket Number VII-90-F-0033) between the USEPA Region 7, the MDNR, and the US Department of the Army (Fort Leonard Wood).

The location of WSOW chemical contaminants was refined and a ROD for OU1 was signed in 1996; an ESD was signed in 2004. OU1 addressed contaminated soils. Pipelines associated with the former WSOW and groundwater were to be addressed as OU2 on a separate schedule. The areas identified as requiring remediation have been fully remediated according to the remediation goals identified in the OU1 ROD. The remediation of OU1 was conducted outside of the IRP.

OU2 was initiated as a joint effort with the DOE and a remedial investigation (RI) was completed as part of the joint effort. Subsequently, a supplemental feasibility study (FS) and proposed plan were developed by the USACE for OU2. In September 2004 the ROD for OU2 was signed. The selected remedy was MNA, with the collection of groundwater data to assess the effectiveness of the process. Five-year reviews are scheduled and address both OU1 and OU2. The next five-year review is scheduled for 2014.

The USACE Kansas City District managed the remediation for the US Army under the Formerly Used Defense Sites (FUDS) program, but in FY05 the funding source changed from FUDS to IRP and now the remediation of OU2 is being performed under the IRP.

CLEANUP/EXIT STRATEGY

MNA and five-year reviews will be continued. MNA is estimated to be complete in 2165. While areas with high contaminant concentrations are expected to require 160 years of MNA, some groundwater areas currently impacted are expected to meet remediation goals within 30 years and groundwater monitoring may be adjusted assuming MNA sampling shows a decreasing contaminant trend.

Site ID: WSTA-001

Site Name: Former TNT/DNT Production Area

The response complete (RC) date and RA(O) phase end date are listed as September 2040 in the phase schedule due to guidance limitations. The correct anticipated RC date and RA(O) phase end date is September 2165. Action items from the PBA are tracked as professional labor management in Army Environmental Database-Restoration (AEDB-R).

Site ID: WSTA-002
Site Name: Building S-28

STATUS

Regulatory Driver: OTHER

RRSE: LOW

Contaminants of Concern: Petroleum, Oil and Lubricants (POL)

Media of Concern: Soil

Phases	Start	End
PA.....	200611.....	200711
SI.....	200611.....	200711
RI/FS.....	201006.....	201209
LTM.....	201210.....	204209

RIP Date: N/A

RC Date: 201209

SITE DESCRIPTION

Building S-28 was a locomotive repair house and fueling point for diesel locomotives and vehicles. Six USTs were located in a tank basin to the east of the building. Although the tanks were removed in the 1980s, no closure documentation exists. In fall 2006 maintenance work conducted in the area detected suspected contamination. Sampling conducted in 2007 confirmed the presence of residual contamination, but not the extent.

In September 2009, Building S-28 was demolished. Contaminated soils were encountered below the former Locomotive Maintenance Facility. In addition, the gasoline product lines associated with the former fuel USTs east of the building were removed. The contaminated soils below Building S-28 have been included with the contaminated soils associated with the fuel lines as site WSTA-002. WSTA-001 is an NPL site and has a Hazard Ranking System (HRS) score of 30.3; however, WSTA-002 is not part of the NPL site.

In FY10 additional delineation of the site was performed and a contract was let for cleanup of contaminated soils.

In FY11, funds were obligated for project support, a screening risk assessment for the site investigation (SI), and for Land Use Control Implementation (LUCIP) and Site Summary Report (to be done by USACE Kansas City District (KCD)). It was determined that impacted soils could be left-in-place as long as the site is not used for residential purposes. The Screening Risk Assessment was approved by the MDNR in June 2011, and the Final Removal Site Evaluation Report was approved by the MDNR in December 2011. The Final Site Closure Documentation Report and Final LUCIP will be completed in 2012. Five-year reviews for this site will be done in conjunction with WSTA-001. This site work is being performed in accordance with MDNR under MRBCA program.

CLEANUP/EXIT STRATEGY

Since some chemical compound concentrations in the soil exceed MRBCA residential-use criteria, LUCs and five-year reviews will be required at WSTA-002. Five-year reviews will be performed in conjunction with those for WSTA-001.

Site Closeout (No Further Action) Summary

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

IRP Schedule

Date of IRP Inception: 198801

Past Phase Completion Milestones

1988

SI (WSTA-001 - Former TNT/DNT Production Area)
PA (WSTA-001 - Former TNT/DNT Production Area)

2005

RA(C) (WSTA-001 - Former TNT/DNT Production Area)
RI/FS (WSTA-001 - Former TNT/DNT Production Area)
RD (WSTA-001 - Former TNT/DNT Production Area)

2008

SI (WSTA-002 - Building S-28)
PA (WSTA-002 - Building S-28)

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
WSTA-002	Building S-28	Site Closure Documentation Report	20120930

Final RA(C) Completion Date: 200509

Schedule for Next Five-Year Review: 2014

Estimated Completion Date of IRP at Installation (including LTM phase): 204209

WELDON SPRING TRAINING AREA IRP Schedule

= phase underway

SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
WSTA-001	Former TNT/DNT Production Area	RA(O)						
SITE ID	SITE NAME	PHASE	FY13	FY14	FY15	FY16	FY17	FY18+
WSTA-002	Building S-28	LTM						

Community Involvement

Technical Review Committee (TRC): None

Community Involvement Plan (Date Published): 199209

Restoration Advisory Board (RAB): RAB established 199701

RAB Adjournment Date: N/A

RAB Adjournment Reason: None

Additional Community Involvement Information

At the request of the RAB members, the WSTA RAB is in the process of being formally adjourned. A RAB meeting was held on March 17, 2008 for the purpose of coming to an agreement on the rationale for adjournment. No issues were raised and the RAB agreed to adjourn.

The rationale for adjournment is being documented in a memorandum in accordance with the requirements of section 202.10 of the RAB Rule, "RAB Adjournment and Dissolution," and will be submitted to USAEC.

After the RAB is formally adjourned an announcement will be placed in the local newspaper.

A public meeting was held in Weldon Spring, MO on Aug. 18, 2010 to discuss the five-year review and current environmental activities at the WSTA. No members of the public attended the meeting. An announcement and invitation for the meeting was published in local newspapers 30 days prior to the meeting.

A Supplemental Community Relations Plan was completed by the USACE KCD in July 2010.

Administrative Record is located at

Middendorf-Kredell Branch of St. Charles City - County Library Branch
2750 HWY K
O'Fallon, MO 63366

Information Repository is located at

Middendorf-Kredell Branch of St. Charles City - County Library Branch
2750 HWY K
O'Fallon, MO 63366

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

TAPP Title: N/A

Potential TAPP: N/A

