Appendix B

Field Methods

B-1.0 INTRODUCTION

This appendix summarizes the field methods implemented during the 2011 investigation at the Lower Mortandad/Cedro Canyons Aggregate Area at Los Alamos National Laboratory (LANL or Laboratory). Table B-1.0-1 summarizes the field investigation methods, and the following sections provide more detailed descriptions of these methods. All activities were conducted in accordance with approved subcontractor procedures that are technically equivalent to Laboratory standard operating procedures (SOPs) listed in Table B-1.0-2 and are available at http://www.lanl.gov/environment/all/qa/adep.shtml.

B-2.0 EXPLORATORY DRILLING CHARACTERIZATION

No exploratory drilling characterization was conducted during the 2011 investigation. All drilling was conducted for the purpose of collecting investigation samples.

B-3.0 FIELD-SCREENING METHODS

This section summarizes the field-screening methods used during the investigation activities. Field screening for organic vapors was performed for health and safety purposes. Field screening for radioactivity was performed on every sample submitted to the Sample Management Office (SMO). Field-screening results for all investigation activities are described in section 3.2.3 and are presented in Table 3.2-2 of the investigation report.

B-3.1 Field Screening for Organic Vapors

Field screening for organic vapors was conducted for all samples at all locations. Screening was conducted using a MiniRAE 2000 photoionization detector (PID) equipped with an 11.7-electron volt lamp. Screening was performed in accordance with the manufacturer's specifications and SOP-06.33, Headspace Vapor Screening with a Photo Ionization Detector. Screening was performed on each sample collected, and screening measurements were recorded on the field sample collection logs (SCLs), provided on DVD in Appendix F. The field-screening results are presented in Table 3.2-2 of the investigation report.

B-3.2 Field Screening for Radioactivity

All samples collected were field screened for radioactivity before they were submitted to the SMO, targeting alpha and beta/gamma emitters. A Laboratory radiation control technician (RCT) conducted radiological screening using an Eberline E-600 radiation meter with an SHP-380AB alpha/beta scintillation detector held within 1 in. of the sample. The Eberline E-600 with attachment SHP-380AB consists of a dual phosphor plate covered by two Mylar windows housed in a light-excluding metal body. The phosphor plate is a plastic scintillator used to detect beta and gamma emissions and is thinly coated with zinc sulfide to detect alpha emissions. The operational range varies from trace emissions to 1 million disintegrations per minute. Screening measurements were recorded on the SCLs, which are provided on DVD in Appendix F. The screening results are presented in Table 3.2-2 of the investigation report.

B-3.3 XRF Survey

A survey of lead contamination at Solid Waste Management Unit (SWMU) 05-006(c) was conducted using a field x-ray fluorescence (XRF) instrument to identify areas of elevated lead concentrations. The survey was conducted using a Niton XL3t 600 XRF analyzer with sufficient sensitivity (i.e., 100 mg/kg or less) to identify areas of lead contamination above the industrial soil screening level (SSL). The survey was conducted in accordance with an approved subcontractor procedure technically equivalent to

SOP-5047, X-Ray Fluorescence Analysis. The instrument was operated according to the manufacturer's instructions, including collecting, preparing, and analyzing samples. Details of the XRF survey and the results are presented in Appendix C.

B-4.0 FIELD INSTRUMENT CALIBRATION

Instrument calibration and/or function check was completed daily. Several environmental factors affected the instruments' integrity, including air temperature, atmospheric pressure, wind speed, and humidity. Calibration of the PID was conducted by the site-safety officer. The RCT calibrated the Eberline E-600 instrument according to the manufacturer's specifications and requirements.

B-4.1 MiniRAE 2000 Instrument Calibration

The MiniRAE 2000 PID was calibrated both to ambient air and a standard reference gas (100 ppm isobutylene). The ambient-air calibration determined the zero point of the instrument sensor calibration curve in ambient air. Calibration with the standard reference gas determined a second point of the sensor calibration curve. Each calibration was within 10% of 100 ppm isobutylene, qualifying the instrument for use.

The following calibration information was recorded daily on operational calibration logs:

- instrument identification number
- final span settings
- date and time

concentration and type of calibration gas used (isobutylene at 100 ppm) and name of the personnel performing the calibration

All daily calibration procedures for the MiniRAE 2000 PID met the manufacturer's specifications for standard reference gas calibration.

B-4.2 Eberline E-600 Instrument Calibration

The RCT calibrated the Eberline E-600 daily before local background levels for radioactivity were measured. The instrument was calibrated using plutonium-239 and chloride-36 sources for alpha and beta emissions, respectively. The following five checks were performed as part of the calibration procedures:

- calibration date
- physical damage
- battery
- response to a source of radioactivity
- background

All calibrations performed for the Eberline E-600 met the manufacturer's specifications and the applicable radiation detection instrument manual.

B-4.3 Niton XL3t 600 XRF Analyzer Calibration

The Niton XL3t 600 XRF Analyzer was calibrated by the manufacturer and provided with a certification of calibration. The instrument was checked daily for proper function and calibration using standard aliquots of metals, including lead, as provided by the manufacturer.

B-5.0 SURFACE AND SUBSURFACE SAMPLING

This section summarizes the methods used for collecting surface and subsurface samples, including soil, tuff, and sediment samples, according to the approved investigation work plan (LANL 2010, 108281; NMED 2010, 108451).

B-5.1 Surface Sampling Methods

Surface samples were collected in Technical Area 05 (TA-05) using either hand-auger or spade-and-scoop methods. Surface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.09, Spade and Scoop Method for the Collection of Soil Samples. A hand auger or spade and scoop were used to collect material in approximately 6-in. increments. Samples for volatile organic chemical (VOC) analysis were transferred immediately from the sampler to the sample container to minimize the loss of VOCs during the sample-collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. The remaining sample material was placed in a stainless-steel bowl with a stainless-steel scoop, after which it was transferred to sterile sample collection jars or bags. Samples were preserved using coolers to maintain the required temperature and chemical preservatives such as nitric acid in accordance with an approved subcontractor procedure technically equivalent to SOP-5056, Sample Containers and Preservation.

Samples were appropriately labeled, sealed with custody seals, and documented before transporting to the SMO. Samples were managed according to approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and WES-EDA-QP-219, Sample Control and Field Documentation.

Sample collection tools were decontaminated (section B-5.7) immediately before each sample was collected in accordance with a subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment.

B-5.2 Borehole Logging

Borehole logs were completed for all boreholes drilled at TA-05 with a hollow-stem auger drill rig. The logs were completed in accordance with an approved subcontractor procedure technically equivalent to SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials. Information recorded in field boring logs included footage and percent recovery, lithology and depths of lithologic contacts, depth of samples collected, field screening results, core descriptions, and other relevant observations. The borehole logs are presented in Appendix D.

B-5.3 Subsurface Tuff Sampling Methods

Subsurface samples were collected in accordance with approved subcontractor procedures technically equivalent to SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, or SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials.

Samples for VOC analysis were transferred immediately from the split-spoon core barrel or hand auger to the sample container to minimize the loss of VOCs during the sample-collection process. Containers for VOC samples were filled as completely as possible, leaving no or minimal headspace, and sealed with a Teflon-lined cap. If necessary, pieces small enough to fit into the sample container were removed from the core using a decontaminated rock hammer or stainless-steel spoon to minimize the loss of VOCs. The remaining material was then field screened for radioactivity and visually inspected. After the VOC samples were collected and field screened, the remaining sample material was placed in a stainless-steel bowl, and the material was broken, if necessary, with a decontaminated rock hammer or stainless-steel spoon to fit the material into the sample containers.

A stainless-steel scoop and bowl were used to transfer samples to sterile sample collection jars or bags for transport to the SMO. The sample collection tools were decontaminated immediately before each sample was collected (see section B-5.7) in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment.

A hollow-stem auger drill rig equipped with an unlined split-spoon core barrel sampler was used to collect samples for VOC analysis at one location at SWMU 05-004. The sampling procedure involves some disturbance of the sample during collection and transfer to the sample container.

Samples for VOC analysis were collected at SWMU 05-004 using a hollow-stem auger drill rig at depths of 5–6 ft, 9–10 ft, 14–15 ft, 19–20 ft, 24–25 ft, 34–35 ft, and 44–45 ft below ground surface (bgs) at location 05-613790. Vertical extent of VOC contamination at this location was defined using decreasing concentration trends. Because all samples were collected using the same procedure, potential VOC loss associated with the procedure should not have affected the vertical concentration trends used to define extent.

Four VOC chemicals of potential concern were identified in analytical results at SWMU 05-004: 2-hexanone, 4-isopropyltoluene, methylene chloride, and styrene. The residential soil screening levels (SSLs) for these VOCs are 3 to 7 orders of magnitude greater than the maximum detected concentrations. Therefore, even if significant VOC (e.g., 99%) loss had occurred during sample collection (which is not likely), the actual concentrations of VOCs would still be far less than SSLs, and the determination of acceptable risk is accurate.

B-5.4 Sediment Sampling

Before sediment samples were collected, the field geologist identified sediment accumulation areas within the drainage channel most likely to have received runoff from the sites being investigated. As a result, sediment samples were collected from areas of sediment accumulation that would be representative of historical Laboratory operations. When applicable, sampling locations were biased to areas with the greatest thickness of fine-grained sediments. In addition, sampling was restricted to the drainage channel and all surface samples were collected from 0 to 1 ft bgs.

In the drainage channels downgradient of SWMUs 05-004 and 05-005(b), the sediment cover was thin, and the sediment/tuff interface was typically a foot or less below the ground surface. The shallow depth of sediment accumulation above the tuff indicated the sediment deposits were relatively recent and therefore were representative of geomorphic conditions most likely to have affected by discharges from Laboratory operations at these sites.

B-5.~~4~~5 Quality Control Samples

Quality control (QC) samples were collected in accordance with an approved subcontractor procedure technically equivalent to SOP-5059, Field Quality Control Samples. The QC samples included field duplicates, field rinsate blanks, and field trip blanks. Field duplicate samples were collected from the same material as the regular investigation samples and submitted for the same analyses. Field duplicate samples were collected at a frequency of at least 1 duplicate sample for every 10 samples.

Field rinsate blanks were collected to evaluate field decontamination procedures. Rinsate blanks were collected by rinsing sampling equipment (i.e., auger buckets and sampling bowls and spoons) after decontamination with deionized water. The rinsate water was collected in a sample container and submitted to the SMO. Field rinsate blank samples were analyzed for inorganic chemicals (target analyte list metals, cyanide, nitrate, and perchlorate) and were collected from sampling equipment at a frequency of at least 1 rinsate sample for every 10 solid samples.

Field trip blanks were collected at a frequency of one per day at the time samples were collected for VOCs. Trip blanks consisted of containers of certified clean sand opened and kept with the other sample containers during the sampling process. Trip blanks were analyzed for VOCs only.

B-5.~~5~~6 Sample Documentation and Handling

Field personnel completed a SCL form for each sample. Sample containers were sealed with signed custody seals and placed in coolers at approximately 4°C. Samples were handled in accordance with approved subcontractor procedures technically equivalent to SOP-5057, Handling, Packaging, and Transporting Field Samples, and SOP-5056, Sample Containers and Preservation. Swipe samples were collected from the exterior of sample containers and analyzed by the RCT before the sample containers were removed from the site. Samples were transported to the SMO for processing and shipment to off-site contract analytical laboratories. The SMO personnel reviewed and approved the SCLs and accepted custody of the samples.

B-5.~~6~~7 Borehole Abandonment

All boreholes were abandoned in accordance with an approved subcontractor procedure technically equivalent to SOP-5034, Monitor Well and RFI Borehole Abandonment, by filling the boreholes with bentonite chips up to 1 ft from the ground surface. The chips were hydrated and clean soil placed on top. All cuttings were managed as investigation-derived waste (IDW) as described in Appendix G.

B-5.~~7~~8 Decontamination of Sampling Equipment

The split-spoon core barrels and all other sampling equipment that came (or could have come) in contact with sample material were decontaminated after each core was retrieved and logged. Decontamination included wiping the equipment with Fantastik and paper towels. Decontamination of the drilling equipment was conducted before mobilization of the drill rig to another borehole to avoid cross-contamination between samples and borehole locations. Residual material adhering to equipment was removed using dry decontamination methods such as the use of wire brushes and scrapers. Decontamination activities were performed in accordance with an approved subcontractor procedure technically equivalent to SOP-5061, Field Decontamination of Equipment. Decontaminated equipment was surveyed by an RCT before it was released from the site.

B-5.~~8~~9 Site Demobilization and Restoration

Before equipment was removed from the site, a Laboratory RCT screened the equipment for radioactivity to ensure all equipment was clean of site contamination. All temporary fencing and staging areas were dismantled and returned to pre-investigation conditions. All excavated and disturbed areas were re-contoured.

B-6.0 DEBRIS REMOVAL AND EXCAVATION

B-6.1 Debris Removal

The approved work plan called for debris removal at SWMU 05-006(c) (LANL 2010, 108281). A small amount of burned debris (charred wood, melted glass, and metal) was removed from the former location of building 05-5 [SWMU 05-006(c)]. Also present in the debris were fragments of lead from the shielding in building 05-5. XRF field screening identified two sampling locations with lead levels above the industrial SSL (Figure C-2.2-1 and Table C-2.2-1 in Appendix C). Contaminated soil and tuff were excavated and depth of the excavation ranged from 0.5–1 ft bgs to remove media that contained lead exceeding the industrial SSL. The debris and underlying soil or tuff were removed with a combination of hand tools and heavy equipment. The debris was segregated and containerized in accordance with the waste characterization strategy form (WCSF). Confirmation sampling was conducted to define the nature and extent of lead contamination at the excavation at SWMU 05-006(c). The results of confirmation samples are presented in section 6.4.2.4 of the investigation report.

B-6.2 Excavation at Location 05-613800

After evaluating the initial analytical results, the Laboratory proposed to conduct further sampling (LANL 2011, 203592) and NMED approved the additional sampling (NMED 2011, 203618). The additional sampling included excavating the surface soil at location 05-613800 (outside the debris area) associated with SWMU 05-006(c), but located within SWMU 05-005(b), to remove additional lead contamination. The surface soil and underlying tuff at this location were excavated and depth of the excavation ranged from 1–2 ft bgs within the remediated area. Confirmation samples were collected to define the nature and extent of lead contamination. The results of confirmation samples are presented in section 6.4.2.4 of the investigation report.

B-7.0 GEODETIC SURVEYING

Geodetic surveys of all sampling locations were performed using a Trimble R8 Global Navigation Satellite System (GNSS) referenced from published and monumented external Laboratory survey control points in the vicinity. All sampling locations were surveyed in accordance with an approved subcontractor procedure technically equivalent to SOP-5028, Coordinating and Evaluating Geodetic Surveys. Horizontal accuracy of the monumented control points is within 0.1 ft. The Trimble R8 GNSS instrument referenced from Laboratory control points is accurate within 0.2 ft. The surveyed coordinates are presented in Table 3.2-1 of the investigation report.

B-8.0 IDW STORAGE AND DISPOSAL

All IDW generated during the field investigation was managed in accordance with an approved subcontractor procedure technically equivalent to SOP-5238, Characterization and Management of Environmental Program Waste. This procedure incorporates the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, U.S. Department of Energy orders, and Laboratory implementation requirements. IDW was also managed in accordance with the approved

WCSF and the IDW management appendix of the approved investigation work plan (LANL 2010, 108281; NMED 2010, 108451). Details of IDW management for the Lower Mortandad/Cedro Canyons Aggregate Area investigation are presented in Appendix G.

B-9.0 DEVIATIONS FROM THE WORK PLAN

Implementation of investigation activities resulted in the following deviations from the approved investigation work plan:

1. *SWMU 05-005(b):* Nine samples were collected from three new locations in another discernable drainage identified during sampling of the preapproved locations according to the work plan in order to capture the nature and extent of contamination in the drainages downgradient of the site.

2. *SWMU 05-005(b):* Sample RE05-11-14597 from 2–3 ft bgs was inadvertently analyzed for acenaphthylene instead of acenaphthene. However, three other samples, RE05-11-14596, RE05-11-14598, and RE05-11-14599, collected at this location from 0–1 ft, 5–6 ft, and 9–10 ft bgs, respectively, are sufficient to define the lateral and vertical extent of acenaphthene at the site.

3. *SWMU 05-006(c):* Confirmation samples were collected at four locations (05-613925, 05-613926, 05-613927, and 05-613928) from 0–1 ft bgs at the bottom of excavation. Only surface samples were collected (the work plan proposed 0–1 ft, 2–3 ft, and 5–6 ft bgs, Table 4.0-1, LANL 108281) because there were sampling locations with multiple depths within the immediate vicinity of these four locations.

4. *Geomorphic Characterization Report:* In its January 22, 2010, approval with modifications letter (NMED 2010, 108451) NMED added a requirement to include a geomorphic characterization report as an appendix to this investigation report. The investigation work plan (LANL 2010, 108281) indicated that field observation of geomorphic relationships would be considered by the field geologist to aid in selecting locations likely to have been impacted by Laboratory operations. The purpose of these observations was not to perform a detailed geomorphic characterization, such as are performed in canyons investigations and presented in canyons investigation reports. Preparation of a geomorphic characterization report is beyond the scope of investigation activities previously and currently conducted for aggregate area investigations. Therefore, the geomorphic characterization report was not prepared and is not presented as an appendix to this investigation report.

   As indicated in sections 3.2.4 of the report and B-5.4 of this apendix, sediment samples were collected from areas of sediment accumulation that include sediment determined to be representative of the historical period of Laboratory operations. Field screening was also used to identify areas potentially impacted by historical releases from Laboratory operations. There were no deviations from the proposed sampling approach in the investigation work plan to identify sediment sampling locations.

B-10.0 REFERENCES

The following list includes all documents cited in this appendix. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau and the Directorate. The set was developed to ensure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), January 2010. "Investigation Work Plan for Lower Mortandad/Cedro Canyons Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-10-0048, Los Alamos, New Mexico. (LANL 2010, 108281)

LANL (Los Alamos National Laboratory), May 20, 2011. "Extension Request for the Lower Mortandad/Cedro Canyons Aggregate Area Investigation Report," Los Alamos National Laboratory letter (EP2011-0189) to J. Kieling (NMED-HWB) from M.J. Graham (LANL) and G.J. Rael (DOE-LASO), Los Alamos, New Mexico. (LANL 2011, 203592)

NMED (New Mexico Environment Department), January 22, 2010. "Approval with Modifications, Investigation Work Plan for Lower Mortandad/Cedro Canyons Aggregate Area, Revision 1," New Mexico Environment Department letter to M.J. Graham (LANL) and G.J. Rael (DOE-LASO) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2010, 108451)

NMED (New Mexico Environment Department), May 31, 2011. "Approval, Extension Request, Lower Mortandad/Cedro Canyons Aggregate Area Investigation Report," New Mexico Environment Department letter to G.J. Rael (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2011, 203618)

Table B-1.0-1
Summary of Field Investigation Methods

Method	Summary
Spade-and-Scoop Collection of Soil Samples	This method was used to collect shallow (i.e., approximately 0-12 in.) soil or sediment samples. The spade-and-scoop method involved digging a hole to the desired depth, as prescribed in the approved work plan, and collecting a discrete grab sample. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. Remaining sample material was placed in a clean stainless-steel bowl for transfer into various sample containers.
Hand-Auger Sampling	This method is typically used for sampling soil or sediment at depths of less than 10–15 ft but in some cases may be used to collect samples of weathered or nonwelded tuff. The method involves hand-turning a stainless-steel bucket auger (typically 3–4 in.-inside diameter [I.D.]), creating a vertical hole that can be advanced to the desired sampling depth. When the desired depth was reached, the auger was decontaminated before the hole was advanced through the sampling depth. Samples for VOC analysis were transferred immediately into sample containers. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The remaining sample material was transferred from the auger bucket to a stainless-steel sampling bowl before the various required sample containers were filled.
Split-Spoon Core-Barrel Sampling	A stainless-steel core barrel was advanced using a hollow-stem auger drilling rig. The core barrel extracted a continuous length of soil and/or rock. The split-spoon core barrel is a cylindrical barrel split length-wise so the two halves can be separated to expose the core sample. Once the core barrel was extracted and opened, a sample for VOC analysis was transferred immediately to a sample container. If necessary, pieces small enough to fit into the sample container were removed from the core using a decontaminated rock hammer or stainless-steel spoon. Containers for VOC analysis were filled as completely as possible and sealed with Teflon-lined caps. The section of core in the core barrel was then screened for radioactivity and organic vapors, and described in a geologic log. A portion of the core was then collected as a discrete sample from the desired depth for remaining analyses.
Handling, Packaging, and Shipping of Samples	Field team members sealed and labeled samples before packing to ensure the sample and the transport containers were free of external contamination. Field team members packaged all samples to minimize the possibility of breakage during transport. After all environmental samples were collected, packaged, and preserved, a field team member transported them to the SMO. The SMO arranged to ship the samples to the analytical laboratories.
Sample Control and Field Documentation	The collection, screening, and transport of samples were documented on standard forms generated by the SMO. These included SCLs and sample container labels. SCLs were completed at the time of sample collection, and the logs were signed by the sampler and a reviewer who verified the logs for completeness and accuracy. Corresponding labels were initialed and applied to each sample container, and custody seals were placed around each sample container. SCLs were completed and signed to verify that the samples were not left unattended.
Field QC Samples	Field QC samples were collected as follows: *Field Duplicates*: At a frequency of 10%; collected at the same time as a regular sample and submitted for the same analyses. *Equipment Rinsate Blank*: At a frequency of 10%; collected by rinsing sampling equipment with deionized water, which was collected in a sample container and submitted for laboratory analysis. *Trip Blanks*: Required for all field events that include the collection of samples for VOC analysis. Trip blank containers of certified clean sand were opened and kept with the other sample containers during the sampling process.

Table B-1.0-1 (continued)

Method	Summary
Field Decontamination of Drilling and Sampling Equipment	Dry decontamination was used to minimize the generation of liquid waste. Dry decontamination included the use of a wire brush or other tool to remove soil or other material adhering to the sampling equipment, followed by use of a commercial cleaning agent (nonacid, waxless cleaners) and paper wipes.
Containers and Preservation of Samples	Specific requirements/processes for sample containers, preservation techniques, and holding times are based on EPA guidance for environmental sampling, preservation, and quality assurance. Specific requirements for each sample were printed on the SCL provided by the SMO (size and type of container [e.g., glass, amber glass, or polyethylene]). All samples were preserved by placing them in insulated containers with ice to maintain a temperature of 4°C.
Coordinating and Evaluating Geodetic Surveys	Geodetic surveys focused on obtaining survey data of acceptable quality to use during project investigations. Geodetic surveys were conducted with a Trimble R8 GNSS. The survey data conformed to Laboratory Information Architecture project standards IA-CB02, GIS Horizontal Spatial Reference System, and IA-D802, Geospatial Positioning Accuracy Standards for A/E/C/ and Facility Management. All coordinates were expressed as State Plane Coordinate System 83, NM Central, U.S. feet. All elevation data were reported relative to the National Geodetic Vertical Datum of 1983.
Management of Environmental Restoration Project Waste, Waste Characterization	IDW was managed, characterized, and stored in accordance with an approved WCSF that documents the site history, field activities, and characterization approach for each waste stream managed. Waste characterization complied with on- or off-site waste acceptance criteria. All stored IDW was marked with appropriate signage and labels. Drummed IDW was stored on pallets to prevent the containers from deteriorating. A waste storage area was established before waste was generated. Waste storage areas were located in controlled areas of the Laboratory to prevent unauthorized personnel from inadvertently adding or managing wastes. Each container of waste generated was individually labeled with waste classification, item identification number, and radioactivity (if applicable), immediately following containerization. All waste was segregated by classification and compatibility to prevent cross-contamination. Management of IDW is described in Appendix G.

Table B-1.0-2
SOPs Used for Investigation Activities Conducted at the Lower Mortandad/Cedro Canyons Aggregate Area

SOP-5018, Integrated Fieldwork Planning and Authorization
SOP-5028, Coordinating and Evaluating Geodetic Surveys
SOP-5034, Monitor Well and RFI Borehole Abandonment
SOP-5047, X-Ray Fluorescence Analysis
SOP-5055, General Instructions for Field Investigations
SOP-5056, Sample Containers and Preservation
SOP-5057, Handling, Packaging, and Transporting Field Samples
WES-EDA-QP-219, Sample Control and Field Documentation
SOP-5059, Field Quality Control Samples
SOP-5061, Field Decontamination of Equipment
SOP-5181, Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities
SOP-5238, Characterization and Management of Environmental Program Waste
SOP-01.12, Field Site Closeout Checklist
SOP-06.09, Spade and Scoop Method for Collection of Soil Samples
SOP-06.10, Hand Auger and Thin-Wall Tube Sampler
SOP-06.26, Core Barrel Sampling for Subsurface Earth Materials
SOP-06.33, Headspace Vapor Screening with a Photo Ionization Detector
SOP-12.01, Field Logging, Handling, and Documentation of Borehole Materials
EP-DIR-QAP-0001, Quality Assurance Plan for the Environmental Programs

Note: Procedures used were approved subcontractor procedures technically equivalent to the procedures listed.