Attachment D-1

Waste Characterization Strategy Form and Amendment #1
(on CD included with this document)

Environmental Programs (EP)
Document Signature Form

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TA-21 Delayed Sites EP2010-0549

Associated Document Catalog Number(s):

Author: Wedgeworth, Bruce S 231-0108 brucew@lanl.gov

Organuzation: Environmental Programs (ADEP) – PKG - 1725

Document Team:

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Amendment #1 TA-21 Delayed Sites	

Reason for Change:

Amendment #1 to WCSF TA-21 Delayed Sites (original EP2010-0549) is to include additional sampling scope for the DP Site Aggregate Area (DPSAA) Phase III sites located on DP Mesa within TA-21. Additional SWMUs and AOCs, for TA-21 DPSAA Phase III sites, which require sampling are as follows:

SWMUs 21-003-99, 21-024(c), , 21-006(c)-99, , 21-022(h), 21-022(h)-99, 21-022(i), 21-022(j), 21-023(a)-99,, 21-024(b), 21-024(d), 21-024(g), 21-024(k), 21-024(n), 21-024(l)-99, , 21-026(a)-99, , 21-027(a),), C-21-027,, 21-006(c)-99 and Diesel fuel spill from above ground storage tank 21-57.

This additional site investigation is included in the TA-21 Delayed Sites work scope and is expected to generate the following unchanged waste streams: **Waste # 1: Drill Cuttings (IDW), Waste # 2: Excavated Environmental Media** and **Waste # 5: Contact Waste**.

The Characterization Strategy, Characterization Table, Waste Description, Anticipated Regulatory Status and Storage and Disposal Method will remain unchanged.

Signatures	Date
ADEP Project Manager (Bruce Wedgeworth) Bruce Wedgeworth	8/3/11
Preparer (Kim Oman) Kim Oman	8/4/11
Waste Management Coordinator (~~Ron De Sotel~~) e Alicia Amerson	8/3/11
ENV-RCRA Representative (Jocelyn Buckley) Jocelyn K. Buckley	8-4-11
WES-Waste Acceptance Representative (Andy Elicio) Andy Elicio	08/04/2011
Waste Certification Program Representative (Randy J. Martinez) Rdy J. M	8/4/11

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Author: Wedgeworth, Bruce S 606 1422 brucew@lanl.gov

Organuzation: TA-21 Closure Project – PKG-1727

Document Team: Sena, Joseph 662-1837 JSena@LATA.com

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Waste Characterization Strategy Form

Project Title	**TA-21 Delayed Sites**
Solid Waste Management Unit	**SWMU's and AOCs Located within MDAT but Outside of the NES Area Boundary, Consolidated Unit 21-022(b)-99, SWMU 21-011(b)**
Activity Type	**Site Investigation**
LATA Field Team Leader	**Saul Alanis**
Waste Management Coordinator	**Ron Desotel**
Completed by	**Kim Oman**
Date	**12/14/2010**

1.0 Description of Activity

The objectives of the proposed investigation activities are removal of inactive structures related to the sites and collect confirmation samples and to define the lateral and vertical extent of contaminants below previously removed structures at DP East and West. The work will be performed in accordance with Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites, EP2009-0434. Trained and qualified Subcontractor Field Waste Management Technician(s) (FWMT), Waste Sampling Personnel (SP), and Hazardous Materials Packaging and Transportation (HMPT) personnel will be assigned to perform the duties outlined in EP-SOP-5238, *Characterization and Management of Environmental Program Waste*.

This waste characterization strategy form (WCSF) describes the management of investigation-derived waste (IDW) and deactivation and decommissioning (D&D) waste which are expected to be generated during the investigation in Technical Area (TA)-21. The IDW and D&D waste may include, but are not limited to, drill cuttings, excavated environmental media, excavated man-made debris, contact waste, decontamination fluids, municipal solid waste, petroleum-contaminated soils, returned or excess samples and un-containerized liquid wastes.

The following activities are planned:

1) All Activities— Includes all hazards, controls, reference documents, and training that are consistent for all activities.
2) Geodetic Survey— This task involves surveying the former disposal units and sampling locations using a hand held GPS unit and/or Total Station unit
3) Mobilization/Demobilization of Equipment – This step will involve delivery of support equipment to the site.
4) Site Preparation – This task will involve the deployment of the heavy equipment and support equipment at each excavation location, establishing HAZWOPER zones (Support Zone (SZ), Contamination Reduction Zones (CRZ), and Exclusion Zone (EZ), and all postings and barriers which will be utilized to control access to the site.
5) Field Screening—This task includes radiological and organic vapor screening of site locations, structures, excavated soils, materials, and field samples.
6) Heavy Equipment Operation—This task includes the use of heavy equipment as required.
7) Excavation/Trenching—This task includes the removal of soil overlying the piping and structures to be removed from the site.
8) Pipe Cutting—This task involves the breaching of pipes for stabilization or removal.
9) Fluid/Sludge Stabilization—This task includes the introduction of stabilizing materials into the components being removed to minimize the potential for dispersal of the contents.

10) Demolition—This task involves razing foundations and associated structural features.

11) Tank/Piping/Sump Removal—This task involves removal of the structures for disposal.

12) Collecting Soil and Tuff Samples—This task involves collecting soil or tuff samples using either a hand auger or an auger drill rig.

13) Using Hand Auger to Collect Soil and Tuff Samples—This task includes collecting samples using a hand auger.

14) Using Auger Drill Rig to Collect Soil and Tuff Samples—This task involves collecting samples using a powered auger drill rig.

15) Borehole Abandonment—This task involves sealing boreholes with grout where required.

16) Decontamination—This task includes the removal of contamination from personnel or equipment.

17) Waste Management –This task involves the management of investigation-derived (IDW) and deactivation and decommissioning (D&D) waste in accordance with this waste characteristic strategy form (WCSF) and all applicable procedures, including but not limited to SOP-5238, Characterization and Management of Environmental Program Waste; P930-1, LANL Waste Acceptance Criteria; P930-2, Waste Certification Program; and P-409, Waste Management. The IDW and D&D wastes may include, but are not limited to, excavated man made debris, excavated environmental media, drill cuttings, contact waste, sampling supplies, decontamination fluids, petroleum-contaminated soils, un-containerized liquid waste, and all other waste that has potentially come into contact with contaminants.

18) Site restoration –This activity involves the restoration of sites to pre-investigation conditions to the degree practicable. This may involve patching concrete or asphalt pavement, land application of cuttings, or seeding or planting vegetation.

2.0 Relevant Site History and Description

TA-21 is located on DP Mesa on the northern boundary of the Laboratory and is immediately east-southeast of the Los Alamos townsite. It extends from the mesa top to the stream channels in two adjacent canyons, DP Canyon to the north and Los Alamos Canyon to the south.

During World War II, the Laboratory was established for the research, development, and testing of the first deliverable nuclear weapon. In 1945, the operations for establishing the chemical and metallurgical properties of the nuclear material necessary to achieve and sustain the nuclear fission reaction were transferred to newly built facilities at TA-21.

DP West operations began in September 1945, primarily to produce metal and alloys of plutonium from the nitrate solution feedstock provided by other production facilities. This procedure involved several acid dissolution and chemical precipitation steps to separate the plutonium and other valuable actinides from the feedstock. A major research objective at DP West was the development of new purification techniques that would increase the efficiency of the separation processes. Details of the purification techniques are discussed in the operable unit work plan for TA-21. Other operations performed at DP West included nuclear fuel reprocessing. In 1977, a transfer of work to the new plutonium facility at TA-55 began, and much of the DP West complex was vacated.

DP East operations also began in September 1945. These facilities were used to process polonium and actinium and to produce initiators (a nuclear weapons component). In 1964, building 21-209 was built to house research into high-temperature and actinide chemistry. Building 21-155 housed the TSTA for developing and demonstrating effective technology for handling and processing deuterium and tritium fuels used in fusion reactors.

TA-21 includes five MDAs: A, B, T, U, and V (Figure 1.0-1). Process wastes, transuranic (TRU) wastes, and liquid wastes were disposed of at the MDAs from the early 1940s until the late 1970s. Details of the disposal methods are presented in the TA-21 operable unit work plan. The major contributors to waste streams at TA-21 were plutonium-processing activities. Numerous other chemicals were used for separation techniques and were present in the waste stream. Airborne emissions, including tritium, were released from some of the buildings at DP West and DP East; these releases are also discussed in the TA-21 operable unit work plan.

Consolidated Unit 21-004(b)-99 Waste Lines, Outfall, and Overflow Holding Tanks Background

Consolidated Unit 21-004(b)-99 (Figure 4.1-1) consists of SWMU 21-004(b), SWMU 21-004(c), and AOC 21-004(d). SWMUs 21-004(b) and (c) are two aboveground stainless steel tanks that were installed in 1979. They were used as overflow holding tanks for liquid waste from cooling towers, and Laboratory and radionuclide experimental operations in the TSTA facility (building 21-155). Each tank is 9 ft high and 8 ft in diameter and has a capacity of 3000 gallons. Both tanks are currently mounted on steel legs above the surface of an asphalt bermed area. The bermed area has a capacity of approximately 9600 gal. and measures 36 ft long by 18 ft wide. The drain line connected to these tanks, as well as an outfall area that was present in 1965 before the tanks were installed, comprises AOC 21-004(d). The tanks were connected to the existing vitrified clay outfall pipe and concrete headwall (a small retaining wall placed at the outlet of a stormwater pipe or culvert) by an aboveground 6-in. galvanized pipe that connects to the top of the tanks. The former outfall discharge area was located where the concrete headwall is situated today

SWMU 21-011 (B), Acid Waste Sump and Lines

SWMU 21-011(b) is an acid waste sump (structure 21-223) located approximately 760 ft east of the TA-21 waste treatment plant (building 21-257) and 70 ft northwest of the TSTA (building 21-155).
The sump is located inside a small metal building (no structure number assigned). In 1965, 4-in. piping was installed to transport acid waste from building 21-155 to the sump (structure 21-223).
From the sump, a 3-in. waste line transported acid waste to the old waste treatment plant/laboratory (building 21-035). The sump also connected to a 6-in. vitrified clay overflow pipe, which discharged to DP Canyon, eventually running into the same area as the discharge from the SWMU 21-024(h) septic system. The SWMU 21-024(h) outfall was addressed in the DP Site Phase I and II investigations.

In 1967/1968, the old waste treatment plant/laboratory (building 21-035) was removed and the sump outlet line was extended to the new waste treatment plant (building 21-257). In 1979, the sump overflow pipe was connected to the aboveground stainless steel storage tanks [structure 21-346, Consolidated Unit 21-004(b)-99] In the mid- to late-1980s, two new 4-in. acid waste steel or iron lines were connected from building 21-155 to manhole 21-221.

Consolidated Unit 21-022 (b)-99, Industrial Waste Lines and Sumps

Consolidated Unit 21-022(b)-99 consists of SWMUs 21-022(b), 21-022(c), 21-022(d), 21-022(e), and 21-022(g). These SWMUs are industrial waste lines and associated underground liquid waste sumps; structure 21-082 [SWMU 21-022(b)], structure 21-084 [SWMU 21-022(c)], structure 21-087 [SWMU 21-022(d)], structure 21-089 [SWMU 21-022(e)], and structure 21-189 [SWMU 21-022(g)].

Structures 21-082, 21-084, 21-087, and 21-089 [SWMUs 21-022(b)-(e)] were located adjacent to the northeast corners of buildings 21-002, 21-003, 21-004, and 21-005, respectively. These brick and concrete sumps were constructed in 1945 and were approximately 5 ft, 4 in. in diameter and 10 ft deep.

Construction drawings show a 2-ft-diameter, 5-ft-deep steel catch basin within each sump. The sumps received all of the liquid waste discharges, including the floor drains, janitor sinks, and chilled water overflows, from their respective buildings and subsequently flowed through the industrial waste lines to MDA T for disposal. The pipeline connecting the sumps to the buildings was constructed of 6-in. cast iron or steel).

In 1952, the waste treatment plant/laboratory (building 21-035) was constructed at MDA T. A 4-in. extra heavy cast iron (EHCI) waste line was installed north of the old 6-in. iron pipe (which was left in place). The sumps were connected to the new line through 4-in. EHCI pipes; the 6-in. connections were removed. Buildings 21-002, 21-003, and 21-005 had additional 1.5-in. stainless steel raffinate waste (liquid remaining after extraction) lines or citrate waste lines that connected directly to the waste treatment plant/laboratory (building 21-035). In 1963, plastic liners were placed inside and grouted to the walls of structures 21-082, 21-084, 21-087, and 21-089. In the late 1960s, building 21-035 was removed and all 4-in. and 1.5-in. waste lines were extended to the new waste treatment plant building 21-257.

In the early 1960s, a sump [structure 21-189, SWMU 21-022(g)] was constructed of concrete with dimensions of 5 ft, 4 in. in diameter and 12 ft deep. It was located off the northwest corner of building 21-150, the plutonium fuel service and development building, which housed plutonium fuels development activities. The sump was connected to the plutonium fuel storage building and the waste treatment plant/laboratory (21-035) by 4-in. EHCI pipes. This line was extended to building 21-257 when building 21-035 was removed in 1968.

In 1979 and 1980, all five sumps (structures 21-082, 21-084, 21-087, 21-089, and 21-189) were excavated and removed and disposed of at TA-54. Contaminated soil was removed around the sumps until further excavation jeopardized the buildings. Some of the removed soil had retrievable levels of plutonium. The removal of additional soil was deferred to a later date when the buildings or waste lines were decommissioned. All excavated surfaces were sprayed with asphalt undercoating and backfilled with clean soil. The radioactive contamination remaining on the walls and bottoms of the excavation areas was monitored using a zinc sulfide (ZnS) alpha scintillator. The depths of the excavation at all five sump locations were approximately 14 to 16 ft bgs.

In the late 1980s, a work order was issued to replace the industrial waste lines in the utility tunnels around the inside perimeter of buildings 21-003 and 21-004. The work was started at building 21-004 in 1988 and ended in 1989. Sludge accounted for 50% of the volume of the pipe and was treated as TRU waste. The waste lines associated with building 21-003 were not replaced. Around this same time, an asbestos survey was completed in the pipe tunnels of buildings 21-003 and 21-004. Asbestos covered some of the piping and was found to have fallen on the pipe tunnel floors.

In the early to mid 1990s, dye tests were performed to identify all drains from the buildings and structures at TA-21 and to determine where they terminated. A series of dye tests were performed in buildings 21-003 and 21-004. Dye testing at building 21-004 was successful; all dye reached the expected destination. Dye was not reaching building 21-257, the waste treatment plant, from building 21-003. Camera equipment was placed into the piping in building 21-003 at the northeast corner of the building; the piping contained standing water, which appeared to be from a leak or plug in the piping. NMED was notified of the situation on November 30, 1994. Following, NMED requested a Corrective Action Report. In response, the Laboratory submitted a National Pollutant Discharge Elimination System Permit Release Notification Form, stating a discharge had not been identified and was being reported as a potential concern. The release notification summarized the dye test findings and summarized that there was no indication that liquid had escaped into the environment. A critique of the findings was conducted on December 1, 1994. It was decided to report this incident as an off-normal potential concern pending further investigation.

In the early to late 1990s, the north and south ends of buildings 21-003 and 21-004 were removed. Buildings 21-002, 21-005, and 21-150 are still present, as well as the hallways connecting these buildings.

SWMU's and AOCs Located within MDA T but Outside of the NES Area Boundary

These SWMUs/AOCs include former building 21-035 and other structures associated with this building:

- SWMU 21-010(a), building 21-035, was an industrial liquid waste treatment facility used for treating and disposing of contaminated liquid waste from plutonium and uranium-processing laboratories at DP Site beginning in 1952 and removed in 1968;
- SWMU 21-010(b), structure 21-093, was initially a water manhole that was changed to an acid valve pit manhole, located on the southwest corner of building 21-035, and likely removed in 1968;
- SWMU 21-010(c), structure 21-145, was a steel 500-gal. underground process tank located near the southwest corner of building 21-035 and likely removed in 1968;
- SWMU 21-010(d), structure 21-147, was a steel 500-gal. underground process tank located near the southwest corner of building 21-035 and likely removed in 1968;
- SWMU 21-010(e), structure 21-185, was a 390-gal. sanitary waste septic tank and leach field located on the northeast corner of building 21-035; the septic tank was likely removed in 1968; it is unknown if the leach field is still present;
- SWMU 21-010(f), structure 21-192, was a grit chamber located at the northeast corner of building 21-035 and removed in 1968;
- SWMU 21-010(g), structure 21-255, was a 2000-gal. aboveground process tank located at the southwest corner of building 21-035 and removed in 1968;
- SWMU 21-010(h), structure 21-271, was a process manhole located at the southwest corner of building 21-035 and likely removed in 1968;
- AOC C-21-002 was a radionuclide leak from a waste storage tank to the surrounding soil near building 21-035;
- AOC C-21-010 was a radiation leak at building 21-035;
- AOC C-21-028(a) was an inactive satellite storage area utilized for the storage of acetone and Freon. Location of the site is unknown. The SWMU report identifies this site as structure 21-121 near loading docks. The Rogers report indicates 21-121 is the location of the distribution box between Absorption Beds 1 and 2 at MDA T;
- AOC C-21-034, structure 21-091, was a 1000-gal. raffinate holding tank with a manhole located at the southwest corner of building 21-035 and likely removed in 1961 (LANL 1983, 035510);
- AOC C-21-035, structure 21-110, was the former location of an aboveground process water holding tank on the south side of building 21-035 and now located near building 21-257;
- AOC C-21-036, structure 21-111, was the former location of an aboveground process water holding tank on the south side of building 21-035 and now located near building 21-257;
- AOC C-21-037, structure 21-256, was the former location of a 2000-gal. aboveground process tank located at the southwest corner of building 21-035 and now located near building 21-257;
- A 6-in. cast-iron drain pipe from former building 21-012, which discharged into the west side of MDA T, and was removed in 1973.

Building 21-012, the old plutonium filter facility, removed in 1973, was connected to the west side of MDA T through a 6-in. cast iron pipe used as a drain pipe from the precipitron and filter area of the building (Christensen et al. 1975, 005481).

3.0 Characterization Strategy

This WCSF identifies the types of wastes expected, based on historical site information and Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites; LA-UR-09-6108 Appendix B, Management Plan for Investigation-Derived Waste. However, other types of wastes may be encountered and an amendment to this strategy form will be prepared and submitted for review and approval if any of the waste streams change in description or characterization approach or a new waste stream is generated. All IDW will be managed in accordance with Los Alamos National Laboratory (LANL) Standard Operating Procedure (SOP) 5238, *Characterization and Management of Environmental Program Waste*.

Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type waste and its regulatory classification. The selection of waste containers will be based on U.S. Department of Transportation requirements, waste types, and estimated volumes of IDW and deactivation and decommissioning (D&D) waste to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number and with information such as waste classification, contents, radioactivity, and date generated, if applicable. Waste streams with the same regulatory classification that are destined for the same receiving facility may be combined into a single container for disposal (e.g. contact waste with drill cuttings).

IDW characterization will be completed using investigation sampling data or by direct sampling of the IDW. If the waste is directly sampled, it will be sampled within 10 days of generation, and a 21 day turnaround time for analyses will be requested unless the waste is stored in a Satellite Accumulation Area (SAA) or Area of Contamination where samples will be collected within the time frame needed to expedite waste dispositioning before project completion. Deactivation and decommissioning (D&D) waste will be characterized using Acceptable Knowledge, whenever possible. However, if there is insufficient AK for waste characterization, direct sampling may be required. The waste will be sampled within 10 days of generation. Turnaround times for D&D waste will be determined by the type of waste being sampled, with a maximum turnaround time of 21 days. Samples for IWD and D&D wastes must be collected using the methods described in this WCSF by trained and qualified sampling personnel. Sampling personnel must record waste sampling information in accordance with LANL's procedure, EP-ERSS-SOP-5058, Sample Control and Field Documentation and EP-ERSS-SOP-5181, Documentation of Waste and Environmental Technical Field Activities.

A waste determination will be made within 45 days of the generation date of waste unless the waste is stored in a Satellite Accumulation Area or an approved Area of Contamination. A Waste Acceptance Criteria (WAC) exception form (WEF) can be used if the generator does not meet the 45 day deadline. The generation of no path forward wastes must be approved by Department of Energy (DOE) prior to generation of the waste; however, no such wastes are anticipated for this project.

If documentation exist that the contaminant(s) originated from a listed source but the levels are below residential screening levels and the land disposal restriction treatment standards, a "contained-in" request may be submitted to the New Mexico Environment Department (NMED), who may approve removing the listings from the waste stream. A request to submit a "contained-in" determination to NMED must be submitted to Environmental Protection (ENV-RCRA) through the Subcontract Technical Representative (STR) within 70 days of generating the waste. A copy of the due diligence reviews already prepared for this investigation or the NMED "contained-in" approval letter should accompany all waste profiles prepared for the waste(s) with potentially listed contaminants.

Investigation and deactivation and decommissioning activities will be conducted in a manner that minimizes the generation of waste. Waste minimization will be accomplished by implementing the most recent version of the "Los Alamos National Laboratory Hazardous Waste Minimization Report". Waste streams will be recycled/reused, as appropriate.

The most recent version of the Laboratory's Hazardous Waste Minimization Report will be implemented during the investigation to minimize waste generation. The Hazardous Waste Minimization Report is updated annually as a requirement of Module VIII of the Laboratory's Hazardous Waste Facility Permit.

If low levels of listed hazardous waste are identified, a "contained in" determination may be submitted for approval to NMED. Data currently available for the sites addressed in this WCSF do not identify polychlorinated biphenyl (PCB) concentrations greater than 1 mg/kg. Considerable material will be excavated during the remediation of:

- Consolidated Unit 21-004(b)-99, structure 21-346, aboveground overflow holding tanks [Solid Waste Management Units (SWMUs) 21-004(b and c)], waste line, and outfall Area [area of Concern, (AOC) 21-004(d)],
- SWMU 21-011(b), structure 21-223, acid waste sump and lines originating at DP East and terminating at Material Disposal Area (MDA) T,
- Consolidated Unit 21-022(b)-99, structures 21-082, 21-084, 21-087, 21-089, and 21-189, removed waste sumps [SWMUs 21-022(b)-(e) & (g)] and industrial waste lines originating in DP West buildings 21-002, 21-003, 21-004, 21-005, and 21-150 and terminating at MDA T; and
- MDA T outside of the nuclear environmental site (NES) boundary.

To facilitate the staging and segregation of the remediation waste, the Laboratory will submit area of contamination designation requests for the consolidated units, SWMUs, AOCs, and MDA T outside of the NES boundary to NMED for approval. The request will specify the boundaries of the proposed areas of contamination and will describe the activities to be conducted within the boundaries.

Wastes will be containerized and placed in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of waste and its classification. Container and storage requirements will be detailed in the WCSF and approved before the waste is generated.

The waste streams that are anticipated to be generated during work plan implementation are described below.

Waste # 1: Drill Cuttings (IDW)

This waste stream consists of soil and tuff/rock chips generated by the drilling of boreholes for the intent of sampling. Drill cuttings include excess core sample not submitted for analysis and any returned samples sent for analysis. Drill cuttings may be land applied if they meet the criteria in Quality Procedure (QP)-011, *Land Application of Drill Cuttings*. Approximately 20 yd^3 of drill cuttings are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, Low-level radioactive waste (LLW), Mixed low-level radioactive waste (MLLW), New Mexico Special Waste (NMSW) Asbestos Containing Material, Land Applied, TSCA, TRU

Characterization Approach: The drill cuttings will be characterized by direct sampling of the containerized cuttings. Cuttings not generated within an Area of Contamination will be sampled within 10 days of generation and submitted for analysis with a 21 day turnaround time. Drill cuttings from a single potential release site (PRS) may be combined into a single container before sampling. If container sizes are small, a representative sample may be collected from more than one container (e.g., one sample for every 20 cy^3 generated from a single potential release site). A hand auger or thin-wall tube sampler will be used in accordance with LANL SOP-06.10, *Hand Auger and Thin-Wall Tube Sampler,* to collect waste material from each container, augering from the surface to the bottom of the waste in a sufficient number of locations to obtain a representative sample. To meet the requirements of the investigation work plan, drill cuttings will be analyzed for isotopic radionuclides, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), explosive compounds (if site sampling indicates the presence of high

explosives), radionuclides, total metals, and if needed, toxicity characteristic metals. Asbestos will be analyzed for in soil/tuff generated by drilling under the former pipe tunnels at former buildings 21-003 and 21-004. If process knowledge, odors, or staining indicate the cuttings may be contaminated with petroleum products, the materials will be analyzed for total petroleum hydrocarbons (TPH [DRO/GRO]) and polychlorinated biphenyls (PCBs). Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. A final waste determination will be made using the automated waste determination tool (AWD) in accordance with SOP 5238, *Characterization and Management of Environmental Program Waste*. Each borehole location will use a different sampling event number to simplify AWD evaluations.

Storage and Disposal Method: Drill cuttings will be containerized in the appropriate sized DOT approved containers at the point of generation. If drilling is conducted within the boundary of an area of contamination (AOC), the drill cuttings will be managed within those boundaries. If drilling occurs outside the area of contamination boundaries, the initial management of the cuttings will rely on the data from previous investigations and/or acceptable process knowledge. Drill cuttings will be managed in secure, designated areas appropriate to the type of the waste. Most cuttings are expected to be land applied or disposed as low-level waste (LLW) at the appropriate disposal facility. Cuttings may be land applied if they meet the criteria of the NMED-approved NOI decision tree for land application. Land application will be conducted in accordance with ENV-RCRA-QP-011, *Land Application of Drill Cuttings*. Drill cuttings that cannot be land applied will be used as attic cover at TA-54 or treated and/or disposed of at authorized off-site facilities appropriate for the waste classification. If screening indicates transuranic (TRU) levels of contamination, the work will be stopped, TA-21 Operations and DOE notified, and an evaluation of how to proceed will be developed.

Waste # 2: Excavated Environmental Media

This waste stream consists of layback and overburden spoils (including environmental media mixed with buried debris) and will consist of soil and tuff removed from within or adjacent to (e.g., from benching to stabilize a trench) the sites to be excavated. Approximately 600 yd^3 of excavated environmental media are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, Asbestos Containing Material, TSCA, TRU, Fill

Characterization Approach: Per the IWP, this material will be field screened for radioactivity and organic vapors during the excavation process. If field screening indicates the potential for contamination, the layback and overburden spoils will be placed in roll-off bins or other suitable containers. The spoils will remain within the area of contamination boundary of the consolidated unit or SWMU from which spoils were excavated, awaiting analytical results. Samples of the spoils will be collected as the spoils are excavated and composited, if appropriate (one composite sample for every 20 to 50 yd^3, depending on the homogeneity of spoils). The samples will be analyzed for VOCs, target analyte list (TAL) metals, radionuclides, and toxicity characteristic metals, as needed. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If process knowledge, odors, or staining indicate the soils may be contaminated with petroleum products, the materials will also be analyzed for total petroleum hydrocarbons (TPH) and PCBs. A final waste determination will be made using the automated waste determination tool (AWD) in accordance with SOP 5238, *Characterization and Management of Environmental Program Waste*. Each borehole location will use a different sampling event number to simplify AWD evaluations.

Storage and Disposal Method: If contamination is not detected during screening, the spoils will be stored either in roll-off bins, other suitable containers, or on the ground surface with appropriate best management practices. If the spoils are determined to be suitable for reuse (i.e., is not hazardous waste and meets residential soil screening levels [SSLs] or screening action levels [SALs]), the evacuated

environmental media will be segregated from any man-made debris, and the soil will be used to backfill the excavations. If the spoils do not meet residential SSLs/SALs or are determined to be hazardous waste, they will be treated/disposed of at an authorized facility appropriate for the waste regulatory classification. If screening indicates TRU levels of contamination, the work will be stopped, NMED notified, and an evaluation of how to proceed will be developed.

Waste #3: Excavated Man-Made Debris - Excavated man-made debris will be generated from the removal of pipelines, a sump, aboveground storage tanks, concrete, asphalt, and any other encountered buried structures. This waste stream will consist of metal and polyethylene tanks, piping, (e.g., stainless steel, clay, iron, Orangeburg, duriron, etc.), concrete, acid waste sump components and lines, contaminated soil and/or asphalt. Approximately 400 yd^3 of excavated man-made debris are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, Asbestos Containing Material, TRU, TSCA

Characterization Approach: The excavated materials will be placed initially in containers (e.g., roll-off bins) within the boundaries of an area of contamination (AOC). Debris will be segregated as it is excavated, to the extent practical, based on factors such as the type and size of debris, field screening, process knowledge, and/or staining or odors. Where practicable, this waste stream will be characterized utilizing acceptable knowledge or, if required, by direct sampling of the waste (e.g., concrete). Direct samples will be analyzed for VOCs, SVOCs, explosive compounds, radionuclides, total metals, and, if needed, toxicity characteristic metals. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility or if process knowledge or visual observations indicate other contaminants may be present (e.g., PCBs or asbestos). For debris that is difficult to characterize; acceptable knowledge (AK) will be used whenever possible, supplemented by sampling as needed. Sampling methods will often have to be identified on a case-by-case basis by qualified sampling personnel and all decisions documented in the field activity notebook. If the project anticipates finding ACM a NOI must be submitted to NMED 10 days before the start of the project with the assistance of ENV-EAQ.

Storage and Disposal Method: Debris will be containerized at the point of generation in appropriately sized DOT approved containers. Any debris that leaks as it is excavated must immediately be placed in an area with secondary contamination. The debris will initially be managed within the Area of Contamination. If analytical data changes the waste classification or the waste is hazardous and is moved outside the Area of Contamination, the waste will be stored in an area appropriate for the type of waste. The waste will be treated and/or disposed of at an authorized off-site facility appropriate for the waste classification. If screening indicates TRU levels of contamination, the work will be stopped, TA-21 Operations and DOE notified, and an evaluation of how to proceed will be developed.

Waste #4: Decontamination Fluids (potential) - The decontamination fluids waste stream will consist of liquid wastes generated from decontamination of excavation, sampling and drilling equipment. Consistent with waste minimization practices, the Laboratory employs dry decontamination methods to the extent possible. If dry decontamination cannot be performed, liquid decontamination wastes will be collected in appropriate containers at the point of generation. Less than 55 gal of decontamination fluids are expected to be generated.

Anticipated Regulatory Status: Industrial, Sanitary, Hazardous, LLW, MLLW, TSCA

Characterization Approach: All drilling equipment and tooling will be steam-cleaned by the drilling subcontractor prior to arriving onsite. If tooling appears unclean or odors are detected, the equipment must be steam-clean onsite in accordance with EP-ERSS-SOP-5061, Field Decontamination of Equipment or an approved equivalent procedure. The rinsate must be separately collected and sampled (do not mix with any other decontamination fluids).

Decontamination fluids will be characterized by investigation samples from the media they contacted or by direct sampling. Samples will be collected from the storage container in accordance with LANL SOP-

06.15, *COLIWASA Sampler for Liquids and Slurries.* If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the *RCRA Waste Sampling Draft Technical Guidance* (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, radionuclides, and total metals, High explosives will be analyzed only if the work plan requires analysis of these contaminants in investigation samples for the potential release site. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If wastes will be treated on-site at the Sanitary Waste Water System (SWWS) or the Radioactive Liquid Waste Treatment Facility (RLWTF), submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml for additional constituents identified in Characterization Table, footnote 1. If the fluids cannot be treated on-site, they may be solidified for disposal off-site. The Material Safety Data Sheet (MSDS) for any absorbent used for solidification will be used as AK for waste characterization.

Storage and Disposal Method: Decontamination fluids will be collected in appropriate containers at the point of generation and initially managed in secure, designated non-hazardous waste area in accordance with Table 1. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. It is expected that the decontamination fluids will be treated on-site at the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF), or the Sanitary Waste Water System (SWWS). Decontamination wastes not meeting the WAC for on-site facilities will be treated and/or disposed of in authorized off-site treatment/disposal facilities. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent. Solidification activities must be reviewed by the ENV-RCRA before being conducted.

Waste # 5: Contact Waste - This waste stream includes personnel protective equipment (PPE), contaminated sampling supplies, and dry decontamination waste that may have come in contact with contaminated environmental media or man-made debris and cannot be decontaminated. This includes, but is not limited to plastic sheeting (e.g., tarps and liners), gloves, coveralls, booties, paper towels, plastic and glass sample bottles, and disposable sampling supplies. Approximately 5 yd^3 of drill cuttings are expected to be generated.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW

Characterization Approach: Contact waste will be characterized using AK based on data from the media with which they came into contact, as follows:

- If generated during drilling, data from the associated drill cuttings will be used.
- If generated during hand augering, associated investigation sample data will be used.
- If generated during excavations, data from the associated excavated environmental media will be used.
- If generated during excavation of man-made debris, acceptable knowledge and/or data (if available) from the associated debris will be used.

All contact waste will be inspected before being placed in containers to determine if environmental media or staining is present, indicating contamination. If staining is present, an estimate of the portion or percentage of the item stained will be recorded. Results from the analytical data will be weighted by the extent of contamination for determining whether wastes are characteristic. If the material with which the contact waste came into contact is listed, the contact waste will be assumed to be listed unless a "contained-in" approval is obtained.

Storage and Disposal Method: The contact waste may be separately containerized or it may be placed into the same containers as the media with which it is contaminated if the media will not be land applied. The waste will initially be managed in secure, designated areas within an Area of Contamination. If analytical data changes the waste classification or if hazardous waste is moved outside the boundaries of

the Area of Contamination, the waste will be stored in an area appropriate for the type of waste. For disposal, separately containerized contact waste may also be combined with the material that it contacted (the WPF will document the decision to combine the waste streams). Wastes will be treated and/or disposed of in authorized off-site facilities appropriate for the waste classification.

Waste #6: Municipal Solid Waste (MSW) – This waste stream primarily consists of non- contact trash including, but not limited to paper, cardboard, wood, plastic, food and beverage containers, empty solution containers, but may also include commercial solid wastes which are derived from project activities. It is estimated that less than one yd^3 of MSW will be generated.

Anticipated Regulatory Status: MSW

Characterization Approach: MSW will be characterized based on acceptable knowledge (AK) of the waste materials (including MSDS) and methods of generation.

Management and Disposal Method: MSW will be segregated from all other waste streams and managed in approved containers. It is anticipated that the waste will be stored in plastic trash bags or other appropriate containers and disposed of at the County of Los Alamos Transfer Station or other authorized solid waste landfill.

Waste #7: Petroleum Contaminated Soils (PCS), (potential) - PCS may be generated from releases of products such as hydraulic fluid, motor oil, unleaded gasoline, or diesel fuel (e.g. from the rupture of hydraulic or fuel hoses, or spills during maintenance or filling equipment) onto soil. PCS created by legacy contamination may also be encountered during investigations. Absorbent padding, paper towels, spill pillows or other absorbent material used to contain the released material may be added to the PCS waste for storage and disposal. It is estimated that less than one cubic yard of PCS will be generated.

Anticipated Regulatory Status: NMSW, Industrial, Hazardous, LLW, MLLW, PCB

***Characterization Approach*:** The contaminated soil may either be sampled in-place (by gridding the spill location and collecting and combining incremental samples into one sample) or after containerization in accordance with LANL SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. If the spill is shallow (in-place sampling) or containers are small, Spade and Scoop Method for Collection of Soil Samples (LANL SOP-06.11) may also be appropriate. If the spill is new, it must be immediately reported to ENV-RCRA and the contaminated material must be containerized the same day it is spilled unless permission is received from ENV-RCRA to leave it longer (generally only granted for large spills). Representative samples will be analyzed at a minimum for VOCs, SVOCs, TPH (DRO/GRO), and total metals. Herbicides and pesticides will be analyzed only if the work plan requires analysis of these contaminants for investigation samples. High explosives (HE), perchlorates, nitrate, and total cyanide will be analyzed only if screening indicates the presence of HE or if analysis of these constituents is required by the work plan for the contaminated area. If legacy petroleum contamination is present, the soils will also be analyzed for PCBs. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility.

***Storage and Disposal Method*:** PCS will be stored in clearly marked and appropriately constructed waste accumulation areas. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the most restrictive waste classification appropriate to the area where the spill occurred. If the PCS is suspect or known hazardous or MLLW, it will initially be managed in a registered hazardous waste accumulation area pending analysis. All PCS will be treated and/or disposed of, at an authorized off-site facility appropriate for the waste classification.

Waste #8: Returned or Excess Samples- This waste stream consists of soil and tuff samples returned from a laboratory or samples collected but not submitted to the analytical laboratory. It is estimated that less than approximately 0.5 yd^3 of material will be generated from this activity.

Anticipated Regulatory Status: Industrial, Hazardous, LLW, MLLW, NMSW, Asbestos Containing Material

Characterization Approach: Waste characterization will be based upon analytical results obtained from the direct sampling of containerized waste or from investigation or characterization data from media associated with the returned/excess samples. Direct sampling will be conducted in accordance with LANL SOP-06.10, Hand Auger and Thin-Wall Tube Sampler or SOP-06.09, Spade and Scoop Method for Collection of Soil Samples. Representative samples will be analyzed for VOCs, SVOCs, total metals, and TCLP metals, as needed. Herbicides and pesticides will be analyzed only if the work plan requires analysis of these contaminants for investigation samples. Perchlorates, nitrate, and total cyanide will be analyzed only if required by the work plan for investigation samples. If process knowledge, odors, or staining indicate the returned samples may be contaminated with petroleum products, the materials will also be analyzed for TPH and PCBs. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility.

Storage and Disposal Method: These wastes will be containerized in 5 gallon buckets, 55 gallon drums, or placed into the same containers as the environmental media from which they were taken. They will initially be stored in secure, designated waste areas. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. The wastes will be sent to an authorized on-site or off-site treatment or disposal facilities, as appropriate to their waste regulatory classification.

Waste #9: Un-containerized Liquid – This waste stream will consist of un-containerized liquid waste which includes, but is not limited to, the liquid which is known to be present in the sump pit. Other un-containerized liquid wastes may be discovered as the project progresses. Un-containerized liquid wastes will be transferred to appropriate containers at the point of generation. Approximately 600 gallons of Un-containerized liquid waste are expected to be generated.

Anticipated Regulatory Status: Industrial, Sanitary, Hazardous, LLW, MLLW, TSCA

Characterization Approach: Un-containerized liquid waste will be transferred to appropriate containers, such as 55-gallon drums. The waste will then be sampled for characterization.

Un-containerized liquid waste will be characterized by direct sampling. Samples will be collected from the storage container in accordance with LANL SOP-06.15, *COLIWASA Sampler for Liquids and Slurries*. If the container does not permit COLIWASA or bailer sampling, the type of sampling equipment used will be appropriate for the waste container and properly operated in accordance with Chapter 7 and Appendix E of the *RCRA Waste Sampling Draft Technical Guidance* (EPA 530-D-02-002, August 2002, http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed for VOCs, SVOCs, radionuclides, and total metals, High explosives will be analyzed only if the work plan requires analysis of these contaminants in investigation samples for the potential release site. Other constituents may be analyzed as necessary to meet the WAC for a receiving facility. If wastes will be treated on-site at the Sanitary Waste Water System (SWWS) or the Radioactive Liquid Waste Treatment Facility (RLWTF), submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml for additional constituents identified in Characterization Table, footnote 1. If the fluids cannot be treated on-site, they may be solidified for disposal off-site. The Material Safety Data Sheet (MSDS) for any absorbent used for solidification will be used as AK for waste characterization.

Storage and Disposal Method: Un-containerized liquid wastes will be transferred to appropriate containers at the point of generation and initially managed in secure, designated waste areas in accordance with Table 1. Acceptable knowledge will be used to determine the appropriate waste area. If insufficient AK is available, the waste should initially be managed as hazardous, until analytical data is available for characterization. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste. It is expected that the un-containerized liquid waste will be treated on-site at the TA-16 High Explosives Wastewater Treatment Facility (HEWTF), the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF), or the Sanitary Waste Water System (SWWS).

Decontamination wastes not meeting the WAC for on-site facilities will be treated and/or disposed of in authorized off-site treatment/disposal facilities. If solidification of decontamination fluids is required for transportation or disposal, it may be solidified using an approved absorbent. Solidification activities must be reviewed by the ENV-RCRA before being conducted.

REFERENCES

LANL (Los Alamos National Laboratory). "Los Alamos National Laboratory Hazardous Waste Minimization Report," (LANL, 2009).

LANL (Los Alamos National Laboratory), December, 2009. "**Investigation Work Plan for Delta Prime Site Aggregate Area Delayed Sites**" Los Alamos, New Mexico. (LANL 2009, EP2009-0660)

CHARACTERIZATION TABLE				
Waste Description	**Waste # 1 Drill Cuttings**	**Waste #2 Excavated Media**	**Waste # 3 Excavated Man Made Debris**	**Waste #4 Decontamination Fluids**
Estimated Volume	20 CY	600 CY	400 CY	< 55 gallons
Packaging	DOT approved containers	Roll-offs or on ground	Roll-offs or other containers	30 or 55 gallon drums
Regulatory classification:				
Radioactive Waste	X	X	X	X
Municipal Solid Waste (MSW)				
Waste destined for LANL's SWWS or RLWTF or HEWTF[1]				X
Hazardous Waste	X	X	X	X
Mixed (hazardous and radioactive) Waste	X	X	X	X
Polychlorinated Biphenyls-Contaminated Waste (PCBs)		X	X	
New Mexico Special Waste	X		X	
Industrial Waste	X	X	X	X
Asbestos Containing Material	X	X	X	
Characterization Method			X	
Acceptable knowledge (AK): Existing Data/Documentation		X	X	
AK: Site Characterization		X	X	X
Direct Sampling of Waste	X	X	X	X
Analytical Testing			X	
Volatile Organic Compounds (VOCs) (EPA 8260-B)	X[4]	X[4]	X[4]	X[4]
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)	X[4]	X[4]	X[4]	X[4]
Organic Pesticides (EPA 8081-A)	X[4]	X[4]	X[4]	X[4]
Organic Herbicides (EPA 8151-A)	X[4]	X[4]	X[4]	X[4]
PCBs (EPA 8082)	X[4]	X[4]	X[4]	X[4]
Total Metals (EPA 6010-B/7471-A or EPA 6020)	X	X	X[4]	X[4]
Total Cyanide (EPA 9012-A)	X[4]	X[4]	X[4]	X[4]
High Explosives Constituents (EPA 8330/8321-A)	X[4]	X[4]	X[4]	X[4]
Asbestos (EPA 600M4 or equivalent)	X[4]		X[4]	
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X[4]	X[4]	X[4]	
TPH-DRO (EPA 8015-M)	X[4]	X[4]	X[4]	X[4]
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X[4]	X[4]	X[4]	X[4]
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	X[4]		X[4]	
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)				
Gross Alpha (alpha counting) (EPA 900)	X	X[4]		X[4]
Gross Beta (beta counting) (EPA 900)	X	X[4]	X[4]	X[4]
Tritium (liquid scintillation) (EPA 906.0)	X	X	X	X
Gamma spectroscopy (EPA 901.1)	X	X[4]	X[4]	X[4]
Isotopic plutonium (HASL-300)	X	X	X[4]	X
Isotopic uranium (HASL-300)	X	X	X[4]	X
Total uranium (EPA 6020)	X	X	X[4]	X
Strontium-90 (EPA 905)	X	X	X[4]	X
Americium-241 (HASL-300)	X	X	X[4]	X
Perchlorates (EPA 6850)	X	X[4]	X[4]	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	X[4]	X[4]	X[4]	X[4]
Oil / Grease (EPA 1665)			X[4]	X[1]
Fluorine, Chorine, Sulfate (EPA 300)				X[1]
TTO (EPA 8260-B and EPA 8270-C)[2]				
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)			**Request VOCs and SVOCs above**	X[1]
Chemical Oxygen Demand (COD) (EPA 410.4)				X[1]
pH (EPA 904c)				X[1]

Microtox or Biological Oxygen Demand (BOD)[3]				X[1]

CHARACTERIZATION TABLE (Continued)					
Waste Description	**Waste #5 Contact Waste**	**Waste #6 Municipal Solid Waste**	**Waste #7 Petroleum Contaminated Soils**	**Waste #8 Returned or Excess Samples**	**Waste # 9 Un-containerized Liquid Waste**
Estimated Volume	5 CY	< 1 CY	< 1 CY	< 0.5 CY	600 Gal
Packaging	55 gallon drums	Plastic trash bags	30 or 55 gallon drums	Same containers as the environmental media from which they were taken or other drums.	55 gallon drums
Regulatory classification:					
Radioactive Waste	X		X	X	X
Municipal Solid Waste (MSW)		X			
Waste destined for LANL's SWWS or RLWTF[1]					X
Hazardous Waste	X		X	X	X
Mixed (hazardous and radioactive) Waste	X		X	X	X
Polychlorinated Biphenyls-Contaminated Waste (PCBs)			X		
New Mexico Special Waste			X	X	
Industrial Waste	X		X	X	X
Asbestos Containing Material				X	
Characterization Method	X				
Acceptable knowledge (AK): Existing Data/Documentation	X	X			
AK: Site Characterization				X	X
Direct Sampling of Waste			X	X	X
Analytical Testing					
Volatile Organic Compounds (VOCs) (EPA 8260-B)			X[4]	X[4]	X[4]
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)			X[4]	X[4]	X[4]
Organic Pesticides (EPA 8081-A)			X[4]	X[4]	X[4]
Organic Herbicides (EPA 8151-A)			X[4]	X[4]	X[4]
PCBs (EPA 8082)			X	X[4]	X[4]
Total Metals (EPA 6010-B/7471-A or EPA 6020)			X	X	X[4]
Total Cyanide (EPA 9012-A)			X[4]	X[4]	X[4]
High Explosives Constituents (EPA 8330/8321-A)			X[4]	X[4]	X[4]
Asbestos (EPA 600M4 or equivalent)			X[4]		
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)			X	X[4]	
TPH-DRO (EPA 8015-M)			X	X[4]	X[4]
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)			X	X[4]	X[4]
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)					
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)					
Gross Alpha (alpha counting) (EPA 900)			X[4]	X[4]	X[4]
Gross Beta (beta counting) (EPA 900)			X[4]	X[4]	X[4]
Tritium (liquid scintillation) (EPA 906.0)			X	X[4]	X
Gamma spectroscopy (EPA 901.1)			X[4]	X[4]	X[4]
Isotopic plutonium (HASL-300)			X	X	X
Isotopic uranium (HASL-300)			X	X	X
Total uranium (EPA 6020)			X	X	X
Strontium-90 (EPA 905)			X	X	X
Americium-241 (HASL-300)			X	X	X
Perchlorates (EPA 6850)			X	X	X
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)			X	X	X[4]
Oil / Grease (EPA 1665)					X[1]
Fluorine, Chorine, Sulfate (EPA 300)					X[1]

TTO (EPA 8260-B and EPA 8270-C)[2]	Request VOCs and SVOCs above				
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)					X[1]
Chemical Oxygen Demand (COD) (EPA 410.4)					X[1]
pH (EPA 904c)					X[1]
Microtox or Biological Oxygen Demand (BOD)[3]					X[1]

Characterization Table (Cont'd)

[1]in addition to other analytes needed to characterize the waste (e.g., VOC, SVOC, total metals), analyze for TSS, TDS, Oil and Grease, gross alpha, gross beta, tritium, and pH for liquids destined for the LANL sanitary waste water system (SWWS). For wastes destined for the RLWTF additional constituents include TTO,TSS, COD, pH, total nitrates/nitrites, and gross alpha, gross beta (not including tritium), and gross gamma **or** the sum of individual alpha-, beta-, and gamma-emitting nuclides. Submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml . I

[2]TTO is the total of volatile organic and semi-volatile organic compound contaminants. Request methods EPA 8260-B (VOCs) and EPA 8270-C (SVOCs).

[3] If Microtox analysis is not available, request BOD. Submit a sampling request to http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa_form.shtml . I

[4] If needed

Signatures	Date
Project Manager (Bruce Wedgeworth)	12/15/10
Preparer (Kimberly Oman)	12-15-10
Waste Management Coordinator (Ron DeSotel)	12-16-10
ENV-RCRA Representative (Frank W. Chromec)	12-16-10
Waste Acceptance Representative Andy u. Elicio	12/16/10
Waste Certification Program Representative (Michelle Coriz)	12-16-10