## Environmental Programs (EP) Document Signature Form

### Document Catalog Number: EP2010-0456

(Please prefix the name of all electronic versions of this document with this number.)

Document Title/Subject: Phase III Material Disposal Area C Investigation at TA-50

## Associated Document Catalog Number(s):

Author: Fuller, Stephanie		606-1628	sfuller@ia	anl.gov			
Organuzation: El	P-CAP						
Document Team:	Branch, John Buckley, Jocelyn De Sotel, Ronald	-	65 5209 62-7600	jbranch@lata.com jbuckley@lanl.gov rdesotel@lanl.gov			
Document Type: Waste Characterzation Strategy Form (WCSF)							
Date Due:	Date Final Complete:						
Date To ADEP:		Date To DOE:					
Date To NMED:		Date To RP	F:				
Comm Tracker #:		LAUR #		ERID #:			
Status/Comments	5:						

Reviewer Signatures: By signing below, the reviewer indicates that he/she reviewed and approves the document.

Document Catalog Number: EP2010-0456

## 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:

<u>Pore Gas Sample Collection</u> – This activity includes collecting pore-gas samples from existing vapormonitoring 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.

<u>Borehole Drilling</u> – 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.

<u>Vapor-Monitoring Well Construction</u> – 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 *Peer Review Draft WCSF Phase III Material Disposal Area C* Page 1 EP2010-0456

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

<u>Waste Management</u> –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.

<u>Site restoration</u> –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<sup>3</sup> 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<sup>3</sup> 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<sup>3</sup> 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<sup>3</sup> 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 <u>not</u> 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 <a href="http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf">http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/rwsdtg.pdf</a>). 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 <a href="http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa">http://esp-esh-as01-f5.lanl.gov/~esh19/database/rfa</a> 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<sup>3</sup> 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 (inplace 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<sup>3</sup> 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)

	Waste # 1	Waste #2	Waste #3
Waste Description	Drill Cuttings	Contact Waste	Decontamination Fluids
Estimated Volume	80 CY	2 CY	< 55 gallons
Packaging	20 yd <sup>3</sup> Roll-off	55 gallon drums	30 or 55 gallon drums
	Bins		
Regulatory classification:			
Radioactive Waste	X	X	Х
Municipal Solid Waste (MSW)			
Waste destined for LANL's SWWS or RLWTF <sup>1</sup>			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		1860 - Sec. Se	
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)	X4		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)	X⁴		
TPH-DRO (EPA 8015-M)	X⁴		
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)	X <sup>6</sup>		
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 <sup>4</sup>		X <sup>4</sup>
Gross Beta (beta counting) (EPA 900)	X <sup>4</sup>		X <sup>4</sup>
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)	Χ		X
Americium-241 (HASL-300)	X		X
Perchlorates (EPA 6850)	X		
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)	Χ		X <sup>1</sup>
Oil / Grease (EPA 1665)			<u> </u>
Fluonine, Chorine, Sulfate (EPA 300)			X <sup>1</sup>
TTO (EPA 8260-B and EPA 8270-C) <sup>2</sup>	R	equest VOC and SVOCs	
Total Suspended & Dissolved Solids (TSS) and Total Dissolved Solids (TDS) (EPA 160.1 and			X <sup>1</sup>

	3.1-1. Waste Charac	terization	
Waste Description	Waste # 1 Drill Cuttings	Waste #2 Contact Waste	Waste #3 Decontamination Fluid
Chemical Oxygen Demand (COD) (EPA 410.4)			X <sup>1</sup>
pH (EPA 904c)			X <sup>1</sup>
Microtox or Biological Oxygen Demand ( BOD) <sup>3</sup>			X <sup>1</sup>

Table 3.1-2. Wa			
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:	tern Solitik all fan de skiller		
Radioactive Waste		X	X
Municipal Solid Waste (MSW)	X		
Waste destined for LANL's SWWS or RLWTF <sup>1</sup>			
Hazardous Waste			
Mixed (hazardous and radioactive) Waste			
Polychlorinated Biphenyls-Contaminated Waste (PCBs)	1 1	Х	
New Mexico Special Waste		X	X
Industrial Waste	<u> </u>	X	X
Characterization Method			
Acceptable knowledge (AK): Existing			T
Data/Documentation	X		X
AK: Site Characterization			X
Direct Sampling of Waste		X	X
Analytical Testing			
Volatile Organic Compounds (VOCs) (EPA 8260-B)		X	<b>x</b>
Semivolatile Organic Compounds (SVOCs) (EPA 8270- C)		X	X
Organic Pesticides (EPA 8081-A)			
Organic Herbicides (EPA 8151-A)			+
PCBs (EPA 8082)		X4	X <sup>4</sup>
Total Metals (EPA 6010-B/7471-A or EPA 6020)	<u> </u>	X	X
Total Cyanide (EPA 9012-A)		X <sup>5</sup>	X <sup>5</sup>
High Explosives Constituents (EPA 8330/8321-A)		~	
		• • • •	
Asbestos (EPA 600M4)			¥
Total petroleum hydrocarbon (TPH)-GRO (EPA 8015-M)		X	X <sup>4</sup>
TPH-DRO (EPA 8015-M)		X	X <sup>4</sup>
Toxicity characteristic leaching procedure (TCLP) Metals (EPA 1311/6010-B)		X <sup>6</sup>	X <sub>6</sub>
TCLP Organics (EPA 1311/8260-B & 1311/8270-C)	+	····	
TCLP Pest. & Herb. (EPA 1311/8081-A/1311/8151-A)		×4	
Gross Alpha (alpha counting) (EPA 900)		X <sup>4</sup>	X <sup>4</sup>
Gross Beta (beta counting) (EPA 900)		X <sup>4</sup>	X <sup>4</sup>
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)		х	X
Total uranium (EPA 6020)		X	X
Strontium-90 (EPA 905)		X	X
Americium-241 (HASL-300)		X	X
Perchlorates (EPA 6850)			1
Nitrates/Nitrites (EPA 300.09-soil or 343.2-water)		X <sup>5</sup>	X <sup>5</sup>
Oil / Grease (EPA 1665)		<u> </u>	
Fluorine, Chorine, Sulfate (EPA 300)	<u> </u>		
TTO (EPA 8260-B and EPA 8270-C) <sup>2</sup>	L		L

Table 3.1-2. Wa	aste Characteriz	ation	
	Waste #4	Waste #5 Petroleum	Waste #6
Waste Description	Municipal	Contaminated	Returned or
	Solid Waste	Soils	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) <sup>3</sup>			· · · · · · · · · · · · · · · · · · ·

### Characterization Table (Cont'd)

<sup>1</sup>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.

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

<sup>3</sup> If Microtox analysis is not available, request BOD.

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

<sup>5</sup> If required for investigation samples by the Phase II IWP

<sup>6</sup> TCLP metals must be analyzed for drill cuttings if total metals divided by 20 exceed toxicity characteristic limits.

Signatures	Date
Project Manager (Stephani Fuller)	
Biller	10-15-10
Preparer (John Branch)	10-18-10
Waste Management Coordinator (Ron DeSotel)	
RIEDO	10-15-10
ENV-RCRA Representative (Jocelyn Buckley)	
Jacoba 13 Jundlen	10-14-10
Waste Acceptance Representative (Jose Orlega)	
fin A A	10/14/0
Waste Certification Program Representative (Michelle Coriz)	
Michulli & Com	10/18/10

1

#### **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 R			evlewer Nam	le:	an a		Z#			Aut	norized GIC	C Generato	r ()	Yes ()No
Acceptable Knowledge Materials: (X) For SWO verification and potential release Waste Generator Return:														
() For Database Entry Only (Direct released by generator without shipment to SWO) Name: Stephanie Fuller FAX #: 665-4747														
WMC Z#	WMC Name (PRIN	T)	WMC Tel.	¥	WMC Ma		ubmitted	RCA				assified Ma		Pure Beta Emitter
212070	Ron De Sotel		665-5505		M	381 02/17/2	2011	()β/	γ ()α	🚫 Bo	th ()	Yes (X)	NO	() Yes (X) No
Generator	(X) Routine	() Surface	Compactab	le		erator Will Deliver				Was	te Verificati	on Location	1	
Group	() Non-routine	(X) Volume	(X) Yes		Ø≰ SW	O to Pick Up Load	at (Specify)	<u> </u>		(X)	ΓΑ-54-2 (α,	β,γ) ()	TA-48	(β,γ)
PMF5-00			( ) No		TA	Bldg-Rm	<u>o (mu</u> a	-()		()(	Other (Speci	fy)		·
	Generated At	Charge C		Vol.	Wt.			Dispos	ition (Pe	ercent)	Date	Veri-		
GIC ID #	(TA-Bldg-Rm)	(Cost Cntr		(Ft <sup>3</sup> )	(Lbs)	Material Des	cription	Solid	Re-	LLW	Processed			Comments
		Acct/Worl							cycle			Init.		
7032110	50	61000A/MR2A/	051B/2S00	2	7	Contact W					L		ļ	
7032112	50			2	4.5	Contact W							Į	<u></u>
7032113	50			2	6.5	Contact W							<b></b>	
7032115	50	"		2	7	Contact W								
7032117	50	"		1	5.5	Contact W								
7032111	50			2	7.5	Contact W	aste							
7032114	50	sc		1	10.5	Contact W	aste							
7031995	50			2	10.5	Contact W	aste							
7031998	50	••		2	11	Contact W	aste							
7031989	50	"		1	7.5	Contact W	aste							
7031992	50	"		2	11	Contact W	aste							
7032001	50	"		2	13	Contact W	aste							
7032109	50	"		2	7	Contact W	aste							
7631990	50	()		$\mathcal{R}$	9	Contact	waste.							
7031991	50	11		2	9:3	Contact								

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.

Date:

Date:

Waste Generator Signature (Required):

Date: 2

Waste Management Coordinator: Lhave reviewed this form, and to the best of my knowledge, the information is complete and accurate. •• 2-17-11 2

WMC Signature (Required): **GIC Verifier Name** (Required):

\*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

FMU64-F224, R.1 (5/01) IN PLAN-WASTEMGT-002

Page 1 of 2 Printed on: 2/17/2011 y

Ť	Sial	5	810
-11	101	43	862

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 lan	d application.	and the second
Estimated Quantity: <u>48.43</u> (cubic feet or tons) Composition (e.g., 98% tuff and 2% quick gel, etc.): <u>100.70.501</u> Proposed Method of Land Application (describe): <u>Drull Qualfings Will be land (</u> <u>within the project feet print (Swmu 50-009)</u> to <u>previously</u> <u>areas and Coulered with a druper of read base</u>	OMU 50-1 Topliscl Clisturbect	009)
Note: An EX-ID Permit is required prior to land application. $101 - 0849 - 50$		
<b>Decision Tree—Decision Point Evaluation</b>		
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.		
<b>2.</b> 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.		
<b>3.</b> 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 reque         application per the Decision Tree and that the drill cuttings will be land applied as described.         Show Fuller         Name (Print)         Signature	est meet the crite	11 PP4
ENV-RCRA Review (below):	, <u>1</u> 5 <u></u>	
Does request provide all the required information, and do the drill cuttings meet all the criteria for Yes No Note deficiency in the space provided:	or land applicati	on?
ENV-RCRA Reviewer Name (Print) <u>Socelyn 1. Buble</u> Signature <u>Stable</u>	<u>Sulle</u> Pate_	-25-11

Package Expiration Date: 2-11-11

10#1014 3862 Bin 5810

> Water Quality and RCRA Group Los Alamos National Laboratory

ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

## Post Land Application Field Certification Sheet

Date(s) of land application: Projection	ct: MDA C. Phase
	Aphint TA: 50 (SUMUSO-009)
EX-ID Number: $100 \times -0849$ EX-ID	Expiration Date: $\frac{1}{29}$
Please explain any deviations from original application (Attach	ament 2) in the space provided:
Note: ENV-RCRA must approve any deviations from Attachm	nent 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.

phani Fuller

POYCE MGY.

Date

PRS Number: 50-0	09 (Borehole 50-613185)	
Source of contaminants:	Yes	No
F-listed		Х
U- or P-listed		Х
K-listed		Х
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.

	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								

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

Phase II Investigation Work Plan for MDA C, Rev. 1	100143				
Investigation Report for MDA C, SWMU 50-009	094688				
Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 2	091493				
1/1/2003 Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 1					
Investigation Work Plan for MDA-C, SWMU 50-009 at TA- 50	087392				
RFI Work Plan for Operable Unit 1147	007672				
SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513				
PRS Database	NA				
	Investigation Report for MDA C, SWMU 50-009 Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 2 Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 1 Investigation Work Plan for MDA-C, SWMU 50-009 at TA- 50 RFI Work Plan for Operable Unit 1147 SWMU Report, Volume 1 of IV (TA-00 through TA-09)				

#### 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
			K031,K060,K161,K171,
			K172,K176,K084,K101,
Arsenic	0.304	F032,F034,F035,	K102,
		F032,F034,F035,F037,	K090
Chromium	4.42	F038,	
			K002, K003, K005,
			K048, K049, K051,
			K062, K064, K086,
			K100, K176, K046,
Lead	11.1	F035,F037,F038,	K052, K061, K069
Nickel	2.18	F006	

page 3 of 5

Sampling event ID

3233

## SAL and background companison I file: ev3233.2085.awd, 1, 13, 2011(1).xlsm

evaluation date: 1/13/2011

SWMU ev 3233.2085 Stockpile Number ev 3233.2085

			unit of		Indust-	Constr.	Recrea-		Canyon			Qbt 1g,
	CAS/	concen-	measur	Residen-	rial	Worker	tional		Sedi-	QBT2,	QBt	Qct,
Analyte	Symbol	tration	е	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	Qbo
Bismuth-214	Bi-214	2.26	pCi/g				$\sim$	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.		pCi/g	/	/		/		/		$\backslash$	
Radium-226	Ra-226		pCi/g	/		pass	pass	pass		FAIL	pass	pass
Radium-228	Ra-228		pCi/g	/		pass	pass	FAIL	FAIL	FAIL	pass	pass
Thallium-208	TI-208	0.841	pCi/g	/	/	/	/		pass	pass	pass	pass
Thorium-234	Th-234		pCi/g	/			/	FAIL	FAIL	FAIL	pass	pass
Tritium	H-3	0.02429		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		pass	pass	pass	pass	/	/		$\searrow$	
Uranium-238	U-238		pCi/g	pass	pass	pass	pass	pass	pass	FAIL	pass	pass
Americium-241	Am-241	0.00287	pCi/g	/	/		/	/			$\sum$	
Cerium-139	Ce-139	-0.0103		/	/		/		/		$\square$	
Cesium-137	Cs-137	0.0025		/	/	/	/	/	/		$\sum$	/
Cobalt-60	Co-60	-0.00614		/	/		/	/	/		$\sum$	
Europium-152	Eu-152	0.0187	pCi/g	/	/		/	/	/	/	$\sum$	
Lanthanum-140	La-140	-0.0338		/	/		/	/	/		$\searrow$	/
Mercury-203	Hg-203	0.0361		/	/	/			/	/		
Plutonium-238	Pu-238	0.00205	pCi/g			/	/	/	/		$\searrow$	/
Plutonium-239/240	Pu-239/240	-0.0041		/	/			$\backslash$	/		$\searrow$	/
Radium-223	Ra-223	0.265						$\geq$			$\geq$	
Ruthenium-106	Ru-106	-0.0577						$\geq$			$\geq$	
Sodium-22	Na-22	-0.0238								$\backslash$	$\geq$	
Strontium-90	Sr-90	0.139		/				$\geq$			$\sum$	
Thorium-227	Th-227	-0.154			$\geq$		/	$\geq$				
Thorium-231	Th-231	0.265			$\geq$		$\sim$	$\geq$		$\geq$	$\geq$	
Tin-113	Sn-113	0.00048			$\geq$			$\geq$	$\geq$	$\geq$	$\geq$	
Uranium-235	U-235	0.258		/	$\geq$			$\geq$	/		$\geq$	
Yttrium-88	Y-88	0.00142	pCi/g	/			/	$\overline{)}$	/		$\sim$	

 $Ra^{228}$  2.91-2.33 = 0.58 45 (attachment 6) OK to land apply

#### Sampling event ID 3233

## **Detected Chemicals Form**

Stockpile Number ev 3233.2085

SWMU ev 3233.2085

# page 3 of 5 associated Excel file: ev3233.2085.awd.1.13.2011(1).xism

evaluation date: 1/13/2011

Analyte	CAS/ Symbol	concen- tration	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		mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K 084,K101,K102,			
Barium	Ва	11.1	mg/kg	pass	pass					
Beryllium	Be	0.633	mg/kg	pass	pass					
Calcium	Ca	474	mg/kg							
Chromium	Сг	2.07	mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,	······		
Cobalt	Co		mg/kg							
Copper	Cu	2.48	mg/kg							
Iron	Fe	5350	mg/kg							
Lead	Pb		mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
Magnesium	Mg	179	mg/kg	1				······································		
Manganese	Mn	212	mg/kg		]		]			
Nickel	Ni	1.13	mg/kg	pass	pass	F006,				
Potassium	к		mg/kg							
Sodium	Na		mg/kg							
Uranium	U	0.833	mg/kg							
Vanadium	V		mg/kg	pass	pass					
Zinc	Zn	39.3	mg/kg	pass	pass					

Sampling event ID 3233

## Solid Waste Evaluation

page 1 of 5

SWMU ev 3233.2085 Stockpile Number ev 3233.2085 Summary iated Excel file: ev3233.2085.awd.1.13.2011(1).xlsm evaluation date: 1/13/2011

RCRA	
33 analytes pass	
between these <u>31</u> analytes pass as unc	letected
10 analytes fail	
Dataata	
Detects	
Total PCB (pr	pm) Not analy
4 analytes with potential F-code	e Non-wastewater LDR: 8 pass 0 FAIL
3 analytes with potential K-code	
0 analytes with potential U-cod	
0 analytes with potential P-code	e
Residential Soil (mg/kg	):14 pass 0 FAIL
Industrial/ Occupational Soil (mg/kg	
Construction Worker Soil (mg/kg	
Recreational Soil (mg/kg	
soil backgrou	
Canyon Sediment backgrou Qbt 2.3.4 backgrou	
Qbt 2,3,4 backgrou Qbt 1v backgrou	······································
Qbt 1g, Qct,Qbo backgrou	
RAD total do	se: 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	<u>0 FAIL</u>
Soil: 7 pass	4 FAIL
Canyon Sedi-ment: 7 pass	4 FAIL
QBT2,3,4: 2 pass	9 FAIL
QBt 1v: 10 pass Qbt 1g, Qct, Qbo: 11 pass	1 FAIL 0 FAIL
ability, add, abb. 11 pass	

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

orted da	ev3233.1.13.2011.txt		
----------	----------------------	--	--

associated duplicate	
associated blanks	
Sample ID	WST50-11-2085

# 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	AI	1050	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Arsenic	As		<u> </u>	· · · ·			pass	1	pass	• • • • • • • • • • • • • • • • • • • •	1	pass
Barium	Ba		<u> </u>	•	pass	pass	pass		pass			pass
Beryllium	Be Ca			1	pass NA	pass NA	pass NA		pass		• • • • • • • • • • • • • • • • • • • •	pass
Calcium									pass			pass
Chromium	Cr			1	pass	NA	pass	1	pass	r	• • • • • • • • • • • • • • • • • • • •	pass
Cobalt	Co		mg/kg	pass	pass	pass	pass	•	pass	1	1	pass
Copper	Cu		<u> </u>	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			pass	pass	pass	pass		pass	• • • • • • • • • • • • • • • • • • • •	pass	pass
Magnesium	Mg			NA	NA	NA	NA		pass		pass	pass
Manganese	Mn		mg/kg	pass	pass	FAIL	pass	1 · · · ·	pass		pass	FAIL
Nickel	Ni		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Potassium	К		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

Bate 1/02 50-613185

Sampling event ID 3233

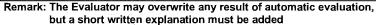
SWMU ev 3233.2085.2084.2094 Stockpile Number ev 3233.2085.2084.2094

## Solid Waste Evaluation

page 1 of 5

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

RCRA 33 analytes pass 31 analytes pass as undetected between these 10 analytes fail Detects Total PCB (ppm) Not analy 4 analytes with potential F-code Non-wastewater LDR: 9 pass 0 FAIL 4 analytes with potential K-code Hazardous soil LDR: 9 pass 0 FAIL 0 analytes with potential U-code 0 analytes with potential P-code 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



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

3233

page 3 of 5 associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

SWMU ev 3233.2085.2084.2094 RCRA Characteristics Form

Stockpile Number ev 3233.2085.2084.2094

Potential Reg. concenunit of Pass/ Haz Code limit tration measure Qualifier Analyte CAS/ Symbol Fail comments Arsenic 5000 50 ug/L As U pass 216 ug/L Barium Ba D005 100000 pass J Cadmium Cd 1000 10 ug/L U pass 21.5 ug/L 5000 Chromium Cr U pass D008 5000 18.7 ug/L Pb \_ead .1 pass 200 2 ug/L U Mercury Hg pass 1000 50 ug/L U Selenium Se pass Ag Silver 5000 10 ug/L U pass Endrin 72-20-8 D012 20 ug/L FAIL BHC[gamma-] 58-89-9 D013 400 FAIL ug/L D014 10000 Methoxychlor[4,4'-] 72-43-5 ug/L FAIL Toxaphene (Technical Grade) D015 500 8001-35-2 FAIL ug/L D016 10000 FAIL D[2,4-] 94-75-7 ug/L TP[2,4,5-] D017 1000 FAIL 93-72-1 ug/L Benzene 71-43-2 500 0.053 ug/L pass 0.053 ug/L Carbon Tetrachloride 56-23-5 500 11 pass Chlordane(alpha/gamma) 57-74-9 D020 30 FAIL ug/L D020 FAIL Chlordane[gamma-] 5103-74-2 ug/L 5103-71-9 D020 FAIL Chlordane[alpha-] ug/L 108-90-7 100000 0.053 ug/L Chlorobenzene U pass 6000 0.053 ug/L U Chloroform 67-66-3 pass Methylphenol[2-] 95-48-7 200000 17.6 ug/L U pass Methylphenol[3-] 200000 108-39-4 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 8027-16-5 200000 Methylphenol(total) 35.2 ug/L UU pass 7500 17.6 ug/L Dichlorobenzene[1,4-] 106-46-7 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 121-14-2 130 17.6 ug/L Dinitrotoluene[2,4-] U nass Heptachlor 76-44-8 D031 FAIL 8 ug/L Hexachlorobenzene 118-74-1 130 17.6 ug/L U pass 500 Hexachlorobutadiene 87-68-3 17.6 ug/L U pass 67-72-1 3000 17.6 ug/L Hexachloroethane П pass 200000 0.264 ug/L ŪJ Butanone[2-] 78-93-3 pass 17.6 ug/L Nitrobenzene 98-95-3 2000 U pass 100000 Pentachlorophenol 87-86-5 17.6 ug/L U pass 5000 Pyridine 110-86-1 17.6 ug/L U pass 0.053 ug/L Tetrachloroethene 127-18-4 700 U pass Trichloroethene 79-01-6 500 0.053 ug/L U pass Trichlorophenol[2,4,5-] 400000 17.6 ug/L 95-95-4 U pass 88-06-2 Trichlorophenol[2,4,6-] 2000 17.6 ug/L U pass 0.053 ug/L Vinyl Chloride 75-01-4 200 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.

Sampling event ID

# 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 Ba		mg/kg	pass	pass	pass	pass		pass		pass	pass
Barium	Ве		mg/kg	pass	pass	pass	pass	· · · · · · · · · · · · · · · · · · ·	pass		pass	pass
Beryllium Calcium	Са		mg/kg mg/kg	pass NA	pass NA		pass NA	pass pass	pass pass		pass pass	pass pass
Chromium	Cr		mg/kg	pass			pass	pass	pass		FAIL	FAIL
				P			pass				pass	
Cobalt	Cu		<u> </u>	pass			P	<u> </u>	pass	11	FAIL	pass pass
Copper	Fe			pass pass			pass pass		pass pass		pass	FAIL
Lead	Рb						pass		pass			pass
Magnesium	Mg			NA	NA	NA	NA	pass	pass	pass	FAIL	FAIL
Manganese	Mn		mg/kg	pass	pass	FAIL	pass	pass	pass	pass	pass	FAIL
Nickel	Ni		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		mg/kg	NA	NA	NA	NA		pass	1	pass	pass
Uranium	U		mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn		X	pass	pass	pass	pass	pass	pass	pass	pass	pass

Sampling event ID

## **Detected Chemicals Form**

\*

3233

page 3 of 5 associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xism

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		mg/kg							
Antimony	Sb	0.71	1mg/kg	pass	pass		K161,K021,K177,			
Arsenic	As		mg/kg	pass		F032,F034,F035,	K031,K060,K161,K171,K172,K176,K 084,K101,K102,			
Barium	Ba			pass	pass					
Beryllium	Be			pass	pass					
Calcium	Ca		mg/kg							
Chromium	Cr		mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co		mg/kg							
Copper	Cu	3.6	mg/kg							
Iron	Fe	5350	mg/kg							
Lead	Рb	11.1	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
Magnesium	Mg	829	mg/kg							
Manganese	Mn	212	mg/kg							
Nickel	Ni	2.18		pass	pass	F006.				
Potassium	К		mg/kg	[						
Sodium	Na		mg/kg							
Uranium	U		mg/kg			1				
Vanadium	V			pass	pass	İ				
Zinc	Zn			pass	pass					

SWMU ev 3233.2085.2084.2094

Stockpile Number ev 3233.2085.2084.2094

#### Sampling event ID

3233

#### page 3 of 5

## SWMU ev 3233.2085.2084.2094 SAL and backgrounds comparison 233 2085 2084 2094 awd 1 20 2011.xism Stockpile Number ev 3233.2085.2084.2094

evaluation date: 1/20/2011

Qbt 1g, unit of Indust-Constr. Recrea-Canyon Worker CAS/ measur Residenrial Sedi-QBT2, QBt Qct, concentional Symbol tration tial SAL SAL SAL SAL Soil 3,4 Qbo Analyte е ment 1v Bismuth-214 Bi-214 2.55 pCi/g FAIL pass pass pass pass 2.97 pCi/g Pb-212 FAIL Lead-212 FAIL FAIL pass pass FAIL FAIL pass Lead-214 Pb-214 3.31 pCi/g FAIL FAIL pass pass Potassium-40 K-40 36.2 pCi/g FAIL FAIL pass Radium 226/228 5.46 pCi/g calc. Ra-226 Radium-226 FAIL 2.55 pCi/g pass pass pass pass pass pass Radium-228 Ra-228 2.91 pCi/g FAIL FAIL FAIL pass pass pass pass Thallium-208 TI-208 0.868 pCi/g pass pass pass pass pass FAIL pass FAIL FAIL FAIL Thorium-234 Th-234 3.13 pCi/g 0.02429 pCi/g Tritium pass pass pass pass pass H-3 pass pass pass pass Uranium-234 U-234 2.78 pCi/g FAIL FAIL FAIL pass pass pass pass pass pass 0.287 pCi/g Uranium-235/236 U-235/236 lpass pass pass pass FAIL FAIL Uranium-238 FAIL U-238 2.9 pCi/g pass pass pass pass pass pass Americium-241 Am-241 -0.00101 pCi/g Cerium-139 Ce-139 -0.0144 pCi/g -0.00727 pCi/g Cesium-137 Cs-137 Cobalt-60 -0.00614 pCi/g Co-60 -0.073 pCi/g Europium-152 Eu-152 -0.0338 pCi/g La-140 Lanthanum-140 0.0361 pCi/g Mercury-203 Hg-203 0 pCi/g Plutonium-238 Pu-238 Plutonium-239/240 Pu-239/240 -0.0041 pCi/g Radium-223 0.121 pCi/g Ra-223 -0.0901 pCi/g Ruthenium-106 Ru-106 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

page 3 of 5

Sampling event ID

3233

SWMU ev 3233.2085.2084.209 **Radioisotopes**d **E@lfme**v3233 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	TI-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	2. 2.
Thorium-231	Th-231	0.121	pCi/g	U	
Tin-113	Sn-113	-0.000488	pCi/g	U	
Uranium-235	U-235	0.129		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

		concentr		Results					
Analyte	CAS/ Symbol	ation	Unit	(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	Ве	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		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	К	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		ug/kg		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	
NOTE 1: This ta	IOTE 1: This table contains all detected, non D-coded analytes TOTAL 0.645 1.003 % (all analytes from all pages were								

NOTE 2: Highlighted analytes are potentially F-coded

0.645

1.003 % (all analytes from all pages were added for this total

## **Additional Constituents - RAD**

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

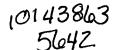
% of total | % of total rad from rad from Max Total Min Total Max Min Max Min Ci from Ci from CAS/ Symbol Result Result Unit values values isotope isotope comments Analyte 2.260 pCi/g 4.22 4.24 5.1E-07 4.5E-07 Bismuth-214 Bi-214 2.550 5.9E-07 5.8E-07 2.900 pCi/g Lead-212 Pb-212 2.970 4.91 5.44 Lead-214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

volume of waste: 200 kg

NOTE 1: This table contains all detected radioisotopes

pages were added for this total

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.



Water Quality and RCRA Group Los Alamos National Laboratory

## **Request for Land Application of Drill Cuttings Form**

<b>Decision Tree—Decision Point Evaluation</b>							
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:	Ē						
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.		Ľ					
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	FRIULL	Project Mar	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:

are brekgen als allow EN FER (MIGTIN Signature ENV-RCRA Reviewer Name (Print) Package Expiration Date: 5/28/11

10143863

5642

Water Quality and RCRA Group Los Alamos National Laboratory ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

## Post Land Application Field Certification Sheet

Date(s) of land application: 3/2/1/ Project: MDAC Phase I	
Location of land application: $WHun Phyloth Location Date: TA: 50 (SWMU)$ EX-ID Number: $UX - 0815 - 50$ EX-ID Expiration Date: $4/12/2011$	-50-009
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.

"Sh

3/3/11

Name (Print)

Signature

Title

Date

Sampling event ID 3233

## **Solid Waste Evaluation**

page 1 of 5

SWMU ev3233.2088.2096 Stockpile Number ev3233.2088.2096 SummaryExcel file: ev3233.2088.2096.awd.2.24.2011(1).xlsm evaluation date: 2/24/2011

RCRA							
	33	analytes pas	ss				
between these	32	analytes pas	ss as undete	cted			
	10	analytes fai	1				
Detects						· · ·	
		Total	PCB (ppm)	Not analy	ł		
		s with potenti	al F-code		on-wastewater LDR:	8 pass	0 FAIL
		s with potenti		ŀ	lazardous soil LDR:	8 pass	0 FAIL
		s with potenti					
0	analyte	s with potenti	al P-code				
	R	esidential So	oil (ma/ka) :	15 pass	0 FAIL		
Indus		cupational So			0 FAIL		
Co	onstructio	on Worker Sc	oil (mg/kg) :	12 pass	1 FAIL		
	Re	creational Sc	oil (mg/kg) :	15 pass	0 FAIL		
			ackground:		0 FAIL		
	Canyo	n Sediment b	•	•	0 FAIL		
			ackground:				
	0		ackground:		0 FAIL		
	QDT	g, Qct,Qbo b	ackground:	17 pass	1 FAIL		
RAD			total dose:	0.8375	mRem/year		
		d for H-3					
	-	d for Pu-239 isotopes,		10	were detected		
	50	isotopes,			undetected		
				13	undetected		
Residen-ti	al SAL:	3 pass		0 FAIL			
	al SAL:	•		0 FAIL			
Constr. Worke	er SAL:	5 pass		0 FAIL			
Recrea-tion		•		0 FAIL	_		
		6 pass		3 FAIL			
Canyon Sed		•		3 FAIL			
	T2,3,4:			7 FAIL			
	QBt 1v:			0 FAIL			
Qbt 1g, Qo	л, QDO:	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	WST50-11-2088 WST50-11-2096	

SWMU ev3233.2088.2096 Stockpile Number ev3233.2088.2096

### **Detected Chemicals Form**

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

evaluation date: 2/24/2011

Nonconcenunit of wastewater Hazardous Potential Haz CAS/ Symbol Soil LDR Analyte tration measure LDR Potential Haz F-codes Potential Haz K-codes Potential Haz U-codes P-codes comments Aluminum AI 1710 mg/kg K031,K060,K161,K171,K172,K176,K 0.269 mg/kg 084,K101,K102, Arsenic As pass pass Barium Ba 13 mg/kg pass pass 13 mg/kg 0.523 mg/kg 679 mg/kg 2.13 mg/kg 0.663 mg/kg 1.89 mg/kg 4440 mg/kg Beryllium Be pass pass Calcium Са K090, Chromium Cr pass pass Cobalt Co Copper Cu Fe Iron K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52.K061.K069. 5.55 mg/kg Lead РЬ pass Dass 384 mg/kg 153 mg/kg Magnesium Manganese Mg Mn 1.37 mg/kg Nickel Ni pass Dass 1.2 mg/kg 1.2 mg/kg 415 mg/kg 374 mg/kg 0.426 mg/kg Nitrate NO3 Potassium κ Sodium Na Uranium U Vanadium ĪV 2.97 mg/kg pass pass 29.3 mg/kg Zn pass pass Zinc

page 3 of 5

# 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
	As	0.269	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
	Be	0.523	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
-	Ca		mg/kg	NA			NA	pass	pass	pass	pass	pass
	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
	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	К	415	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na		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		pass	pass	pass	pass	pass	pass	pass	pass	pass
Zinc	Zn	29.3	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

page 3 of 5

Sampling event ID 3233

### SWMU ev3233.2088.2096 Stockpile Number ev3233.2088.2096

### SAL and background comparis on ev3233.2088.2096.awd.2.24.2011(1).xlsm

evaluation date: 2/24/2011

unit of Indust-Constr. Recrea-Canyon Obt 1g, CAS/ concenmeasur Residenrial Worker QBT2. tional Sedi-QBt Qct. Analyte Symbol tration tial SAL SAL SAL SAL Soil ment 3.4 1v Qbo A Bismuth-214 Bi-214 2.1 pCi/g FAIL pass pass pass pass Lead-212 Pb-212 2.82 pCi/g FAIL FAIL FAIL pass pass tead-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/a Radium-226 Ra-226 2.1 pCi/g FAIL pass pass pass pass pass pass 2.73 pCi/a Radium-228 Ra-228 FAIL FAIL FAIL pass pass pass pass Thallium-208 TI-208 0.792 pCi/g pass pass pass pass pass Uranium-234 Ū-234 2.24 pCi/g pass pass pass pass pass pass FAIL pass pass 0.1 pÇi/g Uranium-235/236 U-235/236 pass pass pass pass Uranium-238 U-238 2.19 6Ci/g pass pass FAIL pass pass pass pass pass pass Americium-241 Am-241 -0.00615 pCi/g Cerium-139 Ce-139 -0.00444 pCi/g -0.0328 pCi/g Cesium-137 Cs-137 Co-60 Cobalt-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/a Plutonium-239/240 Pu-239/240 0.00129 pCi/g Radium-223 Ra-223 -0.368 pCi/q 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 RAO 2-287 Yttrium-88 Y-88 -0.00054 pCi/g 5 Ra ZZO 2.73-0.4 for land app.  $Ra^{228}$  2.73-2.33 = 0.4

0% for land app

BIN 5765 # 10143864

Water Quality and RCRA Group Los Alamos National Laboratory

4

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

50-613185

### **Request for Land Application of Drill Cuttings Form**

ENV-RCRA must approve any deviation(s) from this request prior to lan	d application	•	_
Date: $12010$ Project: $100$ Project: $100$ Phase $11$ Location of Land Application: $100$ Phase $11$ TA: $50$ (SW) Estimated Quantity: $48$ ft $3$ (cubic feet or tons) Composition (e.g., 98% tuff and 2% quick gel, etc.): $10090$ Soil Proposed Method of Land Application (describe): $10090$ Soil Proposed Method of Land Application (describe): $10090$ Soil 10090 Soil Note: An EX-ID Permit is required prior to land application. $100$ - $0849$ - $50$	mu 50 <u>appluo</u> l isiljaista	-009) <u>v</u> be0[	
Decision Tree—Decision Point Evaluation			-
<ul><li>The following questions require yes or no answers.</li><li>1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.</li></ul>	Yes	No	
<b>2.</b> D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:		V V	
<ul><li>Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.</li><li>Has a <i>No Longer Contained In</i> been approved for this waste? Attach a copy of the <i>No Longer</i></li></ul>	$\checkmark$		
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?	Ľ		
Generator or Project Leader Certification: I certify that the drill cuttings described in this request application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision Tree and that the drill cuttings will be land applied as described.         Application per the Decision per the Decision per the drill cuttings.         Application per the Decision per the Decision per the Decision per the Decision per the drill cuttings.         Application per the Decision p	ipi	iteria for land	RRD
ENV-RCRA Review (below): Does request provide all the required information, and do the drill cuttings meet all the criteria for Yes No Note deficiency in the space provided:	or land applica	ition?	-
ENV-RCRA Reviewer Name (Print) <u>Signature</u> Signature <u>Souly</u>	2m Qu Dat	e 1-25-11	

10 # 10143864 Bin 5765

Water Quality and RCRA Group Los Alamos National Laboratory

ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

**Post Land Application Field Certification Sheet** 

Date(s) of land application: F	Project: MDAC Phase. III	
Date(s) of land application: H Location of land application: Project F	Ecotphint TA: 50 (SWI	<u>MU</u> 50-009)
EX-ID Number: $10 \times -0849 - 50$ EX	X-ID Expiration Date: <u>4/29/11</u>	
Please explain any deviations from original application (A	Attachment 2) in the space provided:	
		_
Note: ENV-RCRA must approve any deviations from Att	ttachment 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.

ani Fuller

Project Mgr. 1/28/11 Date

PRS Number: 50-0	09 (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.

	Documents Reviewed	
Date	Title	ER ld 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

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

	094688 091493
ork Plan for MDA C, SWMU 50-009 at TA-	)91493
ork Plan for MDA C, SWMU 50-009 at TA-	)87152
ork Plan for MDA-C, SWMU 50-009 at TA-	)87392
for Operable Unit 1147	007672
	007513
Volume 1 of IV (TA-00 through TA-09)	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
			K031,K060,K161,K171,
			K172,K176,K084,K101,
Arsenic	0.304	F032,F034,F035,	K102,
		F032,F034,F035,F037,	K090
Chromium	4.42	F038,	
			K002, K003, K005,
			K048, K049, K051,
			K062, K064, K086,
			K100, K176, K046,
Lead	11.1	F035,F037,F038,	K052, K061, K069
Nickel	2.18	F006	

¢

page 3 of 5

Sampling event ID

3233

### SAL and background comparison file: ev3233.2084.awd.1.13.2011(1).xlsm

SWMU ev 3233.2084 Stockpile Number ev 3233.2084

AL and Dackground Compaties EXE! file: ev3233.2084.awd.1.13.2011(1).xlsm evaluation date: 1/13/2011

			unit of		Indust-	Constr.	Recrea-		Canyon			Qbt 1g,
	CAS/	concen-	measur	Residen-	rial	Worker	tional		Sedi-	QBT2,	QBt	Qct,
Analyte	Symbol	tration	е	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	Qbo
Bismuth-214	Bi-214	2.55	pCi/g	$\sim$		$\sim$	$\sim$	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		pCi/g	/				pass	pass	pass	pass	pass
Radium 226/228	calc.	5.07	pCi/g	/	/				/	$\backslash$	$\sum$	
Radium-226	Ra-226		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	TI-208	0.868	pCi/g	/				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	/		/	$\langle$	/
Uranium-238	U-238		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		$\backslash$	/	/	$\backslash$		$\langle$	$\leq$	
Cesium-137	Cs-137	-0.00727				/			/	/	$\backslash$	/
Cobalt-60	Co-60	0.0208		/	/	/	/	$\overline{)}$	/	$\backslash$	/	/
Europium-152	Eu-152	-0.073	pCi/g	/	/			$\langle$	/	$\backslash$	$\langle$	/
Lanthanum-140	La-140	-0.0263	pCi/g	/	/	/	/	/	/	$\backslash$	$\backslash$	
Plutonium-238	Pu-238	0	pCi/g		/	/	/		/	$\backslash$		/
Plutonium-239/240	Pu-239/240	-0.00141	pCi/g	/	/	/	/	/		/	$\langle$	/
Radium-223	Ra-223	0.121		/	/	/	/		/		$\geq$	/
Ruthenium-106	Ru-106	-0.0901				/	/	/	/	/	/	/
Sodium-22	Na-22	0.0278		/		/	/		/		$\backslash$	/
Strontium-85	Sr-85	0.0156		/	/	/	/	/		/	/	/
Strontium-90	Sr-90	-0.0542	pCi/g	/	/		/		/	/	$\smallsetminus$	/
Thorium-227	Th-227	-0.141	pCi/g	/				/	/	/	/	/
Thorium-231	Th-231	0.121	pCi/g		$\sim$	$\sim$	/		/		$\geq$	$\backslash$
Tin-113	Sn-113	-0.00049		/	$\sim$	$\sim$	/	$\geq$	/		$\geq$	$\backslash$
Tritium	H-3	-0.01401			$\sim$	$\sim$	//	$\langle$	$\backslash$	$\backslash$	$\leq$	$\sim$
Uranium-235	U-235	0.129	pCi/g			$\sim$	//	$\overline{)}$		$\backslash$	$\sim$	$\backslash$
Yttrium-88	Y-88	0.01	pCi/g	/	$\backslash$	$\sim$	$\backslash$	$\backslash$	/	$\backslash$	$\sim$	$\sim$

 $R_{0}^{228} = 2.57 - 2.33 = 0.19 / 5 = 0.038$   $u^{234} = 2.78 - 2.59 = 0.19 / 213 = 0.000892$   $u^{238} 2.90 - 2.29 = 0.61 / 140 = 0.00436$  0.0432 - 1 0.0432 - 10.0432 - 1

SWMU ev 3233.2084

### **Detected Chemicals Form**

Stockpile Number ev 3233.2084

F

page 3 of 5 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	AI	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	Са	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		K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
Magnesium	Mg	829	mg/kg		·P					
Manganese	Mn	123	mg/kg					······································		
Nickel	Ni	2.18	mg/kg	pass	pass	F006,				전 이상 사람은 것 같은 것
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			· · · · · · · · · · · · · · · · · · ·		

### Solid Waste Evaluation

page 1 of 5

SWMU ev 3233.2084 Stockpile Number ev 3233.2084 Summary iated Excel file: ev3233.2084.awd.1.13.2011(1).xlsm evaluation date: 1/13/2011

RCRA	
33 analytes pass	
between these <u>32</u> analytes pass as undete	cted
10 analytes fail	
Detects	
Delecis	
Total PCB (ppm)	Non-contract of the second
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	
o analytes with potential 1-code	
Residential Soil (mg/kg):	14 pass 0 FAIL
Industrial/ Occupational Soil (mg/kg) :	
Construction Worker Soil (mg/kg) :	
Recreational Soil (mg/kg) :	14 pass 0 FAIL
soil background:	
Canyon Sediment background:	•
Qbt 2,3,4 background: Qbt 1v background:	
Qbt 1g, Qct,Qbo background:	
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 Soil: 4 pass	0 FAIL 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
	Al	1650	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
	Sb			pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
	Ba			pass	pass	pass	pass	pass	pass	pass	pass	pass
	Be	0.21	mg/kg		pass			pass	pass	pass	pass	pass
	Са	1130	mg/kg	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		<u> </u>	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				pass			pass	pass	pass	pass	pass
Magnesium	Mg	829		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		mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	К			NA	NA		NA	pass	pass	pass	pass	pass
Sodium	Na			NA	NA		NA	pass	pass	pass	pass	pass
Uranium	U		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



.

.

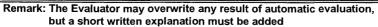
Sampling event ID 3233

### Solid Waste Evaluation

page 1 of 5

SWMU ev 3233.2085.2084.2094 Stockpile Number ev 3233.2085.2084.2094 Summary cel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm evaluation date: 1/20/2011

DCDA	
RCRA	
33 analytes pass between these 31 analytes pass as undeted	ted
10 analytes fail	
Detects	
· · · · · · · · · · · · · · · · · · ·	
Total PCB (ppm)	
<ul> <li>4 analytes with potential F-code</li> <li>4 analytes with potential K-code</li> </ul>	Non-wastewater LDR: 9 pass 0 FAIL Hazardous soil LDR: 9 pass 0 FAIL
0 analytes with potential U-code	Hazardous soil LDR: 9 pass 0 FAIL
0 analytes with potential P-code	
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:	the second s
Qbt 1v background:	
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
•	0 FAIL
	0 FAIL
· · · · · · · · · · · · · · · · · · ·	0 FAIL
	6 FAIL
	6 FAIL 9 FAIL
	9 FAIL 3 FAIL
	0 FAIL



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

page 3 of 5 associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm

evaluation date: 1/20/2011

SWMU ev 3233.2085.2084.2094 RCRA Characteristics Form

Stockpile Number ev 3233.2085.2084.2094

	I	Potential	Reg.	concen-	unit of		Pass/	
Analyte	CAS/ Symbol	Haz Code	limit	tration	measure	Qualifier	Fail	comments
Arsenic	As		5000	50	ug/L	lυ	pass	
Barium	Ba	D005	100000		ug/L	J	pass	
Cadmium	Cd		1000		ug/L	U	pass	
Chromium	Cr		5000	21.5	ug/L	U	pass	
Lead	Pb	D008	5000	18.7	ug/Ľ	J	pass	3
Mercury	Hg		200		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	1	FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L		FAIL	
Benzene	71-43-2		500	0.053		U	pass	
Carbon Tetrachloride	56-23-5		500	0,053		U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30	en en	ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020	$\sim$		ug/L	1	FAIL	
Chlordane[alpha-]	5103-71-9	D020	$\sim$		ug/L		FAIL	, // - (
Chlorobenzene	108-90-7		100000	0.053	ug/L	U	pass	
Chloroform	67-66-3		6000	0.053		Ū	pass	
Methylphenol[2-]	95-48-7		200000		ug/L	U	pass	
Methylphenol[3-]	108-39-4		200000		ug/L	U	pass	
Methylphenol[4-]	106-44-5		200000		ug/L	Ū	pass	
Methylphenol[3-,4-]	65794-96-9		200000	17.6		Ū	pass	
Methylphenol(total)	8027-16-5		200000	35.2	ug/L	UU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500		ug/L	U	pass	
Dichloroethane[1,2-]	107-06-2		500	0.053		U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.053	ug/L	U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	17.6		U	pass	
Heptachlor	76-44-8	D031	8	Énera 1996	ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	17.6		U	pass	
Hexachlorobutadiene	87-68-3		500	17.6	ug/L	U	pass	
Hexachloroethane	67-72-1		3000		ug/L	υ	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		ug/L	U	pass	
Pyridine	110-86-1		5000	17.6		U	pass	
Tetrachloroethene	127-18-4		700	0.053	ug/L	U	pass	
Trichloroethene	79-01-6		500	0.053		U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	17.6		U	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	17.6		Ū	pass	
Vinyl Chloride	75-01-4		200	0.053	ua/L	lū	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
Antimony	Sb	0.71	mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
	As		mg/kg		pass	pass	pass		pass			pass
	Ba		mg/kg	pass	pass	pass	pass	pass	pass		pass	pass
Beryllium	Be		<u> </u>	pass			pass	pass	pass			pass
Calcium	Ca		¥¥			NA	NA	pass	pass			pass
Chromium	Cr			pass	1		pass	pass	pass	· · · · · · · · · · · · · · · · · · ·	FAIL	FAIL
Cobalt	Со		<u> </u>	pass	pass	1	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		mg/kg	and the second s		pass	11	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			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		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

**Detected Chemicals Form** 

SWMU ev 3233,2085.2084.2094 Stockpile Number ev 3233.2085.2084.2094

3233

# page 3 of 5 associated Excel hie: ev3233 2085 2084 2094 awd 1 20 2011,xism

evaluation date: 1/20/2011

Analyte	CAS/ Symbol		No nit of wastev asure LD	vater Hazardous	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	Potential Haz P-codes	comments
Aluminum	Al	1650 mg/kg							在10月1日日日日日日 (11月1日日日日)) (11月1日日日日日日)
Antimony	Sb	0.71 mg/kg	g pass	pass		K161,K021.K177,			
Arsenic	As	0.304 mg/kg		pass		K031,K060,K161,K171,K172,K176,K 084,K101, <u>K102,</u>			
Barium	Ва	15.3 mg/kg		pass					
Beryllium	Be	0.633 mg/kg		pass					
Calcium	Ca	1130 mg/kg							
Chromium	Cr	4.42 mg/kg		pass ·	F022F12EE005F627F22E	K090,			
Cobalt	Со	0.883 mg/kg							
Copper	Cu	3.6 mg/kg							
Iron	Fe	5350 mg/kg	g l						
Lead	Pb	11.1 mg/kg	q pass	pass	TO SEE STORE	K002, K003, K005, K048, K049, K051, K 062, K064, K086, K100, K176, K046, K0 52, K061, K069,			
Magnesium	Mg	829 mg/k							
Manganese	Mn	212 mg/k					· · · · · · · · · · · · · · · · · · ·		
Nickel	Ni	2.18 mg/k	g pass	pass	FOOC				
Potassium	К	419 mg/k	g					÷	
Sodium	Na	390 mg/k							
Uranium	U	0.833 mg/k							
Vanadium	V	4.16 mg/k		pass					
Zinc	Zn	39.3 mg/k	g pass	pass					

.

#### page 3 of 5

#### Sampling event ID

#### SWMU ev 3233.2085.2084,2094 SAL and backgrounds comparison 3233 2085 2084 2094 awd 1 20 2011.xlsm Stockpile Number ev 3233.2085.2084.2094 evaluation date: 1/20/2011

unit of Qbt 1g, Indust-Constr. Recrea-Canyon Worker CAS/ measur Residenrial Sedi-QBT2, concentional QBt Qct, Analyte Symbol tial SAL tration e SAL SAL SAL Soil ment 3,4 1v Qbo Bismuth-214 Bi-214 2.55 pCi/g FAIL pass pass pass pass Lead-212 2.97 pCi/g Pb-212 FAIL FAIL FAIL pass pass Lead-214 Pb-214 3.31 pCi/g FAIL FAIL FAIL pass FAIL Potassium-40 K-40 36.2 pCi/g FAIL pass pass pass FAIL 5.46 pCi/g Radium 226/228 calc. Radium-226 FAIL 2.55 pCi/g Ra-226 pass pass pass pass pass pass Radium-228 Ra-228 2.91 pCi/g pass FAIL FAIL FAIL pass pass pass Thallium-208 TI-208 0.868 pCi/g pass pass pass pass pass Thorium-234 Th-234 3.13 pCi/g FAIL FAIL FAIL FAIL pass Tritium 0.02429 pCi/g H-3 pass pass pass pass pass pass pass pass pass Uranium-234 U-234 2.78 pCi/g FAIL FAIL FAIL pass pass pass pass pass pass 0.287 pCi/g Uranium-235/236 U-235/236 pass pass pass pass Uranium-238 U-238 2.9 pCi/g FAIL FAIL FAIL pass pass pass pass pass pass Am-241 -0.00101 pCi/g Americium-241 -0.0144 pCi/g Cerium-139 Ce-139 Cesium-137 Cs-137 -0.00727 pCi/g -0.00614 pCi/g Cobalt-60 Co-60 Europium-152 -0.073 pCi/g Eu-152 -0.0338 pCi/g Lanthanum-140 La-140 Mercury-203 Hg-203 0.0361 pCi/g Plutonium-238 Pu-238 0 pCi/g -0.0041 pCi/g Plutonium-239/240 Pu-239/240 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 -0.00049 pCi/g Tin-113 Sn-113 Uranium-235 U-235 0.129 pCi/g Yttrium-88 0.00142 pCi/g Y-88

page 3 of 5

SWMU ev 3233.2085.2084.209 **Radioisotopes**d **E@lfime**v3233 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	TI-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		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		U	
Yttrium-88	Y-88	0.00142		U	

### **Additional Constituents - Chemicals**

Sampling event ID 3233 SWMU ev 3233.2085.2084.2094 associated Excel file: ev3233 2085 2084 2094 awd 1 20 2011.xlsm evaluation date: 1/20/2011

Stockpile Number ev 3233.2085.2084.2094

		concentr		Results					
Analyte	CAS/ Symbol	ation	Unit	(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	Са	1130000	ug/kg	1130.000	474.000	1130.000	0.047	0.113	
Cobalt	Со	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	К	419000	ug/kg	419.000	282.000	419.000	0.028	0.042	
Sodium	Na	390000		390.000	200.000	390.000	0.020	0.039	
Uranium	U		ug/kg	0.833	0.150	0.833	1.5E-05	8.3E-05	a a construction of the co
Vanadium	V		ug/kg	4.160	1.330	4.160	1.3E-04	4.2E-04	nan tanaharan tara tara dara dara dara dara dara dara
Zinc	Zn	39300		39.300	12.300	39.300	1.2E-03	3.9E-03	
NOTE 1: This t	IOTE 1: This table contains all detected, non D-coded analytes							1.003	% (all analytes from all pages were

NOTE 1: This table contains all detected, non D-coded analytes NOTE 2: Highlighted analytes are potentially F-coded **1.003** % (all analytes from all pages were added for this total

### Additional Constituents - RAD

volume of waste: 200 kg

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

Sampling event ID 3233 SWMU ev 3233.2085.2084.2094 Stockpile Number ev 3233.2085.2084.2094

		Maria			% of total rad from	% of total rad from Min	Max Total Ci from	Min Total Ci from	
Analyte	CAS/ Symbol	Max Result	Min Result	Unit	Max values	values	isotope	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	TI-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

NOTE 1: This table contains all detected radioisotopes

pages were added for this total

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.

BIN	5659
-----	------

# 10143865

Water Quality and RCRA Group Los Alamos National Laboratory

AB1

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

50-613182

**Request for Land Application of Drill Cuttings Form** 

ENV-RCRA must approve any deviation(s) from this request prior to	and application	•	_
Date: 12011 Project: MDA C Phase III Location of Land Application: 10thin project footprint TA: 50 ( Estimated Quantity: 571 ft <sup>3</sup> (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 Within - Me, project feetprint (Swmu 50-609) to proviously Andas and Covered with a layer of road base Note: An EX-ID Permit is required prior to land application. 10X - 0815 - 57	applied Clisturbe (	-009) <u>+</u>	
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.	Ĺ		
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:		ď	
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.	Ţ/		
Has a No Longer Contained In been approved for this waste? Attach a copy of the No Longer			
Contained In approval.			
<b>3.</b> D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?	B		
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?		l and	
Generator or Project Leader Certification: I certify that the drill cuttings described in this re application per the Decision Tree and that the drill cuttings will be land applied as described. SHEPHAN FULL PART HALL Name (Print) Signature Fitle	quest meet the cri	teria for land 시॥ ate	ppi)
ENV-RCRA Review (below): Does request provide all the required information, and do the drill cuttings meet all the criteri Yes No Note deficiency in the space provided:	a for land applica	ition?	
ENV-RCRA Reviewer Name (Print) <u>Sole has Sukley</u> Signature <u>Signature</u>	Lin Day Dat	1-25-11 ° e <u>211-11</u>	R

10 # 10143865 Bin 5659

> Water Quality and RCRA Group Los Alamos National Laboratory

ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

Post Land Application Field Certification Sheet

Date(s) of land application:	Project:	MDA C	Phases Ill	<u> </u>
Location of land application:			TA: <u>50</u>	<u>(Smmu</u> 50-004)
EX-ID Number:() \ -0.815 - 50	EX-ID Exp	iration Date:		
Please explain any deviations from original application	(Attachmen	t 2) in the space	provided:	
		······································		
Note: ENV-RCRA must approve any deviations from	Attachment	2 prior to land ap	oplication.	

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.

vani Fuller

Project Mgr. 1/8/11

Date

Name (Print)

Signature

PRS Number: 50-0	09 (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.

	Documents Reviewed						
Date	Title	ER ld 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					

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

Phase II Investigation Work Plan for MDA C, Rev. 1	100143
Investigation Report for MDA C, SWMU 50-009	094688
Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 2	091493
Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 1	087152
Investigation Work Plan for MDA-C, SWMU 50-009 at TA- 50	087392
RFI Work Plan for Operable Unit 1147	007672
SWMU Report, Volume 1 of IV (TA-00 through TA-09)	007513
PRS Database	NA
	Investigation Report for MDA C, SWMU 50-009 Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 2 Investigation Work Plan for MDA C, SWMU 50-009 at TA- 50, Rev. 1 Investigation Work Plan for MDA-C, SWMU 50-009 at TA- 50 RFI Work Plan for Operable Unit 1147 SWMU Report, Volume 1 of IV (TA-00 through TA-09)

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

### Attachment 1.

page 3 of 5

3233

#### SWMU ev 3233.2083.2093 Stockpile Number ev 3233.2083.2093

Sampling event ID

SAL and background comparison ev3233.2083.2093.awd.1.13.2011(1).xlsm evaluation date: 1/13/2011

Qbt 1g, unit of Indust-Constr. Recrea-Canyon CAS/ measur Residen-Worker concenrial tional Sedi-QBT2. QBt Qct, Analyte Symbol tration tial SAL SAL SAL SAL Soil 3,4 Qbo e ment 1v Bismuth-214 Bi-214 2.46 pCi/g FAIL pass pass pass pass Lead-212 Pb-212 2.36 pCi/g FAIL FAIL pass pass pass Lead-214 Pb-214 2.39 pCi/g FAIL pass pass pass pass K-40 Potassium-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 FAIL pass pass pass pass pass pass Radium-228 FAIL FAIL Ra-228 2.42 pCi/g pass pass pass pass pass Thallium-208 TI-208 0.658 pCi/g pass pass pass pass pass Tritium 0.04751 pCi/g H-3 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 2.17 pCi/g Uranium-238 pass FAIL U-238 pass pass pass pass pass pass pass Americium-241 -0.0009 pCi/g Am-241 Cerium-139 Ce-139 -0.0224 pCi/g Cesium-137 Cs-137 -0.0121 pCi/g Cobalt-60 0.0137 pCi/g Co-60 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 0.13 pCi/g Th-227 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 0.0509 pCi/g U-235 Yttrium-88 Y-88 0.00172 pCi/g

 $Ra^{228}$  2.46 - 2.33 = 0.13 25 (attachment 6) OK to land apply

#### 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		mg/kg	pass	pass		K031,K060,K161,K171,K172,K176,K 084,K101,K102,			
Barium	Ва	70.5	mg/kg	pass	pass					
Beryllium	Be	0.346	mg/kg	pass	pass					an a
Chromium	Cr		mg/kg	pass	pass	F032,F034,F035,F037,F038,	K090,			
Cobalt	Co		mg/kg							
Copper	Cu		mg/kg							
Iron	Fe	7150	mg/kg							
Lead	Pb	46	mg/kg	pass	pass		K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
Manganese	Mn		mg/kg		1					
Methyl-2-pentanone[4-]		0.00382		pass	pass					F003,U161 codes not applicable
Nickel	Ni	5.68	mg/kg	pass	pass	F006,				
Nitrate	NO3	0.934	mg/kg							
Potassium	К	819	mg/kg							
Sodium	Na	540	mg/kg							
Uranium	U	0.282	mg/kg			1				
Vanadium	V	11.2	mg/kg	pass	pass					
Zinc	Zn	18.3	mg/kg	pass	pass					

#### page 3 of 5

### **Solid Waste Evaluation**

page 1 of 5

SWMU ev 3233.2083.2093 Stockpile Number ev 3233.2083.2093 SummaryExcel file: ev3233.2083.2093.awd.1.13.2011(1).xlsm evaluation date: 1/13/2011

				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
RCRA 33 analytes pass between these 31 analytes pass 10 analytes fail	as undeted	cted			
Detects					<u></u>
Total P	CP (nnm)	Notanaly	1		
4 analytes with potential 3 analytes with potential 0 analytes with potential 0 analytes with potential	F-code K-code U-code		n-wastewater LDR: lazardous soil LDR:		0 FAIL 0 FAIL
Canyon Sediment bac Qbt 2,3,4 bac	(mg/kg) : (mg/kg) : (mg/kg) : ckground: ckground: ckground: ckground:	16 pass 14 pass 16 pass 16 pass 16 pass 14 pass 10 pass	0 FAIL 0 FAIL 0 FAIL 0 FAIL 0 FAIL 0 FAIL 2 FAIL 7 FAIL		
RAD ti	otal dose:	0.8198	mRem/year		<u> </u>
? analysed for H-3 analysed for Pu-239 32 isotopes,			were detected undetected		
Residen-tial SAL: 4 pass Indust-rial SAL: 4 pass Constr. Worker SAL: 6 pass Recrea-tional SAL: 6 pass Soil: 8 pass Canyon Sedi-ment: 8 pass QBT2,3,4: 5 pass QBT 1v: 10 pass Qbt 1g, Qct, Qbo: 10 pass		0 FAIL 0 FAIL 0 FAIL 2 FAIL 2 FAIL 5 FAIL 0 FAIL 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	AI	4030	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
	As		<u> </u>	pass	pass	pass	pass	pass	pass			pass
Barium	Ва		<b>V V</b>	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
Beryllium	Be			pass	pass		pass	pass	pass		pass	pass
Chromium	Cr			pass	pass	NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Со		¥ ¥	pass	pass	pass	pass	pass	pass	pass	FAIL	pass
Copper	Cu		<u> </u>	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			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	<b>v v</b>	pass	pass	pass	pass				the second s	NA
Nickel	Ni		mg/kg	pass	pass	pass	pass		pass	pass	FAIL	FAIL
Nitrate	NO3		mg/kg	pass	pass	pass	pass			NA	NA	NA
Potassium	к		mg/kg	NA	NA		NA	pass	pass	pass	pass	pass
Sodium	Na		mg/kg	NA	NA		NA	pass	pass	pass	pass	pass
Uranium	U		mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V		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

BOREHOUE 50-613182

Sampling event ID 3233 SWMU ev 3233

### Solid Waste Evaluation

page 1 of 5

Summaryed Excel file: AWD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

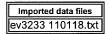
Stockpile Number ev 3233

<ul> <li>8 analytes with potential K-code</li> <li>3 analytes with potential U-code</li> <li>0 analytes with potential P-code</li> <li>Residential Soil (mg/kg) : 23 pass</li> <li>Industrial/ Occupational Soil (mg/kg) : 23 pass</li> <li>Construction Worker Soil (mg/kg) : 20 pass</li> <li>Recreational Soil (mg/kg) : 23 pass</li> <li>Construction Worker Soil (mg/kg) : 20 pass</li> <li>Recreational Soil (mg/kg) : 23 pass</li> <li>Canyon Sediment background: 18 pass</li> <li>Qbt 2,3,4 background: 17 pass</li> <li>Qbt 1v background: 13 pass</li> <li>Qbt 1g, Qct,Qbo background: 9 pass</li> </ul>	between these 31 analytes pass as undetected 10 analytes fail	1
6 analytes with potential F-code       Non-wastewater LDR: 15 pass       0 FAI         8 analytes with potential U-code       0 analytes with potential P-code       0 FAIL         9 analytes with potential Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         1ndustrial/Occupational Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL       0 FAIL         Soil background: 18 pass       0 FAIL       0 FAIL         Qbt 1g, Qct,Qbo background: 19 pass       0 FAIL       0 FAIL         Qbt 1g, Qct,Qbo background: 9 pass       0 FAIL       0 FAIL         analysed for H-3       0 Analysed for Pu-239       12 were detected         32 isotopes,       12 were detected       19 undetected         Residen-tial SAL: 4 pass       0 FAIL       0 FAIL         Constr. Worker SAL: 6 pass       0 FAIL       0 FAIL         Soil: 8 pass       0 FAIL       0 FAIL         Soil: 8 pass       0 FAI	Detects	
6 analytes with potential F-code       Non-wastewater LDR: 15 pass       0 FAI         8 analytes with potential U-code       0 analytes with potential U-code       0 FAIL         0 analytes with potential P-code       0 FAIL       0 FAIL         Residential Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 20 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Qubt 2,3,4 background: 18 pass       0 FAIL         Qbt 1g, Qct,Qbo background: 19 pass       0 FAIL         Qbt 1g, Qct,Qbo background: 9 pass       0 FAIL         Analysed for H-3       0 FAIL         analysed for H-3       0 FAIL         analysed for H-3       0 FAIL         analysed for Pu-239       12 were detected         32 isotopes,       12 were detected         19 undetected       19 undetected         Recreational SAL: 4 pass       0 FAIL         Constr. Worker SAL: 6 pass       0 FAIL         Soii: 8 pass       0 FAIL <t< th=""><th>Total PCB (ppm) No</th><th>tanaly</th></t<>	Total PCB (ppm) No	tanaly
3 analytes with potential U-code 0 analytes with potential P-code Residential Soil (mg/kg) : 23 pass Industrial/Occupational Soil (mg/kg) : 23 pass Construction Worker Soil (mg/kg) : 23 pass Recreational Soil (mg/kg) : 23 pass Soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2,3,4 background: 17 pass Qbt 1, Qct,Qbo background: 9 pass Qbt 1g, Qct,Qbo background: 9 pass Abt 1g, Qct,Qbo background: 9 pass analysed for H-3 analysed for H-3 analysed for H-3 analysed for Pu-239 32 isotopes, Recrea-tional SAL: 4 pass Constr. Worker SAL: 6 pass Canyon Sedi-ment: 8 pass Canyon Sedi-ment: 8 pass QBT 1, 3,4: 5 pass QBT 1, 3,4: 5 pass QBT 1, 10 pass Canyon Sedi-ment: 8 pass Canyon Sedi-ment	6 analytes with potential F-code	Non-wastewater LDR: 15 pass 0 FAI
0 analytes with potential P-code Residential Soil (mg/kg) : 23 pass Industrial/Occupational Soil (mg/kg) : 23 pass Construction Worker Soil (mg/kg) : 20 pass Recreational Soil (mg/kg) : 20 pass Soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2,3,4 background: 17 pass Qbt 1v, background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass TFAIL T	, ,	Hazardous soil LDR: 15 pass 0 FAI
Residential Soil (mg/kg) : 23 pass       0 FAIL         Industrial/Occupational Soil (mg/kg) : 23 pass       0 FAIL         Construction Worker Soil (mg/kg) : 23 pass       0 FAIL         Recreational Soil (mg/kg) : 23 pass       0 FAIL         Soil background: 18 pass       0 FAIL         Soil background: 18 pass       0 FAIL         Qbt 2,3,4 background: 19 pass       0 FAIL         Qbt 1, background: 17 pass       0 FAIL         Qbt 1g, Qct,Qbo background: 9 pass       0 FAIL         TFAL       1 FAIL         TFAL       1 FAIL         TFAL       1 FAIL         Pass       0 FAIL         Qbt 1g, Qct,Qbo background: 9 pass       1 FAIL         TFAL       1 fFAIL         TFAIL       1 fFAIL         Industrial SAL: 4 pass       0 FAIL         Constr. Worker SAL: 6 pass       <		
Industrial/ Occupational Soil (mg/kg) : 23 pass Construction Worker Soil (mg/kg) : 20 pass Recreational Soil (mg/kg) : 23 pass Soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2, 3,4 background: 17 pass Qbt 1v background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass Abt 1g, Qct,Qbo background: 9 pass analysed for H-3 analysed for H-3 analysed for Pu-239 32 isotopes, Recrea-tional SAL: 4 pass Constr. Worker SAL: 6 pass Constr. Worker SAL: 6 pass Constr. Worker SAL: 6 pass Canyon Sedi-ment: 8 pass Canyon Sedi-ment: 8 pass QBT 1v; 10 pass Network 1 fall Canyon Sedi-ment: 8 pass QBT 1v; 10 pass Network 1 fall Canyon Sedi-ment: 8 pass QBT 1v; 10 pass Network 1 fall Network	0 analytes with potential P-code	
Industrial/ Occupational Soil (mg/kg) : 23 pass Construction Worker Soil (mg/kg) : 20 pass Recreational Soil (mg/kg) : 23 pass Soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2, 3,4 background: 17 pass Qbt 1, background: 13 pass Qbt 1, Qct,Qbo background: 9 pass Abt 1, Qct,Qbo background: 9 pass TAIL F	in the state of t	
Industrial/ Occupational Soil (mg/kg) : 23 pass Construction Worker Soil (mg/kg) : 20 pass Recreational Soil (mg/kg) : 23 pass Soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2, 3,4 background: 17 pass Qbt 1, background: 13 pass Qbt 1, Qct,Qbo background: 9 pass Abt 1, Qct,Qbo background: 9 pass TAIL F	Posidential Soil (ma/ka) + 23	
Construction Worker Soil (mg/kg) : 20 pass Recreational Soil (mg/kg) : 23 pass soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2,3,4 background: 17 pass Qbt 1y, Qct,Qbo background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass 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 0 FAIL Soil: 8 pass 0 FAIL Canyon Sedi-ment: 8 pass 0 FAIL QBT2,3,4: 5 pass 0 FAIL QBT12,3,4: 5 pass 0 FAIL QBT2,3,4: 5 pass 0 FAIL Constr. Worker SAL: 0 PASS 0 FAIL CANON Sedi-ment: 8 pase 0 FAIL CANON Sedi-ment: 8 pase 0 FAIL CA		1
Recreational Soil (mg/kg) : 23 pass soil background: 18 pass Qbt 2,3,4 background: 19 pass Qbt 1, Qct,Qbo background: 17 pass Qbt 1g, Qct,Qbo background: 9 pass 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 Constr. Worker SAL: 6 pass Recrea-tional SAL: 6 pass Soil: 8 pass Soil: 8 pass Canyon Sedi-ment: 8 pass QBT2,3,4: 5 pass QBT1, 3,4: 5 pass QBT1, 3,4: 5 pass QBT1, 3,4: 5 pass QBT2, 3,4: 5 pass QBT1, 10 pass DEALL Canyon Sedi-ment: 8 pass QBT2, 3,4: 5 pass		
soil background: 18 pass Canyon Sediment background: 19 pass Qbt 2,3,4 background: 17 pass Qbt 1v background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass Qbt 1g, Qct,Qbo background: 9 pass TFALL 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 Soil: 8 pass 3 FAIL QBT2,3,4: 5 pass 6 FAIL QBT2,3,4: 5 pass 6 FAIL QBT2,3,4: 5 pass 6 FAIL QBT 1v: 10 pass 1 FAIL		
Canyon Sediment background: 19 pass Qbt 2,3,4 background: 17 pass Qbt 1v background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass TALL FAL FA		
Qbt 2,3,4 background:       17 pass Qbt 1v background:       13 pass Qbt 1g, Qct,Qbo background:       9 pass         RAD       total dose:       0.8205 mRem/year         analysed for H-3 analysed for Pu-239 32 isotopes,       12 were detected         Residen-tial SAL:       4 pass       0 FAIL         Indust-rial SAL:       4 pass       0 FAIL         Constr. Worker 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 2,3,4:       5 pass       6 FAIL         QBT 1v:       10 pass       1 FAIL	8	
Qbt 1v background: 13 pass Qbt 1g, Qct,Qbo background: 9 pass       TAL         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         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		
RAD       total dose:       0.8205 mRem/year         ?       analysed for H-3 analysed for Pu-239 32 isotopes,       12 were detected		
?       analysed for H-3 analysed for Pu-239 32 isotopes,       12 were detected         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 background: 9 p	ass 11 FAIL
?       analysed for H-3 analysed for Pu-239 32 isotopes,       12 were detected         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         QBT2,3,4: 5 pass       6 FAIL         QBT 1v: 10 pass       1 FAIL		
analysed for Pu-239       32 isotopes,       12 were detected         32 isotopes,       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	RAD total dose:	0.8205 mRem/year
analysed for Pu-239       32 isotopes,       12 were detected         32 isotopes,       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	?	
32 isotopes,       12 were detected         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         QBT2,3,4: 5 pass       6 FAIL         QBT 1v: 10 pass       1 FAIL	•	
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	•	
Residen-tial SAL: 4 pass0 FAILIndust-rial SAL: 4 pass0 FAILConstr. Worker SAL: 6 pass0 FAILRecrea-tional SAL: 6 pass0 FAILSoil: 8 pass3 FAILCanyon Sedi-ment: 8 pass3 FAILQBT2,3,4: 5 pass6 FAILQBt 1v: 10 pass1 FAIL	32 isotopes,	
Indust-rial SAL: 4 pass0 FAILConstr. Worker SAL: 6 pass0 FAILRecrea-tional SAL: 6 pass0 FAILSoil: 8 pass3 FAILCanyon Sedi-ment: 8 pass3 FAILQBT2,3,4: 5 pass6 FAILQBt 1v: 10 pass1 FAIL		19 undetected
Indust-rial SAL: 4 pass0 FAILConstr. Worker SAL: 6 pass0 FAILRecrea-tional SAL: 6 pass0 FAILSoil: 8 pass3 FAILCanyon Sedi-ment: 8 pass3 FAILQBT2,3,4: 5 pass6 FAILQBt 1v: 10 pass1 FAIL	Peciden-tial SAL 4 page 0 F	Δ11
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	· · · · · · · · · · · · · · · · · · ·	
Recrea-tional SAL:6 pass0 FAILSoil:8 pass3 FAILCanyon Sedi-ment:8 pass3 FAILQBT2,3,4:5 pass6 FAILQBt 1v:10 pass1 FAIL		
Soil:8 pass3 FAILCanyon Sedi-ment:8 pass3 FAILQBT2,3,4:5 pass6 FAILQBt 1v:10 pass1 FAIL		
Canyon Sedi-ment: 8 pass 3 FAIL QBT2,3,4: 5 pass 6 FAIL QBt 1v: 10 pass 1 FAIL		
QBT2,3,4:         5 pass         6 FAIL           QBt 1v:         10 pass         1 FAIL		
		AIL
Qbt 1g, Qct, Qbo: 11 pass 0 FAIL		
	Qbt 1g, Qct, Qbo: 11 pass 0 F	AIL

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	

.



,

SWMU ev 3233 Stockpile Number ev 3233 3233

### **RCRA** Characteristics Form

page 3 of 5 associated Excel file: AWD 3233 110118 ws\_050empty.xlsm

evaluation date: 1/18/2011

concen Potential Reg. unit of Pass/ Haz Code Qualifier limit tration Analyte CAS/ Symbol measure Fail comments Arsenic 5000 50 ug/L U pass As D005 100000 853 ug/L NQ Barium Ba pass 1000 10 ug/L Cadmium Cd U pass 5000 22.2 ug/L Chromium Cr U pass D008 25.2 ug/L Lead Pb 5000 NQ pass Mercury 200 U Hg 2 ug/L pass 50 ug/L Selenium Se 1000 U pass 5000 10 ug/L Silver Ag U pass Endrin 72-20-8 D012 20 FAIL ug/L 400 BHC[gamma-] 58-89-9 D013 FAIL ug/L D014 10000 FAIL Methoxychlor[4,4'-72-43-5 ug/L Toxaphene (Technical Grade) 8001-35-2 D015 500 ug/L FAIL D[2,4-] 94-75-7 D016 10000 FAIL ug/L TP[2,4,5-] 93-72-1 D017 1000 FAIL ug/L 71-43-2 0.0505 ug/L Ű 500 Benzene pass Carbon Tetrachloride 56-23**-**5 0.0505 ug/L U 500 pass Chlordane(alpha/gamma) 57-74-9 D020 30 FAIL ug/L 5103-74-2 Chlordane[gamma-] D020 FAIL ug/L Chlordane[alpha-] 5103-71-9 D020 ug/L FAIL 100000 Chlorobenzene 108-90-7 0.0505 ug/L 11 pass Chloroform 67-66-3 6000 0.0505 ug/L U pass 200000 16.75 ug/L Methylphenol[2-] 95-48-7 UJ pass 16.75 ug/L Methylphenol[3-] 108-39-4 200000 UJ pass Methylphenol[4-] 106-44-5 200000 16.75 ug/L UJ pass 65794-96-9 200000 16.75 ug/L Methylphenol[3-,4-] UĴ pass 33.5 ug/L Methylphenol(total) 8027-16-5 200000 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 0.0505 ug/L 700 U Dichloroethene[1,1-] 75-35-4 pass Dinitrotoluene[2,4-] 121-14-2 130 16.75 ug/L UJ pass 76-44-8 D031 Heptachlor 8 FAIL ug/L 16.75 ug/L UJ Hexachlorobenzene 118-74-1 130 pass 16.75 ug/L Hexachlorobutadiene 87-68-3 500 UJ pass Hexachloroethane 67-72-1 3000 16.75 ug/L UJ pass 200000 Butanone[2-] 78-93-3 0.2525 ug/L UJ pass Nitrobenzene 98-95-3 2000 16.75 ug/L UJ pass 100000 Pentachlorophenol 87-86-5 16.75 ug/L UJ pass 5000 16.75 ug/L UJ Pyridine 110-86-1 pass Tetrachloroethene 0.0505 ug/L 127-18-4 700 U pass 0.0505 ug/L Trichloroethene 79-01-6 500 υ pass 16.75 ug/L Trichlorophenol[2,4,5-] 95-95-4 400000 UJ pass Trichlorophenol[2,4,6-] 88-06-2 2000 16.75 ug/L UJ pass 0.0505 ug/L 75-01-4 200 Vinyl Chloride 11 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
	As		mg/kg	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	ma/ka	pass	pass	pass	pass	NA	NA	NA	NA	NA
	Be		mg/kg	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		mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Chromium	Cr		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
	Mg		mg/kg	NA		NA	NA	pass	pass	pass	pass	pass
	Mn		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	NA		NA		NA
	Ni		mg/kg	pass		pass	pass	pass	pass	pass	FAIL	FAIL
	NO3		mg/kg	pass	pass		pass	NA	NA	NA		NA
	K		mg/kg	NA			NA	pass	pass NA	pass	pass	pass
Pyrene	129-00-0 Na	0.0425	mg/kg mg/kg	pass <sup>*</sup>			pass NA			NA	NA	NA
Sodium Thallium	Na TI	0.0753		pass					pass pass	pass	pass	pass
Uranium	11		mg/kg	pass			pass pass		F	pass pass	pass	pass FAIL
	V		mg/kg	pass	·····		pass	and the second	1 · · · ·	pass	pass FAIL	FAIL
	v Zn		mg/kg	pass	pass		pass	FAIL	pass			FAIL
	ZII	<u> </u>	ling/kg	lhass	Ipass	[µaəə	lhass	TAIL	lhass	pass	pass	ГАIL

Stockpile Number ev 3233

SWMU ev 3233

#### **Detected Chemicals Form**

page 3 of 5 associated Excel file: AWD 3233 110118 ws\_050empty.xism

evaluation date: 1/18/2011

				Non-						
	CAS/	concen-	unit of	wastewater	Hazardous				Potential Haz	
Analyte	Symbol	tration	measure	LDR	Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	P-codes	comments
	Al		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,K 084,K101,K102,			
	Ва		mg/kg	pass	pass					
	50-32-8	0.0144		pass	•	F032.F034.F037.F038.	K001,K035,K141,K142,K144,K145,K 147,K148,K170,	U022,		
Benzo(b)fluoranthene	205-99-2	0.0214	mg/kg	pass	pass		K001,K035,K141,K142,K143,K144,K 147,K148,K170,			
Beryllium	Ве		mg/kg		pass			· · · · ·	1	
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797	mg/kg	pass	pass			U028,		
Calcium	Ca	791	mg/kg	ľ						
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,	1 mar	
Cobalt	Co		mg/kg							
Copper	Cu		mg/kg							
Iron	Fe	7150	mg/kg							
1		4 70					K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0			
Lead	Pb Ma		mg/kg	pass	pass	F035,F037,F038.	52,K061,K069,			
Magnesium	Mn		mg/kg mg/kg							
Manganese	IVIII	317	ппд/кд							F003,U161 codes not
Methyl-2-pentanone[4-]	108-10-1	0.0142	mg/kg	pass	pass					applicable
	Ni		mg/kg	pass	pass	F006,				
	NO3		mg/kg							
Potassium	К		mg/kg							
Pyrene	129-00-0	0.0425		pass	pass					
	Na		mg/kg							
	TI	0.0753					K178,			
	U		mg/kg		•		· · ·			
	V		mg/kg		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

	PI	concentr		Results					
Analyte	CAS/ Symbol	ation	Unit	(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	Ве	524	ug/kg	0.524	0.346		3.5E-05	5.2E-05	
Bis(2-ethylhexyl)phthalate	117-81-7	79.7	ug/kg	0.080		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		ug/kg	2.280	0.845	2.280	8.5E-05	2.3E-04	
Copper	Cu		ug/kg	6.200	3.730	6.200	3.7E-04	6.2E-04	
Iron	Fe	7150000		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		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	К	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	TI	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		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	0 720		0/ / IL I / C IL

NOTE 1: This table contains all detected, non D-coded analytes NOTE 2: Highlighted analytes are potentially F-coded TOTAL 0.738

**1.428** % (all analytes from all pages were added for this total

page 3 of 5

Sampling event ID

#### 3233

SWMU ev 3233 Stockpile Number ev 3233 SAL and background companies AWD 3233 110118 ws\_050empty.xism evaluation date: 1/18/2011

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

3233

page 3 of 5

SWMU ev 3233 Stockpile Number ev 3233 Radioisotopesodatament 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	TI-208	0.664	pCi/g	NQ	
Thorium-234	Th-234		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		U	
Plutonium-238	Pu-238	-0.0024		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		U	
Thorium-231	Th-231	-0.502		U	
Tin-113	Sn-113	-0.0249		U	
Uranium-235	U-235	0.0509		U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

Bin 5758 10# 1014 3860

Water Quality and RCRA Group Los Alamos National Laboratory

BH 50-603470 <u>50-613183</u>

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	d application	۹
Date: 2/4/11 Project: MDA C Phate T Location of Land Application: Within Project Footprint TA: 50 (S Estimated Quantity:	WMU S lied with d Covene	50-009) hin 21
Decision Tree—Decision Point Evaluation	<u></u>	
The following questions require yes or no answers.	Yes	No
<b>1.</b> D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	iv liv	
2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:	đ	$\checkmark$
Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.		. Versen
Has a No Longer Contained In been approved for this waste? Attach a copy of the No Longer		. //
Contained In approval.	2/	V
<b>3.</b> 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 reque application per the Decision Tree and that the drill cuttings will be land applied as described.Hphuhi FulkyHullHopethype Project May.Name (Print)SignatureFitle	Э	iteria for land 9       vate
ENV-RCRA Review (below): Does request provide all the required information, and do the drill cuttings meet all the criteria for Yes No Note deficiency in the space provided:	or land applica	ation?
ENV-RCRA Reviewer Name (Print) Jowel, N. Buckley Signature July St Package Expiration Date: 3-11-11	Des Dat	e <sup>2-9</sup> -11

Bin 5758 10# 1044 3860

Water Quality and RCRA Group Los Alamos National Laboratory ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

#### Post Land Application Field Certification Sheet

Date(s) of land application: <u>2411</u> Project: <u>MDAC Phase</u>	· · · · · · · · · · · · · · · · · · ·
Location of land application: Within project doot print TA: 50 (SW)	<u>mu</u> 50-009
EX-ID Number: $(0) - 0915 - 50$ 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.

Shani Fuller

BRIDEL

Project Manager 2-16-11 Title Date

Name (Print

Signature

Ben 5758 10# 1014 3866

#### **Solid Waste Evaluation**

page 1 of 5

SWMU ev 3233.2086.2100 Stockpile Number ev 3233.2086.2100 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 undeted         10 analytes fail	cted
Detects	,
<b>Total PCB (ppm)</b> 3 analytes with potential F-code 3 analytes with potential K-code 0 analytes with potential U-code 0 analytes with potential P-code	Not analy Non-wastewater LDR: 8 pass 0 FAIL Hazardous soil LDR: 8 pass 0 FAIL
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:	15 pass0 FAIL13 pass0 FAIL15 pass0 FAIL15 pass0 FAIL18 pass0 FAIL18 pass0 FAIL17 pass1 FAIL15 pass3 FAIL
RAD total dose:	0.7108 mRem/year
analysed for H-3 analysed for Pu-239 31 isotopes,	<ul><li>11 were detected</li><li>19 undetected</li></ul>
Indust-rial SAL: 4 pass Constr. Worker SAL: 6 pass Recrea-tional SAL: 6 pass Soil: 10 pass Canyon Sedi-ment: 10 pass QBT2,3,4: 7 pass QBt 1v: 10 pass	0 FAIL 0 FAIL 0 FAIL 0 FAIL 0 FAIL 0 FAIL <b>3 FAIL</b> 0 FAIL 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	

SWMU ev 3233.2086.2100 Stockpile Number ev 3233.2086.2100

#### **Detected Chemicals Form**

page 3 of 5 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,			hi dharacha an Albara an Albara.
Barium	Ва	18.4	mg/kg	pass	pass					
Beryllium	Be	0.333	mg/kg	pass	pass					
Calcium	Са	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		mg/kg							
Iron	Fe	4700	mg/kg							
Lead	РЬ	6.34	mg/kg	pass	pass	F035,F037,F038,	K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
Magnesium	Mg		mg/kg		1					
Manganese	Mn		mg/kg							
Nickel	Ni		mg/kg	pass	pass	F006,				
Nitrate	NO3	1.06	mg/kg							
Potassium	К	489	mg/kg			-				
Sodium	Na		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	AI	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	Ва		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Ве	0.333	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Calcium	Са	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		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		mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Sodium	Na	316	mg/kg	NA		NA	NA	pass	pass	pass	pass	pass
Uranium	U		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

page 3 of 5

Sampling event ID 3233

#### SAL and background comparison: ev3233.2086.2100.awd.2.2.2011(1).xlsm evaluation date: 2/2/2011

SWMU ev 3233.2086.2100 Stockpile Number ev 3233.2086.2100

	l	ľ	unit of		Indust-	Constr.	Recrea-	[	Canyon		1	Qbt 1g.
	CAS/	concen-	]	Residen-	rial	Worker	tional		Sedi-	QBT2.	QBt	Qct,
Analyte	Symbol	tration	e	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	Qbo
Bismuth-214	Bi-214	2.03	pCi/g					pass	pass	FAIL	pass	pass
Lead-212	Pb-212		pCi/g	$\vee$	$\vee$			-	pass	pass		pass
Lead-214	Pb-214		pCi/g	$\square$	$\sim$		$\sim$	-		FAIL	pass	
Potassium-40	K-40		pCi/g		$\vee$	1	$\sim$		pass	pass	pass	pass
Radium 226/228	calc.		pCi/g	$\backslash$	$\vee$	$\sim$	$\sim$		$\backslash$		$\sim$	
Radium-226	Ra-226		pCi/g	$\backslash$	$\backslash$	pass	pass	pass	pass	FAIL	pass	pass
Radium-228	Ra-228		pCi/g	$\square$	$\backslash$	pass	pass	pass	pass	pass	pass	pass
Thallium-208	TI-208	0.738		$\backslash$	$\sim$		$\sim$	pass	pass	pass	pass	pass
Tritium	H-3	0.03409		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		pass	pass	pass	pass	$\vee$	$\sim$		$\sim$	
Uranium-238	U-238		pCi/g	pass	pass	pass	pass	pass	pass	pass	pass	pass
Americium-241	Am-241	-0.00091	pCi/g		$\vee$	$\sim$	$\sim$		/		$\sim$	/
Cerium-139	Ce-139	-0.00907	pCi/g		$\sim$	/			/	$\sim$	$\smallsetminus$	
Cesium-137	Cs-137	0.0143	pCi/g		/	/		$\backslash$	/	$\backslash$	$\geq$	/
Cobalt-60	Co-60	0.0247	pCi/g		/		/	/	/		$\overline{)}$	/
Europium-152	Eu-152	0.00197	pCi/g	/	/		/	$\backslash$	/		$\backslash$	/
Lanthanum-140	La-140	-0.0344	pCi/g		/			/	/	/	$\langle$	/
Mercury-203	Hg-203	0.0389	pCi/g		$\backslash$	/		$\geq$	/		$\geq$	/
Plutonium-238	Pu-238	0	pCi/g	/	/	/		/	/		$\geq$	/
Plutonium-239/240	Pu-239/240	0.00676		/		/			/		$\geq$	
Radium-223	Ra-223	-0.179		/	/	/			/	$\backslash$	$\square$	/
Ruthenium-106	Ru-106	-0.172		/				$\geq$			$\geq$	$\square$
Sodium-22	Na-22	-0.0162						$\geq$	$\square$		$\square$	
Strontium-90	Sr-90		pCi/g	/	/				/		$\square$	$\sim$
Thorium-227	Th-227	-0.218	pCi/g	/		/		$\backslash$	/		$\sum$	$\square$
Thorium-231	Th-231	-0.179			$\backslash$			$\geq$	/	$\geq$	$\geq$	
Thorium-234	Th-234		pCi/g		$\geq$			$\geq$	/		$\geq$	
Tin-113	Sn-113	-0.00032		/	/			$\geq$	/	$\geq$	$\geq$	
Uranium-235	U-235	0.193		/	$\backslash$		$\sim$	$\geq$		$\backslash$	$\geq$	
Yttrium-88	Y-88	-0.00336	pCi/g	$\backslash$	$\sim$		$\sim$	$\overline{)}$	/	$\backslash$	$\sim$	/

No comparisons or calculations regulaid. Of for land application

Bin 5708 1D10143867

B+ #-50-603470 50-613183

Water Quality and RCRA Group Los Alamos National Laboratory

### ENV-RCRA-OP-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: MDAC Phase III
Location of Land Application: Within Project Actphint TA: 50 (SWMU 50-009)
Estimated Quantity: $36ft^3$ (cubic feet or tons)
Composition (e.g., 98% tuff and 2% quick gel, etc.):
Proposed Method of Land Application (describe): Within Project featphint - Drill
Cuttings will be land applied to previously disturbed
avilas DE Covered with a charge 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. $\Box$ 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.

Sephani Fuller	Queller	POKH Mar.	219/11
Name <sup>1</sup> (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 🗙 Note deficiency in the space provided: No\_\_\_\_\_

ENV-RCRA Reviewer Name (Print) Jorly Mey Signature Jely Jorden 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:	Utthin project dootprint	TA: 50 (SWMU 50-009)
EX-ID Number:/OX	- 0815-50 EX-ID Expiration Date: _	4/12/2011
Please explain any deviations	from original application (Attachment 2) in the space	ce provided:
Note: ENV-RCRA must appr	rove 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 Buller Project Manager 2-16-11 Date

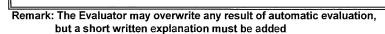
Name (Print

### Solid Waste Evaluation

page 1 of 5

SWMU ev 3233 Stockpile Number ev 3233 SummaryExcel file: AWD ev3233 s2087 ws\_054empty(1).xlsm evaluation date: 2/7/2011

and a second and a second s	
RCRA	
33 analytes pass between these 32 analytes pass as undete	orted
10 analytes fail	
Detects	
Total PCB (ppm)	Not analyz
3 analytes with potential F-code	Non-wastewater LDR: 9 pass 0 FAIL
2 analytes with potential K-code	Hazardous soil LDR: 9 pass 0 FAIL
1 analytes with potential U-code	
0 analytes with potential P-code	
Residential Soil (mg/kg):	15 pass 0 FAIL
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 2,3,4 background: Qbt 1v background:	
Qbt 1g, Qct, Qbo background:	
RAD total dose:	1.2691 mRem/yea
?	
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 Soil: 2 pass	
Canyon Sedi-ment: 2 pass	
QBT2,3,4: 2 pass	8 FAIL
QBt 1v: 3 pass	7 FAIL
Qbt 1g, Qct, Qbo: 7 pass	



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

Imported data files ev3233 110207.txt

SWMU ev 3233

#### **Detected Chemicals Form**

Stockpile Number ev 3233

page 3 of 5 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		pass	pass					F003,U002 codes not applicable
Aluminum	Al		mg/kg							
Barium	Ва		mg/kg	pass	pass					
Beryllium	Ве		mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0874		pass	pass			U028,		
Calcium	Ca		mg/kg							
Chromium	Cr		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,K 062,K064,K086,K100,K176,K046,K0 52,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		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	malka	pass	pass	pass	pass	NA	NA	NA	NA	NA
Aluminum	AI		mg/kg	•	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ba				pass	pass	pass	pass	pass		pass	pass
	Ве		mg/kg			P · · ·		1		pass	1 · · · ·	1
Beryllium Big (2. athuthaug) abthalata	ре 117-81-7		mg/kg		pass	pass	pass	pass NA	pass NA	pass NA	pass NA	pass NA
Bis(2-ethylhexyl)phthalate		0.0874	······································		pass	pass	pass					
Calcium	Ca		mg/kg			NA	NA	pass	pass	pass	pass	pass
Chromium	Cr		mg/kg			NA	pass	pass	pass	pass	FAIL	FAIL
Cobalt	Co		mg/kg	•	pass	pass	pass	pass	pass	pass	pass	pass
Copper	Cu		mg/kg		pass	pass	pass	pass	pass	pass	FAIL	pass
Iron	Fe	4150	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	Pb					pass	pass	pass	pass	pass		pass
Magnesium	Mg			NA	NA	NA	NA	pass	pass	pass	pass	FAIL
<b>1</b>	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	К	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

page 3 of 5

3233

### SAL and background comparison AWD ev3233 s2087 ws\_054empty(1).xlsm

evaluation date: 2/7/2011

SWMU ev 3233 Stockpile Number ev 3233

i	······································			unit of		Indust-	Constr.	Recrea-		Canyon			Qbt 1g,
		CAS/	concen-	measur	Residen-	rial	Worker	tional		Sedi-	QBT2,	QBt	Qct,
	Analyte	Symbol	tration	е	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	Qbo
N/A	Bismuth-214	Bi-214	3.66	pCi/g	$\sim$	$\sim$	$\sim$		FAIL	FAIL	FAIL	FAIL	pass
NA	Lead-212	Pb-212	3.73	pCi/g	/		$\sim$	/	FAIL	FAIL	FAIL	pass	pass
NA	Lead-214	Pb-214	4.2	pCi/g		/	/	/	FAIL	FAIL	FAIL	FAIL	FAIL
w	Potassium-40	K-40		pCi/g	/	$\sim$	$\sim$	/	pass	pass	pass	pass	pass
	Radium 226/228	calc.	7,43	pCi/g	/	/	/	/	$\langle$	/	/	$\langle$	/
	Radium-226	Ra-226	3.66	pCi/g		/	pass	pass	FAIL	FAIL	FAIL	FAIL	pass
	Radium-228	Ra-228		pCi/g	/		pass	pass	FAIL	FAIL	FAIL	FAIL	pass
	Thallium-208	TI-208	1.11	pCi/g	/	/	/	/	pass	pass	pass	pass	pass
N/A	Thorium-234	Th-234		pCi/g	/		/	/		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		pass	pass	pass	pass			/	$\geq$	/
	Uranium-238	U-238		pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
	Americium-241	Am-241	-0.00187		/		/		$\geq$	/	/	$\geq$	/
	Cerium-139	Ce-139	-0.00062					/		/	/	$\geq$	
	Cesium-137	Cs-137	-0.0779						$\geq$		/	$\backslash$	
	Cobalt-60	Co-60	-0.0349						$\geq$		$\geq$	$\geq$	$\geq$
	Europium-152	Eu-152	0.0982						$\geq$			$\geq$	
	Lanthanum-140	La-140	0.139						$\sum$		$\leq$	$\geq$	
	Plutonium-238	Pu-238	0.00218						$\sum$		$\square$	$\geq$	
	Plutonium-239/240	Pu-239/240	-0.00764						$\geq$			$\geq$	
	Radium-223	Ra-223	0.361						$\geq$			$\geq$	
	Ruthenium-106	Ru-106	-0.287						$\geq$			$\geq$	
	Sodium-22	Na-22	0.0209						$\geq$			$\geq$	
	Strontium-90	Sr-90	0.0583						$\geq$		$\geq$	$\geq$	
	Thorium-227	Th-227	0.0266						$\geq$			$\geq$	
	Thorium-231	Th-231	0.361			$\geq$			$\geq$	$\geq$	$\geq$	$\geq$	$\geq$
ļ	Tin-113	Sn-113	-0.0273			$\geq$			$\geq$			$\geq$	
	Tritium	H-3	0.02437			$ \geq $		$\square$	$\geq$		$\geq$	$\geq$	$\geq$
	Uranium-235	U-235	0.182						$\geq$		$\geq$	$\geq$	
	Yttrium-88	Y-88	-0.011	pCi/g								$\sim$	

Ra<sup>224</sup> 3.66 - 2.59 = 1.07/4 = 0.268 Ra<sup>228</sup> 3.77 - 2.33 = 1.44/5 = 0.288 U<sup>234</sup> 3.89 - 2.59 = 1.30/213 = 0.006 U<sup>238</sup> 4.21 - 2.29 = 1.92/140 = 0.014 0.576 2 1 OK -10 Land apply

BOREHOLE B |

BIN 5732 10143868

Water Quality and RCRA Group Los Alamos National Laboratory

### 50-6/3182 ENV-RCRA-QP-011.2 Attachment 2, Page 1 of 1

### **Request for Land Application of Drill Cuttings Form**

ENV-RCRA mus	t approve any deviation(s) f	rom this request prior	to land applic:	ation.
Date:P Location of Land Application: (1) Estimated Quantity:2COff_3 Composition (e.g., 98% tuff and 2% of Proposed Method of Land Applicatio AC UMA UMA	(cubic feet or tons) quick gel, etc.):(CO 10	hase TT ss Rais TA: <u>50</u> ( Dall Cutlings - e Janol applied 1 af access roads	Swmu 50 Soul Whin pa	0-009)
Note: An EX-ID Permit is required p	rior to land application.	- 0815 - 50	$\supset$	
	Decision Tree—Decisio	on Point Evaluation		
The following questions require yes	or no answers.		Yes	No
1. D1: Is existing characterization da a summary table of results, validated		h		
2. D2: Do drill cuttings contain RCR limits? If yes:	A Hazardous Waste or Hazard co	onstituents above RCRA		
Has a Due Diligence been condu documentation.	·		V	, F
Has a No Longer Contained In b	een approved for this waste? Att	ach a copy of the <i>No Long</i>	zer.	
Contained In approval.			. /	M
3. D6: Do drill cuttings meet the 5 cr		raa Attachment 22		1
4. Do drill cuttings meeting the criter	a in the Radiological Decision 1	ree, Attachment 5?	$\checkmark$	.1
Generator or Project Leader Certit application per the Decision Tree a				he criteria for land
Stephani Filler	Zalle	Providence	VIOOV	1/24/1
Name (Print)	Signature	Title	ugi	Date
n <mark>a presidente de la constanta /mark>	ENV-RCRA Re	view (below):	ور میں ایک ایک اور اور ایک اور ایک ایک اور ایک	ang dan pilakan kanang sama di minang pantan sa mang kanang di sa pilakan sa mang kanang kanang kanang kanang k
Does request provide all the requir Yes No	ed information, and do the dril Note deficiency in the space		iteria for land aj	pplication?
ENV-RCRA Reviewer Name (P		Mgignature Jerby	J. S. Dey	Date 1-25-11
Package Expiration Date: 2-1	<u>-1</u>			

#### **Post Land Application Field Certification Sheet**

Date(s) of land application:	Project: MDA C	Phase III
Location of land application: Within project	Ecceptint	TA: <u>50</u>
EX-ID Number:		
Please explain any deviations from original application	(Attachment 2) in the spac	e 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.

nani Fuller

Proyect Manager 1/28/11 Title Date

Signature

PRS Number: 50-0	09 (Borehole 50-613182)	
Source of contaminants:	Yes	No
F-listed		Х
U- or P-listed		Х
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.

Documents Reviewed								
Date	Title	ER ld 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						

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

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>1</u>

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	0-00063		K161, K021, K177
				K031,K060,K161,
				K171,K172,K176,
Arsenic	0.34		F032,F034,F035,	K084,K101,K102,
		U022		K001, K035, K141,
				K142, K144, K145,
Benzo(a)pyrene	0.0144		F032,F034,F037,F038	K147, K148, K170
				K001,K035,K141,
				K142,K143,K144,
Benzo(b)fluoranthene	0.0214			K147,K148,K170,
Bis(2-		U028		
ethylhexyl)phthalate	0.0797			
Chromium	4.96		F032,F034,F035,F037	K090
Chrysene	0.019	U050	F037, F038	K001, K035
				K002, K003, K005,
				K048, K049, K051,
				K062, K064, K086,
		1		K100, K176, K046,
Lead	4.73		F035,F037,F038,	K052, K061, K069
Nickel	5.68		F006	
Thallium	0.0753			K178

page 3 of 5

3233

#### SAL and background comparison AWD 3233 110103 ws\_049empty(1).xism

evaluation date: 1/3/2011

SWMU ev 3233 Stockpile Number ev 3233

Qbt 1g, unit of Indust-Constr. Recrea-Canyon Daughter CAS/ concenmeasur Residen-QBT2. QBt rial Worker tional Sedi-Qct. Analyte Symbol tration е tial SAL SAL SAL SAL Soil ment 3.4 1v 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 FAIL pass pass pass pass 32.5 pCi/g Potassium-40 K-40 pass pass pass pass pass Radium 226/228 calc. 3.94 pCi/g K Daur that 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 TI-208 0.664 pCi/g pass pass pass pass pass Thorium-234 2.51 pCi/g Th-234 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 -0.00522 pCi/g Americium-241 Am-241 Cerium-139 Ce-139 0.0239 pCi/g Cesium-137 Cs-137 0.0149 pCi/g 0.0215 pCi/g Cobalt-60 Co-60 Europium-152 Eu-152 0.0485 pCi/g Lanthanum-140 La-140 -0.0408 pCi/g Hg-203 Mercury-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 0.0122 pCi/g Ru-106 Sodium-22 Na-22 -0.0724 pCi/g Strontium-85 Sr-85 0.00652 pCi/q 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

Calculation not requered

Sampling event ID

SWMU ev 3233

#### **Detected Chemicals Form**

Stockpile Number ev 3233

page 3 of 5 associated Excel file: AWD 3233 110103 ws\_049empty(1).xlsm

evaluation date: 1/3/2011

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
	Al		mg/kg							
Antimony	Sb	0.91	mg/kg	pass	pass		K161,K021,K177,			
	As		mg/kg	pass	pass	F032,F034,F035,	K031,K060,K161,K171,K172,K176,K 084,K101,K102,			
Barium	Ba	13.8	mg/kg	pass	pass					
Beryllium	Be	0.524	mg/kg	pass	pass					
Calcium	Ca	359	mg/kg							en de la la la la constancia de la la la la la constancia de la la la la constancia de la constancia de la cons
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							
	Fe	6370	mg/kg							
Lead	Pb		mg/kg	pass	pass	F035.F037.F038,	K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 52,K061,K069,			
	Mg	174	mg/kg	ľ	1				1	
	Mn	317	mg/kg							
Methyl-2-pentanone[4-]	108-10-1	0.0142		pass	pass					F003,U161 codes not applicable
Nickel	Ni	3.38	mg/kg	pass	pass	F006,				
Nitrate	NO3	0.967	mg/kg							
Potassium	К		mg/kg				·			
	Na	270	mg/kg							
Thallium	TI	0.0686	mg/kg				K178,			
Uranium	U		mg/kg							
Vanadium	V	7.76	mg/kg	pass	pass					
Zinc	Zn	51.7	mg/kg	pass	pass					te esta de la constante de la c

# 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	AI	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		mg/kg	pass	pass		pass	pass		P	pass	pass
Barium	Ba		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Beryllium	Ве		mg/kg	pass	11		pass	pass	pass		pass	pass
Calcium	Ca		mg/kg	NA			NA	pass	pass		pass	pass
Chromium	Cr		mg/kg	pass	pass	NA	pass	pass	pass		FAIL	FAIL
Cobalt	Co		mg/kg	pass	pass	pass	pass	pass			pass	pass
Copper	Cu		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		mg/kg	pass			pass NA			J	pass	pass
Magnesium	Mg		mg/kg						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	~ ~	pass	pass	pass	pass	NA	NA			NA
Nickel	Ni		mg/kg	pass	pass	pass	pass		pass		FAIL	FAIL
Nitrate	NO3		mg/kg	pass		pass	pass	NA	NA	NA	NA	NA
Potassium	К		mg/kg	NA		NA	NA	pass	pass	pass	pass	pass
Sodium	Na	270	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	TI	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

### Solid Waste Evaluation

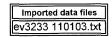
page 1 of 5

SWMU ev 3233 Stockpile Number ev 3233 Summary Excel file: AWD 3233 110103 ws\_049empty(1).xlsm evaluation date: 1/3/2011

RCRA	analytes pass				
	analytes pass analytes pass as unde	tected			
	analytes fail	lecied			
Detects					
	Total PCB (ppn	n) Not analy			
	with potential F-code		on-wastewater LDR:		0 FAIL
	with potential K-code	ł	Hazardous soil LDR:	10 pass	0 FAIL
	with potential U-code with potential P-code				
0 analytes	with potential 1 -code				
Re	sidential Soil (mg/kg)	: 18 pass	0 FAIL		
	upational Soil (mg/kg)	•	0 FAIL		
Construction	Worker Soil (mg/kg)	: 15 pass	1 FAIL		
Rec	reational Soil (mg/kg)		0 FAIL		
Conver	soil background	•			
Canyon	Sediment background Qbt 2.3.4 background				
	Qbt 1v background		S FAIL		
Qbt 1g	g, Qct,Qbo background	l: 11 pass	9 FAIL		
RAD	total dose	e: 0.6790	) mRem/year		
2			, <b>,</b>		
analysed					
-	for Pu-239				
32	isotopes,		were detected		
		20	undelected		
Residen-tial SAL: 3		0 FAIL			
Indust-rial SAL: 3		0 FAIL			
Constr. Worker SAL: 5 Recrea-tional SAL: 5		0 FAIL 0 FAIL			
Soil: 8	•	2 FAIL			
Canyon Sedi-ment: 8		2 FAIL			
QBT2,3,4: 8	B pass	2 FAIL			
QBt 1v: 1		0 FAIL 0 FAIL			
Qbt 1g, Qct, Qbo: 1					

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	



3233

SWMU ev 3233 Stockpile Number ev 3233

## **RCRA Characteristics Form**

page 3 of 5 associated Excel file: AWD 3233 110103 ws\_049empty(1).xlsm

evaluation date: 1/3/2011

an an tha <u>an an a</u>	and a second	Potential	Reg.	concen-	unit of		Pass/	
Analyte	CAS/ Symbol	Haz Code	limit	tration	measure	Qualifier	Fail	comments
Arsenic	As		5000	50	ug/L	U	pass	
Barium	Ва	D005	100000		ug/L	J	pass	
Cadmium	Cd		1000		ug/L	U	pass	
Chromium	Cr		5000		ug/L	U	pass	
Lead	Pb		5000	20	ug/L	U	pass	
Mercury	Ha		200		ug/L	U	pass	
Selenium	Se		1000	50	ug/L	U	pass	
Silver	Ag		5000		ug/L	U	pass	
Endrin	72-20-8	D012	20		ug/L	<u> </u>	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		U	pass	
Carbon Tetrachloride	56-23-5		500	0.0505		Ū	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30		ug/L		FAIL	
Chlordane[gamma-]	5103-74-2	D020		No.	ug/L		FAIL	
Chlordane[alpha-]	5103-71-9	D020			ug/L		FAIL	
Chlorobenzene	108-90-7		100000	0.0505		U	pass	
Chloroform	67-66-3		6000	0.0505		Ŭ	pass	
Methylphenol[2-]	95-48-7		200000	16.75		UJ	pass	
Methylphenol[3-]	108-39-4		200000	16.75		UJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75		UJ	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75		UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5		UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75		UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505		lu	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505		U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75		UJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75		UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75		UJ	pass	
Hexachloroethane	67-72-1		3000	16.75		UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525		UJ	pass	
Nitrobenzene	98-95-3		2000	16.75		UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75		UJ	pass	
Pyridine	110-86-1		5000	16.75		UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505		U	pass	
Trichloroethene	79-01-6		500	0.0505		U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75		lũj —	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75		100	pass	
Vinyl Chloride	75-01-4		200	0.0505		100	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.

3233

page 3 of 5

SWMU ev 3233 Stockpile Number ev 3233 Radioisotopesate example: 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	TI-208	0.664	pCi/g	NQ	
Thorium-234	Th-234		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		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		U	
Thorium-227	Th-227	-0.0104	pCi/g	U	
Thorium-231	Th-231	-0.502		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	

3925-401E 50-613182

Stockpile Number ev 3233

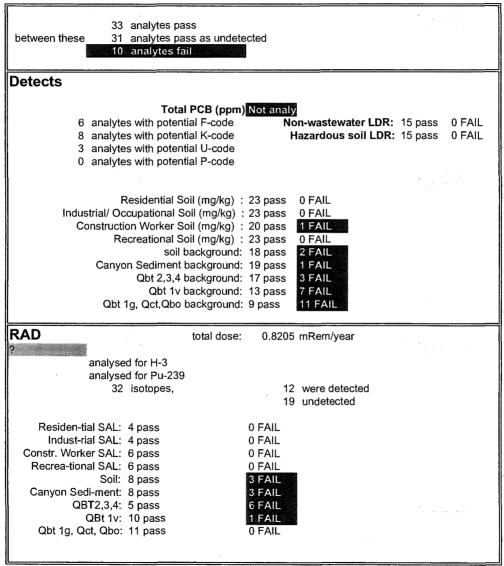
3233

SWMU ev 3233

### Solid Waste Evaluation

page 1 of 5

Summaryed Excel file: AWD 3233 110118 ws\_050empty.xism evaluation date: 1/18/2011



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

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

Imported data files ev3233 110118.txt

evaluation date: 1/18/2011

#### SWMU ev 3233 Stockpile Number ev 3233

# **RCRA Characteristics Form**

						1		
Analyte	CAS/ Symbol	Potential Haz Code	Reg. limit	concen- tration	unit of measure	Qualifier	Pass/ Fail	comments
Arsenic	As		5000		ug/L	U	pass	
Barium	Ва	D005	100000		ug/L	NQ	pass	
Cadmium	Cd	<b>2000</b>	1000		ug/L		pass	
Chromium	Cr		5000		ug/L	lu	pass	
Lead	Pb	D008	5000		ug/L	NQ	pass	•
Mercury	Hg		200		ug/L	lu lu	pass	
Selenium	Se		1000		ug/L	Ū	pass	
Silver	Ag		5000		ug/L	Ū	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	en stre	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	$\sim$		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	IJ	pass	
Methylphenol[4-]	106-44-5		200000	16.75	ug/L	U1	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		IJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505		U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505		U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75		ΟJ	pass	
Heptachlor	76-44-8	D031	8		ug/L		FAIL	
Hexachlorobenzene	118-74-1		130			UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75	Y	UJ	pass	
Hexachloroethane	67-72-1		3000	16.75		UJ	pass	
Butanone[2-]	78-93-3		200000	0.2525		UJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	UJ	pass	
Pentachlorophenol	87-86-5		100000	16.75		UJ	pass	
Pyridine	110-86-1		5000	16.75		UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505		U	pass	
Trichloroethene	79-01-6		500	0.0505		U	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75		UJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75	ug/L	ΠJ	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
	Al		mg/kg		pass	L'	pass		pass			FAIL
Antimony	Sb	0.91	mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
Aroonio	<b>A</b> -	0.24	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
	As Ba		mg/kg		pass	pass	pass	pass		FAIL	FAIL	FAIL
Barium	Ба	70.5	тід/ку	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	0.524	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	Са	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	Со	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
	Mg		mg/kg	NA			NA	pass	pass	pass	pass	pass
	Mn		mg/kg	pass	pass	FAIL	pass	· · · · · · · · · · · · · · · · · · ·	pass	pass	pass	FAIL
Methyl-2-pentanone[4-]	108-10-1	0.0142		pass	pass	pass	pass				NA	NA
Nickel	Ni		i mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
	NO3		mg/kg	pass	pass	pass	pass		NA	NA	NA	NA
Potassium	к		mg/kg	NA	NA		NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425		pass	pass	pass	pass	· · · ·	NA	NA	NA	NA
	Na		mg/kg	NA	NA		NA	pass	pass	pass	pass	pass
Thallium	TI	0.0753		pass	pass	pass	pass		pass	pass	pass	pass
Uranium	U		mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V		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

SWMU ev 3233 Stockpile Number ev 3233

#### **Detected Chemicals Form**

page 3 of 5 associated Excel file: AWD 3233 110118 ws\_050empty.xlsm

evaluation date: 1/18/2011

Non-CAS/ wastewater Potential Haz concenunit of Hazardous Symbol tration LDR Soil LDR Potential Haz F-codes Potential Haz K-codes Potential Haz U-codes P-codes Analyte measure comments Aluminum AI 4030 mg/kg Antimony 0.91 mg/kg K161,K021,K177, Sb pass pass K031.K060.K161.K171.K172.K176.K 84.K101.K102, Arsenic 0.34 mg/kg As pass Dass Barium Ba 70.5 mg/kg pass pass K001, K035, K141, K142, K144, K145, K Benzo(a)pyrene 50-32-8 0.0144 mg/kg pass pass 147.K148.K170. U022, K001, K035, K141, K142, K143, K144, K 0.0214 mg/kg 147.K148.K170, Benzo(b)fluoranthene 205-99-2 pass pass Beryllium Be 0.524 mg/kg pass pass Bis(2-ethylhexyl)phthalate 117-81-7 0.0797 mg/kg U028, pass pass Calcium Ca 791 mg/kg Chromium Сг 4.96 mg/kg pass pass K090, Chrysene Cobalt 218-01-9 0.019 mg/kg U050, pass pass K001,K035. Co 2.28 mg/kg 6.2 mg/kg Cu Copper 7150 mg/kg Iron Fe K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0 Pb 4.73 mg/kg 52,K061,K069, Lead pass pass 555 mg/kg Magnesium Mg 317 mg/kg Manganese Mn F003,U161 codes not 108-10-1 Methyl-2-pentanone[4-] 0.0142 mg/kg pass pass applicable Nickel 5.68 mg/kg Ni pass pass 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 0.0753 mg/kg Thallium TI 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 SWMU ev 3233

Stockpile Number ev 3233

3233

associated Excel file: AWD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

		concentr		Results		1			
Analyte	CAS/ Symbol	ation	Unit	(ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
Aluminum	AI	4030000	ug/kg	4030.000	1080.000	4030.000	0.108	0.403	
Antimony	Sb		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	м
Chrysene	218-01-9		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		ug/kg	6.200	3.730	6.200	3.7E-04	6.2E-04	
Iron	Fe	7150000		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		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		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	TI	75.3	ug/kg	0.075	0.069	0.075	6.9E-06	7.5E-06	
Uranium	U		ug/kg	0.829	0.180	0.829	1.8E-05	8.3E-05	
Vanadium	V	11200		11.200	3.480	11.200	3.5E-04	1.1E-03	
Zinc	Zn	51700		51.700	14.600	51.700	1.5E-03	5.2E-03	

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

.

TOTAL 0.738 1.428 % (all analytes from all pages were added for this total

D 3233

SWMU ev 3233

Stockpile Number ev 3233

SAL and background companies on lie: AWD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

unit of Indust-Constr. Recrea-Canvon Qbt 1g, CAS/ concenmeasur Residenrial Worker tional Sedi-QBT2. QBt Qct, Symbol tial SAL SAL SAL Soil Analyte tration е SAL ment 3.4 1v Qbo Bismuth-214 Bi-214 2.46 pCi/g FAIL pass pass pass pass Lead-212 Pb-212 2.46 pCi/g FAIL FAIL pass pass pass Pb-214 Lead-214 2.39 pCi/g pass pass FAIL passpass Potassium-40 K-40 34.7 pCi/g pass pass pass FAIL pass Radium 226/228 4.88 pCi/g calc. Radium-226 Ra-226 2.46 pCi/g FAIL pass pass pass pass pass pass Ra-228 Radium-228 2.42 pCi/g FAIL FAIL pass pass pass pass pass TI-208 Thallium-208 0.664 pCi/g pass pass pass pass pass EAIL FAIL Thorium-234 Th-234 2.51 pCi/g 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 FAIL 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 2.17 pCi/g FAIL pass pass pass pass pass pass pass pass Americium-241 Am-241 -0.00522 pCi/g -0.0224 pCi/g Cerium-139 Ce-139 Cs-137 -0.061 pCi/g Cesium-137 Cobalt-60 Co-60 -0.0162 pCi/g Eu-152 -0.1 pCi/g Europium-152 Lanthanum-140 La-140 -0.093 pCi/g Hg-203 0.00024 pCi/g Mercury-203 Pu-238 -0.0024 pCi/g Plutonium-238 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 -0.0775 pCi/g Strontium-90 Sr-90 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

page 3 of 5

page 3 of 5

3233

# Radioisotopes and the file: AWD 3233 110118 ws\_050empty.xlsm

evaluation date: 1/18/2011

SWMU ev 3233 Stockpile Number ev 3233

Analyte	CAS/ Symbol	concen- tration	unit of measure	Qualifier	comments
				NQ	comments
Bismuth-214	Bi-214 Pb-212		pCi/g	NQ NQ	
Lead-212 Lead-214	Pb-212 Pb-214		pCi/g	NQ	
Potassium-40	K-40		pCi/g	NQ	
			pCi/g	NQ	
Radium 226/228	calc.		pCi/g		
Radium-226	Ra-226		pCi/g	NQ	
Radium-228	Ra-228		pCi/g	NQ	
Thallium-208	TI-208	0.664		NQ	
Thorium-234	Th-234		pCi/g	NQ	
Tritium	H-3	0.0564979		NQ	
Uranium-234	U-234		pCi/g	NQ	
Uranium-235/236	U-235/236	0.109		NQ	
Uranium-238	U-238		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		U	
Thorium-227	Th-227	-0.0104		U	14 (A)
Thorium-231	Th-231	-0.502		U	
Tin-113	Sn-113	-0.0249	pCi/g	U	
Uranium-235	U-235	0.0509		U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

BIN 5789 AI 10143869

50-613182

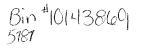
Water Quality and RCRA Group Los Alamos National Laboratory

\*351

# 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	d application	l.
Date: <u>12011</u> Project: <u>MDAC Phase III</u> Location of Land Application: <u>1044hin project Cotprint</u> TA: <u>50</u> (SW Estimated Quantity: <u>48.43</u> (cubic feet or tons) Composition (e.g., 98% tuff and 2% quick gel, etc.): <u>100.96 Soil</u> Proposed Method of Land Application (describe): <u>Drill Cuttlings</u> (Will be land application (Within the project tectprint TSWMU 50009) to previously and covered with a layer of readbase Note: An EX-ID Permit is required prior to land application. <u>100</u> - <u>6815</u> - <u>50</u>	A 1	-009) Zd
Decision Tree—Decision Point Evaluation		
The following questions require yes or no answers. 1. D1: Is existing characterization data consistent with WCSF? Attach a summary table of results, validated raw data, etc.	Yes	No
<ul> <li>2. D2: Do drill cuttings contain RCRA Hazardous Waste or Hazard constituents above RCRA limits? If yes:</li> <li>Has a Due Diligence been conducted for this waste? Attach a copy of the due diligence documentation.</li> <li>Has a No Longer Contained In been approved for this waste? Attach a copy of the No Longer</li> </ul>		
<ul> <li><i>Contained In</i> approval.</li> <li>3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?</li> <li>4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?</li> </ul>		
Generator or Project Leader Certification: I certify that the drill cuttings described in this reque application per the Decision Tree and that the drill cuttings will be land applied as described.SupportSupportName (Print)Signature	st meet the cr	iteria for land 4 4 11 Date
ENV-RCRA Review (below):         Does request provide all the required information, and do the drill cuttings meet all the criteria for Yes         Yes       No         No       Note deficiency in the space provided:	or land applic:	ation?
ENV-RCRA Reviewer Name (Print) <u>Sarly Y Subly</u> Signature <u>Saly</u> Package Expiration Date: <u>2-11-11</u>	<u>x Qlez</u> Dat	te <u>1-15-/1</u>



#### Water Quality and RCRA Group Los Alamos National Laboratory

#### Post Land Application Field Certification Sheet

Date(s) of land application:	Project: MDA (	Phase III.	
Location of land application: Uthin. project	fectprint		<u>NU</u> 50-009)
EX-ID Number: 101 - 0815-50			_
Please explain any deviations from original application	(Attachment 2) in the spac	e 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.

Hephani Fuller

Name (Print)

Signature

PRS Number: 50-009 (Borehole 50-613182)					
Source of contaminants:	Yes	No			
F-listed		X			
U- or P-listed		X			
K-listed		Х			
5					

#### 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.

	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						

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

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	1

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
				K031,K060,K161,
				K171,K172,K176,
Arsenic	0.34		F032,F034,F035,	K084,K101,K102,
		U022		K001, K035, K141,
				K142, K144, K145,
Benzo(a)pyrene	0.0144		F032,F034,F037,F038	K147, K148, K170
				K001,K035,K141,
				K142,K143,K144,
Benzo(b)fluoranthene	0.0214			K147,K148,K170,
Bis(2-		U028		
ethylhexyl)phthalate	0.0797			
Chromium	4.96		F032,F034,F035,F037	K090
Chrysene	0.019	U050	F037, F038	K001, K035
Onlysene	0.010		1001,1000	K002, K003, K005,
				K048, K049, K051,
				K062, K064, K086,
				K100, K176, K046,
Lead	4.73		F035,F037,F038,	K052, K061, K069
Nickel	5.68		F006	
Thallium	0.0753			K178

#### Attachment 1.

page 3 of 5

Sampling event ID

# 3233

SWMU ev 3233.2082.2092 Stockpile Number ev 3233.2082.2092 SAL and background comparisonev3233.2082.2092.awd.1.13.2011(2).xlsm evaluation date: 1/13/2011

	<u> </u>		unit of		Indust-	Constr.	Recrea-	[	Canyon		[	Qbt 1g,
	CAS/	concen-	measur	Residen-	rial	Worker	tional		Sedi-	QBT2,	QBt	Qct,
Analyte	Symbol	tration	е	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	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	/					$\sim$		$\backslash$	
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	TI-208	0.589	pCi/g	/	/		$\sim$	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		$\sim$	$\sim$		
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		$\backslash$		$\sim$		$\backslash$	$\backslash$	$\smallsetminus$	$\sim$
Cerium-139	Ce-139	-0.0044	pCi/g	/	/			$\backslash$	/	$\backslash$		
Cesium-137	Cs-137	-0.061	pCi/g	/			/		/	$\backslash$		
Cobalt-60	Co-60	-0.0162	pCi/g	/	$\backslash$			$\backslash$	$\sim$	$\sim$		$\sim$
Europium-152	Eu-152	-0.0335	pCi/g						/	$\backslash$		$\backslash$
Lanthanum-140	La-140	-0.093	pCi/g						/	$\backslash$		
Mercury-203	Hg-203	0.0275	pCi/g		$\backslash$		$\sim$	$\vee$	/	$\backslash$		$\sim$
Plutonium-238	Pu-238	-0.00101	pCi/g	/				$\overline{)}$	/			
Plutonium-239/240	Pu-239/240	-0.00101	pCi/g		$\backslash$		$\sim$	$\backslash$	$\backslash$	$\backslash$	$\smallsetminus$	
Radium-223	Ra-223	-0.177	pCi/g	/			$\sim$		$\backslash$	$\backslash$		
Ruthenium-106	Ru-106	-0.369	pCi/g				$\sim$	$\backslash$	/			
Sodium-22	Na-22	-0.0301	pCi/g				$\sim$	$\backslash$	/	$\vee$		
Strontium-85	Sr-85	0.0193	pCi/g		$\backslash$		$\sim$	$\backslash$	/	$\backslash$		$\backslash$
Strontium-90	Sr-90	0.0878	pCi/g	/	$\backslash$	/			/	$\backslash$		
Thorium-227	Th-227	0.148	pCi/g	/					/	$\backslash$		$\backslash$
Thorium-231	Th-231	-0.177		//	$\backslash$	$\backslash$	$\sim$	$\smallsetminus$	$\backslash$	$\sim$	$\smallsetminus$	$\sim$
Thorium-234	Th-234	1.05	pCi/g	/	$\backslash$	$\sim$	$\sim$	$\smallsetminus$	$\backslash$	$\sim$	$\smallsetminus$	$\sim$
Tin-113	Sn-113	0.0164	pCi/g		$\sim$			$\overline{}$	$\sim$			$\sim$
Uranium-235	U-235	0.124	pCi/g		$\backslash$	$\backslash$			$\sim$	$\geq$	$\backslash$	$\sim$
Yttrium-88	Y-88	0.0152	pCi/g	/	$\backslash$		$\sim$		$\backslash$	$\sim$	$\backslash$	$\sim$

No comparisons or sum of Aractions regulated OK for land application

Stockpile Number ev 3233.2082.2092

SWMU 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
Alumínum	Al	1900	mg/kg							
Barium	Ba		ma/ka	Dass	pass					
Benzo(a)pyrene	50-32-8	0.0144	mg/kg	pass	pass	F032,F034,F037,F038,		U022,		
Benzo(b)fluoranthene	205-99-2	0.0214		pass	pass		K001,K035,K141,K142,K143,K144,K 147,K148,K170,			
Beryllium	Be		mg/kg	pass	pass					
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797		pass	pass			U028,		deservation de Caliere
Calcium	Ca		mg/kg							
Chromium	Cr		mg/kg	pass	pass		K090,			승규님은 방법을 다 같이 있었는데?
Chrysene	218-01-9	0.019	mg/kg	pass	pass	F037,F038,	K001,K035,	U050,		
Cobalt	Co		mg/kg							
Copper	Cu		mg/kg							
Iron	Fe	5000	mg/kg				·			
							K002,K003,K005,K048,K049,K051,K 062,K064,K086,K100,K176,K046,K0			
Lead	Pb			pass	pass	F035,F037,F038,	52,K061,K069,		<u> </u>	
Magnesium	Mg		mg/kg							
Manganese	Mn		mg/kg							
Nickel	Ni		mg/kg	pass	pass	F006,			<u> </u>	<u> na se </u>
Potassium	К		mg/kg							
Pyrene	129-00-0		mg/kg	pass	pass					
Sodium	Na		mg/kg						<u> </u>	
Thallium	ΤΙ	0.0753			L		K178,			
Uranium	U		mg/kg						<u> </u>	
Vanadium	V		mg/kg	pass	pass					
Zinc	Zn	L 14.6	mg/kg	pass	pass					

#### page 3 of 5

#### **Solid Waste Evaluation**

page 1 of 5

SWMU ev 3233.2082.2092 Stockpile Number ev 3233.2082.2092 SummaryExcel 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 undete	cted			
10 analytes fail	as andere				
		-			
Detects					
Total P	CB (ppm)	Not analy	Z		
5 analytes with potential			on-wastewater LDR:		0 FAIL
6 analytes with potential			Hazardous soil LDR:	12 pass	0 FAIL
3 analytes with potential					
0 analytes with potential	P-CODE				
Residential Soil	(mg/kg) ;	19 pass	0 FAIL		
Industrial/ Occupational Soil		19 pass	0 FAIL		
Construction Worker Soil			0 FAIL		
Recreational Soil	,		0 FAIL		
soil bac Canyon Sediment bac	kground:	18 pass 18 pass	0 FAIL 0 FAIL		
Qbt 2,3,4 bac			0 FAIL		
Qbt 1v bac			3 FAIL		
Qbt 1g, Qct,Qbo bad	ckground:	15 pass	3 FAIL		
RAD to	otal dose:	0.6550	) mRem/year		
?					
analysed for H-3					
analysed for Pu-239 32 isotopes,		11	were detected		
52 isotopes,			) undetected		
Residen-tial SAL: 4 pass		0 FAIL			
Indust-rial SAL: 4 pass		0 FAIL			
Constr. Worker SAL: 6 pass Recrea-tional SAL: 6 pass		0 FAIL 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
ev:	3233.1.12.2011.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	AI	1900	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Barium	Ва	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	ma/ka	pass	pass	pass	pass	NA	NA	NA	NA	NA
Beryllium	Be	0.439	mg/kg	pass		pass	pass		pass	pass	pass	pass
Bis(2-ethylhexyl)phthalate	117-81-7	0.0797		pass	pass	pass	pass	NA	NA	NA	NA	NA
Calcium	Са	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		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	РЬ		mg/kg	pass			pass	pass	pass	pass	pass	pass
Magnesium	Mg	555	mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Nickel	Ni		mg/kg	pass		pass	pass	pass	pass	pass	FAIL	FAIL
Potassium	К			NA	NA	NA	NA			pass	pass	pass
Pyrene	129-00-0	0.0425		pass		pass	pass	NA	NA	NA	NA	NA
Sodium	Na		mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Thallium	TI	0.0753		pass		pass	pass	pass	pass	pass	pass	pass
Uranium	U		mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	pass
Vanadium	V		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

Balerlové 50-613182

Sampling event ID 3233 SWMU ev 3233 Stockpile Number ev 3233

#### Solid Waste Evaluation

page 1 of 5

Summary ed Excel file: AVVD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

33 analytes pass	-
between these 31 analytes pass as undete	
Detects	
Total PCB (ppm)	Not analy
6 analytes with potential F-code	Non-wastewater LDR: 15 pass 0 FAIL
8 analytes with potential K-code	Hazardous soil LDR: 15 pass 0 FAIL
3 analytes with potential U-code	
0 analytes with potential P-code	
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:	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
Bosidon tipl SALL 4 page	
Residen-tial SAL: 4 pass Indust-rial SAL: 4 pass	0 FAIL 0 FAIL
Constr. Worker SAL: 6 pass	0 FAIL
	0 FAIL
	3 FAIL
·	3 FAIL
QBT2,3,4: 5 pass	6 FAIL
QBt 1v: 10 pass Qbt 1g, Qct, Qbo: 11 pass	1 FAIL 0 FAIL
abilig, Qui, Qbu. 11 pass	

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

page 3 of 5 associated Excel file: AWD 3233 110118 ws\_050empty.xlsm

evaluation date: 1/18/2011

SWMU ev 3233 Stockpile Number ev 3233

# **RCRA Characteristics Form**

		Potential	Reg.	concen-	unit of		Pass/	
Analyte	CAS/ Symbol	Haz Code	limit	tration	measure	Qualifier	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		ug/L	U	pass	
Lead	Pb	D008	5000	25.2	ug/L	NQ	pass	
Mercury	Hg		200		ug/L	U	pass	
Selenium	Se		1000		ug/L	U	pass	
Silver	Ag		5000		ug/L	U	pass	
Endrin	72-20-8	D012	20	$\sum_{\substack{i=1,\dots,n\\ i=1,\dots,n}} \frac{(M-i)_{i=1}}{(i-1)} \sum_{\substack{i=1,\dots,n\\ i=1,\dots,n}} \frac{(M-i)_{i=1}}{(i-1)}$	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	1	FAIL	
D[2,4-]	94-75-7	D016	10000		ug/L	1	FAIL	
TP[2,4,5-]	93-72-1	D017	1000		ug/L	1	FAIL	
Benzene	71-43-2		500	0.0505		U	pass	
Carbon Tetrachloride	56-23-5		500			U	pass	
Chlordane(alpha/gamma)	57-74-9	D020	30	and the second of the second	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		U	pass	
Chloroform	67-66-3		6000	0.0505		U	pass	
Methylphenol[2-]	95-48-7		200000			UJ	pass	
Methylphenol[3-]	108-39-4		200000			IJ	pass	
Methylphenol[4-]	106-44-5		200000			0J	pass	
Methylphenol[3-,4-]	65794-96-9		200000	16.75		UJ	pass	
Methylphenol(total)	8027-16-5		200000	33.5		UJU	pass	
Dichlorobenzene[1,4-]	106-46-7		7500	16.75		UJ	pass	
Dichloroethane[1,2-]	107-06-2		500	0.0505		U	pass	
Dichloroethene[1,1-]	75-35-4		700	0.0505		U	pass	
Dinitrotoluene[2,4-]	121-14-2		130	16.75		UJ	pass	
Heptachlor	76-44-8	D031	8	86 1953 1953	ug/L		FAIL	
Hexachlorobenzene	118-74-1		130	16.75		UJ	pass	
Hexachlorobutadiene	87-68-3		500	16.75		UJ	pass	
Hexachloroethane	67-72-1		3000	16.75		IJ	pass	
Butanone[2-]	78-93-3		200000	0.2525	ug/L	ΠJ	pass	
Nitrobenzene	98-95-3		2000	16.75	ug/L	ΠÌ	pass	
Pentachlorophenol	87-86-5		100000	16.75		UJ	pass	
Pyridine	110-86-1		5000	16.75		UJ	pass	
Tetrachloroethene	127-18-4		700	0.0505		Ū	pass	
Trichloroethene	79-01-6		500	0.0505		Ū	pass	
Trichlorophenol[2,4,5-]	95-95-4		400000	16.75		ŪJ	pass	
Trichlorophenol[2,4,6-]	88-06-2		2000	16.75		UJ	pass	
Vinyl Chloride	75-01-4		200	0.0505		l <u>ŭ</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	FAIL
Antimony	Sb		mg/kg	pass	pass	pass	pass	FAIL	FAIL	FAIL	FAIL	FAIL
		0.01				F						
Arsenic	As	0.34	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
	Ba		mg/kg		pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
					F			<u></u>	· · · · · · · · · · · · · · · · · · ·			
Benzo(a)pyrene	50-32-8	0.0144	ma/ka	pass	pass	pass	pass	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	0.0214	ma/ka	pass	pass	pass	pass	NA	NA	NA	NA	NA
	Be		mg/kg		pass		pass	pass	pass	pass	pass	Dass
	117-81-7	0.0797		<u> </u>			pass	NA	NA	NA	NA	NA
Calcium	Са		mg/kg				NA	pass	pass	pass	pass	pass
	Cr		mg/kg	pass			pass	pass	pass	pass	FAIL	FAIL
Chrysene	218-01-9		mg/kg	pass	pass		pass	NA	NA		NA	NA
Cobalt	Co		mg/kg	pass	pass		pass	pass	pass	pass	FAIL	pass
	Cu		mg/kg	pass	pass	pass	pass	pass	pass	FAIL	FAIL	FAIL
liron	Fe		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	FAIL
Lead	РЬ		mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg		mg/kg	NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn		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	NA	NA		NA	NA
Nickel	Ni		mg/kg	pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
	NO3		mg/kg	pass	pass		pass	NA	NA	NA	NA	NA
Potassium	К		mg/kg	NA	NA		NA	pass	pass	pass	pass	pass
Pyrene	129-00-0	0.0425		pass	pass	pass	pass	NA	NA	NA	NA	NA
Sodium	Na		mg/kg	the second se	NA		NA	pass	pass	pass	pass	pass
Thallium	TI	0.0753		pass	pass	pass	pass	pass	pass	pass	pass	pass
Uranium	U		mg/kg	pass	pass	NA	pass	pass	pass	pass	pass	FAIL
Vanadium	V		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

#### **Detected Chemicals Form**

page 3 of 5 associated Excel tile: AWD 3233 110118 ws\_050empty.xlsm

evaluation date: 1/18/2011

Non-Potential Haz CAS/ concenunit of wastewater Hazardous Soil LDR Potential Haz U-codes P-codes Symbol tration LDR Potential Haz F-codes Potential Haz K-codes comments Analyte measure Aluminum 4030 mg/kg AI Antimony Sb 0.91 mg/kg pass K161,K021,K177, pass K031, K060, K161, K171, K172, K176, K 0.34 mg/kg 084,K101,K102 Arsenic As Dass Dass Barium Ba 70.5 mg/kg pass pass K001, K035, K141, K142, K144, K145, K 50-32-8 147,K148,K170, U022, Benzo(a)pyrene 0.0144 mg/kg pass pass K001, K035, K141, K142, K143, K144, K 0.0214 mg/kg 147.K148.K170, Benzo(b)fluoranthene 205-99-2 pass pass 0.524 mg/kg Beryllium Be pass pass Bis(2-ethylhexyl)phthalate 117-81-7 0.0797 mg/kg U028, pass pass Calcium Ca 791 mg/kg Chromium Cr 4.96 mg/kg pass K090, pass Chrysene 218-01-9 0.019 mg/kg K001,K035. U050. pass pass 2.28 mg/kg Cobalt Co 6.2 mg/kg Cu Copper 7150 mg/kg Fe Iron K002,K003,K005,K048,K049,K051,K 062.K064,K086,K100,K176,K046,K0 4.73 mg/kg Lead Pb 52,K061,K069, pass pass 555 mg/kg 317 mg/kg Mg Magnesium Mn Manganese F003,U161 codes not Methyl-2-pentanone[4-] 108-10-1 0.0142 mg/kg applicable pass pass Nickel Ni 5.68 mg/kg pass pass Nitrate NO3 0.967 mg/kg Potassium 819 mg/kg K Pyrene Sodium 129-00-0 0.0425 mg/kg pass pass 540 mg/kg Na 0.0753 mg/kg Thallium TI K178. Uranium lυ 0.829 mg/kg Vanadium V 11.2 mg/kg pass pass Zinc Zn 51.7 mg/kg pass pass

SWMU ev 3233 Stockpile Number ev 3233

.

# **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

	concentr		Results					
CAS/ Symbol	ation	Unit	(ppm)	MIN (ppm)	MAX (ppm)	MIN. %	MAX. %	comments
AI	4030000	ug/kg	4030.000	1080.000	4030.000	0.108	0.403	
Sb	910	ug/kg	0.910	0	0.910	0	9.1E-05	
50-32-8	14.4	ug/kg	0.014	0	0.014	0	1.4E-06	
205-99-2	21.4	ug/kg	0.021	0	0.021	0		
Be	524	ug/kg	0.524	0.346		3.5E-05		
117-81-7			0.080	0		0	8.0E-06	· · · · · · · · · · · · · · · · · · ·
Ca	791000	ug/kg	791.000	359.000	791.000	0.036	0.079	
218-01-9			0.019	0	0.019	0	1.9E-06	
Co	2280	ug/kg	2.280	0.845	2.280	8.5E-05	2.3E-04	
Cu			6.200	3.730		3.7E-04	6.2E-04	
Fe			7150.000	5000.000	7150.000	0.500	0.715	·
Mg			555.000	174.000	555.000	0.017	0.056	
Mn	317000	ug/kg	317.000	137.000	317.000	0.014	0.032	
108-10-1	14.2	ug/kg	0.014	3.8E-03	0.014	3.8E-07	1.4E-06	
Ni	5680	ug/kg	5.680	2.980	5.680	3.0E-04	5.7E-04	
NO3	0.967	mg/kg	0.967	0.934	0.967	9.3E-05	9.7E-05	
К	819000	ug/kg	819.000	332,000	819.000	0.033	0.082	
129-00-0	42.5	ug/kg	0.043	0	0.043	0	4.3E-06	
Na	540000	ug/kg	540.000	270.000	540.000	0.027	0.054	
TI			0.075	0.069	0.075	6.9E-06	7.5E-06	
U			0.829	0.180	0.829	1.8E-05	8.3E-05	
V	11200	ug/kg	11.200	3.480	11.200	3.5E-04	1.1E-03	
Zn	51700	ug/kg	51.700	14.600	51.700	1.5E-03	5 <u>.2E-03</u>	
	AI Sb 50-32-8 205-99-2 Be 117-81-7 Ca 218-01-9 Co Cu Cu Fe Mg Mn 108-10-1 Ni NO3 K 129-00-0 Na TI U V	AI         4030000           Sb         910           50-32-8         14.4           205-99-2         21.4           Be         524           117-81-7         79.7           Ca         791000           218-01-9         19           Co         2280           Cu         6200           Fe         7150000           Mg         555000           Mn         317000           108-10-1         14.2           Ni         5680           NO3         0.967           K         819000           129-00-0         42.5           Na         540000           TI         75.3           U         829           V         11200	AI       4030000       ug/kg         Sb       910       ug/kg         50-32-8       14.4       ug/kg         205-99-2       21.4       ug/kg         Be       524       ug/kg         117-81-7       79.7       ug/kg         Ca       791000       ug/kg         218-01-9       19       ug/kg         Co       2280       ug/kg         Co       2280       ug/kg         Ga       791000       ug/kg         Co       2280       ug/kg         Gu       6200       ug/kg         Mg       555000       ug/kg         Mg       555000       ug/kg         Ni       5680       ug/kg         Ni       5680       ug/kg         NO3       0.967       mg/kg         K       819000       ug/kg         Na       540000       ug/kg         TI       75.3       ug/kg         V       11200       ug/kg	Al         4030000         ug/kg         4030.000           Sb         910         ug/kg         0.910           50-32-8         14.4         ug/kg         0.014           205-99-2         21.4         ug/kg         0.021           Be         524         ug/kg         0.524           117-81-7         79.7         ug/kg         0.080           Ca         791000         ug/kg         791.000           218-01-9         19         ug/kg         0.019           Co         2280         ug/kg         6.200           Fe         7150000         ug/kg         7150.000           Mg         555000         ug/kg         317.000           108-10-1         14.2         ug/kg         0.014           Ni         5680         ug/kg         0.667           K         819000         ug/kg         5630           NO3         0.967         mg/kg         0.967           K         819000         ug/kg         540.000           129-00-0         42.5         ug/kg         0.043           Na         540000         ug/kg         0.075           U         829 <td< td=""><td>AI         4030000         ug/kg         4030.000         1080.000           Sb         910         ug/kg         0.910         0           50-32-8         14.4         ug/kg         0.014         0           205-99-2         21.4         ug/kg         0.021         0           Be         524         ug/kg         0.524         0.346           117-81-7         79.7         ug/kg         0.019         0           Ca         791000         ug/kg         791.000         359.000           218-01-9         19         ug/kg         0.019         0           Co         2280         ug/kg         6.200         3.730           Fe         7150000         ug/kg         7150.000         5000.000           Mg         555000         ug/kg         317.000         1074.000           Mn         317000         ug/kg         0.014         3.8E-03           Ni         5680         ug/kg         0.967         0.934           K         819000         ug/kg         0.043         0           129-00-0         42.5         ug/kg         0.043         0           Na         540000</td><td>AI         4030000         ug/kg         4030.000         1080.000         4030.000           Sb         910         ug/kg         0.910         0         0.910           50-32-8         14.4         ug/kg         0.014         0         0.014           205-99-2         21.4         ug/kg         0.524         0.346         0.524           117-81-7         79.7         ug/kg         0.080         0         0.080           Ca         791000         ug/kg         791.000         359.000         791.000           218-01-9         19         ug/kg         0.019         0         0.019           Co         2280         ug/kg         6.200         3.730         6.200           Cu         6200         ug/kg         7150.000         5000.000         7150.000           Mg         555000         ug/kg         317.000         137.000         317.000           Ma         317000         ug/kg         0.014         3.8E-03         0.014           Ni         5680         ug/kg         0.967         0.934         0.967           K         819000         ug/kg         0.043         0         0.043</td><td>AI         4030000         ug/kg         4030.000         1080.000         4030.000         0.108           Sb         910         ug/kg         0.910         0         0.910         0           50-32-8         14.4         ug/kg         0.014         0         0.014         0           205-99-2         21.4         ug/kg         0.524         0.346         0.524         3.5E-05           117-81-7         79.7         ug/kg         0.019         0         0.008         0           Ca         791000         ug/kg         791.000         359.000         791.000         0.036           218-01-9         19         ug/kg         0.019         0         0.019         0           Co         2280         ug/kg         2.280         0.845         2.280         8.5E-05           Cu         6200         ug/kg         6.200         3.730         6.200         3.7E-04           Fe         7150000         ug/kg         555.000         174.000         555.000         0.017           Mn         317000         ug/kg         317.000         317.000         0.014         3.8E-07           Ni         5680         ug/kg</td><td>Al         4030000         ug/kg         4030.000         1080.000         4030.000         0.108         0.403           Sb         910         ug/kg         0.910         0         0.910         0         9.10         0         9.1E-05           50-32-8         14.4         ug/kg         0.014         0         0.014         0         9.1E-05           50-32-8         14.4         ug/kg         0.021         0         0.014         0         1.4E-06           205-99-2         21.4         ug/kg         0.021         0         0.021         0         2.1E-06           Be         524         ug/kg         0.080         0         0.080         0         8.0E-05         5.2E-05           117-81-7         79.7         ug/kg         0.900         359.000         791.000         0.036         0.079           213-01-9         19         ug/kg         2.280         0.845         2.280         8.5E-05         2.3E-04           Cu         6200         ug/kg         6.200         3.730         6.200         3.7E-04         6.2E-04           Fe         7150.000         ug/kg         317.000         317.000         0.017         0.056&lt;</td></td<>	AI         4030000         ug/kg         4030.000         1080.000           Sb         910         ug/kg         0.910         0           50-32-8         14.4         ug/kg         0.014         0           205-99-2         21.4         ug/kg         0.021         0           Be         524         ug/kg         0.524         0.346           117-81-7         79.7         ug/kg         0.019         0           Ca         791000         ug/kg         791.000         359.000           218-01-9         19         ug/kg         0.019         0           Co         2280         ug/kg         6.200         3.730           Fe         7150000         ug/kg         7150.000         5000.000           Mg         555000         ug/kg         317.000         1074.000           Mn         317000         ug/kg         0.014         3.8E-03           Ni         5680         ug/kg         0.967         0.934           K         819000         ug/kg         0.043         0           129-00-0         42.5         ug/kg         0.043         0           Na         540000	AI         4030000         ug/kg         4030.000         1080.000         4030.000           Sb         910         ug/kg         0.910         0         0.910           50-32-8         14.4         ug/kg         0.014         0         0.014           205-99-2         21.4         ug/kg         0.524         0.346         0.524           117-81-7         79.7         ug/kg         0.080         0         0.080           Ca         791000         ug/kg         791.000         359.000         791.000           218-01-9         19         ug/kg         0.019         0         0.019           Co         2280         ug/kg         6.200         3.730         6.200           Cu         6200         ug/kg         7150.000         5000.000         7150.000           Mg         555000         ug/kg         317.000         137.000         317.000           Ma         317000         ug/kg         0.014         3.8E-03         0.014           Ni         5680         ug/kg         0.967         0.934         0.967           K         819000         ug/kg         0.043         0         0.043	AI         4030000         ug/kg         4030.000         1080.000         4030.000         0.108           Sb         910         ug/kg         0.910         0         0.910         0           50-32-8         14.4         ug/kg         0.014         0         0.014         0           205-99-2         21.4         ug/kg         0.524         0.346         0.524         3.5E-05           117-81-7         79.7         ug/kg         0.019         0         0.008         0           Ca         791000         ug/kg         791.000         359.000         791.000         0.036           218-01-9         19         ug/kg         0.019         0         0.019         0           Co         2280         ug/kg         2.280         0.845         2.280         8.5E-05           Cu         6200         ug/kg         6.200         3.730         6.200         3.7E-04           Fe         7150000         ug/kg         555.000         174.000         555.000         0.017           Mn         317000         ug/kg         317.000         317.000         0.014         3.8E-07           Ni         5680         ug/kg	Al         4030000         ug/kg         4030.000         1080.000         4030.000         0.108         0.403           Sb         910         ug/kg         0.910         0         0.910         0         9.10         0         9.1E-05           50-32-8         14.4         ug/kg         0.014         0         0.014         0         9.1E-05           50-32-8         14.4         ug/kg         0.021         0         0.014         0         1.4E-06           205-99-2         21.4         ug/kg         0.021         0         0.021         0         2.1E-06           Be         524         ug/kg         0.080         0         0.080         0         8.0E-05         5.2E-05           117-81-7         79.7         ug/kg         0.900         359.000         791.000         0.036         0.079           213-01-9         19         ug/kg         2.280         0.845         2.280         8.5E-05         2.3E-04           Cu         6200         ug/kg         6.200         3.730         6.200         3.7E-04         6.2E-04           Fe         7150.000         ug/kg         317.000         317.000         0.017         0.056<

NOTE 1: This table contains all detected, non D-coded analytes NOTE 2: Highlighted analytes are potentially F-coded TOTAL 0.738

**1.428** % (all analytes from all pages were added for this total

page 3 of 5

Sampling event ID

#### 3233

SWMU ev 3233 Stockpile Number ev 3233

#### SAL and background companies onlie: AWD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

unit of Indust-Constr. Recrea-Canyon Qbt 1g, measur Residen-OBT2, CAS/ rial Worker QBt concentional Sedi-Qct, tration tial SAL Symbol SAL SAL SAL Soil Analyte ment 3,4 1v Qbo е Bismuth-214 Bi-214 2.46 pCi/g FAIL pass pass pass pass Pb-212 2.46 pCi/g Lead-212 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 FAIL pass pass Radium 226/228 4.88 pCi/g ċalc. FAIL pass pass Radium-226 Ra-226 2.46 pCi/g pass pass pass pass Radium-228 Ra-228 2.42 pCi/g FAIL FAIL pass pass pass pass pass Thallium-208 TI-208 0.664 pCi/g pass pass pass pass pass Thorium-234 Th-234 2.51 pCi/g FAIL FAIL FAIL pass pass Tritium 0.0565 pCi/g H-3 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 U-235/236 Uranium-235/236 0.109 pCi/g pass pass pass pass 2.17 pCi/g Uranium-238 U-238 pass pass pass pass FAIL pass pass pass pass Americium-241 Am-241 -0.00522 pCi/g Cerium-139 Ce-139 -0.0224 pCi/g -0.061 pCi/g Cesium-137 Cs-137 Cobalt-60 Co-60 -0.0162 pCi/g Europium-152 Eu-152 -0.1 pCi/g Lanthanum-140 La-140 -0.093 pCi/g 0.00024 pCi/g Hg-203 Mercury-203 Plutonium-238 Pu-238 -0.0024 pCi/g Plutonium-239/240 Pu-239/240 -0.00101 pCi/g -0.502 pCi/g Radium-223 Ra-223 -0.369 pCi/g Ruthenium-106 Ru-106 -0.0724 pCi/g Sodium-22 Na-22 0.00652 pCi/g Strontium-85 Sr-85 -0.0775 pCi/g Strontium-90 Sr-90 -0.0104 pCi/g Thorium-227 Th-227 Thorium-231 Th-231 -0.502 pCi/g Tin-113 Sn-113 -0.0249 pCi/g U-235 0.0509 pCi/g Uranium-235 Yttrium-88 Y-88 -0.0202 pCi/g

3233

page 3 of 5

SWMU ev 3233 Stockpile Number ev 3233 Radioisotopes a factor I 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	TI-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		pCi/g	U	
Lanthanum-140	La-140	-0.093		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		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		U	
Yttrium-88	Y-88	-0.0202	pCi/g	U	

#### Additional Constituents - RAD volume of waste: 200 kg assoc

Sampling event ID 3. SWMU ev 3233 Stockpile Number ev 3233 associated Excel file: AWD 3233 110118 ws\_050empty.xlsm evaluation date: 1/18/2011

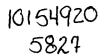
Analyte	CAS/ Symbol	Max Result	Min Result	Unit	% of total rad from Max values	% of total rad from Min values	Max Total Ci from isotope	Min Total Ci from isotope	comments
Bismuth-214	Bi-214	2.460	1.650	pCi/g	4.50	4.09	4.9E-07	3.3E-07	
Lead-212	Pb-212	2.460	2.220	pCi/g	4.50	5.50	4.9E-07	4.4E-07	
Lead-214	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	TI-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

NOTE 1: This table contains all detected radioisotopes

pages were added for this total

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.

3233



Water Quality and RCRA Group Los Alamos National Laboratory

### **Request for Land Application of Drill Cuttings Form**

ENV-RCRA must approve any deviation(s) from this request prior to lan	d application.	
Date: <u>1</u> <u>24</u> / <u>11</u> Project: <u>MDA C Phase</u> , <u>TI</u> Location of Land Application: <u>TA: 50(SWN</u> Estimated Quantity: <u>3</u> / <u>0</u> <u>4</u> / <u>3</u> (cubic feet or tons) Composition (e.g., 98% tuff and 2% quick gel, etc.): <u>10070</u> <u>5011</u> Proposed Method of Land Application (describe): <u>111 be</u> <u>Jand Application</u> (describe): <u>111 be</u> <u>Jand Application</u> (describe): <u>10070</u> <u>5011</u> Within <u>400</u> <u>A01007</u> <u>40050</u> <u>1017</u> , <u>400</u> <u>40050</u> <u>1017</u> , <u>400</u>	nu 50-0	109) -
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.	Π	
Has a No Longer Contained In been approved for this waste? Attach a copy of the No Longer		
Contained In approval.		Ľ
3. D6: Do drill cuttings meet the 5 criteria in D6, Attachment 1?		<u> </u>
4. Do drill cuttings meeting the criteria in the Radiological Decision Tree, Attachment 3?	$\mathbf{V}$	
Generator or Project Leader Certification: I certify that the drill cuttings described in this request application per the Decision Tree and that the drill cuttings will be land applied as described. SHOMAN FURC Signature Title	est meet the crit Ə ( H Da	<u>   </u>
ENV-RCRA Review (below):		
Does request provide all the required information, and do the drill cuttings meet all the criteria f Yes No Note deficiency in the space provided: Metals are below background; Due Diligence for the second of	or land applicat	tion?
ENV-RCRA Reviewer Name (Print) ENVITION (74) An Signature	Date	2/28/11

///////

Package Expiration Date: 5/28/11

Water Quality and RCRA Group Los Alamos National Laboratory

ENV-RCRA-QP-011.2 Attachment 4, Page 1 of 1

#### **Post Land Application Field Certification Sheet**

Date(s) of land application: 3/2/11 Project: MDA C ThasLIL	
Location of land application: Within project feetphint TA: 50 CSWM	u 50009
EX-ID Number: $10\chi - 0815 - 50$ EX-ID Expiration Date: $412201$	
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.

Koy Bohn Name (Print)

Hog Sch Signature

Title

Date

#### Solid Waste Evaluation

page 1 of 5

SWMU ev 3233.2089.2097 Stockpile Number ev 3233.2089.2097 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 undetec 10 analytes fail	xted
Detects	
Total PCB (ppm)	Not analy:
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): Industrial/ Occupational Soil (mg/kg):	16 pass 0 FAIL
Construction Worker Soil (mg/kg): Recreational Soil (mg/kg): soil background:	16 pass 0 FAIL
Canyon Sediment background: Qbt 2,3,4 background: Qbt 1v background:	19 pass 0 FAIL 19 pass <u>0 FAIL</u>
Qbt 1g, Qct,Qbo background:	
RAD total dose:	0.7200 mRem/year
analysed for H-3	
analysed for Pu-239 32 isotopes,	10 were detected
	21 undetected
	0 FAIL 0 FAIL
······································	0 FAIL
Recrea-tional SAL: 5 pass	0 FAIL
	3 FAIL
	3 FAIL 5 FAIL
	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

associated duplicate	
associated blanks	ST50-11-2089 WST50-11-2097
Sample ID	WST50-11-2089



3233

#### **Detected Chemicals Form**

SWMU ev 3233,2089,2097 Stockpile Number ev 3233.2089.2097

associated Excel file: ev3233.2089.2097.awd.2.23.2011(1).xism evaluation date: 2/23/2011

				Non-						
		concen-	unit of	wastewater	Hazardous			<b>-</b>	Potential Haz	
Analyte	CAS/ Symbol	tration	measure	LDR	Soil LDR	Potential Haz F-codes	Potential Haz K-codes	Potential Haz U-codes	P-codes	comments
Aluminum	Al	1680	mg/kg							
Antimony	Sb	0.399	mg/kg	pass	pass		K161,K021,K177,			
	Ba			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		mg/kg							
Chromium	Cr	4.69		pass	pass		K090,			
Cobalt	Co	1.06	mg/kg							
Copper	Cu	3.97	mg/kg							
Iron	Fe	4230	mg/kg							
Lead	Pb _			pass	pass		K002, K003, K005, K048, K049, K051, K 052, K064, K066, K100, K176, K046, K0 52, K061, K069,			
Magnesium	Mg		mg/kg							
	Mn		mg/kg							
Nickel	Ni	3.47	mg/kg	pass	pass					
Potassium	к		mg/kg							
Silver	Ag	0.144	mg/kg	pass	pass					
Sodium	Na		mg/kg							
Uranium	U	0.16	mg/kg							
Vanadium	V	7.02	mg/kg	pass	pass					
Zinc	Zn	9.75	mg/kg	pass	pass					

page 3 of 5

# 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	Ва	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	РЬ	4.42	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass
Magnesium	Mg			NA	NA	NA	NA	pass	pass	pass	pass	pass
Manganese	Mn		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			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			pass	pass	pass	pass	pass	pass	pass	FAIL	FAIL
Zinc	Zn	9.75	mg/kg	pass	pass	pass	pass	pass	pass	pass	pass	pass

page 3 of 5

Sampling event ID

#### SAL and background comparisonev3233.2089.2097.awd.2.23.2011(1).xism evaluation date: 2/23/2011

SWMU ev 3233.2089.2097 Stockpile Number ev 3233.2089.2097

3233

l		CAS/	concen-	unit of measur	Residen-	Indust- rial	Constr. Worker	Recrea- tional		Canyon Sedi-	QBT2,	QBt	Qbt 1g, Qct.
	Analyte	Symbol	tration	e	tial SAL	SAL	SAL	SAL	Soil	ment	3,4	1v	Qbo
	Bismuth-214	Bi-214	2.09	pCi/g	$\vee$		$\sim$	$\sim$	pass	pass	FAIL	pass	pass
NA	Lead-212	Pb-212		pCi/g		$\sim$	$\sim$			FAIL	pass	pass	pass
NA		Pb-214		pCi/g		$\sim$			FAIL	FAIL	FAIL	pass	pass
pro	Potassium-40	K-40		pCi/g		$\sim$			pass	pass	pass	pass	pass
	Radium 226/228	calc.	4.23	pCi/g	/	$\sim$	$\sim$			$\sim$		$\vee$	$\backslash$
	Radium-226	Ra-226	2.09	pCi/g	$\vee$	$\backslash$	pass	pass	pass	pass	FAIL	pass	pass
	Radium-228	Ra-228	2.14	pCi/g		$\backslash$	pass	pass	pass	pass	pass	pass	pass
	Thallium-208	TI-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		pass	pass	pass	pass	$\geq$	$\backslash$	$\backslash$		
	Uranium-238	U-238		pCi/g	pass	pass	pass	pass	FAIL	FAIL	FAIL	pass	pass
	Americium-241	Am-241	0.00128	pCi/g		/	$\square$			/	/	Ζ	
	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	/			/	$\langle$		/	/	/
	Mercury-203	Hg-203	0.0298			/			/		/		
	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			/			/		$\geq$	$\sum$	$\backslash$
	Sodium-22	Na-22	-0.00266						$\square$				$\backslash$
	Strontium-85	Sr-85	0.0744						$\geq$			$\sum$	$\backslash$
	Strontium-90	Sr-90	0.00257						$\sum$			$\square$	
	Thorium-227	Th-227	0.179						$\geq$				
	Thorium-231	Th-231	-0.00246						$\geq$			$\geq$	$\backslash$
	Thorium-234	Th-234		pCi/g								$\geq$	$\sum$
	Tin-113	Sn-113	0.0282						$\geq$			$\geq$	
	Tritium	H-3	0.00777		$\square$				$ \geq $				
1	Uranium-235	U-235	-0.00967										
	Yttrium-88	Y-88	-0.00098	pCi/g		$\sim$					$\geq$		/

 $U^{238}$  2.32 - 2.29 = 0.03  $\angle$  140 OR 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) <u>Management of Remediation Waste under RCRA (EPA 530-F-98-026)</u>, 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, 50-603063, 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.

.

.

Location ID	Sample ID	Waste Bin No.	SWMU(s) evaluated	Acetone	Bis(2-ethythexyl)phthalate	2-Butanonë	Di-n-buty (phthatate	Fluoranthene	Heptachlor	4-Methyl-2-pentanone	Methylane 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	-	- <u>-</u>	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	_	<b>—</b>	_
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 concentration — Indicates an	ons in mg/kg. alyte was not detecte	d		<u>.</u>							

## Table 1. Organic Compound Detections in MDA C Waste Samples

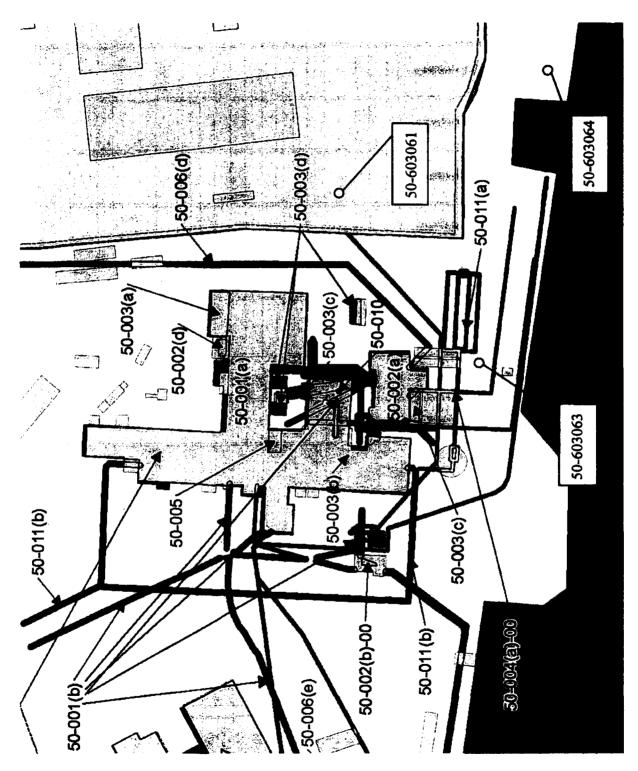


Figure 1. Approximate locations of boreholes 50-603061, 50-603063, and 50-603064 and surrounding SWMUs/AOCs

July 2008

Due Diligence Assessment for MDA C Boreholes Page 5 of 17

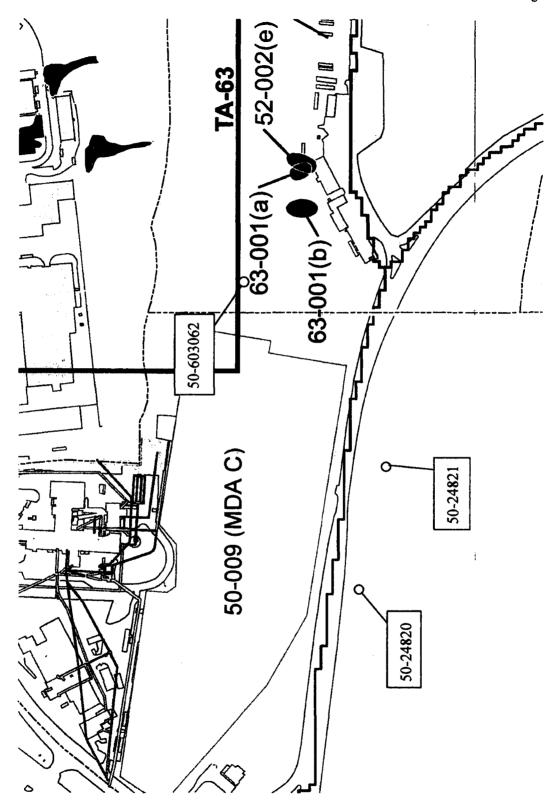


Figure 2. Approximate locations of boreholes 50-24820, 50-24821, and 50-603062 and surrounding SWMUs/AOCs

July 2008

Due Diligence Assessment for MDA C Boreholes Page 6 of 17

# **ATTACHMENT 1**

4

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

PRS Numbe	r: 50-001(b)						
Discharge, Spill, or Disposal of: Yes No							
F-listed wastes		X					
U- or P-listed wastes		X					
PRS De	scription	·					
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.							
	s Reviewed						
<ul> <li>Solid Waste Management Units Report, Volu 1990, 07513</li> </ul>		gh TA-50), October					
• RFI Work Plan for Operable Unit 1147, May	1992, 07672						
<ul> <li>Historical Investigation Report for Upper Mo 2007, 98955, pp. 40–42</li> </ul>		te Area, November					
<ul> <li>Investigation Work Plan for Upper Mortandae 100750, pp. 50-52</li> </ul>	d Canyon Aggregate Area	, November 2007,					
• Liquid Release Notifications, Los Alamos Na	tional Laboratory, April	990-June 2008					
• PRS Database (http://erinternal.lanl.gov/PRS/	(PRSMain.asp)						
• Holly Wheeler-Benson, personal communicat	tion, July 22, 2008						
Summary of	Listed Status						
There was no documentation that F-, U-, or P-lis these RLW lines. According to the HIR, methyle documentation that it was discharged to the RLW and the RLWTF does not accept listed wastes (se detected concentration was below the EQL, so th characteristics. The other potentially listed comp 50-24817, 50-603061, 50-603063, and 50-60303 di-n-butylphthalate, fluoranthene) were not detect SWMU 50-001(b) is not considered a source of I in this assessment.	the chloride was detected, V as a solvent or as an unu- te the LANL Waste Acce te material would not exhi- ounds detected in cuttings 4 (bis[2-ethylhexyl]phtha ted at SWMU 50-001(b).	but there is no used/unspent product, ptance Criteria). The ibit hazardous s from locations late, 2-butanone, For these reasons,					

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

PRS Numb	er: 50-002(a)	
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		X
U- or P-listed wastes		x
PRS D	escription	
SWMU 50-002(a) consists of an underground, n houses an equipment room, six flow-through pr which are associated with the TA-50 RLWTF (J (Building 50-2) through a system of transfer lin (including lines 55 and 67) connecting the RLW vault (Building 50-2); four steel lines added in 1 in Building 50-2; five cast iron lines from drain sink in the former vehicle-decontamination bay Building 50-2; an influent line connecting Build 50-90); and an effluent line connecting build in the Building 50-2 vault. In 1990, the integrity tied from the vault to Building 50-1 were check September 1974, two separate, unintended oper sump in Building 50-2. Both releases caused un 55 and 67 (the waste lines for treated effluent) a Canyon [see SWMU 50-006(a)].	occess tanks, and several v Building 50-1). Wastes and es. Waste transfer lines in /TF (Building 50-1) to the 1984 to connect Room 61 in Building 50-1 and or in Building 50-1 to the fit ling 50-2 to a 100,000-gat tank 50-90 to one of the y of the Building 50-2 tan ed, and no leaks were for ational releases occurred treated wastewater to be and into the outfall area a	waste-transfer lines, all of re transported to the vault include six cast-iron lines the equipment room in the to the equipment room he cast-iron line from a former D&D tank in al. holding tank (structure 25,000-gal. influent tanks the vault and the pipelines and. In July and from the overflow of a discharged to waste lines
Documen	ts Reviewed	
<ul> <li>Solid Waste Management Units Report, Vol 1990, 007513</li> </ul>	ume II of IV (TA-26 thro	ough TA-50), October
• RFI Work Plan for Operable Unit 1147, May	y 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 Des	scription				
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 haz Documents	ardous constituents.				
<ul> <li>Solid Waste Management Units Report, Volus 1990, 007513</li> </ul>	me II of IV (TA-26 throu	gh TA-50), October			
• RFI Work Plan for Operable Unit 1147, May	1992, 007672				
<ul> <li>RFI Report for Potential Release Sites 50-004 054836</li> </ul>	(a), 50-004(c), and 50-01	1(a), February 1996,			
<ul> <li>Historical Investigation Report for Upper Mor 2007, 098955, pp. 45–48</li> </ul>	rtandad Canyon Aggrega	e Area, November			
<ul> <li>Investigation Work Plan for Upper Mortandae 100750, pp. 56–57</li> </ul>	l Canyon Aggregate Area	, November 2007,			
• Liquid Release Notifications, Los Alamos Na	tional Laboratory, April	990-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.

#### July 2008

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

PRS Numbe	r: 50-006(a)	
Discharge, Spill, or Disposal of:	Yes	No
F-listed wastes		x
U- or P-listed wastes		<u>x</u>
PRS Des		
SWMU 50-006(a) is the area at the head of Ten S operational releases when a sump in a pumping s untreated wastewater to be discharged to waste line effluent). The releases occurred in July and Septe plugged at its outfall. Analysis of soil samples co September 1976 showed elevated levels of gross- downgradient from the outfall. In 1981, both was During waste line removal, elevated levels of rad partially decontaminated by the removal of 70 cu location.	tation (Building 50-2) on nes 55 and 67 (the was suber 1974. In Februar llected below the wast alpha radioactivity ext te lines 55 and 67 were ionuclides were detected	overflowed, causing te lines for treated y 1975, waste line 67 was e line 67 outfall in ending 984 ft e completely removed. ed. The outfall area was
The ER Project conducted an RFI at SWMU 50-6 Site Canyon outfall. Samples were collected belo the drainage channel, and in the canyon drainage approximately 1300 ft downstream from the TA- concentrations of PAHs above their respective sc IA in November 1996. Approximately 0.72 cubic removed. Ten confirmation samples were collected the 1997 IA report showed that residual gross-alp	w the former waste lin channel at regular inte 50 boundary. Analytics reening levels. The ER yards of contaminated ed from the excavated	e outfall, on both banks of rvals over a distance of al results showed Project implemented an I soil was excavated and area. Results reported in
Documents	Reviewed	
<ul> <li>Solid Waste Management Units Report, Volum 1990, 007513</li> </ul>	me II of IV (TA-26 thr	ough TA-50), October
• RFI Work Plan for Operable Unit 1147, May	1992, 007672	
• Interim Action Report for SWMU 50-006(a),	May 1997, 055834	
<ul> <li>Historical Investigation Report for Upper Mon 2007, 098955, pp. 48–53</li> </ul>	•	gate Area, November
• Liquid Release Notifications, Los Alamos Nat	tional Laboratory, Apr	il 1990-June 2008
<ul> <li>PRS Database (<u>http://erinternal.lanl.gov/PRS/</u></li> </ul>		
Summary of		
Di-n-butylphthalate was the only potentially liste #5835, which contains cuttings from two borehol 50-006(a) is in the vicinity of these boreholes. As reviewed for detections of di-n-butylphthalate. A 57 locations were analyzed for SVOCs. Trace (es detected at 10 locations. There was no evidence of indicative of a release. The primary use of di-n-b there is no documentation that a plastics producti however, in plastics used to collect and analyze e source of the contamination. The RLWTF does Acceptance Criteria). Nor is there any documenta was historically discharged to the RLWTF. For considered a source of listed contaminants at bot	d contaminant detected es, 50-603062 and 50- vailable documents for ccording to the HIR, a stimated quantities of d of a "plume" of di-n-bu utylphthalate is in the on process discharged nvironmental samples, not accept listed waste ation that unused/unspet these reasons SWMU	603064. SWMU SWMU 50-006(a) were total of 110 samples from in-butylphthalate were tylphthalate that would be manufacture of plastics; to the RLWTF. It is, , which is the most likely s (see LANL Waste ent di-n-butylphthalate

#### 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								
U- or P-listed wastes		X						
PRS De	scription							
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-indiameter 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	s Reviewed							
<ul> <li>Solid Waste Management Units Report, Volu 1990, 007513</li> </ul>	me II of IV (TA-26 thro	ugh TA-50), October						
• RFI Work Plan for Operable Unit 1147, May	1992, 007672							
<ul> <li>RFI Report for Potential Release Sites 5-006( 049925</li> </ul>	a), 50-006(c), 50-007, 50	0-008, September 1995,						
<ul> <li>Historical Investigation Report for Upper Mo 2007, 098955, pp. 55–57</li> </ul>	rtandad Canyon Aggreg	ate Area, November						
• Liquid Release Notifications, Los Alamos Na	tional Laboratory, April	1990-June 2008						
• PRS Database ( <u>http://erinternal.lanl.gov/PRS/</u>	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 low (estimated) concentrations at SWMU 50-006 no documentation that unused/unspent products outfall, and the RLWTF does not accept listed we Based on the data and available documentation, S listed contaminants at boreholes 50-603061 or 50	5(d); this is not indicative were disposed of through astes (see the LANL Wa SWMU 50-006(d) is not	e of a release. There is a the drainline and ste Acceptance Criteria).						

#### 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 De	scription				
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	s Reviewed				
<ul> <li>Solid Waste Management Units Report, Volu 1990, 007513</li> </ul>	me II of IV (TA-26 throu	gh TA-50), October			
• RFI Work Plan for Operable Unit 1147, May	1992, 007672				
Investigation Work Plan for Material Disposa	l Area C (MDA C), July	2003, 087392			
<ul> <li>Investigation Work Plan for Material Disposa 087152</li> </ul>	l Area C (MDA C), Revis	sion 1, November 2003,			
Investigation Work Plan for Material Disposa at Technical Area 50, Revision 2, October 200		nagement Unit 50-009,			
Investigation Report for Material Disposal Ar	ea C, SWMU 50-009, De	cember 2006, 094688			
• Phase II Investigation Work Plan for MDA C	, Revision 1, July 2007, 0	98425			
<ul> <li>Drilling and Sampling Results from Borehole 50-009, April 2007, 097285</li> </ul>	s Between Pit 2 and Pit 3	at MDA C, SWMU			
• Liquid Release Notifications, Los Alamos Na	tional 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-but methylene chloride were detected in drill cutting SWMU 50-009.	lyphthalate, fluoranthene,	-			
Bis(2-ethylhexyl)phthalate was detected sporadic from 1995 and 2006), with no indication that the contamination from contact with plastics used du documentation that unused/unspent bis(2-ethylhe	re is a "plume" of the mat ring sampling and analys	terial (more likely, it is is). There is no			
2-butanone was not detected in any tuff samples there is no evidence that it was disposed of as un sporadically in pore-gas samples in 2006, but bec the mixture rule, derived-from rule, and containe by the vapor. Therefore, any waste contacting the	used/unspent product. It v cause the vapor is not a so d-in policy do not apply t	was detected blid or hazardous waste, to wastes contaminated			
Di-n-butylphthalate was detected only in drill cut from borehole locations 50-603062 and 50-60306 surface soil or tuff samples in the vicinity of bore	64. Di-n-butylphthalate w	vas not detected in			

#### 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 poregas 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)

	<b>50-011(8)</b>					
PRS Number	Yes	No				
Discharge, Spill, or Disposal of: F-listed wastes	1 CS	f				
U- or P-listed wastes		x				
PRS Des	crintion	<b>^</b>				
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 charac boreholes, including one adjacent to the seepage p new pump house and influent storage tank vault a	pit, to determine the feas					
Documents						
<ul> <li>Solid Waste Management Units Report, Volum 1990, 07513</li> <li>RFI Work Plan for Operable Unit 1147, May</li> <li>RFI Report for Potential Release Sites at TA- 1996, 054460</li> </ul>	me II of IV (TA-26 throu 1992, 007672					
<ul> <li>Historical Investigation Report for Upper Mon 2007, 098955, pp. 59–60</li> </ul>	tandad Canyon Aggrega	te Area, November				
<ul> <li>Investigation Work Plan for Upper Mortandac pp. 63–64</li> </ul>						
<ul> <li>Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008</li> <li>PRS Database (<u>http://erinternal.lanl.gov/PRS/PRSMain.asp</u>)</li> </ul>						
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 ( <u>http://erinternal.lanl.gov/PRS/PRSMain.asp</u> )			
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				
<ul> <li>Solid Waste Management Units Report, Volume II of IV (TA-26 through TA-50), October 1990, 07513</li> </ul>				
RFI Work Plan for Operable Unit 1129, May 1992, 007666				
<ul> <li>Investigation Report for the Middle Mortandad/Ten Site Aggregate, Revision 1, July 2007, 100119, p. D-486</li> </ul>				
• Liquid Release Notifications, Los Alamos National Laboratory, April 1990-June 2008				
<ul> <li>PRS Database (<u>http://erinternal.lanl.gov/PRS/PRSMain.asp</u>)</li> </ul>				
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.				