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Waste Characterization Strategy Form

Project Title	**Phase III Material Disposal Area C Investigation at TA-50**
Solid Waste Management Unit	**SWMU** 50-009
Activity Type	**Site Investigation**
LATA Field Team Leader	**Jon Marin**
Waste Management Coordinator	**Ron DeSotel**
Completed by	**John Branch, LATA**
Date	**September 28, 2010**

1.0 Description of Activity

The objectives of the proposed investigation activities are to define the lateral and vertical extent of subsurface volatile organic compound (VOC) vapor and tritium contamination at MDA C, install four vapor monitoring wells, collect pore-gas samples from the four new vapor monitoring wells and 14 existing vapor monitoring wells, and characterize background concentrations of inorganic chemicals detected in dacite lava. The data collected during the Phase III investigation will be used to support future corrective action decisions for MDA C. The work will be performed in accordance with the New Mexico Environment Department (NMED)-approved Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1, and EXHIBIT "D" Scope of Work and Technical Implementation of the Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50 Phase III, Subcontract No. 54907-001-07.

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) that is expected to be generated during the investigation in Technical Area (TA)-50. The IDW may include, but is not limited to, drill cuttings, contact waste, decontamination fluids, municipal solid waste, petroleum-contaminated soils, and returned or excess samples.

The following activities are planned:

Pore Gas Sample Collection – This activity includes collecting pore-gas samples from existing vapor-monitoring well ports and from the proposed new vapor-monitoring well ports. The samples from each borehole will be collected in accordance with EP-ERSS-SOP-5074, Sampling for Sub-Atmospheric Air. Subsurface pore-gas samples will be collected in SUMMA canisters and submitted to the Sample Management Office (SMO) for shipment to the analytical laboratory for VOC analysis by EPA Method TO-15. Pore-gas samples will also be collected in silica gel sample tubes for analysis of tritium by EPA Method 906.0.

Borehole Drilling – This activity includes drilling four boreholes using the air rotary method of drilling. The air-rotary method uses a drill pipe or drill stem coupled to a drill bit that rotates and cuts through soil and rock. The cuttings produced from the rotation of the drill bit are transported to the surface by compressed air, which is forced down the borehole through the drill pipe and returns to the surface through the annular space between the drill pipe and the borehole wall. The each borehole will advance to approximately 660 ft bgs.

Vapor-Monitoring Well Construction – This activity includes constructing four vapor-monitoring wells at each of the four borehole locations. The wells will be constructed by installing sample screens within filter

packs at target depth intervals. The sample screens will be connected to stainless-steel tubes that will extend to the ground surface.

Waste Management –This task involves the management of investigation-derived waste (IDW 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 may include, but is not limited to drill cuttings, contact waste, sampling supplies, decontamination fluids, petroleum-contaminated soils, and all other waste that has potentially come into contact with contaminants.

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

MDA C is located in TA-50 at the head of Ten Site Canyon. TA-50 is bounded on the north by Effluent and Mortandad Canyons, on the east by the upper reaches of Ten Site Canyon, on the south by Twomile Canyon, and on the west by TA-55. Facilities at TA-50 include a radioactive liquid waste treatment facility (RLWTF), a waste reduction characterization facility, offices, several storage areas, other SWMUs, and MDA C.

MDA C is an inactive 11.8-acre landfill consisting of 6 disposal pits, a chemical disposal pit, and 108 shafts. Solid low-level radioactive wastes and chemical wastes were disposed of in the landfill between 1948 and 1974. The depths of the seven pits at MDA C range from 12 to 25 ft below the original ground surface. The depths of the 108 shafts range from 10 to 25 ft below the original ground surface. The original ground surface is defined as beneath the cover that was placed over the site in 1984. The pits and shafts are constructed in the Tshirege Member of the Bandelier Tuff.

MDA C is a decommissioned material disposal area established to replace MDA B at TA-21 as a disposal area for Laboratory-derived waste. MDA C operated from May 1948 to April 1974 but received waste only intermittently from 1968 until it was decommissioned in 1974. Wastes disposed of at MDA C consisted of liquids, solids, and containerized gases generated from a broad range of nuclear research and development activities conducted at the Laboratory. These wastes include uncontaminated classified materials, metals, hazardous materials, and radioactively contaminated materials. After closure, the pits and shafts were subsequently covered with varying amounts of fill material.

3.0 Characterization Strategy

This WCSF identifies the types of wastes expected, based on the data from previous investigations; however, other types of wastes may be encountered. An amendment to this WCSF 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.*

Wastes will initially be managed as non-hazardous in accordance with the due diligence review already prepared for SWMU 50-009. Based on characterization and investigative data from the 2009 Phase II investigation report, the waste is also expected to be low-level. 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 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. A non-hazardous waste label, date of generation, the generator's name, and container contents will be placed on non-hazardous waste containers as a best management practice. 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. Samples will be collected using the methods described in this WCSF by trained and qualified sampling personnel. Sampling personnel will record waste sampling information in accordance with LANL's procedure, EP-ERSS-SOP-5058, *Sample Control and Field Documentation* and EP-ERSS-SOP-5181, *Notebook and Logbook Documentation for Environmental Directorate Technical and Field Activities.*

A waste determination will be made within 45 days of the generation date of waste. A Waste Acceptance Criteria 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.

A copy of the due diligence reviews already prepared for this investigation will accompany all waste profiles prepared for the waste(s) with potentially listed contaminants.

Investigation 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.

3.1 Waste # 1: Drill Cuttings (IDW)

This waste stream consists of soil and rock cuttings generated from the drilling of boreholes. Drill cuttings may include excess core samples not submitted for analysis and any returned drill cutting samples. Drill cuttings may be land applied if they meet the criteria in Quality Procedure (QP)-011, *Land Application of Drill Cuttings*. Approximately 80 yd^3 of drill cuttings are expected to be generated.

Anticipated Regulatory Status: Industrial, Low-level radioactive waste (LLW), New Mexico Special Waste (NMSW), Land Applied

Characterization Approach: The drill cuttings will be characterized by direct sampling of the containerized cuttings. Cuttings 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. Cuttings will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), radionuclides, total metals, perchlorates, nitrates, and toxicity characteristic (TCLP) metals, if needed (see Table 3.1-1). 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 at the point of generation in LANL approved 20 yd^3 roll-off bins, or other containers appropriate for the quantity of waste generated. The cuttings will initially be managed as non-hazardous. Because they will be directly sampled, they will be

managed as radioactive only if they cannot be land applied and the analytical data identify them as radioactive. If analytical data changes the waste classification (e.g., PCB waste), the waste will be stored in a secure, designated area appropriate for the type of waste. 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.

3.2 Waste # 2: 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 and cannot be decontaminated. This includes, but is not limited to plastic sheeting (e.g., tarps and liners), gloves, coveralls (e.g. Tyvek), booties, paper towels, plastic and glass sample bottles, and disposable sampling supplies. Approximately 2 yd^3 of contact waste are expected to be generated.

Anticipated Regulatory Status: Industrial, LLW, Green is Clean

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

- If generated during drilling, data from the associated drill cuttings will be used.
- If generated during hand augering, associated 2009 or 2010 investigation data will be used.
- If generated during excavations, data from the associated excavated environmental media (using the 2009 investigation data and 2010 TCLP metals data) will be used.

The amount of media contaminating the contact waste can be estimated and the results from the analytical data may be weighted by the extent of contamination for determining whether wastes are characteristic. This calculation must be submitted with the WPF as acceptable knowledge.

Storage and Disposal Method: The contact waste may initially be separately containerized in drums 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. Based on existing investigation and waste data, waste will initially be managed as radioactive if/when the waste with which it came into contact is being managed as radioactive. If analytical data changes the waste classification, the waste will be stored in an area appropriate for the type of waste (e.g., PCB 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 disposed of in authorized on-site or off-site facilities appropriate for the waste classification.

3.3 Waste #3: Decontamination Fluids (potential)

This waste stream consists 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. It is estimated that less than 55 gal of decontamination fluids are expected to be generated from this activity.

Anticipated Regulatory Status: Industrial, LLW

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 will be separately collected and sampled (do not mix with any other decontamination fluids).

Decontamination fluids will be characterized by investigation samples from the media it contacted or by direct sampling. Representative samples will be collected within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be collected from the storage container in accordance with EP-ERSS-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, available at http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf). Samples will be analyzed in accordance with Table 3.1-2. 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 Table 3.1-2, 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 managed in secure, designated waste areas. Waste will initially be managed as non-hazardous. If analytical data changes the waste classification (e.g., PCB or radioactive wastes), the waste will be stored in an area appropriate for the type of waste. It is expected that most of the decontamination fluids will be treated on-site at the Sanitary Waste Water System (SWWS) or TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Decontamination fluids 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.

3.4 Waste #4: 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 non-hazardous solution containers, and other non-contact trash. This waste stream may also include vegetation from sites with no radioactive contamination. It is estimated that approximately 2 yd^3 of MSW will be generated, but may change if vegetation removal is required.

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.

3.5 Waste #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. 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 will 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, LLW, 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-06.09) may also be appropriate. If the spill is new, it must be 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 of containerized waste will be collected within 10 days of generation and submitted for analysis with a 21 day turnaround time. Samples will be analyzed in accordance with Table 3.1-2. Other constituents will be considered significant only if analysis of these constituents is required by the work plan for the PRS (see Table 3.1-2). If legacy petroleum contamination is discovered, the soils will also be analyzed for PCBs and TPH DRO/GRO). 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. All PCS will be treated and/or disposed of, at an authorized on-site or off-site facility appropriate for the waste classification.

3.6 Waste #6: 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, LLW, NMSW

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 sampled within 10 days of the return of the samples and and submitted for analysis with a 21 day turnaround time. Samples will be analyzed for the constituents identified in Table 3.1-2. 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 the same manner as the media from which they originated. 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 disposal facility, appropriate for the waste regulatory classification.

REFERENCES

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

EP2010-0445- Integrated Work Document (IWD) – Implementation of the Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Rev.1

EP2010-0446- Site-Specific Health and Safety Plan (SSHASP) – Implementation of the Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1

LANL (Los Alamos National Laboratory), April 2010. "Phase III Investigation Work Plan for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50, Revision 1," Los Alamos, New Mexico. (LANL 2010, EP2010-0197)

LANL (Los Alamos National Laboratory), May 2009. "Phase II Investigation Report for Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," Los Alamos, New Mexico. (LANL 2009, EP2009-0215)

Table 3.1-1. Waste Characterization			
Waste Description	**Waste # 1 Drill Cuttings**	**Waste #2 Contact Waste**	**Waste #3 Decontamination Fluids**
Estimated Volume	80 CY	2 CY	< 55 gallons
Packaging	20 yd^3 Roll-off Bins	55 gallon drums	30 or 55 gallon drums
Regulatory classification:			
Radioactive Waste	X	X	X
Municipal Solid Waste (MSW)			
Waste destined for LANL's SWWS or RLWTF[1]			X
Hazardous Waste			
Mixed (hazardous and radioactive) Waste			
Polychlorinated Biphenyls-Contaminated Waste (PCBs)			
New Mexico Special Waste	X		
Industrial Waste	X	X	X
Characterization Method			
Acceptable knowledge (AK): Existing Data/Documentation		X	
AK: Site Characterization		X	
Direct Sampling of Waste	X		X
Analytical Testing			
Volatile Organic Compounds (VOCs) (EPA 8260-B)	X		X
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)	X		X
Organic Pesticides (EPA 8081-A)			
Organic Herbicides (EPA 8151-A)			
PCBs (EPA 8082)	X[4]		X
Total Metals (EPA 6010-B/7471-A or EPA 6020)	X		X
Total Cyanide (EPA 9012-A)			X
High Explosives Constituents (EPA 8330/8321-A)			
Asbestos (EPA 600M4)			
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)	X[4]		
TPH-DRO (EPA 8015-M)	X[4]		
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X[6]		
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]
Gross Beta (beta counting) (EPA 900)	X[4]		X[4]
Tritium (liquid scintillation) (EPA 906.0)	X		X
Gamma spectroscopy (EPA 901.1)	X		X
Isotopic plutonium (HASL-300)	X		X
Isotopic uranium (HASL-300)	X		X
Total uranium (EPA 6020)	X		X
Strontium-90 (EPA 905)	X		X
Americium-241 (HASL-300)	X		X
Perchlorates (EPA 6850)	X		
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	X		X[1]
Oil / Grease (EPA 1665)			X[1]
Fluorine, Chorine, Sulfate (EPA 300)			X[1]
TTO (EPA 8260-B and EPA 8270-C)[2]	**Request VOC and SVOCs above[1]**		
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)			X[1]

Table 3.1-1. Waste Characterization			
Waste Description	**Waste # 1 Drill Cuttings**	**Waste #2 Contact Waste**	**Waste #3 Decontamination Fluids**
Chemical Oxygen Demand (COD) (EPA 410.4)			X[1]
pH (EPA 904c)			X[1]
Microtox or Biological Oxygen Demand (BOD)[3]			X[1]

Table 3.1-2. Waste Characterization			
Waste Description	**Waste #4 Municipal Solid Waste**	**Waste #5 Petroleum Contaminated Soils**	**Waste #6 Returned or Excess Samples**
Estimated Volume	< 1 CY	< 1 CY	0.5 CY
Packaging	Plastic trash bags	30 or 55 gallon drums	Same containers as the environmental media from which they were taken or other drums.
Regulatory classification:			
Radioactive Waste		X	X
Municipal Solid Waste (MSW)	X		
Waste destined for LANL's SWWS or RLWTF[1]			
Hazardous Waste			
Mixed (hazardous and radioactive) Waste			
Polychlorinated Biphenyls-Contaminated Waste (PCBs)		X	
New Mexico Special Waste		X	X
Industrial Waste		X	X
Characterization Method			
Acceptable knowledge (AK): Existing Data/Documentation	X		X
AK: Site Characterization			X
Direct Sampling of Waste		X	X
Analytical Testing			
Volatile Organic Compounds (VOCs) (EPA 8260-B)		X	X
Semivolatile Organic Compounds (SVOCs) (EPA 8270-C)		X	X
Organic Pesticides (EPA 8081-A)			
Organic Herbicides (EPA 8151-A)			
PCBs (EPA 8082)		X[4]	X[4]
Total Metals (EPA 6010-B/7471-A or EPA 6020)		X	X
Total Cyanide (EPA 9012-A)		X[5]	X[5]
High Explosives Constituents (EPA 8330/8321-A)			
Asbestos (EPA 600M4)			
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)		X	X[4]
TPH-DRO (EPA 8015-M)		X	X[4]
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)		X[6]	X[6]
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]
Gross Beta (beta counting) (EPA 900)		X[4]	X[4]
Tritium (liquid scintillation) (EPA 906.0)		X	X
Gamma spectroscopy (EPA 901.1)		X	X
Isotopic plutonium (HASL-300)		X	X
Isotopic uranium (HASL-300)		X	X
Total uranium (EPA 6020)		X	X
Strontium-90 (EPA 905)		X	X
Americium-241 (HASL-300)		X	X
Perchlorates (EPA 6850)			
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)		X[5]	X[5]
Oil / Grease (EPA 1665)			
Fluorine, Chorine, Sulfate (EPA 300)			
TTO (EPA 8260-B and EPA 8270-C)[2]			

Table 3.1-2. Waste Characterization			
Waste Description	**Waste #4 Municipal Solid Waste**	**Waste #5 Petroleum Contaminated Soils**	**Waste #6 Returned or Excess Samples**
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and 160.2)			
Chemical Oxygen Demand (COD) (EPA 410.4)			
pH (EPA 904c)			
Microtox or Biological Oxygen Demand (BOD)[3]			

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.

[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.

[4] If required by a receiving facility's acceptance criteria or if required due to discovered contamination (e.g., TPH and PCBs)

[5] If required for investigation samples by the Phase II IWP

[6] TCLP metals must be analyzed for drill cuttings if total metals divided by 20 exceed toxicity characteristic limits.

Signatures	Date
Project Manager (Stephani Fuller)	10-15-10
Preparer (John Branch)	10-18-10
Waste Management Coordinator (Ron DeSotel)	10-15-10
ENV-RCRA Representative (Jocelyn Buckley)	10-14-10
Waste Acceptance Representative (Jose Ortega)	10/14/10
Waste Certification Program Representative (Michelle Coriz)	10/18/10

GREEN IS CLEAN MATERIAL DISPOSAL REQUEST FORM

To: SWO GIC Operation for Pre-Approval FAX 665-8347			**( ) Approved For Shipment to TA-54 Area G (665-4356): Date Approved**			**SWO Approver Initials**	
SWO GIC Request #:	**SWO Reviewer Name:**			**Z#**		**Authorized GIC Generator ( ) Yes ( ) No**	
Acceptable Knowledge Materials: (X) For SWO verification and potential release ( ) For Database Entry Only (Direct released by generator without shipment to SWO)					Waste Generator Return: Name: Stephanie Fuller FAX #: 665-4747		
WMC Z# 212070	WMC Name (PRINT) Ron De Sotel	WMC Tel. # 665-5505	WMC Mail Stop M881	Date Submitted 02/17/2011	RCA Type ( ) β/γ ( ) α (X) Both	Classified Material ( ) Yes (X) No	Pure Beta Emitter ( ) Yes (X) No
Generator Group PMF5-00	(X) Routine ( ) Non-routine	( ) Surface (X) Volume	Compactable (X) Yes ( ) No	( ) Generator Will Deliver (X) SWO to Pick Up Load at (Specify) TA-Bldg-Rm TA-50 (MDA-C)		Waste Verification Location (X) TA-54-2 (α,β,γ) ( ) TA-48 (β,γ) ( ) Other (Specify) _____	

GIC ID #	Generated At (TA-Bldg-Rm)	Charge Code* (Cost Cntr/ Prog/ Acct/Work Pkg)	Vol. (Ft^3)	Wt. (Lbs)	Material Description	Disposition (Percent) Solid	Re-cycle	LLW	Date Processed	Verifier Init.	Comments
7032110	50	61000A/MR2A/051B/2S00	2	7	Contact Waste						
7032112	50	"	2	4.5	Contact Waste						
7032113	50	"	2	6.5	Contact Waste						
7032115	50	"	2	7	Contact Waste						
7032117	50	"	1	5.5	Contact Waste						
7032111	50	"	2	7.5	Contact Waste						
7032114	50	"	1	10.5	Contact Waste						
7031995	50	"	2	10.5	Contact Waste						
7031998	50	"	2	11	Contact Waste						
7031989	50	"	1	7.5	Contact Waste						
7031992	50	"	2	11	Contact Waste						
7032001	50	"	2	13	Contact Waste						
7032109	50	"	2	7	Contact Waste						
7031990	50	"	2	9	Contact Waste						
7031991	50	"	2	9.3	Contact Waste						

NOTE: This shipment is exempt from DOT requirements. The activity level is less than 2 nanocuries per gram, and does not meet the DOT definition of a radioactive material.

- **Waste Generator Certification:** *Based on my process knowledge of the waste and/or chemical/physical/radiological analysis, the waste is expected to be free of radioactive contamination, and I certify that the information on this form is correct. I understand that this information may be made available to regulatory agencies and that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

  Waste Generator Signature (Required): _____ **Date:** 2-17-11

- **Waste Management Coordinator:** *I have reviewed this form, and to the best of my knowledge, the information is complete and accurate.*

  WMC Signature (Required): _____ **Date:** 2-17-11

- **GIC Verifier Name** (Required): _____ **Date:** _____

*Although there is no charge for Green is Clean waste, the complete generator "Charge Code" is required; it is the participant identifier in the database

4 BIN 5810 # 10143862 50-613185

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/20/11 Project: MDA C Phase III

Location of Land Application: Within project footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 48 ft 3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Drill cuttings will be land applied within the project footprint (SWMU 50-009) to previously disturbed areas and covered with a layer of roadbase

Note: An EX-ID Permit is required prior to land application. 10X-0849-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☑	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

Stephani Fuller		Project Mgr.	1/24/11
Name (Print)	**Signature**	**Title**	**Date**

RRP

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes X **No** _____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Jocelyn T. Buckley **Signature** Jocelyn T. Buckley **Date** 1-25-11

Package Expiration Date: 2-11-11

ID# 1014 3862
Bin 5810

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDA C, Phase

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0849 EX-ID Expiration Date: 4/29/11

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	Stephani Fuller	Project Mgr.	1/28/11
Name (Print)	**Signature**	**Title**	**Date**

PRS Number: 50-009 (Borehole 50-613185)		
Source of contaminants:	Yes	No
F-listed		X
U- or P-listed		X
K-listed		X

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area (landfill) for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

RFI activities were conducted at MDA C from 1993 to 1996. Surface soil sampling was conducted during the summer of 1993. A subsurface investigation was performed during portions of 1994, 1995, and 1996.Conclusions regarding the nature and extent of contamination at MDA C based on the results of preliminary site characterization activities are as follows:

-Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C before the placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination has not been defined.

-Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath Pit 6 indicate that contamination has migrated from pit 6 into underlying rock. The extent of subsurface contamination has not been defined.

-Tritium and volatile organic compounds (VOC) contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exist in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined.

-Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Documents Reviewed

Date	Title	ER Id No.
4/1/2010	Investigation Report for Upper Mortandad Canyon Aggregate Area, Rev. 1	109180
4/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, at TA-50, Rev. 1	109260
2/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, TA-50	108594
10/1/2009	Phase II Investigation report for MDA C, SWMU 50-009, at TA-50, Rev. 1	107389
5/1/2009	Phase II Investigation Report for MDA C, SWMU 50-009, at TA-50	106047
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [IWP]	098954
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [HIR]	098955

4/23/2007	Phase II Investigation Work Plan for MDA C, Rev. 1	100143
12/6/2006	Investigation Report for MDA C, SWMU 50-009	094688
10/1/2005	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 2	091493
11/1/2003	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 1	087152
7/31/2003	Investigation Work Plan for MDA-C, SWMU 50-009 at TA-50	087392
5/20/1992	RFI Work Plan for Operable Unit 1147	007672
11/30/90	SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
July 2010	PRS Database	NA

Summary of Listed Status

U-listed constituents were detected in soil samples; however, there was no documented evidence of a spill, release, or discharge of unused/unspent commercial chemical products in the vicinity of the SWMU. K-listed constituents were also detected in the soil samples from 50-009, BH 50-613182; however most K-listed sources are industrial in nature and not typical of Laboratory operations. The Laboratory generates only small amounts of K-listed wastes, primarily spent carbon from high explosives processing that is disposed off-site. The documented amounts of K-listed wastes generated are not sufficient to have impacted investigation/remediation activities. Therefore, the IDW is not K-listed. In addition, Arsenic (F032, F034, F035), Chromium (F032, F034, F035, F037, and F038), Lead (F035, F037, and F038), and Nickel (F006) were also detected in the soil samples from 50-009 site investigation activities. There is no documented evidence that the following processes (F-listed sources) occurred in the vicinity of the SWMU: Wood preserving processes (F032, F034, and F035), Petroleum refinery operations (F037 and F038) and Electroplating operations (F006). See Attachment 1 for the complete list of potentially listed constituents detected in the soil sample.

Based on analytical data and documentation, there is no conclusive evidence of a listed source impacting SWMU 50-009, MDA-C. Therefore, the IDW may be managed as non-hazardous waste.

DD Completed January 25, 2011

Attachment 1.

Analyte	Concentration	Potential F-Codes	Potential K-Codes
Antimony	0.71		K161, K021, K177
Arsenic	0.304	F032,F034,F035,	K031,K060,K161,K171, K172,K176,K084,K101, K102,
Chromium	4.42	F032,F034,F035,F037, F038,	K090
Lead	11.1	F035,F037,F038,	K002, K003, K005, K048, K049, K051, K062, K064, K086, K100, K176, K046, K052, K061, K069
Nickel	2.18	F006	

SWMU ev 3233.2085

SAL and background comparison

Spreadsheet file: ev3233.2085.awd.1.13.2011(1).xlsm

Stockpile Number ev 3233.2085

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.26	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.97	pCi/g					FAIL	FAIL	FAIL	pass	pass
Lead-214	Pb-214	2.7	pCi/g					FAIL	FAIL	FAIL	pass	pass
Potassium-40	K-40	36.2	pCi/g					pass	pass	FAIL	FAIL	pass
Radium 226/228	calc.	5.17	pCi/g									
Radium-226	Ra-226	2.26	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.91	pCi/g			pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	Tl-208	0.841	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	2.71	pCi/g					FAIL	FAIL	FAIL	pass	pass
Tritium	H-3	0.02429	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.09	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.104	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.02	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	0.00287	pCi/g									
Cerium-139	Ce-139	-0.0103	pCi/g									
Cesium-137	Cs-137	0.0025	pCi/g									
Cobalt-60	Co-60	-0.00614	pCi/g									
Europium-152	Eu-152	0.0187	pCi/g									
Lanthanum-140	La-140	-0.0338	pCi/g									
Mercury-203	Hg-203	0.0361	pCi/g									
Plutonium-238	Pu-238	0.00205	pCi/g									
Plutonium-239/240	Pu-239/240	-0.0041	pCi/g									
Radium-223	Ra-223	0.265	pCi/g									
Ruthenium-106	Ru-106	-0.0577	pCi/g									
Sodium-22	Na-22	-0.0238	pCi/g									
Strontium-90	Sr-90	0.139	pCi/g									
Thorium-227	Th-227	-0.154	pCi/g									
Thorium-231	Th-231	0.265	pCi/g									
Tin-113	Sn-113	0.00048	pCi/g									
Uranium-235	U-235	0.258	pCi/g									
Yttrium-88	Y-88	0.00142	pCi/g									

NA
NA
NA

Ra^{228} 2.91 − 2.33 = 0.58 < 5 (attachment 6)

OK to land apply

Sampling event ID 3233

SWMU ev 3233.2085

Stockpile Number ev 3233.2085

Detected Chemicals Form

associated Excel file:
ev3233.2085.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1050	mg/kg							
Arsenic	As	0.304	mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	11.1	mg/kg	pass	pass					
Beryllium	Be	0.633	mg/kg	pass	pass					
Calcium	Ca	474	mg/kg							
Chromium	Cr	2.07	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	0.299	mg/kg							
Copper	Cu	2.48	mg/kg							
Iron	Fe	5350	mg/kg							
Lead	Pb	11.1	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	179	mg/kg							
Manganese	Mn	212	mg/kg							
Nickel	Ni	1.13	mg/kg	pass	pass	F006,				
Potassium	K	282	mg/kg							
Sodium	Na	200	mg/kg							
Uranium	U	0.833	mg/kg							
Vanadium	V	1.33	mg/kg	pass	pass					
Zinc	Zn	39.3	mg/kg	pass	pass					

Sampling event ID 3233

SWMU ev 3233.2085

Stockpile Number ev 3233.2085

Solid Waste Evaluation

Summary

Associated Excel file: ev3233.2085.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

RCRA

33 analytes pass

between these 31 analytes pass as undetected

10 analytes fail

Detects

Total PCB (ppm) Not analyz

4 analytes with potential F-code

3 analytes with potential K-code

0 analytes with potential U-code

0 analytes with potential P-code

Non-wastewater LDR: 8 pass 0 FAIL

Hazardous soil LDR: 8 pass 0 FAIL

Residential Soil (mg/kg) :	14 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	14 pass	0 FAIL
Construction Worker Soil (mg/kg) :	11 pass	1 FAIL
Recreational Soil (mg/kg) :	14 pass	0 FAIL
soil background:	18 pass	0 FAIL
Canyon Sediment background:	18 pass	0 FAIL
Qbt 2,3,4 background:	18 pass	0 FAIL
Qbt 1v background:	18 pass	0 FAIL
Qbt 1g, Qct,Qbo background:	15 pass	3 FAIL

RAD

total dose: 0.8917 mRem/year

?

analysed for H-3

analysed for Pu-239

31 isotopes,

12 were detected

18 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	7 pass	4 FAIL
Canyon Sedi-ment:	7 pass	4 FAIL
QBT2,3,4:	2 pass	9 FAIL
QBt 1v:	10 pass	1 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2085		

Imported data files
ev3233.1.13.2011.txt

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1050	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Arsenic	As	0.304	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	11.1	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.633	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	474	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	2.07	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Cobalt	Co	0.299	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	2.48	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Iron	Fe	5350	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	11.1	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	179	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	212	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Nickel	Ni	1.13	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Potassium	K	282	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	200	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.833	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	1.33	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	39.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Sampling event ID 3233

SWMU ev 3233.2085.2084.2094

Stockpile Number ev 3233.2085.2084.2094

Solid Waste Evaluation

Summary cel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

RCRA

33 analytes pass

between these 31 analytes pass as undetected

10 analytes fail

Detects

Total PCB (ppm) Not analy

4 analytes with potential F-code

4 analytes with potential K-code

0 analytes with potential U-code

0 analytes with potential P-code

Non-wastewater LDR: 9 pass 0 FAIL

Hazardous soil LDR: 9 pass 0 FAIL

Residential Soil (mg/kg) :	15 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	15 pass	0 FAIL
Construction Worker Soil (mg/kg) :	12 pass	1 FAIL
Recreational Soil (mg/kg) :	15 pass	0 FAIL
soil background:	19 pass	0 FAIL
Canyon Sediment background:	19 pass	0 FAIL
Qbt 2,3,4 background:	18 pass	1 FAIL
Qbt 1v background:	14 pass	5 FAIL
Qbt 1g, Qct,Qbo background:	12 pass	7 FAIL

RAD

total dose: 0.9427 mRem/year

?

analysed for H-3

analysed for Pu-239

32 isotopes, 12 were detected

19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	5 pass	6 FAIL
Canyon Sedi-ment:	5 pass	6 FAIL
QBT2,3,4:	2 pass	9 FAIL
QBt 1v:	8 pass	3 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2084	WST50-11-2094	
WST50-11-2085	WST50-11-2094	

Imported data files
ev3233.1.20.2011.txt

Sampling event ID 3233

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

SWMU ev 3233.2085.2084.2094

RCRA Characteristics Form

Stockpile Number ev 3233.2085.2084.2094

evaluation date: 1/20/2011

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	216	ug/L	J	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	21.5	ug/L	U	pass	
Lead	Pb	D008	5000	18.7	ug/L	J	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.053	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.053	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.053	ug/L	U	pass	
Chloroform	67-66-3		6000	0.053	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	17.6	ug/L	U	pass	
Methylphenol[3-]	108-39-4		200000	17.6	ug/L	U	pass	
Methylphenol[4-]	106-44-5		200000	17.6	ug/L	U	pass	
Methylphenol[3-,4-]	65794-96-9		200000	17.6	ug/L	U	pass	
Methylphenol(total)	8027-16-5		200000	35.2	ug/L	UU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	17.6	ug/L	U	pass	
Dichloroethane[1,2-]	107-06-2		500	0.053	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.053	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	17.6	ug/L	U	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	17.6	ug/L	U	pass	
Hexachlorobutadiene	87-68-3		500	17.6	ug/L	U	pass	
Hexachloroethane	67-72-1		3000	17.6	ug/L	U	pass	
Butanone[2-]	78-93-3		200000	0.264	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	17.6	ug/L	U	pass	
Pentachlorophenol	87-86-5		100000	17.6	ug/L	U	pass	
Pyridine	110-86-1		5000	17.6	ug/L	U	pass	
Tetrachloroethene	127-18-4		700	0.053	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.053	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	17.6	ug/L	U	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	17.6	ug/L	U	pass	
Vinyl Chloride	75-01-4		200	0.053	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1650	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.71	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Arsenic	As	0.304	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	15.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.633	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	1130	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.42	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	0.883	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.6	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	5350	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	11.1	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	829	mg/kg	NA	NA	NA	NA	pass	pass	pass	FAIL	FAIL
Manganese	Mn	212	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Nickel	Ni	2.18	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	K	419	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	390	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.833	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	4.16	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	39.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Sampling event ID 3233

SWMU ev 3233.2085.2084.2094

Stockpile Number ev 3233.2085.2084.2094

Detected Chemicals Form

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1650	mg/kg							
Antimony	Sb	0.71	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.304	mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	15.3	mg/kg	pass	pass					
Beryllium	Be	0.633	mg/kg	pass	pass					
Calcium	Ca	1130	mg/kg							
Chromium	Cr	4.42	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	0.883	mg/kg							
Copper	Cu	3.6	mg/kg							
Iron	Fe	5350	mg/kg							
Lead	Pb	11.1	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	829	mg/kg							
Manganese	Mn	212	mg/kg							
Nickel	Ni	2.18	mg/kg	pass	pass	F006,				
Potassium	K	419	mg/kg							
Sodium	Na	390	mg/kg							
Uranium	U	0.833	mg/kg							
Vanadium	V	4.16	mg/kg	pass	pass					
Zinc	Zn	39.3	mg/kg	pass	pass					

SWMU ev 3233.2085.2084.2094 **SAL and background comparison** ...3233 2085 2084 2094 awd 1 20 2011.xlsm

Stockpile Number ev 3233.2085.2084.2094 evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.55	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.97	pCi/g					FAIL	FAIL	FAIL	pass	pass
Lead-214	Pb-214	3.31	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Potassium-40	K-40	36.2	pCi/g					pass	pass	FAIL	FAIL	pass
Radium 226/228	calc.	5.46	pCi/g									
Radium-226	Ra-226	2.55	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.91	pCi/g			pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	Tl-208	0.868	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	3.13	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Tritium	H-3	0.02429	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.78	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Uranium-235/236	U-235/236	0.287	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.9	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Americium-241	Am-241	-0.00101	pCi/g									
Cerium-139	Ce-139	-0.0144	pCi/g									
Cesium-137	Cs-137	-0.00727	pCi/g									
Cobalt-60	Co-60	-0.00614	pCi/g									
Europium-152	Eu-152	-0.073	pCi/g									
Lanthanum-140	La-140	-0.0338	pCi/g									
Mercury-203	Hg-203	0.0361	pCi/g									
Plutonium-238	Pu-238	0	pCi/g									
Plutonium-239/240	Pu-239/240	-0.0041	pCi/g									
Radium-223	Ra-223	0.121	pCi/g									
Ruthenium-106	Ru-106	-0.0901	pCi/g									
Sodium-22	Na-22	-0.0238	pCi/g									
Strontium-85	Sr-85	0.0156	pCi/g									
Strontium-90	Sr-90	-0.0542	pCi/g									
Thorium-227	Th-227	-0.154	pCi/g									
Thorium-231	Th-231	0.121	pCi/g									
Tin-113	Sn-113	-0.00049	pCi/g									
Uranium-235	U-235	0.129	pCi/g									
Yttrium-88	Y-88	0.00142	pCi/g									

SWMU ev 3233.2085.2084.2094 **Radioisotopes Form** Sod Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

Stockpile Number ev 3233.2085.2084.2094 evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	2.55	pCi/g	NQ	
Lead-212	Pb-212	2.97	pCi/g	NQ	
Lead-214	Pb-214	3.31	pCi/g	NQ	
Potassium-40	K-40	36.2	pCi/g	NQ	
Radium 226/228	calc.	5.46	pCi/g		
Radium-226	Ra-226	2.55	pCi/g	NQ	
Radium-228	Ra-228	2.91	pCi/g	NQ	
Thallium-208	Tl-208	0.868	pCi/g	NQ	
Thorium-234	Th-234	3.13	pCi/g	NQ	
Tritium	H-3	0.0242893	pCi/g	NQ	
Uranium-234	U-234	2.78	pCi/g	NQ	
Uranium-235/236	U-235/236	0.287	pCi/g	NQ	
Uranium-238	U-238	2.9	pCi/g	NQ	
Americium-241	Am-241	-0.00101	pCi/g	U	
Cerium-139	Ce-139	-0.0144	pCi/g	U	
Cesium-137	Cs-137	-0.00727	pCi/g	U	
Cobalt-60	Co-60	-0.00614	pCi/g	U	
Europium-152	Eu-152	-0.073	pCi/g	U	
Lanthanum-140	La-140	-0.0338	pCi/g	U	
Mercury-203	Hg-203	0.0361	pCi/g	U	
Plutonium-238	Pu-238	0	pCi/g	U	
Plutonium-239/240	Pu-239/240	-0.0041	pCi/g	U	
Radium-223	Ra-223	0.121	pCi/g	U	
Ruthenium-106	Ru-106	-0.0901	pCi/g	U	
Sodium-22	Na-22	-0.0238	pCi/g	U	
Strontium-85	Sr-85	0.0156	pCi/g	U	
Strontium-90	Sr-90	-0.0542	pCi/g	U	
Thorium-227	Th-227	-0.154	pCi/g	U	
Thorium-231	Th-231	0.121	pCi/g	U	
Tin-113	Sn-113	-0.000488	pCi/g	U	
Uranium-235	U-235	0.129	pCi/g	U	
Yttrium-88	Y-88	0.00142	pCi/g	U	

Additional Constituents - Chemicals

Sampling event ID 3233
SWMU ev 3233.2085.2084.2094
Stockpile Number ev 3233.2085.2084.2094

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm
evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concentration	Unit	Results (ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	Al	1650000	ug/kg	1650.000	1050.000	1650.000	0.105	0.165	
Antimony	Sb	710	ug/kg	0.710	0	0.710	0	7.1E-05	
Beryllium	Be	633	ug/kg	0.633	0.210	0.633	2.1E-05	6.3E-05	
Calcium	Ca	1130000	ug/kg	1130.000	474.000	1130.000	0.047	0.113	
Cobalt	Co	883	ug/kg	0.883	0.299	0.883	3.0E-05	8.8E-05	
Copper	Cu	3600	ug/kg	3.600	2.480	3.600	2.5E-04	3.6E-04	
Iron	Fe	5350000	ug/kg	5350.000	4120.000	5350.000	0.412	0.535	
Magnesium	Mg	829000	ug/kg	829.000	179.000	829.000	0.018	0.083	
Manganese	Mn	212000	ug/kg	212.000	123.000	212.000	0.012	0.021	
Nickel	**Ni**	**2180**	**ug/kg**	**2.180**	**1.130**	**2.180**	**1.1E-04**	**2.2E-04**	
Potassium	K	419000	ug/kg	419.000	282.000	419.000	0.028	0.042	
Sodium	Na	390000	ug/kg	390.000	200.000	390.000	0.020	0.039	
Uranium	U	833	ug/kg	0.833	0.150	0.833	1.5E-05	8.3E-05	
Vanadium	V	4160	ug/kg	4.160	1.330	4.160	1.3E-04	4.2E-04	
Zinc	Zn	39300	ug/kg	39.300	12.300	39.300	1.2E-03	3.9E-03	
						TOTAL	**0.645**	**1.003**	% (all analytes from all pages were added for this total

NOTE 1: This table contains all detected, non D-coded analytes
NOTE 2: Highlighted analytes are potentially F-coded

Additional Constituents - RAD

Sampling event ID 3233
SWMU ev 3233.2085.2084.2094
Stockpile Number ev 3233.2085.2084.2094

volume of waste: 200 kg

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm
evaluation date: 1/20/2011

Analyte	CAS/ Symbol	Max Result	Min Result	Unit	% of total rad from Max values	% of total rad from Min values	Max Total Ci from isotope	Min Total Ci from isotope	comments
Bismuth-214	Bi-214	2.550	2.260	pCi/g	4.22	4.24	5.1E-07	4.5E-07	
Lead-212	Pb-212	2.970	2.900	pCi/g	4.91	5.44	5.9E-07	5.8E-07	
Lead-214	Pb-214	3.310	2.700	pCi/g	5.47	5.07	6.6E-07	5.4E-07	
Potassium-40	K-40	36.200	32.900	pCi/g	59.86	61.72	7.2E-06	6.6E-06	
Radium-226	Ra-226	2.550	2.260	pCi/g	4.22	4.24	5.1E-07	4.5E-07	
Radium-228	Ra-228	2.910	2.520	pCi/g	4.81	4.73	5.8E-07	5.0E-07	
Thallium-208	Tl-208	0.868	0.841	pCi/g	1.44	1.58	1.7E-07	1.7E-07	
Thorium-234	Th-234	3.130	2.710	pCi/g	5.18	5.08	6.3E-07	5.4E-07	
Tritium	H-3	0.023	0	pCi/g	0.04	0	4.6E-09	0	
Uranium-234	U-234	2.780	2.090	pCi/g	4.60	3.92	5.6E-07	4.2E-07	
Uranium-235/236	U-235/236	0.287	0.104	pCi/g	0.47	0.20	5.7E-08	2.1E-08	
Uranium-238	U-238	2.900	2.020	pCi/g	4.80	3.79	5.8E-07	4.0E-07	
	TOTAL	**60.48**	**53.31**		100.0	100.0	**1.2E-05**	**1.1E-05**	all detected isotopes from all pages were added for this total

NOTE 1: This table contains all detected radioisotopes

NOTE 2: If only one detected result exist, 0 is listed as minimum, if more than one detect exist, lowest detect is listed as minimum.

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Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 2/24/11 Project: MDAC Phase III
Location of Land Application: Within project footprint TA-50 (SWMU 50-009)
Estimated Quantity: 48ft3 (cubic feet or tons)
Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil
Proposed Method of Land Application (describe): Cuttings will be land applied within the project footprint in previously disturbed areas & covered with a layer of road base

Note: An EX-ID Permit is required prior to land application.

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☐	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

Stephani Fuller	[signature]	Project Mgr	2/24/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes ☑ **No** ☐ **Note deficiency in the space provided:**
Metals are below background

ENV-RCRA Reviewer Name (Print) JENNIFER GRIFFIN **Signature** [signature] **Date** 2/28/11

Package Expiration Date: 5/28/11

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Post Land Application Field Certification Sheet

Date(s) of land application: 3/2/11 Project: MDA C Phase II

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/2011

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Roy Bohn		PM STR	3/3/11
Name (Print)	**Signature**	**Title**	**Date**

Solid Waste Evaluation

SWMU ev3233.2088.2096
Stockpile Number ev3233.2088.2096

Summary Excel file: ev3233.2088.2096.awd.2.24.2011(1).xlsm
evaluation date: 2/24/2011

RCRA

between these
- 33 analytes pass
- 32 analytes pass as undetected
- 10 analytes fail

Detects

Total PCB (ppm) Not analyz

- 4 analytes with potential F-code
- 3 analytes with potential K-code
- 0 analytes with potential U-code
- 0 analytes with potential P-code

Non-wastewater LDR: 8 pass 0 FAIL
Hazardous soil LDR: 8 pass 0 FAIL

Residential Soil (mg/kg) :	15 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	15 pass	0 FAIL
Construction Worker Soil (mg/kg) :	12 pass	1 FAIL
Recreational Soil (mg/kg) :	15 pass	0 FAIL
soil background:	18 pass	0 FAIL
Canyon Sediment background:	18 pass	0 FAIL
Qbt 2,3,4 background:	18 pass	0 FAIL
Qbt 1v background:	18 pass	0 FAIL
Qbt 1g, Qct,Qbo background:	17 pass	1 FAIL

RAD

[redacted]

total dose: 0.8375 mRem/year

analysed for H-3
analysed for Pu-239
30 isotopes,
- 10 were detected
- 19 undetected

Residen-tial SAL:	3 pass	0 FAIL
Indust-rial SAL:	3 pass	0 FAIL
Constr. Worker SAL:	5 pass	0 FAIL
Recrea-tional SAL:	5 pass	0 FAIL
Soil:	6 pass	3 FAIL
Canyon Sedi-ment:	6 pass	3 FAIL
QBT2,3,4:	2 pass	7 FAIL
QBt 1v:	9 pass	0 FAIL
Qbt 1g, Qct, Qbo:	9 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2088	WST50-11-2096	

Imported data files
ev3233.2.24.2011.txt

SWMU ev3233.2088.2096

Stockpile Number ev3233.2088.2096

Detected Chemicals Form

associated Excel file:
ev3233.2088.2096.awd.2.24.2011(1).xlsm

evaluation date: 2/24/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1710	mg/kg							
Arsenic	As	0.269	mg/kg	pass	pass	[redacted]	K031,K060,K161,K171,K172,K176,K084,K101,K102,	✓		
Barium	Ba	13	mg/kg	pass	pass					
Beryllium	Be	0.523	mg/kg	pass	pass					
Calcium	Ca	679	mg/kg							
Chromium	Cr	2.13	mg/kg	pass	pass	[redacted]	K090,	✓		
Cobalt	Co	0.663	mg/kg							
Copper	Cu	1.89	mg/kg							
Iron	Fe	4440	mg/kg							
Lead	Pb	5.55	mg/kg	pass	pass	[redacted]	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,	✓		
Magnesium	Mg	384	mg/kg							
Manganese	Mn	153	mg/kg							
Nickel	Ni	1.37	mg/kg	pass	pass	[redacted]		✓		
Nitrate	NO3	1.2	mg/kg							
Potassium	K	415	mg/kg							
Sodium	Na	374	mg/kg							
Uranium	U	0.426	mg/kg							
Vanadium	V	2.97	mg/kg	pass	pass					
Zinc	Zn	29.3	mg/kg	pass	pass					

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1710	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Arsenic	As	0.269	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	13	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.523	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	679	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	2.13	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Cobalt	Co	0.663	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	1.89	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Iron	Fe	4440	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	5.55	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	384	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	153	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	pass
Nickel	Ni	1.37	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nitrate	NO3	1.2	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	415	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	374	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.426	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	2.97	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	29.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

SWMU ev3233.2088.2096 **SAL and background comparison** Source data file: ev3233.2088.2096.awd.2.24.2011(1).xlsm

Stockpile Number ev3233.2088.2096 evaluation date: 2/24/2011

Analyte	CAS/ Symbol	concen- tration	unit of measur e	Residen- tial SAL	Indust- rial SAL	Constr. Worker SAL	Recrea- tional SAL	Soil	Canyon Sedi- ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.1	pCi/g					pass	pass	FAIL	pass	pass
NA Lead-212	Pb-212	2.82	pCi/g					FAIL	FAIL	FAIL	pass	pass
NA ~~Lead-214~~	Pb-214	2.62	pCi/g					FAIL	FAIL	FAIL	pass	pass
Potassium-40	K-40	33.8	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	4.83	pCi/g									
Radium-226	Ra-226	2.1	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.73	pCi/g			pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	Tl-208	0.792	pCi/g					pass	pass	pass	pass	pass
Uranium-234	U-234	2.24	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.1	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.19	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.00615	pCi/g									
Cerium-139	Ce-139	-0.00444	pCi/g									
Cesium-137	Cs-137	-0.0328	pCi/g									
Cobalt-60	Co-60	0.0127	pCi/g									
Europium-152	Eu-152	-0.0441	pCi/g									
Lanthanum-140	La-140	-0.271	pCi/g									
Plutonium-238	Pu-238	0.00129	pCi/g									
Plutonium-239/240	Pu-239/240	0.00129	pCi/g									
Radium-223	Ra-223	-0.368	pCi/g									
Ruthenium-106	Ru-106	0.188	pCi/g									
Sodium-22	Na-22	0.00605	pCi/g									
Strontium-90	Sr-90	0.0728	pCi/g									
Thorium-227	Th-227	-0.17	pCi/g									
Thorium-231	Th-231	-0.368	pCi/g									
Thorium-234	Th-234	1.94	pCi/g									
Tin-113	Sn-113	0.0198	pCi/g									
Tritium	H-3	0.00865	pCi/g									
Uranium-235	U-235	0.115	pCi/g									
Yttrium-88	Y-88	-0.00054	pCi/g									

~~Ra 228 2.73 − 2.59 = 0.14 < 5~~ 2.33 KAO 0.4 < 5 KAO 2-28-11

OK for land app. KAO

Ra 228 2.73 − 2.33 = 0.4 < 5

OK for land app

4 BIN 5765
10143864

50-613185

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/20/10 Project: MDA C Phase III

Location of Land Application: Within project footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 48 ft 3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Drill cuttings will be land applied within the project footprint (SWMU 50-009) to previously disturbed areas, and covered with a layer of road base.

Note: An EX-ID Permit is required prior to land application. 10X-0849-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☑	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

RAD

Stephani Fuller	S Fuller	Project Mgr.	1/24/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes ✓ **No**_____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Jocelyn Buckley **Signature** Jocelyn Buckley **Date** 1-25-11

Package Expiration Date: 2/11/11

ID # 10143864
Bin 5765

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDA C Phase III

Location of land application: Within Project Footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0849-50 EX-ID Expiration Date: 4/29/11

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	Fuller	Project Mgr.	1/28/11
Name (Print)	**Signature**	**Title**	**Date**

PRS Number: 50-009 (Borehole 50-613185)		
Source of contaminants:	Yes	No
F-listed		X
U- or P-listed		X
K-listed		X

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area (landfill) for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

RFI activities were conducted at MDA C from 1993 to 1996. Surface soil sampling was conducted during the summer of 1993. A subsurface investigation was performed during portions of 1994, 1995, and 1996.Conclusions regarding the nature and extent of contamination at MDA C based on the results of preliminary site characterization activities are as follows:

-Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C before the placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination has not been defined.

-Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath Pit 6 indicate that contamination has migrated from pit 6 into underlying rock. The extent of subsurface contamination has not been defined.

-Tritium and volatile organic compounds (VOC) contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exist in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined.

-Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Documents Reviewed

Date	Title	ER Id No.
4/1/2010	Investigation Report for Upper Mortandad Canyon Aggregate Area, Rev. 1	109180
4/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, at TA-50, Rev. 1	109260
2/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, TA-50	108594
10/1/2009	Phase II Investigation report for MDA C, SWMU 50-009, at TA-50, Rev. 1	107389
5/1/2009	Phase II Investigation Report for MDA C, SWMU 50-009, at TA-50	106047
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [IWP]	098954
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [HIR]	098955

4/23/2007	Phase II Investigation Work Plan for MDA C, Rev. 1	100143
12/6/2006	Investigation Report for MDA C, SWMU 50-009	094688
10/1/2005	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 2	091493
11/1/2003	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 1	087152
7/31/2003	Investigation Work Plan for MDA-C, SWMU 50-009 at TA-50	087392
5/20/1992	RFI Work Plan for Operable Unit 1147	007672
11/30/90	SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
July 2010	PRS Database	NA

Summary of Listed Status

U-listed constituents were detected in soil samples; however, there was no documented evidence of a spill, release, or discharge of unused/unspent commercial chemical products in the vicinity of the SWMU. K-listed constituents were also detected in the soil samples from 50-009, BH 50-613182; however most K-listed sources are industrial in nature and not typical of Laboratory operations. The Laboratory generates only small amounts of K-listed wastes, primarily spent carbon from high explosives processing that is disposed off-site. The documented amounts of K-listed wastes generated are not sufficient to have impacted investigation/remediation activities. Therefore, the IDW is not K-listed. In addition, Arsenic (F032, F034, F035), Chromium (F032, F034, F035, F037, and F038), Lead (F035, F037, and F038), and Nickel (F006) were also detected in the soil samples from 50-009 site investigation activities. There is no documented evidence that the following processes (F-listed sources) occurred in the vicinity of the SWMU: Wood preserving processes (F032, F034, and F035), Petroleum refinery operations (F037 and F038) and Electroplating operations (F006). See Attachment 1 for the complete list of potentially listed constituents detected in the soil sample.

Based on analytical data and documentation, there is no conclusive evidence of a listed source impacting SWMU 50-009, MDA-C. Therefore, the IDW may be managed as non-hazardous waste.

DD Completed January 25, 2011

Attachment 1.

Analyte	Concentration	Potential F-Codes	Potential K-Codes
Antimony	0.71		K161, K021, K177
Arsenic	0.304	F032,F034,F035,	K031,K060,K161,K171, K172,K176,K084,K101, K102,
Chromium	4.42	F032,F034,F035,F037, F038,	K090
Lead	11.1	F035,F037,F038,	K002, K003, K005, K048, K049, K051, K062, K064, K086, K100, K176, K046, K052, K061, K069
Nickel	2.18	F006	

SWMU ev 3233.2084

SAL and background comparison

Stockpile Number ev 3233.2084

data source: excel file: ev3233.2084.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.55	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.9	pCi/g					FAIL	FAIL	FAIL	pass	pass
Lead-214	Pb-214	3.31	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Potassium-40	K-40	32.9	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	5.07	pCi/g									
Radium-226	Ra-226	2.55	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.52	pCi/g			pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	Tl-208	0.868	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	3.13	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Uranium-234	U-234	2.78	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Uranium-235/236	U-235/236	0.287	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.9	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Americium-241	Am-241	-0.00101	pCi/g									
Cerium-139	Ce-139	-0.0144	pCi/g									
Cesium-137	Cs-137	-0.00727	pCi/g									
Cobalt-60	Co-60	0.0208	pCi/g									
Europium-152	Eu-152	-0.073	pCi/g									
Lanthanum-140	La-140	-0.0263	pCi/g									
Plutonium-238	Pu-238	0	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00141	pCi/g									
Radium-223	Ra-223	0.121	pCi/g									
Ruthenium-106	Ru-106	-0.0901	pCi/g									
Sodium-22	Na-22	0.0278	pCi/g									
Strontium-85	Sr-85	0.0156	pCi/g									
Strontium-90	Sr-90	-0.0542	pCi/g									
Thorium-227	Th-227	-0.141	pCi/g									
Thorium-231	Th-231	0.121	pCi/g									
Tin-113	Sn-113	-0.00049	pCi/g									
Tritium	H-3	-0.01401	pCi/g									
Uranium-235	U-235	0.129	pCi/g									
Yttrium-88	Y-88	0.01	pCi/g									

$Ra^{228} = 2.52 - 2.33 = 0.19 / 5 = 0.038$

$U^{234} = 2.78 - 2.59 = 0.19 / 213 = 0.000892$

U^{238} $2.90 - 2.29 = 0.61 / 140 = 0.00436$

$0.0432 < 1$

OK to land apply

Sampling event ID 3233

SWMU ev 3233.2084

Stockpile Number ev 3233.2084

Detected Chemicals Form

associated Excel file:
ev3233.2084.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1650	mg/kg							
Antimony	Sb	0.71	mg/kg	pass	pass		K161,K021,K177,			
Barium	Ba	15.3	mg/kg	pass	pass					
Beryllium	Be	0.21	mg/kg	pass	pass					
Calcium	Ca	1130	mg/kg							
Chromium	Cr	4.42	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	0.883	mg/kg							
Copper	Cu	3.6	mg/kg							
Iron	Fe	4120	mg/kg							
Lead	Pb	5.36	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	829	mg/kg							
Manganese	Mn	123	mg/kg							
Nickel	Ni	2.18	mg/kg	pass	pass	F006,				
Potassium	K	419	mg/kg							
Sodium	Na	390	mg/kg							
Uranium	U	0.15	mg/kg							
Vanadium	V	4.16	mg/kg	pass	pass					
Zinc	Zn	12.3	mg/kg	pass	pass					

Sampling event ID 3233

SWMU ev 3233.2084

Stockpile Number ev 3233.2084

Solid Waste Evaluation

Summary iated Excel file: ev3233.2084.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

RCRA

	33	analytes pass
between these	32	analytes pass as undetected
	10	analytes fail

Detects

Total PCB (ppm) Not analy;

3	analytes with potential F-code	**Non-wastewater LDR:** 8 pass	0 FAIL
3	analytes with potential K-code	**Hazardous soil LDR:** 8 pass	0 FAIL
0	analytes with potential U-code		
0	analytes with potential P-code		

Residential Soil (mg/kg) :	14 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	14 pass	0 FAIL
Construction Worker Soil (mg/kg) :	12 pass	0 FAIL
Recreational Soil (mg/kg) :	14 pass	0 FAIL
soil background:	18 pass	0 FAIL
Canyon Sediment background:	18 pass	0 FAIL
Qbt 2,3,4 background:	17 pass	1 FAIL
Qbt 1v background:	13 pass	5 FAIL
Qbt 1g, Qct,Qbo background:	13 pass	5 FAIL

RAD

total dose: 0.8647 mRem/year

?

analysed for H-3

analysed for Pu-239

31 isotopes, 11 were detected

19 undetected

Residen-tial SAL:	3 pass	0 FAIL
Indust-rial SAL:	3 pass	0 FAIL
Constr. Worker SAL:	5 pass	0 FAIL
Recrea-tional SAL:	5 pass	0 FAIL
Soil:	4 pass	6 FAIL
Canyon Sedi-ment:	4 pass	6 FAIL
QBT2,3,4:	2 pass	8 FAIL
QBt 1v:	8 pass	2 FAIL
Qbt 1g, Qct, Qbo:	10 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2084		

Imported data files
ev3233.1.13.2011.txt

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1650	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.71	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Barium	Ba	15.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.21	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	1130	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.42	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	0.883	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.6	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	4120	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	5.36	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	829	mg/kg	NA	NA	NA	NA	pass	pass	pass	FAIL	FAIL
Manganese	Mn	123	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni	2.18	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	K	419	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	390	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.15	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	4.16	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	12.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Borehole
50-613185

Sampling event ID 3233

SWMU ev 3233.2085.2084.2094

Stockpile Number ev 3233.2085.2084.2094

Solid Waste Evaluation

Summary cel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

RCRA

33 analytes pass
between these 31 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analy

4 analytes with potential F-code
4 analytes with potential K-code
0 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 9 pass 0 FAIL
Hazardous soil LDR: 9 pass 0 FAIL

Residential Soil (mg/kg) :	15 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	15 pass	0 FAIL
Construction Worker Soil (mg/kg) :	12 pass	1 FAIL
Recreational Soil (mg/kg) :	15 pass	0 FAIL
soil background:	19 pass	0 FAIL
Canyon Sediment background:	19 pass	0 FAIL
Qbt 2,3,4 background:	18 pass	1 FAIL
Qbt 1v background:	14 pass	5 FAIL
Qbt 1g, Qct,Qbo background:	12 pass	7 FAIL

RAD

total dose: 0.9427 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes, 12 were detected
19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	5 pass	6 FAIL
Canyon Sedi-ment:	5 pass	6 FAIL
QBT2,3,4:	2 pass	9 FAIL
QBt 1v:	8 pass	3 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2084	WST50-11-2094	
WST50-11-2085	WST50-11-2094	

Imported data files
ev3233.1.20.2011.txt

SWMU ev 3233.2085.2084.2094 **RCRA Characteristics Form**

Stockpile Number ev 3233.2085.2084.2094

evaluation date: 1/20/2011

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	216	ug/L	J	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	21.5	ug/L	U	pass	
Lead	Pb	D008	5000	18.7	ug/L	J	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.053	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.053	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.053	ug/L	U	pass	
Chloroform	67-66-3		6000	0.053	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	17.6	ug/L	U	pass	
Methylphenol[3-]	108-39-4		200000	17.6	ug/L	U	pass	
Methylphenol[4-]	106-44-5		200000	17.6	ug/L	U	pass	
Methylphenol[3-,4-]	65794-96-9		200000	17.6	ug/L	U	pass	
Methylphenol(total)	8027-16-5		200000	35.2	ug/L	UU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	17.6	ug/L	U	pass	
Dichloroethane[1,2-]	107-06-2		500	0.053	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.053	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	17.6	ug/L	U	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	17.6	ug/L	U	pass	
Hexachlorobutadiene	87-68-3		500	17.6	ug/L	U	pass	
Hexachloroethane	67-72-1		3000	17.6	ug/L	U	pass	
Butanone[2-]	78-93-3		200000	0.264	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	17.6	ug/L	U	pass	
Pentachlorophenol	87-86-5		100000	17.6	ug/L	U	pass	
Pyridine	110-86-1		5000	17.6	ug/L	U	pass	
Tetrachloroethene	127-18-4		700	0.053	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.053	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	17.6	ug/L	U	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	17.6	ug/L	U	pass	
Vinyl Chloride	75-01-4		200	0.053	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1650	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.71	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Arsenic	As	0.304	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	15.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.633	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	1130	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.42	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	0.883	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.6	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	5350	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	11.1	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	829	mg/kg	NA	NA	NA	NA	pass	pass	pass	FAIL	FAIL
Manganese	Mn	212	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Nickel	Ni	2.18	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	K	419	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	390	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.833	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	4.16	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	39.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Sampling event ID 3233

SWMU ev 3233.2085.2084.2094

Stockpile Number ev 3233.2085.2084.2094

Detected Chemicals Form

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1650	mg/kg							
Antimony	Sb	0.71	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.304	mg/kg	pass	pass	[redacted]	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	15.3	mg/kg	pass	pass					
Beryllium	Be	0.633	mg/kg	pass	pass					
Calcium	Ca	1130	mg/kg							
Chromium	Cr	4.42	mg/kg	pass	pass	[redacted]	K090,			
Cobalt	Co	0.883	mg/kg							
Copper	Cu	3.6	mg/kg							
Iron	Fe	5350	mg/kg							
Lead	Pb	11.1	mg/kg	pass	pass	[redacted]	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	829	mg/kg							
Manganese	Mn	212	mg/kg							
Nickel	Ni	2.18	mg/kg	pass	pass	[redacted]				
Potassium	K	419	mg/kg							
Sodium	Na	390	mg/kg							
Uranium	U	0.833	mg/kg							
Vanadium	V	4.16	mg/kg	pass	pass					
Zinc	Zn	39.3	mg/kg	pass	pass					

SWMU ev 3233.2085.2084.2094 **SAL and background comparison** ...3233 2085 2084 2094 awd 1 20 2011.xlsm

Stockpile Number ev 3233.2085.2084.2094 evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.55	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.97	pCi/g					FAIL	FAIL	FAIL	pass	pass
Lead-214	Pb-214	3.31	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Potassium-40	K-40	36.2	pCi/g					pass	pass	FAIL	FAIL	pass
Radium 226/228	calc.	5.46	pCi/g									
Radium-226	Ra-226	2.55	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.91	pCi/g			pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	Tl-208	0.868	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	3.13	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
Tritium	H-3	0.02429	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.78	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Uranium-235/236	U-235/236	0.287	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.9	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Americium-241	Am-241	-0.00101	pCi/g									
Cerium-139	Ce-139	-0.0144	pCi/g									
Cesium-137	Cs-137	-0.00727	pCi/g									
Cobalt-60	Co-60	-0.00614	pCi/g									
Europium-152	Eu-152	-0.073	pCi/g									
Lanthanum-140	La-140	-0.0338	pCi/g									
Mercury-203	Hg-203	0.0361	pCi/g									
Plutonium-238	Pu-238	0	pCi/g									
Plutonium-239/240	Pu-239/240	-0.0041	pCi/g									
Radium-223	Ra-223	0.121	pCi/g									
Ruthenium-106	Ru-106	-0.0901	pCi/g									
Sodium-22	Na-22	-0.0238	pCi/g									
Strontium-85	Sr-85	0.0156	pCi/g									
Strontium-90	Sr-90	-0.0542	pCi/g									
Thorium-227	Th-227	-0.154	pCi/g									
Thorium-231	Th-231	0.121	pCi/g									
Tin-113	Sn-113	-0.00049	pCi/g									
Uranium-235	U-235	0.129	pCi/g									
Yttrium-88	Y-88	0.00142	pCi/g									

SWMU ev 3233.2085.2084.2094 **Radioisotopes Form** Sed Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

Stockpile Number ev 3233.2085.2084.2094 evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	2.55	pCi/g	NQ	
Lead-212	Pb-212	2.97	pCi/g	NQ	
Lead-214	Pb-214	3.31	pCi/g	NQ	
Potassium-40	K-40	36.2	pCi/g	NQ	
Radium 226/228	calc.	5.46	pCi/g		
Radium-226	Ra-226	2.55	pCi/g	NQ	
Radium-228	Ra-228	2.91	pCi/g	NQ	
Thallium-208	Tl-208	0.868	pCi/g	NQ	
Thorium-234	Th-234	3.13	pCi/g	NQ	
Tritium	H-3	0.0242893	pCi/g	NQ	
Uranium-234	U-234	2.78	pCi/g	NQ	
Uranium-235/236	U-235/236	0.287	pCi/g	NQ	
Uranium-238	U-238	2.9	pCi/g	NQ	
Americium-241	Am-241	-0.00101	pCi/g	U	
Cerium-139	Ce-139	-0.0144	pCi/g	U	
Cesium-137	Cs-137	-0.00727	pCi/g	U	
Cobalt-60	Co-60	-0.00614	pCi/g	U	
Europium-152	Eu-152	-0.073	pCi/g	U	
Lanthanum-140	La-140	-0.0338	pCi/g	U	
Mercury-203	Hg-203	0.0361	pCi/g	U	
Plutonium-238	Pu-238	0	pCi/g	U	
Plutonium-239/240	Pu-239/240	-0.0041	pCi/g	U	
Radium-223	Ra-223	0.121	pCi/g	U	
Ruthenium-106	Ru-106	-0.0901	pCi/g	U	
Sodium-22	Na-22	-0.0238	pCi/g	U	
Strontium-85	Sr-85	0.0156	pCi/g	U	
Strontium-90	Sr-90	-0.0542	pCi/g	U	
Thorium-227	Th-227	-0.154	pCi/g	U	
Thorium-231	Th-231	0.121	pCi/g	U	
Tin-113	Sn-113	-0.000488	pCi/g	U	
Uranium-235	U-235	0.129	pCi/g	U	
Yttrium-88	Y-88	0.00142	pCi/g	U	

Additional Constituents - Chemicals

Sampling event ID 3233
SWMU ev 3233.2085.2084.2094
Stockpile Number ev 3233.2085.2084.2094

associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm
evaluation date: 1/20/2011

Analyte	CAS/ Symbol	concentration	Unit	Results (ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	Al	1650000	ug/kg	1650.000	1050.000	1650.000	0.105	0.165	
Antimony	Sb	710	ug/kg	0.710	0	0.710	0	7.1E-05	
Beryllium	Be	633	ug/kg	0.633	0.210	0.633	2.1E-05	6.3E-05	
Calcium	Ca	1130000	ug/kg	1130.000	474.000	1130.000	0.047	0.113	
Cobalt	Co	883	ug/kg	0.883	0.299	0.883	3.0E-05	8.8E-05	
Copper	Cu	3600	ug/kg	3.600	2.480	3.600	2.5E-04	3.6E-04	
Iron	Fe	5350000	ug/kg	5350.000	4120.000	5350.000	0.412	0.535	
Magnesium	Mg	829000	ug/kg	829.000	179.000	829.000	0.018	0.083	
Manganese	Mn	212000	ug/kg	212.000	123.000	212.000	0.012	0.021	
Nickel	Ni	2180	ug/kg	2.180	1.130	2.180	1.1E-04	2.2E-04	
Potassium	K	419000	ug/kg	419.000	282.000	419.000	0.028	0.042	
Sodium	Na	390000	ug/kg	390.000	200.000	390.000	0.020	0.039	
Uranium	U	833	ug/kg	0.833	0.150	0.833	1.5E-05	8.3E-05	
Vanadium	V	4160	ug/kg	4.160	1.330	4.160	1.3E-04	4.2E-04	
Zinc	Zn	39300	ug/kg	39.300	12.300	39.300	1.2E-03	3.9E-03	
						TOTAL	**0.645**	**1.003**	% (all analytes from all pages were added for this total

NOTE 1: This table contains all detected, non D-coded analytes
NOTE 2: Highlighted analytes are potentially F-coded

Additional Constituents - RAD

Sampling event ID 3233 **volume of waste: 200 kg** associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

SWMU ev 3233.2085.2084.2094 evaluation date: 1/20/2011

Stockpile Number ev 3233.2085.2084.2094

Analyte	CAS/ Symbol	Max Result	Min Result	Unit	% of total rad from Max values	% of total rad from Min values	Max Total Ci from isotope	Min Total Ci from isotope	comments
Bismuth-214	Bi-214	2.550	2.260	pCi/g	4.22	4.24	5.1E-07	4.5E-07	
Lead-212	Pb-212	2.970	2.900	pCi/g	4.91	5.44	5.9E-07	5.8E-07	
Lead-214	Pb-214	3.310	2.700	pCi/g	5.47	5.07	6.6E-07	5.4E-07	
Potassium-40	K-40	36.200	32.900	pCi/g	59.86	61.72	7.2E-06	6.6E-06	
Radium-226	Ra-226	2.550	2.260	pCi/g	4.22	4.24	5.1E-07	4.5E-07	
Radium-228	Ra-228	2.910	2.520	pCi/g	4.81	4.73	5.8E-07	5.0E-07	
Thallium-208	Tl-208	0.868	0.841	pCi/g	1.44	1.58	1.7E-07	1.7E-07	
Thorium-234	Th-234	3.130	2.710	pCi/g	5.18	5.08	6.3E-07	5.4E-07	
Tritium	H-3	0.023	0	pCi/g	0.04	0	4.6E-09	0	
Uranium-234	U-234	2.780	2.090	pCi/g	4.60	3.92	5.6E-07	4.2E-07	
Uranium-235/236	U-235/236	0.287	0.104	pCi/g	0.47	0.20	5.7E-08	2.1E-08	
Uranium-238	U-238	2.900	2.020	pCi/g	4.80	3.79	5.8E-07	4.0E-07	
	TOTAL	**60.48**	**53.31**		100.0	100.0	**1.2E-05**	**1.1E-05**	all detected isotopes from all pages were added for this total

NOTE 1: This table contains all detected radioisotopes

NOTE 2: If only one detected result exist, 0 is listed as minimum, if more than one detect exist, lowest detect is listed as minimum.

#81

BIN 5659

10143865

50-613182

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/20/11 Project: MDA C Phase III

Location of Land Application: Within project footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 57 ft 3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Drill cuttings will be land applied within the project footprint (SWMU 50-009) to previously disturbed areas and covered with a layer of road base

Note: An EX-ID Permit is required prior to land application. 10X - 0815 - 50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☑	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

RPD

Stephani Fuller	Stephani Fuller	Project Manager	1/24/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes X **No** _____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Jocelyn Buckley **Signature** _____ **Date** ~~2-11-11~~ 1-25-11 JB

Package Expiration Date: 2-11-11

ID # 10143865
Bin 5659

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDA C Phase III

Location of land application: _____ TA: 50 (SMMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/11

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	[signature]	Project Mgr.	1/28/11
Name (Print)	**Signature**	**Title**	**Date**

PRS Number: 50-009 (Borehole 50-613182)		
Source of contaminants:	Yes	No
F-listed		X
U- or P-listed		X
K-listed		X

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area (landfill) for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

RFI activities were conducted at MDA C from 1993 to 1996. Surface soil sampling was conducted during the summer of 1993. A subsurface investigation was performed during portions of 1994, 1995, and 1996.Conclusions regarding the nature and extent of contamination at MDA C based on the results of preliminary site characterization activities are as follows:

-Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C before the placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination has not been defined.

-Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath Pit 6 indicate that contamination has migrated from pit 6 into underlying rock. The extent of subsurface contamination has not been defined.

-Tritium and volatile organic compounds (VOC) contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exist in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined.

-Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Documents Reviewed

Date	Title	ER Id No.
4/1/2010	Investigation Report for Upper Mortandad Canyon Aggregate Area, Rev. 1	109180
4/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, at TA-50, Rev. 1	109260
2/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, TA-50	108594
10/1/2009	Phase II Investigation report for MDA C, SWMU 50-009, at TA-50, Rev. 1	107389
5/1/2009	Phase II Investigation Report for MDA C, SWMU 50-009, at TA-50	106047
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [IWP]	098954
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [HIR]	098955

4/23/2007	Phase II Investigation Work Plan for MDA C, Rev. 1	100143
12/6/2006	Investigation Report for MDA C, SWMU 50-009	094688
10/1/2005	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 2	091493
11/1/2003	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 1	087152
7/31/2003	Investigation Work Plan for MDA-C, SWMU 50-009 at TA-50	087392
5/20/1992	RFI Work Plan for Operable Unit 1147	007672
11/30/90	SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
July 2010	PRS Database	NA

Summary of Listed Status

U-listed constituents were detected in soil samples; however, there was no documented evidence of a spill, release, or discharge of unused/unspent commercial chemical products in the vicinity of the SWMU. K-listed constituents were also detected in the soil samples from 50-009, BH 50-613182; however most K-listed sources are industrial in nature and not typical of Laboratory operations. The Laboratory generates only small amounts of K-listed wastes, primarily spent carbon from high explosives processing that is disposed off-site. The documented amounts of K-listed wastes generated are not sufficient to have impacted investigation/remediation activities. Therefore, the IDW is not K-listed. In addition, Arsenic (F032, F034, F035), Benzo(a)pyrene (F032, F034, F037, and F038), Chromium (F032, F034, F035, F037, and F038), Chrysene (F037 and F038), Lead (F035, F037, and F038), and Nickel (F006) were also detected in the soil samples from 50-009 site investigation activities. There is no documented evidence that the following processes (F-listed sources) occurred in the vicinity of the SWMU: Wood preserving processes (F032, F034, and F035), Petroleum refinery operations (F037 and F038) and Electroplating operations (F006). See Attachment 1 for the complete list of potentially listed constituents detected in the soil sample.

Based on analytical data and documentation, there is no conclusive evidence of a listed source impacting SWMU 50-009, MDA-C. Therefore, the IDW may be managed as non-hazardous waste.

DD Completed January 18, 2011

Attachment 1.

Analyte	Concentration	Potential U-Codes	Potential F-Codes	Potential K-Codes
Antimony	0.91			K161, K021, K177
Arsenic	0.34		F032,F034,F035,	K031,K060,K161, K171,K172,K176, K084,K101,K102,
Benzo(a)pyrene	0.0144	U022	F032,F034,F037,F038	K001, K035, K141, K142, K144, K145, K147, K148, K170
Benzo(b)fluoranthene	0.0214			K001,K035,K141, K142,K143,K144, K147,K148,K170,
Bis(2-ethylhexyl)phthalate	0.0797	U028		
Chromium	4.96		F032,F034,F035,F037 ,F038,	K090
Chrysene	0.019	U050	F037, F038	K001, K035
Lead	4.73		F035,F037,F038,	K002, K003, K005, K048, K049, K051, K062, K064, K086, K100, K176, K046, K052, K061, K069
Nickel	5.68		F006	
Thallium	0.0753			K178

SWMU ev 3233.2083.2093

SAL and background comparison

Stockpile Number ev 3233.2083.2093

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.46	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.36	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.39	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	28	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	4.88	pCi/g									
Radium-226	Ra-226	2.46	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.42	pCi/g			pass	pass	FAIL	FAIL	pass	pass	pass
Thallium-208	Tl-208	0.658	pCi/g					pass	pass	pass	pass	pass
Tritium	H-3	0.04751	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.21	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.0838	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.17	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.0009	pCi/g									
Cerium-139	Ce-139	-0.0224	pCi/g									
Cesium-137	Cs-137	-0.0121	pCi/g									
Cobalt-60	Co-60	0.0137	pCi/g									
Europium-152	Eu-152	-0.1	pCi/g									
Lanthanum-140	La-140	0.0355	pCi/g									
Mercury-203	Hg-203	0.0457	pCi/g									
Plutonium-238	Pu-238	0.00118	pCi/g									
Plutonium-239/240	Pu-239/240	0.00118	pCi/g									
Radium-223	Ra-223	0.596	pCi/g									
Ruthenium-106	Ru-106	0.0615	pCi/g									
Sodium-22	Na-22	-0.00394	pCi/g									
Strontium-85	Sr-85	0.0614	pCi/g									
Strontium-90	Sr-90	-0.0775	pCi/g									
Thorium-227	Th-227	0.13	pCi/g									
Thorium-231	Th-231	0.596	pCi/g									
Thorium-234	Th-234	1.81	pCi/g									
Tin-113	Sn-113	-0.0249	pCi/g									
Uranium-235	U-235	0.0509	pCi/g									
Yttrium-88	Y-88	0.00172	pCi/g									

NA

Ra^{228} 2.46 − 2.33 = 0.13 < 5 (attachment 6)

OK to land apply

Sampling event ID 3233

SWMU ev 3233.2083.2093

Stockpile Number ev 3233.2083.2093

Detected Chemicals Form

associated Excel file:
ev3233.2083.2093.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	4030	mg/kg							
Arsenic	As	0.34	mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	70.5	mg/kg	pass	pass					
Beryllium	Be	0.346	mg/kg	pass	pass					
Chromium	Cr	4.96	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	2.28	mg/kg							
Copper	Cu	6.2	mg/kg							
Iron	Fe	7150	mg/kg							
Lead	Pb	4.6	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Manganese	Mn	137	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.00382	mg/kg	pass	pass					F003,U161 codes not applicable
Nickel	Ni	5.68	mg/kg	pass	pass	F006,				
Nitrate	NO3	0.934	mg/kg							
Potassium	K	819	mg/kg							
Sodium	Na	540	mg/kg							
Uranium	U	0.282	mg/kg							
Vanadium	V	11.2	mg/kg	pass	pass					
Zinc	Zn	18.3	mg/kg	pass	pass					

Solid Waste Evaluation

SWMU ev 3233.2083.2093

Stockpile Number ev 3233.2083.2093

Summary Excel file: ev3233.2083.2093.awd.1.13.2011(1).xlsm

evaluation date: 1/13/2011

RCRA

between these
- 33 analytes pass
- 31 analytes pass as undetected
- 10 analytes fail

Detects

Total PCB (ppm) Not analyz

- 4 analytes with potential F-code
- 3 analytes with potential K-code
- 0 analytes with potential U-code
- 0 analytes with potential P-code

Non-wastewater LDR: 9 pass 0 FAIL

Hazardous soil LDR: 9 pass 0 FAIL

Residential Soil (mg/kg) :	16 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	16 pass	0 FAIL
Construction Worker Soil (mg/kg) :	14 pass	0 FAIL
Recreational Soil (mg/kg) :	16 pass	0 FAIL
soil background:	16 pass	0 FAIL
Canyon Sediment background:	16 pass	0 FAIL
Qbt 2,3,4 background:	14 pass	2 FAIL
Qbt 1v background:	10 pass	6 FAIL
Qbt 1g, Qct,Qbo background:	9 pass	7 FAIL

RAD

total dose: 0.8198 mRem/year

?

analysed for H-3

analysed for Pu-239

32 isotopes,

- 11 were detected
- 20 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	8 pass	2 FAIL
Canyon Sedi-ment:	8 pass	2 FAIL
QBT2,3,4:	5 pass	5 FAIL
QBt 1v:	10 pass	0 FAIL
Qbt 1g, Qct, Qbo:	10 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2083	WST50-11-2093	

Imported data files
ev3233.1.13.2011.txt

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	4030	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Arsenic	As	0.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	70.5	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Beryllium	Be	0.346	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Chromium	Cr	4.96	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	2.28	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Copper	Cu	6.2	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Iron	Fe	7150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.6	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Manganese	Mn	137	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Methyl-2-pentanone[4-]	108-10-1	0.00382	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Nickel	Ni	5.68	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Nitrate	NO3	0.934	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	819	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	540	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.282	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	11.2	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	18.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Borehole
50-613182

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

Solid Waste Evaluation

Summary ted Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

between these
33 analytes pass
31 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analy

6 analytes with potential F-code
8 analytes with potential K-code
3 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 15 pass 0 FAIL
Hazardous soil LDR: 15 pass 0 FAIL

Residential Soil (mg/kg) :	23 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	23 pass	0 FAIL
Construction Worker Soil (mg/kg) :	20 pass	1 FAIL
Recreational Soil (mg/kg) :	23 pass	0 FAIL
soil background:	18 pass	2 FAIL
Canyon Sediment background:	19 pass	1 FAIL
Qbt 2,3,4 background:	17 pass	3 FAIL
Qbt 1v background:	13 pass	7 FAIL
Qbt 1g, Qct,Qbo background:	9 pass	11 FAIL

RAD

total dose: 0.8205 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes, 12 were detected
19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	8 pass	3 FAIL
Canyon Sedi-ment:	8 pass	3 FAIL
QBT2,3,4:	5 pass	6 FAIL
QBt 1v:	10 pass	1 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2081	WST50-11-2091	
WST50-11-2082	WST50-11-2092	
WST50-11-2083	WST50-11-2093	

Imported data files
ev3233 110118.txt

Sampling event ID 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

SWMU ev 3233

Stockpile Number ev 3233

RCRA Characteristics Form

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	853	ug/L	NQ	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	22.2	ug/L	U	pass	
Lead	Pb	D008	5000	25.2	ug/L	NQ	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.0505	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.0505	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.0505	ug/L	U	pass	
Chloroform	67-66-3		6000	0.0505	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-]	108-39-4		200000	16.75	ug/L	UJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75	ug/L	UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5	ug/L	UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75	ug/L	UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75	ug/L	UJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75	ug/L	UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75	ug/L	UJ	pass	
Hexachloroethane	67-72-1		3000	16.75	ug/L	UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75	ug/L	UJ	pass	
Pyridine	110-86-1		5000	16.75	ug/L	UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.0505	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75	ug/L	UJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75	ug/L	UJ	pass	
Vinyl Chloride	75-01-4		200	0.0505	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	4030	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Antimony	Sb	0.91	mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
Arsenic	As	0.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	70.5	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Beryllium	Be	0.524	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	791	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.96	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Chrysene	218-01-9	0.019	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Cobalt	Co	2.28	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Copper	Cu	6.2	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Iron	Fe	7150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.73	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	555	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	317	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Nickel	Ni	5.68	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Nitrate	NO3	0.967	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	819	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Sodium	Na	540	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	Tl	0.0753	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U	0.829	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	11.2	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	51.7	mg/kg	pass	pass	pass	pass	FAIL	pass	pass	pass	FAIL

Sampling event ID 3233

SWMU ev 3233

Stockpile Number ev 3233

Detected Chemicals Form

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	4030	mg/kg							
Antimony	Sb	0.91	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.34	mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	70.5	mg/kg	pass	pass					
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	F032,F034,F037,F038,	K001,K035,K141,K142,K144,K145,K147,K148,K170,	U022,		
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass		K001,K035,K141,K142,K143,K144,K147,K148,K170,			
Beryllium	Be	0.524	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass			U028,		
Calcium	Ca	791	mg/kg							
Chromium	Cr	4.96	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Chrysene	218-01-9	0.019	mg/kg	pass	pass	F037,F038,	K001,K035,	U050,		
Cobalt	Co	2.28	mg/kg							
Copper	Cu	6.2	mg/kg							
Iron	Fe	7150	mg/kg							
Lead	Pb	4.73	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	555	mg/kg							
Manganese	Mn	317	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass					F003,U161 codes not applicable
Nickel	Ni	5.68	mg/kg	pass	pass	F006,				
Nitrate	NO3	0.967	mg/kg							
Potassium	K	819	mg/kg							
Pyrene	129-00-0	0.0425	mg/kg	pass	pass					
Sodium	Na	540	mg/kg							
Thallium	Tl	0.0753	mg/kg				K178,			
Uranium	U	0.829	mg/kg							
Vanadium	V	11.2	mg/kg	pass	pass					
Zinc	Zn	51.7	mg/kg	pass	pass					

Additional Constituents - Chemicals

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concentration	Unit	Results (ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	Al	4030000	ug/kg	4030.000	1080.000	4030.000	0.108	0.403	
Antimony	Sb	910	ug/kg	0.910	0	0.910	0	9.1E-05	
Benzo(a)pyrene	50-32-8	14.4	ug/kg	0.014	0	0.014	0	1.4E-06	
Benzo(b)fluoranthene	205-99-2	21.4	ug/kg	0.021	0	0.021	0	2.1E-06	
Beryllium	Be	524	ug/kg	0.524	0.346	0.524	3.5E-05	5.2E-05	
Bis(2-ethylhexyl)phthalate	117-81-7	79.7	ug/kg	0.080	0	0.080	0	8.0E-06	
Calcium	Ca	791000	ug/kg	791.000	359.000	791.000	0.036	0.079	
Chrysene	218-01-9	19	ug/kg	0.019	0	0.019	0	1.9E-06	
Cobalt	Co	2280	ug/kg	2.280	0.845	2.280	8.5E-05	2.3E-04	
Copper	Cu	6200	ug/kg	6.200	3.730	6.200	3.7E-04	6.2E-04	
Iron	Fe	7150000	ug/kg	7150.000	5000.000	7150.000	0.500	0.715	
Magnesium	Mg	555000	ug/kg	555.000	174.000	555.000	0.017	0.056	
Manganese	Mn	317000	ug/kg	317.000	137.000	317.000	0.014	0.032	
Methyl-2-pentanone[4-]	108-10-1	14.2	ug/kg	0.014	3.8E-03	0.014	3.8E-07	1.4E-06	
Nickel	Ni	5680	ug/kg	5.680	2.980	5.680	3.0E-04	5.7E-04	
Nitrate	NO3	0.967	mg/kg	0.967	0.934	0.967	9.3E-05	9.7E-05	
Potassium	K	819000	ug/kg	819.000	332.000	819.000	0.033	0.082	
Pyrene	129-00-0	42.5	ug/kg	0.043	0	0.043	0	4.3E-06	
Sodium	Na	540000	ug/kg	540.000	270.000	540.000	0.027	0.054	
Thallium	Tl	75.3	ug/kg	0.075	0.069	0.075	6.9E-06	7.5E-06	
Uranium	U	829	ug/kg	0.829	0.180	0.829	1.8E-05	8.3E-05	
Vanadium	V	11200	ug/kg	11.200	3.480	11.200	3.5E-04	1.1E-03	
Zinc	Zn	51700	ug/kg	51.700	14.600	51.700	1.5E-03	5.2E-03	
						TOTAL	**0.738**	**1.428**	% (all analytes from all pages were added for this total

NOTE 1: This table contains all detected, non D-coded analytes
NOTE 2: Highlighted analytes are potentially F-coded

SWMU ev 3233

SAL and background comparison

Stockpile Number ev 3233

data loaded from file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.46	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.46	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.39	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	34.7	pCi/g					pass	pass	pass	FAIL	pass
Radium 226/228	calc.	4.88	pCi/g									
Radium-226	Ra-226	2.46	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.42	pCi/g			pass	pass	FAIL	FAIL	pass	pass	pass
Thallium-208	Tl-208	0.664	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	2.51	pCi/g					FAIL	FAIL	FAIL	pass	pass
Tritium	H-3	0.0565	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.21	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.109	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.17	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.00522	pCi/g									
Cerium-139	Ce-139	-0.0224	pCi/g									
Cesium-137	Cs-137	-0.061	pCi/g									
Cobalt-60	Co-60	-0.0162	pCi/g									
Europium-152	Eu-152	-0.1	pCi/g									
Lanthanum-140	La-140	-0.093	pCi/g									
Mercury-203	Hg-203	0.00024	pCi/g									
Plutonium-238	Pu-238	-0.0024	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g									
Radium-223	Ra-223	-0.502	pCi/g									
Ruthenium-106	Ru-106	-0.369	pCi/g									
Sodium-22	Na-22	-0.0724	pCi/g									
Strontium-85	Sr-85	0.00652	pCi/g									
Strontium-90	Sr-90	-0.0775	pCi/g									
Thorium-227	Th-227	-0.0104	pCi/g									
Thorium-231	Th-231	-0.502	pCi/g									
Tin-113	Sn-113	-0.0249	pCi/g									
Uranium-235	U-235	0.0509	pCi/g									
Yttrium-88	Y-88	-0.0202	pCi/g									

SWMU ev 3233

Stockpile Number ev 3233

Radioisotopes Form

Associated Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	2.46	pCi/g	NQ	
Lead-212	Pb-212	2.46	pCi/g	NQ	
Lead-214	Pb-214	2.39	pCi/g	NQ	
Potassium-40	K-40	34.7	pCi/g	NQ	
Radium 226/228	calc.	4.88	pCi/g		
Radium-226	Ra-226	2.46	pCi/g	NQ	
Radium-228	Ra-228	2.42	pCi/g	NQ	
Thallium-208	Tl-208	0.664	pCi/g	NQ	
Thorium-234	Th-234	2.51	pCi/g	NQ	
Tritium	H-3	0.0564979	pCi/g	NQ	
Uranium-234	U-234	2.21	pCi/g	NQ	
Uranium-235/236	U-235/236	0.109	pCi/g	NQ	
Uranium-238	U-238	2.17	pCi/g	NQ	
Americium-241	Am-241	-0.00522	pCi/g	U	
Cerium-139	Ce-139	-0.0224	pCi/g	U	
Cesium-137	Cs-137	-0.061	pCi/g	U	
Cobalt-60	Co-60	-0.0162	pCi/g	U	
Europium-152	Eu-152	-0.1	pCi/g	U	
Lanthanum-140	La-140	-0.093	pCi/g	U	
Mercury-203	Hg-203	0.000237	pCi/g	U	
Plutonium-238	Pu-238	-0.0024	pCi/g	U	
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g	U	
Radium-223	Ra-223	-0.502	pCi/g	U	
Ruthenium-106	Ru-106	-0.369	pCi/g	U	
Sodium-22	Na-22	-0.0724	pCi/g	U	
Strontium-85	Sr-85	0.00652	pCi/g	U	
Strontium-90	Sr-90	-0.0775	pCi/g	U	
Thorium-227	Th-227	-0.0104	pCi/g	U	
Thorium-231	Th-231	-0.502	pCi/g	U	
Tin-113	Sn-113	-0.0249	pCi/g	U	
Uranium-235	U-235	0.0509	pCi/g	U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

Bin 5758 IO# 1014386d

BH 50-603470
50-613183

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 2/4/11 Project: MDA C Phase II

Location of Land Application: Within Project Footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 60 ft3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Drill cuttings will be applied within project footprint to previously disturbed areas, and covered with a layer(s) of road base

Note: An EX-ID Permit is required prior to land application. IOX-0815-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☐	☑
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☑
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

Stephani Fuller	Project Mgr.	2/9/11
Name (Print)	**Title**	**Date**

Signature

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes X **No** _____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Jourly J. Buckley **Signature** _____ **Date** 2-9-11

Package Expiration Date: 3-11-11

Bin 5758 ID# 104386O

Post Land Application Field Certification Sheet

Date(s) of land application: 2/4/11 Project: MDA C Phase II

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/11

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	[signature]	Project Manager	2-16-11
Name (Print)	**Signature**	**Title**	**Date**

Bin 5758
ID# 014386

Sampling event ID 3233

SWMU ev 3233.2086.2100

Stockpile Number ev 3233.2086.2100

Solid Waste Evaluation

Summary Excel file: ev3233.2086.2100.awd.2.2.2011(1).xlsm

evaluation date: 2/2/2011

RCRA

33 analytes pass

between these 33 analytes pass as undetected

10 analytes fail

Detects

Total PCB (ppm) Not analyz

3 analytes with potential F-code

3 analytes with potential K-code

0 analytes with potential U-code

0 analytes with potential P-code

Non-wastewater LDR: 8 pass 0 FAIL

Hazardous soil LDR: 8 pass 0 FAIL

Residential Soil (mg/kg) :	15 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	15 pass	0 FAIL
Construction Worker Soil (mg/kg) :	13 pass	0 FAIL
Recreational Soil (mg/kg) :	15 pass	0 FAIL
soil background:	18 pass	0 FAIL
Canyon Sediment background:	18 pass	0 FAIL
Qbt 2,3,4 background:	17 pass	1 FAIL
Qbt 1v background:	15 pass	3 FAIL
Qbt 1g, Qct,Qbo background:	14 pass	4 FAIL

RAD

total dose: 0.7108 mRem/year

?

analysed for H-3

analysed for Pu-239

31 isotopes,

11 were detected

19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	10 pass	0 FAIL
Canyon Sedi-ment:	10 pass	0 FAIL
QBT2,3,4:	7 pass	3 FAIL
QBt 1v:	10 pass	0 FAIL
Qbt 1g, Qct, Qbo:	10 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2086	WST50-11-2100	

Imported data files
ev3233.2.2.2011.txt

Sampling event ID 3233

SWMU ev 3233.2086.2100

Stockpile Number ev 3233.2086.2100

Detected Chemicals Form

associated Excel file:
ev3233.2086.2100.awd.2.2.2011(1).xlsm

evaluation date: 2/2/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1750	mg/kg							
Antimony	Sb	0.507	mg/kg	pass	pass		K161,K021,K177,			
Barium	Ba	18.4	mg/kg	pass	pass					
Beryllium	Be	0.333	mg/kg	pass	pass					
Calcium	Ca	934	mg/kg							
Chromium	Cr	4.75	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	0.845	mg/kg							
Copper	Cu	2.89	mg/kg							
Iron	Fe	4700	mg/kg							
Lead	Pb	6.34	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	587	mg/kg							
Manganese	Mn	112	mg/kg							
Nickel	Ni	1.95	mg/kg	pass	pass	F006,				
Nitrate	NO3	1.06	mg/kg							
Potassium	K	489	mg/kg							
Sodium	Na	316	mg/kg							
Uranium	U	0.115	mg/kg							
Vanadium	V	7.38	mg/kg	pass	pass					
Zinc	Zn	9.57	mg/kg	pass	pass					

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1750	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.507	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Barium	Ba	18.4	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.333	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	934	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.75	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	0.845	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	2.89	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Iron	Fe	4700	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	6.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	587	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	112	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni	1.95	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nitrate	NO3	1.06	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	489	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	316	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.115	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	7.38	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	9.57	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

SWMU ev 3233.2086.2100

SAL and background comparison

Stockpile Number ev 3233.2086.2100

Assessment Record: ev3233.2086.2100.awd.2.2.2011(1).xlsm

evaluation date: 2/2/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.03	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.14	pCi/g					pass	pass	pass	pass	pass
Lead-214	Pb-214	2.58	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	33.4	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	4.19	pCi/g									
Radium-226	Ra-226	2.03	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.16	pCi/g			pass	pass	pass	pass	pass	pass	pass
Thallium-208	Tl-208	0.738	pCi/g					pass	pass	pass	pass	pass
Tritium	H-3	0.03409	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	1.94	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-235/236	U-235/236	0.123	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	1.74	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Americium-241	Am-241	-0.00091	pCi/g									
Cerium-139	Ce-139	-0.00907	pCi/g									
Cesium-137	Cs-137	0.0143	pCi/g									
Cobalt-60	Co-60	0.0247	pCi/g									
Europium-152	Eu-152	0.00197	pCi/g									
Lanthanum-140	La-140	-0.0344	pCi/g									
Mercury-203	Hg-203	0.0389	pCi/g									
Plutonium-238	Pu-238	0	pCi/g									
Plutonium-239/240	Pu-239/240	0.00676	pCi/g									
Radium-223	Ra-223	-0.179	pCi/g									
Ruthenium-106	Ru-106	-0.172	pCi/g									
Sodium-22	Na-22	-0.0162	pCi/g									
Strontium-90	Sr-90	0.36	pCi/g									
Thorium-227	Th-227	-0.218	pCi/g									
Thorium-231	Th-231	-0.179	pCi/g									
Thorium-234	Th-234	1.76	pCi/g									
Tin-113	Sn-113	-0.00032	pCi/g									
Uranium-235	U-235	0.193	pCi/g									
Yttrium-88	Y-88	-0.00336	pCi/g									

No comparisons or calculations required.

OK for land application

Bin 5708 ID10143867 BH # ~~50-603470~~ 50-613183

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 2/7/11 Project: MDA C Phase III

Location of Land Application: Within Project footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 36 ft^3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Within project footprint - Drill Cuttings will be land applied to previously disturbed areas & covered with a layer(s) of road base.

Note: An EX-ID Permit is required prior to land application.

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☐	☑
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☑
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

Stephani Fuller	[signature]	Project Mgr.	2/9/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes X **No**_____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Jocelyn T. Buckley **Signature** [signature] **Date** 2-9-11

Package Expiration Date: 3/11/11

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDAC Phase III

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/2011

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	[signature]	Project Manager	2-16-11
Name (Print)	**Signature**	**Title**	**Date**

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

Solid Waste Evaluation

Summary

Excel file: AWD ev3233 s2087 ws_054empty(1).xlsm
evaluation date: 2/7/2011

RCRA

33 analytes pass
between these 32 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analy

3 analytes with potential F-code
2 analytes with potential K-code
1 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 9 pass 0 FAIL
Hazardous soil LDR: 9 pass 0 FAIL

Residential Soil (mg/kg) :	15 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	15 pass	0 FAIL
Construction Worker Soil (mg/kg) :	13 pass	0 FAIL
Recreational Soil (mg/kg) :	15 pass	0 FAIL
soil background:	17 pass	0 FAIL
Canyon Sediment background:	17 pass	0 FAIL
Qbt 2,3,4 background:	17 pass	0 FAIL
Qbt 1v background:	14 pass	3 FAIL
Qbt 1g, Qct,Qbo background:	14 pass	3 FAIL

RAD

total dose: 1.2691 mRem/ye

?

analysed for H-3
analysed for Pu-239
30 isotopes,
11 were detected
18 undetected

Residen-tial SAL:	3 pass	0 FAIL
Indust-rial SAL:	3 pass	0 FAIL
Constr. Worker SAL:	5 pass	0 FAIL
Recrea-tional SAL:	5 pass	0 FAIL
Soil:	2 pass	8 FAIL
Canyon Sedi-ment:	2 pass	8 FAIL
QBT2,3,4:	2 pass	8 FAIL
QBt 1v:	3 pass	7 FAIL
Qbt 1g, Qct, Qbo:	7 pass	3 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2087	WST50-11-2095	

Imported data files
ev3233 110207.txt

Sampling event ID 3233

SWMU ev 3233

Stockpile Number ev 3233

Detected Chemicals Form

associated Excel file: AWD ev3233 s2087 ws_054empty(1).xlsm

evaluation date: 2/7/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Acetone	67-64-1	0.00335	mg/kg	pass	pass					F003,U002 codes not applicable
Aluminum	Al	1650	mg/kg							
Barium	Ba	18.3	mg/kg	pass	pass					
Beryllium	Be	0.178	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0874	mg/kg	pass	pass			U028,		
Calcium	Ca	1340	mg/kg							
Chromium	Cr	6.02	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	1.26	mg/kg							
Copper	Cu	3.81	mg/kg							
Iron	Fe	4150	mg/kg							
Lead	Pb	5.2	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	778	mg/kg							
Manganese	Mn	97.8	mg/kg							
Nickel	Ni	1.55	mg/kg	pass	pass	F006,				
Potassium	K	378	mg/kg							
Sodium	Na	383	mg/kg							
Uranium	U	0.191	mg/kg							
Vanadium	V	4.58	mg/kg	pass	pass					
Zinc	Zn	12	mg/kg	pass	pass					

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Acetone	67-64-1	0.00335	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Aluminum	Al	1650	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	18.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.178	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0874	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	1340	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	6.02	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	1.26	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.81	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	4150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	5.2	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	778	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	FAIL
Manganese	Mn	97.8	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni	1.55	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Potassium	K	378	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	383	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.191	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	4.58	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Zinc	Zn	12	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

SWMU ev 3233

Stockpile Number ev 3233

SAL and background comparison

evaluation date: 2/7/2011

	Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
N/A	Bismuth-214	Bi-214	3.66	pCi/g					FAIL	FAIL	FAIL	FAIL	pass
N/A	Lead-212	Pb-212	3.73	pCi/g					FAIL	FAIL	FAIL	pass	pass
N/A	Lead-214	Pb-214	4.2	pCi/g					FAIL	FAIL	FAIL	FAIL	FAIL
	Potassium-40	K-40	32.4	pCi/g					pass	pass	pass	pass	pass
	Radium 226/228	calc.	7.43	pCi/g									
	Radium-226	Ra-226	3.66	pCi/g			pass	pass	FAIL	FAIL	FAIL	FAIL	pass
	Radium-228	Ra-228	3.77	pCi/g			pass	pass	FAIL	FAIL	FAIL	FAIL	pass
	Thallium-208	Tl-208	1.11	pCi/g					pass	pass	pass	pass	pass
N/A	Thorium-234	Th-234	4.22	pCi/g					FAIL	FAIL	FAIL	FAIL	FAIL
	Uranium-234	U-234	3.89	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	pass
	Uranium-235/236	U-235/236	0.325	pCi/g	pass	pass	pass	pass					
	Uranium-238	U-238	4.21	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
	Americium-241	Am-241	-0.00187	pCi/g									
	Cerium-139	Ce-139	-0.00062	pCi/g									
	Cesium-137	Cs-137	-0.0779	pCi/g									
	Cobalt-60	Co-60	-0.0349	pCi/g									
	Europium-152	Eu-152	0.0982	pCi/g									
	Lanthanum-140	La-140	0.139	pCi/g									
	Plutonium-238	Pu-238	0.00218	pCi/g									
	Plutonium-239/240	Pu-239/240	-0.00764	pCi/g									
	Radium-223	Ra-223	0.361	pCi/g									
	Ruthenium-106	Ru-106	-0.287	pCi/g									
	Sodium-22	Na-22	0.0209	pCi/g									
	Strontium-90	Sr-90	0.0583	pCi/g									
	Thorium-227	Th-227	0.0266	pCi/g									
	Thorium-231	Th-231	0.361	pCi/g									
	Tin-113	Sn-113	-0.0273	pCi/g									
	Tritium	H-3	0.02437	pCi/g									
	Uranium-235	U-235	0.182	pCi/g									
	Yttrium-88	Y-88	-0.011	pCi/g									

Ra^{226} $3.66 - 2.59 = 1.07/4 = 0.268$

Ra^{228} $3.77 - 2.33 = 1.44/5 = 0.288$

U^{234} $3.89 - 2.59 = 1.30/213 = 0.006$

U^{238} $4.21 - 2.29 = 1.92/140 = 0.014$

$0.576 < 1$

OK to land apply

Borehole B1

BIN 5732 | ITEM ID. 101438 68

50-013182

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/4/10 Project: MDA C Phase III

Location of Land Application: Within Project Footprint/Access Rds TA: 50 (SWMU 50-009)

Estimated Quantity: 200 ft 3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Drill Cuttings - Soil

Proposed Method of Land Application (describe): Cuttings Soil KAG will be land applied within project footprint (disturbed areas) or on project access roads & covered with a layer of road base.

Note: An EX-ID Permit is required prior to land application. 10X-0815-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	✓	
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:		✓
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	✓	
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.		✓
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	✓	
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	✓	

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

EED

Stephani Fuller | Stephani Fuller | Project Manager | 1/24/11

Name (Print) | **Signature** | **Title** | **Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes ✓ **No** _____ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Joselyn Bullock **Signature** Joselyn Bullock **Date** 1-25-11

Package Expiration Date: 2-11-11

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDA C Phase III

Location of land application: Within project Footprint TA: 50

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/2011

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	[signature]	Project Manager	1/28/11
Name (Print)	**Signature**	**Title**	**Date**

PRS Number: 50-009 (Borehole 50-613182)		
Source of contaminants:	Yes	No
F-listed		X
U- or P-listed		X
K-listed		X

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area (landfill) for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

RFI activities were conducted at MDA C from 1993 to 1996. Surface soil sampling was conducted during the summer of 1993. A subsurface investigation was performed during portions of 1994, 1995, and 1996.Conclusions regarding the nature and extent of contamination at MDA C based on the results of preliminary site characterization activities are as follows:

-Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C before the placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination has not been defined.

-Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath Pit 6 indicate that contamination has migrated from pit 6 into underlying rock. The extent of subsurface contamination has not been defined.

-Tritium and volatile organic compounds (VOC) contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exist in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined.

-Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Documents Reviewed

Date	Title	ER Id No.
4/1/2010	Investigation Report for Upper Mortandad Canyon Aggregate Area, Rev. 1	109180
4/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, at TA-50, Rev. 1	109260
2/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, TA-50	108594
10/1/2009	Phase II Investigation report for MDA C, SWMU 50-009, at TA-50, Rev. 1	107389
5/1/2009	Phase II Investigation Report for MDA C, SWMU 50-009, at TA-50	106047
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [IWP]	098954
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [HIR]	098955

4/23/2007	Phase II Investigation Work Plan for MDA C, Rev. 1	100143
12/6/2006	Investigation Report for MDA C, SWMU 50-009	094688
10/1/2005	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 2	091493
11/1/2003	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 1	087152
7/31/2003	Investigation Work Plan for MDA-C, SWMU 50-009 at TA-50	087392
5/20/1992	RFI Work Plan for Operable Unit 1147	007672
11/30/90	SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
July 2010	PRS Database	NA

Summary of Listed Status

U-listed constituents were detected in soil samples; however, there was no documented evidence of a spill, release, or discharge of unused/unspent commercial chemical products in the vicinity of the SWMU. K-listed constituents were also detected in the soil samples from 50-009, BH 50-613182; however most K-listed sources are industrial in nature and not typical of Laboratory operations. The Laboratory generates only small amounts of K-listed wastes, primarily spent carbon from high explosives processing that is disposed off-site. The documented amounts of K-listed wastes generated are not sufficient to have impacted investigation/remediation activities. Therefore, the IDW is not K-listed. In addition, Arsenic (F032, F034, F035), Benzo(a)pyrene (F032, F034, F037, and F038), Chromium (F032, F034, F035, F037, and F038), Chrysene (F037 and F038), Lead (F035, F037, and F038), and Nickel (F006) were also detected in the soil samples from 50-009 site investigation activities. There is no documented evidence that the following processes (F-listed sources) occurred in the vicinity of the SWMU: Wood preserving processes (F032, F034, and F035), Petroleum refinery operations (F037 and F038) and Electroplating operations (F006). See Attachment 1 for the complete list of potentially listed constituents detected in the soil sample.

Based on analytical data and documentation, there is no conclusive evidence of a listed source impacting SWMU 50-009, MDA-C. Therefore, the IDW may be managed as non-hazardous waste.

DD Completed January 18, 2011

Attachment 1.

Analyte	Concentration	Potential U-Codes	Potential F-Codes	Potential K-Codes
Antimony	0.91			K161, K021, K177
Arsenic	0.34		F032,F034,F035,	K031,K060,K161, K171,K172,K176, K084,K101,K102,
Benzo(a)pyrene	0.0144	U022	F032,F034,F037,F038	K001, K035, K141, K142, K144, K145, K147, K148, K170
Benzo(b)fluoranthene	0.0214			K001,K035,K141, K142,K143,K144, K147,K148,K170,
Bis(2-ethylhexyl)phthalate	0.0797	U028		
Chromium	4.96		F032,F034,F035,F037 ,F038,	K090
Chrysene	0.019	U050	F037, F038	K001, K035
Lead	4.73		F035,F037,F038,	K002, K003, K005, K048, K049, K051, K062, K064, K086, K100, K176, K046, K052, K061, K069
Nickel	5.68		F006	
Thallium	0.0753			K178

SWMU ev 3233

SAL and background comparison

[illegible] AWD 3233 110103 ws_049empty(1).xlsm

Stockpile Number ev 3233

evaluation date: 1/3/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	1.65	pCi/g					pass	pass	pass	pass	pass
Lead-212	Pb-212	2.46	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.01	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	32.5	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	3.94	pCi/g									
Radium-226	Ra-226	1.65	pCi/g			pass	pass	pass	pass	pass	pass	pass
Radium-228	Ra-228	2.29	pCi/g			pass	pass	pass	pass	pass	pass	pass
Thallium-208	Tl-208	0.664	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	2.51	pCi/g					FAIL	FAIL	FAIL	pass	pass
Uranium-234	U-234	1.06	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-235/236	U-235/236	0.0556	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	1.14	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Americium-241	Am-241	-0.00522	pCi/g									
Cerium-139	Ce-139	0.0239	pCi/g									
Cesium-137	Cs-137	0.0149	pCi/g									
Cobalt-60	Co-60	0.0215	pCi/g									
Europium-152	Eu-152	0.0485	pCi/g									
Lanthanum-140	La-140	-0.0408	pCi/g									
Mercury-203	Hg-203	0.00024	pCi/g									
Plutonium-238	Pu-238	-0.0024	pCi/g									
Plutonium-239/240	Pu-239/240	0.0012	pCi/g									
Radium-223	Ra-223	-0.502	pCi/g									
Ruthenium-106	Ru-106	0.0122	pCi/g									
Sodium-22	Na-22	-0.0724	pCi/g									
Strontium-85	Sr-85	0.00652	pCi/g									
Strontium-90	Sr-90	-0.00646	pCi/g									
Thorium-227	Th-227	-0.0104	pCi/g									
Thorium-231	Th-231	-0.502	pCi/g									
Tin-113	Sn-113	-0.0218	pCi/g									
Tritium	H-3	-1.27	pCi/g									
Uranium-235	U-235	0.0622	pCi/g									
Yttrium-88	Y-88	-0.0202	pCi/g									

* Daughter

* Daughter

Calculation not required

Detected Chemicals Form

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1080	mg/kg							
Antimony	Sb	0.91	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.275	mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	13.8	mg/kg	pass	pass					
Beryllium	Be	0.524	mg/kg	pass	pass					
Calcium	Ca	359	mg/kg							
Chromium	Cr	4.09	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co	1.67	mg/kg							
Copper	Cu	5.54	mg/kg							
Iron	Fe	6370	mg/kg							
Lead	Pb	4.73	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	174	mg/kg							
Manganese	Mn	317	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass					F003,U161 codes not applicable
Nickel	Ni	3.38	mg/kg	pass	pass	F006,				
Nitrate	NO3	0.967	mg/kg							
Potassium	K	332	mg/kg							
Sodium	Na	270	mg/kg							
Thallium	Tl	0.0686	mg/kg				K178,			
Uranium	U	0.829	mg/kg							
Vanadium	V	7.76	mg/kg	pass	pass					
Zinc	Zn	51.7	mg/kg	pass	pass					

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1080	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.91	mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
Arsenic	As	0.275	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	13.8	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.524	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Ca	359	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.09	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	1.67	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	5.54	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Iron	Fe	6370	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.73	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	174	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	317	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Nickel	Ni	3.38	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Nitrate	NO3	0.967	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	332	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	270	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	Tl	0.0686	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U	0.829	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	7.76	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	51.7	mg/kg	pass	pass	pass	pass	FAIL	pass	pass	pass	FAIL

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

Solid Waste Evaluation

Summary Excel file: AWD 3233 110103 ws_049empty(1).xlsm

evaluation date: 1/3/2011

RCRA

33 analytes pass
between these 32 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analyz

4 analytes with potential F-code
5 analytes with potential K-code
0 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 10 pass 0 FAIL
Hazardous soil LDR: 10 pass 0 FAIL

Residential Soil (mg/kg) :	18 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	18 pass	0 FAIL
Construction Worker Soil (mg/kg) :	15 pass	1 FAIL
Recreational Soil (mg/kg) :	18 pass	0 FAIL
soil background:	18 pass	2 FAIL
Canyon Sediment background:	19 pass	1 FAIL
Qbt 2,3,4 background:	18 pass	2 FAIL
Qbt 1v background:	15 pass	5 FAIL
Qbt 1g, Qct,Qbo background:	11 pass	9 FAIL

RAD

total dose: 0.6790 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes,

11 were detected
20 undetected

Residen-tial SAL:	3 pass	0 FAIL
Indust-rial SAL:	3 pass	0 FAIL
Constr. Worker SAL:	5 pass	0 FAIL
Recrea-tional SAL:	5 pass	0 FAIL
Soil:	8 pass	2 FAIL
Canyon Sedi-ment:	8 pass	2 FAIL
QBT2,3,4:	8 pass	2 FAIL
QBt 1v:	10 pass	0 FAIL
Qbt 1g, Qct, Qbo:	10 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2081	WST50-11-2091	

Imported data files
ev3233 110103.txt

Sampling event ID 3233

associated Excel file: AWD 3233 110103 ws_049empty(1).xlsm

SWMU ev 3233

Stockpile Number ev 3233

RCRA Characteristics Form

evaluation date: 1/3/2011

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	367	ug/L	J	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	29.7	ug/L	U	pass	
Lead	Pb		5000	20	ug/L	U	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.0505	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.0505	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.0505	ug/L	U	pass	
Chloroform	67-66-3		6000	0.0505	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-]	108-39-4		200000	16.75	ug/L	UJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75	ug/L	UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5	ug/L	UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75	ug/L	UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75	ug/L	UJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75	ug/L	UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75	ug/L	UJ	pass	
Hexachloroethane	67-72-1		3000	16.75	ug/L	UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75	ug/L	UJ	pass	
Pyridine	110-86-1		5000	16.75	ug/L	UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.0505	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75	ug/L	UJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75	ug/L	UJ	pass	
Vinyl Chloride	75-01-4		200	0.0505	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

SWMU ev 3233

Radioisotopes Form

Stockpile Number ev 3233

Associated Excel file: AWD 3233 110103 ws_049empty(1).xlsm

evaluation date: 1/3/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	1.65	pCi/g	NQ	
Lead-212	Pb-212	2.46	pCi/g	NQ	
Lead-214	Pb-214	2.01	pCi/g	NQ	
Potassium-40	K-40	32.5	pCi/g	NQ	
Radium 226/228	calc.	3.94	pCi/g		
Radium-226	Ra-226	1.65	pCi/g	NQ	
Radium-228	Ra-228	2.29	pCi/g	NQ	
Thallium-208	Tl-208	0.664	pCi/g	NQ	
Thorium-234	Th-234	2.51	pCi/g	NQ	
Uranium-234	U-234	1.06	pCi/g	NQ	
Uranium-235/236	U-235/236	0.0556	pCi/g	NQ	
Uranium-238	U-238	1.14	pCi/g	NQ	
Americium-241	Am-241	-0.00522	pCi/g	U	
Cerium-139	Ce-139	0.0239	pCi/g	U	
Cesium-137	Cs-137	0.0149	pCi/g	U	
Cobalt-60	Co-60	0.0215	pCi/g	U	
Europium-152	Eu-152	0.0485	pCi/g	U	
Lanthanum-140	La-140	-0.0408	pCi/g	U	
Mercury-203	Hg-203	0.000237	pCi/g	U	
Plutonium-238	Pu-238	-0.0024	pCi/g	U	
Plutonium-239/240	Pu-239/240	0.0012	pCi/g	U	
Radium-223	Ra-223	-0.502	pCi/g	U	
Ruthenium-106	Ru-106	0.0122	pCi/g	U	
Sodium-22	Na-22	-0.0724	pCi/g	U	
Strontium-85	Sr-85	0.00652	pCi/g	U	
Strontium-90	Sr-90	-0.00646	pCi/g	U	
Thorium-227	Th-227	-0.0104	pCi/g	U	
Thorium-231	Th-231	-0.502	pCi/g	U	
Tin-113	Sn-113	-0.0218	pCi/g	U	
Tritium	H-3	-1.27	pCi/g	U	
Uranium-235	U-235	0.0622	pCi/g	U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

BORE-HOLE
50-013182

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

Solid Waste Evaluation

Summary ed Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

between these
33 analytes pass
31 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analy

6 analytes with potential F-code
8 analytes with potential K-code
3 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 15 pass 0 FAIL
Hazardous soil LDR: 15 pass 0 FAIL

Residential Soil (mg/kg) :	23 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	23 pass	0 FAIL
Construction Worker Soil (mg/kg) :	20 pass	1 FAIL
Recreational Soil (mg/kg) :	23 pass	0 FAIL
soil background:	18 pass	2 FAIL
Canyon Sediment background:	19 pass	1 FAIL
Qbt 2,3,4 background:	17 pass	3 FAIL
Qbt 1v background:	13 pass	7 FAIL
Qbt 1g, Qct,Qbo background:	9 pass	11 FAIL

RAD

total dose: 0.8205 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes,
12 were detected
19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	8 pass	3 FAIL
Canyon Sedi-ment:	8 pass	3 FAIL
QBT2,3,4:	5 pass	6 FAIL
QBt 1v:	10 pass	1 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2081	WST50-11-2091	
WST50-11-2082	WST50-11-2092	
WST50-11-2083	WST50-11-2093	

Imported data files
ev3233 110118.txt

Sampling event ID 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

SWMU ev 3233

Stockpile Number ev 3233

RCRA Characteristics Form

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	853	ug/L	NQ	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	22.2	ug/L	U	pass	
Lead	Pb	D008	5000	25.2	ug/L	NQ	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.0505	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.0505	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.0505	ug/L	U	pass	
Chloroform	67-66-3		6000	0.0505	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-]	108-39-4		200000	16.75	ug/L	UJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75	ug/L	UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5	ug/L	UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75	ug/L	UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75	ug/L	UJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75	ug/L	UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75	ug/L	UJ	pass	
Hexachloroethane	67-72-1		3000	16.75	ug/L	UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75	ug/L	UJ	pass	
Pyridine	110-86-1		5000	16.75	ug/L	UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.0505	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75	ug/L	UJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75	ug/L	UJ	pass	
Vinyl Chloride	75-01-4		200	0.0505	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	4030	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Antimony	Sb	0.91	mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
Arsenic	As	0.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	70.5	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Beryllium	Be	0.524	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	791	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.96	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Chrysene	218-01-9	0.019	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Cobalt	Co	2.28	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Copper	Cu	6.2	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Iron	Fe	7150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.73	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	555	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	317	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Nickel	Ni	5.68	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Nitrate	NO3	0.967	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	819	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Sodium	Na	540	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	Tl	0.0753	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U	0.829	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	11.2	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	51.7	mg/kg	pass	pass	pass	pass	FAIL	pass	pass	pass	FAIL

Sampling event ID 3233

SWMU ev 3233

Stockpile Number ev 3233

Detected Chemicals Form

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	4030	mg/kg							
Antimony	Sb	0.91	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.34	mg/kg	pass	pass	[redacted]	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	70.5	mg/kg	pass	pass					
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	[redacted]	K001,K035,K141,K142,K144,K145,K147,K148,K170,	U022,		
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass		K001,K035,K141,K142,K143,K144,K147,K148,K170,			
Beryllium	Be	0.524	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass			U028,		
Calcium	Ca	791	mg/kg							
Chromium	Cr	4.96	mg/kg	pass	pass	[redacted]	K090,			
Chrysene	218-01-9	0.019	mg/kg	pass	pass	[redacted]	K001,K035,	U050,		
Cobalt	Co	2.28	mg/kg							
Copper	Cu	6.2	mg/kg							
Iron	Fe	7150	mg/kg							
Lead	Pb	4.73	mg/kg	pass	pass	[redacted]	K002,K003,K005,K046,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	555	mg/kg							
Manganese	Mn	317	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	[redacted]				F003,U161 codes not applicable
Nickel	Ni	5.68	mg/kg	pass	pass	[redacted]				
Nitrate	NO3	0.967	mg/kg							
Potassium	K	819	mg/kg							
Pyrene	129-00-0	0.0425	mg/kg	pass	pass					
Sodium	Na	540	mg/kg							
Thallium	Tl	0.0753	mg/kg				K178,			
Uranium	U	0.829	mg/kg							
Vanadium	V	11.2	mg/kg	pass	pass					
Zinc	Zn	51.7	mg/kg	pass	pass					

Additional Constituents - Chemicals

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concentration	Unit	Results (ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	Al	4030000	ug/kg	4030.000	1080.000	4030.000	0.108	0.403	
Antimony	Sb	910	ug/kg	0.910	0	0.910	0	9.1E-05	
Benzo(a)pyrene	50-32-8	14.4	ug/kg	0.014	0	0.014	0	1.4E-06	
Benzo(b)fluoranthene	205-99-2	21.4	ug/kg	0.021	0	0.021	0	2.1E-06	
Beryllium	Be	524	ug/kg	0.524	0.346	0.524	3.5E-05	5.2E-05	
Bis(2-ethylhexyl)phthalate	117-81-7	79.7	ug/kg	0.080	0	0.080	0	8.0E-06	
Calcium	Ca	791000	ug/kg	791.000	359.000	791.000	0.036	0.079	
Chrysene	218-01-9	19	ug/kg	0.019	0	0.019	0	1.9E-06	
Cobalt	Co	2280	ug/kg	2.280	0.845	2.280	8.5E-05	2.3E-04	
Copper	Cu	6200	ug/kg	6.200	3.730	6.200	3.7E-04	6.2E-04	
Iron	Fe	7150000	ug/kg	7150.000	5000.000	7150.000	0.500	0.715	
Magnesium	Mg	555000	ug/kg	555.000	174.000	555.000	0.017	0.056	
Manganese	Mn	317000	ug/kg	317.000	137.000	317.000	0.014	0.032	
Methyl-2-pentanone[4-]	108-10-1	14.2	ug/kg	0.014	3.8E-03	0.014	3.8E-07	1.4E-06	
Nickel	Ni	5680	ug/kg	5.680	2.980	5.680	3.0E-04	5.7E-04	
Nitrate	NO3	0.967	mg/kg	0.967	0.934	0.967	9.3E-05	9.7E-05	
Potassium	K	819000	ug/kg	819.000	332.000	819.000	0.033	0.082	
Pyrene	129-00-0	42.5	ug/kg	0.043	0	0.043	0	4.3E-06	
Sodium	Na	540000	ug/kg	540.000	270.000	540.000	0.027	0.054	
Thallium	Tl	75.3	ug/kg	0.075	0.069	0.075	6.9E-06	7.5E-06	
Uranium	U	829	ug/kg	0.829	0.180	0.829	1.8E-05	8.3E-05	
Vanadium	V	11200	ug/kg	11.200	3.480	11.200	3.5E-04	1.1E-03	
Zinc	Zn	51700	ug/kg	51.700	14.600	51.700	1.5E-03	5.2E-03	
						TOTAL	**0.738**	**1.428**	% (all analytes from all pages were added for this total

NOTE 1: This table contains all detected, non D-coded analytes
NOTE 2: Highlighted analytes are potentially F-coded

SWMU ev 3233

Stockpile Number ev 3233

SAL and background comparison

data spreadsheet file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.46	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.46	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.39	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	34.7	pCi/g					pass	pass	pass	FAIL	pass
Radium 226/228	calc.	4.88	pCi/g									
Radium-226	Ra-226	2.46	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.42	pCi/g			pass	pass	FAIL	FAIL	pass	pass	pass
Thallium-208	Tl-208	0.664	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	2.51	pCi/g					FAIL	FAIL	FAIL	pass	pass
Tritium	H-3	0.0565	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.21	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.109	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.17	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.00522	pCi/g									
Cerium-139	Ce-139	-0.0224	pCi/g									
Cesium-137	Cs-137	-0.061	pCi/g									
Cobalt-60	Co-60	-0.0162	pCi/g									
Europium-152	Eu-152	-0.1	pCi/g									
Lanthanum-140	La-140	-0.093	pCi/g									
Mercury-203	Hg-203	0.00024	pCi/g									
Plutonium-238	Pu-238	-0.0024	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g									
Radium-223	Ra-223	-0.502	pCi/g									
Ruthenium-106	Ru-106	-0.369	pCi/g									
Sodium-22	Na-22	-0.0724	pCi/g									
Strontium-85	Sr-85	0.00652	pCi/g									
Strontium-90	Sr-90	-0.0775	pCi/g									
Thorium-227	Th-227	-0.0104	pCi/g									
Thorium-231	Th-231	-0.502	pCi/g									
Tin-113	Sn-113	-0.0249	pCi/g									
Uranium-235	U-235	0.0509	pCi/g									
Yttrium-88	Y-88	-0.0202	pCi/g									

SWMU ev 3233

Radioisotopes Form

Stockpile Number ev 3233

Associated Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	2.46	pCi/g	NQ	
Lead-212	Pb-212	2.46	pCi/g	NQ	
Lead-214	Pb-214	2.39	pCi/g	NQ	
Potassium-40	K-40	34.7	pCi/g	NQ	
Radium 226/228	calc.	4.88	pCi/g		
Radium-226	Ra-226	2.46	pCi/g	NQ	
Radium-228	Ra-228	2.42	pCi/g	NQ	
Thallium-208	Tl-208	0.664	pCi/g	NQ	
Thorium-234	Th-234	2.51	pCi/g	NQ	
Tritium	H-3	0.0564979	pCi/g	NQ	
Uranium-234	U-234	2.21	pCi/g	NQ	
Uranium-235/236	U-235/236	0.109	pCi/g	NQ	
Uranium-238	U-238	2.17	pCi/g	NQ	
Americium-241	Am-241	-0.00522	pCi/g	U	
Cerium-139	Ce-139	-0.0224	pCi/g	U	
Cesium-137	Cs-137	-0.061	pCi/g	U	
Cobalt-60	Co-60	-0.0162	pCi/g	U	
Europium-152	Eu-152	-0.1	pCi/g	U	
Lanthanum-140	La-140	-0.093	pCi/g	U	
Mercury-203	Hg-203	0.000237	pCi/g	U	
Plutonium-238	Pu-238	-0.0024	pCi/g	U	
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g	U	
Radium-223	Ra-223	-0.502	pCi/g	U	
Ruthenium-106	Ru-106	-0.369	pCi/g	U	
Sodium-22	Na-22	-0.0724	pCi/g	U	
Strontium-85	Sr-85	0.00652	pCi/g	U	
Strontium-90	Sr-90	-0.0775	pCi/g	U	
Thorium-227	Th-227	-0.0104	pCi/g	U	
Thorium-231	Th-231	-0.502	pCi/g	U	
Tin-113	Sn-113	-0.0249	pCi/g	U	
Uranium-235	U-235	0.0509	pCi/g	U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

#31

BIN 5787
10143869

50-613182

Water Quality and RCRA Group
Los Alamos National Laboratory

ENV-RCRA-QP-011.2
Attachment 2, Page 1 of 1

Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/20/11 Project: MDAC Phase III

Location of Land Application: Within project footprint TA: 50 (SWMU 50-009)

Estimated Quantity: 48 ft^3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Drill cuttings will be land applied within the project footprint (SWMU 50-009) to previously disturbed areas and covered with a layer of roadbase

Note: An EX-ID Permit is required prior to land application. 10X-0815-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☑	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

RPD

Stephani Fuller	S Fuller	Project Manager	1/24/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes ☑ **No** ☐ **Note deficiency in the space provided:**

ENV-RCRA Reviewer Name (Print) Sarah J. Burkhardt **Signature** Sarah J. Burkhardt **Date** 1-25-11

Package Expiration Date: 2-11-11

Bin #10143869
5181

Post Land Application Field Certification Sheet

Date(s) of land application: _____ Project: MDA C Phase III

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/11

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Stephani Fuller	[signature]	Project Mgr.	1/28/11
Name (Print)	**Signature**	**Title**	**Date**

PRS Number: 50-009 (Borehole 50-613182)		
Source of contaminants:	Yes	No
F-listed		X
U- or P-listed		X
K-listed		X

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area (landfill) for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

RFI activities were conducted at MDA C from 1993 to 1996. Surface soil sampling was conducted during the summer of 1993. A subsurface investigation was performed during portions of 1994, 1995, and 1996.Conclusions regarding the nature and extent of contamination at MDA C based on the results of preliminary site characterization activities are as follows:

-Elevated concentrations of americium-241 and isotopic plutonium in surface soils in the northeast area of MDA C are likely related to releases from MDA C before the placement of crushed tuff on the surface of the site in 1984. The extent of current surface radionuclide contamination has not been defined.

-Concentrations of specific metals (including barium, copper, and lead) and radionuclides (strontium-90 and americium-241) in tuff beneath Pit 6 indicate that contamination has migrated from pit 6 into underlying rock. The extent of subsurface contamination has not been defined.

-Tritium and volatile organic compounds (VOC) contamination (primarily trichloroethylene [TCE], tetrachloroethene [PCE], and 1,1,1-trichloroethane [TCA]) exist in subsurface pore gas; however, the vertical and horizontal extent of this contamination has not been defined.

-Surface flux of VOCs and near-surface tritium soil-gas concentrations indicate localized areas where releases to the atmosphere are occurring.

Documents Reviewed

Date	Title	ER Id No.
4/1/2010	Investigation Report for Upper Mortandad Canyon Aggregate Area, Rev. 1	109180
4/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, at TA-50, Rev. 1	109260
2/1/2010	Phase III Investigation Work Plan for MDA C, SWMU 50-009, TA-50	108594
10/1/2009	Phase II Investigation report for MDA C, SWMU 50-009, at TA-50, Rev. 1	107389
5/1/2009	Phase II Investigation Report for MDA C, SWMU 50-009, at TA-50	106047
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [IWP]	098954
11/30/2007	Investigation Work Plan and HIR for Upper Mortandad Canyon Aggregate Area [HIR]	098955

4/23/2007	Phase II Investigation Work Plan for MDA C, Rev. 1	100143
12/6/2006	Investigation Report for MDA C, SWMU 50-009	094688
10/1/2005	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 2	091493
11/1/2003	Investigation Work Plan for MDA C, SWMU 50-009 at TA-50, Rev. 1	087152
7/31/2003	Investigation Work Plan for MDA-C, SWMU 50-009 at TA-50	087392
5/20/1992	RFI Work Plan for Operable Unit 1147	007672
11/30/90	SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
July 2010	PRS Database	NA

Summary of Listed Status

U-listed constituents were detected in soil samples; however, there was no documented evidence of a spill, release, or discharge of unused/unspent commercial chemical products in the vicinity of the SWMU. K-listed constituents were also detected in the soil samples from 50-009, BH 50-613182; however most K-listed sources are industrial in nature and not typical of Laboratory operations. The Laboratory generates only small amounts of K-listed wastes, primarily spent carbon from high explosives processing that is disposed off-site. The documented amounts of K-listed wastes generated are not sufficient to have impacted investigation/remediation activities. Therefore, the IDW is not K-listed. In addition, Arsenic (F032, F034, F035), Benzo(a)pyrene (F032, F034, F037, and F038), Chromium (F032, F034, F035, F037, and F038), Chrysene (F037 and F038), Lead (F035, F037, and F038), and Nickel (F006) were also detected in the soil samples from 50-009 site investigation activities. There is no documented evidence that the following processes (F-listed sources) occurred in the vicinity of the SWMU: Wood preserving processes (F032, F034, and F035), Petroleum refinery operations (F037 and F038) and Electroplating operations (F006). See Attachment 1 for the complete list of potentially listed constituents detected in the soil sample.

Based on analytical data and documentation, there is no conclusive evidence of a listed source impacting SWMU 50-009, MDA-C. Therefore, the IDW may be managed as non-hazardous waste.

DD Completed January 18, 2011

Attachment 1.

Analyte	Concentration	Potential U-Codes	Potential F-Codes	Potential K-Codes
Antimony	0.91			K161, K021, K177
Arsenic	0.34		F032,F034,F035,	K031,K060,K161, K171,K172,K176, K084,K101,K102,
Benzo(a)pyrene	0.0144	U022	F032,F034,F037,F038	K001, K035, K141, K142, K144, K145, K147, K148, K170
Benzo(b)fluoranthene	0.0214			K001,K035,K141, K142,K143,K144, K147,K148,K170,
Bis(2-ethylhexyl)phthalate	0.0797	U028		
Chromium	4.96		F032,F034,F035,F037 ,F038,	K090
Chrysene	0.019	U050	F037, F038	K001, K035
Lead	4.73		F035,F037,F038,	K002, K003, K005, K048, K049, K051, K062, K064, K086, K100, K176, K046, K052, K061, K069
Nickel	5.68		F006	
Thallium	0.0753			K178

SWMU ev 3233.2082.2092

SAL and background comparison

Stockpile Number ev 3233.2082.2092

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	1.9	pCi/g					pass	pass	pass	pass	pass
Lead-212	Pb-212	2.22	pCi/g					pass	pass	pass	pass	pass
Lead-214	Pb-214	2.21	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	34.7	pCi/g					pass	pass	pass	FAIL	pass
Radium 226/228	calc.	3.85	pCi/g									
Radium-226	Ra-226	1.9	pCi/g			pass	pass	pass	pass	pass	pass	pass
Radium-228	Ra-228	1.95	pCi/g			pass	pass	pass	pass	pass	pass	pass
Thallium-208	Tl-208	0.589	pCi/g					pass	pass	pass	pass	pass
Tritium	H-3	0.0565	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	1.93	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-235/236	U-235/236	0.109	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.14	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.0021	pCi/g									
Cerium-139	Ce-139	-0.0044	pCi/g									
Cesium-137	Cs-137	-0.061	pCi/g									
Cobalt-60	Co-60	-0.0162	pCi/g									
Europium-152	Eu-152	-0.0335	pCi/g									
Lanthanum-140	La-140	-0.093	pCi/g									
Mercury-203	Hg-203	0.0275	pCi/g									
Plutonium-238	Pu-238	-0.00101	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g									
Radium-223	Ra-223	-0.177	pCi/g									
Ruthenium-106	Ru-106	-0.369	pCi/g									
Sodium-22	Na-22	-0.0301	pCi/g									
Strontium-85	Sr-85	0.0193	pCi/g									
Strontium-90	Sr-90	0.0878	pCi/g									
Thorium-227	Th-227	0.148	pCi/g									
Thorium-231	Th-231	-0.177	pCi/g									
Thorium-234	Th-234	1.05	pCi/g									
Tin-113	Sn-113	0.0164	pCi/g									
Uranium-235	U-235	0.124	pCi/g									
Yttrium-88	Y-88	0.0152	pCi/g									

No comparisons or sum of fractions required

OK for land application

Sampling event ID 3233

SWMU ev 3233.2082.2092

Stockpile Number ev 3233.2082.2092

Detected Chemicals Form

associated Excel file:
ev3233.2082.2092.awd.1.13.2011(2).xlsm

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1900	mg/kg							
Barium	Ba	20.9	mg/kg	pass	pass					
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	F032,F034,F037,F038,	K001,K035,K141,K142,K144,K145,K147,K148,K170,	U022,		
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass		K001,K035,K141,K142,K143,K144,K147,K148,K170,			
Beryllium	Be	0.439	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass			U028,		
Calcium	Ca	791	mg/kg							
Chromium	Cr	2.81	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Chrysene	218-01-9	0.019	mg/kg	pass	pass	F037,F038,	K001,K035,	U050,		
Cobalt	Co	0.845	mg/kg							
Copper	Cu	3.73	mg/kg							
Iron	Fe	5000	mg/kg							
Lead	Pb	4.17	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	555	mg/kg							
Manganese	Mn	146	mg/kg							
Nickel	Ni	2.98	mg/kg	pass	pass	F006,				
Potassium	K	521	mg/kg							
Pyrene	129-00-0	0.0425	mg/kg	pass	pass					
Sodium	Na	413	mg/kg							
Thallium	Tl	0.0753	mg/kg				K178,			
Uranium	U	0.18	mg/kg							
Vanadium	V	3.48	mg/kg	pass	pass					
Zinc	Zn	14.6	mg/kg	pass	pass					

Sampling event ID 3233

SWMU ev 3233.2082.2092

Stockpile Number ev 3233.2082.2092

Solid Waste Evaluation

Summary Excel file: ev3233.2082.2092.awd.1.13.2011(2).xlsm

evaluation date: 1/13/2011

RCRA

33 analytes pass
between these 32 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analyz

5 analytes with potential F-code
6 analytes with potential K-code
3 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 12 pass 0 FAIL
Hazardous soil LDR: 12 pass 0 FAIL

Residential Soil (mg/kg) :	19 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	19 pass	0 FAIL
Construction Worker Soil (mg/kg) :	17 pass	0 FAIL
Recreational Soil (mg/kg) :	19 pass	0 FAIL
soil background:	18 pass	0 FAIL
Canyon Sediment background:	18 pass	0 FAIL
Qbt 2,3,4 background:	18 pass	0 FAIL
Qbt 1v background:	15 pass	3 FAIL
Qbt 1g, Qct,Qbo background:	15 pass	3 FAIL

RAD

total dose: 0.6550 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes, 11 were detected
20 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	10 pass	0 FAIL
Canyon Sedi-ment:	10 pass	0 FAIL
QBT2,3,4:	8 pass	2 FAIL
QBt 1v:	9 pass	1 FAIL
Qbt 1g, Qct, Qbo:	10 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2082	WST50-11-2092	

Imported data files
ev3233.1.12.2011.txt

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1900	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	20.9	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Beryllium	Be	0.439	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	791	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	2.81	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Chrysene	218-01-9	0.019	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Cobalt	Co	0.845	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.73	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	5000	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.17	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	555	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	146	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni	2.98	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	K	521	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Sodium	Na	413	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	Tl	0.0753	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U	0.18	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	3.48	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	14.6	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

Borehole
50-6/3182

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

Solid Waste Evaluation

Summary ed Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

between these
33 analytes pass
31 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analy

6 analytes with potential F-code
8 analytes with potential K-code
3 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 15 pass 0 FAIL
Hazardous soil LDR: 15 pass 0 FAIL

Residential Soil (mg/kg) :	23 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	23 pass	0 FAIL
Construction Worker Soil (mg/kg) :	20 pass	1 FAIL
Recreational Soil (mg/kg) :	23 pass	0 FAIL
soil background:	18 pass	2 FAIL
Canyon Sediment background:	19 pass	1 FAIL
Qbt 2,3,4 background:	17 pass	3 FAIL
Qbt 1v background:	13 pass	7 FAIL
Qbt 1g, Qct,Qbo background:	9 pass	11 FAIL

RAD

total dose: 0.8205 mRem/year

?

analysed for H-3
analysed for Pu-239
32 isotopes,
12 were detected
19 undetected

Residen-tial SAL:	4 pass	0 FAIL
Indust-rial SAL:	4 pass	0 FAIL
Constr. Worker SAL:	6 pass	0 FAIL
Recrea-tional SAL:	6 pass	0 FAIL
Soil:	8 pass	3 FAIL
Canyon Sedi-ment:	8 pass	3 FAIL
QBT2,3,4:	5 pass	6 FAIL
QBt 1v:	10 pass	1 FAIL
Qbt 1g, Qct, Qbo:	11 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2081	WST50-11-2091	
WST50-11-2082	WST50-11-2092	
WST50-11-2083	WST50-11-2093	

Imported data files
ev3233 110118.txt

Sampling event ID 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

SWMU ev 3233

Stockpile Number ev 3233

evaluation date: 1/18/2011

RCRA Characteristics Form

Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen-tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ba	D005	100000	853	ug/L	NQ	pass	
Cadmium	Cd		1000	10	ug/L	U	pass	
Chromium	Cr		5000	22.2	ug/L	U	pass	
Lead	Pb	D008	5000	25.2	ug/L	NQ	pass	
Mercury	Hg		200	2	ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000	10	ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L		FAIL	
BHC[gamma-]	58-89-9	D013	400		ug/L		FAIL	
Methoxychlor[4,4'-]	72-43-5	D014	10000		ug/L		FAIL	
Toxaphene (Technical Grade)	8001-35-2	D015	500		ug/L		FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L		FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.0505	ug/L	U	pass	
Carbon Tetrachloride	56-23-5		500	0.0505	ug/L	U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020			ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.0505	ug/L	U	pass	
Chloroform	67-66-3		6000	0.0505	ug/L	U	pass	
Methylphenol[2-]	95-48-7		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-]	108-39-4		200000	16.75	ug/L	UJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75	ug/L	UJ	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75	ug/L	UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5	ug/L	UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75	ug/L	UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505	ug/L	U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75	ug/L	UJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75	ug/L	UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75	ug/L	UJ	pass	
Hexachloroethane	67-72-1		3000	16.75	ug/L	UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525	ug/L	UJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75	ug/L	UJ	pass	
Pyridine	110-86-1		5000	16.75	ug/L	UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.0505	ug/L	U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75	ug/L	UJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75	ug/L	UJ	pass	
Vinyl Chloride	75-01-4		200	0.0505	ug/L	U	pass	

NOTE 1: If multiple results exist for given analyte, first, the highest detected result is chosen. If there are no detected results, the lowest undetected result is chosen.

NOTE 2: Often chlordane is analyzed as alpha and gamma isomers. If no total chlordane result exist, total concentration will be calculated from individual isomer results.

NOTE 3: Most frequently 2-Methylphenol is analyzed separately and 3- and 4-methylphenols are reported together.
Often, raw data contain only two results - for 2- methylphenol and 4-methylphenol. In such case 4-methyl is in fact a result for two isomers together: 3-methyl + 4-methylphenol. The macro evaluates present data and calculates concentrations for 3-, 4-, and total. methylphenols. Results reported separatedly for 3- and 4- methylphenols with calc. remark are, in fact, partial total, 3- + 4-methylphenol together.

NOTE 4: Undetected results pass automatically, without comparing to standard. Detected results pass only if reported concentration is lower than legal standard.

NOTE 5: CAS number is highlighted in pink if there is a large discrepancy between sample and duplicate.

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	4030	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Antimony	Sb	0.91	mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
Arsenic	As	0.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	70.5	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Beryllium	Be	0.524	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	791	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.96	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Chrysene	218-01-9	0.019	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Cobalt	Co	2.28	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Copper	Cu	6.2	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Iron	Fe	7150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.73	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	555	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	317	mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Nickel	Ni	5.68	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Nitrate	NO3	0.967	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Potassium	K	819	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Sodium	Na	540	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	Tl	0.0753	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U	0.829	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V	11.2	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	51.7	mg/kg	pass	pass	pass	pass	FAIL	pass	pass	pass	FAIL

Sampling event ID 3233

SWMU ev 3233

Stockpile Number ev 3233

Detected Chemicals Form

associated Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	4030	mg/kg							
Antimony	Sb	0.91	mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As	0.34	mg/kg	pass	pass	[redacted]	K031,K060,K161,K171,K172,K176,K084,K101,K102,			
Barium	Ba	70.5	mg/kg	pass	pass					
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	[redacted]	K001,K035,K141,K142,K144,K145,K147,K148,K170,	U022,		
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass		K001,K035,K141,K142,K143,K144,K147,K148,K170,			
Beryllium	Be	0.524	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass			U028,		
Calcium	Ca	791	mg/kg							
Chromium	Cr	4.96	mg/kg	pass	pass	[redacted]	K090,			
Chrysene	218-01-9	0.019	mg/kg	pass	pass	[redacted]	K001,K035,	U050,		
Cobalt	Co	2.28	mg/kg							
Copper	Cu	6.2	mg/kg							
Iron	Fe	7150	mg/kg							
Lead	Pb	4.73	mg/kg	pass	pass	[redacted]	K002,K003,K005,K048,K049,K051,K062,K064,K086,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	555	mg/kg							
Manganese	Mn	317	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass	[redacted]				F003,U161 codes not applicable
Nickel	Ni	5.68	mg/kg	pass	pass	[redacted]				
Nitrate	NO3	0.967	mg/kg							
Potassium	K	819	mg/kg							
Pyrene	129-00-0	0.0425	mg/kg	pass	pass					
Sodium	Na	540	mg/kg							
Thallium	Tl	0.0753	mg/kg				K178,			
Uranium	U	0.829	mg/kg							
Vanadium	V	11.2	mg/kg	pass	pass					
Zinc	Zn	51.7	mg/kg	pass	pass					

Additional Constituents - Chemicals

Sampling event ID 3233
SWMU ev 3233
Stockpile Number ev 3233

associated Excel file: AWD 3233 110118 ws_050empty.xlsm
evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concentration	Unit	Results (ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	Al	4030000	ug/kg	4030.000	1080.000	4030.000	0.108	0.403	
Antimony	Sb	910	ug/kg	0.910	0	0.910	0	9.1E-05	
Benzo(a)pyrene	50-32-8	14.4	ug/kg	0.014	0	0.014	0	1.4E-06	
Benzo(b)fluoranthene	205-99-2	21.4	ug/kg	0.021	0	0.021	0	2.1E-06	
Beryllium	Be	524	ug/kg	0.524	0.346	0.524	3.5E-05	5.2E-05	
Bis(2-ethylhexyl)phthalate	117-81-7	79.7	ug/kg	0.080	0	0.080	0	8.0E-06	
Calcium	Ca	791000	ug/kg	791.000	359.000	791.000	0.036	0.079	
Chrysene	218-01-9	19	ug/kg	0.019	0	0.019	0	1.9E-06	
Cobalt	Co	2280	ug/kg	2.280	0.845	2.280	8.5E-05	2.3E-04	
Copper	Cu	6200	ug/kg	6.200	3.730	6.200	3.7E-04	6.2E-04	
Iron	Fe	7150000	ug/kg	7150.000	5000.000	7150.000	0.500	0.715	
Magnesium	Mg	555000	ug/kg	555.000	174.000	555.000	0.017	0.056	
Manganese	Mn	317000	ug/kg	317.000	137.000	317.000	0.014	0.032	
Methyl-2-pentanone[4-]	108-10-1	14.2	ug/kg	0.014	3.8E-03	0.014	3.8E-07	1.4E-06	
Nickel	Ni	5680	ug/kg	5.680	2.980	5.680	3.0E-04	5.7E-04	
Nitrate	NO3	0.967	mg/kg	0.967	0.934	0.967	9.3E-05	9.7E-05	
Potassium	K	819000	ug/kg	819.000	332.000	819.000	0.033	0.082	
Pyrene	129-00-0	42.5	ug/kg	0.043	0	0.043	0	4.3E-06	
Sodium	Na	540000	ug/kg	540.000	270.000	540.000	0.027	0.054	
Thallium	Tl	75.3	ug/kg	0.075	0.069	0.075	6.9E-06	7.5E-06	
Uranium	U	829	ug/kg	0.829	0.180	0.829	1.8E-05	8.3E-05	
Vanadium	V	11200	ug/kg	11.200	3.480	11.200	3.5E-04	1.1E-03	
Zinc	Zn	51700	ug/kg	51.700	14.600	51.700	1.5E-03	5.2E-03	
						TOTAL	**0.738**	**1.428**	% (all analytes from all pages were added for this total

NOTE 1: This table contains all detected, non D-coded analytes
NOTE 2: Highlighted analytes are potentially F-coded

SWMU ev 3233

SAL and background comparison

Stockpile Number ev 3233

Stockpile Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.46	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.46	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.39	pCi/g					pass	pass	FAIL	pass	pass
Potassium-40	K-40	34.7	pCi/g					pass	pass	pass	FAIL	pass
Radium 226/228	calc.	4.88	pCi/g									
Radium-226	Ra-226	2.46	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.42	pCi/g			pass	pass	FAIL	FAIL	pass	pass	pass
Thallium-208	Tl-208	0.664	pCi/g					pass	pass	pass	pass	pass
Thorium-234	Th-234	2.51	pCi/g					FAIL	FAIL	FAIL	pass	pass
Tritium	H-3	0.0565	pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium-234	U-234	2.21	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.109	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.17	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	-0.00522	pCi/g									
Cerium-139	Ce-139	-0.0224	pCi/g									
Cesium-137	Cs-137	-0.061	pCi/g									
Cobalt-60	Co-60	-0.0162	pCi/g									
Europium-152	Eu-152	-0.1	pCi/g									
Lanthanum-140	La-140	-0.093	pCi/g									
Mercury-203	Hg-203	0.00024	pCi/g									
Plutonium-238	Pu-238	-0.0024	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g									
Radium-223	Ra-223	-0.502	pCi/g									
Ruthenium-106	Ru-106	-0.369	pCi/g									
Sodium-22	Na-22	-0.0724	pCi/g									
Strontium-85	Sr-85	0.00652	pCi/g									
Strontium-90	Sr-90	-0.0775	pCi/g									
Thorium-227	Th-227	-0.0104	pCi/g									
Thorium-231	Th-231	-0.502	pCi/g									
Tin-113	Sn-113	-0.0249	pCi/g									
Uranium-235	U-235	0.0509	pCi/g									
Yttrium-88	Y-88	-0.0202	pCi/g									

SWMU ev 3233

Stockpile Number ev 3233

Radioisotopes Form

Soda data Excel file: AWD 3233 110118 ws_050empty.xlsm

evaluation date: 1/18/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Qualifier	comments
Bismuth-214	Bi-214	2.46	pCi/g	NQ	
Lead-212	Pb-212	2.46	pCi/g	NQ	
Lead-214	Pb-214	2.39	pCi/g	NQ	
Potassium-40	K-40	34.7	pCi/g	NQ	
Radium 226/228	calc.	4.88	pCi/g		
Radium-226	Ra-226	2.46	pCi/g	NQ	
Radium-228	Ra-228	2.42	pCi/g	NQ	
Thallium-208	Tl-208	0.664	pCi/g	NQ	
Thorium-234	Th-234	2.51	pCi/g	NQ	
Tritium	H-3	0.0564979	pCi/g	NQ	
Uranium-234	U-234	2.21	pCi/g	NQ	
Uranium-235/236	U-235/236	0.109	pCi/g	NQ	
Uranium-238	U-238	2.17	pCi/g	NQ	
Americium-241	Am-241	-0.00522	pCi/g	U	
Cerium-139	Ce-139	-0.0224	pCi/g	U	
Cesium-137	Cs-137	-0.061	pCi/g	U	
Cobalt-60	Co-60	-0.0162	pCi/g	U	
Europium-152	Eu-152	-0.1	pCi/g	U	
Lanthanum-140	La-140	-0.093	pCi/g	U	
Mercury-203	Hg-203	0.000237	pCi/g	U	
Plutonium-238	Pu-238	-0.0024	pCi/g	U	
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g	U	
Radium-223	Ra-223	-0.502	pCi/g	U	
Ruthenium-106	Ru-106	-0.369	pCi/g	U	
Sodium-22	Na-22	-0.0724	pCi/g	U	
Strontium-85	Sr-85	0.00652	pCi/g	U	
Strontium-90	Sr-90	-0.0775	pCi/g	U	
Thorium-227	Th-227	-0.0104	pCi/g	U	
Thorium-231	Th-231	-0.502	pCi/g	U	
Tin-113	Sn-113	-0.0249	pCi/g	U	
Uranium-235	U-235	0.0509	pCi/g	U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

Additional Constituents - RAD

Sampling event ID 3233 **volume of waste: 200 kg** associated Excel file: AWD 3233 110118 ws_050empty.xlsm

SWMU ev 3233 evaluation date: 1/18/2011

Stockpile Number ev 3233

Analyte	CAS/ Symbol	Max Result	Min Result	Unit	% of total rad from Max values	% of total rad from Min values	Max Total Ci from isotope	Min Total Ci from isotope	comments
Bismuth-214	Bi-214	2.460	1.650	pCi/g	4.50	4.09	4.9E-07	3.3E-07	
Lead-212	Pb-212	2.460	2.220	pCi/g	4.50	5.50	4.9E-07	4.4E-07	
Lead-214	Pb-214	2.390	2.010	pCi/g	4.38	4.98	4.8E-07	4.0E-07	
Potassium-40	K-40	34.700	28.000	pCi/g	63.55	69.36	6.9E-06	5.6E-06	
Radium-226	Ra-226	2.460	1.650	pCi/g	4.50	4.09	4.9E-07	3.3E-07	
Radium-228	Ra-228	2.420	1.950	pCi/g	4.43	4.83	4.8E-07	3.9E-07	
Thallium-208	Tl-208	0.664	0.589	pCi/g	1.22	1.46	1.3E-07	1.2E-07	
Thorium-234	Th-234	2.510	0	pCi/g	4.60	0	5.0E-07	0	
Tritium	H-3	0.054	0.044	pCi/g	0.10	0.11	1.1E-08	8.8E-09	
Uranium-234	U-234	2.210	1.060	pCi/g	4.05	2.63	4.4E-07	2.1E-07	
Uranium-235/236	U-235/236	0.109	0.056	pCi/g	0.20	0.14	2.2E-08	1.1E-08	
Uranium-238	U-238	2.170	1.140	pCi/g	3.97	2.82	4.3E-07	2.3E-07	
	TOTAL	**54.61**	**40.37**		100.0	100.0	**1.1E-05**	**8.1E-06**	all detected isotopes from all pages were added for this total

NOTE 1: This table contains all detected radioisotopes

NOTE 2: If only one detected result exist, 0 is listed as minimum, if more than one detect exist, lowest detect is listed as minimum.

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Request for Land Application of Drill Cuttings Form

ENV-RCRA must approve any deviation(s) from this request prior to land application.

Date: 1/24/11 Project: MDA C Phase II

Location of Land Application: _____ TA: 50 (Sumu 50-009)

Estimated Quantity: 36 ft3 (cubic feet or tons)

Composition (e.g., 98% tuff and 2% quick gel, etc.): 100% Soil

Proposed Method of Land Application (describe): Cuttings will be land applied within the project footprint, to previously disturbed areas, and covered with a layer of road base.

Note: An EX-ID Permit is required prior to land application. 10X-0815-50

Decision Tree—Decision Point Evaluation

The following questions require yes or no answers.	Yes	No
1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	☑	☐
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	☐	☑
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	☐	☐
Has a *No Longer Contained In* been approved for this waste? Attach a copy of the *No Longer Contained In* approval.	☐	☐
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	☑	☐
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	☑	☐

Generator or Project Leader Certification: I certify that the drill cuttings described in this request meet the criteria for land application per the Decision Tree and that the drill cuttings will be land applied as described.

Stephani Fuller	Stephani Fuller	Project Mgr.	2/24/11
Name (Print)	**Signature**	**Title**	**Date**

ENV-RCRA Review (below):

Does request provide all the required information, and do the drill cuttings meet all the criteria for land application?
Yes X **No** _____ **Note deficiency in the space provided:**

Metals are below background; Due Diligence for U028 indicates the code is not applicable

ENV-RCRA Reviewer Name (Print) Jennifer Griffin **Signature** _____ **Date** 2/28/11

Package Expiration Date: 5/28/11

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Post Land Application Field Certification Sheet

Date(s) of land application: 3/2/11 Project: MDA C Phase II

Location of land application: Within project footprint TA: 50 (SWMU 50-009)

EX-ID Number: 10X-0815-50 EX-ID Expiration Date: 4/12/2011

Please explain any deviations from original application (Attachment 2) in the space provided: _____

Note: ENV-RCRA must approve any deviations from Attachment 2 prior to land application.

Generator or Project Leader Certification (below):

I certify that

- land application complied with the requirements of this procedure (ENV-RCRA-SOP-011.1),
- no free liquids were applied during land application,
- an inspection was conducted to ensure the requirements in Attachment 2 of this procedure was met, and
- the land application of drill cuttings complied with the excavation permit.

Roy Bohn		PM/STR	3/3/11
Name (Print)	**Signature**	**Title**	**Date**

Sampling event ID 3233

SWMU ev 3233.2089.2097

Stockpile Number ev 3233.2089.2097

Solid Waste Evaluation

Summary Excel file: ev3233.2089.2097.awd.2.23.2011(1).xlsm

evaluation date: 2/23/2011

RCRA

33 analytes pass
between these 31 analytes pass as undetected
10 analytes fail

Detects

Total PCB (ppm) Not analyz

3 analytes with potential F-code
3 analytes with potential K-code
1 analytes with potential U-code
0 analytes with potential P-code

Non-wastewater LDR: 10 pass 0 FAIL
Hazardous soil LDR: 10 pass 0 FAIL

Residential Soil (mg/kg) :	16 pass	0 FAIL
Industrial/ Occupational Soil (mg/kg) :	16 pass	0 FAIL
Construction Worker Soil (mg/kg) :	14 pass	0 FAIL
Recreational Soil (mg/kg) :	16 pass	0 FAIL
soil background:	19 pass	0 FAIL
Canyon Sediment background:	19 pass	0 FAIL
Qbt 2,3,4 background:	19 pass	0 FAIL
Qbt 1v background:	15 pass	4 FAIL
Qbt 1g, Qct,Qbo background:	14 pass	5 FAIL

RAD

total dose: 0.7200 mRem/year

[redacted]

analysed for H-3
analysed for Pu-239
32 isotopes,

10 were detected
21 undetected

Residen-tial SAL:	3 pass	0 FAIL
Indust-rial SAL:	3 pass	0 FAIL
Constr. Worker SAL:	5 pass	0 FAIL
Recrea-tional SAL:	5 pass	0 FAIL
Soil:	6 pass	3 FAIL
Canyon Sedi-ment:	6 pass	3 FAIL
QBT2,3,4:	4 pass	5 FAIL
QBt 1v:	9 pass	0 FAIL
Qbt 1g, Qct, Qbo:	9 pass	0 FAIL

Remark: The Evaluator may overwrite any result of automatic evaluation, but a short written explanation must be added

Sample ID	associated blanks	associated duplicate
WST50-11-2089	WST50-11-2097	

Imported data files
ev3233.2.23.2011.txt

Sampling event ID 3233

SWMU ev 3233.2089.2097

Stockpile Number ev 3233.2089.2097

Detected Chemicals Form

associated Excel file:
ev3233.2089.2097.awd.2.23.2011(1).xlsm

evaluation date: 2/23/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Non-wastewater LDR	Hazardous Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1680	mg/kg							
Antimony	Sb	0.399	mg/kg	pass	pass		K161,K021,K177,			
Barium	Ba	16.1	mg/kg	pass	pass					
Beryllium	Be	0.158	mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0869	mg/kg	pass	pass			U028,		
Calcium	Ca	1350	mg/kg							
Chromium	Cr	4.69	mg/kg	pass	pass	[redacted]	K090,			
Cobalt	Co	1.06	mg/kg							
Copper	Cu	3.97	mg/kg							
Iron	Fe	4230	mg/kg							
Lead	Pb	4.42	mg/kg	pass	pass	[redacted]	K002,K003,K005,K048,K049,K051,K052,K064,K066,K100,K176,K046,K052,K061,K069,			
Magnesium	Mg	637	mg/kg							
Manganese	Mn	85.9	mg/kg							
Nickel	Ni	3.47	mg/kg	pass	pass	[redacted]				
Potassium	K	345	mg/kg							
Silver	Ag	0.144	mg/kg	pass	pass					
Sodium	Na	416	mg/kg							
Uranium	U	0.16	mg/kg							
Vanadium	V	7.02	mg/kg	pass	pass					
Zinc	Zn	9.75	mg/kg	pass	pass					

Detected Chemicals: SSL and Background check

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residential Soil (mg/kg)	Industrial/ Occupational Soil (mg/kg)	Construction Worker Soil (mg/kg)	Recreational Soil (mg/kg)	soil background	Canyon Sediment background	Qbt 2,3,4 background	Qbt 1v background	Qbt 1g, Qct,Qbo background
Aluminum	Al	1680	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Antimony	Sb	0.399	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba	16.1	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Be	0.158	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0869	mg/kg	pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Ca	1350	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr	4.69	mg/kg	pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co	1.06	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu	3.97	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Iron	Fe	4230	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb	4.42	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg	637	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn	85.9	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni	3.47	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	K	345	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Silver	Ag	0.144	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Sodium	Na	416	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Uranium	U	0.16	mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V	7.02	mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	9.75	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

SWMU ev 3233.2089.2097 **SAL and background comparison** [illegible]ev3233.2089.2097.awd.2.23.2011(1).xlsm

Stockpile Number ev 3233.2089.2097 evaluation date: 2/23/2011

Analyte	CAS/ Symbol	concen-tration	unit of measure	Residen-tial SAL	Indust-rial SAL	Constr. Worker SAL	Recrea-tional SAL	Soil	Canyon Sedi-ment	QBT2, 3,4	QBt 1v	Qbt 1g, Qct, Qbo
Bismuth-214	Bi-214	2.09	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212	2.33	pCi/g					FAIL	FAIL	pass	pass	pass
Lead-214	Pb-214	2.71	pCi/g					FAIL	FAIL	FAIL	pass	pass
Potassium-40	K-40	28	pCi/g					pass	pass	pass	pass	pass
Radium 226/228	calc.	4.23	pCi/g									
Radium-226	Ra-226	2.09	pCi/g			pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228	2.14	pCi/g			pass	pass	pass	pass	pass	pass	pass
Thallium-208	Tl-208	0.697	pCi/g					pass	pass	pass	pass	pass
Uranium-234	U-234	2.23	pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Uranium-235/236	U-235/236	0.131	pCi/g	pass	pass	pass	pass					
Uranium-238	U-238	2.32	pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
Americium-241	Am-241	0.00128	pCi/g									
Cerium-139	Ce-139	0.00183	pCi/g									
Cesium-137	Cs-137	-0.051	pCi/g									
Cobalt-60	Co-60	0.0268	pCi/g									
Europium-152	Eu-152	0.0137	pCi/g									
Lanthanum-140	La-140	-0.092	pCi/g									
Mercury-203	Hg-203	0.0298	pCi/g									
Plutonium-238	Pu-238	-0.00479	pCi/g									
Plutonium-239/240	Pu-239/240	-0.00958	pCi/g									
Radium-223	Ra-223	-0.00246	pCi/g									
Ruthenium-106	Ru-106	-0.00485	pCi/g									
Sodium-22	Na-22	-0.00266	pCi/g									
Strontium-85	Sr-85	0.0744	pCi/g									
Strontium-90	Sr-90	0.00257	pCi/g									
Thorium-227	Th-227	0.179	pCi/g									
Thorium-231	Th-231	-0.00246	pCi/g									
Thorium-234	Th-234	1.77	pCi/g									
Tin-113	Sn-113	0.0282	pCi/g									
Tritium	H-3	0.00777	pCi/g									
Uranium-235	U-235	-0.00967	pCi/g									
Yttrium-88	Y-88	-0.00098	pCi/g									

NA
NA

U^{238} 2.32 − 2.29 = 0.03 < 140

OK for land app.

Due Diligence for Waste Drill Cuttings from Boreholes 50-24817, 50-24820, 50-24821, 50-603061, 50-603062, 50-603063, and 50-603064
July 2008

Table 1 shows the detected concentrations of potentially listed organic chemicals in drill cuttings from six boreholes at MDA C, SWMU 50-009. The nine detected compounds—acetone, bis(2-ethyhexyl)phthalate, 2-butanone, di-n-butylphthalate, Endrin, fluoranthene, heptachlor (and some of its isomers), 4-methyl-2-pentanone, and methylene chloride—could cause the drill cuttings to be listed hazardous waste if they originated from listed sources. Additional detected organic chemicals that are not listed waste, and are not included in Table 1, include Aroclor-1242, Aroclor-1260, benzoic acid, TPH-DRO, and TPH-DRO. All were detected at very low or trace concentrations.

- Acetone is a listed waste (F003 or U002) if the source was an unused/unspent material that was disposed of or if present in concentrations such that it is ignitable. The single detected concentration of acetone is 0.0033 mg/kg, far below ignitable concentrations. Therefore, the waste is not listed for acetone.
- Bis(2-ethylhexyl)phthalate is a listed waste (U028) if the source was an unused/unspent material that was disposed of or spilled.
- 2-Butanone is a listed waste (P045, U159, U160) if it was an unused/unspent product that was disposed of or spilled.
- Di-n-butyl phthalate is a listed waste (U069) if the source was an unused/unspent product that was disposed of or spilled.
- Endrin is a listed waste (D012) if its concentration exceeds the regulatory limit for TCLP analysis. The single detected concentration (0.000219 mg/L) does not exceed the regulatory limit of 0.02 ppm, and therefore this waste is not D-listed for Endrin. Endrin is P-listed (P051) if disposed of or spilled as an unused/unspent product.
- Fluoranthene is a listed waste if present as bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol (K001) or wastewater treatment sludges generated in the production of creosote (K035). There are no records of these operations occurring at LANL; therefore this waste is not considered K-listed for fluoranthene. Fluoranthene is also listed (U120) if it was an unused/unspent product that was disposed of or spilled.
- Heptachlors are listed wastes (D031) if its concentration exceeds the regulatory limit for TCLP analysis. The single detected concentration of 0.000101 mg/L does not exceed the regulatory limit of 0.008 ppm; therefore this waste is not D-listed for heptachlor. Heptachlors are P-listed waste (P059) if disposed of or spilled as an unused/unspent product.
- 4-Methyl-2-pentanone is a listed waste (U161) if it was an unused product that was disposed of or spilled and is present in concentrations such that it is ignitable. The maximum detected concentration of 4-methyl-2-pentanone was 0.00194 mg/kg, which is below the ignitable concentration. Therefore, this waste is not listed for 4-methyl-2-pentanone.

- Methylene chloride is a listed waste if its source was spent solvents (F001 and/or F002) or if its source was unused/unspent material that was disposed or spilled (U080).

If the detected organic compounds do not meet the specific criteria listed but the waste exhibits hazardous characteristics (toxicity, ignitability, corrosivity, or reactivity), the waste should be considered hazardous waste.

This due diligence is based on the guidance provided by the Environmental Protection Agency's (EPA's) Management of Remediation Waste under RCRA (EPA 530-F-98-026), Determination of When Contamination is caused by Listed Hazardous Waste, which states:

> Where a facility owner/operator makes a good faith effort to determine if a material is a listed hazardous waste but cannot make such a determination because documentation regarding a source of contamination, contaminant, or waste is unavailable or inconclusive, EPA has stated that one may assume the source, contaminant or waste is not listed hazardous waste and, therefore, provided the material in question does not exhibit a characteristic of hazardous waste, RCRA requirements do not apply.

Following is a summary of the good faith effort LANL undertook to determine whether the detected organic compounds were from listed sources.

Figure 1 shows the approximate locations of boreholes 50-603061, 50-603063, and 50-603064 and surrounding SWMUs/AOCs. The SWMUs/AOCs in the vicinity are 50-001(b), 50-002(a), 50-003(b), 50-003(c), Consolidated Unit 50-004(a)-00, 50-006(a), 50-006(d), 50-011(a), and 50-009 (MDA C). SWMUs 50-003(b) and 50-003(c) have been approved for No Further Action, and are therefore not considered sources of contamination.

Figure 2 shows the approximate locations of boreholes 50-24820, 50-24821, and 50-603062 and surrounding SWMUs/AOCs. The SWMUs/AOCs in the vicinity of the three boreholes are 63-001(a), 63-001(b), 52-002(e), and 50-009 (MDA C). SWMU 52-002(e) is not discussed because it was a duplicate of SWMU 63-001(a).

Evaluations of whether each SWMU/AOC is a source of listed contaminants that may have contaminated the drill cuttings from the six boreholes addressed in this assessment are attached (Attachment 1). The only nearby PRS with solvent and other chemical disposal is MDA C (SWMU 05-009). MDA C has been extensively studied but, as documented in Attachment 1, there is no evidence that transport of contaminants from MDA C impacted boreholes the boreholes addressed in this assessment. The area north of MDA C (vicinity of boreholes 50-603061, 50-603063, and 50-603064) is also crossed by lines that carry waste to the Radioactive Waste Liquid Treatment Facility (RLWTF) and treated water to outfalls. The RLWTF does not currently accept listed waste and there is no documentation that it accepted liquid wastes in the past. Based on the reviews of existing documentation identified for each PRS in Attachment 1, there is no evidence that boreholes 50-24820, 50-24821, 50-603061, 50-603062, 50-603063, and 50-603064 were contaminated with listed wastes.

The detected concentrations of the contaminants are extremely low, and the drill cuttings are not classified as characteristic waste because of the detected organic compounds nor any other constituents. Because the waste is not characteristic and is not listed, it need not be managed as hazardous waste.

Table 1. Organic Compound Detections in MDA C Waste Samples

Location ID	Sample ID	Waste Bin No.	SWMU(s) evaluated	Acetone	Bis(2-ethylhexyl)phthalate	2-Butanone	Di-n-butylphthalate	Fluoranthene	Heptachlor	4-Methyl-2-pentanone	Methylene chloride
50-24817	MD50-08-11823	5797	50-001(b), 50-004(a)-00, 50-002(a), 50-009	—	—	—	—	—	—	—	0.00286
50-24817 50-24820	MD50-08-11824	5624	50-001(b), 50-004(a)-00, 50-002(a), 50-009	—	—	0.00288	—	—	—	0.00194	0.00328
50-24820 50-24821	MD50-08-11801	5829	50-009	0.0033	—	—	—	—	—	—	—
50-24820 50-24821	MD50-08-11802	5829	50-009	—	0.079	—	—	—	—	—	—
50-24820 50-24821	MD50-08-11814	5836	50-009	—	0.468	—	—	—	—	—	—
50-24820 50-24821	MD50-08-11816	5836	50-009	—	—	—	—	—	0.000101	—	—
50-24820 50-24821	MD50-08-11817	5836	50-009	—	—	—	—	0.0188	—	—	—
50-603061	MD50-08-11821	5787	50-001(b), 50-002(a), 50-006(d), 50-009, 50-011(a)	—	0.122	—	—	—	—	—	0.00227
50-603063	MD50-08-11822	5799	50-001(b), 50-002(a), 50-004(a)-00, 50-006(d), 50-009, 50-011(a)	—	—	—	—	0.0148	—	—	0.00331
50-603062 50-603064	MD50-08-11811	5835	50-001(b), 50-002(a), 50-006(a), 50-009, 63-001(a), 63-001(b)	—	—	—	0.0342	—	—	—	—

All concentrations in mg/kg.
— Indicates analyte was not detected.

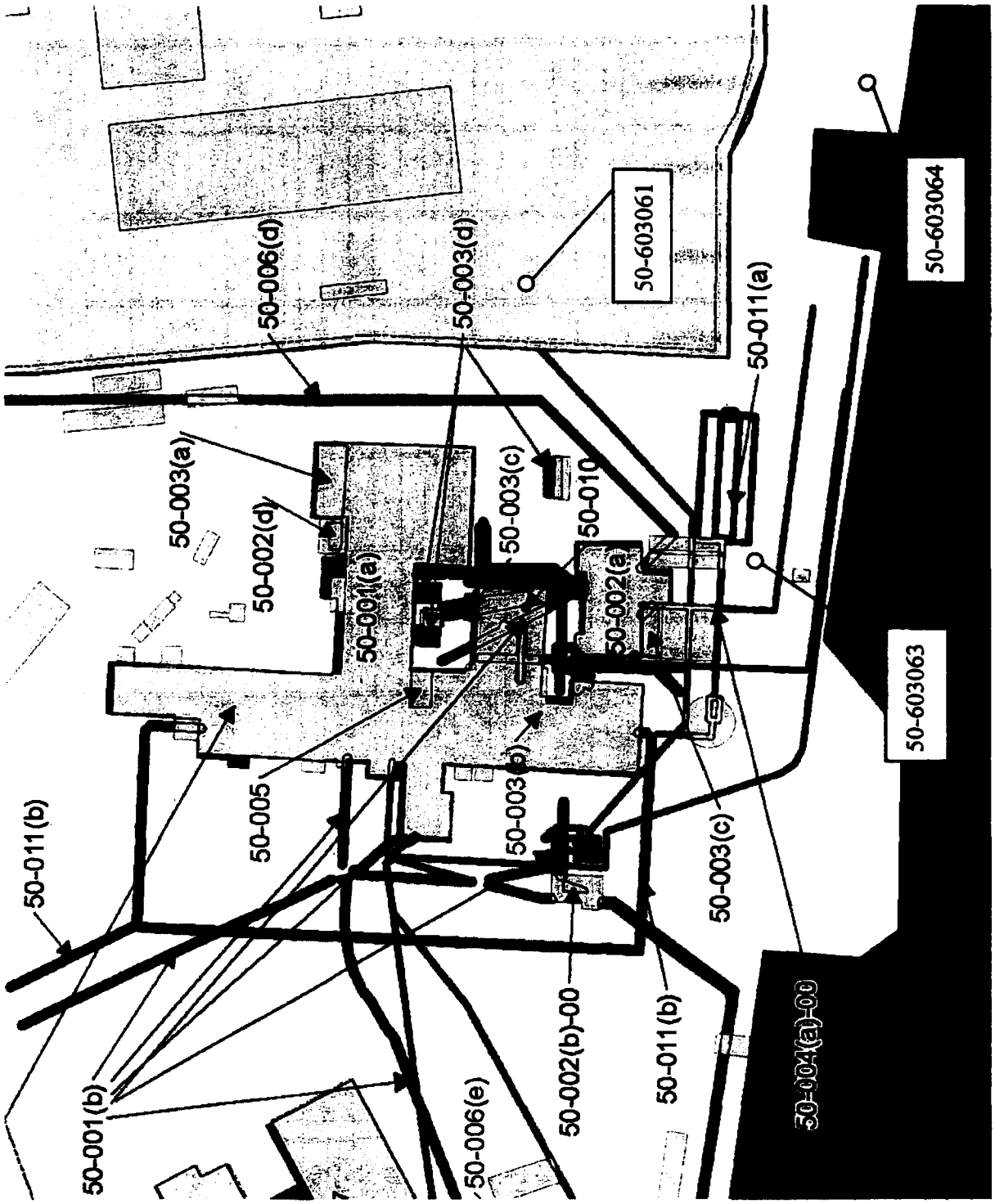

Figure 1. Approximate locations of boreholes 50-603061, 50-603063, and 50-603064 and surrounding SWMUs/AOCs

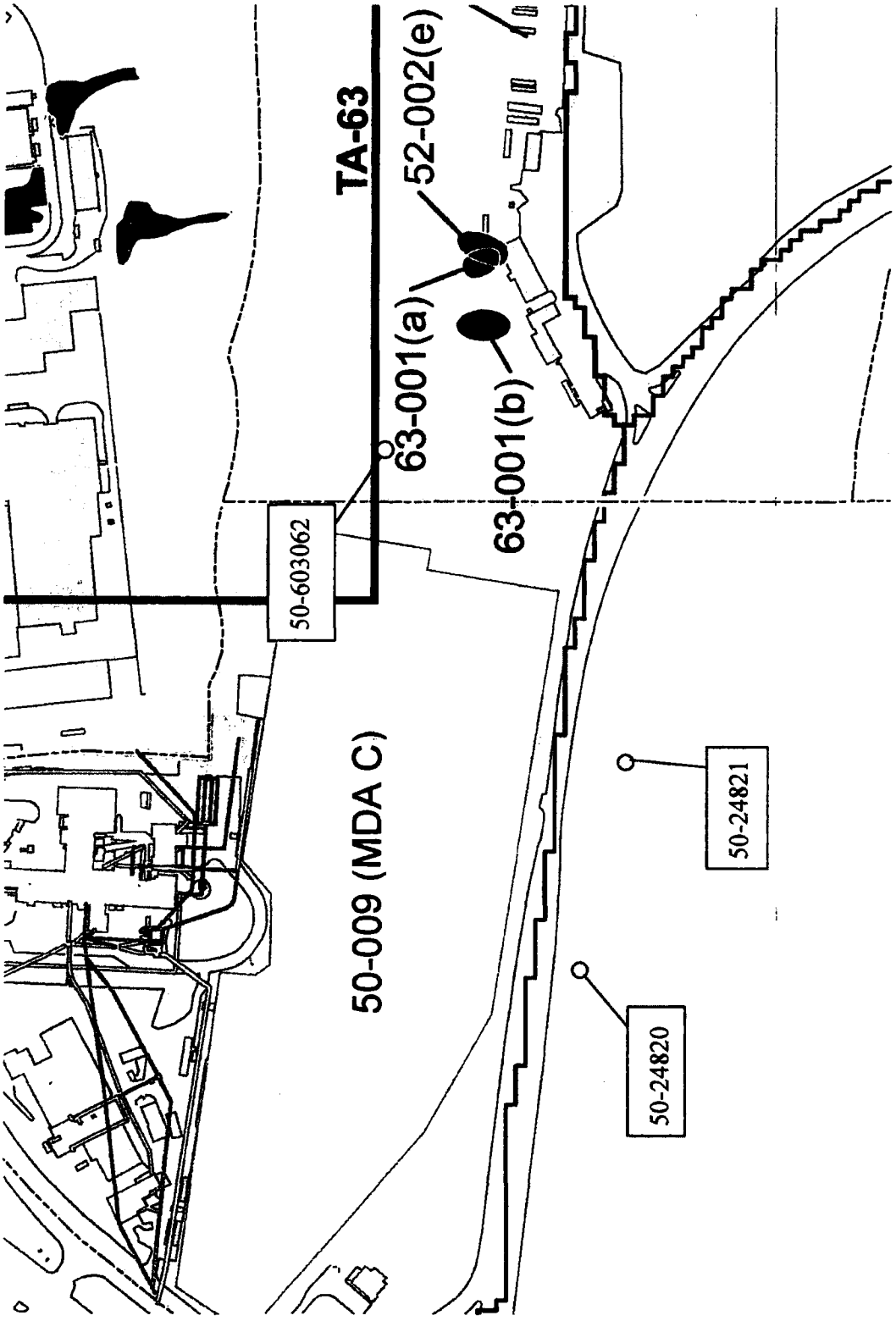

Figure 2. Approximate locations of boreholes 50-24820, 50-24821, and 50-603062 and surrounding SWMUs/AOCs

ATTACHMENT 1

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-001(b)

PRS Number: 50-001(b)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

AOC 50-001(b) is the active underground drainline system, including manholes, through which liquid waste is transferred to the RLWTF (Building 50-1) at TA-50. A manhole (structure 50-0072) is the central collection area for most incoming liquid waste. Three lines feed into the manhole. According to the 1990 SWMU report, there was some concern about contamination from the waste lines carrying TA-55 effluent because the original vacuum seals had lost their integrity. However, the drip pans never collected fluid that showed the inner lines were leaking. The area where the lines run into Building 50-1 and the area west and north of the tank farm (Building 50-2) were sampled in August 1990. Sample results showed no radionuclides above BVs. Samples were collected at 7 locations (surface and to 91.5 ft bgs at one location) in 2001 and 2005. Methylene chloride was detected in one surface sample, but was below the EQL. No other potentially listed compounds were detected.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 07513
- RFI Work Plan for Operable Unit 1147, May 1992, 07672
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 98955, pp. 40–42
- Investigation Work Plan for Upper Mortandad Canyon Aggregate Area, November 2007, 100750, pp. 50–52
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)
- Holly Wheeler-Benson, personal communication, July 22, 2008

Summary of Listed Status

There was no documentation that F-, U-, or P-listed wastes were discharged to or released from these RLW lines. According to the HIR, methylene chloride was detected, but there is no documentation that it was discharged to the RLW as a solvent or as an unused/unspent product, and the RLWTF does not accept listed wastes (see the LANL Waste Acceptance Criteria). The detected concentration was below the EQL, so the material would not exhibit hazardous characteristics. The other potentially listed compounds detected in cuttings from locations 50-24817, 50-603061, 50-603063, and 50-603034 (bis[2-ethylhexyl]phthalate, 2-butanone, di-n-butylphthalate, fluoranthene) were not detected at SWMU 50-001(b). For these reasons, SWMU 50-001(b) is not considered a source of listed contaminants for any boreholes addressed in this assessment.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-002(a)

PRS Number: 50-002(a)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 50-002(a) consists of an underground, reinforced-concrete vault (Building 50-2) that houses an equipment room, six flow-through process tanks, and several waste-transfer lines, all of which are associated with the TA-50 RLWTF (Building 50-1). Wastes are transported to the vault (Building 50-2) through a system of transfer lines. Waste transfer lines include six cast-iron lines (including lines 55 and 67) connecting the RLWTF (Building 50-1) to the equipment room in the vault (Building 50-2); four steel lines added in 1984 to connect Room 61 to the equipment room in Building 50-2; five cast iron lines from drains in Building 50-1 and one cast-iron line from a sink in the former vehicle-decontamination bay in Building 50-1 to the former D&D tank in Building 50-2; an influent line connecting Building 50-2 to a 100,000-gal. holding tank (structure 50-90); and an effluent line connecting holding tank 50-90 to one of the 25,000-gal. influent tanks in the Building 50-2 vault. In 1990, the integrity of the Building 50-2 tank vault and the pipelines tied from the vault to Building 50-1 were checked, and no leaks were found. In July and September 1974, two separate, unintended operational releases occurred from the overflow of a sump in Building 50-2. Both releases caused untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent) and into the outfall area at the head of Ten Site Canyon [see SWMU 50-006(a)].

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 098955, pp. 42–43
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

The RLWTF does not accept listed wastes (see the LANL Waste Acceptance Criteria) and none of the documents reviewed identified historic releases of F-, U-, or P-listed wastes into the RLWTF. The two known releases of radioactive (not listed) wastes from Building 50-2 resulted in a discharge from the outfall at the head of Ten Site Canyon that is discussed under SWMU 50-006(a). Based on the documents reviewed, the SWMU 50-002(a) is not considered a source of listed contaminants.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at Consolidated Unit 50-004(a)-00

PRS Number: 50-004(a)-00		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

Consolidated unit 50-004(a)-00 consists of SWMUs 50-004(a,b, and c), which are former components of the TA-50 RLWTF, Building 50-1. SWMU 50-004(a) consists of the former locations of underground RLW and industrial waste lines. These waste lines routed wastes to the TA-50 RLWTF from the LANL TAs located along Pajarito Road. The majority of these waste lines were decommissioned and removed in 1975, when excavated soils were characterized for radioactive constituents and remediated to meet ALARA levels.

SWMU 50-004(b) is the location of a decommissioned underground vault (structure 50-3) that housed three stainless-steel-lined concrete storage tanks. The tanks were used to collect and store wastewater from the Omega Reactor, formerly at TA-02. Waste lines and manholes to this tank vault included waste line 49 from TA-35 and waste line 50 from Building 50-1. Waste line 49, the vault, and the tanks were removed in 1989.

SWMU 50-004(c) consists of 13 industrial waste lines and three associated manholes that discharged to the decommissioned underground tank vault (structure 50-3). With the exception of waste line 56, all of the waste lines and manholes associated with the underground vault [SWMU 50-004(b)] were removed between 1981 and 1989. Waste line 56 remains in service. Radionuclide contamination encountered during decommissioning of the waste lines and manholes was remediated to ALARA levels through removal of the pipe and affected soil to approximately 19 ft below grade. Field screening for radionuclides confirmed that ALARA levels had been met. No samples were analyzed for hazardous constituents.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- RFI Report for Potential Release Sites 50-004(a), 50-004(c), and 50-011(a), February 1996, 054836
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 098955, pp. 45–48
- Investigation Work Plan for Upper Mortandad Canyon Aggregate Area, November 2007, 100750, pp. 56–57
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

There was no documentation that F-, U-, or P-listed wastes were discharged to these RLW lines, and the RLWTF does not accept listed wastes (see the LANL Waste Acceptance Criteria). According to the HIR and RFI Report, volatile organic compounds and semivolatile organic compounds were analyzed for in 11 samples collected in 1993-1994; acetone, 2-hexanone, and methylene chloride were detected at low concentrations in screening-level samples from SWMU 50-004(c) (of 24 detects, only 7 were above the EQL—3 acetone [max 0.038 mg/kg], 1 2-hexanone [0.041 mg/kg], and 3 methylene chloride [0.02 mg/kg]). Additional sampling will be conducted as directed by the IWP for Upper Mortandad Canyon Aggregate Area. Theese

sporadic, low levels of contaminants are not indicative of a release. Based on the data and the available documentation, Consolidated Unit 50-004(a)-00 is not considered a source of source of listed contaminants for the boreholes addressed in this assessment.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-006(a)

PRS Number: 50-006(a)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 50-006(a) is the area at the head of Ten Site Canyon impacted by two accidental operational releases when a sump in a pumping station (Building 50-2) overflowed, causing untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent). The releases occurred in July and September 1974. In February 1975, waste line 67 was plugged at its outfall. Analysis of soil samples collected below the waste line 67 outfall in September 1976 showed elevated levels of gross-alpha radioactivity extending 984 ft downgradient from the outfall. In 1981, both waste lines 55 and 67 were completely removed. During waste line removal, elevated levels of radionuclides were detected. The outfall area was partially decontaminated by the removal of 70 cubic meters of contaminated soil from the outfall location.

The ER Project conducted an RFI at SWMU 50-006(a) in 1993 in and around the area of the Ten Site Canyon outfall. Samples were collected below the former waste line outfall, on both banks of the drainage channel, and in the canyon drainage channel at regular intervals over a distance of approximately 1300 ft downstream from the TA-50 boundary. Analytical results showed concentrations of PAHs above their respective screening levels. The ER Project implemented an IA in November 1996. Approximately 0.72 cubic yards of contaminated soil was excavated and removed. Ten confirmation samples were collected from the excavated area. Results reported in the 1997 IA report showed that residual gross-alpha radiation levels met the IA cleanup levels.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- Interim Action Report for SWMU 50-006(a), May 1997, 055834
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 098955, pp. 48–53
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

Di-n-butylphthalate was the only potentially listed contaminant detected in drill cuttings in bin #5835, which contains cuttings from two boreholes, 50-603062 and 50-603064. SWMU 50-006(a) is in the vicinity of these boreholes. Available documents for SWMU 50-006(a) were reviewed for detections of di-n-butylphthalate. According to the HIR, a total of 110 samples from 57 locations were analyzed for SVOCs. Trace (estimated quantities of di-n-butylphthalate were detected at 10 locations. There was no evidence of a "plume" of di-n-butylphthalate that would be indicative of a release. The primary use of di-n-butylphthalate is in the manufacture of plastics; there is no documentation that a plastics production process discharged to the RLWTF. It is, however, in plastics used to collect and analyze environmental samples, which is the most likely source of the contamination. The RLWTF does not accept listed wastes (see LANL Waste Acceptance Criteria). Nor is there any documentation that unused/unspent di-n-butylphthalate was historically discharged to the RLWTF . For these reasons SWMU 50-006(a) is not considered a source of listed contaminants at borehole 50-603064.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-006(d)

PRS Number: 50-006(d)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 50-006(d) consists of a TA-50 drainline and associated NPDES-permitted outfall in Mortandad Canyon for treated wastewater from the RLWTF (building 50-01). The 6-in.-diameter iron pipe extends from building 50-01 northward to Mortandad Canyon. Samples were collected in 1993 from 27 locations downgradient from the outfall. PAHs, benzoic acid and bis(2-ethylhexyl)phthalate were detected at some locations, but most concentrations were below the EQL.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- RFI Report for Potential Release Sites 5-006(a), 50-006(c), 50-007, 50-008, September 1995, 049925
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 098955, pp. 55–57
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

Bis(2-ethylhexyl)phthalate, fluoranthene, and methylene chloride were detected in drill cuttings from bins #5787 and #5799, which contained cuttings from boreholes 50-603061 and 50-603063 respectively. Those boreholes are in the vicinity of SWMU 50-006(d). According to the HIR, bis(2-ethylhexyl)phthalate was detected at trace concentrations in 2 of 50 samples collected at SWMU 50-006(d) in 1993. Fluoranthene was also detected at low concentrations in 2 of the 50 samples collected. VOCs (including methylene chloride) were not analyzed for in the samples collected in 1993.

Bis(2-ethylhexyl)phthalate and fluoranthene were detected only sporadically and at trace or very low (estimated) concentrations at SWMU 50-006(d); this is not indicative of a release. There is no documentation that unused/unspent products were disposed of through the drainline and outfall, and the RLWTF does not accept listed wastes (see the LANL Waste Acceptance Criteria). Based on the data and available documentation, SWMU 50-006(d) is not considered a source of listed contaminants at boreholes 50-603061 or 50-603063.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-009

PRS Number: 50-009		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 50-009 consists of decommissioned MDA C, established to replace MDA B at TA-21 as a disposal area for LANL derived waste. MDA C operated from May 1948 to April 1974. The northern boundary of MDA C is approximately 50 feet south of the planned south wall of the new RLWTF. Wastes disposed at MDA C included liquids, solids, and gases generated from a broad range of nuclear energy research and development activities conducted at LANL, including uncontaminated classified materials, metals, hazardous materials, and radionuclides. Historical reports indicate that it was common practice for chemicals to be burned in the chemical disposal pit at MDA C. At MDA C, 7 pits and 108 shafts were excavated into the overlying soil and tuff.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- Investigation Work Plan for Material Disposal Area C (MDA C), July 2003, 087392
- Investigation Work Plan for Material Disposal Area C (MDA C), Revision 1, November 2003, 087152
- Investigation Work Plan for Material Disposal Area C, Solid Waste management Unit 50-009, at Technical Area 50, Revision 2, October 2005, 091493
- Investigation Report for Material Disposal Area C, SWMU 50-009, December 2006, 094688
- Phase II Investigation Work Plan for MDA C, Revision 1, July 2007, 098425
- Drilling and Sampling Results from Boreholes Between Pit 2 and Pit 3 at MDA C, SWMU 50-009, April 2007, 097285
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

Bis(2-ethylhexyl)phthalate, 2-butanone, di-n-butlyphthalate, fluoranthene, heptachlor, and methylene chloride were detected in drill cuttings from one or more boreholes in the vicinity of SWMU 50-009.

Bis(2-ethylhexyl)phthalate was detected sporadically in the tuff at MDA C (12 of 74 tuff samples from 1995 and 2006), with no indication that there is a "plume" of the material (more likely, it is contamination from contact with plastics used during sampling and analysis). There is no documentation that unused/unspent bis(2-ethylhexyl)phthalate was disposed of at MDA C.

2-butanone was not detected in any tuff samples from boreholes in the vicinity of MDA C, and there is no evidence that it was disposed of as unused/unspent product. It was detected sporadically in pore-gas samples in 2006, but because the vapor is not a solid or hazardous waste, the mixture rule, derived-from rule, and contained-in policy do not apply to wastes contaminated by the vapor. Therefore, any waste contacting the vapor is not a listed waste.

Di-n-butylphthalate was detected only in drill cuttings from bin #5835, which contains cuttings from borehole locations 50-603062 and 50-603064. Di-n-butylphthalate was not detected in surface soil or tuff samples in the vicinity of borehole 50-603062 or 603064 or anywhere in the

PRS Number: 50-009
eastern portion of the site during 1995 or 2006. It was detected in a single tuff sample at the far western end of MDA C in 2006. Because it was detected only sporadically and at low concentrations, there is no evidence that MDA C is a source of di-n-butylphthalate in the drill cuttings in bin #5835. Endrin was detected in one waste sample, from bin #5836. Bin #5836 contains drill cuttings from borehole locations 50-24820 and 50-24821, across Pajarito Road to the south of MDA C. The only SWMU in the vicinity of these boreholes is 50-009 (MDA C). There is no documentation that Endrin was disposed of at MDA C as an unused/unspent product. Endrin was not detected in any tuff samples collected from boreholes in 1995, including 5 boreholes between Pit 6 (chemical pit) and locations 50-24820 and 50-24821. There is no evidence that MDA C is the source of Endrin detected in these drill cuttings. Fluoranthene was detected in only 3 of 74 tuff samples collected in 1995 and 2006, including locations 50-24820 and 50-24821. There is no evidence that fluoranthene was disposed of at MDA C as an unused/unspent product, and the sporadic detects do not support the concept that there is a "plume" of fluoranthene that was transported from MDA C to any of the borehole locations. Heptachlor was detected in one sample from bin #5836, which includes cuttings from borehole locations 50-24820 and 50-24821 across Pajarito Road south of MDA C. There is no evidence that unused/unspent heptachlor was disposed of or spilled at MDA C, and there are no other SMWUs or AOCs in the vicinity of those two boreholes. Heptachlor was not detected in any tuff samples collected from boreholes in 1995, including the boreholes on the south side of MDA C and closest to boreholes 50-24820 and 50-24821 (pesticides were not analyzed in samples collected in 2006). Methylene chloride was detected in one tuff sample in one of 11 boreholes drilled in 1995; the borehole was located south of MDA C, Pit 6. Pit 6 is not near any of the boreholes addressed in this assessment. No methylene chloride was detected in tuff samples from any of the six boreholes drilled during 2005 between the borehole where the methylene chloride was detected in 1995 nor in other boreholes in the vicinity. Therefore, there is no evidence of methylene chloride transport from MDA C to the borehole locations. Methylene chloride has been detected in pore-gas at some MDA C boreholes. However, EPA has documented their decision that uncontained gas is not a solid (or hazardous) waste in 54 Federal Register (FR) 50973 and 56 FR 7200. Because the vapor is not a solid or hazardous waste, the mixture rule, derived-from rule, and contained-in policy do not apply to wastes contaminated by the vapor. Therefore, any waste contacting the vapor is not a listed waste. Based on the data and available documentation, MDA C is not considered a source of listed contaminants at any of the boreholes addressed in this assessment.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 50-011(a)

PRS Number: 50-011(a)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 50-011(a) is the location of a former septic system that was installed at TA-50 in 1964 at the south end of the RLWTF (Building 50-1). The septic system consisted of an influent line from Building 50-1 that discharged to a manhole (structure 50-9) and then to a septic tank (structure 50-10). The effluent line from the tank tied to a distribution box (structure 50-11), which discharged to four parallel perforated pipes traversing a leach field.

In 1978, a 4-ft-diameter x 50-ft-deep shaft was drilled at the east end of the leach field to address problems with standing water on the ground surface. A 4-in. perforated pipe was installed in the shaft, and the annulus was backfilled to within 4 ft of the ground surface. The outlets of the four parallel pipes were then tied into the newly installed perforated pipe.

With the exception of the perforated pipe installed in the leach field in 1978, the entire septic system was removed in 1983. Currently, a storage building (Building 50-83) and an asphalt pad cover the area formerly occupied by the septic system. The 50-ft-deep shaft and perforated pipe that remain in place are also located beneath storage Building 50-83.

Previous investigations of the area surrounding SWMU 50-011(a) were conducted in 1986, during decommissioning of the RLW line. Excavated soils were characterized for radioactive constituents and remediated to meet ALARA levels.

The ER Project conducted an RFI at SWMU 50-011(a) in 1994 to determine the presence of and define the nature and extent of any contamination. The ER project conducted supplemental RFI sampling in 2004 and 2005. Acetone was the only organic chemical detected.

In December 2001, geotechnical and waste characterization samples were collected from eight boreholes, including one adjacent to the seepage pit, to determine the feasibility of constructing a new pump house and influent storage tank vault at TA-50.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 07513
- RFI Work Plan for Operable Unit 1147, May 1992, 007672
- RFI Report for Potential Release Sites at TA-50: 50-004(a), 50-004(c), 50-011(a), March 1996, 054460
- Historical Investigation Report for Upper Mortandad Canyon Aggregate Area, November 2007, 098955, pp. 59–60
- Investigation Work Plan for Upper Mortandad Canyon Aggregate Area, March 2008, 010110, pp. 63–64
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

There is no evidence that unused/unspent products were disposed of at SWMU 50-011(a). The only organic chemical detected in samples from the SWMU (acetone) was not detected in cuttings from borehole 50-603063, the location nearest the SWMU. SWMU 50-011(a) is not considered a source of contamination for any of the boreholes addressed in this assessment.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 63-001(a)

PRS Number: 63-001(a)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 63-001(a) is an inactive 1000-gal. septic tank (structure 63-12, formerly designated as structure 52-49) and its associated seepage pit and drainline (formerly designated as structure 52-50). The seepage pit is 4 ft in diameter and 50 ft deep. This septic system formerly served Buildings 63-3, -4, -5, and -6. The septic system was removed from service in 1993 when the lines were connected to the TA-46 SWSC. Building 63-3 is a single-story concrete-block building that contains carpentry, welding, plumbing, and paint shops and two offices. Building 63-4 is a modular office building. Buildings 63-5 and 63-6 are trailers that are subdivided into offices.

The area now designated as TA-63 has undergone several redesignations. In the 1950s, the area was part of TA-4 and part of TA-00 in the 1960s, 1970s, and 1980s. The site also was part of TA-52. In 1989, the western part of TA-52 was redesignated as TA-63. The dates of the redesignations from TA-4 to TA-00 and from TA-00 to TA-52 are unknown. Potential contaminants at SWMU 63-001(a) are solvents and other unspecified chemicals. No documentation of spills, releases, or incidents at TA-63 has been found.

Sampling was conducted at SWMU 63-001(a) in 1995. A total of 31 samples were collected from four locations and submitted for laboratory analysis of inorganic chemicals, organic chemicals, and radionuclides. Two organic chemicals, xylene and di-n-butylpthalate, were detected.

In 2004, the ER Project sampled SWMU 63-001(a) to address additional data needs identified following the 1995 RFI sampling activities. Trace concentrations of di-n-butylphthalate and xylene were detected in tuff samples.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 007513
- RFI Work Plan for Operable Unit 1129, May 1992, 007666
- Investigation Report for the Middle Mortandad/Ten Site Aggregate, Revision 1, July 2007, 100119, p. D-486
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

Di-n-butylphthalate was detected in cuttings from bin #5835, which contained cuttings from boreholes 50-603062 and 50-603064. According to the Investigation Report for the Middle Mortandad/Ten Site Aggregate, Revision 1, p. D-486) di-n-butylphthalate was detected at low (estimated) concentrations in 2 of 3 subsurface tuff samples during the investigation of SWMU 63-001(a). The primary use of di-n-butylphthalate is as a plasticizer in plastics manufacture; there is no documentation that plastics production processes occurred in the buildings associated with SWMU 63-001(a). There is also no documentation that any other process disposed of or spilled unused/unspent di-n-butylphthalate to this SWMU. The RFI Work Plan (p. 7-132) states that the suspect contaminants at SMWU 63-001(a) include "organic solvents," however, di-n-butylphthalate is not used as a solvent and there is no documentation that unused/unspent chemicals were disposed of or spilled. Therefore this SWMU is not considered a listed source of di-n-butylphthalate in bin #5835. Di-n-butylphthalate is more likely a contaminant from plastic

items used in sampling or analysis.

Potential Release Site Due Diligence Summary for Potentially Listed Organic Compounds at SWMU 63-001(b)

PRS Number: 63-001(b)		
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		x

PRS Description

SWMU 63-001(b) is an inactive 920-gal. septic tank (structure 63-14) and its associated seepage pit and drainlines. The seepage pit is 4 ft in diameter and 50 ft deep. This septic system served Building 63-1 and received only sanitary wastewater. The septic system was removed from service in 1993 when the lines were connected to the TA-46 SWSC. Building 63-1 is a single-story building that houses offices, an electronics shop, and a machine shop. Potential contaminants at SWMU 63-001(b) are solvents and other unspecified chemicals. No documentation of spills, releases, or incidents at TA-63 has been found.

Documents Reviewed

- Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 07513
- RFI Work Plan for Operable Unit 1129, May 1992, 007666
- Investigation Report for the Middle Mortandad/Ten Site Aggregate, Revision 1, July 2007, 100119, p. D-486
- Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008
- PRS Database (http://erinternal.lanl.gov/PRS/PRSMain.asp)

Summary of Listed Status

Di-n-butylphthalate was detected in cuttings from bin #5835, which contained cuttings from boreholes 50-603062 and 50-603064. According to the Investigation Report for the Middle Mortandad/Ten Site Aggregate, Revision 1, p. D-486) di-n-butylphthalate was detected at low (estimated) concentrations in 2 of 3 subsurface tuff samples during the investigation of SWMU 63-001(b). The primary use of di-n-butylphthalate is as a plasticizer in plastics manufacture; there is no documentation that plastics production processes occurred in the building associated with SWMU 63-001(b). There is also no documentation that any other process disposed of or spilled unused/unspent di-n-butylphthalate to this SWMU. Therefore this SWMU is not considered a listed source of di-n-butylphthalate listed waste in bin #5835. Di-n-butylphthalate is more likely a contaminant from plastic items used in sampling or analysis.