SAND2017-5343R

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016063

Waste Generator And Waste Generation Information

Primary Waste Generator	Organization Number	Date Completed
Grelle, Nibby L.	01673	1/7/2016
Frequency Of Generation	**Point Of Generation**	**Generator SNL ID**
Routine	SNL/NM	17672

Waste Pickup Location Information

Technical Area	Building	Room
4	961N	N/A
Additional Location Info	**Pickup Contact**	**Pickup Contact Phone**
Stg shed directly west of MO2	Gluth, Jeffry W.	(505) 844-7329

Parcel Count And Type

Number Of Parcels	Parcel Description	Explanation for 'Other'
1	Other	544 Metal Box

Waste Type Categorization

Yes	Waste has radiological constituents
No	Waste is RCRA (Resource Conservation and Recovery Act) regulated. If unsure, check box.
No	Waste is Classified

Waste Pickup Hazards And Access Requirements

No	Are there hazards (other than radiological) that a WMPPD waste handler should be aware of prior to waste pick up?
No	Are there special access briefings/requirements or site-specific training requirements that a WMPPD waste handler must have prior to waste pick up?

Waste Pickup Hazards And Access Requirements Comments

Not Applicable

Container Inspection And Barcode Information

Yes	Were the container or containers including bags inspected prior to use and in good condition?
Yes	Are all metal drums (30, 55, & 85-gal) and metal boxes (742s, 744s) labeled with a WMPPD SNL/NM barcode?
8/31/2015	Date waste was first introduced into the container(s)

Waste Description

Attachment 1) DR 2016063_LANL Isotopics_Aug 18, 2015
Attachment 2) DR 2016063_Atom Activity Mass Calculator_WCT_DRAFT
Attachment 3) DR 2016063_WCT_RadChar
Attachment 4) DR 2016063_IH Beryllium Rpt S03432_Z-2841
Attachment 5) DR 2016063_Estd Be Concentration

Attachment 6) DR 2016063_Contmt Assy Matl Summary_Z-2841
Attachment 7) DR 2016063_WCT_TCLP_Z-2841
Attachment 8) DR 2016063_CEN_SNMUNLD_OPPRO_Z-2841
Attachment 9) DR 2016063_Transport Survey I-20150903-4_Z-2841

Radiological Movement Survey Information

Survey Numbers	I-20150903-4	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Enter maximum contact dose rate or NA if H-3 only: 40.1 mrem/hour

Does waste contain any parcels with a dose rate > 5 mrem/hour at 1 foot ?

Yes	No
	✓

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Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016063

Physical Form Of The Waste

Yes	Solid	
No	Liquid	Not Applicable
		Not Applicable
No	Gas	Not Applicable

Resource Conservation and Recovery Act (RCRA) Waste Information

No	Is waste a Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste or mixed waste?
Process Knowledge	Basis for RCRA determination?
Not Applicable	
Not Applicable	
Not Applicable	

California Code of Regulations (CCR) Non-RCRA Hazardous Waste Information

Not Applicable
Not Applicable
Not Applicable

Toxic Substances Control Act (TSCA) Information

No	Is waste regulated under the TSCA?
Process Knowledge	Basis for TSCA determination?
No	Does waste contain Polychlorinated Biphenyls (PCBs)?
Not Applicable	
No	Does waste contain asbestos at > 1% by weight?
Not Applicable	
Not Applicable	

Additional Waste Information

Yes	Waste has been physically inventoried within the last two years or do have direct knowledge of the waste contents?		
No	Does waste contain a Beryllium-containing or beryllium-contaminated waste?	No	Does waste contain a beryllium article?
No	Does waste contain etiologic agents or radioactive animal carcasses?		
No	Does waste contain chelating or complexing agents?		
Not Applicable			
No	Does waste contain fine particulates?		
No	Does waste contain unbound engineered nanoscale particles?		
No	Does waste contain batteries?		
No	Does waste contain sealed radioactive sources?		
Not Applicable			
No	Does waste contain any parcels with a concentration of alpha-emitting transuranic nuclides with half-lives > 20 years exceeding 100 nCi/g?		
No	Is waste potentially pyrophoric?		
No	Is Accountable Nuclear Material (ANM) present?	Not Applicable	Have safeguards been terminated?
Not Applicable	Accountable nuclear material safeguards category and attractiveness level		
No	Are containers labeled with a Criticality Safety Index?		
Unclassified	Waste security classification		
Not Applicable	Classified work station (CWS) #		
Not Applicable			
No	Has this waste been treated prior to submitting this DR form?		
Not Applicable			

Waste Generator Signature

By signing below, I verify that the waste is properly packaged and labeled and that the disposal request (DR) is complete and accurately represents the waste contents. I certify that I have made a good faith effort to minimize my waste generation.

Waste Generator H Arelle 1/8/2016
Signature And Date

EC Coordinator Review (Initials and Date) 1/11/16

Sandia National Laboratories | Radioactive Or Mixed Waste Disposal Request Form | Disposal Request 2016063

WMPPD Waste Characterization Project Leader Review

No	Does waste require sorting by WMPPD?
No	Does waste require treatment by WMPPD?
Nevada Nuclear Security Site	Recommended Waste Disposition Facility
LLRW (Lab Trash)	Waste Profile
ASLA000000011	Waste Stream ID
Not Applicable	
Not Applicable	
Not Applicable	
Not Applicable	

Additional WMPPD Waste Characterization Project Leader Comments

Non-TRU PU-ICE unit to be disposed at NNSS under profile ASLA000000011 (LLRW Lab Trash). Note: Profile will need to be modified for higher Pu-239 and Pu-240 concentrations.

Summary Waste Description

Radioactive Non-Debris

Physical Form (Solid)

Sandia National Laboratories | Radioactive Or Mixed Waste Disposal Request Form | Disposal Request 2016063

SNL/NM Characteristic of ignitability

No	Liquid with a flash point < 140 °F
No	Solid capable of causing fire through friction, absorption of moisture, or spontaneous chemical changes
No	An ignitable compressed gas
No	An oxidizer such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter

SNL/NM Characteristic of corrosivity

No	Aqueous liquid with a pH ≤ 2 or ≥ 12.5
Not Applicable	
No	A liquid and corrodes steel at a rate > 6.35 mm (0.250 inch) per year at a test temperature of 130 °F

SNL/NM Characteristic of reactivity

No	Normally unstable and readily undergoes violent change without detonating
No	Reacts violently with water
No	Forms explosive mixtures with water
No	When mixed with water, generates toxic gas, fumes, or vapors
No	Cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 & 12.5, can generate toxic gases, vapors or fumes
No	Capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement
No	Readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure
No	Contains an explosive

SNL/NM Characteristic of toxicity

No	Contains Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, and/or Silver ≥ regulatory thresholds
No	Contains organic constituents ≥ regulatory thresholds

Not Applicable
Not Applicable
Not Applicable

Not Applicable
Not Applicable

Listed hazardous wastes

No	Contains spent solvent wastes (F001 through F005)
No	Contains discarded commercial chemical products, off-specification species, container residues, and spill residues thereof (i.e., RCRA listed P and U chemicals or spill materials contaminated with these chemicals)
No	Contains other listed hazardous wastes

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Radioactive Or Mixed Waste Disposal Request Form

Disposal Request **2016063**

RCRA Characterization (For WMPPD Use Only)

EPA Hazardous Waste Number	Specific Chemical Name, Commercial Product or Trade Name (attach MSDS)	Quantity or Concentration	Quantity or Concentration Units
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Site-Wide Waste Analysis Plan & 40 CFR Part 265, Appendix I, Table 2 Information (For WMPPD Use Only)

Waste Stream Description	Permit Process	Handling And Treatment Codes	SNL/NM Mixed Waste Treatability Group
Not Applicable	Not Applicable	Not Applicable	Not Applicable

National Biennial RCRA Hazardous Waste Report Information (For WMPPD Use Only)

G - Source Code	Code Description
Not Applicable	Not Applicable
W - Form Code	**Code Description**
Not Applicable	Not Applicable
H - Management Method Code	**Code Description**
Not Applicable	Not Applicable

SF 2042-1RA (09-2014) Supersedes (08-2014)

Parcel Information.

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016063

Parcel ID	2016063-01									
Container Type	Other									
Size & Composition	544 Metal Box									
Container Tare Weight (lbs)	7.25E+02									
WMPPD Container ID	Not Applicable									
Waste Volume (ft^3)	1.000E+01									
Measured Net Weight (lbs)	1.035E+03									
Scale Serial Number	Estimated									
Date waste last entered into the container	8/31/2015									
Basis for radiological characterization	Process Knowledge									

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)

"See RF 2042-RTS Form(s)"

Additional Radiological Characterization Comments

Refer to the following attachments to this DR: 1) DR 2016063_LANL Isotopics_Aug 18, 2015; 2) DR 2016063_Atom Activity Mass Calculator_WCT_DRAFT; 3) DR 2016063_WCT_RadChar.
NOTE: Isotopic masses listed in Section 2 of attachment 2 were calculated from the total material mass (0.287 g) multiplied by the isotopic mass fractions listed in attachment 1. The start date used for purposes of decay calculations is assumed to be Aug. 1, 2015 since it was not otherwise specified in attachment 1.

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Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016063

Parcel ID	2016063-01									
Container Type	Other									
Size & Composition	544 Metal Box									
Container Tare Weight (lbs)	7.25E+02									
WMPPD Container ID	Not Applicable									
Waste Volume (ft^3)	1.000E+01									
Measured Net Weight (lbs)	1.035E+03									
Scale Serial Number	Estimated									

Date waste last entered into the container	8/31/2015									
	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID
	Not Applicable									
	Not Applicable									
	Not Applicable									
	Not Applicable									
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	Not Applicable									
	Not Applicable									
	Not Applicable									

1) DR 2016063_LANL Isotopics_Aug 18, 2015

Los Alamos NATIONAL LABORATORY EST. 1943

memorandum

Materials Science Division

To/MS: Joel Lash, SNL
From/MS: Franz Freibert, LANL
Phone/Fax: 505-667-6879/Fax 505-665-7815
Symbol: MST-16:15-017

Date: August 18, 2015

Plutonium Samples for August 2015 Z-Accelerator Experiment

As per your June 25, 2015 memo entitled "Configuration for the Pu Experiment scheduled for the week of August 24, 2015 and plutonium sample specifications request", I am providing the requested information on the samples containerized in the Isentropic Compression Experiment (ICE) Assembly prior to shipment to the Z-Accelerator Facility at Sandia National Laboratory. The Pu isotopic and Am analyses of the sample materials are given below with measurement uncertainties:

	Pu Alloy (2005)	
Actinide Isotope	Mass Spectroscopy April 2005 [1σ in %]	* ISOPOW August 2015 [1σ in %]
^{238}Pu	0.0114 [0.0013]	0.0105 [0.0013]
^{239}Pu	93.9260 [0.1221]	93.9758 [0.1221]
^{240}Pu	5.8944 [0.0648]	5.8928 [0.0648]
^{241}Pu	0.1204 [0.0011]	0.0731 [0.0011]
^{242}Pu	0.0478 [0.0008]	0.0478 [0.0008]
Relat. Pu Tot. Mass	99.29%	99.21%
**^{241}Am	421 μg/g [1σ=21 μg/g]	884 μg/g [1σ=21 μg/g]

* ISOPOW is the Los Alamos National Laboratory standard isotope decaying spreadsheet for SNM accountability utilizing Bateman eq. and standard halflives for the isotopes.

** ^{241}Am values and measurement errors are reported in wt.ppm.

The final sample weights with measurement uncertainties and ICE panel locations are given below:

Sample Location (ICE Panel)	Ave. Thickness (mm) +/- 0.001mm	Ave. Width (mm) +/- 0.05mm	Ave. Width (mm) +/- 0.05mm	Final Mass (g) +/- 0.001g
S. Mid.	0.258	5.99	5.99	0.143
N. Mid.	0.255	5.99	5.99	0.144
			Total	0.287 g

Also as requested, LANL conducted the He leak-test of the Secondary O-ring Seal defined in the SNL memo. The results for the He leak rate for the South and North panel assemblies inner volume into the test roughing chamber was $<3\times10^{-7}$ atm cm^3/s and $<8\times10^{-7}$ atm cm^3/s, respectively against a calibrated leak of 1.7×10^{-7} atm cm^3/s after approximately 15 minutes of test time. Also, all the ICE assembly components when surveyed for radiological activity showed No-Detectable Activity (NDA).

This document has been reviewed as Unclassified. FJF, 8/18/2015.

Distribution:

Bob Webster (LANL)
Mary Y. Hockaday (LANL)
Russ Olson (LANL)
David Teter (LANL)
MST-16 Files (LANL)
John Benage (SNL)
Mark Herrmann (SNL)
Dawn G. Flicker (SNL)
M. Keith Matzen (SNL)
Thomas Mattson (SNL)

Sandia National Laboratories **ACTIVITY, MASS, AND ATOM CONVERSION CALCULATOR**

Half lives per US DOT Office of Packaging and Transportation. Radcalc NQA-1 validated software application
amu values per "The 1995 Update to the Atomic Mass Evaluation" G. Audi & A.H. Wapstra, Nuclear Physics A595 (1995) 409-480.

Section 1 - Atoms To Activity & Mass

Nuclide	Atoms	Activity (Bq)	Mass (g)	Atom Fraction	Activity Fraction	Mass Fraction
Total	0.00E+00	0.00E+00	0.00E+00	0.000000	0.000000	0.000000

Section 2 - Convert Mass To Activity & Atoms

Nuclide	Mass (g)	Activity (Bq)	Atoms	Mass Fraction	Activity Fraction	Atom Fraction
Pu-238	3.0135E-05	1.91E+07	7.62E+16	0.000105	0.011847	0.000105
Pu-239	2.6971E-01	6.19E+08	6.79E+20	0.938928	0.384025	0.939176
Pu-240	1.6912E-02	1.42E+08	4.24E+19	0.058876	0.088104	0.058648
Pu-241	2.0980E-04	7.99E+08	5.24E+17	0.000730	0.495048	0.000724
Pu-242	1.3719E-04	2.01E+04	3.41E+17	0.000478	0.000012	0.000472
Am-241	2.5371E-04	3.22E+07	6.34E+17	0.000883	0.019963	0.000876
	2.87E-01	1.61E+09	7.23E+20	1.000000	1.000000	1.000000

Section 3 - Convert Activity To Mass & Atoms

Nuclide	Activity (Bq)	Mass (g)	Atoms	Activity Fraction	Mass Fraction	Atom Fraction
	0.00E+00	0.00E+00	0.00E+00	0.000000	0.000000	0.000000

3) DR 2016063_WCT_RadChar.xls (part 1)

Reference For Plutonium Material Type Isotopic Mass Fractions: MT42_84%, MT42_90%, MT42_95%, MT51, MT52, MT53, MT54, MT55, MT56, MT57, MT83_83%, MT83_89%
LA-12846-MS "Specific Activities and DOE-STD-1027-92 Hazard Category 2 Thresholds LANL Fact Sheet" Issued: November 1994
Table 3b. Data for Plutonium Material Types or Mixtures

Reference For Plutonium Material Type Isotopic Mass Fractions: Reactor Grade
DOE-STD-1128-2008 "Guide of Good Practices for Occupational Radiological Protection in Plutonium Facilities" December 2008
Table 2.1. Isotopic Composition of Three Grades of Plutonium: Heat Source, Weapons, and Reactor

	MT42_84%	MT42_90%	MT42_95%	MT83_83%	MT83_89%	Reactor Grade
Nuclide	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction
Pu-238	0.010200	0.007200	0.004500	0.838900	0.892600	0.015000
Pu-239	0.013700	0.012600	0.005600	0.138000	0.100700	0.581000
Pu-240	0.103200	0.064000	0.024700	0.019000	0.006330	0.241000
Pu-241	0.031300	0.018600	0.009060	0.003200	0.000210	0.114000
Pu-242	0.841400	0.897700	0.955800	0.000900	0.000150	0.049000
Pu-244	0.000200	0.000000	0.000290	0.000000	0.000000	0.000000
Am-241	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Summation	1.000000	1.000100	0.999950	1.000000	0.999990	1.000000

	MT51	MT52	MT53	MT54	MT55	MT56	MT57
Nuclide	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction
Pu-238	0.000060	0.000100	0.000300	0.000460	0.000600	0.000610	0.004330
Pu-239	0.967700	0.937800	0.910800	0.874200	0.838800	0.819000	0.746300
Pu-240	0.031300	0.060000	0.084500	0.115000	0.147300	0.165100	0.207000
Pu-241	0.000760	0.002000	0.003660	0.008100	0.010300	0.011800	0.025500
Pu-242	0.000180	0.000200	0.000710	0.002200	0.003040	0.003550	0.016900
Pu-244	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Am-241	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Summation	1.000000	1.000100	0.999970	0.999960	1.000040	1.000060	1.000030

	User_01	User_02	User_03	User_04	User_05	User_06	User_07
	Z-2841						
Nuclide	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction	Mass Fraction
Pu-238	0.000105						
Pu-239	0.938928						
Pu-240	0.058876						
Pu-241	0.000730						
Pu-242	0.000478						
Pu-244	0.000000						
Am-241	0.000883						
Summation	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

√ mdw 1/14/16

Comments

Mass Fraction values entered here were taken from attachment "2) DR 2016063_Atom Activity Mass Calculator_WCT_DRAFT."
Mass values entered in the attachment were taken from "1) DR 2016063_LANL Isotopics_Aug 18, 2015." Stated error margins were ignored, and to be conservative, relative Pu total mass was assumed to be 100% rather than the stated relative Pu total mass of 99.21%.

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MASS OR MASS CONCENTRATION TO ACTIVITY CALCULATION WORKSHEET

DATA ENTRY

Disposal Request	2016063
Waste Parcel ID	2016063-01
Additional Note	Z-2841
"From" Mass Unit	g
"From" Concentration Unit	NA
Amount	1.000
Amount Unit	g
"To" Activiy Unit	Ci
Start Date	8/1/2015
Stop Date	1/7/2016
Decay Time (days)	159

Nuclide	Comments	g
Pu-238		3.01E-05
Pu-239		2.69E-01
Pu-240		1.69E-02
Pu-241		2.10E-04
Pu-242		1.37E-04
Am-241		2.53E-04

√ mdw 1/14/16

Mass values above were calculated using initial mass fractions from the "Pu" worksheet multiplied by a total plutonium mass of 0.287 grams [see attachment 1) DR 2016063_LANL Isotopics_Aug 18, 2015].

ACTIVITY

Nuclide	Half Life (days)	Ci
Pu-238	3.20E+04	5.14E-04
Pu-239	8.81E+06	1.67E-02
Pu-240	2.40E+06	3.83E-03
Pu-241	5.24E+03	2.12E-02
Pu-242	1.37E+08	5.40E-07
Am-241	1.58E+05	8.69E-04

Mass Unit

Reviewed by: Michael Moore mwm 1/14/16

Sandia National Laboratories

ISOTOPIC PLUTONIUM MASS FRACTION AND ACTIVITY FRACTION CALCULATION WORKSHEET

DATA ENTRY

Disposal Request	2016063
Waste Parcel ID	2016063-01
Additional Note	Z-2841
Start Date	8/1/2015
Stop Date	1/7/2016
Plutonium Material Type	User_01
Decay Time (days)	159
Effective Atomic Weight (Initial)	239.1157
Effective Atomic Weight (Decay Corrected)	239.1157
Plutonium Mass Fraction Remaining	0.999985

Plutonium "material type (MT)" initial mass fractions per Table 3b of LA-12846-MS "Specific Activities and DOE-STD-1027-92 Hazard Category 2 Thresholds LANL Fact Sheet" Issued: November 1994.
Plutonium "reactor grade" initial mass fractions per Table 2.1 of DOE-STD-1128-2008 "Guide of Good Practices for Occupational Radiological Protection in Plutonium Facilities" December 2008.
Atomic weights calculated per values in The AME2003 atomic mass evaluation (II). Tables, graphs, and references. G. Audi, A.H. Wapstra, and C. Thibault. Nuclear Physics A729, 337-676 (2003).

INITIAL ISOTOPIC PLUTONIUM INFORMATION

INITIAL MASS FRACTIONS

Nuclide	Mass Fraction
Pu-238	0.000105
Pu-239	0.938928
Pu-240	0.058876
Pu-241	0.000730
Pu-242	0.000478
Pu-244	0.000000
Am-241	0.000883
	1.000000

INITIAL ACTIVITY FRACTIONS

Nuclide	Activity Fraction
Pu-238	0.011839
Pu-239	0.383479
Pu-240	0.087955
Pu-241	0.496764
Pu-242	0.000012
Pu-244	0.000000
Am-241	0.019951
	1.000000

INITIAL ACTIVITY RATIOS

	Activity Ratio
Pu alpha/Am-241	24.2241
Pu-241/Alpha	0.9871

Reviewed by: Michael Mar 1/14/16

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ISOTOPIC PLUTONIUM MASS FRACTION AND ACTIVITY FRACTION CALCULATION WORKSHEET

DATA ENTRY

Disposal Request	2016063
Waste Parcel ID	2016063-01
Additional Note	Z-2841
Start Date	8/1/2015
Stop Date	1/7/2016
Plutonium Material Type	User_01
Decay Time (days)	159
Effective Atomic Weight (Initial)	239.1157
Effective Atomic Weight (Decay Corrected)	239.1157
Plutonium Mass Fraction Remaining	0.999985

Plutonium "material type (MT)" initial mass fractions per Table 3b of LA-12846-MS "Specific Activities and DOE-STD-1027-92 Hazard Category 2 Thresholds LANL Fact Sheet" Issued: November 1994.
Plutonium "reactor grade" initial mass fractions per Table 2.1 of DOE-STD-1128-2008 "Guide of Good Practices for Occupational Radiological Protection in Plutonium Facilities" December 2008.
Atomic weights calculated per values in The AME2003 atomic mass evaluation (II). Tables, graphs, and references. G. Audi, A.H. Wapstra, and C. Thibault. Nuclear Physics A729, 337-676 (2003).

DECAY CORRECTED ISOTOPIC PLUTONIUM INFORMATION

DECAY CORRECTED MASS FRACTIONS

Nuclide	Mass Fraction
Pu-238	0.000105
Pu-239	0.938931
Pu-240	0.058874
Pu-241	0.000715
Pu-242	0.000478
Pu-244	0.000000
Am-241	0.000898
	1.000000

DECAY CORRECTED ACTIVITY FRACTIONS

Nuclide	Activity Fraction
Pu-238	0.011918
Pu-239	0.387370
Pu-240	0.088644
Pu-241	0.491369
Pu-242	0.000013
Pu-244	0.000000
Am-241	0.020486
	1.000000

DECAY CORRECTED ACTIVITY RATIOS

	Activity Ratio
Pu alpha/Am-241	23.8285
Pu-241/Alpha	0.9661

Reviewed by: Michael May 4/14/16

BE EQUIPMENT RELEASE PU SHOT Z2841 UCC AND UCV (ID: S03432)

TO: Jeff Gluth
FROM: Amanda Caldwell

Pu shot Z-2841

SUMMARY

Description (Purpose for sampling or monitoring)

This report documents results for biased beryllium (Be) wipe sampling conducted on 08/31/2015. The sampling was conducted to determine the presence and potential extent of removable surface Be contamination on equipment Enhanced Containment Chamber (ECC) and the Ultra-fast Closure Valve (UCV) prior to release from Building 983 to MBA-160 for temporary storage pending submittal of WDDR. The ECC will be seperated from the Upper Containment Chamber (UCC) under controled conditions. The primary containment assembly consisting of the UCC and UCV will be packaged for disposal to the Nevada repository.

Summary of results

Six biased wipe samples were collected from the ECC and UCV. Results of the sampling demonstrate the levels of removable beryllium contamination were below the Department of Energy (DOE) criterion of 0.2 micrograms beryllium per 100 centimeters squared (ug Be/100 cm2) for release to the general public. Additionally, as a result of design the item does not pose the potential for contaminated internal configuration. As a result, the item is not subject to 10 CFR 850.31 release criteria provisions and can be released following Uncontrolled Release Procedures specified in ESH100.2.IH.24, Manage and Control Beryllium Exposure (i.e., Labeling and the recipients' commitment letter are not required).

Sample ID	Date	Sample detail	Type	Agent	TWA/Result	OEL	Unit
098282-001	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2
098282-002	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2
098282-003	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2
098282-004	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2
098282-005	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2
098282-006	31 AUG 2015	TA4 983CENTER SECTION	EQUIPMENT	BERYLLIUM	< 0.025	0.2	UG/100 CM2

Survey comments

Samples were collected in accordance with NIOSH Method 9100 and were analyzed for beryllium by an inductively coupled plasma (ICP) scan in accordance with NIOSH Method 7303. Field blank samples were also prepared and submitted for analysis following NIOSH 7303. Beryllium was not detected in the field blanks.

IH / safety officer		Primary sampler	
Badge / ID		Badge / ID	
170040	MCKEAN, CR (CHRISTOPHER)	258651	CALDWELL, A (AMANDA)

PPE AND OTHER WORKPLACE CONTROLS

ASSESSMENT METHODS AND STANDARDS

Description of sampling method

Sampling rationale	Sampling and analytical method	Sampling device category
EQUIPMENT RELEASE	NIOSH 7303	GENERAL

RESULTS

Sample ID	Date	Type	Description
098282-001	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Top

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
098282-002	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Top

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
098282-003	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Top

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
098282-004	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Side

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
098282-005	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Side

SANDIA
TA4
Survey Summary Report

Sample ID	Date	Type	Description

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
098282-006	31 AUG 2015	WIPE SAMPLING	EQUIPMENT TA4 983 CENTER SECTION Bottom

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	< 0.025	0.2	UG/100CM2	DOE

Sandia National Laboratories
Operated for the U.S. Department of Energy by
Sandia Corporation
Albuquerque, New Mexico 87185

date: January 6, 2016

to: File (RMWMF DR-2016063)

from: Nibby Grelle, Org. 1673

subject: Calculated Concentration of Beryllium on External Surface of Waste Item Submitted Under RMWMF DR-2016063
[Dynamic Material Properties Containment (DMPC) Assembly Fielded on Z-Machine Experiment Z-2841]

Reference: IH Report ID # S03432 (Attachment 4 to DR-2016063)

Beryllium wipe sampling results by sample ID:

- 098282-001 < 0.025 µg/100 cm² (< 2.5e-8 grams)
- 098282-002 < 0.025 µg/100 cm²
- 098282-003 < 0.025 µg/100 cm²
- 098282-004 < 0.025 µg/100 cm²
- 098282-005 < 0.025 µg/100 cm²
- 098282-006 < 0.025 µg/100 cm²

Total Surface Area of the Containment Assembly (includes Enhanced Containment Chamber and Ultra-fast Closure Valve):

22,361.25 cm²
22,361.25 cm²/100 cm² = 223.6125

2.5e-8 g * 223.6125 = **5.59e-6 g** Beryllium on Exterior surface of the Containment Assembly (worst case)

Reference: CEN_SNMUNLD_OPPRO_Z-2841 (Attachment 8 to DR-2016063)

Measured Weight of Containment Assembly = 1035 lbs.
Convert lbs to g = 1041 lbs * (454 g/lb) = **4.699e5 g**

(5.59e-6 g Be/4.699e5 g Assembly Weight) * 100 = **1.19e-9 %** (by weight)

6) DR 2016063_Contmt Assy Matl Summary_Z-2841.xlsx

ALL UNITS IN POUNDS EXCEPT COLUMN "N"												
Material	**Gauges**	**RM4**	**VS6**	**BNV51**	**Probes**	**Manifold**	**Load**	**UCV & Vent Tank**	**HEPA**	**UCC**	**TOTAL (lbs)**	**Material**
Aluminum	0.0114				0.0068	0.0068	1.1846	4.0994		1.1870	6.4960	Aluminum
Steel	0.5252	0.2745	1.9500	2.4800	1.0310	1.0310	33.3293	452.7375	1.5320	411.0000	905.8905	Steel
Copper							3.4140	1.3000			4.7140	Copper
PZT (Excluding lead)								0.0100			0.0100	PZT (Excluding lead)
Glass					0.0097		0.0020				0.0117	Glass
Copper/Graphite (50/50 composite)							0.0310				0.0310	Copper/Graphite (50/50 composite)
Epoxy (Cured)					0.0677	0.0048	0.0005	0.7560			0.8290	Epoxy (Cured)
Plastic	0.0464	0.0007	0.0080	0.0072	0.0209			0.5970	0.0320		0.7122	Plastic
Rubber	0.0062				0.0161		0.0026	0.7160		0.4185	1.1594	Rubber
Lead				0.0006				0.0400			0.0406	Lead
Silver				0.0003		0.0001					0.0004	Silver
Tin								0.0020			0.0020	Tin
Silicone Vacuum Grease								0.0100			0.0100	Silicone Vacuum Grease
Carbon (From expended HE)								0.2000			0.2000	Carbon (From expended HE)
Aluminum Oxide (Al_2O_3)									0.1410		0.1410	Aluminum Oxide (Al_2O_3)
Platinum							0.0017				0.0017	Platinum
TOTAL (lbs)	0.5892	0.2752	1.9580	2.4881	1.1522	1.0427	37.9657	460.4679	1.7050	412.6055	920.2495	

See page 12 for measured weight of the containment assembly.

SNM HARDWARE UNLOAD PROCEDURE

1.0 PURPOSE AND SCOPE

The purpose of this document is to guide Center Section Personnel through the unloading process for explosive closure containment experiments with Special Nuclear Material (SNM) (e.g., Plutonium) on Z. This procedure is only used when all indications are that it is an uncontaminated unload; at the first indication that there is contamination, this procedure shall be stopped.

This is a controlled-activity technical work document: it shall be "in-hand" when the work is being performed, and section 7.0 shall be retained as a record.

This document is owned by Center Section Manager.

NOTE: This document is considered a Critical Lift Technical Work Document (TWD). Modifications to it should be considered for routing through the Critical Lift Designated Person(s) for concurrence.

NOTE: This document is considered an Integrated Radiological Technical Work Document. This procedure must be reviewed and have concurrence by the Radiation Protection Project Lead or delegate prior to the document being released.

NOTE: This document is executed as part of a complex process involving personnel other than those explicitly mentioned in this TWD. The master sequencing document, ACC_HARMUNLD_OPPRO, is owned by Accelerator Activities Manager. Modifications to this document should be consulted with the Accelerator Activities Manager for concurrence.

2.0 CHANGE HISTORY

This revision (11) switched the order of steps 7.1 and 7.2. It also added two additional steps to ensure that shot number is marked on ECC and that the keys are taped to the top of the ECC. A full change history is shown in Attachment A.

3.0 RESPONSIBILITIES

3.1 Center Section Personnel

Only individuals who have completed the "Containment Shot Load & Unload Qualification Card," CEN_SNMLOADQUAL_FORM, may perform the work described in this procedure. Additionally, personnel performing the top or bottom load unsupervised shall be qualified for the task being performed; see the "Topside Load & Unload Qualification Card," CEN_TOPLOADQUAL_FORM, and the "Bottomside Load & Unload Qualification Card," CEN_BTMLOADQUAL_FORM.

The Center Section Process Owner is responsible for initiating the C5 checklist (SF 2001-CSA) and is also responsible for designating the Person-In-Charge for the associated critical lifts.

3.2 Shot Director

The Shot Director is responsible for directing the overall process and checking off the steps as they are performed.

3.3 Radiation Protection (RP)

Radiation Protection personnel are responsible for recommending the appropriate radiological controls, performing radiological surveys, and assessing radiological conditions.

3.4 Industrial Hygiene (IH)

Industrial Hygiene personnel are responsible for taking Beryllium swipes from the containment system to allow for its release.

3.5 Critical Lift Person-in-Charge

The Critical Lift Person-in-Charge is responsible for developing and maintaining the critical lift datasheets for the associated critical lifts.

4.0 DEFINITIONS

UCV -	The Ultrafast Closure Valve is used to contain SNM during a shot.
UCC -	The Upper Containment Chamber is the primary containment for the SNM.
ECC –	Enhanced Containment Chamber
Hold point -	A hold point is process/procedure step at which work shall not proceed until the radiological controls/conditions have been assessed and additional controls have been implemented as needed.
Confinement tent	There are confinement tents for the top and bottom. They are visually inspected, and smoke-tested and before use.

5.0 HAZARD IDENTIFICATION AND CONTROLS

5.1 Exposure to Radiation and Radioactive Materials (SNM shots only) – The primary radiological hazard associated with the SNM ICE shot is removable and fixed alpha contamination. Gamma radiation is expected to be indistinguishable from background.

Controls include the use of tents, HEPA filtered ventilation, continuous air monitoring, full face air purified respirators with P100 cartridges, lapel air sampling, PPE, TLDs, bagout methodology for sample collection, and continuous RCT coverage.

At the first indication of contamination, this process shall stop.

5.2 Gravity hazards – Crane usage and suspended loads are controlled via the crane qualification card, direct supervision, and load support/resting devices. Swivel-hoist rings shall be used for the hoisting of components to and from the chamber. There shall be a critical lift plan for the unloading of the UCC assembly for SNM shots.

5.3 Beryllium – The Center Section is a Beryllium Operational Activity Area (BOAA). It is controlled via PPE, the Center Section access list, the ADM_CBDPPIP_ADPRO, and IH support.

During entry and work in the bottom tent, the pathway from the tent to the exit of the -25' CS

BOAA is maintained as a general work 'clean' area. Personnel are required to remove their PPE (Tyvek coveralls, booties, gloves, and respirator) to prevent potential contamination spread and be frisked without PPE as a radiation control upon leaving the tent. Because personnel must exit the tent and pass through the -25' CS BOAA without the required PPE for beryllium controls, the following conditions shall be met:

- The ladder used to enter the containment tent in the BOAA shall be wet wiped upon introduction and removal into the BOAA and stored outside of the BOAA when not in use.
- Clean Herculite shall be placed at the bottom of the ladder and along the exit path to the outside of the CS BOAA. If Herculite remains in place for more than a day, the Herculite shall be HEPA vacuumed or wet wiped each day.
- Personnel exiting and entering the containment tent as well as RCTs must remain on the Herculite pathway.
- No work activities that could disturb beryllium removable surface contamination are allowed in the CS BOAA while maintaining the area as a general work 'clean' area.

5.4 **Confined space** - The center section is a confined space at all times, C5 alternate procedures may be used if ventilation and air monitoring is used. Personnel shall follow applicable confined space procedures and be on the access list.

5.5 **Pressurized gases** – There is a potential for pressurized gases inside of the vent tank. There is a pressure safety data package for the system.

5.6 **Emergency response with a tent set up:**
Continuous Air Monitoring (CAM) Alarm - For individuals located outside of the tent the response to a CAM alarm is to STOP work, place work in a safe configuration, and rally outside of the main door on the zero foot level that leads to the hall. Individuals shall stay at this location until an RCT arrives and then follow RCT direction.

For individuals located inside the tent, the response to a CAM alarm is to STOP work, place work in a safe configuration, rally at the Radiological Buffer Area in the tent, and allow an RCT to verify the CAM alarm. Individuals shall leave all PPE on (including respirator) and follow RCT direction.

Building Fire Alarm - Individuals located outside of the tent shall follow the building evacuation procedure. Individuals located inside the tent shall leave immediately by whatever means is necessary. They should not remove their PPE (including respirators) or concern themselves with frisking out of the tent. Individuals shall leave the tent and follow the building evacuation procedure. At the rally point all individuals in PPE must segregate themselves away from the other people and follow RCT directions.

SNM HARDWARE UNLOAD PROCEDURE

6.0 REQUIRED EQUIPMENT

6.1 PPE:
Safety shoes, Tyvek® coveralls with hood, 2 pairs of latex or nitrile gloves (inner pair taped), shoe covers, hard hats, full-faced APR respirators with P-100 cartridges, TLD. Lapel air samplers must be worn if there is the potential for radiological contamination.

6.2 Crane Scale/Load Cell – within calibration date

6.3 Preassembled ultra-high purity filter, gauge, and gasket assembly

6.4 UCV/Vent Tank Stand

6.5 Rigging equipment – see critical lift documentation

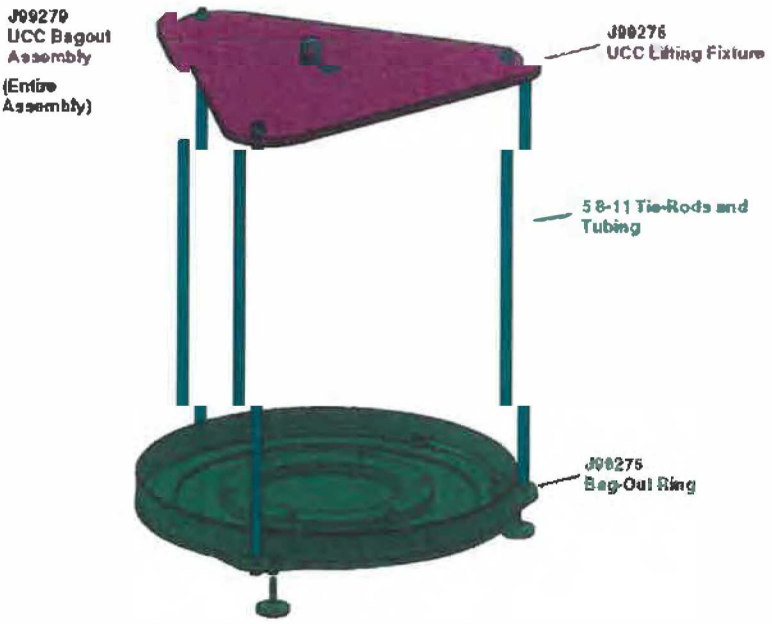
6.6 Critical lift datasheets SNM-044 and SNM-030 (SNM-036 is used instead of SNM-030 if the anode is attached to the assembly)

6.7 Cryo swipe bag

6.8 Ethyl alcohol for beryllium decon of post-shot unit

6.9 Pallet and fasteners: J99341, socket head cap screws ½"-13 x 2.75", leveling mounts ½"-13 (x 3.125" overall height), leveling mount jam (hex) nuts: ½" - 13

6.10 Bag-out assembly (see below), primary bag (J99373), O-ring for base of primary bag (3/8" x Ø 79.8")



SNM HARDWARE UNLOAD PROCEDURE

7.0 PROCEDURE Actually shot 2841 - note added after document scanned in HMH **Date:** 8-26-15 **Shot:** 2741

Signature: [signature]

NOTE: This document is executed as part of a complex process involving personnel other than those explicitly mentioned in this TWD. The steps in the master sequencing document, ACC_HARMUNLD_OPPRO, are directed by the Shot Director. The steps in this procedure do not begin until after the Hold Point 1 is completed. In addition, the top and bottom air samples have been taken.

Top Cryo Smears

7.1 ☑ **When requested by the Shot Director, prepare the top access port to enable a cryo smear, ensuring the port isn't removed until the cryo-swipe bag is secured over the port.**

- 7.1.1 ☑ Loosen 4 equally spaced bolts including the security bolt from the top access port, and then retighten these 4 bolts by hand to 0 lash.
- 7.1.2 ☑ Remove the remaining bolts excluding the 4 previously loosened bolts from the top access port.
- 7.1.3 ☑ Place ½" ratchet with a ¾" hex socket in a bag over the top access port cover.
- 7.1.4 ☑ Have RP install cryo-swipe bag over the top access port.

7.2 ☑ **When requested by the Shot Director, help configure the bottom tent, establish bottom-side section BOAA for tent activities, and ensure that Herculite path is in place.**

NOTE: Hold Point 2 is completed. In order to make bottom-side entry, configuration 3 (Convolute Pull) must be established.

LINERS TEST

Bottom-Side Entry

WARNING: The PPE listed in 6.1 shall be worn when entering the center section or as directed by RP.

If Radiation Protection detects contamination inside the center section, the unload process shall be stopped.

At any time if the tent is torn or its integrity questioned, stop work and evaluate the issue.

7.3 ☑ **Ensure all involved Center Section personnel are engaged in the Shot Director's pre-job briefing.**

SNM HARDWARE UNLOAD PROCEDURE

7.4 ☒ **When requested by the Shot Director, open the bottom trap door to the chamber.**

7.5 **Take a smear according to RP directions.**

7.6 ☒ **When requested by the Shot Director, enter the bottom-side with RP present and remove the convolute(s).**

7.6.1 If some of the bolts on the lower cathode are unable to be removed without utilizing destructive methods (i.e., drilling), remove bolts that are not stuck and pass them and the bottom anode to RP personnel for surveying.

7.6.2 If the bolts and anode are free from slag and contamination, drilling of the bolt heads is allowed. If there is slag but no contamination, cease the bottom unload. Hold Point 6 will be designated "welded."

7.7 ☒ **Allow RP to survey the convolutes.** Ensure the trap door remains open until survey results are known. Do not use any power tools to separate the convolutes.

NOTE: Hold Point 3 must be completed before beginning the next step. In order to access the top-side, configuration 4 (Top Smear on a Stick) must be established.

7.8 **When requested by the Shot Director, close the trap door.**

Top-Side Access Port Survey

7.9 ☑ **If requested by the Shot Director, help remove the standard top lid or the security bolt from the top access port, depending on which MBA security posture was previously assumed.**

NOTE: Hold Point 4 is completed.

7.10 ☑ **When requested by the Shot Director, help re-install the top access port.**

Extended Top-Side Survey

7.11 ☑ **When requested by the Shot Director, remove the top lid (SNM) to the chamber.**

NOTE: Hold Point 5 is completed. In order to make bottom-side entry, configuration 5 (Top Extended Survey) must be established.

Unload

SNM HARDWARE UNLOAD PROCEDURE

WARNING: The PPE listed in 6.1 shall be worn when entering the center section or as directed by RP.

If Radiation Protection detects contamination inside the center section, the unload process shall be stopped.

At any time if the tent is torn or its integrity questioned, stop work and evaluate the issue.

CAUTION: DO NOT unscrew detonators when disconnecting fireset cables. This will breach the seal on the UCV, possibly resulting in chamber contamination. If the seal is disturbed, notify RP.

7.12 ☑ **When requested by the Shot Director, disconnect and remove the fireset cables from the UCV to the outer top lid assembly.**

7.13 ☑ **When requested by the Shot Director, disconnect VISAR and MITL B-dot feedthroughs.**

7.13.1 Cut the VISAR cables just below the interface plate and at the inside and outside of the feedthrough on the outer top lid assembly.

7.13.2 Disconnect the MITL B-dot feedthroughs from the top anode, the outer top lid assembly, and the wall.

7.14 ☑ **When requested by the Shot Director, remove the outer top lid assembly.**

NOTE: HOLD POINT 6 occurs at this time. CENTER SECTION is part of the signature process for this hold point.

7.15 ☑ **Consult with the Shot Director and RP to determine the path forward as either a "Welded Unload," or a "Not Welded Unload."**

☐ Perform step 7.16 through 7.20 (if welded)

☑ Skip to step 7.21 (if not welded)

Welded Unload

7.16 ☐ **When requested by the Shot Director, install the top tent with RP.**

7.17 ☐ **When requested by the Shot Director, install and seal the top tent chamber liner with RP.**

SNM HARDWARE UNLOAD PROCEDURE

CAUTION: Critical lift documentation shall be completed.

7.18 ☐ When requested by the Shot Director, proceed with bag-out process for removing ECC/UCC assembly working with RP.

7.18.1 ☐ Use the crane to lower the bag-out sealing ring assembly into the center section. The swivel hoist rings (3 each 1/4"-20; located 120 degrees apart) shall be threaded into bag-out sealing plate. Locate the bag-out sealing ring assembly off to the side, on the MITL work platform.

7.18.2 ☐ With permanent ink mark the ECC and the bag out ring with the Z shot number.

7.18.3 Install top tent lid with ECC bagout sleeve.

7.18.4 ☐ Allow RP to visually inspect and perform a smoke test of the top tent lid.

7.18.5 ☐ Attach ECC bagout sleeve to ECC. Tape the sleeve approximately 4" below the top of the ECC.

7.18.6 ☐ Remove the bolts securing the UCV to the adapter ring. The bolt directly below the PZT pin cannot be removed but it can be fully unthreaded; verify that it is not partially engaged during the hoisting process.

7.18.7 ☐ Conduct a pre-job briefing for the critical lift (data sheet SNM-044).

7.18.8 ☐ Attach the certified scale/load cell with the rigging (specified bridle chain sling) attached to the crane, and zero (tare) scale.

WARNING: Do not allow tension on the rigging to exceed what is specified in the Critical Lift Plan. This is an indication of a welded load.

7.18.9 ☐ Following the critical lift plan, use the crane to lift the ECC/UCC assembly no higher than necessary for installation of the bag-out ring, leaving adequate clearance for RCT survey. If there is no indication of movement, stop the lift and proceed with step7.18.10.

Weight: _____

7.18.10 ☐ If the assembly is welded and does not lift out, lower the crane to relieve tension on the rigging.

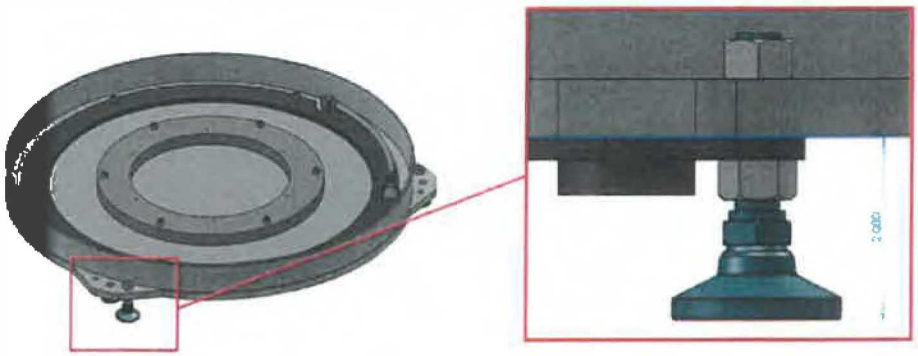
- If the assembly is welded, rebolt the UCV to the adapter ring in four equally spaced locations. Unbolt the top anode 2 foot transition from the 4 foot MITL transition. Repeat step 7.18.9. If the assembly lifts out, the anode is welded; proceed with step 7.18.11. If the assembly does not lift out, the cathode is welded; lower the crane to relieve tension on the rigging and rebolt the anode 2 foot.
- If the cathode is welded, enter via the bottomside to install three cathode extension pusher bolts. Raise the load until the scale reads approximately the weight cited in the Critical Lift Plan. Tighten the pusher bolts until the cathode extension separates from the convolute.

7.18.11 ☐ Allow RP to survey underneath the explosive enclosure.

7.18.12 ☐ Using two people, install tent liner cap over the tent liner opening. Seal the tenting using Velcro and tape for a redundant seal.

SNM HARDWARE UNLOAD PROCEDURE

7.18.13 ☐ Ensure 3 leveling mounts are attached to the bag-out plate (J99275) leaving a 2" gap between the base of the bag-out plate and the bottom of the leveling mounts as shown:



7.18.14 ☐ Using two people manually position the bag-out plate (J99275) onto the MITL work platform; ensure that the bag-out sealing plate is securely resting on the MITL work platform. Reposition ECC and containment assembly over the bag-out sealing plate.

7.18.15 ☐ Lower the ECC assembly onto the bag-out plate and bolt to the platform using (4) 1/4"-20 hardware; tighten, and ensure the ECC assembly is secure.

7.18.16 ☐ If the 2' transition is attached to the assembly, secure the transition to bag-out plate.

7.19 ☐ Hold the process at this point to allow RP survey results to be returned.

NOTE: Hold Point 7 is completed. Do not proceed until confirmation received from RP that explosive enclosure survey results are clean.

7.20 ☐ When requested by the Shot Director, proceed with the unload and Beryllium decontamination.

7.20.1 ☐ Disconnect the bridle sling from the ECC.

7.20.2 ☐ Separate the ECC sleeve from the ECC.

7.20.3 ☐ Perform beryllium decon of the ECC and the UCV using wet appropriate methods.

7.20.4 ☐ Ask IH to take 2 beryllium wipe samples (using ghost wipes) on the ECC (top surface and side surface) and 1 beryllium wipe sample on the UCV to include the area immediately around the UCV. Ensure that samples are marked for location and that rad swipes have been taken at the same locations. When beryllium samples have been released by Radiation Protection, have IH pick up the samples to record and send out for analysis.

7.20.5 ☐ Ensure RP stages rad swipes on top of the ECC for future use.

7.20.6 ☐ Attach two material identification stickers to the ECC located 180° apart.

7.20.7 ☐ Mark the ECC with the shot number.

7.20.8 ☐ Inspect the bag assembly. Ensure that the gloves are inside the transportation bag.

SNM HARDWARE UNLOAD PROCEDURE

7.20.9 ☐ Ensure keys are taped to the top of the ECC.

7.20.10 ☐ Place small bag around the ECC/UCC.

7.20.11 ☐ Seal the bag to the bag-out plate. Visually inspect to ensure a good seal.

- 7.20.11.1 Pull the bag through the O-ring, and then pull the bag over the lip of the bag-out plate.
- 7.20.11.2 Leave approximately 2" of bag material past the lip of the bag-out plate.
- 7.20.11.3 Stretch the O-ring over the lip of the bag-out plate.
- 7.20.11.4 Fold the bag back over the O-ring toward the lip of the bag-out plate.
- 7.20.11.5 Tape the folded bag so that the tape covers the edge of tbe folded bag at the top and the O-ring. Wrap the entire circumference.

7.20.12 ☐ Attach a Be sticker and two material identification stickers to the radiation control bag located 180° apart, 90° offset from stickers located on ECC.

7.20.13 ☐ Remove top tent lid with ECC sleeve. If necessary, cut the sleeve as high as possible to aid in the top tent lid removal.

7.20.14 ☐ Complete lifting fixture assembly that is attached to the bagout ring. See drawing #J99325.

7.20.15 ☐ Conduct a pre-job briefing for the critical lift (data sheet SNM-030 without anode attached, SNM-036 with anode attached).

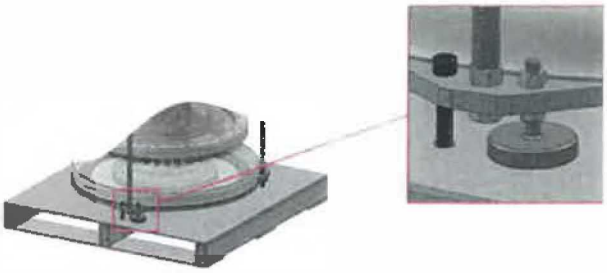
7.20.16 ☐ Attach the bridle sling specified in the critical lift documentation to the lifting fixture.

7.20.17 ☐ Lift the ECC/UCC assembly out of the Center Section and rest the bag-out plate (J99275) on the SNM large pallet (J99341) while the clamping holes and corresponding threads are aligned or inside the 544.

7.20.18 ☐ Ensure the SNM large pallet or 544 is staged on Herculite.

7.20.19 ☐ Fasten the bag-out plate (J99275) to the SNM large pallet using 3x ½"-13 x 2-3/4" socket head cap screws, if utilized.

SNM HARDWARE UNLOAD PROCEDURE



7.20.20 ☐ Transport the 544 or palletized containment hardware to an MBA cage.

NOTE: Remove tent liner and complete remainder of unload by normal procedures (see CEN_UNLOAD_OPPRO).

Not Welded Unload

NOTE: The following steps are only conducted if steps step 7.16 through 7.20 were skipped per Hold Point 6.

CAUTION: Critical lift documentation shall be completed.

7.21 When requested by the Shot Director, proceed with bag-out process for removing ECC/UCC assembly working with RP.

7.21.1 ☑ Use the crane to lower the bag-out sealing ring assembly into the center section. The swivel hoist rings (3 each 1/4"-20; located 120 degrees apart) shall be threaded into bag-out sealing plate. Locate the bag-out sealing ring assembly off to the side, on the MITL work platform.

7.21.2 ☑ Using two people manually position the bag-out plate (J99275) onto the MITL work platform; ensure that the bag-out sealing plate is securely resting on the MITL work platform.

7.21.3 ☑ Remove the bolts securing the UCV to the adapter ring. The bolt directly below the PZT pin cannot be removed but it can be fully unthreaded; verify that it is not partially engaged during the hoisting process.

7.21.4 ☑ Conduct a pre-job briefing for the critical lift (data sheet SNM-044).

7.21.5 ☑ Attach the certified scale/load cell with the rigging (specified bridle chain sling) attached to the crane, and zero (tare) scale.

SNM HARDWARE UNLOAD PROCEDURE

7.21.6 ☑ Ensure 3 leveling mounts are attached to the bag-out plate (J99275) leaving a 1-5/8" gap between the base of the bag-out plate and the bottom of the leveling mounts (see 7.18.13).

WARNING: Do not allow tension on the rigging to exceed what is specified in the Critical Lift Plan. This is an indication that the load is welded.

7.21.7 ☑ Following the critical lift plan, use the crane to lift the ECC/UCC assembly no higher than necessary for installation of the bag-out ring, leaving adequate clearance for RCT survey. If there is no indication of movement, stop the lift and proceed with step 7.21.8.

Weight: 1035

RP Survey

7.21.8 ☒ If the assembly is welded and does not lift out, lower the crane to relieve tension on the rigging.

- If the assembly is welded, rebolt the UCV to the adapter ring in four equally spaced locations. Unbolt the top anode 2 foot transition from the 4 foot MITL transition. Repeat step 7.21.7. If the assembly lifts out, the anode is welded; proceed with step 7.21.9. If the assembly does not lift out, the cathode is welded; lower the crane to relieve tension on the rigging and rebolt the anode 2 foot.
- If the cathode is welded, enter via the bottomside to install three cathode extension pusher bolts. Raise the load until the scale reads approximately the weight cited in the Critical Lift Plan. Tighten the pusher bolts until the cathode extension separates from the convolute.

7.21.9 ☑ Lower the ECC assembly onto the bag-out plate and bolt to the platform using (4) 1/4"-20 hardware; tighten, and ensure the ECC assembly is secure.

7.21.10 ☑ Disconnect the bridle sling from the ECC.

7.21.11 ☒ If the 2' transition is attached to the assembly, secure the transition to bag-out plate.

OE-ON

7.21.12 ☑ Ask IH to take 2 beryllium wipe samples (using ghost wipes) on the ECC (top surface and side surface) and 1 beryllium wipe sample on the UCV to include the area immediately around the UCV. Ensure that samples are marked for location and that rad swipes have been taken at the same locations. When beryllium samples have been released by Radiation Protection, have IH pick up the samples to record and send out for analysis.

7.21.13 ☑ Ensure RP stages rad swipes on top of the ECC for future use.

7.21.14 ☐ Attach two material identification stickers to the ECC, 180° apart (see 7.20.6).

7.21.15 ☑ Mark the ECC with the shot number.

7.21.16 ☑ Inspect the bag assembly. Ensure that the gloves are inside the transportation bag.

7.21.17 ☑ Ensure keys are taped to the top of the ECC.

7.21.18 ☑ Place complete primary bag (J99373) around the ECC/UCC.

SNM HARDWARE UNLOAD PROCEDURE

7.21.19 ☑ Seal the bag to the bag-out plate. Visually inspect to ensure a good seal.

- 7.21.19.1 Pull the bag through the O-ring, and then pull the bag over the lip of the bag-out plate.
- 7.21.19.2 Leave approximately 2" of bag material past the lip of the bag-out plate.
- 7.21.19.3 Stretch the O-ring over the lip of the bag-out plate.
- 7.21.19.4 Fold the bag back over the O-ring toward the lip of the bag-out plate.
- 7.21.19.5 Tape the folded bag so that the tape covers the edge of the folded bag at the top and the O-ring. Wrap the entire circumference.

7.21.20 ☑ Attach a Be sticker and two material identification stickers to the radiation control bag located 180° apart, 90° offset from stickers located on ECC (see **7.20.12**).

7.21.21 ☐ Complete lifting fixture assembly that is attached to the bag-out ring. See drawing #J99325.

7.21.22 ☑ Conduct a pre-job briefing for the critical lift (data sheet SNM-030 without anode attached, SNM-036 with anode attached).

7.21.23 ☑ Lift the ECC/UCC assembly out of the Center Section per the critical lift plan.

- 7.21.23.1 If a 544 is not available, load the bag-out plate (J99275) onto the SNM large pallet (J99341) while the clamping holes and corresponding threads are aligned. Fasten the bag-out plate (J99275) to the SNM large pallet using 3x ½"-13 x 2-3/4" socket head cap screws.
- 7.21.23.2 If a 544 is available, ensure it is prepared with foam seal installed on the lid.
- 7.21.23.3 Load unit into 544, center and disconnect crane.
- 7.21.23.4 Unbolt and remove the top plate of the lifting unit.
- 7.21.23.5 Return the ½ x 1.25" nuts to the threaded rods; tighten them against the nut still attached.
- 7.21.23.6 Use wrench to loosen the rod from the bag-out ring
- 7.21.23.7 Remove all 3 lifting rods.
- 7.21.23.8 Replace lid onto 544, tighten bolts to 20 ft-lb using calibrated torque wrench.
- 7.21.23.9 Retighten all bolts to 30 ft-lb.

7.21.24 ☑ Transport the 544 or palletized containment hardware to an MBA cage.

NOTE: Complete remainder of unload by normal procedures (see CEN_UNLOAD_OPPRO).

8.0 RECORDS

Results of radiological surveys shall be kept by Radiation Protection.

Results of beryllium sampling shall be kept by Industrial Hygiene.

This completed controlled-activity TWD shall be kept with the shot documentation; see the Records Coordinator for the location.

9.0 REFERENCES

"Z Crane Use," ACC_CRANE_OPPRO

"Chronic Beryllium Disease Prevention Program Implementation Plan," ADM_CBDPPIP_ADPRO

"Unloading the Center Section," CEN_UNLOAD_OPPRO

"Taking Air Samples," CEN_SNMAIRSMPL_OPPRO

"Pu-ICE Post Shot Reentry Process," RP Line Support Team Document

"Remote A&F Support," SP_540002, Explosives Applications Department Operating Procedure

10.0 ASSOCIATED DOCUMENTS

None.

11.0 ATTACHMENTS

Attachment A- Change History

Attachment B – Radiological Controls and Hazards

Attachment C – Primary Containment Assembly Model

Attachment D – Secondary Containment Assembly Model

Attachment E – Air Flow Configurations

Attachment F – SNM Unload Procedures

Attachment A
Change History

Rev	Description of Change	Author	Issue Date
A	Initial Release. Derived from CEN_SNMSHOTS_OPPRO_Rev.F1; added ECC.	B. Lewis, D. Dalton, P. Wakeland, et al	11/18/10
B	Incorporated redlines from first Pu shot. Removed ECC/UCC separation from this document.	B. Lewis, P. Wakeland, et al	3/15/11
C	Incorporated red-lines from the second confirmatory shot. The tent lid will not be replaced after hold point 4.	B. Lewis, et al	3/30/11
D	Incorporated red-lines. Removed non-SNM unload. Added option if the convolutes do not weld.	B. Lewis, P. Wakeland, et al	9/14/11
E	Added steps to place the ECC/UCC assembly on the pallet and allowed unload without the top tent in place Added attachment C (airflow configurations)	M. Christison, T. Chavez	11/15/11
F	Incorporated red lines, added beryllium surveys, and addressed MBA issues regarding cryo smear.	A. Edens, B. Lewis, et al	2/2/12
G	Incorporated red lines, referenced the air sample procedure, added use of 544, and modified attachment C.	M. Christison, J. Gluth	8/16/12
H	Added step to mark the ECC and the bag out ring with the Z shot number. Also added Attachment B which identifies radiological hazards and concerns.	P. Wakeland	05/13/13
H1	Modified two steps to ensure that ensure gloves are in transportation bag and that the bag assembly is inspected. Also added two steps on how the cathode and anode need to be handled.	P. Wakeland, A. Edens	08/22/13
H2	Added a step to perform decontamination of the ECC or UCV. Also, the step to inspect the bag assembly was re-ordered.	J. Gluth	06/26/14
H3	Added a step that ensures the HEPA filter system remains in place.	E. Breden	09/08/14
H4	Added column S (Bottom SNM Tent Valve) to table in Attachment D as well as incorporated a new picture to better represent the system.	M. Christison	09/29/14
I	Added new Attachment D – which is Secondary Containment Assembly (former Attachment D – Ventilation Configurations is not Attachment E). Added new Attachment F – SNM Unload Procedures. Changed title to reflect High Activity Radioactive Material (HARM) Hardware Unload Procedure. Ensured that steps integrated with ACC_HARMUNLD_OPPRO (new procedure).	L. Baldwin	02/19/15

SNM HARDWARE UNLOAD PROCEDURE

Rev	Description of Change	Author	Issue Date
I1	Switched order of steps 7.1 and 7.2. Added two additional steps to ensure that shot number is marked on ECC and that the keys are taped to the top of the ECC.	G. Olivas	03/05/15

Attachment B

Radiological Hazards and Conditions

Dose Estimates

The external (ED) and internal (CED) dose estimates for completing this work:

	ED	CED	TED
Highest Individual	0 (mrem)	0 (mrem)	0 (mrem)
Collective	0 (person-mrem)	0 (person-mrem)	0 (person-mrem)

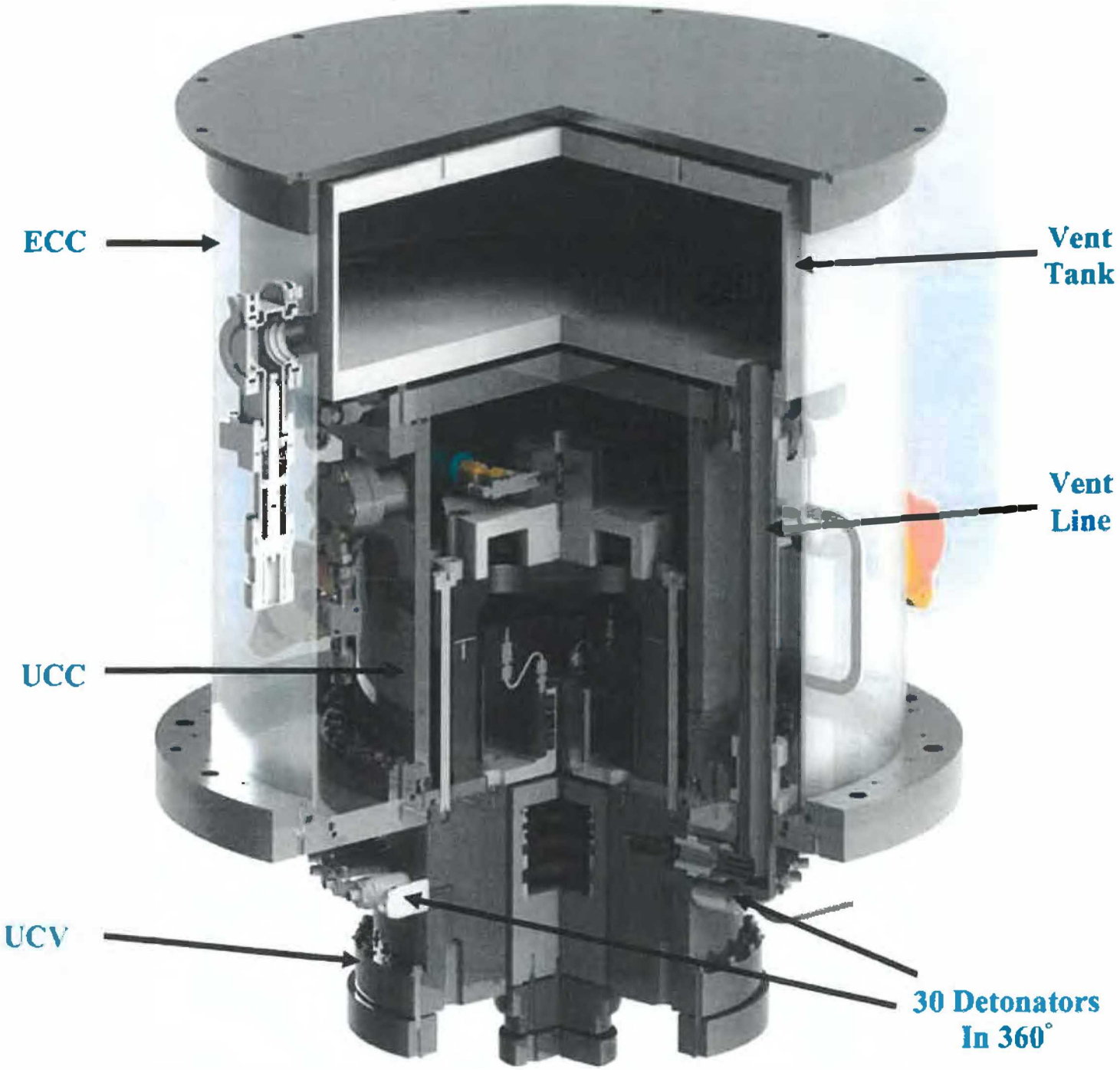
Operational ALARA Screen

Select the appropriate response to the following questions:

	Yes	No
Highest individual dose is expected to be >100 mrem TED to complete the work.		X
Collective dose is expected to be >500 person-mrem TED to complete the work.		X
Airborne radioactivity in the accessible work area is expected to routinely meet or exceed the criteria for an airborne radioactivity area.		X
Removable contamination in the accessible work area is expected to routinely meet or exceed the criteria for a high contamination area.		X
Hot particles are expected in the accessible work area.		X
General area dose rates in the accessible work area are expected to routinely meet or exceed the criteria for a high or very high radiation area.		X
Dose rates >50 µrem/hr are expected in occupied areas for a period >1 week.		X

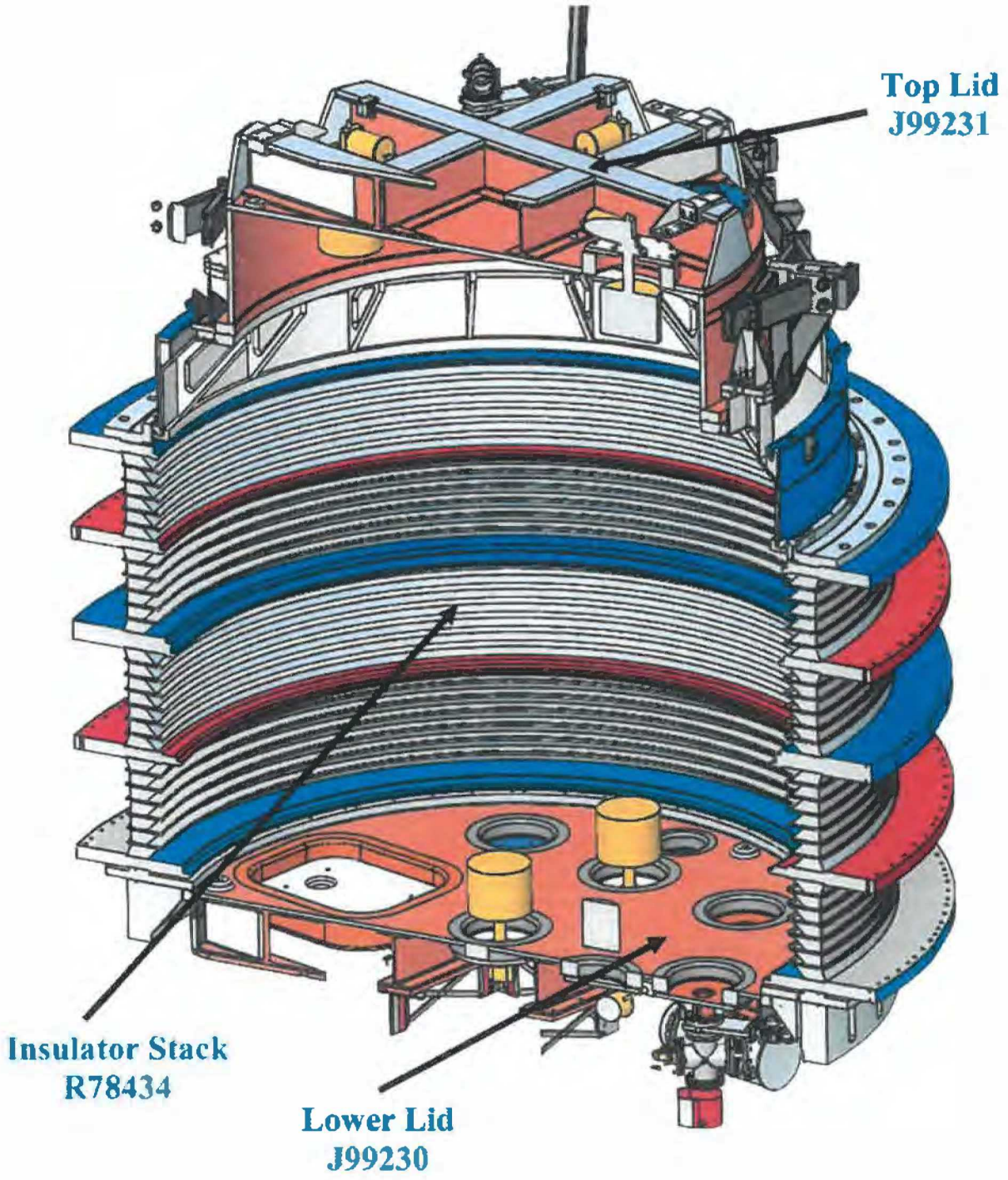
Attachment C

Primary Containment Assembly (J99490) - Model View



Attachment D

Secondary Containment Assembly (J34003) - Model View



SNM HARDWARE UNLOAD PROCEDURE

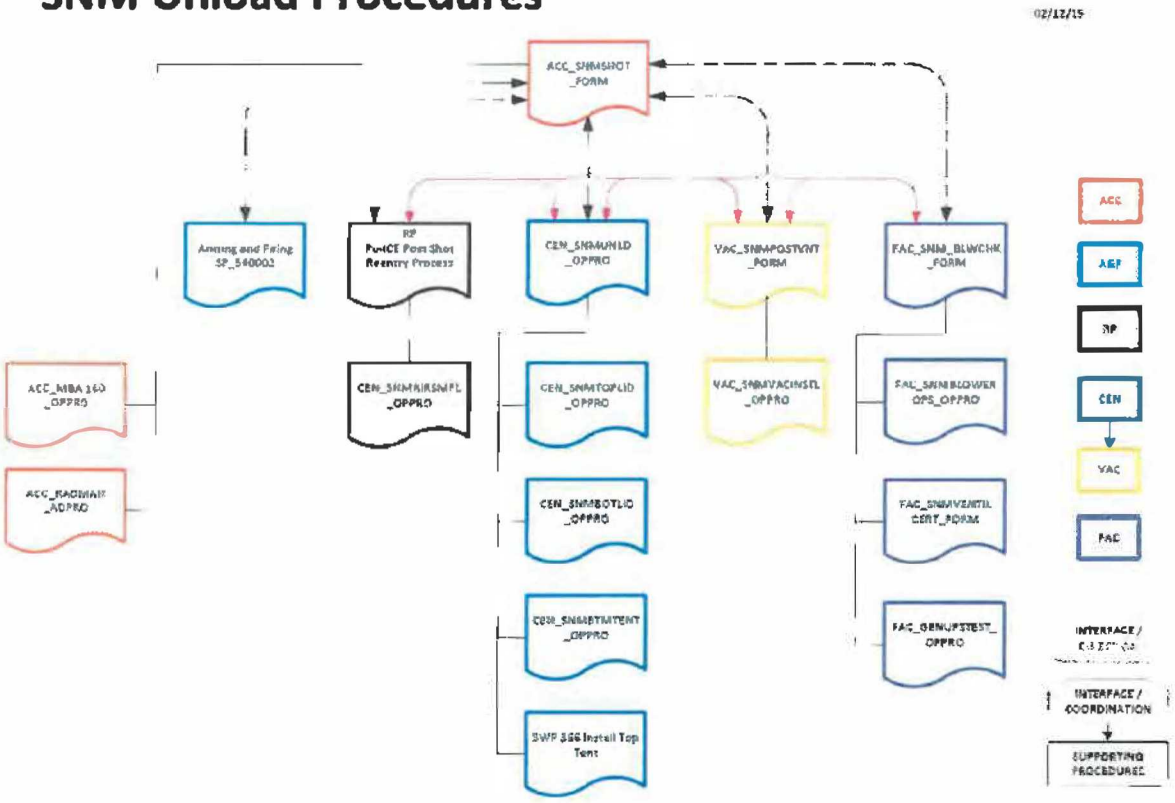
Attachment E – Ventilation Configurations

	Configuration	Top HEPA filter Valve V-756	Top HEPA Filter Valve V-757	Top HEPA Filter Valve V-758	Top HEPA Filter Valve V-755 (Screen)	Top Air Sample Valve V-745	Ducting Connected to Top Air Sample	Bottom HEPA filter Valve V-750	Ducting Connected to Bottom HEPA filter	Bottom Tent Installed	Bottom Air Sample Valve V-740	Ducting Connected to Bottom Air Sample Valve	Bottom Manway	Ducting: Tent to (R)	Top HEPA Blower	Bottom HEPA Blower	Bottom SNM Tent Valve
		A	B	C	D	F	G	H	J	K	L	M	N	P	Q	R	S
A	Shot Configuration (Safe)	Closed	Closed	Closed	Closed	Closed	No	Closed	Yes	No	Closed	No	Closed	No	Off	Off	NA
B	Vent Start	Closed	Closed	Closed	Open	Closed	No	Closed	Yes	No	Closed	No	Closed	No	Off	Off	NA
C	Vent Finish	Open	Closed	Closed	Closed	Closed	No	Closed	Yes	No	Closed	No	Closed	No	Off	Off	NA
D	Negative Pressure (If Read)	Open	Open	Open	Closed	Closed	No	Open	Yes	No	Closed	No	Closed	No	Off	Off	Closed
1A	Top Air Sample	Closed	Closed	Closed	Closed	Open	Yes	Open	No	No	Closed	No	Closed	No	Rate*	Off	NA
1B	Bottom Air Sample	Open	Open	Open	Closed	Closed	No	Closed	No	No	Open	Yes	Closed	No	Off	Rate*	NA
2A	Bottom Tent Installation	Closed	Closed	Closed	Closed	Closed	No	Closed	No	No	Closed	No	Closed	No	Off	Off	NA
2B	Bottom Tent Survey	Closed	Closed	Closed	Closed	Closed	No	Closed	No	Yes	Closed	No	Closed	Yes	Off	On	On
2C	Top Cryo Swipe	Closed	Closed	Closed	Closed	Closed	No	Open	Yes	Yes	Closed	No	Closed	No	Off		Closed
3	Bottom Convolute Pull	Closed	Closed	Closed	Closed	Closed	No	Open	Yes	Yes	Closed	No	Open	No	Off		Closed
4	Top Smear on Stick	Closed	Closed	Closed	Closed	Closed	No	Open	Yes	Yes	Closed	No	Closed	No	Off		Closed
5	Top Extended Survey	NA	NA	NA	NA	NA	NA	Open	Yes	Yes	Closed	No	Closed	No	NA	On	Closed

*This is the ventilation flow rate and is recorded on the ventilation check list (FAC_SNM_BLWCHK_FORM).

Attachment F

SNM Unload Procedures



Radiological Survey Report

Survey I-20150903-4

General Information

Title: SNL/NM007540 (544 containing Z2841)

Survey Date/Time: 9/3/2015 08:30

Lead Surveyor: Finley, Edward

Location: 961N / 1

Work Order/Task #: 174580/4.46.01

TWD or RTWD #: N/A

Purpose: Transportation

Requestor Org: 01646

Status: Approved by: Green, Kelly, 9/8/2015

Ready for Review by: Walton, Edward, 9/4/2015

Additional Surveyors

Surveyor
Walton, Edward

Instruments Used

#	Instrument Model	Instrument Serial #	Inst Type	Probe Model	Probe Serial #	Probe Type	Calibration Date	Efficiency β/γ	Efficiency α
1	MICROREM	19098	D	N/A	N/A	D	9/10/2015	N/A	N/A
2	RADEYESX	11147	C	SHP380AB	00680	C	2/10/2016	0.05	0.15

Instruments Used - Notes

#	Notes
1	N/A
2	N/A

Comments:

S44 Container (SNL/NM007540) Transportation Survey

The container was being stored in a cage inside 961-N storage building, awaiting movement to the RWMWF. It contained the Pu shot containment from Z-Machine Pu shot conducted on 8/27/2015.
The container was pulled out of the cage on a hand-powered pallet forklift to the center of the room for surveying.

Initial Conditions:
Cage posting: Controlled Area/Radioactive Material
No non-rad hazards posted
Radionuclides of concern are: Alpha-Pu239, Beta/Gamma-Unknown.
Microrem background: 6µrem
Radeye SX/ 380AB background: 2/224 (α/β)

Survey Details:
A total of 8 swipes were taken around all sides of the container. The swipes were field counted with a Radeye SX w/380AB probe to ensure dpm was below 50,000 prior to lab submission. The swipes were then submitted for "Gross Alpha/ Beta by GP. See attachment for results.
A scan was done with the Radeye SX/ 380AB around all sides of the container. No reading was above background.
Dose rates were taken around all sides; all read at background of 6µrem.

Swipe results from the lab are attached.
All alpha and beta activities reported clear the box for transport.

Radiological Survey Report

Itemized Details - Items

#	Item Location/Description	Comments
1	Eastside top	
2	Eastside bottom	
3	Northside top	
4	Northside bottom	
5	Westside top	
6	Westside bottom	
7	Southside center	
8	Hand-powered forklift	

Radiation Survey

Background: 6
Background Units: urem/hr
Radiation Type: Gamma

#	Radiation Type	Reading	Units	Distance From Source	Comment
1	Gamma	6	urem/hr	OC/30 cm	
2	Gamma	6	urem/hr	OC/30 cm	
3	Gamma	6	urem/hr	OC/30 cm	
4	Gamma	6	urem/hr	OC/30 cm	
5	Gamma	6	urem/hr	OC/30 cm	
6	Gamma	6	urem/hr	OC/30 cm	
7	Gamma	6	urem/hr	OC/30 cm	
8	Gamma	6	urem/hr	OC/30 cm	

neywell In

Attachments

Order	Filename	Description	Pages
1	544 Box #007540 Movement.pdf	Lab GPC results	1

Radiation Protection Sample Diagnostics
Swipe Analysis IAW Procedure RPSD-09-02

Survey Number: I-20150903-4

Page _____ of _____

Print Date: 9/3/2015
Counting Unit ID: Unit 21 SN: 97-3984
RPSD Batch ID: P0077401
Program ID: RPOP
Sample Category: SA
Analyzed By: BJMAES
Customer Name: WALTON, EDWARD
Customer E-Mail ID: EEWALTO
Customer Org.: 4128
Sample Description: SNL/NM 007540 CONTAINER @ 8:35

Reviewed By: RT Preston 9/3/15

Alpha Activity Action Level (DPM): 2.00E+001
Beta Activity Action Level (DPM): 1.00E+003
Confidence Level: 95%
High Voltage Setting: 1305
Crosstalk Correction: Applied
Application Revision: 3.1.2
Collection Date: 09/03/2015
Received Date: 09/03/2015
Count Date: 09/03/2015
COC:

Alpha Efficiency Std:	DZ532 Pu-238
Alpha Efficiency:	23.82 %
Alpha to Beta Crosstalk:	8.87 %
Alpha Background CPM:	0.05
Alpha Correction Factor:	1.00
Beta Efficiency Std:	DZ525 Cl-36
Beta Efficiency:	36.86 %
Beta to Alpha Crosstalk:	0.98 %
Beta Background CPM:	1.15
Beta Correction Factor:	1.00

Sample		Alpha Activity				Beta Activity				Count time (min)	Alpha CPM	Beta CPM	Time Completed
RPSD ID	Customer ID	DPM	Error	Flag	MDA	DPM	Error	Flag	MDA				
001	001	0.56	0.87	<MDA	3.86	4.44	2.18	<MDA	5.77	5.00	0.20	2.80	13:00
002	002	-0.25	0.21	<MDA	3.79	2.86	1.94	<MDA	5.74	5.00	0.00	2.20	13:05
003	003	-0.27	0.21	<MDA	3.84	3.95	2.10	<MDA	5.74	5.00	0.00	2.60	13:11
004	004	-0.31	0.22	<MDA	3.96	6.67	2.49	<AL	5.74	5.00	0.00	3.60	13:16
005	005	-0.23	0.21	<MDA	3.72	1.23	1.67	<MDA	5.74	5.00	0.00	1.60	13:21
006	006	0.59	0.87	<MDA	3.79	2.82	1.94	<MDA	5.78	5.00	0.20	2.20	13:27
007	007	-0.25	0.21	<MDA	3.77	2.32	1.85	<MDA	5.74	5.00	0.00	2.00	13:32
008	008	0.58	0.87	<MDA	3.82	3.36	2.02	<MDA	5.78	5.00	0.20	2.40	13:37

Sandia National Laboratories

MAXIMUM THEORETICAL LEACHATE CONCENTRATION CALCULATIONAL WORKSHEET

References - Calculation of TCLP Concentrations From Total Concentrations

11721 (Notes on RCRA Methods and QA Activities - January 12, 1993)
13563 (Calculation of TCLP concentrations from total concentrations - September 21, 1992)
13647 (Use of Total Waste Analysis in Toxicity Characteristic Determinations - January 1994)
14695 (EPA to AFIOH/RSEO - June 20, 2004)

Background

To evaluate the regulatory status of a 100% solid, a generator can simply divide each total constituent concentration in mg/kg by 20 and then compare the resulting maximum theoretical leachate concentration to the appropriate regulatory limit (the division factor reflects the 20-to-1 ratio of extraction fluid to solid used in the Toxicity Characteristic Leaching Procedure (TCLP). If the maximum theoretical leachate concentration does not equal or exceed the appropriate regulatory limit, the solid cannot exhibit the toxicity characteristic and the TCLP need not be run.

Item #1

Disposal Request	Contaminant Weight (lbs)	Item Weight (lbs)	Calculated Totals Concentration (mg/kg)
2016063	4.060E-02	9.202E+02	4.41E+01
Waste Parcel	Contaminant Weight (grams)	Item Weight (grams)	Maximum Theoretical Leachate Concentration (mg/L)
2016063-01	1.842E+01	4.174E+05	2.21E+00
Assumptions/Comments			
LEAD - Refer to attachment 6) DR 2016063_Contmt Assy Matl Summary_Z-2841			

Item #2

Disposal Request	Contaminant Weight (lbs)	Item Weight (lbs)	Calculated Totals Concentration (mg/kg)
2016063	4.000E-04	9.202E+02	4.35E-01
Waste Parcel	Contaminant Weight (grams)	Item Weight (grams)	Maximum Theoretical Leachate Concentration (mg/L)
	1.814E-01	4.174E+05	2.17E-02
Assumptions/Comments			
SILVER - Refer to attachment 6) DR 2016063_Contmt Assy Matl Summary_Z-2841			

Reviewed by: _____

DR Number 2016063

Chemical Characterization Comments: As necessary, use the following space to document the characterization methodology, the supporting information, and any assumptions.

Characterization is based on the following:

- Waste Description section and page 2 of the DR form
- RCRA characterization page of DR form
- Attachment 4 – *DR 2016063_IH Beryllium Rpt S03432_Z-2841*
- Attachment 6 – *DR 2016063_Contmt Assy Matl Summary_Z-2841*
- Attachment 7 – *DR 2016063_WCT_TCLP_Z-2841.xls*

Based on the documentation above, this waste is not RCRA regulated hazardous or mixed waste. It does not contain beryllium and is not TSCA regulated.

Reviewed by: John Pieniazek, Weston Solutions, Inc.
Date: 1/13/16

Sandia National Laboratories

Radiological Characterization Summary Form Data Entry — **RF 2042-RCS (0814, Revision 11)**

Section I. General Information.

Disposal Request	2016063		
NNSS Waste Profile	LLRW (Lab Trash)	ASLA000000011	Rev. 09, 04/21/11

Worksheet	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Activity Date	1/7/2015									
Waste Parcel	2016063-01									
Waste Volume	1.30E+01									
Waste Volume Units	ft3									
Net Weight	1035.00									
Net Weight Units	lb									
Waste Volume (cubic feet)	1.30E+01									
Net Weight (pounds)	1.04E+03									
Effective Waste Density (g/cc)	1.275									

Section II. Uranium information.

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)
U-238										
U-236										
U-235										
U-234										
Th-234										
Uranium Type	Not Applicable									
U-238/U-235 Activity Ratio	Not Applicable									
U-235 Enrichment	Not Applicable									
U-235 Fissile Mass (grams)	Not Applicable									
Uranium Activity (Ci)	Not Applicable									
Uranium Mass (grams)	Not Applicable									

Section III. Radiological information.

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)
Th-232										
Th-228										
Ra-228										
Pu-238	5.14E-04									
Pu-239	1.67E-02									
Pu-240	3.83E-03									
Pu-241	2.12E-02									
Pu-242	5.40E-07									
Am-241	8.69E-04									
Waste Class (10 CFR 61.55)	Class C									
Waste Class (UAC)	Class C									
> 10% of Category 3 Limit	No									
> 2-g U-235 FGE	No									
> 100 nCi/g TRU	No									
> 3 PE-g	No									
> 2-g U-235 FGE per kg	No									

Section IV. Notes for Radiological Characterization Reviewer

Performed by: Michael Moore MLMoore 1/14/16
(Name, signature, date)

Checked by: Pat Gubert 10-13-16
(Name, signature, date)

1/14/2016 10:27 AM

Sandia National Laboratories	Radiological Characterization Summary Form Data Entry	RF 2042-RCS (0814, Revision 11)

DR contains a waste parcel(s) with nuclide(s) exceeding 1 nCi/g TRU. These nuclide(s) require rigorous waste characterization by NNSS & shall be reported on the Package Shipment Disposal Request (PSDR) & the WP.

DR contains a waste parcel(s) with nuclide(s) exceeding NNSS waste profile Bq/m3 limits inform the Waste Characteration Project Leader.

Profile Mod Needed
-mdm 1/14/16

Performed by: Michael Mayo Mdm 1/14/16
(Name, signature, date)

Checked by: Pat Lambert 10-13-16
(Name, signature, date)

1/14/2016 10:27 AM

Sandia National Laboratories

Radiological Characterization Summary Form

RF 2042-RCS (0814, Revision 11)

Section I. General information.

2016083	Disposal Request	4.59E+05	Net Weight (grams)	1035.00	lb	Conversion	Not Applicable	Type Of Uranium	Not Applicable	U-235 Enrichment
2016063-01	Waste Parcel	1.30E+01	Waste Volume (cubic feet)	1.30E+01	ft3	Calculator	Not Applicable	U-236/U-235 Activity Ratio	Not Applicable	Uranium Activity (Ci)

Section II. Radiological information.

Nuclide	Activity (Ci)	Activity without DPs (Ci)	>1% of Total Activity wo DPs >1% of NNSS Table E-1 >0.1% of Total A_2 Fraction TRU or ESH100.2.SB.2 Fissile	% of Total Activity without DPs	Activity/m^3 (Bq/m^3)	Activity/gram (pCi/g)	Mass (grams)	Fraction of Category 3 Limit	Fraction of ACEM Limit	Fraction of ALEC Limit	% of Total A_1 Limit	% of Total A_2 Fraction	TRU Conc. (nCi/g)	Fraction of NNSS Profile Limit (Bq/m^3)	Fraction of NNSS Profile Limit (nCi/g)	Fraction of NNSS Table E-1 Limit
Pu-238	5.14E-04	5.14E-04	Yes	1.19E+00	5.17E+07	1.69E+03	3.00E-05	1.96E-04	4.05E+01	1.90E+03	1.89E+00	2.31E+00	1.09E+00	Less than 1.0	Less than 1.0	Less than 0.01
Pu-239	1.67E-02	1.67E-02	Yes	3.87E+01	1.68E+09	3.56E+04	2.69E-01	6.96E-03	1.32E+03	6.18E+04	6.14E+01	7.50E+01	3.56E+01	2.6	Less than 1.0	Less than 0.01
Pu-240	3.83E-03	3.83E-03	Yes	8.88E+00	3.85E+08	8.16E+03	1.69E-02	1.60E-03	3.02E+02	1.42E+05	1.41E+01	1.72E+01	8.16E+00	2.4	Less than 1.0	Less than 0.01
Pu-241	2.12E-02	2.12E-02	Yes	4.92E+01	2.13E+09	4.52E+04	2.05E-04	1.61E-04	1.67E+01	7.84E+03	1.95E+01	1.59E+00	0.00E+00	Less than 1.0	Not Applicable	Less than 0.01
Pu-242	5.40E-07	5.40E-07	Yes	1.25E-03	5.43E+04	1.15E+00	1.37E-04	2.11E-07	4.26E-02	2.00E+00	1.98E-03	2.43E-03	1.15E-03	Less than 1.0	Less than 1.0	Less than 0.01
Am-241	8.69E-04	8.69E-04	Yes	2.02E+00	8.73E+07	1.85E+03	2.53E-04	3.01E-04	6.85E+01	3.22E+03	3.19E+00	3.90E+00	1.85E+00	Less than 1.0	Less than 1.0	Less than 0.01
Total	4.31E-02	4.31E-02			4.33E+09	9.18E+04	2.87E-01	9.21E-03	1.74E+03	2.16E+05	1.00E+02	1.00E+02	4.67E+01			

Section III. 49 CFR Class 7 (Radioactive) material calculations.

Yes	Is The Activity Concentration For Exempt Material (ACEM) Fraction Greater Than One?	1.74E+03	ACEM Fraction
Yes	Is The Activity Limit For Exempt Consignment (ALEC) Fraction Greater Than One?	2.16E+05	ALEC Fraction
Yes	Is The Reportable Quantity (RQ) Fraction Equal To Or Greater Than One?	2.21E+00	RQ Fraction
Yes	Is The Limited Quantity (LQ) Package Limit Fraction For Normal Form Solids And Gases Greater Than One?	8.24E+02	LQ Package Limit Fraction: Normal Form (Solids And Gases)
Yes	Is The Low Specific Activity (LSA)-I Limit Fraction Greater Than One?	5.81E+01	LSA-I Limit Fraction
No	Is The LSA-II Limit Fraction For Solids And Gases Greater Than One?	1.75E-02	LSA-II Limit Fraction: Solids And Gases
No	Is The A2 Fraction Greater Than One?	8.24E-01	A_2 Fraction
No	Is The Highway Route Controlled Quantity (HRCQ) Normal Form Fraction Greater Than One?	2.75E-04	HRCQ Fraction: Normal Form
Yes	Is The LQ Package Limit Fraction For Special Form Solids And Gases Greater Than One?	8.24E+01	LQ Package Limit Fraction: Special Form (Solids And Gases)
No	Is The A1 Fraction Greater Than One?	1.01E-04	A_1 Fraction
No	Is The HRCQ Special Form Fraction Greater Than One?	1.60E-06	HRCQ Fraction: Special Form

Section IV. Waste classification, hazard category 2 & 3 threshold limit, U-235 fissile mass, fissile mass, transuranic nuclide concentration, plutonium equivalent gram, and U-235 fissile gram equivalent information.

Yes	Is The Package "Class B", "Class C", Or "> Class C" Waste Per 10 CFR 61.55?	Class C	10 CFR 61.55 Waste Classification
Yes	Is The Package "Class B", "Class C", Or "> Class C" Per UAC R313-15-1008?	Class C	Utah Administrative Code (UAC) R313-15-1008 Waste Classification
No	Does Package Exceed 10% Of The Hazard Category 3 Threshold Limit?	0.9212%	Percent Of The Hazard Category 3 Threshold Limit
No	Does Package Exceed 10% Of The Hazard Category 2 Threshold Limit?	0.0137%	Percent Of The Hazard Category 2 Threshold Limit
No	Does Package Exceed 2 Grams Of Fissile U-235?	0.00E+00	Grams Of Fissile U-235
No	Does Package Exceed 2 Grams Of Fissile Material Per 49 CFR?	2.69E-01	Grams Of Fissile Material Per 49 CFR
No	Does Package Exceed 2 Grams Of U-235 Fissile Gram Equivalence (FGE) Per NNSS WAC?	4.31E-01	Grams Of U-235 Fissile Gram Equivalence (FGE) Per NNSS WAC
No	Does Package Exceed 2 Grams Of U-235 Fissionable Equivalent Mass (FEM) Per SNL MSB CSA?	4.86E-01	Grams Of U-235 Fissionable Equivalent Mass (FEM) Per SNL MSB Criticality Safety Assessment
No	Is The Fissile Threshold Limit Ratio Equal To Or Greater Than One Per SNL Corporate Procedure: ESH100.2.SB.2?	6.01E-04	Fissile Threshold Limit Ratio Per SNL Corporate Procedure: ESH100.2.SB.2, 'Ensure Nuclear Criticality Safety'
No	Does TRU Concentration Exceed 100 nCi/g?	4.67E+01	TRU Concentration In nCi/g
No	Does Plutonium Equivalent Gram (PE-g) Total Exceed Three?	4.32E-01	Plutonium Equivalent Gram (PE-g) Total Per NNSS WAC
No	Does U-235 Fissile Gram Equivalence (FGE) Exceed 2 Grams U-235 Per kg Of Waste?	4.31E-01	U-235 Fissile Gram Equivalence (FGE) In Grams Per NNSS WAC

Sandia National Laboratories

RF 2042-DRA (0614, Rev. 23)

WASTE DISPOSAL REQUEST REVIEW FORM

Reviews for: (check one)
- ☒ **SF 2042-TRA** (ref. AOP 98-03)
- ☐ **RF 2042-CMDR** (ref. AOP 13-07)
- ☐ **Change Request** (ref. AOP 98-03 or AOP 13-07)

DR Number: 2016063

Initial Waste Acceptance

Technical Field	Reviewer's Name	Reviewer's Signature (Check Box if Review is Not Required)	Date
Classified Project Leader	Dwight Stockham or Alternate	☐ Not Required	1/12/2016
Chemical Characterization	John Pieniazek or Alternate	☐ Not Required	1/13/16
Radiological Characterization	Pat Lambert or Alternate	☐ Not Required	1/14/16
Waste Characterization Project Leader	Mike Moore or Alternate	☐ Not Required	1/14/16
Radiation Protection	WMPPD RCT	☐ Not Required	1/18/16
Operations Supervisor	Leroy Duran or Alternate Storage Location 6926	☐ Not Required	1/18/16

NOTE: *If comments are provided, use the associated comment sheets.*

Waste Pickup Information (Enter "N/A" for Change Requests)

Picked Up by	Parcel and Container ID	Pickup Date and Comments
Bixby Valleys	SNL NM00 7540 - P1600240	1/21/16

SF 2042-TRA (09-2014) Supersedes (08-2014)

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016322

Waste Generator And Waste Generation Information

Primary Waste Generator	Organization Number	Date Completed
Gluth, Jeffry W.	01646	11/2/2016
Frequency Of Generation	**Point Of Generation**	**Generator SNL ID**
Routine	SNL/NM	4605

Waste Pickup Location Information

Technical Area	Building	Room
4	961N	N/A
Additional Location Info	**Pickup Contact**	**Pickup Contact Phone**
Stg Shed directly west of MO2	Gluth, Jeffry W.	(505) 844-7329

Parcel Count And Type

Number Of Parcels	Parcel Description	Explanation for 'Other'
1	Other	544 Metal Box

Waste Type Categorization

Yes	Waste has radiological constituents
No	Waste is RCRA (Resource Conservation and Recovery Act) regulated. If unsure, check box.
No	Waste is Classified

Waste Pickup Hazards And Access Requirements

No	Are there hazards (other than radiological) that a WMPPD waste handler should be aware of prior to waste pick up?
No	Are there special access briefings/requirements or site-specific training requirements that a WMPPD waste handler must have prior to waste pick up?

Waste Pickup Hazards And Access Requirements Comments

Not Applicable

Container Inspection And Barcode Information

Yes	Were the container or containers including bags inspected prior to use and in good condition?
Yes	Are all metal drums (30, 55, & 85-gal) and metal boxes (742s, 744s) labeled with a WMPPD SNL/NM barcode?
9/3/2016	Date waste was first introduced into the container(s)

Waste Description

Attachment 1) DR 2016322_LANL Isotopics_Z3008
Attachment 2) DR 2016322_Z3008_Pu_ICE_worksheet
Attachment 4) DR 2016322_IH Beryllium Rpt_Z3008
Attachment 5) DR 2016322_MOR-Estd Be Mass

Attachment 6) DR 2016322_Contmt Assy Matl Summary_Z3008
Attachment 7) DR 2016322_WCT_TCLP_Z3008
Attachment 8) DR2016322_CEN_SNMUNLD_OPPRO_Z3008
Attachment 9) DR 2016322_Transport Survey I-20161004-2_Z3008

Radiological Movement Survey Information

Survey Numbers	I-20161004-2	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Enter maximum contact dose rate or NA if H-3 only: 0.010 mrem/hour

Does waste contain any parcels with a dose rate > 5 mrem/hour at 1 foot ? Yes: | No: X

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016322

Physical Form Of The Waste

Yes	Solid	
No	Liquid	Not Applicable
		Not Applicable
No	Gas	Not Applicable

Resource Conservation and Recovery Act (RCRA) Waste Information

No	Is waste a Resource Conservation and Recovery Act (RCRA)-regulated hazardous waste or mixed waste?
PK and S&A	Basis for RCRA determination?
Not Applicable	
Not Applicable	
Not Applicable	

California Code of Regulations (CCR) Non-RCRA Hazardous Waste Information

Not Applicable	
Not Applicable	
Not Applicable	

Toxic Substances Control Act (TSCA) Information

No	Is waste regulated under the TSCA?
Process Knowledge	Basis for TSCA determination?
No	Does waste contain Polychlorinated Biphenyls (PCBs)?
Not Applicable	
No	Does waste contain asbestos at > 1% by weight?
Not Applicable	
Not Applicable	

Additional Waste Information

Yes	Waste has been physically inventoried within the last two years or do have direct knowledge of the waste contents?		
No	Does waste contain a Beryllium-containing or beryllium-contaminated waste?	No	Does waste contain a beryllium article?
No	Does waste contain etiologic agents or radioactive animal carcasses?		
No	Does waste contain chelating or complexing agents?		
Not Applicable			
No	Does waste contain fine particulates?		
No	Does waste contain unbound engineered nanoscale particles?		
No	Does waste contain batteries?		
No	Does waste contain sealed radioactive sources?		
Not Applicable			
No	Does waste contain any parcels with a concentration of alpha-emitting transuranic nuclides with half-lives > 20 years exceeding 100 nCi/g?		
No	Is waste potentially pyrophoric?		
No	Is Accountable Nuclear Material (ANM) present?	Not Applicable	Have safeguards been terminated?
Not Applicable	Accountable nuclear material safeguards category and attractiveness level		
No	Are containers labeled with a Criticality Safety Index?		
Unclassified	Waste security classification		
Not Applicable	Classified work station (CWS) #		
Not Applicable			
No	Has this waste been treated prior to submitting this DR form?		
Not Applicable			

Waste Generator Signature

By signing below, I verify that the waste is properly packaged and labeled and that the disposal request (DR) is complete and accurately represents the waste contents. I certify that I have made a good faith effort to minimize my waste generation.

Waste Generator Jeffrey W Smith 10/31/2016

Signature And Date

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

EC Coordinator Review (Initials and Date) KL 11/3/16

Sandia National Laboratories | Radioactive Or Mixed Waste Disposal Request Form | Disposal Request 2016322

WMPPD Waste Characterization Project Leader Review

No	Does waste require sorting by WMPPD?
No	Does waste require treatment by WMPPD?

To Be Determined	Recommended Waste Disposition Facility
Not Applicable	
Not Applicable	

Not Applicable
Not Applicable
Not Applicable
Not Applicable

Additional WMPPD Waste Characterization Project Leader Comments

Pu-ICE waste. Final disposition to be determined.

Summary Waste Description

Radioactive Non-Debris

Physical Form (Solid)

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016322

Parcel ID	2016322-01									
Container Type	Other									
Size & Composition	544 Metal Box									
Container Tare Weight (lbs)	7.26E+02									
WMPPD Container ID	Not Applicable									
Waste Volume (ft^3)	1.000E+01									
Measured Net Weight (lbs)	1.048E+03									
Scale Serial Number	Estimated									
Date waste last entered into the container	9/30/2016									
Basis for radiological characterization	Process Knowledge									

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)
Pu-238	6.97E-04									
Pu-239	2.30E-02									
Pu-240	5.34E-03									
Pu-241	2.72E-02									
Pu-242	7.34E-07									
Am-241	1.24E-03									

«See RF 2042-RCS Form(s)»

Additional Radiological Characterization Comments

Refer to the following attachments to this DR: 1) DR 2016322_LANL Isotopics

Sandia National Laboratories

Radioactive Or Mixed Waste Disposal Request Form

Disposal Request 2016322

Parcel ID	2016322-01
Container Type	Other
Size & Composition	544 Metal Box
Container Tare Weight (lbs)	7.26E+02
WMPPD Container ID	Not Applicable
Waste Volume (ft^3)	1.000E+01
Measured Net Weight (lbs)	1.048E+03
Scale Serial Number	Estimated

Date waste last entered into the container: 9/30/2016

SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID	SNL Source ID
Not Applicable									
Not Applicable									
Not Applicable									
Not Applicable									
Not Applicable									
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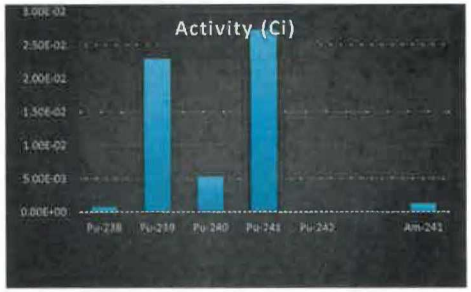
Not Applicable									

jjbland 9/21/16

9/16/2016 Pu ICE Analytical Chem.

Isotope	%	1σ (%)	Mass (g)	SA (Ci/g)	Activity (Ci)	Total Mass (g)
Pu-238	1.04E-02	1.30E-03	4.10E-05	1.70E+01	6.97E-04	3.94E-01
Pu-239	9.40E+01	1.22E-01	3.70E-01	6.20E-02	2.30E-02	
Pu-240	5.89E+00	6.48E-02	2.32E-02	2.30E-01	5.34E-03	
Pu-241	6.91E-02	1.10E-03	2.72E-04	1.00E+02	2.72E-02	
Pu-242	4.78E-02	8.00E-04	1.88E-04	3.90E-03	7.34E-07	
	ug/g	ug/g				
Am-241	922.00	2.10E+01	3.63E-04	3.40E+00	1.24E-03	
Totals	1.00E+02		3.94E-01		5.75E-02	



Assumptions

100% of mass is Pu/Am. Assay represents one material, assayed in 2005, decayed to 2016 and split into two aliquots of identical geometry and mass

1) DR2016322 LANL Isotopics

Los Alamos NATIONAL LABORATORY EST 1943

memorandum

Materials Science Division

To/MS: Joel Lash, SNL
From/MS: Paul Tobash, LANL PHT
Phone/Fax: 505-667-6879/Fax 505-665-7815
Symbol: MST-16:16-011
Date: September 19, 2016

Plutonium Samples for September 2016 Z-Accelerator Experiment

As per your August 3, 2016 memo entitled "Configuration for the Pu Experiment scheduled for the week of September 26, 2016 and plutonium sample specifications request", I am providing the requested information on the samples containerized in the Isentropic Compression Experiment (ICE) Assembly prior to shipment to the Z-Accelerator Facility at Sandia National Laboratory. The Pu isotopic and Am analyses of the sample materials are given below with measurement uncertainties:

Actinide Isotope	Pu Alloy (2005) Mass Spec./ April 2005 [1σ in %]	* ISOPOW September 2016 [1σ in %]
^{238}Pu	0.0114 [0.0013]	0.0104 [0.0013]
^{239}Pu	93.9260 [0.1221]	93.9800 [0.1221]
^{240}Pu	5.8944 [0.0648]	5.8926 [0.0648]
^{241}Pu	0.1204 [0.0011]	0.0691 [0.0011]
^{242}Pu	0.0478 [0.0008]	0.0478 [0.0008]
Relat. Pu Tot. Mass	99.29%	99.20%
**^{241}Am	421 µg/g [1σ =21 µg/g]	922 µg/g [1σ =21 µg/g]

* ISOPOW is the Los Alamos National Laboratory standard isotope decaying spreadsheet for SNM accountability utilizing Bateman eq. and standard halflives for the isotopes.

** ^{241}Am values and measurement errors are reported in wt.ppm.

The final sample weights with measurement uncertainties and ICE panel locations are given below:

Sample Location (ICE Panel)	Ave. Thickness (mm) +/- 0.001mm	Ave. Width (mm) +/- 0.05mm	Ave. Width (mm) +/- 0.05mm	Final Mass (g) +/- 0.001g
South	0.350	5.981	5.996	0.197
North	0.351	5.981	5.996	0.197
			Total	**0.394 g**

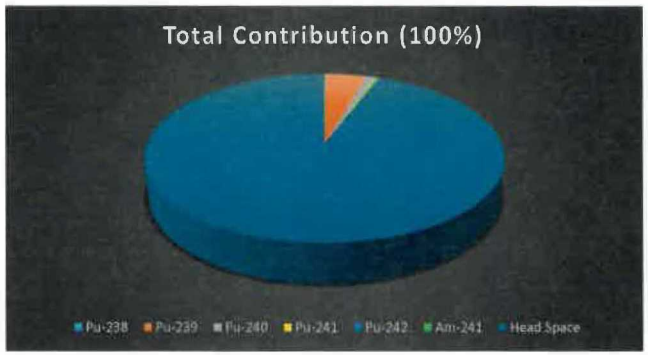
Also as requested, LANL conducted the He leak-test of the Secondary O-ring Seal defined in the SNL memo. The results for the He leak rate for the South and North panel assemblies inner volume into the test roughing chamber was $<x10^{-9}$ atm cm³/s and $<x10^{-9}$ atm cm³/s, respectively against a calibrated leak of $1.7x10^{-7}$ atm cm³/s after approximately 20 minutes of test time. Also, all the ICE assembly components when surveyed for radiological activity showed No-Detectable Activity (NDA).

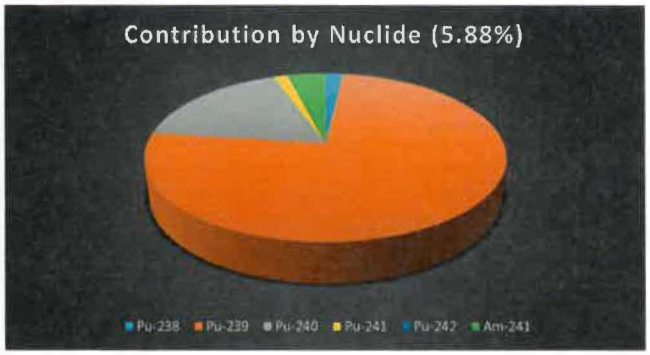
This document has been reviewed as Unclassified. JR, 9/20/2016.

Distribution:

Bob Webster (LANL)
Mary Y. Hockaday (LANL)
Russ Olson (LANL)
David Teter (LANL)
MST-16 Files (LANL)
John Benage (SNL)
Mark Herrmann (SNL)
Dawn G. Flicker (SNL)
M. Keith Matzen (SNL)
Thomas Mattson (SNL)

Nuclide	1027 HC3 value (Ci)	Activity (Ci)	Fraction	Sum of Fractions
Pu-238	0.62	6.97E-04	1.12E-03	5.88%
Pu-239	0.52	2.30E-02	4.41E-02	
Pu-240	0.52	5.34E-03	1.03E-02	
Pu-241	32	2.72E-02	8.51E-04	
Pu-242	0.62	7.34E-07	1.18E-06	
Am-241	0.52	1.24E-03	2.38E-03	
Head Space			9.41E-01	





Wed 9/21/2016 1:05 PM

Strong, Warren R

RE: Sept_2016_PuICE.xlsx

To Bland, Jesse John

Jesse,
I reviewed your calculation sheets. I found no transcription errors, no calculation errors. All logic and calculations appear correct to me.
Thanks

Warren

From: Bland, Jesse John
Sent: Wednesday, September 21, 2016 12:02 PM
To: Strong, Warren R
Subject: Sept_2016_PuICE.xlsx

2) DR2016322_Z3008

Sandia National Laboratories

Pu-ICE worksheet

	2016322	DR number
11-16-16	~~1~~	Parcel number 2016322-01
	9/19/2016	Date of LANL percent fractions?
	0.394	Total grams

Nuclide	Percent	Multiplier	Grams	Specific Activity Ci/g	Activity (Ci)
Pu-238	0.0104	1.04E-04	4.0976E-05	1.71E+01	7.02E-04
Pu-239	93.98	9.40E-01	3.7028E-01	6.20E-02	2.30E-02
Pu-240	5.8926	5.89E-02	2.3217E-02	2.27E-01	5.27E-03
Pu-241	0.0691	6.91E-04	2.7225E-04	1.03E+02	2.81E-02
Pu-242	0.0478	4.78E-04	1.8833E-04	3.94E-03	7.42E-07
	ug/g				
Am-241	922	9.22E-04	3.6327E-04	3.43E+00	1.25E-03

Performed by / date: [signature] 10/31/2016

Review by / date: Pat Lambert 11-16-16

SANDIA
TA4
Survey Summary Report

4) DR2016322_Z3008_Modified Be report

983 CENTER SECTION CONTROLLED SHOT BERYLLIUM SAMPLING (ID: S03986)

TO:	Jeffry Gluth
FROM:	Hugh Fritz

SUMMARY

Description (Purpose for sampling or monitoring)

This report documents results for a biased beryllium (Be) equipment release survey conducted on October 3, 2016. Sampling was performed to determine the presence and extent of removable Be surface contamination on portions of an explosively-sealed containment assembly; specifically, the Enhanced Containment Chamber (ECC) and the Ultra-Fast Closure Valve (UCV) prior to being released from the center section in building 983 to the Radioactive and Mixed Waste Management Facility (RMWMF) pending submittal of a Waste Description and Disposal Request (WDDR). This assembly was used in a contained shot at the Z-machine (shot number Z3008).

All samples were collected in accordance with objectives established in IH WI-15, Beryllium Wipe Sampling and Data Analysis Work Instruction. Results were compared to the Department of Energy (DOE) criterion for release to the general public (release criterion) of 0.2 micrograms of Be per 100 centimeters squared (ug Be/100cm2).

Summary of results

Six biased wipe samples were collected from the surface of the assembly: two were collected on the top of the ECC, two were collected on the sides of the ECC, and two were collected on the sides of the UCV. Results of the sampling demonstrate levels of removable Be contamination were below the DOE release criterion of 0.2 ug Be/100 cm2 (Sandia National Laboratories' adopted release criterion). Also, due to design, the there is no potential for internal Be contamination. As a result, the containment assembly is not subject to 10 CFR 850.31 release criteria provisions and can be released following Uncontrolled Release Procedures specified in ESH100.2.IH.24, Manage and Control Beryllium Exposure (i.e., labeling and recipients' commitment letter are not required).

Survey comments

All samples were collected in accordance with NIOSH Method 9100 and were analyzed for Be by an inductively coupled plasma (ICP) scan in accordance with NIOSH Method 7303. Field blank samples were also prepared and submitted for analysis following NIOSH 7303. No beryllium was detected on any of the field blanks above the laboratory's reporting limit.

IH / safety officer

Badge / ID	
277649	BRAEM, M (MARIA)

Primary sampler

Badge / ID	
281684	FRITZ, H (HUGH)

RESULTS

SANDIA
TA4
Survey Summary Report

Sample ID	Date	Type	Description
100718-001	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			ECC Top

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
100718-002	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			ECC Top

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
100718-003	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			ECC Side

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
100718-004	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			ECC Side

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
100718-005	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			UCV Module

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

Sample ID	Date	Type	Description
100718-006	03 OCT 2016	WIPE SAMPLING	EQUIPMENT
			UCV Module

Agent	Result	OEL	Unit	OEL source
BERYLLIUM	<0.025	0.2	UG/100CM2	DOE

5) DR 2016322_MOR_Estd Be Mass

Sandia National Laboratories
Operated for the U.S. Department of Energy by
Sandia Corporation
Albuquerque, New Mexico 87185

date: October 27, 2016

to: File (RMWMF DR-2016322)

from: Jeffry W Gluth Org. 01646

subject: Calculated Mass of Beryllium Present in Waste Submitted Under RMWMF DR-2016322 [Pu ICE Containment Assembly used on Z shot 3008]

Reference: IH Report ID # S03986 (Attachment 4 to DR-2016322)

Beryllium wipe sampling results by sample ID:

- 100718-001 < 0.025 µg/100 cm²
- 100718-002 < 0.025 µg/100 cm²
- 100718-003 < 0.025 µg/100 cm²
- 100718-004 < 0.025 µg/100 cm²
- 100718-005 < 0.025 µg/100 cm²
- 100718-006 < 0.025 µg/100 cm²

Total Surface Area of the Pu Containment Assembly (includes Enhanced Containment Chamber and Ultra-fast Closure Valve):

22,361.25 cm² (rounded to 22,361)
22,361 cm²/100 cm² = 223.61

2.5e-8 g * 223.61 = **5.59e-6 g** Beryllium on Exterior of Pu Containment Assembly (worst case)

Reference: CEN_SNMUNLD_OPPRO_Z3008 (Attachment 8 to DR-2016322)

Measured Weight of Pu Containment Assembly = 1048 lbs.
Convert lbs to g = 1048 lbs * (454 g/lb) = 4.76e5 g

(5.59e-6 g Be/4.76e5 g Assembly Weight) * 100 = **1.00e-9 %** (by weight)

6) DR2016322_Z3008_MassConstituent spreadsheet

ALL UNITS IN POUNDS EXCEPT COLUMN "N"

Material	GAUGES	RM4	VS6	BNV51	PROBES	MANIFOLD	LOAD	UCV&VENT	HEPA	UCC	TOTAL (LB)	
aluminum	0.0114				0.0068	0.0068	0.7509	4.0994		1.187	6.0623	aluminum
steel	0.5252	0.2745	1.95	2.48	1.8048	1.031	33.385	452.7375	1.532	411	906.72	steel
copper							4.156	1.3			5.456	copper
PZT(excluding lead)								0.01			0.01	PZT(excluding lead)
glass					0.0121		0.002				0.0141	glass
copper/graphite							0.031				0.031	copper/graphite
epoxy, cured					0.1348	0.0048	0.0005	0.756			0.8961	epoxy, cured
plastic	0.0464	0.0007	0.008	0.0072	0.0249			0.597	0.032		0.7162	plastic
rubber	0.0062				0.0097		0.0026	0.716		0.4185	1.153	rubber
lead				0.0006				0.04			0.0406	lead
silver				0.0003		0.0001					0.0004	silver
tin								0.002			0.002	tin
platinum							0.0092					
silicon vacuum grease								0.01			0.01	silicon vacuum grease
carbon from burned HE								0.2			0.2	carbon from burned HE
aluminum oxide (Al2O3)									0.141		0.141	aluminum oxide (Al2O3)
TOTAL	0.5892	0.2752	1.958	2.4881	1.9931	1.0427	38.3372	460.4679	1.705	412.6055	921.4527	

7) DR2016322_WCT_TCLP_Z3008.xls

Sandia National Laboratories

MAXIMUM THEORETICAL LEACHATE CONCENTRATION CALCULATIONAL WORKSHEET

References - Calculation of TCLP Concentrations From Total Concentrations

11721 (Notes on RCRA Methods and QA Activities - January 12, 1993)
13563 (Calculation of TCLP concentrations from total concentrations - September 21, 1992)
13647 (Use of Total Waste Analysis in Toxicity Characteristic Determinations - January 1994)
14695 (EPA to AFIOH/RSEQ - June 20, 2004)

Background

To evaluate the regulatory status of a 100% solid, a generator can simply divide each total constituent concentration in mg/kg by 20 and then compare the resulting maximum theoretical leachate concentration to the appropriate regulatory limit (the division factor reflects the 20-to-1 ratio of extraction fluid to solid used in the Toxicity Characteristic Leaching Procedure (TCLP). If the maximum theoretical leachate concentration does not equal or exceed the appropriate regulatory limit, the solid cannot exhibit the toxicity characteristic and the TCLP need not be run.

Item #1

Disposal Request	Contaminant Weight (lbs)	Item Weight (lbs)	Calculated Totals Concentration (mg/kg)
2016322	4.060E-02	9.215E+02	4.41E+01
Waste Parcel	Contaminant Weight (grams)	Item Weight (grams)	Maximum Theoretical Leachate Concentration (mg/L)
2016322-1	1.842E+01	4.180E+05	2.20E+00
Assumptions/Comments			
LEAD - Reference 6) DR 2016322_Contmt Assy Matl Summary_Z3008.			

Item #2

Disposal Request	Contaminant Weight (lbs)	Item Weight (lbs)	Calculated Totals Concentration (mg/kg)
2016322	4.000E-04	9.215E+02	4.34E-01
Waste Parcel	Contaminant Weight (grams)	Item Weight (grams)	Maximum Theoretical Leachate Concentration (mg/L)
2016322-1	1.814E-01	4.180E+05	2.17E-02
Assumptions/Comments			
SILVER - Reference 6) DR 2016322_Contmt Assy Matl Summary_Z3008.			

Reviewed by: _____

8) DR2016322_Z3008_Unload OP

Z3008

SNM HARDWARE UNLOAD PROCEDURE

1.0 PURPOSE AND SCOPE

The purpose of this document is to guide Center Section Personnel through the unloading process for explosive closure containment experiments with Special Nuclear Material (SNM) (e.g., Plutonium) on Z. This procedure is only used when all indications are that it is an uncontaminated unload; at the first indication that there is contamination, this procedure shall be stopped.

This is a controlled-activity technical work document; it shall be "in-hand" when the work is being performed, and section 7.0 shall be retained as a record.

This document is owned by Center Section Manager.

NOTE: This document is considered a Critical Lift Technical Work Document (TWD). Modifications to it should be considered for routing through the Critical Lift Designated Person(s) for concurrence.

NOTE: This document is considered an Integrated Radiological Technical Work Document. This procedure must be reviewed and have concurrence by the Radiation Protection Project Lead or delegate prior to the document being released.

NOTE: This document is executed as part of a complex process involving personnel other than those explicitly mentioned in this TWD. The master sequencing document, ACC_HARMUNLD_OPPRO, is owned by Accelerator Activities Manager. Modifications to this document should be consulted with the Accelerator Activities Manager for concurrence.

2.0 CHANGE HISTORY

This revision (I1) switched the order of steps 7.1 and 7.2. It also added two additional steps to ensure that shot number is marked on ECC and that the keys are taped to the top of the ECC. A full change history is shown in Attachment A.

3.0 RESPONSIBILITIES

3.1 Center Section Personnel

Only individuals who have completed the "Containment Shot Load & Unload Qualification Card," CEN_SNMLOADQUAL_FORM, may perform the work described in this procedure. Additionally, personnel performing the top or bottom load unsupervised shall be qualified for the task being performed; see the "Topside Load & Unload Qualification Card," CEN_TOPLOADQUAL_FORM, and the "Bottomside Load & Unload Qualification Card," CEN_BTMLOADQUAL_FORM.

The Center Section Process Owner is responsible for initiating the C5 checklist (SF 2001-CSA) and is also responsible for designating the Person-In-Charge for the associated critical lifts.

3.2 Shot Director

The Shot Director is responsible for directing the overall process and checking off the steps as they are performed.

3.3 Radiation Protection (RP)

Radiation Protection personnel are responsible for recommending the appropriate radiological controls, performing radiological surveys, and assessing radiological conditions.

3.4 Industrial Hygiene (IH)

Industrial Hygiene personnel are responsible for taking Beryllium swipes from the containment system to allow for its release.

3.5 Critical Lift Person-in-Charge

The Critical Lift Person-in-Charge is responsible for developing and maintaining the critical lift datasheets for the associated critical lifts.

4.0 DEFINITIONS

UCV - The Ultrafast Closure Valve is used to contain SNM during a shot.

UCC - The Upper Containment Chamber is the primary containment for the SNM.

ECC – Enhanced Containment Chamber

Hold point - A hold point is process/procedure step at which work shall not proceed until the radiological controls/conditions have been assessed and additional controls have been implemented as needed.

Confinement tent – There are confinement tents for the top and bottom. They are visually inspected, and smoke-tested and before use.

5.0 HAZARD IDENTIFICATION AND CONTROLS

5.1 Exposure to Radiation and Radioactive Materials (SNM shots only) – The primary radiological hazard associated with the SNM ICE shot is removable and fixed alpha contamination. Gamma radiation is expected to be indistinguishable from background.

Controls include the use of tents, HEPA filtered ventilation, continuous air monitoring, full face air purified respirators with P100 cartridges, lapel air sampling, PPE, TLDs, bagout methodology for sample collection, and continuous RCT coverage.

At the first indication of contamination, this process shall stop.

5.2 Gravity hazards – Crane usage and suspended loads are controlled via the crane qualification card, direct supervision, and load support/resting devices. Swivel-hoist rings shall be used for the hoisting of components to and from the chamber. There shall be a critical lift plan for the unloading of the UCC assembly for SNM shots.

5.3 Beryllium – The Center Section is a Beryllium Operational Activity Area (BOAA). It is controlled via PPE, the Center Section access list, the ADM_CBDPPIP_ADPRO, and IH support.

During entry and work in the bottom tent, the pathway from the tent to the exit of the -25' CS

BOAA is maintained as a general work 'clean' area. Personnel are required to remove their PPE (Tyvek coveralls, booties, gloves, and respirator) to prevent potential contamination spread and be frisked without PPE as a radiation control upon leaving the tent. Because personnel must exit the tent and pass through the -25' CS BOAA without the required PPE for beryllium controls, the following conditions shall be met:

- The ladder used to enter the containment tent in the BOAA shall be wet wiped upon introduction and removal into the BOAA and stored outside of the BOAA when not in use.
- Clean Herculite shall be placed at the bottom of the ladder and along the exit path to the outside of the CS BOAA. If Herculite remains in place for more than a day, the Herculite shall be HEPA vacuumed or wet wiped each day.
- Personnel exiting and entering the containment tent as well as RCTs must remain on the Herculite pathway.
- No work activities that could disturb beryllium removable surface contamination are allowed in the CS BOAA while maintaining the area as a general work 'clean' area.

5.4 **Confined space** - The center section is a confined space at all times, C5 alternate procedures may be used if ventilation and air monitoring is used. Personnel shall follow applicable confined space procedures and be on the access list.

5.5 **Pressurized gases** – There is a potential for pressurized gases inside of the vent tank. There is a pressure safety data package for the system.

5.6 **Emergency response with a tent set up:**
Continuous Air Monitoring (CAM) Alarm - For individuals located outside of the tent the response to a CAM alarm is to STOP work, place work in a safe configuration, and rally outside of the main door on the zero foot level that leads to the hall. Individuals shall stay at this location until an RCT arrives and then follow RCT direction.

For individuals located inside the tent, the response to a CAM alarm is to STOP work, place work in a safe configuration, rally at the Radiological Buffer Area in the tent, and allow an RCT to verify the CAM alarm. Individuals shall leave all PPE on (including respirator) and follow RCT direction.

Building Fire Alarm - Individuals located outside of the tent shall follow the building evacuation procedure. Individuals located inside the tent shall leave immediately by whatever means is necessary. They should not remove their PPE (including respirators) or concern themselves with frisking out of the tent. Individuals shall leave the tent and follow the building evacuation procedure. At the rally point all individuals in PPE must segregate themselves away from the other people and follow RCT directions.

6.0 REQUIRED EQUIPMENT

6.1 PPE:
Safety shoes, Tyvek® coveralls with hood, 2 pairs of latex or nitrile gloves (inner pair taped), shoe covers, hard hats, full-faced APR respirators with P-100 cartridges, TLD. Lapel air samplers must be worn if there is the potential for radiological contamination.

6.2 Crane Scale/Load Cell – within calibration date

6.3 Preassembled ultra-high purity filter, gauge, and gasket assembly

6.4 UCV/Vent Tank Stand

6.5 Rigging equipment – see critical lift documentation

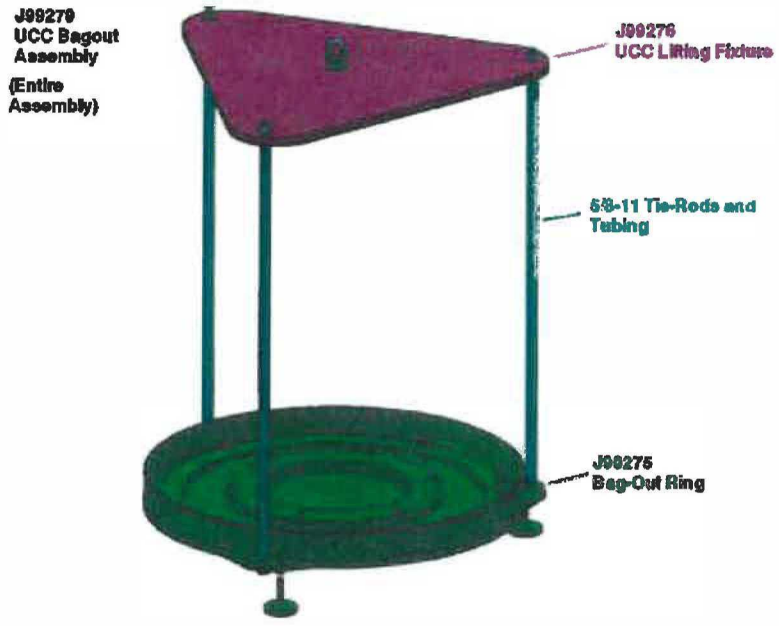
6.6 Critical lift datasheets SNM-044 and SNM-030 (SNM-036 is used instead of SNM-030 if the anode is attached to the assembly)

6.7 Cryo swipe bag

6.8 Ethyl alcohol for beryllium decon of post-shot unit

6.9 Pallet and fasteners: J99341, socket head cap screws ½"-13 x 2.75", leveling mounts ½"-13 (x 3.125" overall height), leveling mount jam (hex) nuts: ½" - 13

6.10 Bag-out assembly (see below), primary bag (J99373), O-ring for base of primary bag (3/8" x Ø 79.8")



SNM HARDWARE UNLOAD PROCEDURE

7.0 PROCEDURE

Date: 9-30-11 **Shot:** 3008

Signature:

NOTE: This document is executed as part of a complex process involving personnel other than those explicitly mentioned in this TWD. The steps in the master sequencing document, ACC_HARMUNLD_OPPRO, are directed by the Shot Director. The steps in this procedure do not begin until after the Hold Point 1 is completed. In addition, the top and bottom air samples have been taken.

Top Cryo Smears

7.1 ☑ **When requested by the Shot Director, prepare the top access port to enable a cryo smear, ensuring the port isn't removed until the cryo-swipe bag is secured over the port.**

7.1.1 ☑ Loosen 4 equally spaced bolts including the security bolt from the top access port, and then retighten these 4 bolts by hand to 0 lash.

7.1.2 ☑ Remove the remaining bolts excluding the 4 previously loosened bolts from the top access port.

7.1.3 ☑ Place ½" ratchet with a ¾" hex socket in a bag over the top access port cover. 3/8"

7.1.4 ☑ Have RP install cryo-swipe bag over the top access port.

7.2 ☑ **When requested by the Shot Director, help configure the bottom tent, establish bottom-side section BOAA for tent activities, and ensure that Herculite path is in place.**

NOTE: Hold Point 2 is completed. In order to make bottom-side entry, configuration 3 (Convolute Pull) must be established.

Bottom-Side Entry

WARNING: The PPE listed in 6.1 shall be worn when entering the center section or as directed by RP.

If Radiation Protection detects contamination inside the center section, the unload process shall be stopped.

At any time if the tent is torn or its integrity questioned, stop work and evaluate the issue.

7.3 ☒ **Ensure all involved Center Section personnel are engaged in the Shot Director's pre-job briefing.**

SNM HARDWARE UNLOAD PROCEDURE

7.4 ☒ **When requested by the Shot Director, open the bottom trap door to the chamber.**

7.5 **Take a smear according to RP directions.**

7.6 ☒ **When requested by the Shot Director, enter the bottom-side with RP present and remove the convolute(s).**

7.6.1 If some of the bolts on the lower cathode are unable to be removed without utilizing destructive methods (i.e., drilling), remove bolts that are not stuck and pass them and the bottom anode to RP personnel for surveying.

7.6.2 If the bolts and anode are free from slag and contamination, drilling of the bolt heads is allowed. If there is slag but no contamination, cease the bottom unload. Hold Point 6 will be designated "welded."

7.7 ☒ **Allow RP to survey the convolutes.** Ensure the trap door remains open until survey results are known. Do not use any power tools to separate the convolutes.

NOTE: Hold Point 3 must be completed before beginning the next step. In order to access the top-side, configuration 4 (Top Smear on a Stick) must be established.

7.8 **When requested by the Shot Director, close the trap door.**

Top-Side Access Port Survey

7.9 ☒ **requested by the Shot Director, help remove the standard top lid or the security bolt from the top access port, depending on which MBA security posture was previously assumed.**

NOTE: Hold Point 4 is completed.

7.10 ☒ **When requested by the Shot Director, help re-install the top access port.**

Extended Top-Side Survey

7.11 ☒ **When requested by the Shot Director, remove the top lid (SNM) to the chamber.**

NOTE: Hold Point 5 is completed. In order to make bottom-side entry, configuration 5 (Top Extended Survey) must be established.

Unload

SNM HARDWARE UNLOAD PROCEDURE

WARNING: The PPE listed in 6.1 shall be worn when entering the center section or as directed by RP.

If Radiation Protection detects contamination inside the center section, the unload process shall be stopped.

At any time if the tent is torn or its integrity questioned, stop work and evaluate the issue.

CAUTION: DO NOT unscrew detonators when disconnecting fireset cables. This will breach the seal on the UCV, possibly resulting in chamber contamination. If the seal is disturbed, notify RP.

7.12 ☑ **When requested by the Shot Director, disconnect and remove the fireset cables from the UCV to the outer top lid assembly.**

7.13 ☒ **When requested by the Shot Director, disconnect VISAR and MITL B-dot feedthroughs.**

7.13.1 Cut the VISAR cables just below the interface plate and at the inside and outside of the feedthrough on the outer top lid assembly.

7.13.2 Disconnect the MITL B-dot feedthroughs from the top anode, the outer top lid assembly, and the wall.

7.14 ☒ **When requested by the Shot Director, remove the outer top lid assembly.**

NOTE: HOLD POINT 6 occurs at this time. CENTER SECTION is part of the signature process for this hold point.

7.15 ☑ **Consult with the Shot Director and RP to determine the path forward as either a "Welded Unload," or a "Not Welded Unload."**

☐ Perform step 7.16 through 7.20 (if welded)

☑ Skip to step 7.21 (if not welded)

Welded Unload

7.16 ☐ **When requested by the Shot Director, install the top tent with RP.**

7.17 ☐ **When requested by the Shot Director, install and seal the top tent chamber liner with RP.**

SNM HARDWARE UNLOAD PROCEDURE

CAUTION: Critical lift documentation shall be completed.

7.18 ☒ **When requested by the Shot Director, proceed with bag-out process for removing ECC/UCC assembly working with RP.**

7.18.1 ☒ Use the crane to lower the bag-out sealing ring assembly into the center section. The swivel hoist rings (3 each 1/4"-20; located 120 degrees apart) shall be threaded into bag-out sealing plate. Locate the bag-out sealing ring assembly off to the side, on the MITL work platform.

7.18.2 ☐ With permanent ink mark the ECC and the bag out ring with the Z shot number.

7.18.3 Install top tent lid with ECC bagout sleeve.

7.18.4 ☐ Allow RP to visually inspect and perform a smoke test of the top tent lid.

7.18.5 ☐ Attach ECC bagout sleeve to ECC. Tape the sleeve approximately 4" below the top of the ECC.

7.18.6 ☐ Remove the bolts securing the UCV to the adapter ring. The bolt directly below the PZT pin cannot be removed but it can be fully unthreaded; verify that it is not partially engaged during the hoisting process.

7.18.7 ☐ Conduct a pre-job briefing for the critical lift (data sheet SNM-044).

7.18.8 ☐ Attach the certified scale/load cell with the rigging (specified bridle chain sling) attached to the crane, and zero (tare) scale.

WARNING: Do not allow tension on the rigging to exceed what is specified in the Critical Lift Plan. This is an indication of a welded load.

7.18.9 ☐ Following the critical lift plan, use the crane to lift the ECC/UCC assembly no higher than necessary for installation of the bag-out ring, leaving adequate clearance for RCT survey. If there is no indication of movement, stop the lift and proceed with step7.18.10.

Weight: 1048

7.18.10 ☐ If the assembly is welded and does not lift out, lower the crane to relieve tension on the rigging.

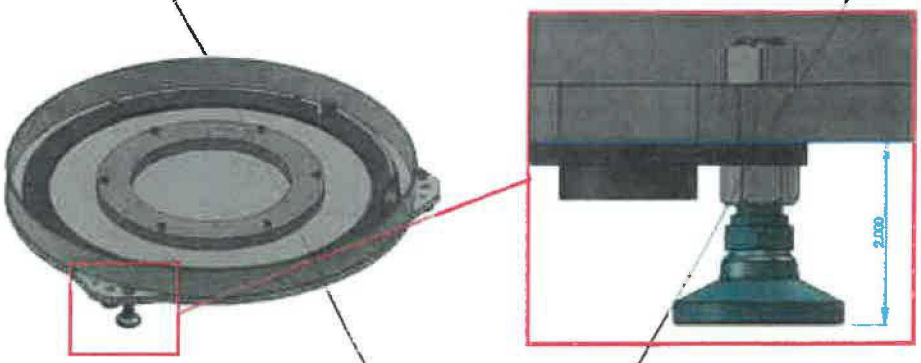
- If the assembly is welded, rebolt the UCV to the adapter ring in four equally spaced locations. Unbolt the top anode 2 foot transition from the 4 foot MITL transition. Repeat step 7.18.9. If the assembly lifts out, the anode is welded; proceed with step 7.18.11. If the assembly does not lift out, the cathode is welded; lower the crane to relieve tension on the rigging and rebolt the anode 2 foot.
- If the cathode is welded, enter via the bottomside to install three cathode extension pusher bolts. Raise the load until the scale reads approximately the weight cited in the Critical Lift Plan. Tighten the pusher bolts until the cathode extension separates from the convolute.

7.18.11 ☐ Allow RP to survey underneath the explosive enclosure.

7.18.12 ☐ Using two people, install tent liner cap over the tent liner opening. Seal the tenting using Velcro and tape for a redundant seal.

SNM HARDWARE UNLOAD PROCEDURE

7.18.13 ☐ Ensure 3 leveling mounts are attached to the bag-out plate (J99275) leaving a 2" gap between the base of the bag-out plate and the bottom of the leveling mounts as shown:



7.18.14 ☐ Using two people manually position the bag-out plate (J99275) onto the MITL work platform; ensure that the bag-out sealing plate is securely resting on the MITL work platform. Reposition ECC and containment assembly over the bag-out sealing plate.

7.18.15 ☐ Lower the ECC assembly onto the bag-out plate and bolt to the platform using (4) 1/4"-20 hardware; tighten, and ensure the ECC assembly is secure.

7.18.16 ☐ If the 2' transition is attached to the assembly, secure the transition to bag-out plate.

7.19 ☐ Hold the process at this point to allow RP survey results to be returned.

NOTE: Hold Point 7 is completed. Do not proceed until confirmation received from RP that explosive enclosure survey results are clean.

7.20 ☐ When requested by the Shot Director, proceed with the unload and Beryllium decontamination.

7.20.1 ☐ Disconnect the bridle sling from the ECC.

7.20.2 ☐ Separate the ECC sleeve from the ECC.

7.20.3 ☐ Perform beryllium decon of the ECC and the UCV using wet appropriate methods.

7.20.4 ☐ Ask IH to take 2 beryllium wipe samples (using ghost wipes) on the ECC (top surface and side surface) and 1 beryllium wipe sample on the UCV to include the area immediately around the UCV. Ensure that samples are marked for location and that rad swipes have been taken at the same locations. When beryllium samples have been released by Radiation Protection, have IH pick up the samples to record and send out for analysis.

7.20.5 ☐ Ensure RP stages rad swipes on top of the ECC for future use.

7.20.6 ☐ Attach two material identification stickers to the ECC located 180° apart.

7.20.7 ☑ Mark the ECC with the shot number.

7.20.8 ☐ Inspect the bag assembly. Ensure that the gloves are inside the transportation bag.

SNM HARDWARE UNLOAD PROCEDURE

7.20.9 ☐ Ensure keys are taped to the top of the ECC.

7.20.10 ☐ Place small bag around the ECC/UCC.

7.20.11 ☐ Seal the bag to the bag-out plate. Visually inspect to ensure a good seal.

- 7.20.11.1 Pull the bag through the O-ring, and then pull the bag over the lip of the bag-out plate.
- 7.20.11.2 Leave approximately 2" of bag material past the lip of the bag-out plate.
- 7.20.11.3 Stretch the O-ring over the lip of the bag-out plate.
- 7.20.11.4 Fold the bag back over the O-ring toward the lip of the bag-out plate.
- 7.20.11.5 Tape the folded bag so that the tape covers the edge of the folded bag at the top and the O-ring. Wrap the entire circumference.

7.20.12 ☐ Attach a Be sticker and two material identification stickers to the radiation control bag located 180° apart, 90° offset from stickers located on ECC.

7.20.13 ☐ Remove top tent lid with ECC sleeve. If necessary, cut the sleeve as high as possible to aid in the top tent lid removal.

7.20.14 ☐ Complete lifting fixture assembly that is attached to the bagout ring. See drawing #J99325.

7.20.15 ☐ Conduct a pre-job briefing for the critical lift (data sheet SNM-030 without anode attached, SNM-036 with anode attached).

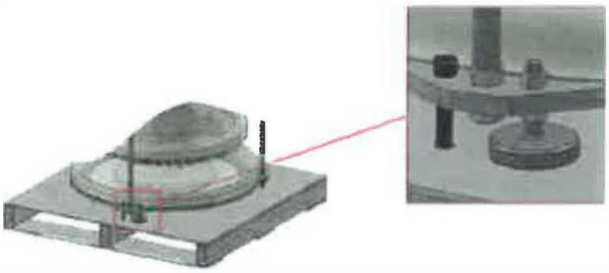
7.20.16 ☐ Attach the bridle sling specified in the critical lift documentation to the lifting fixture.

7.20.17 ☐ Lift the ECC/UCC assembly out of the Center Section and rest the bag-out plate (J99275) on the SNM large pallet (J99341) while the clamping holes and corresponding threads are aligned or inside the 544.

7.20.18 ☐ Ensure the SNM large pallet or 544 is staged on Herculite.

7.20.19 ☐ Fasten the bag-out plate (J99275) to the SNM large pallet using 3x ½"-13 x 2-3/4" socket head cap screws, if utilized.

SNM HARDWARE UNLOAD PROCEDURE



7.20.20 ☐ Transport the 544 or palletized containment hardware to an MBA cage.

NOTE: Remove tent liner and complete remainder of unload by normal procedures (see CEN_UNLOAD_OPPRO).

Not Welded Unload

NOTE: The following steps are only conducted if steps step 7.16 through 7.20 were skipped per Hold Point 6.

CAUTION: Critical lift documentation shall be completed.

7.21 When requested by the Shot Director, proceed with bag-out process for removing ECC/UCC assembly working with RP.

7.21.1 ☑ Use the crane to lower the bag-out sealing ring assembly into the center section. The swivel hoist rings (3 each 1/4"-20; located 120 degrees apart) shall be threaded into bag-out sealing plate. Locate the bag-out sealing ring assembly off to the side, on the MITL work platform.

7.21.2 ☑ Using two people manually position the bag-out plate (J99275) onto the MITL work platform; ensure that the bag-out sealing plate is securely resting on the MITL work platform.

7.21.3 ☑ Remove the bolts securing the UCV to the adapter ring. The bolt directly below the PZT pin cannot be removed but it can be fully unthreaded; verify that it is not partially engaged during the hoisting process.

7.21.4 ☑ Conduct a pre-job briefing for the critical lift (data sheet SNM-044).

7.21.5 ☑ Attach the certified scale/load cell with the rigging (specified bridle chain sling) attached to the crane, and zero (tare) scale.

SNM HARDWARE UNLOAD PROCEDURE

7.21.6 ☑ Ensure 3 leveling mounts are attached to the bag-out plate (J99275) leaving a 1-5/8" gap between the base of the bag-out plate and the bottom of the leveling mounts (see 7.18.13).

WARNING: Do not allow tension on the rigging to exceed what is specified in the Critical Lift Plan. This is an indication that the load is welded.

7.21.7 ☑ Following the critical lift plan, use the crane to lift the ECC/UCC assembly no higher than necessary for installation of the bag-out ring, leaving adequate clearance for RCT survey. If there is no indication of movement, stop the lift and proceed with step 7.21.8.

Weight: 1048

7.21.8 ☐ If the assembly is welded and does not lift out, lower the crane to relieve tension on the rigging.

- If the assembly is welded, rebolt the UCV to the adapter ring in four equally spaced locations. Unbolt the top anode 2 foot transition from the 4 foot MITL transition. Repeat step 7.21.7. If the assembly lifts out, the anode is welded; proceed with step 7.21.9. If the assembly does not lift out, the cathode is welded; lower the crane to relieve tension on the rigging and rebolt the anode 2 foot.
- If the cathode is welded, enter via the bottomside to install three cathode extension pusher bolts. Raise the load until the scale reads approximately the weight cited in the Critical Lift Plan. Tighten the pusher bolts until the cathode extension separates from the convolute.

7.21.9 ☑ Lower the ECC assembly onto the bag-out plate and bolt to the platform using (4) 1/4"-20 hardware; tighten, and ensure the ECC assembly is secure.

7.21.10 ☑ Disconnect the bridle sling from the ECC.

7.21.11 ☐ If the 2' transition is attached to the assembl secure the transition to bag-out plate.

7.21.12 ☑ Ask IH to take 2 beryllium wipe samples (using ghost wipes) on the ECC (top surface and side surface) and 1 beryllium wipe sample on the UCV to include the area immediately around the UCV. Ensure that samples are marked for location and that rad swipes have been taken at the same locations. When beryllium samples have been released by Radiation Protection, have IH pick up the samples to record and send out for analysis.

7.21.13 ☑ Ensure RP stages rad swipes on top of the ECC for future use.

7.21.14 ☑ Attach two material identification stickers to the ECC, 180° apart (see 7.20.6).

7.21.15 ☑ Mark the ECC with the shot number.

7.21.16 ☑ Inspect the bag assembly. Ensure that the gloves are inside the transportation bag.

7.21.17 ☑ Ensure keys are taped to the top of the ECC.

7.21.18 ☑ Place complete primary bag (J99373) around the ECC/UCC.

9) DR2016322_Z3008_Radiation_Protection_Transportation_Survey

Radiological Survey Report

Survey I-20161004-2

General Information

Title: Z-3008 C-DMP ECC/UCC Movement Survey (to RMWMF)

Survey Date/Time: 10/4/2016 09:30

Lead Surveyor: Burke, John

Location: 961N / 1

Work Order/Task #: 174580 4.46.01

TWD or RTWD #: ACC_MBA160_OPPRO

Purpose: Transportation

Requestor Org: 01646

Status: Approved by: Finley, Edward, 10/26/2016

Ready for Review by: Burke, John, 10/11/2016

Instruments Used

#	Instrument Model	Instrument Serial #	Inst Type	Probe Model	Probe Serial #	Probe Type	Calibration Date	Efficiency β/γ	Efficiency α
1	MICROREM	19114	D			D	11/10/2016		

Instruments Used - Notes

#	Notes
1	N/A

Radiological Survey Report

Survey I-20161004-2

General Information

Title: Z-3008 C-DMP ECC/UCC Movement Survey (to RMWMF)

Survey Date/Time: 10/4/2016 09:30

Lead Surveyor: Burke, John

Location: 961N / 1

Work Order/Task #: 174580 4.46.01

TWD or RTWD #: ACC_MBA160_OPPRO

Purpose: Transportation

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Status: Approved by: Finley, Edward, 10/26/2016

Ready for Review by: Burke, John, 10/11/2016

Instruments Used

#	Instrument Model	Instrument Serial #	Inst Type	Probe Model	Probe Serial #	Probe Type	Calibration Date	Efficiency β/γ	Efficiency α
1	MICROREM	19114	D			D	11/10/2016		

Instruments Used - Notes

#	Notes
1	N/A

Radiological Survey Report

Comments:

Movement Survey performed on 544 Metal Box SNL/NM # 007543
Box contains ECC UCC from Z-3008.
Item will be sent to RMWMF for disposal.

Radionuclides of concern are:
Alpha - Pu 239
Beta - Unknown

Dose rates taken on the outside of box with Microrem on contact and at 30cm. Swipes taken on top and all four sides of box.
Results review all less than 6-1 limits, item "ok to move".
ACC_MBA160_OPPRO

Itemized Details - Items

#	Item Location/Description	Comments
1	Dose rates on box	
2	Smears 1-8 on exterior of box.	

Radiation Survey

Background: 10
Background Units: urem/hr
Radiation Type: Gamma

#	Radiation Type	Reading	Units	Distance From Source	Comment
1	Gamma	10/10	urem/hr	OC/30 cm	

Alpha Activity

Counting Data Attached: ☑ Yes ☐ No
Eff. for Removable: Inst:N/A Eff:
Eff. for Total: Inst:N/A Eff:
Radionuclide: Pu
Default Bkg Value:
Default Bkg Units:

#	Data	Data Units	Bkg.	Bkg. Units	T/R	Activity	Activity Units
2	SALI ATT	cpm/100 cm2		cpm/100 cm2			dpm/100 cm2

Beta-Gamma Activity

Counting Data Attached: ☑ Yes ☐ No
Eff. for Removable: Inst:N/A Eff:
Eff. for Total: Inst:N/A Eff:
Radionuclide: UNK
Default Bkg Value:
Default Bkg Units:

#	Data	Data Units	Bkg.	Bkg. Units	T/R	Activity	Activity Units
2	SALI ATT	cpm/100 cm2		cpm/100 cm2			dpm/100 cm2

Radiological Survey Report

Sample Laboratory Data

Program ID: RPOP **Customer:** Burke,John Joseph **Batch Name:** T0070001.LSC **Collection Date:** 10/4/2016

Reviewed By: Reese,Robert P **Review Date:** 10/5/2016

Comments:

Batch Name	Type	Category	Org	Anaylsis Date	Received Date	Building	Room	Sample Description	Customer Email ID	Survey #
T0070001.LSC	SWIPE	SA	041281	10/4/2016	10/4/2016			I-20161004-2 @ 0930	JBURKE	I-20161004-2

Customer Sample ID	Sample #	Nuclide	Activity	2S Error	Critical Level	MDA/LOQ	Activity Units	Aliquot	Aliquot Units	Flag
1	1	ALPHA	-2.35E+000	4.37E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
1	1	LEB	1.42E+000	1.29E+001	1.04E+001	2.20E+001	dpm/Each	1.00E+000	Each	
1	1	BETA	1.48E+000	8.30E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
2	2	LEB	-2.76E+000	1.27E+001	1.04E+001	2.20E+001	dpm/Each	1.00E+000	Each	
2	2	ALPHA	-2.55E+000	4.37E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
2	2	BETA	3.17E+000	8.54E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
3	3	LEB	4.06E+000	1.35E+001	1.09E+001	2.30E+001	dpm/Each	1.00E+000	Each	
3	3	ALPHA	-2.55E+000	4.37E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
3	3	BETA	1.06E+000	8.22E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
4	4	ALPHA	-3.33E+000	4.34E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
4	4	LEB	1.12E+000	1.30E+001	1.07E+001	2.26E+001	dpm/Each	1.00E+000	Each	
4	4	BETA	7.39E+000	9.11E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	@CL
5	5	ALPHA	-2.35E+000	4.37E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
5	5	LEB	4.07E+000	1.34E+001	1.07E+001	2.26E+001	dpm/Each	1.00E+000	Each	
5	5	BETA	3.38E+000	8.55E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
6	6	ALPHA	-3.14E+000	4.35E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
6	6	LEB	9.47E+000	1.46E+001	1.17E+001	2.46E+001	dpm/Each	1.00E+000	Each	
6	6	BETA	-1.46E+000	8.13E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
7	7	LEB	-2.27E+000	1.30E+001	1.13E+001	2.37E+001	dpm/Each	1.00E+000	Each	
7	7	ALPHA	-3.73E+000	4.33E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
7	7	BETA	3.17E+000	8.54E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	
8	8	LEB	3.05E+000	1.35E+001	1.13E+001	2.38E+001	dpm/Each	1.00E+000	Each	
8	8	ALPHA	-1.37E+000	4.40E+000	3.65E+000	7.83E+000	dpm/Each	1.00E+000	Each	
8	8	BETA	5.29E+000	8.81E+000	6.67E+000	1.39E+001	dpm/Each	1.00E+000	Each	

DR Number 2016322

Chemical Characterization Comments: As necessary, use the following space to document the characterization methodology, the supporting information, and any assumptions.

Characterization is based on the following:

- Waste Description section and page 2 of the DR form
- RCRA characterization page of DR form
- Attachment 3- DR 2016322_ Contmt Assy Matl Summary_Z3008
- Attachment 4- DR 2016322_ WCT_ TCLP.xls_Z3008
- Attachment 6 - DR 2016322_IH Beryllium Rpt S03986_Z3008

Based on the documentation above, this waste is not RCRA regulated hazardous or mixed waste. It does not contain beryllium and is not TSCA regulated.

Reviewed by: Howard Seeley, Weston Solutions, Inc. HS
Date: 11/15/16

Sandia National Laboratories

Radiological Characterization Summary Form Data Entry

RF 2042-RCS (0814, Revision 11)

Section I. General information.

Disposal Request	2016322		
NNSS Waste Profile	N/A	#N/A	#N/A

Worksheet	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Activity Date	9/19/2016									
Waste Parcel	2016322-01									
Waste Volume	1.00E+01									
Waste Volume Units	ft3									
Net Weight	1048.00									
Net Weight Units	lb									
Waste Volume (cubic feet)	1.00E+01									
Net Weight (pounds)	1.05E+03									
Effective Waste Density (g/cc)	1.679									

Section II. Uranium information.

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)
U-238										
U-236										
U-235										
U-234										
Th-234										
Uranium Type	Not Applicable									
U-238/U-235 Activity Ratio	Not Applicable									
U-235 Enrichment	Not Applicable									
U-235 Fissile Mass (grams)	Not Applicable									
Uranium Activity (Ci)	Not Applicable									
Uranium Mass (grams)	Not Applicable									

Section III. Radiological information.

Nuclide	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)	Activity (Ci)
Th-232										
Th-228										
Ra-228										
Pu-238	7.02E-04									
Pu-239	2.30E-02									
Pu-240	5.27E-03									
Pu-241	2.81E-02									
Pu-242	7.42E-07									
Am-241	1.25E-03									
Waste Class (10 CFR 61.55)	Class C									
Waste Class (UAC)	Class C									
> 10% of Category 3 Limit	No									
> 2-g U-235 FGE	No									
> 100 nCi/g TRU	No									
> 3 PE-g	No									
> 2-g U-235 FGE per kg	No									

Performed by: [signature] 11-16-16
(Name, signature, date)

Checked by: J. J. Davis [signature] 11/17/16
(Name, signature, date)

11/16/2016 2:03 PM

Sandia National Laboratories

Radiological Characterization Summary Form

RF 2042-RCS (0814, Revision 11)

Section I. General Information.

2016322	Disposal Request	4.75E+05	Net Weight (grams)	1048.00	lb	Conversion	Not Applicable	Type Of Uranium	Not Applicable	U-235 Enrichment
2016322-01	Waste Parcel	1.00E+01	Waste Volume (cubic feet)	1.00E+01	ft3	Calculator	Not Applicable	U-238/U-235 Activity Ratio	Not Applicable	Uranium Activity (Ci)

Section II. Radiological Information.

Nuclide	Activity (Ci)	Activity without DPs (Ci)	>1% of Total Activity wo DPs >1% of NNSS Table E-1 >0.1% of Total A_2 Fraction TRU or ESH100.2.SB.2 Fissile	% of Total Activity without DPs	Activity/m^3 (Bq/m^3)	Activity/gram (pCi/g)	Mass (grams)	Fraction of Category 3 Limit	Fraction of ACEM Limit	Fraction of ALEC Limit	% of Total A_1 Limit	% of Total A_2 Fraction	TRU Conc. (nCi/g)	Fraction of NNSS Profile Limit (Bq/m^3)	Fraction of NNSS Profile Limit (nCi/g)	Fraction of NNSS Table E-1 Limit
Pu-238	7.02E-04	7.02E-04	Yes	1.20E+00	9.17E+07	1.48E+03	4.10E-05	2.68E-04	5.46E+01	2.60E+03	1.89E+00	2.29E+00	1.48E+00	#N/A	#N/A	Less than 0.01
Pu-239	2.30E-02	2.30E-02	Yes	3.94E+01	3.00E+09	4.83E+04	3.70E-01	9.57E-03	1.79E+03	8.50E+04	6.17E+01	7.49E+01	4.83E+01	#N/A	#N/A	Less than 0.01
Pu-240	5.27E-03	5.27E-03	Yes	9.03E+00	6.88E+08	1.11E+04	2.32E-02	2.19E-03	4.10E+02	1.95E+05	1.42E+01	1.72E+01	1.11E+01	#N/A	#N/A	Less than 0.01
Pu-241	2.81E-02	2.81E-02	Yes	4.82E+01	3.68E+09	5.92E+04	2.72E-04	2.13E-04	2.19E+01	1.04E+04	1.89E+01	1.53E+00	0.00E+00	#N/A	#N/A	Less than 0.01
Pu-242	7.42E-07	7.42E-07	Yes	1.27E-03	9.69E+04	1.56E+00	1.88E-04	2.90E-07	5.77E-02	2.74E+00	1.99E-03	2.42E-03	1.56E-03	#N/A	#N/A	Less than 0.01
Am-241	1.25E-03	1.25E-03	Yes	2.14E+00	1.63E+08	2.62E+03	3.63E-04	4.31E-04	9.70E+01	4.61E+03	3.35E+00	4.07E+00	2.62E+00	#N/A	#N/A	Less than 0.01
Total	5.83E-02	5.83E-02			7.62E+09	1.23E+05	3.94E-01	1.27E-02	2.37E+03	2.98E+05	1.00E+02	1.00E+02	6.35E+01			

Section III. 49 CFR Class 7 (Radioactive) material calculations.

Yes	Is The Activity Concentration For Exempt Material (ACEM) Fraction Greater Than One?	2.37E+03	ACEM Fraction
Yes	Is The Activity Limit For Exempt Consignment (ALEC) Fraction Greater Than One?	2.98E+05	ALEC Fraction
Yes	Is The Reportable Quantity (RQ) Fraction Equal To Or Greater Than One?	3.05E+00	RQ Fraction
Yes	Is The Limited Quantity (LQ) Package Limit Fraction For Normal Form Solids And Gases Greater Than One?	1.13E+03	LQ Package Limit Fraction: Normal Form (Solids And Gases)
Yes	Is The Low Specific Activity (LSA)-I Limit Fraction Greater Than One?	7.90E+01	LSA-I Limit Fraction
No	Is The LSA-II Limit Fraction For Solids And Gases Greater Than One?	2.39E-02	LSA-II Limit Fraction: Solids And Gases
Yes	Is The A2 Fraction Greater Than One?	1.13E+00	A_2 Fraction
No	Is The Highway Route Controlled Quantity (HRCQ) Normal Form Fraction Greater Than One?	3.78E-04	HRCQ Fraction: Normal Form
Yes	Is The LQ Package Limit Fraction For Special Form Solids And Gases Greater Than One?	1.13E+02	LQ Package Limit Fraction: Special Form (Solids And Gases)
No	Is The A1 Fraction Greater Than One?	1.38E-04	A_1 Fraction
No	Is The HRCQ Special Form Fraction Greater Than One?	2.16E-06	HRCQ Fraction: Special Form

Section IV. Waste classification, hazard category 2 & 3 threshold limit, U-235 fissile mass, fissile mass, transuranic nuclide concentration, plutonium equivalent gram, and U-235 fissile gram equivalent information.

Yes	Is The Package "Class B", "Class C", Or "> Class C" Waste Per 10 CFR 61.55?	Class C	10 CFR 61.55 Waste Classification
Yes	Is The Package "Class B", "Class C", Or "> Class C" Per UAC R313-15-1008?	Class C	Utah Administrative Code (UAC) R313-15-1008 Waste Classification
No	Does Package Exceed 10% Of The Hazard Category 3 Threshold Limit?	1.2677%	Percent Of The Hazard Category 3 Threshold Limit
No	Does Package Exceed 10% Of The Hazard Category 2 Threshold Limit?	0.0188%	Percent Of The Hazard Category 2 Threshold Limit
No	Does Package Exceed 2 Grams Of Fissile U-235?	0.00E+00	Grams Of Fissile U-235
No	Does Package Exceed 2 Grams Of Fissile Material Per 49 CFR?	3.71E-01	Grams Of Fissile Material Per 49 CFR
No	Does Package Exceed 2 Grams Of U-235 Fissile Gram Equivalence (FGE) Per NNSS WAC?	5.93E-01	Grams Of U-235 Fissile Gram Equivalence (FGE) Per NNSS WAC
No	Does Package Exceed 2 Grams Of U-235 Fissionable Equivalent Mass (FEM) Per SNL MSB CSA?	6.69E-01	Grams Of U-235 Fissionable Equivalent Mass (FEM) Per SNL MSB Criticality Safety Assessment
No	Is The Fissile Threshold Limit Ratio Equal To Or Greater Than One Per SNL Corporate Procedure: ESH100.2.SB.2?	8.27E-04	Fissile Threshold Limit Ratio Per SNL Corporate Procedure: ESH100.2.SB.2, 'Ensure Nuclear Criticality Safety'
No	Does TRU Concentration Exceed 100 nCi/g?	6.35E+01	TRU Concentration In nCi/g
No	Does Plutonium Equivalent Gram (PE-g) Total Exceed Three?	5.99E-01	Plutonium Equivalent Gram (PE-g) Total Per NNSS WAC
No	Does U-235 Fissile Gram Equivalence (FGE) Exceed 2 Grams U-235 Per kg Of Waste?	5.93E-01	U-235 Fissile Gram Equivalence (FGE) In Grams Per NNSS WAC

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