D-3-16

ENTER

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT BLISS
1741 MARSHALL ROAD
FORT BLISS, TEXAS 79916

RECEIVED
AUG - 5 2016
NMED
Hazardous Waste Bureau

Directorate of Public Works

Mr. John E. Kieling
Chief, Hazardous Waste Bureau
New Mexico Environmental Department-HWB
2905 Rodeo Park Dr. East, Building 1
Santa Fe, NM 87505-6303

Dear Mr. Kieling:

On May 13, 2016, the New Mexico Environmental Department (NMED) issued an approval with modifications letter concerning the Corrective Action Work Plan FTBL-014 (SWMU-25) Oro Grande Landfill, Fort Bliss, New Mexico dated December 22, 2015.

As an enclosure to this letter, please find the replacement pages for the Corrective Action Work Plan addressing NMED's requested modifications. If you have any questions regarding these replacement pages, please contact Mr. Ron Baca of my staff at 915-568-7979 or ronald.h.baca.civ@mail.mil.

Sincerely,

Vicki G. Hamilton, R. A.
Chief, Environmental Division
Directorate of Public Works

Enclosure

Final

CORRECTIVE ACTION WORK PLAN

FTB-014 (SWMU-25) ORO GRANDE LANDFILL

FORT BLISS, NEW MEXICO

Contract Number W91ZLK-13-0003
Task Order Number 0003

Prepared for:

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL COMMAND
2450 Connell Road
Fort Sam Houston, TX 78234

and
DEPARTMENT OF THE ARMY
Headquarters, U.S. Army Garrison Command
1741 Marshall Road
Ft. Bliss, TX 79916

Prepared by:

12037 Starcrest Drive
San Antonio, TX 78247-4349

CAPE Project Number 21003.003

Revision Number: Rev 1

December 2015

EXECUTIVE SUMMARY

This Corrective Action (CA) Work Plan has been prepared to complete environmental remediation activities at the Oro Grande Landfill (FTBL-014/Solid Waste Management Unit [SWMU]-025). These activities will be performed in accordance with Resource Conservation and Recovery Act (RCRA) and New Mexico Environment Department (NMED) regulations.

The Oro Grande Range Camp is situated in Otero County, New Mexico within the Fort Bliss Military Reservation. The Oro Grande Landfill is located 0.8 miles south-southwest of the Oro Grande Range Camp at the southwest edge of Elephant Mountain in the Tularosa Basin of New Mexico. The landfill was constructed in 1964 to provide a waste disposal facility to service the Oro Grande Range Camp. The Oro Grande Landfill has not been used since 1994. The landfill was reportedly constructed using a single trench approximately 370 feet long by 20 to 65 feet wide at a depth of 9 to 12 feet below ground surface (bgs). The trench was excavated out of native soil, unlined, and capped with native soil.

Past investigations at the Oro Grande Landfill have found that the landfill is composed of buried waste material including wood, plastic, paper, scrap metal, and demolition debris. It defines the approach to excavation, backfill installation, collection of confirmation samples and waste characterization samples, soil transportation and disposal, and site restoration. The approach for this site involves excavation and disposal at a licensed off-site facility.

In keeping with the goal of protecting human health and the environment, the scope of work described herein will eliminate possible pathways to receptors in the future by removing any potential source of contaminants of concern from the site.

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LIST OF ABBREVIATIONS AND ACRONYMS

ACM	asbestos containing materials
APP	Accident Prevention Plan
bgs	below ground surface
BMP	best management practices
CA	Corrective Action
CAPE	Cape Environmental Management Inc
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CoC	chain of custody
COC	Contaminant of Concern
CQCM	Construction Quality Control Manager
CSP	Certified Safety Professional
CY	Cubic Yard
USEPA	U.S. Environmental Protection Agency
FTBL	Fort Bliss Site
H&S	Health and Safety
HSM	Health and Safety Manager
IAW	in accordance with
NMAC	New Mexico Administrative Code
NMED`	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
PG	Professional Geologist
PM	Project Manager
POP	Period of Performance
PWS	Performance Work Statement
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RAB	Restoration Advisory Board
RFI	RCRA Facility Investigation
SAP	Sampling and Analysis Plan
SSHO	Site Safety & Health Officer
SSHP	Site Safety and Health Plan

SSL	Soil Screening Level
SWMU	Solid Waste Management Unit
TO	Task Order
USAEC	United States Army Environmental Command
WP	Work Plan

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1.0 INTRODUCTION

This Corrective Action (CA) Work Plan (WP) describes the proposed CA activities for the Oro Grande Landfill, also designated as Solid Waste Management Unit (SWMU) 25 and Fort Bliss Site 14 (FTBL-14). The Cape Environmental Management Inc (CAPE) Team will perform all activities within the assigned Period of Performance (POP) and in accordance with the Performance Work Statement (PWS), dated 13 April 2015. This work will be performed for the United States Army Environmental Command (USAEC) under Contract Number W91ZLK-13-003, Task Order 0003.

The CA WP includes a Waste Management Plan, Project Schedule, a Sampling and Analysis Plan (SAP), an Accident Prevention Plan (APP), Site Safety and Health Plan (SSHP), a Stormwater Pollution Prevention Plan (SWPPP), and a Quality Control Plan.

1.1 Facility Description

Fort Bliss covers more than 1,000,000 acres in Texas and New Mexico, including three counties. Fort Bliss is the Army's second largest installation and is home to the 1st Armored Division, the 32nd Army Air and Missile Command, the 11th Air Defense Artillery Brigade, the 1st Armored Division Artillery Brigade, and the 402nd Field Artillery Brigade.

1.2 Environmental Setting

The Oro Grande Landfill is located in Otero County, New Mexico, within the Fort Bliss Military Reservation. The landfill is approximately 0.8 miles south-southwest of the Oro Grande Range Camp at the southwest edge of Elephant Mountain in the Tularosa Basin (See Figures 1, 2 and 3). On average, Fort Bliss receives 8 inches of rain and 6 inches of snow per year. The average number of days with measureable precipitation is 48 and the average number of sunny days is 294. Average daily high temperatures range from about 30 °F in the winter to over 90 °F in the summer. According to one website, Fort Bliss historical earthquake activity is significantly above Texas state average and is in the upper 5 percent for earthquake activity nationally (city-data.com, Fort Bliss, Texas).

1.3 Corrective Measures Objectives and Scope

The *Final Letter Report for the Cover and Borrow Area Investigation of the Oro Grande Landfill (*SWMU-25/FTBL-014), dated 6 September 2013, concluded that the best remedial option for the site is removing and disposing of all of the waste from SWMU-25/FTBL-014 in a permitted municipal landfill. NMED responded in agreement in a letter dated June 26, 2014, and required the Army to provide this work plan describing the removal and disposal activities. The scope of this corrective action is to remove all of the buried waste material from the site, dispose of the waste at a permitted landfill,

confirm the absence of contamination from the waste, restore the landfill area to its previous grade, and re-vegetate the restored surface with native plants.

1.4 Regulatory Requirements

These activities will be performed in accordance with the requirements of the federal Resource Conservation and Recovery Act (RCRA), the solid and hazardous waste rules included in the New Mexico Administrative Code (NMAC), and RCRA Corrective Action Permit #NM4213720101-01, issued by the New Mexico Environment Department (NMED) Hazardous Waste Bureau.

2.0 BACKGROUND

2.1 Site Description and Operational History

The landfill is 0.8 miles south-southwest of the Oro Grande Range Camp at the southwest edge of Elephant Mountain in the Tularosa Basin of New Mexico. Placement of waste material in the landfill area spanned a 30-year period, from 1964 until 1994. The waste material comprising the landfill is reported to consist of concrete, glass, building materials, plastic, wiring, packaging materials, and demolition debris. Reportedly, some waste material may have been burned. The Oro Grande is a trench-type landfill.

Based on the RCRA Facility Investigation (RFI) Report (Malcolm Pirnie, 2009), the extent of the buried waste is approximately 345 feet by 37 feet (0.29 acres), and averages 2.8 feet thick but varies up to about 7 feet thick. The soil cover averages 4.6 feet thick and varies from 1 to 10 feet thick, and the bottom of the debris layer is approximately 12 to 14 feet below ground surface (bgs). The RFI Report estimates the quantity of debris as 2,300 cubic yards (CY). This quantity was further refined to 2,075 CY based upon findings from subsequent additional test pits as acknowledged in a letter (NMED, 2014).

The landfill was previously described as consisting of a hard packed clay caliche pit and rock walls with a hard packed clay and sand floor (Wagner, 2000). Cover material observed in the exploratory trenches consists of poorly-graded sand with clay, silty sand, and clayey sand with a thickness ranging from 1 to 10 feet with an average thickness of approximately 4.6 feet (Malcolm Pirnie, 2009).

2.2 Previous Site Investigations

The RFI generally delineated the extent of the landfill area (and volume) and presented soil sample analytical results. Based on the soil sample results, the RFI concluded that waste deposited in the landfill has not impacted soil above NMED Soil Screening Levels (SSL)-Residential values. Though arsenic was detected above its NMED SSL, it was also detected at a level below the naturally occurring background levels for native soils at this site, which indicates that arsenic detected in soil samples did not occur because of landfill waste.

The RFI concluded that two approaches are feasible to remediate the site. The first approach is to construct an impermeable (clay) cap over the waste material in the landfill. The second approach is to excavate and remove the waste and dispose of it at an off-site permitted landfill. The landfill cap was deemed less feasible due to the lack of suitable construction material nearby. Consequently, the Army and NMED agreed that the best remedial approach is to remove all of the solid waste and dispose of it at an off-site, permitted municipal waste landfill.

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3.0 SITE CONDITIONS

The following subsections are presented to characterize the site.

3.1 Site Geology

Otero County, New Mexico is considered the easternmost edge of the Basin and Range province (O'Neill, 1998). Geologically, the Fort Bliss Military Reservation is located within the Tularosa Basin and Hueco Bolson of the New Mexico Highland section of the Basin and Range province. A groundwater divide separates the two basins hydrogeologically. The Sacramento and Hueco Mountains lie to the east of the basins and the San Andres-Organ-Franklin Mountain chain lies to the west. The Oro Grande Landfill is situated 0.8 miles south-southwest of the Oro Grande Range Camp at the southwest edge of Elephant Mountain at an approximate elevation of 4,240 feet above mean sea level.

The terrain around the landfill generally slopes to the southwest. Arroyos are located east and west of the landfill. The soil type at the landfill is designated Pendero fine sand. The Pendero series is described as reddish brown loamy fine sand and is eolian in origin.

Subsurface soils in this portion of the basin are dry unconsolidated basin fill deposits of fine-grained sand, silt, caliches, and clays. Based on the RFI, the landfill area cross-section consists of about 20 feet (depth) of sandy/gravelly soil overlying a layer caliche about 2 feet thick. It appears that the landfill debris trench is completely contained in this upper layer of sandy soil above the caliche layer. Below the caliche is a layer of sand and gravel extending to a depth of about 30 feet bgs, where there is another layer of caliche. The second layer of caliche is approximately 4 feet thick. Below the second layer of caliche is silty sand to a considerable depth (Malcolm Pirnie, 2009).

3.2 Site Hydrology

Groundwater is estimated to be at a depth between 250 and 500 feet bgs at this site. The water column in Otero County varies from 20 to 500 feet thick, but averages less than 100 feet in thickness. Seven groundwater wells were identified within 20 miles of the site. Four clustered wells (USGS-323759106195201, USGS-323759106195202, USGS-323759106195301, and USGS-323758106195301 are approximately 20 miles to the northwest are completed 49 – 65 bgs. These wells are completed in the alluvium, bolson deposits, and other surface deposits. Another well (USGS-322419106204801) is approximately 11.5 miles west of the site, with a well depth of 478 feet below land surface and a total depth of the hole of 1,010 feet bgs. Well USGS-322721106180801 is approximately 9.9 miles west- northwest of the site with a well depth of 223 feet below land surface and a total depth of the hole of 237 feet bgs. This well is completed in the Bolson Fill, the local aquifer.

The groundwater quality in the regional aquifer is reported to be non-potable due to high total dissolved solids. Groundwater is not used at the Oro Grande Camp for drinking water, as drinking water is piped in from the White Sands Missile Range. No groundwater was encountered in any of the geotechnical borings made for the RFI, and none is expected to be encountered during any future excavations.

3.3 Contaminants of Concern

No exceedances of COCs above NMED SSL-Residential values were found during the RFI. However, if suspected contamination is discovered during excavation, the waste will be segregated and fully characterized in accordance with the procedures included in the SAP.

3.3.1 Potential Pathways

Since the purpose of this task is to remove waste debris and replace that volume of waste with clean soil, no potential for exposure to hazardous substances will remain.

Groundwater. Groundwater is thought to be at a depth of more than 250 feet bgs (2009 RFI). Groundwater quality in the regional aquifer is reported to be non-potable, due to high total dissolved solids. Drinking water at the nearby Oro Grande Range Camp is piped in from the White Sands Missile Range Headquarters. No water sources are near the Oro Grande Landfill site (2009 RFI).

Surface Water. Surface water is not an issue at this site with the exception of the arroyos that flow intermittently as a result of heavy rainfall events. Due to the sandy nature of the site soils, rainwater tends to soak into the ground quickly and not pond. Due to the generally arid conditions at the site and the permeability of the sandy soil, rainwater should be kept from flowing into the excavation.

Direct Contact. Not applicable. Following this removal action, there will be no more waste material on site.

Air and Subsurface Gas. Not applicable.

4.0 SCOPE OF SITE ACTIVITIES/ METHODS

Prior to mobilization, Cape Environmental Management Inc (CAPE) will obtain any permits and licenses required to accomplish the work. A Fort Bliss Dig Permit will be prepared and submitted and a New Mexico one call notification [Dial 811 or (866) DIG-NMOC (344-6662)] will be made to gain approval prior to intrusive activities. In addition, CAPE will provide a Notice of Intent under the United States Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities.

Prior to site work, CAPE will mobilize personnel, equipment (e.g. excavator, loader, dozer, trucking), and construction support facilities to the site. CAPE will also install erosion controls in accordance with the Stormwater Pollution Prevention Plan (SWPPP), provided in Appendix E.

4.1 Excavation Layout

Based on the most recent information, the landfill area is currently marked with stakes. If the stakes are no longer in place when the excavation begins, CAPE will subcontract a registered professional land surveyor to relocate the trenches based on coordinates from the RFI report. Existing stakes that are still in place when the work begins will be used as starting points for the excavation.

4.2 Excavation

All excavation will be performed in strict accordance with Occupational Safety and Health Administration (OSHA) excavation safety requirements. Cover material observed in the exploratory trenches consists of poorly-graded sand with clay, silty sand, and clayey sand with a thickness ranging from 1 to 10 feet with an average thickness of approximately 4.6 feet (Malcolm Pirnie, 2009). The sides of the excavation will be benched or sloped appropriately to ensure stability. The soil at this site is suspected to be OSHA Type C. As debris removal continues, the sidewalls will be laid back to a maximum allowable slope of 1.5:1 (H:V) or flatter. Personnel will not enter an excavation that is not properly sloped.

Heavy equipment used to complete the excavation/backfill activities will include a John Deere 220 excavator, a John Deere 650 dozer, a John Deere 544 loader (or similar equipment), and a water truck to control dust and to moisture-condition the backfill material as necessary.

4.3 Transport and Disposal

CAPE anticipates all waste material will be non-hazardous debris. AC Trucking, of Carrizozo, NM, will be used to transport soil and waste material and to haul clean backfill into the excavation site. The waste material will be hauled to the Otero-Greentree Regional Landfill for disposal. Site access will utilize the existing dirt road to

minimize disturbance. The roadway to the site will be graded, filled and/or stabilized as needed to allow truck access. The landfill area will be cleared and grubbed. Cleared brush/vegetation will be stockpiled and disposed. Clean cover soil (overburden) will be visually segregated, excavated and stockpiled on site. Waste materials will be excavated and directly loaded in dump trucks for disposal. Truck traffic within the project area will be routed in a controlled manner in order to avoid confusion and potential accidents during the excavation activities (Figure 4). All waste material and debris will be removed. Confirmation samples will be collected to confirm that contaminants have been removed, as discussed in Section 5.

4.4 Backfilling

CAPE anticipates utilizing backfill material from one or more of the Fort Bliss borrow sources identified in the *Final Letter Report for the Cover and Borrow Area Investigation* (Malcolm Pirnie, 2011), as stated in government responses to contractor questions dated 13 April 2015. One sample will be collected for every 500 CY of backfill material and analyzed in accordance with the SAP in Appendix B to ensure that free of contamination prior to excavation. When approved, the backfill materials will be excavated and transported to the Oro Grande Landfill site.

Backfill of sandy fill material will be placed in 8- to 12-inch lifts and will be compacted by tracked machinery until surface defection are less than 4 inches, achieving compaction of 80 – 90 percent. Backfill compaction will be overseen by the Site Superintendent and documented by a geotechnical field technician. Since the backfill material is generally sandy, it is anticipated that compaction can be achieved using the dozer and loader. If not, lift thickness will be reduced.

4.5 Site Restoration

After the excavation is backfilled and compacted, the finished surface of the excavation area will be graded to drain. The site will be revegetated similar to natural, pre-excavation conditions.

Raphael Corral, Ph.D, is the Fort Bliss contact who will select the appropriate vegetative cover to restore the site to its original (pre-landfill) condition. CAPE has attempted to contact Dr. Corral via email concerning the re-vegetation requirements and is waiting a response.

4.6 Site Security

While the excavation is open during operations, and pending confirmation analytical results, construction fencing will be placed around the excavation to keep people and animals out of the area and signage (e.g. Construction Area - Keep Out) will be attached

to the fencing. Signage in both Spanish and English will be posted approximately every 200' along the long axis and centered on shorter sides.

4.7 Construction Safety

All personnel working on site will adhere to construction safety procedures as specified in the SSHP, included as Appendix C. The SSHP presents the contractor Health and Safety (H&S) procedures to be implemented by CAPE in the execution of this project. The purpose of the SSHP is to identify and evaluate H&S hazards at the project work site and to prescribe safety control measures to be implemented. The SSHP is implemented in conjunction with the project APP and CAPE H&S policies and procedures. The SSHP has been prepared to meet the requirements of OSHA standards, 29 CFR Part 1910 and 29 CFR Part 1926; USACE *Safety and Health Requirements Manual* (EM 385-1-1).

This SSHP serves as the primary H&S guidance for CAPE operations necessary to accomplish project objectives. The appropriate number of SSHP hard copies will be kept on site during the execution of all project activities and will be readily available to all on-site personnel.

The SSHO will inspect excavation benches and/or slopes daily to monitor slope stability. Instability may be noted by cracks in the ground surface within a few feet of the excavation wall, sloughing material into the excavation, or water seeping into the excavation from the wall. If potential slope instability is noted, the affected areas will be corrected by additional sloping or benching.

In the event of a construction emergency (e.g. fire, earthwork failure, etc.), the Army will be orally notified immediately, followed by notification in writing within 72 hours of the event. CAPE will support the Army, which will initiate any other notifications to OSHA, USEPA, or NMED, as appropriate, within 24 hours. Written notifications will specify what happened, what response action is being taken and/or is planned, and any potential impacts on human health and/or the environment. The CAPE incident response process and report forms are included in the SSHP.

4.8 Waste Management Plan

The landfill waste material is expected to be non-hazardous debris, based on information from the RFI (Malcolm Pirnie, 2009). Wastes will be excavated and stockpiled, and waste characterization sampling will be performed in accordance with the procedures detailed in the SAP and discussed in Section 5.

Landfill waste will be loaded onto trucks using an excavator and/or a loader. Loads will be covered with tarps prior to removal from the site, and gross soil, debris, etc., will be swept from external parts of the trucks before they are allowed to enter roadways.

Excavated waste materials and any incidental investigation derived waste (IDW) will be disposed at the Otero-Greentree Regional Landfill.

IDW, (i.e., used personal protective equipment, expendable sampling equipment, plastic used to cover any waste or stockpiled materials) will be bagged and disposed, pending disposal clearance. Any non-disposable sampling equipment and excavation tools used during site activities will be decontaminated using techniques that minimize the generation of IDW. The IDW will be free of loose soil, and CAPE will discuss the acceptance criteria with the landfill prior to sending them any IDW.

If any excavated material is suspected to contain hazardous substances, it will be segregated, properly characterized in accordance with Title 40 of the Code of Federal Regulations (40 CFR), Part 261, Subpart C, and managed in accordance with its waste determination. If hazardous waste is identified, it will be properly contained and properly disposed at a hazardous waste facility meeting the requirements of 40 CFR Part 268, Land Disposal Restrictions. If asbestos containing materials (ACM) are encountered, CAPE will subcontract a licensed company to handle ACM in accordance with (IAW) appropriate guidelines, and will dispose of them at a licensed disposal facility.

4.9 Corrective Measures Completion Report

Following completion of the fieldwork, a Corrective Measures Completion Report will be submitted, describing the work activities and documenting the site conditions resulting from the corrective measures. The report will include all confirmation sampling results, waste characterization data, waste profiles, manifests, and scale house tickets, and any recyclable waste disposal/destruction documentation. Any deviations from the CA WP will be discussed in the report. Documentation of site restoration activities will include establishment of ground cover, and removal of any erosion/sediment control best management practices (BMPs). The Draft Corrective Measures Completion Report will be submitted within 60 days of completion of fieldwork.

5.0 SAMPLING AND ANALYSIS

The sampling and analysis associated with this task will include waste characterization, analysis of stockpiled overburden soil from the excavation that will be used as backfill, analysis of borrow source soil, and confirmation sampling from the sidewalls and floor of the excavation to verify that the site is cleaned up to NMED SSL-Residential screening levels prior to backfilling. Sampling and analysis will be performed in accordance with the SAP, attached as Appendix B.

5.1 Waste Characterization Sampling

Waste characterization sampling will be performed to properly classify the waste material in preparation for disposal. Analytical results from the RFI and process knowledge will be used to classify the wastes as construction debris. Waste characterization samples will be collected if required by the disposal facility.

5.2 Confirmation Sampling

Confirmation sampling will be performed to verify that all of the waste material has been removed from the site and no COCs are above NMED SSL-Residential screening levels. Sixteen samples will be collected from the sidewalls and five samples will be collected from the excavation bottom, as discussed in the SAP.

5.3 Backfill Sampling

Samples will be collected from Fort Bliss backfill sources to ensure that backfill material is clean. Samples will be collected at a rate of one sample result per 500 cubic yards (CY), prior to excavation of waste material.

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6.0 PROJECT MANAGEMENT

This section outlines the duties and responsibilities of project management and field personnel.

6.1 Duties and Responsibilities

6.1.1 Program Manager

The Program Manager for this contract is Kurt Gates, Certified Industrial Hygienist (CIH), Certified Safety Professional (CSP), and Certified Hazardous Materials Manager (CHMM). Mr. Gates' authority and responsibilities are:

- Establishing and interpreting program policies
- Oversight of long-range program plans
- Implementation of contract requirements.

6.1.2 Project Manager

The Project Manager for this project is Benjamin Shivar. Mr. Shivar's authority and responsibilities are:

- Interaction with USAEC and Fort Bliss installation
- Monitoring schedule and cost performance
- Monitoring performance metrics, assessing opportunities and threats, and planning and implementing actions as required
- Managing project work assignments, technical staff performance, and technical quality of work
- Coordinating the development, implementation, and enforcement of all plans
- Ensuring that the necessary resources are available for work to be completed safely and in compliance with the SSHP, installation requirements, and OSHA regulations
- Reviewing deliverables
- Management of dedicated professional subcontract activities.

6.1.3 Deputy Program Manager

The Deputy Program Manager for this project is Mike Healy, Professional Geologist (PG). Mr. Healy's authority and responsibilities are:

- Participating in monthly progress meetings
- Assessing opportunities and threats; planning and implementing actions as required
- Supporting the Project Manager (PM) by ensuring the availability of resources to the PM
- Approving budgets and subcontracts

- Identifying and avoiding potential problems or conflicts
- Ensuring safety and quality of all work.

6.1.4 Health and Safety Manager

The Health and Safety Manager for this project is Ken Beatty. Mr. Beatty's authority and responsibilities are:

- Administering safety programs, including training and medical monitoring requirements
- Ensuring the appropriate training occurs and that appropriate training and medical records are kept current and on site
- Determining what resources are required to adequately address H&S issues and communicating those resource requirements to the PM
- Developing an activity hazard analysis for any new activity or innovative technology that is not currently in the SSHP
- Conducting random H&S audits in the field
- Assisting in accident investigations with field personnel and reporting to accident review boards, if necessary
- Stop-work authority if safety issues occur.

6.1.5 Project Chemist

Mr. Wayne Vermeychuk is assigned to the project as CAPE's Project Chemist. The Project Chemist will be responsible for all project chemistry-related items. Duties of the Project Chemist include, but are not limited to, the following:

- Coordinating and communicating with the analytical laboratory
- Performing review and validation of all project analytical data
- Preparing Analytical Data Report packages for submittal.

6.1.6 Site Superintendent

The Site Superintendent, to be determined, is charged with the overall responsibility for the successful completion of CAPE field operations. Site Superintendent responsibilities are:

- Preparing and organizing project activities on site
- Reviewing and approving the SSHP
- Providing equipment and materials for project operations
- Emphasizing safety and holding personnel accountable for safe work performance
- Enforcing implementation and compliance with the SSHP and H&S procedures

- Ensuring correction of unsafe work conditions and/or unsafe work practices
- Monitoring and evaluating H&S performance of project operations
- Communicating with the Contracting Officer's Representative to evaluate and resolve H&S issues.

6.1.7 Site Safety and Health Officer

The SSHO will conduct inspections to determine whether operations are being performed in accordance with the SSHP and OSHA regulations. The SSHO is assigned to the PM during execution of project activities, but reports directly to the Health and Safety Manager (HSM) for functional safety issues. An open dialogue will be kept between the SSHO and project supervisory personnel to ensure that safety concerns are quickly addressed and corrective actions are taken. The SSHO has the authority to suspend site operations resulting from SSHP nonconformance. The SSHO's duties include, but are not limited to, the following:

- Reviewing and providing guidance for H&S orientation and implementation during start-up of field activities
- Implementing the SSHP and addressing site hazards and controls necessary to safeguard construction personnel and visitors
- Upgrading or downgrading levels of protection, as described in the SSHP
- Ensuring the procurement, distribution, inspection, and documentation of personal protective equipment
- Ensuring procurement of required air monitoring instrumentation and performing air monitoring, including calibration and documentation
- Ensuring that subcontract personnel performing work are knowledgeable of the SSHP and its requirements
- Conducting tailgate safety meetings
- Conducting random H&S audits in the field
- Assisting in accident investigations with field personnel and reporting to accident review boards, if necessary.

6.1.8 Site Quality Control Officer

The Quality Control (QC) Officer will be responsible for implementation of the QC functions in the field. The QC Officer will report to the Construction Quality Control Manager (CQCM) and will coordinate with all field personnel, including subcontractors. The QC Officer will report any deficiencies immediately to the CQCM for consultation and assignment of corrective actions. The CQCM will empower the QC Officer to enforce all QC issues in the field, and will allow for work stoppage if QC issues are being compromised. Responsibilities of the QC Officer include:

- Receiving, reviewing, transmitting, and tracking all submittals
- Reporting to the CQCM on the status of submittals and QC-related activities
- Preparing the Daily Quality Control Reports covering all project field activities
- Performing inspections of CAPE and subcontractor work activities
- Reading and understanding all QC requirements for specific tasks being performed by CAPE and subcontractors, and monitoring for compliance with the project requirements
- Ensuring the quality standards in the project plans are met
- Performing and monitoring all control activities and testing
- Maintaining complete, accurate, legible, permanent, and defensible QC records that document QC activities work and overall work performed.

6.2 Public Involvement Plan

As stated in the PWS, there is an active Restoration Advisory Board (RAB) at Fort Bliss. CAPE will support the Army during any RAB meetings and will provide briefings and presentations in support of these meetings as well as input or updates for any revisions to the Community Relations Plan or the Community Involvement Plan.

7.0 REFERENCES

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APPENDIX B

SAMPLING AND ANALYSIS PLAN

FINAL

SAMPLING AND ANALYSIS PLAN

FTB-014 (SWMU-25) ORO GRANDE LANDFILL

FORT BLISS, NEW MEXICO

Contract Number W91ZLK-13-0003
Task Order Number 0003

Prepared for:

DEPARTMENT OF THE ARMY
U.S. ARMY ENVIRONMENTAL COMMAND
2450 Connell Road
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CAPE Project Number 21003.003

Revision Number: Rev 1

December 2015

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LIST OF ABBREVIATIONS AND ACRONYMS

BCY	banked cubic yards
bgs	below ground surface
CAPE	Cape Environmental Management, Inc.
CFR	Code of Federal Regulations
CoC	chain-of-custody
COPC	Contaminant of Potential Concern
CY	Cubic Yard
EPA	Environmental Protection Agency
FD	Field Duplicate (sample)
ft	foot (feet)
GWTP	groundwater treatment plant
IAW	in accordance with
IDW	investigative derive waste
MD	matrix spike duplicate (sample)
MICC	Mission and Installation Contracting Command
MS	matrix spike (sample)
NMAC	New Mexico Administrative Code
NMED`	New Mexico Environment Department
oz	ounce
PAH	poly-nuclear aromatic hydrocarbons
PBA	Performance Based Acquisition
PCB	Polychlorinated biphenyls
PM	Project Manager
PPE	personal protective equipment
PWS	Performance Work Statement
QC	Quality Control
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation

SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SSHP	Site Safety and Health Plan
SSL	Soil Screening Level
SVOC	semi-volatile organic compound
SW	Solid Waste
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
T&D	Transport & Disposal
TO	Task Order
TPH-DRO	Total Petroleum Hydrocarbon-Diesel Range Organics
VOC	volatile organic compound

1.0 INTRODUCTION

Cape Environmental Management Inc. (CAPE) is submitting this Sampling and Analysis Plan (SAP) to the United States Army in accordance with (IAW) the Performance Work Statement (PWS), dated April 13, 2015, included in the Performance-Based Acquisition (PBA) Contract W91ZLK-13-D-0003, Task Order (TO) 0003, for firm fixed-price environmental remediation services at four sites at Fort Bliss, Texas. The TO was issued by the U.S. Army Mission and Installation Contracting Command (MICC), Fort Sam Houston, Texas, on July 1, 2015. This SAP only applies to the Oro Grande Landfill Corrective Measures Action.

The Oro Grande Landfill is located in Otero County, New Mexico within the Fort Bliss Military Reservation. The landfill is 0.8 miles south-southwest of the Oro Grande Range Camp at the southwest edge of Elephant Mountain in the Tularosa Basin of New Mexico. Placement of waste material in the landfill area spanned a 30-year period of time, from 1964 until 1994. The waste material comprising the landfill is reported to consist of concrete, glass, building materials, plastic, wiring, packaging materials, and demolition debris. The Oro Grande is a trench-type landfill. Based on findings obtained in a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report, the extent of the buried waste is approximately 345 feet by 37 feet (0.29 acres) and averages 2.8 feet thick, but varies up to about 7 feet thick. The soil cover averages 4.6 feet thick but varies from 1 to 10 feet thick, and the bottom of the debris layer is approximately 12 to 14 feet below ground surface (bgs). It is estimated that there are 2,075 cubic yards of waste debris in the landfill (NMED, 2014).

This SAP has been prepared in reference to environmental remediation work IAW RCRA and New Mexico Administrative Code (NMAC) regulations and requirements of the PWS and Fort Bliss. It defines the approach to collection of confirmation samples and waste characterization, and borrow source characterization samples. This SAP will be submitted to the Army and the New Mexico Environmental Department (NMED) for approval.

2.0 ORO GRANDE LANDFILL FIELD SAMPLING ACTIVITIES

The RFI report from 2009 states that analytical results from samples collected at this site indicate that there were no contaminant concentrations exceeding the NMED Soil Screening Levels (SSLs) for Residential exposure with the exception of arsenic, which was detected at a level below the naturally-occurring background levels for native soils at this site. Consequently, the RFI did not identify any contaminants of potential concern (COPCs). This section provides details and guidance for performing the environmental sampling necessary to provide waste characterization, clean closure confirmation, and clean backfill confirmation. These samples are summarized in Tables 2-1 and 2-2, Sample Summary Table and Analytical Summary Table, and are further described in the following sections.

2.1 Contaminant Delineation

Contaminant delineation sampling and exploratory trench excavations were made as part of the RFI and the excavation area is currently marked. Further excavation delineation will be performed visually in the field by removing debris as it is encountered. When the excavation appears to be clear of debris, confirmation sampling will be conducted.

2.2 Excavation Confirmation Sampling

Since there were no COPCs identified in the RFI, there were no exceedances of COPCs above NMED SSL-Residential values found during the RFI. Subsequently, confirmation soil samples will, be analyzed for the same chemical groups: volatile organic compounds VOCs), by Environmental Protection Agency (EPA) Solid Waste (SW) 5035/8260, semi-volatile organic compounds (SVOCs), by EPA SW 3541/8270, metals (by EPA SW 6020/7000), pesticides (by EPA SW 3541/8081), herbicides (by EPA SW 3550/8151), polychlorinated biphenyls (PCBs) via Arochlor mixtures, by EPA SW 3541/8082, and total petroleum hydrocarbons-diesel range organics (TPH-DRO), by EPA SW 5000/8015C. The most recent NMED SSL list of contaminants for each analytical group, contained in the NMED *Risk Assessment Guidance for Site Investigations and Remediation* dated July 2015 will be reported. If suspect contamination is discovered, the material will be segregated and characterized. Additional analyses may be performed based on any evidence of contaminants other than the NMED SSL list.

If no suspicious materials or substances are uncovered during excavation, 21 confirmation samples will be collected. Sixteen samples will be collected from the sidewalls of the excavation and five from the base of the excavation, as shown on Figure 1. One field duplicate (FD), one matrix spike (MS), and one matrix spike duplicate (MD) will also be collected during confirmation sampling for Quality Control (QC) purposes. If suspicious materials are encountered during excavation, the sampling scheme will be tailored to fit the situation. Sample collection procedures are discussed in Section 3.

All samples will be sent to Accutest Laboratories for analysis. The analytical results will be compared to the NMED SSL-Residential screening values published July 2015, to confirm if cleanup levels have been met or if excavation limits need to be adjusted.

2.3 Clean Backfill Certification

Backfill from the Fort Bliss borrow source will be certified as clean before it is used to backfill the excavation. All backfill material will have laboratory results at a rate of one sample result per 500 cubic yards (CY) and a minimum of one representative discrete sample per source to confirm it is clean. The discrete sample will be collected from a depth interval of 0.5 to 1.0 feet (ft.).

The backfill soil/sand will be analyzed for the following parameters:

- Target Compound List (TCL) SVOCs, by EPA SW 3541/8270, including poly-nuclear aromatic hydrocarbons (PAH),
- TCL VOCs, by EPA SW 5035/8260,
- TCL Pesticides by EPA SW 3541/8081 and PCBs, by EPA SW 3541/8082,
- Target Analyte List (TAL) Metals, by EPA SW 6020/7000.

Based on a total waste volume of approximately 2,075 CY that is estimated to be replaced with backfill borrow source material, three discrete samples from random locations within the borrow soil volume to be used for backfill will be submitted to Accutest to certify. In addition, all stockpiled overburden soil excavated to access the landfill waste material will also be sampled and analyzed at the same frequency of one sample per 500 CY. The results will be compared to the NMED SSL Residential values and to the United States Environmental Protection Agency Regional Screening Levels IAW the procedures contained in the NMED *Risk Assessment Guidance for Site Investigations and Remediation* dated July 2015 to approve the stockpiled overburden for reuse as backfill in the excavation.

2.4 Decontamination Procedures

For the limited sampling required for this excavation it is anticipated that disposable sampling equipment, e.g. food-grade disposable aluminum heating pans and stainless steel spoons for homogenization and bottling of samples will be used. Disposable sampling equipment will be used to collect one sample and then discarded or recycled. No decontamination will be needed for sampling equipment. All potentially contaminated materials will be handled with gloved hands and with the appropriate personal protective equipment (PPE) as determined by the *Site Safety and Health Plan* (SSHP).

Given the dry nature of this site and sandy soil, heavy equipment can likely be swept clean prior to removal from the site. No wet decontamination is anticipated; however, if COPCs are encountered during excavation and wet decontamination is required for heavy equipment, CAPE will decontaminate using a power washer. Any wastewater from a power washer will be captured on a plastic liner, drummed, sampled and appropriately disposed.

2.5 Waste Characterization

Excavation wastes will be characterized and classified in accordance with Title 40 Code of Federal Regulations (CFR) Part 261. All waste will be managed and disposed in accordance with the requirements of the USEPA, NMED, and Fort Bliss.

This project entails transport and disposal (T&D) of landfilled debris. CAPE will sample any portions of the debris necessary to provide the landfill proper waste characterization; however, it is not anticipated that waste characterization of the debris will be needed.

Any debris that appears to contain lead paint, fuels or solvents, industrial or sanitary waste, or any other solid waste not conforming to typical inert debris, will be stockpiled on-site and covered with plastic sheeting, or alternatively placed in drums. Liquid wastes will be placed in drums or poly tanks. Containers will be labeled to protect them from tampering and will be staged in a secured (fenced) area.

Waste characterization samples will be collected from stockpiled wastes to evaluate the disposal requirements for soil accumulated during the sampling activities. CAPE will collect samples of debris and any potentially impacted soil for Toxicity Characteristic Leaching Procedure (TCLP) analysis for VOCs, SVOCs, metals, pesticides and herbicides.

If any debris appears to contain lead paint, fuels or solvents, industrial or sanitary waste, or any other solid waste not conforming to typical inert debris, If waste oil is discovered, it will be analyzed for PCBs and TPH-DRO in addition to the hazardous waste analytical groups (analytical method and sample bottle requirement are provided in Table 2.5-1. Waste characterization results will be compared to the TCLP and reactivity values listed in 40 CFR Part 261 Subpart C, values for PCBs listed in 40 CFR Part 761.61, and the TPH values for residential exposure contained in the NMED SSLs dated July 2015.

The following waste streams could potentially be generated during T&D of landfilled debris:

- Contaminated water from equipment decontamination
- Contaminated solids from equipment decontamination
- Contaminated debris, which include, but are not limited to, discarded materials used in decontamination, plastic sheeting, sampling materials, and personal protective clothing
- General municipal waste.

Soil wastes, liquid waste, decontamination solids, decontamination liquid, and contaminated debris will be segregated from other solid waste generated during the proposed site activities. These wastes will be characterized to determine whether it must be managed and disposed of as special waste, hazardous waste, or non-hazardous waste.

Liquid wastes will be characterized to determine whether it can be transferred to the Fort Bliss groundwater treatment plant (GWTP) for disposal or disposed of as hazardous waste.

Investigative derive waste (IDW), such as used personal protective equipment, expendable sampling equipment, or plastic used to cover any waste or stockpiled materials, will be sampled as needed to characterize the IDW. CAPE will discuss the acceptance criteria with the landfill prior to sending them any IDW. Analytical methods are shown in Table 2-3.

3.0 GENERAL SAMPLING PROCEDURES

This section describes the general procedures to be used for soil contaminant delineation, confirmation and waste characterization sampling activities and provides checklists of the necessary equipment.

3.1 General Sampling Materials

The following general materials are required:

- All data necessary to properly identify the scope of work. This should include items such as reports, historical field and lab data, and any special instructions (i.e., NMED guidelines, project specifications, etc.)
- Chain-of-custody (CoC) forms
- Field notebook/field forms
- Custody seals
- Sampling tool(s)
- Laboratory-prepared sampling containers
- Sample container labels
- Waterproof marking pens
- Laboratory-prepared travel blanks, if required
- Preservatives (supplied by laboratory if required)
- Insulated cooler & ice
- Packing materials for shipping samples
- PPE as specified in the SSHP (Appendix C of the *Work Plan*).

3.2 Sampling for Chemical Analyses

Sample containers (provided by the laboratory) will be pre-labeled prior to commencing the sampling activities. The sampling procedure for the confirmatory and waste characterization samples is summarized below (procedure modifications for grab sample collection are shown in parenthesis):

- Prepare the work area around the sample location by placing plastic sheeting on the ground to avoid cross-contamination.
- Verify that the sample containers for the current location are labeled correctly.
- Collect the soil/sand sample with a disposable spoon.

- Homogenize the sample material, place the soil aliquot in the sample containers and secure the caps tightly. Soil sampled for VOCs will not be homogenized. Soil samples to be analyzed for VOCs will be collected using a coring device (such as a modified syringe or Encore™ Sampler), and immediately capping the sample. New sample equipment (coring devices) will be used for each sample location. (Discrete samples: proceed to next step).

- Check sample label. Be sure label is completed with all necessary information such as time, date and sampler initials.

- Place filled sample containers on ice immediately.

- Complete all required information on each sample collection log sheet prior to moving to the next sampling location.

- Disposable non-latex gloves will be worn during sampling activities, and will be changed between sampling locations.

- Complete COC documents and appropriate field log-book entries prior to leaving the sampling area for breaks, shift termination or for any other non-emergency reason.

Prior to any sample collection, if there are any unidentified odors in the air, or there is a reason to believe that potential hazardous or contaminant vapors are present, the Project Manager (PM) and Site Health and Safety Officer will be notified. Ventilation and/or other engineering controls will be implemented and the conditions will be noted on the field sampling form and the field logbook.

Some other products that may pose cross-contamination issues include: perfumes and cosmetics, skin-applied pharmaceuticals, suntan lotion, and automotive products (e.g., starting fluid, windshield de-icer, carburetor cleaners, upholstery cleaners, etc.). Use of these or other products constituting potential impact on sample integrity will be avoided before and while collecting/managing samples.

The PM will be consulted regarding significant departures from standard operating procedures (SOPs). The PM will document the modifications, then notify the Contracting Officer's Representative to discuss any such variation from the SOP. Notes will be kept describing the sampling procedures and variations, and submitted to the PM for review. Any deviations from the SOPs or the SAP will be discussed in the Corrective Measures Completion Report.

3.3 Sample Containers and Preservation

Pre-preserved sample containers for soil samples will be provided by the contract laboratory. The containers will be shipped, along with labels and manufacturer's quality control documentation, from the laboratory to CAPE via common carrier in clean coolers using custody seals. Coolers will be packed with ice, and will include a temperature blank. For all coolers containing samples for VOC analysis, a trip blank will also be

included. All samples will be collected and shipped such that the 24-hour hold time period for VOC sample preparation is not exceeded.

4.0 REFERENCES

CAPE, 2015. *Corrective Action Work Plan, FTB-014 (SWMU-25) Oro Grande Landfill, Fort Bliss, New Mexico*. September.

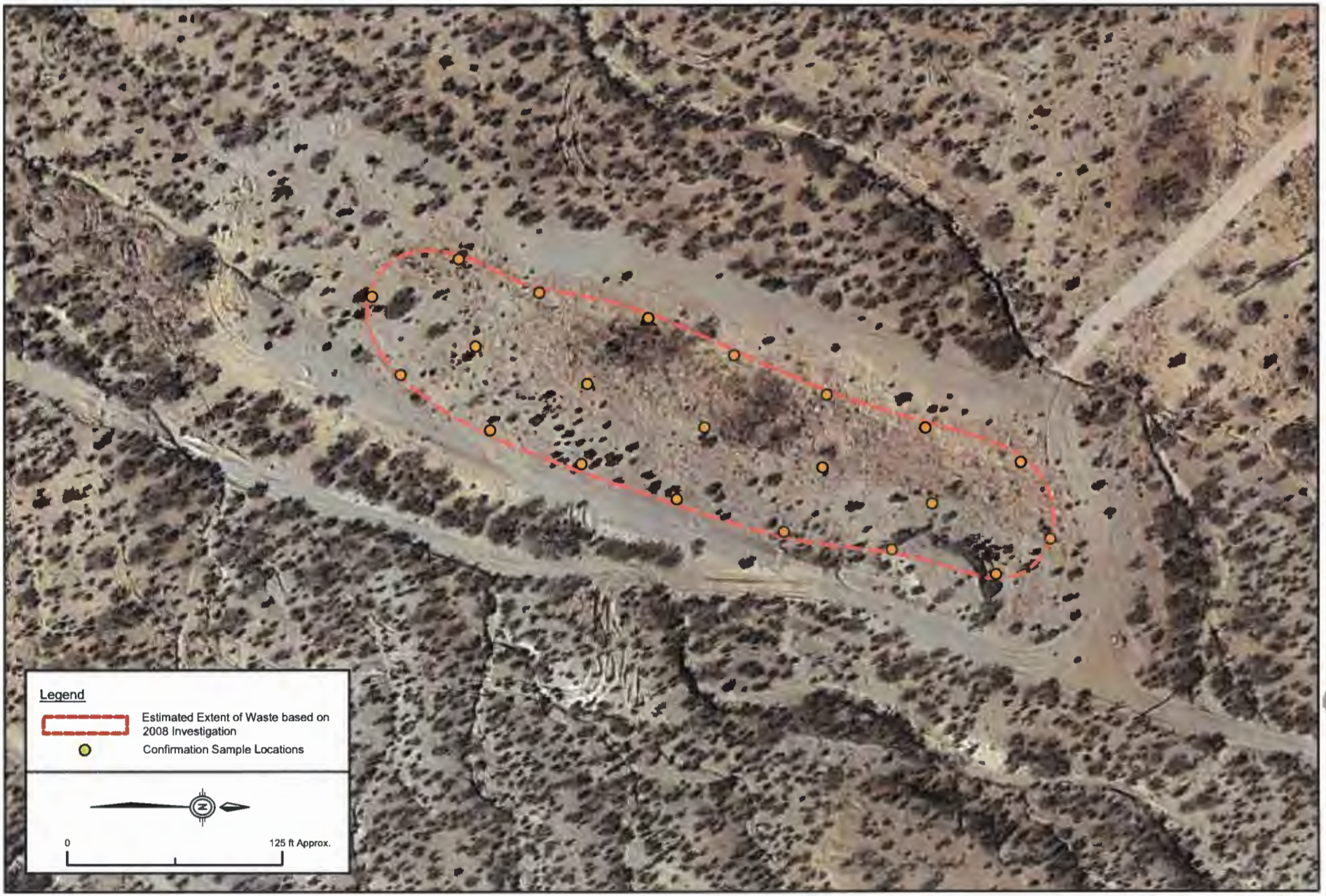
Malcolm Pirnie, 2009. *RCRA Facility Investigation Report, Oro Grande Landfill (SWMU 25/FTBL-14)*. January.

Malcolm Pirnie, 2011. *Final Letter Report for the Cover and Borrow Area Investigation of the Oro Grande Landfill (SWMU-25/FTBL-14)*. November.

NMED, 2015, *Risk Assessment Guidance for Site Investigations and Remediation*. July.

FIGURES

Figure 1: Confirmation Sample Locations



\\TX\SanAnt\users\Projects\Army Environmental Command\Ft Bliss\Plans\Oro Grande\21003.003.100\Orogrande\SAP\Figures 2010\OG Fig1 Sample Locations Map_SAPR1.dwg

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U.S. ARMY

MULTIPLE SITES AT
FORT BLISS, TEXAS

PROJECT NAME

OROGRANDE LANDFILL - FTBL 14
US DEPARTMENT OF THE ARMY
FORT BLISS, TX

SHEET TITLE

CONFIRMATION SAMPLE LOCATIONS

REVISIONS:

No.	Date	By	Chk	Remarks

CONTRACT NO: W91ZLK-13-D0003	JOB NO: 21003.003
CHECKED BY: M. MILLER	DRAWN BY: C.RIOS
REVIEWED BY: B.SHIVAR	DATE: JUL. 2016
SCALE: AS SHOWN	FILE NAME: OG Fig1 Sample locations Map_SAPR1

SHEET NUMBER:

FIGURE 1

TABLES

Table 2-1
Sample Summary Table
Sampling and Analysis Plan
Oro Grande Landfill Remedial Action Work Plan

Sampling Location	Matrix	Analytical Group	Number of Samples	Rationale for Sampling Location
Excavation Base and Sidewalls	Soil	Volatile organic compounds (VOCs), Semi-volatile organic compounds (SVOCs), metals, pesticides, herbicides, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbons-diesel range organics (TPH-DRO) (reporting NMED SSL list of contaminants for each analytical group)	At least 21 (Additional 3 per area of contamination, if discovered)	Delineation and Confirmation
Excavated Contaminated Soil and/or Debris (if discovered)	Soil / Debris	Toxicity Characteristic Leaching Procedure (TCLP) VOCs, TCLP SVOCs, TCLP Pesticides, TCLP Herbicides, PCBs, TPH-DRO, Asbestos, Reactivity, Paint Filter test, selected as appropriate	To be calculated in accordance with EPA SW-846, Chapter 9	Waste Characterization
Segregated Soil For Re-use	Soil	VOCs, SVOCs, metals, pesticides, herbicides, PCBs, and TPH-DRO (reporting NMED SSL list of contaminants for each analytical group)	1 per 500 banked cubic yards (BCY)	Clean Soil Confirmation
Borrow Soil for Backfill	Soil	VOCs, SVOCs, metals, pesticides, herbicides, PCBs, and TPH-DRO (reporting NMED SSL list of contaminants for each analytical group)	1 per 500 BCY	Certification of Clean Backfill

Table 2-2
Analytical Summary Table
Sampling and Analysis Plan
Oro Grande Landfill Remedial Action Work Plan

Matrix	Analytical Group	Analytical and Preparation Method/ SOP Reference	Container	Sample Volume	Preservation Requirements	Preparation Holding Time	Analytical Holding Time
Solid	VOCs	SW-846 5030/8260B	Encore or other sampling device - (3) 40-mL glass + (1) 2 oz glass jar	5 grams per 40 mL vial	Cool to 0-6°C, methanol and sodium bisulfate	48 hours	48 hours
Solid	SVOCs	SW-846 3550C/8270D	(1) 4 oz glass jar	30 grams	Cool to 0-6°C	14 days	40 days
Solid	ICP Metals	SW-846 3010A/6010C	(1) 8 oz glass jar	30 grams	Cool to 0-6°C	180 days	180 days
Solid	Mercury	SW-846 3015A/7471B		30 grams	Cool to 0-6°C	28 days	28 days
Solid	Pesticides	SW-846 3550/8081B	(1) 8 oz glass jar	30 grams	Cool to 4°C	14 days	40 days
Solid	Herbicides	SW-846 3550/8151A		30 grams	Cool to 4°C	14 days	40 days
Solid	Polychlorinated biphenyls	SW-846 3550/8082A	(1) 4 oz jar	30 grams	Cool to 0-6°C	14 days	40 days
Solid	Total petroleum hydrocarbons – Gasoline range organics	SW-846 3550/8015	(1) 4 oz jar	30 grams	Cool to 0-6°C	14 days	40 days
Solid	Total petroleum hydrocarbons – Diesel range organics	SW-846 3550/8015	(1) 4 oz jar	30 grams	Cool to 0-6°C	14 days	40 days
Waste	TCLP VOCs TCLP SVOCs TCLP Metals TCLP Pesticides TCLP Herbicides	SW-846 1311/8260B SW-846 1311/8270C SW-846 1311/6010C/7470A SW-846 1311/8081B SW-846 1311/8151A	16 oz glass jar	For full TCLP analyses - collect a TOTAL of 150 grams minimum	Cool to 0-6°C	VOC, SVOC, Pesticides, Herbicides 14 Days Metals, Mercury 28 days else 6 months	VOC, SVOC, Pesticides, Herbicides 14 Days Metals, Mercury 28 days else 6 months
Waste	Reactivity	Chapter 7, 9012B, 9034			NA	NA	28 Days
Waste	Paint Filter	SW-846 9095			NA	NA	28 Days
Waste	Asbestos	EPA-LIBBY-03 (TEM)	(1) 4 oz glass jar	30 grams	NA	NA	NA

VOCs – Volatile organic compounds
SVOCs – Semivolatile organic compounds
mL – milliliter
oz – ounce
°C – degrees Celsius
ICP – Inductively-coupled plasma
TCLP – Toxicity Characteristic Leaching Procedure
TEM – Transmission Electron Microscopy

Table 2-3
IDW Analytical Method and Sample Bottle Requirements

Parameter	Analytical Method	Bottle Requirement	Preservative
TCLP VOCs	SW1311/8260B	(3) 40-milliliter glass vials	Methanol (1) and $NaHSO_4$ (2)
TCLP VOCs	SW1311/8260B	(1) 4-oz glass jar	Ice
TCLP SVOCs	SW1311/8270D	(1) 8-oz glass jar	Ice
TPH-DRO	SW 3541/8015	(1) 8-oz glass jar	Ice
TCLP Metals	SW1311/6010C	(1) 4-oz glass jar	Ice
PCBs	SW8082A	(1) 4-oz glass jar	Ice
Pesticides/ Herbicides	SW8081B/SW8151A	(1) 8-oz glass jar	Ice
Ignitability	SW1010/1020	(1) 4-oz glass jar	None
Corrosivity	SW9040/9045	(1) 4-oz glass jar	None
Reactivity	SW846 Chapter 7	(1) 4-oz glass jar	None

Notes:
IDW = investigative-derived waste
oz = ounce
SVOC = semivolatile organic compound

TCLP = toxicity characteristic leaching procedure

TPH = total petroleum hydrocarbons

VOC = volatile organic compound