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TechLaw
560 Golden Ridge Road, Suite 130
Golden, CO 80401
(303) 763-7188
(303) 763-8889 FAX
www.techlawinc.com

June 25, 2004

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505-6303

Reference: Work Assignment No. Y513, 06110.150; State of New Mexico Environment Department, Santa Fe, New Mexico; General Permit Support Contract; Research and Permitting Support for the Los Alamos National Laboratory; Review of Selected LANL Environmental Restoration (ER) Project Standard Operating Procedures (SOPs); Task 4 Deliverable

Dear Mr. Cobrain:

Enclosed please find the deliverable for the above-referenced work assignment. This deliverable consists of review comments on selected Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project Standard Operating Procedures (SOPs). Mr. John Young of NMED sent a fax to me on April 30, 2004, which identified a total of 31 LANL SOPs for TechLaw to review. The fax identified specific SOPs that should be compared to the Corrective Action Order. Mr. Young also indicated that these SOPs should be divided into two groups: priority SOPs and non-priority SOPs. Priority SOPs were identified as those SOPs that had been previously commented on by TechLaw, during our 2001 LANL SOP review. A total of 15 SOPs were identified as priority. These 15 SOPs were addressed in two deliverables. The first deliverable dated May 24, 2004 addressed the priority SOPs not linked to Laboratory Implementation Requirements (LIRs) and Laboratory Implementation Guidance (LIGs), and second dated June 11, 2004 addressed those priority SOPs that relied heavily on LIRs and LIGs.

The remaining 16 non-priority SOPs are addressed in the attached deliverable. The review of these SOPs also included review of LIRs and LIGs as appropriate. The following table lists the 16 non-priority SOPs that are addressed in this third SOP deliverable:

ER SOP/Procedure Identification	SOP Title	Effective Date
SOP-01.07, Rev.1	Operational Guidelines for Taking Soil and Water Samples in Explosive Areas	04/27/01
SOP-01.10, Rev.1	Waste Characterization	12/13/01
SOP-03.08, Rev.1	Geomorphic Characterization	12/10/01
SOP-03.11, Rev.1	Coordinating and Evaluating Geodetic Surveys	12/13/01
SOP-06.02, Rev.2	Field Analytical Measurements of Groundwater	04/27/01
SOP-06.15, Rev.1	Coliwasa Sampler for Liquids and Slurries	12/13/01
SOP-06.19, Rev.1	Weighted Bottle Sampler for Liquids and Slurries in Tanks	12/13/01

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SOP-06.29, Rev.2	Single-stage Sampling for Surface Water Run-off	03/30/04
SOP-06.32, Rev.1	Multi-level Groundwater Sampling of Monitoring Wells – Westbay MP Systems	07/12/02
SOP-07.01, Rev.1	Pressure Transducers	04/27/01
SOP-07.02, Rev.1	Water level measurement	04/27/01
SOP-07.03, Rev.1	Slug Tests	04/27/01
SOP-07.04, Rev.2	Pumping Tests	04/27/01
SOP-10.01, Rev.1	Screening for PCBs in Soil	07/19/01
SOP-10.08, Rev.2	Operation of the Spectrace 9000 Field-portable X-ray Fluorescence Instrument	03/11/04
SOP-10.14, Rev.0	Performing and Documenting Gross Gamma Radiation Scoping Surveys	03/26/01

The deliverable consists of an individual review, including a general summary as well as any comments, for each SOP, LIRs, and LIGs. The draft of the deliverable was e-mailed to you on Thursday, June 25, 2004, at david_cobrain@nmenv.state.nm.us. The deliverable is formatted in Microsoft Word 2000.

If you have any questions, please feel free to contact me at (303) 763-7188.

Sincerely,

June K Dreith

June K. Dreith
Program Manager

Enclosure: Technical Review of Selected Los Alamos National Laboratory (LANL) Standard Operating Procedures (SOPs)

cc: Mr. John Young, NMED
Mr. James Ashworth, TechLaw
Ms. Paige Walton, TechLaw

TASK 4 DELIVERABLE

TECHNICAL REVIEW OF SELECTED LOS ALAMOS NATIONAL LABORATORY (LANL) ENVIRONMENTAL RESTORATION (ER) PROJECT, STANDARD OPERATING PROCEDURES (SOPs)

Research and Permitting Support for the Los Alamos National Laboratory

Submitted by:

TechLaw, Inc.
300 Union Boulevard, Suite 600
Lakewood, CO 80228

Submitted to:

Mr. David Cobrain
State of New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East
Building One
Santa Fe, New Mexico 87505

In response to:

Work Assignment No. 06110.150

June 25, 2004

TECHNICAL REVIEW OF SELECTED LOS ALAMOS NATIONAL LABORATORY (LANL), ENVIRONAMENTAL RESTORATION (ER) PROJECT STANDARD OPERATING PROCEDURES (SOPs)

TABLE OF CONTENTS

Standard Operating Procedure ER-SOP-01.07, Rev.1
Operational Guidelines for Taking Soil and Water Samples in Explosive Areas

Description:

Standard Operating Procedure (SOP) ER-SOP-01.04, Revision (Rev.) 1, discusses procedures and precautions for sampling material potentially contaminated with explosives. The SOP also discusses special precautions and packaging in the event the sample collected may contain radionuclides. Special tools and sample collection methods are outlined. The SOP contains one Attachment, which consists of a map of the Los Alamos National Laboratory (LANL) with areas with potential for explosives shaded. This area is labeled the explosive corridor.

Comments:

The procedures described in this SOP appear adequate and consistent with the United States Environmental Protection Agency (EPA) and general industry practices. However, it is suggested that Section 5.4.7, which discusses compliance with Department of Transportation (DOT) requirements for shipping, be modified to include a reference to Laboratory Implementation Requirement (LIR) LIR-405.10-01.2, Packaging and Transportation. It is also advised that Section 5.5, which deals with radiation exposure, include a reference to LIR-402-700-01.2, Occupational Radiation Protection Requirements. Section 8.5.1 discusses managing radioactive waste. As such, as reference to LIR-404-00-5.2, Managing Radioactive Waste, should be provided.

Standard Operating Procedure ER-SOP-01.10, Rev. 1
Waste Characterization

Description:

ER-SOP-01.10, Rev.1 is entitled "Waste Characterization", however, the very little information and direction on how do conduct waste characterization is provided. The SOP really only addresses how to fill out a Waste Characterization Strategy Form (WCSF), provided in Attachment A. The WCSF includes waste description categories, characterization method upon which the waste description is based, and analytical testing.

Comments:

This SOP appears generally consistent with EPA waste management guidance; however, the SOP provides little guidance on how to fill out the WCSF. For example, the SOP relies heavily on acceptable knowledge (AK) to determine needed analytical test for the waste. No direction is provided as to how to determine which analytical tests are necessary in the event that little AK is available. In addition, the WCSF does not have a category for indicating whether the waste is a liquid or solid. While the WCSF is helpful, the SOP should be revised to contain more specific information on how to actually define the waste characteristics.

SOP ER-SOP-01.10, Rev. 1 is to be used in conjunction with the following Laboratory Implementation Requirements (LIRs) and Laboratory Implementation Guidance (LIGs):

LIR 404-00-02.5 General Waste Management Requirements
LIR 404-00-03.1 Hazardous and Mixed Waste Requirements
LIR 404-00-04.1 Managing Solid Waste
LIR 404-00-05.2 Managing Radioactive Waste
LIR 404-00-06.1 Managing Polychlorinated Biphenyls

LIG 404-00-02.0 Acceptable Knowledge Guidance
LIG 404-00-03.0 Waste Profile Form Guidance
LIG 404-00-04.0 Chemical Waste Disposal Request Guidance
LIG 404-00-05.0 Preparing the Waste with No Disposal Path Approval Package

As part of this review, the above LIRs and LIGs were also reviewed to ensure the procedures are complete and appropriate, specifically as related to the Administrative Order (Order). For the most part, the LIRs/LIGs provided only general information. The information provided in each of the LIRs/LIGs was considered adequate, unless noted in the following comments.

LIR 404-00-04.1 Managing Solid Waste. Section 9.10.5 states that the Emergency Management and Response Group (S-8) shall also serve as the point of contact in the event of a spill or release of infectious waste and B/BF (blood and/or body fluid) and shall contact Johnson Controls Northern New Mexico (JCNNM) to response and cleanup spills and releases of infectious waste and B/BF. However, the LIR does not outline where specific contact information (i.e., telephone numbers) can be found. It is suggested that the LIR be revised to include the locations where all emergency contact information is maintained.

LIR 404-00-03.1 Hazardous and Mixed Waste Requirements. The LIR briefly mentions that containers holding liquids be placed in secondary containment. However, the LIR does not

address incompatible, reactive, and/or ignitable wastes with respect the secondary containment. LIR 404-00-02.5, General Waste Management Requirements, was reviewed to see if this document contained discussions on the segregation of secondary waste. However, as neither document discusses this issue. LIR 404-00-03.1, Hazardous and Mixed Waste Requirements, should be revised to be very clear that these types of wastes must be segregated and that separate secondary containment systems should also be maintained.

Standard Operating Procedure ER-SOP-03.08, Rev. 1
Geomorphic Characterization

Description:

SOP ER-SOP-03.08, Rev. 1, describes the procedures to be followed for conducting geomorphic characterization studies of potentially contaminated sediments at the facility. Specifically, the SOP provides procedures for preparing geomorphic maps, defining geomorphic units, describing physical characteristics of the sediments, measuring sediment thickness, and calculating sediment volumes. The SOP consists of a narrative and one attachment. Attachment A contains a geomorphic characterization equipment and supplies checklist.

Comments:

The procedures described in this SOP appear adequate and consistent with standard geologic mapping practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-03.11, Rev. 1
Coordinating and Evaluating Geodetic Surveys

Description:

SOP ER-SOP-03.11, Rev. 1, describes the procedures for coordinating, conducting and evaluating geodetic surveys. Both the Total Station and Global Positioning System (GPS) methods are described along with their advantages and limitations. The SOP consists of a narrative with no attachments.

Comments:

The procedures described in this SOP appear adequate and consistent with standard engineering and surveying practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-06.02, Rev. 2
Field Analytical Measurements of Groundwater

Description:

SOP ER-SOP-06.02, Rev. 2, describes the procedures for measuring the field water quality parameters of groundwater samples, including temperature, specific conductance, alkalinity, pH, dissolved oxygen and turbidity. The SOP provides instructions for use and calibration of the equipment. The SOP consists of a narrative and two attachments. Attachment A contains an equipment and supplies checklist for field analytical measurements of groundwater samples, and Attachment B presents an example of a water quality stabilization record form.

Comments:

Although the procedures described in this SOP are consistent with EPA and general industry practices, two of the procedures are not in strict compliance with the Order. SOP Section 5.2 indicates that groundwater samples will be monitored for temperature, turbidity, specific conductance, pH, alkalinity, and dissolved oxygen during the well purging activities. However, Section IX.B.2.i.i of the Order requires that groundwater samples also be evaluated for redox (oxidation-reduction) potential. The SOP should be revised to incorporate redox potential as a water quality parameter in compliance with the Order.

In addition, Section IX.B.2.i.i of the Order specifies that the groundwater quality parameters be measured using a flow-through cell and instruments approved by the Department. LANL should revise the SOP to ensure that a flow-through cell is used in compliance with the Order.

Standard Operating Procedure ER-SOP-06.15, Rev. 1
Coliwasa Sampler for Liquids and Slurries

Description:

SOP ER-SOP-06.15, Rev. 1, describes the procedures for using a Coliwasa (Composite Liquid Waste Sampler) sampler for the collection of liquid and slurry samples. The SOP describes the construction, uses, and limitations of the sampler, and provides general safety guidelines for sampling drums and containers. The SOP consists of a narrative and one attachment. Attachment A contains an equipment and supplies checklist for Coliwasa sampler for liquids and slurries.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-06.19, Rev. 1
Weighted Bottle Sampler for Liquids and Slurries in Tanks

Description:

SOP ER-SOP-06.19, Rev. 1, describes the procedures for using a weighted bottle sampler for collecting liquid and slurry samples in tanks, wells, sumps, and other containers. The SOP consists of a narrative and one attachment. Attachment A contains an equipment and supplies checklist for weighted bottle sampler for liquids and slurries in tanks.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-06.29, Rev. 2
Single-Stage Sampling of Surface Water Runoff

Description:

ER-SOP-06.29, Rev. 2 discusses the procedures for collecting surface water runoff samples. The SOP outlines different equipment depending on the remoteness of the sample location. A single-stage sampler type 1 is more beneficial for use in more accessible areas, while the single-stage sampler type 2 is more appropriate for remote locations. The SOP also provides a discussion on how the sampler actually collects the sample. Two attachments are provided. Attachment A includes a schematic of how a siphon-type (single-stage sampler type 1) sampler works, while Attachment B provides photographs of environmental liquid samplers (bottles that attach to the single-stage sampler type 2).

Comments:

The procedures described in this SOP appear adequate and consistent with EPA, United State Geological Society (USGS), and general industry practices. Section 7.0 of the SOP discusses the necessary equipment for collecting surface water runoff samples. However, none of the actual sampling equipment (i.e., type 1 or type 2 sampler) is addressed. The list of equipment should contain all equipment necessary, including the siphon sampler and the environmental liquid sampler.

Standard Operating Procedure ER-SOP-06.32, Rev. 1
Multi-level Groundwater Sampling of Monitoring Wells – Westbay MP System®

Description:

SOP ER-SOP-06.32, Rev. 1, describes the procedures to be followed for sampling multi-completion monitoring wells using the Westbay MP System®. The SOP provides instructions for setting up the equipment, and collecting and filtering groundwater samples. The SOP consists of a narrative and three attachments. Attachment A contains an equipment and supplies checklist for sampling the Westbay MP System®. Attachment B presents a Westbay groundwater sampling field data sheet and instructions, and Attachment C presents a water quality sampling record for Westbay wells and instructions.

Comments:

The procedures described in this SOP appear adequate and consistent with general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-07.01, Rev. 1
Pressure Transducers

Description:

SOP ER-SOP-07.01, Rev. 1, describes the procedures to be followed for the setup and use of pressure transducers in monitoring wells and boreholes. The SOP describes the field setup activities, procedures for conducting depth-response and drift tests, and field operation activities. The SOP consists of a narrative and one attachment. Attachment A contains an equipment and supplies checklist for pressure transducers.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-07.02, Rev. 1
Water Level Measurement

Description:

SOP ER-SOP-07.02, Rev. 1, describes the procedures for determining the depth to water in monitoring wells, open boreholes, and piezometers. The SOP describes the equipment and methods used to measure the depth to groundwater, as well as the pre-operational activities and water level measurement procedures. The SOP consists of a narrative and three attachments. Attachment A contains an equipment and supplies checklist for water level measurement. Attachment B presents an example of a water-level elevation data sheet, and Attachment C presents the water-level elevation data sheet completion guidelines.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-07.03, Rev. 1
Slug Tests

Description:

SOP ER-SOP-07.03, Rev. 1, describes the procedures to be followed for conducting slug tests in monitoring wells and boreholes to determine the saturated hydraulic conductivity of a water-bearing formation. The SOP describes the advantages and limitations of using slug tests to estimate aquifer hydraulic conductivity, and outlines the different field procedures required for conducting slug tests with and without pressure transducers, and with straddle-packer assemblies. Methods for analyzing the slug test results are not included in the SOP. The SOP consists of a narrative and three attachments. Attachment A contains an equipment and supplies checklist for slug tests. Attachment B presents an example of a slug test data form and instructions, and Attachment C presents a straddle-packer/injection test data sheet and instructions.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-07.04, Rev. 2
Pumping Tests

Description:

SOP ER-SOP-07.04, Rev. 2, describes the procedures for performing pumping tests to determine the hydraulic properties of an aquifer. The SOP describes the pre-operational, operational, and post-operational procedures involved in conducting pumping tests and discusses both the pumping and recovery phases. Methods for analyzing the pumping test results are not included in the SOP. The SOP consists of a narrative and two attachments. Attachment A contains an equipment and supplies checklist for aquifer pumping tests, and Attachment B presents an example of a pumping/recovery test data form and completion instructions.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices. There are no additional comments at this time.

Standard Operating Procedure ER-SOP-10.01, Rev. 1
Screening for Polychlorinated Biphenyls in Soil

Description:

ER-SOP-10.01, Rev.1 outlines the general procedures for conducted field screening of soil for polychlorinated biphenyls (PCBs). The SOP does not provide much information, as all information on how to use the equipment is listed as "see manufacturer instructions". One attachment is included, Attachment A, which is a sample screening data sheet.

Comments:

Although the information provided in the SOP was quite vague, the procedures described in this SOP appear generally consistent with the EPA and industry practices. However, there are a few concerns as noted in the following:

Section 6.2, which describes how to use the field-screening equipment, simply states to follow the manufacturer's instruction for conducting the screening analysis. While this is important, as there could be variations in equipment operations depending on manufacturer, the general process of how to use the equipment should be provided. In addition to the information noting that specific manufacturer instructions should be followed, the SOP should be revised to also include a general summary of how the equipment should be used.

The SOP does not address equipment that should be used for collection of the sample prior to placement in the PCB screening kit. Nor does the SOP address decontamination of sampling equipment in between samples. It is recommended that the SOP be revised to address all aspects of field screening for PCBs, including how to collect the sample, what type of sampling equipment (type and material) should be used, and decontamination of sampling equipment between samples.

In addition, Section 6.2.2 discusses submitting samples to an outside laboratory for independent analysis. A reference to LIR-404-00-06.1, Managing Polychlorinated Biphenyls, should be included in this section to ensure all proper procedures for sample handling and shipment are followed.

Standard Operating Procedure ER-SOP-10.08, Rev. 2
Operation of the Spectrace 9000 Field-Portable X-Ray Fluorescence Instrument

Description:

ER-SOP-10.08, Rev. 2 describes the process for operating and using the Spectrace 900 field-portable x-ray fluorescence (XRF) analyzer to screen potentially contaminated material. The SOP provides a good discussion of how the XRF works and how the operate and maintain the XRF in good working order. Detailed procedures for sampling handling and applications are provided. Attachment A contains minimum detection levels (MDLs) for various radionuclides depending on source-measuring times and specific source. Attachment B contains a list of acronyms and abbreviation.

Comments:

The procedures described in this SOP appear adequate and consistent with EPA and general industry practices.

The SOP was also compared to the Order. The procedures and uses for the XRF outlined in the SOP appear consistent with the discussion of XRF screening outlined in Section IX.B.2.d, Soil, Rock, and Sediment Sample Field Screening, of the Order.

One minor comment was noted concerning the SOP. Section 6.3.2 states that a leak test be conducted on the source(s) in the probe every six months. Either the SOP should be revised to address how the leak test should be conducted or a reference to the SOP that contains the information should be provided.

Standard Operating Procedure ER-SOP-10.14, Rev. 0
Performing and Documenting Gross Gamma Radiation Scoping Surveys

Description:

ER-SOP-10.14, Rev.0 provides general information on how to conduct a walk-over gamma scooping survey to determine if an area exhibits elevated levels of gamma radiation above background. The SOP describes the types of radiation instruments and detectors (probes) that may be used for conducting gamma surveys, how to conduct daily source checks and instrument checks, assessment instrument calibration, how to determine background, and how to perform an actual survey.

Comments:

The procedures described in this SOP appear consistent with EPA, Department of Energy (DOE), and general industry practices; however, some major concerns with the general procedure are noted below.

Section 6.1.7 describes how to take the background measurements. The description should also include that the detector should be held above the background source at the same level, or close to the same level, as the detector will be maintained above the source area to be surveyed.

Section 6.2.2.1 states that the height of the detector should be varied to determine the maximum radiation level. The SOP should state that the height of the detector should not go below the height of the detector when taking the background measurements. Ideally, the source measurement should be taken with the detector height the same as that used for determining background.

Sections 6.2.2.2 and 6.2.3 indicate that a 15 second reading is sufficient to determine the maximum radiation level. Justification for the adequacy of a 15-second count rate has not been provided. Depending on the radionuclide(s), the concentration/activity, and the instrument sensitivity, longer count times may be necessary. Scanning rates and count times are typically calculated. It is suggested that the SOP be revised in regard to the minimum 15-second count rate. The *Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)* (NUREG 1575) provides information on how to determine count rates and scanning rates.