



CAFBO
DEPARTMENT OF THE AIR FORCE
27TH CIVIL ENGINEER SQUADRON (ACC)
CANNON AIR FORCE BASE NEW MEXICO

22 Mar 06

Lt Col Alexander P. Karibian
Commander, 27th Civil Engineer Squadron
506 N DL Ingram Blvd
Cannon AFB NM 88103-5003

Mr. James Bearzi
Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Dr E Building 1
PO Box 26110
Santa Fe NM 87505



Dear Mr. Bearzi

The purpose of this letter is two-fold. First, it provides copies of the Final Work Plan for Site SD-11 Corrective Measures Implementation for your review and records. This plan (Attachment 1) is in response to Comment No. 7 of your 19 Jul 05 letter, which transmitted your bureau's review comments on the Site SD-11 Corrective Measures Study, dated Jul 99. Second, this letter provides copies of our responses to each of your bureau's comments, including Comment No. 7 (Attachment 2). These attachments will satisfy the requirements necessary to meet your 30 Apr 06 suspense.

Please contact Mr. Peter P. Zamie, Environmental Flight, at (505) 784-1092, if you need additional assistance.

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

Sincerely

ALEXANDER P. KARIBIAN, Lt Col, USAF

Attachments:

1. Final Work Plan for the Site SD-11 Corrective Measures Implementation
2. Responses to Comment Numbers 1 thru 7

cc:

NMED (D. Cobrain) w/o Atchs
EPA Region 6 (B. Sturdivant) w/1 copy

FINAL

LIBRARY COPY

**SITE SD-11
CORRECTIVE MEASURES IMPLEMENTATION
WORK PLAN
CANNON AIR FORCE BASE, NEW MEXICO**

AFCEE Contract No. FA8903-04-D-8679

Task Order No. 0049

Project No. CZQZ20057001

Prepared For:

Department of the Air Force
311th HSW/PKV-B
3300 Sidney Brooks
Brooks City-Base, TX 78235-5112

24 February 2006

URS

URS GROUP, INC.
120120 Shamrock Plaza
Suite 300
Omaha, NE 68154

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- Appendix B Sampling and Analysis Plan (includes Field Sampling Plan and Quality Assurance Project Plan)

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List of Acronyms

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
bgs	below ground surface
CAD	computer aided design
CDRL	Contract Data Requirements List
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
CO	Contracting Officer
COR	Contracting Officer's Representative
CRQLs	Contract-Required Quantitation Limits
DQO	Data Quality Objective
ERP	Environmental Restoration Program
FSP	Field Sampling Plan
gpm	gallon per minute
HSP	Health and Safety Plan
IRP	Installation Restoration Program
MCLs	maximum contaminant levels
MDL	master document list
mg/kg	milligram/kilogram
NFA	No Further Action
NMED	New Mexico Environmental Department
PM	Project Manager
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance/quality control
QC	Quality Control
QPP	Quality Program Plan
RBCs	Risk-Based Concentration
RCRA	Resource Conservation Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SMWUs	Solid Waste Management Units
SOPs	Standard Operating Procedures
SSLs	Soil Screening Level
SVOC	semivolatile organic compound
TAL	Target Analyte List
TCL	Target Compound List
TO	Task Order

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TPH	Total Petroleum Hydrocarbon
TPH-DRO	TPH-diesel range organics
TPH-GRO	TPH-gasoline range organics
TRPH	total recoverable petroleum hydrocarbs
URS	URS Group, Inc.
USGS	U.S. Geological Survey
VOC	volatile organic compound

This Corrective Measures Implementation (CMI) Work Plan addresses the procedures for evaluating risks and, as necessary, for identifying and removing contaminated media from Site SD-11 [Solid Waste Management Units (SWMUs) 86 through 90], at Cannon Air Force Base (AFB), New Mexico. This CMI Work Plan has been prepared by URS Group Inc. (URS) for the Air Force Center for Environmental Excellence (AFCEE) under Task Order (TO) 0049, Contract FA8903-04-D-8679 (Reference project number CZQZ20057001).

1.1 OVERVIEW OF THE PLANNED CORRECTIVE MEASURES

The CMI will be accomplished through five tasks, as follows:

- Respond to the New Mexico Environmental Department (NMED) Comments and Prepare this CMI Work Plan
- Reevaluate Previous Analytical Results
- Complete CMI Field Investigation, as necessary
- Complete CMI Construction Activities, as necessary
- Prepare Site Closure Report or No Further Action Proposal

1.2 FORMAT OF THE CMI WORK PLAN

This CMI Work Plan has been prepared in accordance with the requirements for an Environmental Cleanup Plan [Contract Data Requirements List (CDRL) A004]. This CMI Work Plan summarizes and provides details on the planned CMI Field Investigation and the implementation of the corrective measures at Site SD-11. The Work Plan is organized as follows:

- Section 1 – Introduction
- Section 2 – Project Background and Objectives: Presents a site description, summarizes previous environmental investigation results, and describes the corrective measures objectives
- Section 3 – Project Roles: Summarizes the roles each organization will have in the CMI
- Section 4 – Data Quality Objectives: Specifies the quality of data and defines the level of certainty required to support corrective measure decisions
- Section 5 – CMI Field Investigation Scope of Work: Discusses the scope of the potential CMI investigation, including activities and procedures for site access and digging permit, data collection, sample handling and identification, surveying, and decontamination and investigation-derived waste
- Section 6 – CMI Construction Activities Scope of Work: Discusses the scope of the potential CMI construction activities, including activities and procedures for pre-construction submittals, site preparation activities, soil removal, site restoration, final acceptance, and construction management

- Section 7 – Project Documentation and Reporting: Summarizes project monitoring and reporting requirements
- Section 8 – Anticipated Project Schedule: Presents a preliminary schedule for the CMI
- Section 9 – References: Summarizes the documents referenced in this work plan

Space for the following appendices, which may be developed as part of future updates to this work plan, is also included in this CMI Work Plan:

- Appendix A – Health and Safety Plan (HSP) [CDRL A005]
- Appendix B – Sampling and Analysis Plan (SAP) [CDRL A006], which includes the following:
 - Field Sampling Plan (FSP)
 - Quality Assurance Project Plan (QAPP)

The Quality Program Plan (QPP) for this project will be comprised of this CMI Work Plan together with the HSP and the SAP.

1.3 WORK PLAN SUBMITTALS

This CMI Work Plan will be reviewed by AFCEE and Cannon AFB. Future updates to this work plan will also be submitted to NMED. All comments generated during the reviews will be resolved and incorporated into the next submittal. The work plan distribution list, organized by submittal, is shown below:

Work Plan Submittals	Number of Copies		
	AFCEE	Cannon AFB	NMED
Draft	4	2	0
Final	4	2	3

1.4 SUPPLEMENTAL PLANS

This CMI Work Plan is a stand-alone document for SD-11. Later updates of the work plan will be supplemented with several additional plans specific to the required personnel, equipment, and work methods once the current nature and extent of contamination has been defined in the CMI field investigation phase. Supplemental plans, which will be submitted prior to mobilization to complete any CMI construction activities that may necessary, include:

- Excavation Plan
- Transportation Plan
- Erosion Control Plan
- Demobilization and Closure Plan

2.1 SITE DESCRIPTION

Site SD-11 occupies approximately 1.1 acres located about 5,000 feet east and 2,000 feet south of the intersection of the two main runways at Cannon AFB (See Figure 2-1). The site consists of five SWMUs: a former engine test cell (SWMU 86), a former overflow pit (SWMU 87), a former leach field (SWMU 88), which was later converted to an evaporation pond (SWMU 89), and a former oil/water separator and associated 100-gallon collection tank (SWMU 90).

The former test cell was enclosed by a 50-foot by 10-foot building resting on a concrete slab. Both the test cell structure and a small, associated pumphouse building have been removed, leaving only a bare concrete slab. The oil/water separator system has also been removed. Asphalt, gravel, and weeds cover most of the area surrounding the former test cell. Topography is generally flat with an approximate elevation of 4,268 feet above mean sea level.

2.2 SITE GEOLOGY AND GROUNDWATER

2.2.1 Generalized Geology

In the vicinity of Cannon AFB, Late Miocene to Late Pliocene Ogallala Formation sediments overlie Early Triassic Dockum Group sedimentary rocks. The upper part of the Dockum Group consists mostly of red shale interbedded with minor sandstone. The top of the Dockum Group is marked by an erosional unconformity that has several hundred feet of relief.

The Ogallala Formation is 360 to 415 feet thick near Cannon AFB. It consists of poorly sorted (well graded) gravel, sand, silt, and clay. The base of the Ogallala Formation generally consists of gravel, cobbles, and boulders. In many places, the Ogallala sediments are loose and friable; however, caliche is a major feature of the Ogallala Formation. Caliche is a hard, white to pale tan accumulation of calcium carbonate cement in the pore spaces of the Ogallala sediments. There are numerous continuous and discontinuous caliche layers throughout the Ogallala Formation (Lee Wan 1990).

2.2.2 Groundwater

The lower part of the Ogallala Formation is saturated and forms a regional, unconfined aquifer that is used for domestic and irrigation water. The depth to groundwater is more than 200 feet near Cannon AFB, and the saturated thickness varies from 90 to 140 feet. The regional hydraulic gradient slopes to the southeast at about 13 feet/mile (0.0025 feet/foot). Well yields vary from less than one gallon per minute (gpm) in thinly bedded silts and fine sands to 1,600 gpm in sand and gravel.

Groundwater is the primary water source in eastern New Mexico. Water table declines of between 50 and 100 feet have been observed in the area near Clovis, New Mexico for the period from about 1930 to 1980 (Lee Wan 1990).

2.3 SITE HISTORY

Site SD-11 was active from 1965 to 1988. The site received potential contaminants from a single operation, the steam cleaning and testing of jet aircraft engines. Contaminants that may have been released at the site include lubricating and synthetic oils, residual JP-4 fuel, and solvents.

During the life span of the facility, effluent was handled in several ways. Initially it was discharged only to an overflow pit (SWMU 87). Then the oil/water separator system (SWMU 90), which discharged to a leach field (SWMU 88), was installed. Finally, the effluent was routed through the oil/water separator to an evaporation pond (SWMU 89). The evaporation pond was constructed in the area of the former leach field (SWMU 88).

2.4 SITE INVESTIGATIONS

Site SD-11 has been the subject of several site investigations, which are summarized below:

- A Phase I Installation Restoration Program (IRP) Records Search was completed to identify and evaluate suspected problems associated with past hazardous material disposal sites and spill sites at Cannon AFB (CH2M Hill 1983).
- A Phase II IRP investigation included drilling two boreholes to depths of 35 and 50 feet below ground surface (bgs) at the site. Five soil samples were analyzed for purgeable halocarbons and aromatics, oil and grease, and lead. Analytical results indicated no soil contamination at the site (Radian 1986).
- A Preliminary Review/Visual Site Inspection, Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA) was conducted at Cannon AFB. The RFA identified the SD-11 sites as possible SWMUs and recommended soil sampling to determine if contaminants had been released from the unit (A.T. Kearney 1987).
- A Remedial Investigation (RI) included five soil borings in the area of SD-11 that were sampled and analyzed for volatile organic compounds (VOCs), xylene, base/neutral organics, and total metals. Analytical results indicated very low levels of 2,2'-methylenebis(4-ethyl-6-tert-butylphenol) (known as antioxidant 425) in Boreholes B1 and B4. Silver was the only metal detected at levels exceeding background (Walk, Haydel and Associates 1990).
- An RI for 18 IRP/SWMU Sites at Cannon AFB further evaluated the nature and extent of potential hazardous contaminants at SD-11. Six soil borings were located near the Engine Test Pad and the old oil/water separator. All soil samples were analyzed for Target Compound List (TCL) VOCs and Target Analyte List (TAL) metals. No VOCs, except acetone and toluene, were detected above the Contract-Required Quantitation Limits (CRQLs) in surface and subsurface soil samples at the SWMUs. Metals detected at elevated levels were antimony, barium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, and zinc (W-C 1992).
- The oil/water separator system and surrounding petroleum-contaminated soils were excavated during a removal action in 1994. Reportedly, the oil/water separator was not sealed along the bottom or at the edges, and petroleum contamination was visible after

removing approximately 1 foot of soil. An area measuring approximately 60 feet long by 30 feet wide and up to 25 feet deep was excavated. Soil samples were taken from the excavated soil and analyzed for total petroleum hydrocarbons (TPH), VOCs, semivolatile organic compounds (SVOCs), and TAL metals. Approximately 186 tons of excavated soil was transported to an off-site facility for disposal. The remaining stockpiled soil was mixed with off-site soil to backfill the excavation (RSI 1994).

- Following the removal activity, a Phase III RCRA Facility Investigation (RFI) was completed at SD-11 to assess the vertical and horizontal extent of contamination and to complete a screening-level risk evaluation. Soil boring locations are shown on Figure 2-2. Soil samples were analyzed for VOCs, SVOCs, total recoverable petroleum hydrocarbons (TRPH), and TAL metals. Moderate to high concentrations of TRPH (i.e., greater than 1,000 mg/kg) and some VOCs and SVOCs were detected in soils below the zone of backfill. Bromoform, arsenic, barium, copper, and vanadium were detected in a groundwater sample. All of these chemicals were below their respective published maximum contaminant levels (MCLs), or Risk-Based Concentration (RBCs) for tap water (W-C 1997).
- Three soil borings were drilled and sampled to depths of 40 feet bgs at the evaporation pond as part of a Corrective Measures Study (CMS) investigation. Five soil samples were collected from each boring and analyzed for VOCs, SVOCs, TPH – diesel range organics (TPH-DRO), and TRPH. The CMS included human health and ecological risk assessments, a contaminant fate and transport evaluation, and an evaluation of corrective measures alternatives. The CMS' recommended alternative was No Further Action (URS 1999).
- The U.S. Geological Survey (USGS) completed one boring at the site in June 2000. Four samples were collected and analyzed for TPH – gasoline range organics (TPH-GRO) and VOCs. TPH-GRO was present in the deepest sample (collected from 25 feet bgs) at a concentration of 120 mg/kg, so a second boring was completed approximately 25 feet west of the first USGS boring location in February 2001. Five samples were collected and analyzed for TPH-GRO and VOCs; results for all parameters for all samples from this boring were either nondetect or below detection limits. Soil boring locations are shown on Figure 2-2 (USGS 2001).

NMED issued comments on the CMS in July 2005 (NMED 2005a). URS has prepared this CMI Work Plan in order to comply with NMED Comment #7, which requires a work plan to be developed. NMED later extended the deadline for this work plan until 30 April 2006.

2.5 CORRECTIVE MEASURES OBJECTIVES

The objectives of the corrective measures for Site SD-11 are to ensure that the site does not pose unacceptable risks to human health or the environment, and once this has been verified, to obtain No Further Action (NFA) approval for the site from NMED. To achieve these objectives, existing data will be re-assessed using current NMED screening procedures to determine if site contaminants pose unacceptable risks to human health or the environment. If any such risks are identified or if any data gaps exist, a CMI field investigation will be completed to further assess the site, and, if necessary, a second removal action will be completed to reduce the risk

associated with the site to acceptable levels. The corrective measures for Site SD-11 will be implemented in several phases:

- The first phase will involve reevaluating the analytical results from previous investigations of Site SD-11 by screening these results using the current generic NMED soil screening levels (SSLs), updating the existing human health and ecological risk evaluations, and developing site-specific screening criteria for Site SD-11 (as necessary) to identify any chemicals of concern. This existing data reevaluation will be used to determine if the site meets the requirements for NFA approval, or if additional investigation is warranted to address any data gaps, such as the need to further delineate the horizontal or vertical extents of contamination (as compared to the current screening levels). If data gaps are identified, a sampling scheme for a CMI field investigation, which would be completed as the next phase of the SD-11 CMI, will be devised.
- If necessary, the CMI field investigation will be completed during the second phase of the SD-11 CMI. In addition to collecting samples for chemical analyses, this phase will include an evaluation of the CMI field investigation analytical results by comparing them to current NMED SSLs (again, both generic and site-specific SSLs, as appropriate) to identify any additional chemicals of concern. The results of this data evaluation will be combined with the results of the existing data reevaluation to determine if the site meets the requirements for NFA approval, or if a second removal action is warranted (the first removal action was completed at Site SD-11 by RSI in 1994). If removal action is warranted, the results of this investigation will be used in combination with previous results to delineate the horizontal and vertical limits of contaminated media requiring removal, which would be completed as the next phase of the SD-11 CMI (if warranted).
- If necessary, corrective measures will be implemented as the third phase of the SD-11 CMI. The corrective measures will include excavating contaminated media to the limits delineated during phase three, and transporting the excavated materials off site for disposal in a licensed special waste landfill. Confirmatory samples will also be collected from the floors and walls of the excavation and analyzed for the chemicals of concern in order to verify that human health and ecological risks associated with the site have been reduced to acceptable levels.
- Finally, regardless of which preceding phases were required, a site closure report will be prepared to document all work completed for Site SD-11. The site closure report will be prepared to meet the requirements of both a final report [CDRL A001C] and a closure report [CDRL A001D], and will include the following:
 - An analytical data management report [CDRL A001B] (if samples are collected)
 - A hazardous material and/or hazardous waste disposal report [CDRL A001E] (if contaminated media requires disposal)
 - A hazardous materials survey report [CDRL A012] (again, if contaminated media requires disposal)
 - A master document list (MDL) [CDRL B008]
 - Digital photographs [CDRL B010] and computer aided design (CAD) drawings (if field work is required)

A decision tree for the various phases of the CMI at Site SD-11 is included as Figure 2-3.