Attachment D-1

Waste Characterization Strategy Form
(on CD included with this document)

Waste Characterization Strategy Form

Project Title	Implementation of the Investigation Work Plan for Upper Sandia Canyon Aggregate Area
Solid Waste Management Unit or Area of Concern #	**AOCs:** 03-003(d), 03-003(g), 03-003(n), 03-014(b2), 03-014(c2), 03-036(b), 03-038(c), 03-038(d), 03-047(g), 03-051(c), 03-052(b), 03-053, 03-056(k), 60-004(b), 60-004(d), 60-004(f), C-03-016, C-03-022 and C-61-002 **SWMUs:** 03-002(c), 03-009(a), 03-009(i), 03-012(b), 03-013(i), 03-014(a-o,q,u), 03-015, 03-021, 03-029, 03-045(a,b,c,e,f,g,h), 03-052(f), 03-056(a), 03-056(d), 03-056(l), 03-059, 60-002 (West), 60-006(a), 60-007(a), and 60-007(b)
Activity Type	Characterization Sampling and Remediation
Task Manager	Deborah Steven
Field Waste Management Coordinator	Selene Martinez
Completed by	Paula Bertino
Date	9/15/2009

1.0 Description of Activity

The objective of the project is to characterize the nature and extent of contamination, if any, associated with 58 sites in the Upper Sandia Canyon Aggregate Area. The project is to be executed in compliance with the Consent Order and as described in the Investigation Work Plan for Upper Sandia Canyon Aggregate Area, Revision 1. The following activities are planned:

Site preparation – This activity includes establishment of site access control immediately prior to performing survey, sampling, or drilling activities. Site access control will be minimal, including establishment of a work zone with traffic cones or other markers.

Non-intrusive field surveys – This activity includes the use of various instruments to perform non-intrusive geodetic and geophysical site surveys and. Geodetic surveys will involve the use of GPS or Total Station instruments to determine coordinates of sampling locations and structures as necessary. Geophysical surveys will involve the use of Ground Penetrating Radar to identify possible buried debris.

Surface and subsurface sampling – This activity includes collection of samples using hand auger, spade and scoop and/or core-barrel (hollow-stem auger drill rig) methods. The method(s) used will depend on site conditions and depth of required samples; all samples will be collected using hand methods if possible, and a drill rig will be used only at sites where samples cannot be collected by hand. Four test pits will also be excavated SWMU 03-009(i) with an excavator or backhoe.

Removal of Septic Tank Contents and Septic Tanks – This activity includes the characterization and disposal of septic tank contents and septic tank only for SWMU 60-006(a).

Waste management – This activity involves the management of the investigation-derived waste following all applicable procedures, including but not limited to TPMC-SOP-5238, *Characterization and*

Management of Environmental Restoration Project Waste, TPMC-SOP-6.15, *Coliwasa Sampler for Liquids and Slurries*, TPMC-SOP-6.19, *Weighted Bottle Sampler for Liquids and Slurries*, TPMC-SOP-5194, *Chip Sampling of Porous Surfaces*, P930-1, *LANL Waste Acceptance Criteria*, P409, *Waste Management*, P930-2, *Waste Certification Program*.

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, filling excavations with clean backfill material, land application of cuttings, and seeding or planting vegetation.

2.0 Relevant Site History and Description

2.1 TA-03

TA-03 occupies a large area located near the western end of South Mesa between Los Alamos Canyon to the north and Twomile Canyon to the south. Sandia and Mortandad Canyons originate within TA-03 and divide the eastern two thirds of the area into finger-like mesas. TA-03 contains most of the Laboratory's administrative buildings and public and corporate access facilities. In addition, TA-03 houses several Laboratory activities such as experimental sciences, special nuclear materials, theoretical/computations, and physical support operations. Fifty-two sites within TA-03 will be investigated, including sites associated with the former asphalt batch plant, wastewater treatment plant (WWTP), steam plant, Sigma Building, and Beryllium Facility.

2.2 TA-60

TA-60, also known as Sigma Site, was created from the eastern portion of TA-03 and lies between Sandia Canyon and Mortandad Canyon. All buildings at TA-60 are located on the western end of the mesa and contain Laboratory support and maintenance operations and subcontractor-service facilities. The Nevada Test Site (NTS) test fabrication facility (building 60-0017), the NTS test tower (building 60-0018), several small abandoned experimental areas including a solar pond and a test drill hole, and storage sites for pesticides, topsoil, and recyclable asphalt are also located at TA-60.

2.3 TA-61

TA-61 was created from a portion of TA-03 and is bounded on the north by Los Alamos Canyon and on the south by Sandia Canyon (Plate 1). TA-61 contains physical support and infrastructure facilities including the Los Alamos County landfill, sewer pump stations, a radio shop, general storage sheds, a blower house, a private batch concrete batch plant, a Laboratory-operated asphalt batch plant, and general warehouse storage for maintenance activities. A small parcel of private property, the Royal Crest Manufactured Home Community, is surrounded by TA-61.

3.0 Characterization Strategy

This WCSF identifies the types of wastes expected, based on previous investigations. However, other types of waste may be encountered. An amendment to this WCSF shall 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 wastes will be managed in accordance with LANL SOP-5238, *Characterization and Management of Environmental Program Waste*.

Characterization data from previous investigations exist for many of the sites in this aggregate area; the purpose of the current investigation is to better define nature and extent of contamination. The existing data and source information for each site has been reviewed (see Table 3.0-1) and the wastes will initially be managed based on the most restrictive manage requirements for the potential waste types identified in

this evaluation or described by specific waste type below. The final waste determination will be made as described below for each waste stream.

All wastes will be managed in secure designated areas appropriate to the type of waste and its regulatory classification. Waste accumulation area postings, regulated storage duration, and inspection requirements will be based on the type of 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 investigation derived waste (IDW) to be generated. Immediately following containerization, each waste container will be individually labeled with a unique identification number with information regarding waste classification, content, radioactivity, and date generated. Waste streams with the same regulatory classification that are destined for the same receiving facility may be combined for disposal (e.g., contact waste from drilling with drill cuttings).

Characterization of IDW will be completed through review of sampling data and/or documentation, or by direct sampling of the IDW or the media being investigated. Waste shall be sampled within 10 days of generation and a 21-day (or shorter) turnaround time for analysis requested. A waste determination must be made within 45 days of the generation of the waste. 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 DOE prior to generation the waste; however, no such wastes are anticipated for this project.

If analyses indicate the presence of listed constituents, a due diligence document review may be performed to identify whether the contaminant are from a known listed process. If no documentation of a listed source exists, the waste will not carry the listed hazardous waste number(s). If documentation exists 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 dropping the listings from the waste stream. A copy of either the ENV-RCRA approved due diligence or the NMED contained-in approval letter must accompany all waste profiles prepared for the subject waste(s).

4.1 Waste Stream #1: 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, and any other non-contact waste. This waste stream may also include vegetation from sites with no radioactive contamination. It is estimated that approximately 3.5 cubic yards of MSW will be generated (Note: Volume may change if vegetation removal is required). No LLW vegetation is anticipated to be generated.

Anticipated Regulatory Status: Non-hazardous, non-radioactive, municipal solid waste

Characterization Approach: MSW will be characterized based on acceptable knowledge (AK) of the waste materials and the methods of generation or Material Safety Data Sheets (MSDSs).

Management and Disposal Method: MSW will be segregated from all other waste streams. 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 disposal facility.

4.2 Waste Stream #2: Drill Cuttings (IDW)

Drill cuttings consist of soil and rock removed during the mechanized drilling of boreholes. This may include small chips or unused core samples collected with a hollow-stem auger core barrel. Cuttings will not contain residue of drilling additives (drilling mud or foam) as only dry drilling will be used. It is estimated that approximately 10 cubic yards of borehole cuttings will be generated during this investigation.

Anticipated Regulatory Status: Non-hazardous, LLW, Industrial, PCB

Characterization Approach: Waste characterization will be based upon the analytical results obtained from direct sampling of containerized waste (see Table 4.2-1). Cuttings will be sampled within 10 days of generation and submitted for analysis with a 15 day turnaround time. A hand auger will be used in accordance with 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 composite sample. If data from previous investigations identifies that the waste is not expected to be characteristic, samples from all of containers from a single borehole will be composited to obtain a representative sample of the cuttings. If there is a potential for a characteristic waste, each container will be sampled and analyzed separately.

Storage and Disposal Method: The drill cuttings will be collected and containerized at the point of generation and stored in secure, designated waste staging areas within the aggregate area boundary. The containers will be appropriate for the quantity of wastes generated (e.g., roll-off bins for large quantities of wastes and drums or wrangler bags for small quantities of waste). Cuttings meeting the criteria of the NMED approved notice of intent (NOI) decision tree for land application may be land applied. Land application of drill cuttings will be managed in accordance with ENV-RCRA-SOP-011.1, *Land Application of Drill Cuttings.* Cuttings that cannot be land applied will be treated and/or disposed of at an authorized off-site facility based on waste characterization results.

4.3 Waste Stream #3: Contact IDW

This waste stream is comprised of PPE, sampling equipment and other materials that contacted or potentially contacted contaminated environmental media 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. It is estimated that approximately 0.3 cubic yards of contact IDW will be generated during this investigation.

Anticipated Regulatory Status: Non-hazardous, Industrial, Hazardous, LLW, Green is Clean, PCB

Characterization Approach: Contact IDW will be characterized using AK based on the characterization of Waste #(s) 2,4,6,7, and 8.

- Contact IDW generated while using a drill rig will be characterized using AK based on the analyses of the drill cuttings.
- Contact waste that is generated using a hand auger will be inspected before being placed in containers to determine if environmental media or staining is present. If staining is present, an estimate of the portion or percentage of the item stained will be recorded in the waste accumulation log. These wastes will be characterized using AK consisting of the data from the media with which they came into contact (e.g. environmental soil samples or decontamination fluid), weighted by the extent of contamination.

Storage and Disposal Method: The IDW generated from drilling will be placed into the same containers as the drill cuttings and managed in accordance with the most restrictive waste classification identified in the Characterization Table 3.0-1. Contact waste generated from other operations will be placed into separate containers for each site. If environmental samples (e.g., hand auger samples) will be used to characterize contact waste, it will be placed in a Satellite Accumulation Area pending receipt of the data and a final waste determination; unless a formal due diligence has been performed that shows the waste is not listed. If the contact waste will be characterized based on direct sampling of the material with which it came into contact, it may be managed in accordance with the most restrictive waste classification for the point of origin in Table 3.0-1. The contact waste may be combined with the environmental media for

disposal; if appropriate (the WPF will document the decision to combine the waste streams). Wastes will be treated and/or disposed of at an authorized off-site facility.

4.4 Waste Stream #4: Decontamination Fluids (potential)

This waste stream consists of liquid wastes generated from the decontamination of excavation, sampling and drilling equipment. This waste stream will be generated only if dry decontamination methods are not effective. It is estimated that less than 55 gallons of decontamination fluids could be generated from this activity.

Anticipated Regulatory Status: Industrial

Characterization Approach: The decontamination water will be characterized by direct sampling of the containerized fluids within 10 days after generation. Representative waste characterization samples will be collected with a 21-day analytical data turnaround to ensure that wastes can be dispositioned within 90 days, if necessary. Analyses of the media associated with the decontamination fluids may also be used to augment the characterization.

Storage and Disposal Method: These wastes will be containerized in drums at the point of generation and will be stored in secure, designated waste staging areas within the aggregate area boundary. Wastes will be treated and/or disposed in authorized facilities.

4.5 Waste Stream #5: 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. 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 petroleum contaminated soil will be generated.

Anticipated Regulatory Status: NMSW, industrial waste, hazardous waste

Characterization Approach: The contaminated soil may either be sampled in-place or after containerization in accordance with SOP-06.10, Hand Auger and Thin-Wall Tube Sampler. If the spill is shallow (e.g., in-place sampling) or containers are small, Spade and Scoop Method for Collection of Soil Samples (SOP-06.11) may also be appropriate. The analysis of the samples will be dependent on where the spill occurred:

- If the spill occurred on clean soil, samples will be analyzed for VOCs, TPH, gasoline-range and diesel-range (DRO/GRO), and total metals, at a minimum. These analytical suites are required to determine whether the waste is NMSW. Other constituents must be analyzed as needed to meet the receiving disposal facility's WAC.
- If the spill occurs on soils with known hazardous contaminants or soils with no available information, samples will be analyzed, at a minimum, for VOCs, SVOCs, total metals, and TCLP metals, if necessary, as well as analytes needed to meet the WAC of the anticipated receiving treatment or disposal facility.

The contact waste will be characterized based on AK of the material, the extent of contamination, and the sampling data from the soil.

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 waste classification.

If the PCS is not contaminated with hazardous materials, it will be classified as:

- NMSW PCS if the sum of benzene, toluene, ethylbenzene, and xylene isomer concentrations are greater than 50 mg/kg, if benzene individually is greater than 10 mg/kg, or if TPH (DRO+GRO) concentration is greater than 100 mg/kg. NMSW will be managed in a registered NMSW area.
- Industrial waste if the contaminant levels are less than the NMSW and/or PCB regulatory levels.

If the PCS is suspect or known hazardous or mixed waste, it will initially be managed in a registered hazardous waste accumulation area pending analysis. All PCS will be treated/disposed at an authorized off-site treatment or disposal facility appropriate to the waste classification.

4.6 Waste Stream #6: Returned Rad-Van Samples

This waste stream consists of returned soil and tuff samples (zip lock bag and sample labels) from American Radiation Services (Rad-Van). It is estimated that approximately 0.2 cubic yards of soil will be generated from this activity.

Anticipated Regulatory Status: LLW, Industrial, Hazardous, PCB, Non-hazardous

Characterization Approach: Waste characterization will be based upon the analytical results obtained from the direct sampling of containerized waste or the environmental media from which the samples were collected.

Storage and Disposal Method: Upon their return, these wastes will be containerized in drums or placed into the same containers as the environmental media from which they were taken. The waste containers will be stored in secure, designated waste staging areas appropriate to the most restrictive waste classification in Table 3.0-1 for the site and within the aggregate area boundary. Wastes will be treated and/or disposed of at an authorized off-site facility.

4.7 Waste Stream #7: Debris

This waste stream consists of concrete with rebar, asphalt, and tuff. It is estimated that approximately 10 cubic yards of debris will be generated from this activity primarily from the removal of the SWMU 60-006(a) septic tank. Debris will contain less than 1% associated soil.

Anticipated Regulatory Status: Industrial

Characterization Approach: Waste will be characterized using AK of processes associated with the debris and from direct sampling of the concrete tank by chip sampling after the tank has been pressure washed in accordance with TPMC-SOP-5194, *Chip Sampling of Porous Surfaces.*

Management and Disposal Method: These wastes will be collected and containerized and stored in a registered <90-day accumulation area within the aggregate area boundary. Debris will be treated and/or disposed of at an authorized off-site facility.

4.8 Waste Stream #8: Septic Tank Contents

This waste stream consists of liquid and sludge remaining in the SWMU 60-006(a) septic tank and wastewater from cleaning the tank interior. It is estimated that approximately 300 gal. of waste and sludge will be generated from this activity. Debris will contain less than 1% associated soil.

Anticipated Regulatory Status: LLW, Industrial, Hazardous

Characterization Approach: Waste will be characterized by direct sampling of the septic tank contents and wash water after the contents and water have been containerized.

Management and Disposal Method: These wastes will be collected and containerized and stored in secure, designated waste hazardous waste accumulation area within the aggregate area boundary.

Disposal of sludge may require the sludge to be dewatered or dried first if the disposal facility is not permitted to accept waste containing free liquids. Before any on-site treatment of the waste occurs, TPMC must contact ENV-RCRA for approval. The waste will be treated and/or disposed of at an authorized off-site facility.

5.0 References

TPMC-SOP-5238, *Characterization and Management of Environmental Program Waste*

Investigation Work Plan for Upper Sandia Aggregate Area, Revision 1, July 2008, LA-UR-08-4798, EP2008-0388

ENV-RCRA-SOP-011.1, *Land Application of Drill Cuttings*

TPMC-SOP-6.15, *Coliwasa Sampler for Liquids and Slurries*

TPMC-SOP-6.19, *Weighted Bottle Sampler for Liquids and Slurries*

TPMC-SOP-5194, *Chip Sampling of Porous Surfaces*

P930-1, *LANL Waste Acceptance Criteria*

P409, *Waste Management*

P930-2, *Waste Certification Program*

Table 3.0-1
Review of Existing Site Characterization Data and Operational History

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
SWMU 03-002(c)	Former location of a pesticide storage shed. The shed was removed in 1989 and the floor was disposed of as hazardous waste. Between 1994 and 1996, the original concrete pad beneath the shed was surrounded by a new concrete pad that covered the site. Asphalt paving for a new roadway was placed over the eastern portion of this site in 2006.	RFI sampling data from around the shed show metals detected above BVs, well below TCLP levels. No VOCs detected pr pesticides/herbicides were detected. No radionuclides detected.	Industrial
AOC 03-003(d)	Former location of two PCB-containing (>500 ppm PCBs) transformers east of building 03-0141. The transformers were removed in 1991 and 1992. No staining was observed on the concrete pad.	No RFI sampling data.	Industrial (PCBs < 1ppm) PCB (PCB ≥ 1 ppm)
AOC 03-003(g)	Former location of a PCB-containing transformer in the basement of building 03-0035. The transformer was replaced with a non-PCB transformer in 1984. No oil staining was observed upon removal of the transformer.	No RFI sampling data.	Industrial (PCBs < 1ppm) PCB (PCB ≥ 1 ppm)
SWMU 03-009(a) **SWMU 03-029** **SWMU 03-045(g)** **AOC C-03-016** **AOC C-03-022** **AOC 03-036(b)**	Former asphalt emulsion storage tank locations and disposal sites associated with the former asphalt batch plant (building 03-0073). These disposal sites contained items such as concrete, cured asphalt, and soil. Components of these materials include asphalt, petroleum hydrocarbons, water, and light distillates. AOC C-03-016 was an oil cleanout bin for asphalt trucks located within the former asphalt batch plant. AOC C-03-022 is the location of a former tanker trailer used to store and distribute kerosene to the asphalt batch plant.	Sampling data show metals detected above BVs, well below TCLP levels. Trace concentrations of VOCs, TPH-GRO, TPH-DRO and PAHs detected in a few samples.	Industrial PCB
SWMU 03-009(i)	Inactive construction debris surface disposal site located east of building 03-0170. Construction debris at the site consists of crushed tuff, pieces of concrete, rock, and piles of fill. Use of this surface disposal site was discontinued in 1980.	No RFI sampling data.	Industrial
SWMU 03-012(b) **SWMU 03-045(b)** **SWMU 03-045(c)**	SWMUs 03-012(b) and 03-045(b) are the same site: a discharge point for a permitted outfall associated with LANL's TA-03 steam plant (Building 03-22). Discharge from a current permitted outfall at the TA-46 SWSC plant is pumped to the TA-03 steam plant for re-use and discharges to the SWMUs 03-012(b)/03-045(b) outfall. SWMU 03-045(c) receives effluent from a cooling tower (structure 03-0285), which serves generators for LANL's computer system. SWMU 03-045(c) may have received chromate-treated water.	Sampling data show metals detected above BVs, well below TCLP levels. Trace concentrations of PAHs Aroclor-1260 detected in three samples. Isotopes of plutonium and uranium detected above BVs/FVs in one sample. Tritium detected in three samples – data is screening level only - Steam Plant SWMUs not the source of tritium.	Industrial LLW PCB

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
SWMU 03-013(i)	Soil and gravel contaminated from historical releases of hydraulic oil at buildings 03-0246 and 03-0247, Pull Test Facility. These buildings housed operations that involved testing the tensile strength of various steel cables used in conjunction with underground nuclear test assemblies. The facility was constructed before 1967 and operated until the mid-1980s.	Sampling data show metals detected above BVs, well below TCLP levels. Aroclor-1260 and Aroclor-1254 were detected (<50 ppm) in 10 and 12 samples, respectively. TPH-GRO and TPH-DRO were detected in 10 and 16 samples, respectively.	Industrial PCB potential if the original source was >500.
SWMU 03-014(q)	A non-contact cooling water holding tank for make-up water for the TA-03 steam plant. No releases from the tank.	No RFI sampling data; no hazardous constituents anticipated.	Industrial
SWMU 03-014(a) **SWMU 03-014(b)** **AOC 03-014(b2)** **SWMU 03-014(c)** **AOC 03-014(c2)** **SWMU 03-014(d)** **SWMU 03-014(e)** **SWMU 03-014(f)** **SWMU 03-014(g)** **SWMU 03-014(h)** **SWMU 03-014(i)** **SWMU 03-014(j)** **SWMU 03-014(k)** **SWMU 03-014(l)** **SWMU 03-014(m)** **SWMU 03-014(n)** **SWMU 03-014(o)** **SWMU 03-014(u)**	Components and outfalls of the former WWTP that operated at TA-03 from 1951 to 1992.	Data is primarily from sludge drying beds for the former WWTP and show metals detected above BVs, well below TCLP levels. PAHs detected at low concentrations, likely from asphalt. Trace concentrations of acetone and toluene in 3 samples. PCBs detected in 5 samples, most < 1 ppm, maximum 6.5 ppm. Detects of several radionuclides slightly above BVs/FVs scattered among six samples.	Industrial LLW Hazardous PCB if $\geq$ 1 ppm
SWMU 03-021	An outfall located approximately 60 ft north of the north exterior wall of the liquid and compressed gas facility (building 03-0170). The outfall received caustic wash and rinse water from compressed-gas cylinder cleaning operations from 1964 to 1976. The SWMU was not used after 1976, when the compressed gas suppliers assumed cylinder washing and painting responsibilities. The exact location of the SWMU is unknown because of regrading and other construction work completed in preparation for nearby building 03-1650, the compressed-gas cylinder storage shed. Construction of building 03-1650 resulted in placement of 5 to 10 ft of fill material over the former outfall area.	Sampling data show metals detected above BVs, well below TCLP levels. VOCs and SVOCs were not detected.	Industrial

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
AOC 03-038(c)	A 2-in. cast-iron drainline that carried rinse solution from a copper electroplating bath in building 03-0028, room 46, to the industrial waste line. The electroplating bath initially operated in the 1960s and was used to plate very small parts of printed circuit boards. By 1971, the operation was terminated and moved to building 03-0040. The drainpipe was cut and capped inside the wall to make it inaccessible. There were no documented releases from the drainpipe.	No RFI sampling data; metals expected above BVs, but below TCLP levels.	Industrial Hazardous
AOC 03-038(d)	A former industrial waste line associated with the RLW collection system. Between the 1950s and 1970s, industrial drains from buildings 03-0032 and 03-0034 connected the two buildings to the old industrial waste line, which was replaced with a new line in 1986. The industrial waste line was completely removed between 1981 and 1986 and no evidence of a release was found.	No RFI sampling data, no contamination expected. According to the RFI Work Plan, solvents may have been disposed to the old RLWTF pre-RCRA.	Industrial Hazardous LLW MLLW
SWMU 03-045(a)	An inactive outfall from the power plant (building 03-0022), which operated from the 1950s to 1993. The primary discharge to SWMU 03-045(a) was noncontact water from steam condensate. In addition, water from floor drains in the basement, first floor, mezzanine, heater floor, platform, and roof drains of the steam plant previously discharged to this outfall. A 100 to 200 gal. diesel spill occurred in 1991, but was remediated.	No RFI sample data, no contamination expected.	Industrial PCB
SWMU 03-045(e)	An inactive outfall from a floor drain in the oil pump house (structure 03-0057) at the TA-03 power plant. One line from two diesel storage tanks (structure 03-0026 and former structure 03-0027) passed through the pump house to the steam plant. Valves in the pump house operated each line and allowed diesel to flow from one or both storage tanks. The drain was in place to preven2t the pump house from filling with diesel fuel if a valve junction should rupture or leak. The drain and associated piping were plugged in 1989.	No RFI sample data, no contamination expected.	Industrial (fuel oil only)

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
SWMU 03-045(f)	An inactive outfall from a sink drain that served the utilities control center (building 03-0223) from 1950 to the late 1980s. The outfall was located on the north side of the building and emptied into Sandia Canyon. The sink was used as a quench tank for welding and cutting. The sink contained water to cool welded metal; therefore, no leaching of metal was performed at the site. There were no known releases of hazardous wastes or constituents from the sink and SWMU 03-045(f).	No RFI sample data, no contamination expected.	Industrial
SWMU 03-045(h)	A former NPDES-permitted outfall (EPA 03A024) located at the north perimeter of the Sigma Complex security fence, approximately 50 ft north of a cooling tower (structure 03-0187). The outfall was formerly permitted for the discharge of treated cooling water and stormwater. The outfall served a former cooling tower that was replaced by a smaller cooling tower (structure 03-0187) between 1997 and 1998. The outfall was plugged in 1997 during the removal of the previous cooling tower. The outfall has been removed from the NPDES permit and was not included on the 2007 authorization to discharge.	No RFI sample data; metals above BVs, but well below TCLP levels are expected.	Industrial
AOC 03-047(g)	A product storage area where drums of acetone, oil, and ethylene glycol were stored under a canopy on the north side of building 03-0141. No documented spills, some minor staining observed on concrete.	No RFI sample data; metals above BVs, but well below TCLP levels and low concentrations of TPH are expected.	Industrial
AOC 03-051(c)	Two stained asphalt areas attributed to vacuum pump oil operational leaks or exhaust emissions adjacent to building 03-0141. The areas were remediated in 1995. Confirmation samples were analyzed for metals, SVOCs, and pesticides.	Sampling data show metals above BVs, but well below TCLP levels. SVOCs and pesticides were not detected.	Industrial
AOC 03-052(b)	Five storm drain access areas located about 20 ft north and west of the Sigma Building, building 03-0066. Surface runoff flows across the surrounding area into the system at two locations: the system on the northeast side of building 03-0066 discharges to a storm drain outlet just north of Eniwetok Drive and a single storm drain located on the northwest side of building 03-0066 discharges to a low-lying grassy area.	Sampling data show metals above BVs, but well below TCLP levels. Organic chemicals and radionuclides were not detected.	Industrial

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
SWMU 03-052(f)	A formerly NPDES-permitted storm drain outfall EPA 03A023 northeast of the Oppenheimer Study Center (structure 03-0207) that empties into the head of Sandia Canyon. Stormwater from SWMUs 03-013(a and b) discharged to this outfall. SWMU 03-013(a) consists of floor drains in the basement of building 03-0038. Until 1987, the floor drains discharged to a storm drain [SWMU 03-013(a)]. SWMU 03-013(b) is former 1500-ft long corrugated metal pipe storm drain that served building 03-0038. The storm drain ran underground around building 03-0038, east along the south side of the Otowi Building (building 03-0261), and connected to four other storm drains before daylighting 100 ft east of the Otowi Building where it became an open concrete and rock-lined ditch. The open drain continued past transportable office buildings (buildings 03-1616 and 03-1617) and passed beneath streets and sidewalks to a point where it discharged to SWMU 03-054(f). SWMU 03-013(a) was removed in 2004 to accommodate the construction of the NSSB and a new parking structure. The SWMU 03-052(f) will be the only location sampled.	Sampling data show metals detected above BVs, well below TCLP levels. Aroclor-1254 and total PCBs were detected (<50 ppm) in one sample. VOCs, SVOCs, and radionuclides were not detected.	Industrial PCB
SWMU 03-056(a)	An inactive used-oil accumulation facility built in 1986. The 12-ft × 45-ft structure is located approximately 15 ft north of building 03-0271. The storage area has a concrete floor that slopes toward a sump and is surrounded by a concrete berm. The area is roofed but the sides are open. No spills from the bermed area to the environment have occurred and there is no staining evident on the concrete.	Sampling data show metals above BVs, but well below TCLP levels. TPH was not detected.	Industrial PCB
SWMU 03-056(d)	A former product drum-storage area at the TA-03 WWTP where containers of lubricating oil were mounted in racks with drip pans beneath. Stains were noted within the bermed area but none were observed outside the berm. No reported releases.	No RFI sampling data.	Industrial PCB

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
AOC 03-056(k)	A former container storage area on the north side of a loading dock at the northwest corner of building 03-0066. Waste oil, solvents, and radioactively-contaminated graphite were kept in the storage area. Potential contaminants are inorganic chemicals and DU.	Carbon disulfide and 2-butanone were detected in one sample. Uranium-235 was detected above BV in one fill sample and uranium-238 was detected above BV in three fill samples. Uranium-234, uranium-235, and uranium-238 were detected in all asphalt samples; cesium-134 and cesium-137 were detected in one asphalt sample.	LLW Hazardous PCB
SWMU 03-056(l)	The former location of an area adjacent to the east side of building 03-0141 where reportedly, containers of disposable clothing contaminated with beryllium powder were staged prior to disposal. Carboys used to store beryllium powder in water were also stored in this area. The carboys in a tray that served as secondary containment. There is no history of releases from the drums or carboys to the environment.	Sampling data showed several metals detected above BVs, but well below TCLP levels; however no beryllium was detected.	Industrial
SWMU 03-059 **AOC 03-003(n)**	AOC 03-003(n) is the location of a one-time PCB spill approximately 20 ft south of the northwest corner of building 03-0271 where a transformer ruptured in 1977 and leaked an estimated 10 gal. of PCB-contaminated oil. There is no documentation of spill clean up or confirmation sampling. SWMU 03-059 is the former location of a salvage yard adjacent to the south side of building 03-0271. The salvage yard was used to store transformers, electrical equipment, batteries, and scrap metal.	No PCBs or radionuclides were detected in 1994 RFI samples collected at AOC 03-003(n). No PCBs were detected in 1994 RFI samples collected at SWMU 03-059; tritium was reportedly detected in 3 samples; but he data is screening level only and there is no source of tritium.	Industrial PCB
SWMU 60-002 (West)	Three former storage area locations (designated as western, central, and eastern) on Sigma Mesa that were used for the storage of construction and fill materials for Laboratory support contractors from the 1960s until 2006. Only the former western storage area location will be sampled during this investigation to determine extent.	Sampling data showed several metals detected above BVs, but well below TCLP levels. PAHs were detected at trace concentrations and PCBs were detected below 1 ppm.	– industrial
AOC 60-004(b)	AOC 60-004(b) is the former location of a storage area for 12 containers of diesel sludge from USTs removed from the TA-03 steam plant. The containers were stored at AOC 60-004(b) in 1988. The storage site is located northeast of the geothermal well mud pit within the boundaries of AOC 60-004(d).	Mercury was detected above BV in one sample. PAHs and Aroclor-1254 were detected in one sample. VOCs and radionuclides were not detected.	Industrial

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
AOC 60-004(d)	AOC 60-004(d) is a former area used to dismantle decommissioned diesel USTs and to temporarily store drums containing diesel fuel removed from the USTs.	No RFI sample data, no contamination expected.	Industrial NMSW
AOC 60-004(f)	Two unpaved, bermed storage pads, Pad 2 and Pad 3, used for new product storage adjacent to building 60-0002. 55-gal. drums that dispensed Stoddard solvent, antifreeze, motor oil, grease, transmission fluid, and window-washing fluid were stored on racks at both pads. In 1985, 6-in. asphalt berms were built at the open ends of both pads to mitigate rainfall run-on and runoff problems. In 1990, all containers were removed from the pads.	Sampling data showed several metals detected above BVs, but well below TCLP levels. Aroclor-1254 and Aroclor-1260 were detected in one tuff sample. Tritium was detected in one soil, one sediment, and eight tuff samples – however the data is screening-level and there is no source. VOCs, SVOCs, and pesticides were not detected.	Industrial PCB
SWMU 60-006(a)	An inactive septic system located on Sigma Mesa near the northeast corner of the fence surrounding buildings 60-0017 and 60-0019. This septic system formerly served buildings 60-0017 (NTS Test Rack Fabrication Facility) and 60-0019 (NTS test tower). From 1986 to 1989, wastewater generated from facility bathrooms and seven floor drains, including one in a paint booth, was discharged to the septic system. In 1989, building 60-0017 was connected to the sanitary sewer. The septic tank contents will be characterized, removed and disposed of in accordance with applicable regulatory requirements followed by the septic tank.	Sampling data from the septic tank contents showed several metals detected above BVs, but below TCLP levels. PAHs and VOCs were also detected. The septic contents will be fully characterized upon initiation of the Upper Sandia Canyon Aggregate Area investigation activities.	Industrial or Hazardous
SWMU 60-007(a)	A former storage area located near the east end of Sigma Mesa used to store equipment for drilling a geothermal well. Oil, hydraulic fluid, and similar materials were reported to have been released to the environment. In 1992, areas of stained soil were removed and the remediated areas were covered with gravel.	1994 RFI data showed barium detected above BV in one sample. Toluene was detected at trace concentrations in one sample. SVOCs and PCBs were not detected. 2001 sampling data showed thallium was detected above BV in one sample. TPH-DRO and TPH-LRO were detected at low concentrations. No PCBs were detected.	Industrial PCB NMSW

Table 3.0-1 (continued)

AOC/SWMU	Site Description	Potential Contaminants	Initial Waste Determination
SWMU 60-007(b)	A storm drainage ditch that starts north of the motor pool building (building 60-0001) and extends approximately 600 ft from a paved area directly north of building 60-0001 to the bottom of Sandia Canyon. Two parking lots located east of building 60-0001 drain to a ditch that eventually joins the SWMU 60-007(b) drainage ditch. Other former sources of potential contamination to the ditch are a former steam-cleaning pad, a former used-oil storage tank, and a former oil/water separator.	2001 sampling data showed metals detected above BVs, but well below TCLP levels. TPH-DRO and TPH-LRO were detected at low concentrations and PAHs were detected. No PCBs were detected.	Industrial PCB
AOC C-61-002	An area of subsurface contamination that was encountered in 1995 during a drill rig test. The test hole is located in TA-61, approximately 15 ft north of building 61-0016, a former storage building (former structure 03-0326). During the drilling test, an odor was noted and contamination was encountered at 7 to 8 ft bgs. The contamination was suspected to be petroleum-based (e.g., diesel). A sample of the tuff was collected and the analysis showed the presence of diesel. Personnel interviews conducted after the drilling indicated that the source of the diesel may have been the previous road maintenance support work performed in the area.	No RFI sample data.	NMSW

Table 4.2-1
Waste Characterization Table[a]

Waste Description	Waste Stream #1 MSW	Waste Stream #2 Drill Cuttings	Waste Stream #3 Contact IDW	Waste Stream #4 Decon. Fluids	Waste Stream #5 PCS	Waste Stream #6 Returned Rad-Van Samples	Waste Stream #7 Debris	Waste Stream #8 Septic Tank Contents
Volume	3.5 cy	10 cy	0.3 cy	< 55 gal.	<1 cy	0.2 cy	10 cy	300 gal.
Packaging	Approved Container	Approved Container	Approved Container	Approved Container	Approved Container	Approved Container	Approved Container	Approved Container
Waste Profile Form #	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Regulatory Classification								
Radioactive		X		X	X	X		X
Green is Clean			X					
Solid	X	X	X	X	X	X	X	X
Hazardous		X		X	X	X	X	X
Mixed (hazardous and radioactive)		X		X	X	X		X
PCB		X			X	X	X	X
New Mexico Special Waste					X	X		
Industrial		X	X	X	X	X	X	X
Characterization Method								
Acceptable knowledge (AK): Existing Data/Documentation	X		X		X		X	X
AK: Site Characterization			X				X	X
Direct Sampling of Containerized Waste		X		X	X	X	X	X
Analytical Testing								
Volatile Organic Compounds (EPA 8260-B)		X		X	X	X	X	X
Semivolatile Organic Compounds (EPA 8270-C)		X		X	X	X	X	X
Organic Pesticides (EPA 8081-A)		X[b]				X[b]	X	X
Organic Herbicides (EPA 8151-A)		X[b]				X[b]	X	X
PCBs (EPA 8082)		X		X[f]	X[f]	X[f]	X[f]	X[f]
Total Metals (EPA 6010-B/7471-A)		X		X	X	X	X	X
Total Cyanide (EPA 9012-A)		X		X		X	X	X

Table 4.2-1 (continued)

Waste Description	Waste Stream #1 MSW	Waste Stream #2 Drill Cuttings	Waste Stream #3 Contact IDW	Waste Stream #4 Decon Fluids	Waste Stream #5 NMSW	Waste Stream #6 Returned Rad-Van Samples	Waste Stream #7 Debris	Waste Stream #8 Septic Tank Contents
High Explosives Constituents (EPA 8330/8321-A)								
Asbestos								
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)		X[c]			X[c]	X	X	X
TPH-DRO (EPA 8015-M)		X[c]			X[c]	X	X	X
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)		X		X		X	X	X
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)		X[a]		X[a]		X[a]	X[a]	X[a]
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)		X		X		X	X	X
Gross Alpha (alpha counting) (EPA 900)								
Gross Beta (beta counting) (EPA 900)								
Tritium (liquid scintillation) (EPA 906.0)		X		X	X[d]	X	X	X
Gamma spectroscopy (EPA 901.1)								X
Isotopic plutonium (chem. separation/alpha spec.) (HASL-300)		X		X	X[d]	X	X	X
Isotopic uranium (chem. separation/alpha spec.) (HASL-300)		X		X	X[d]	X	X	X
Total uranium (6020 inductively coupled plasma mass spectroscopy [ICPMS])					X[d]			
Strontium-90 (EPA 905)		X		X	X[d]	X	X	X
Americium-241 (chem. separation/alpha spec.) (HASL-300)		X		X	X[d]	X	X	X
TDS				X[e]				X
TSS				X[e]				X
COD				X[e]				X

Table 4.2-1 (continued)

Waste Description	Waste Stream #1 MSW	Waste Stream #2 Drill Cuttings	Waste Stream #3 Contact IDW	Waste Stream #4 Decon Fluids	Waste Stream #5 NMSW	Waste Stream #6 Returned Rad-Van Samples	Waste Stream #7 Debris	Waste Stream #8 Septic Tank Contents
TTO (Method 624, 625A, 625B)				X[e]				X[e]
Perchlorate				X[e]				X[e]
Nitrates				X[e]				X[e]
Gross Gamma				X[e]				X[e]

[a] If direct sampling of waste is necessary.

[b] If waste is destined for Energy Solutions facility in Clive, Utah.

[c] If waste is destined for an authorized New Mexico Special Waste Facility, it will require TPH data.

[d] If waste may have contacted radioactively-contaminated soil.

[e] If the waste is destined for the RLWTF. Can use VOC, SVOC data to calculate TTO instead of directly sampling.

[f] If the waste may have contacted PCB-contaminated soil

Note: Section 1.2 of the TCLP method 1311 states "If a total analysis of the waste demonstrates that individual analytes are not present in the waste, or that they are present but at such low concentrations that the appropriate regulatory levels could not possibly be exceeded, the TCLP need not be run." The methodology for using total waste analyses determination for the 40 TC constituents is as follows;

Liquids – Wastes containing less than 0.5% filterable solids do not require extraction and therefore by filtering the waste and measuring the total constituent levels of the filtrate and comparing those levels to regulatory levels is appropriate.

Solids – Constituent concentrations from the extraction fluid of wastes that are 100% physical solids are divided by 20 (reflecting the 20 to 1 ratio of TCLP extraction) and then compared to the regulatory levels. If the theoretical levels do not equal or exceed the regulatory levels, the TCLP need not be run. If the levels do equal or exceed the regulatory levels, the generator will run TCLP analyses.

Signatures	Date
WES-CAP Project Leader: Kent Rich	10/5/09
Preparer (Paula Bertino)	10/5/09
WES Waste Management Coordinator: Gordon Jio	10/5/09
ENV-RCRA Representative: Ann Sherrard	10/5/09
Waste Certification Program Representative: Michelle Coriz	10/5/09
WES-WA Representative: Andy Elicio	10/05/09