

Waste Characterization by DOE at the Energy Technology Engineering Center

Phil Rutherford
President, Phil Rutherford *Consulting*

Former Senior Manager of Radiation Safety and RSO (Retired)
Santa Susana Field Laboratory
The Boeing Company

Presented at the Health Physics Society Annual Meeting
National Harbor, Maryland

July 25, 2023

DOE Building Demolition at ETEC

- At the last annual meeting in Spokane, I spoke about the legislation, litigation, and regulatory abuse initiated by activists, politics and LNT-based radiation paranoia in the nuclear decommissioning program at the Santa Susana Field Laboratory
 - [https://philrutherford.com/SSFL/Nuclear Decommissioning at SSFL.pdf](https://philrutherford.com/SSFL/Nuclear_Decommissioning_at_SSFL.pdf)
 - <https://www.youtube.com/watch?v=FXXeCVcAbCU>
- One of the final topics discussed last year was DOE's shipment of demolition debris from decommissioned facilities and non-radiological facilities to the *EnergySolutions* LLRW disposal facility.
- This presentation is a follow-up that describes how that demolition debris was falsely characterized

SSFL Area IV Buildings 1985



DOE-Owned Buildings 2019



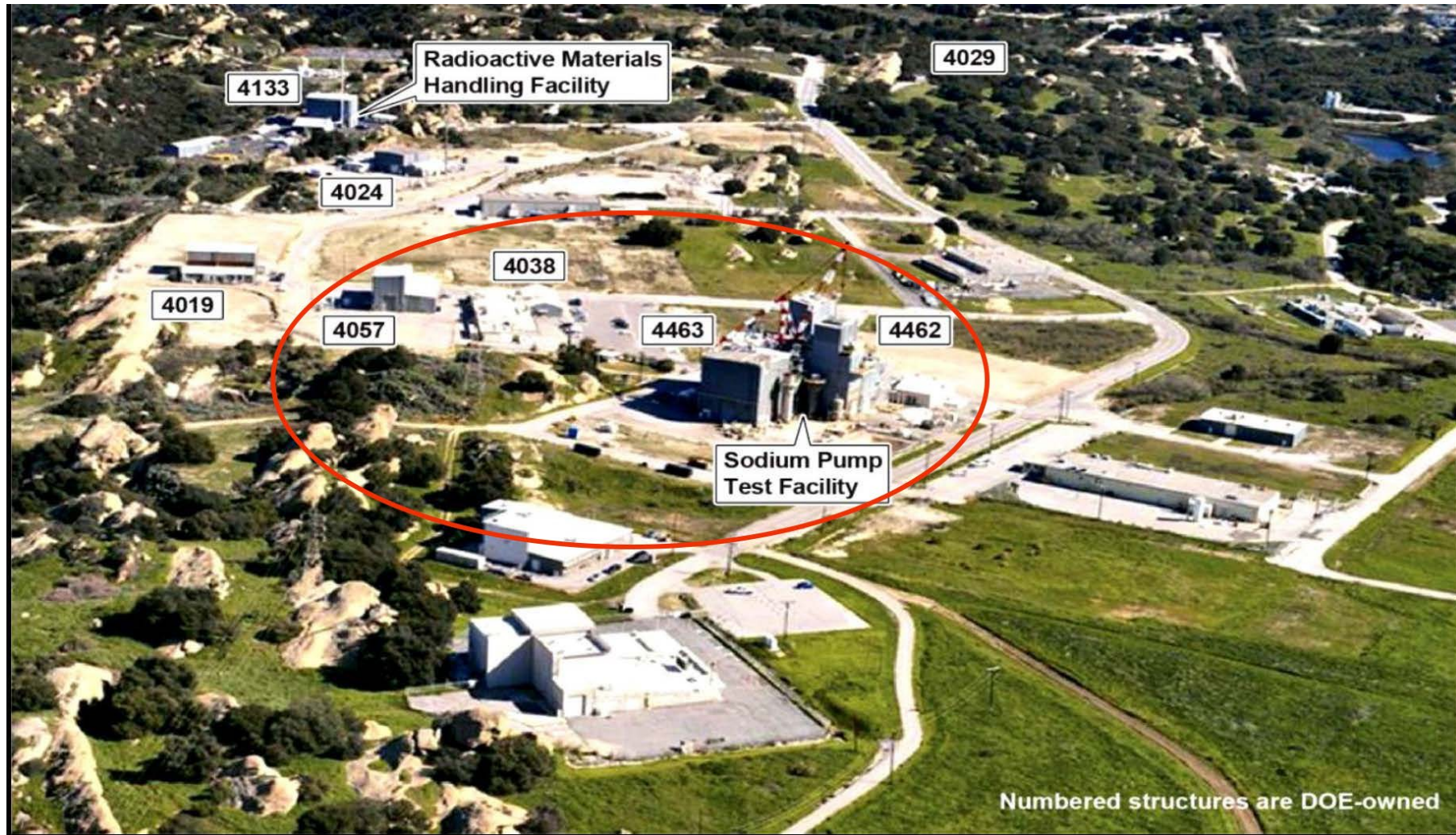
DOE-Owned Buildings (Non-Decommissioned)



DOE-Owned Buildings (Decommissioned)



DOE-Owned Buildings (Non-Radiological)

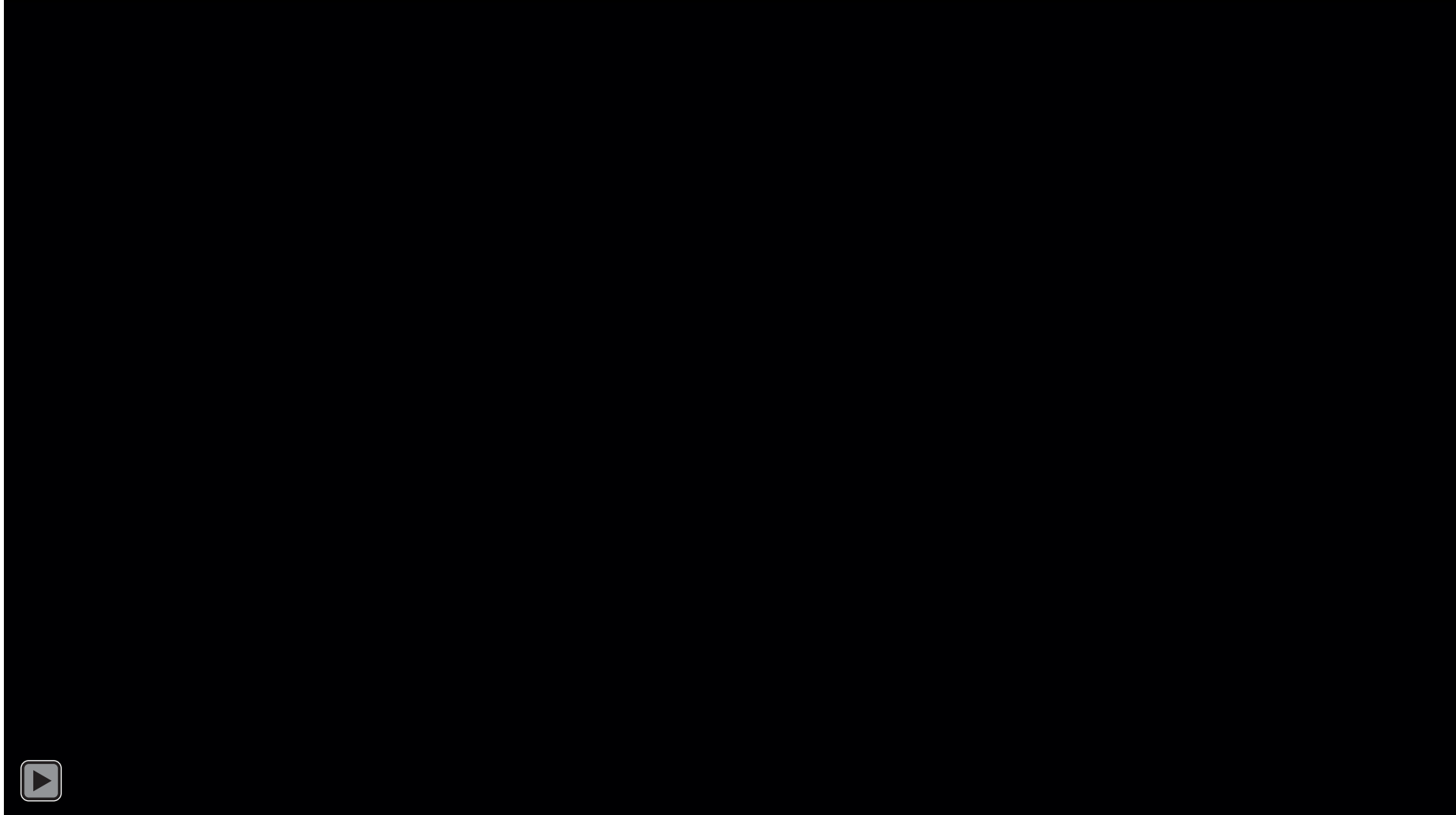


2020 Amendment to Order on Consent (2020 AOC)

- On October 30, 2020, DTSC and DOE signed a 2020 AOC requiring demolition of
 - Two former DOE nuclear/radiological facilities that had been surveyed, decommissioned and *“released for unrestricted use”*
 - Four former DOE non-radiological facilities that had been surveyed and declared to be *“indistinguishable from background”*
 - Debris from all these buildings has been shipped to the licensed LLRW disposal facility operated by EnergySolutions at Clive, Utah
- A DTSC official, during a public Zoom meeting, stated, *“buildings with a history of radiological use, regardless of the status of unrestricted release, was sufficient enough to say that the waste could be characterized as LLRW”*
- Both the 2020 AOC and DTSC use a favorite phrase *“out of an abundance of caution”* as reason for disposing of this clean, unregulated, unlicensed debris as LLRW. When asked for a legal or regulatory citation for this criterion, we are met with silence.

Sodium Pump Test Facility (October 2021)

Throwing caution to the wind ... they blew it up



FOIA Request EMCBC-2022-0149-F

- In November 2021 a FOIA request was submitted to DOE requesting,
 - Documents for shipments of demolition debris from RMHF buildings (4034, 4044, 4075, 4563, 4658, 4665, 4688, 4021, 4022, 4621) and buildings 4019 4024, 4029, 4133, 4038, 4057, 4462 and 4463 from the Energy Technology Engineering Center (ETEC) to EnergySolutions, Clive, Utah
 - Export Permits from the Southwestern LLRW Compact Commission
 - [EnergySolutions' forms, "Radioactive Waste Profile"](#)
 - [NRC Forms 540/541, "Uniform Low-Level Radioactive Waste Manifest"](#)
 - Radiation surveys of transport roll-offs, containers, trailer, and cab of haulers
 - All other DOT required documentation for these shipments
 - All other EnergySolutions required documentation for these shipments
 - Periods of these shipments and documents are for 2020, 2021 and 2022
- In late September 2022, a reply was provided

Comments on ETEC Waste Shipment Profiles and Manifests

- In January 2023, an [18-page critique](#) of waste profiles and shipment manifests was sent to ETEC management, DOE-EM1, Secretary of Energy, North Wind, EnergySolutions and DTSC,
 - Use of limited survey data from contaminated RMHF building(s) used to characterize other decommissioned buildings and buildings with no history of radiological use
 - No building names/numbers are identified in waste profiles and manifests with intent to mask source of waste
 - Manifest radionuclide concentrations are inconsistent with waste stream profile concentrations
 - Containers with significantly dissimilar weights have identical radionuclide activities which is physically impossible
 - Multiple containers have identical radionuclide activities and identical waste weights which is physically impossible



Via Email

REVISED January 10, 2023

Phil Rutherford Consulting
8655 Delmonico Ave
West Hills, CA 91304

Energy Technology Engineering Center Closure Project
Department of Energy
Environmental Management Consolidated Business Center
4100 Guardian Street, Suite 160
Simi Valley, CA 93063

Attention: Josh Mengers, ETEC Federal Project Director

Subject: FOIA EMCBC-2022-00149-F Data Package

Reference: Letter from Melody C. Bell, [Freedom of Information Act Request - EMCBC-2022-00149-F](#),
Undated, EMCBC-00249-22, Digitally signed September 29, 2022

Dear Dr. Mengers,

I am addressing this letter to you, Josh, rather than Michelle Farris at the FOIA Office of EMCBC since my comments on the FOIA data package relate to activities within your direct purview.

These comments are in response to the referenced letter and its enclosed data package on a flash drive. The data package was a response to my FOIA EMCBC-2022-00149-F. My comments are somewhat lengthy for several reasons. They are addressed to several organizations, and it is necessary to explain the background and issues fully to several diverse parties recognizing that the individuals responsible for compiling the FOIA response package are likely not the same individuals who prepared the original shipping documents and are certainly not the staff at EnergySolutions to whom the alleged LLRW was sent. Although EnergySolutions (Clive) is an NRC and State of Utah licensed facility, I am not including the NRC or Utah on distribution.

FOIA EMCBC-2022-00149-F

DOE and DTSC have been criticized for agreeing to dispose of decommissioned material and building debris from buildings with no history of radiological use, as low-level radioactive waste (LLRW). See communications with DTSC (<https://philrutherford.com/ssf.html#2020aoc>) and Section 23.0 of [Nuclear Decommissioning at the Santa Susana Field Laboratory](#).

The objective of FOIA EMCBC-2022-00149-F was to require DOE to provide waste characterization/profiling/manifesting data that proved that building debris from decommissioned buildings and buildings with no history of radiological use was in fact contaminated above state and federal cleanup standards, that would justify classifying, managing, shipping, and disposing of the debris as low-level radioactive waste (LLRW). Specifically the following documents were requested.

Basis for Characterizing Demolition Debris

- Limited survey measurements from a non-decommissioned, potentially contaminated facility ...
 - “One” maximum upper-bound scan surface contamination alpha/beta instrument measurement
 - 1,407 dpm/100 cm² alpha, 50,616 dpm/100 cm² beta (taken in 2007)
 - Isotopic analysis of “three” wipe tests (undated and undocumented)
- Used to characterize demolition debris from ...
 - 3 **decommissioned facilities** (decommissioned material) and
 - 4 **non-radiological facilities with no history of radiological use** (surveyed as being IFB)

Energy Solutions Radioactive Waste Profile 7332-01



RADIOACTIVE WASTE PROFILE RECORD

Waste Stream ID: 7332-01 Revision: 0 Date of Revision: 1/21/2020

C. RADIOLOGICAL INFORMATION

Obtain sufficient samples to adequately determine a range and weighted average of activity in the waste. Attach the gamma spectroscopy or radiochemistry data supporting the radionuclide information listed below.

- Does the waste material contain accessible surfaces with contact dose rates greater than 500 mR/hr? Y N
- Please list the following information for each isotope associated with the waste. Provide an explanation in the narrative description if the waste contains localized "hot spots" or elevated concentrations that significantly exceed the upper concentration range. If additional space is needed, provide an attachment to this profile record formatted as below.

Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)	Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)
AM-241	1.000E1	1.000E0			
CM-243	1.000E1	1.000E0			
CM-245	1.000E1	1.000E0			
CS-137	5.000E0	2.050E0			
PU-239	1.000E0	6.120E-2			
RA-226	1.000E0	1.820E-2			
RA-228	1.000E0	2.570E-2			
SR-90	1.000E0	6.340E-1			
U-234	1.000E0	1.980E-2			
U-235	1.000E0	4.140E-3			
U-238	1.000E0	6.500E-3			

- Five waste streams profiled using identical limited historical data
- However, five different sets of manifested upper concentrations and weighted average concentrations were profiled
- How were concentrations derived?
- How did surface contamination become volume contamination?

Energy Solutions Radioactive Waste Profile 7332-02



RADIOACTIVE WASTE PROFILE RECORD

Waste Stream ID: 7332-02 Revision: 0 Date of Revision: 1/21/2020

C. RADIOLOGICAL INFORMATION

Obtain sufficient samples to adequately determine a range and weighted average of activity in the waste. Attach the gamma spectroscopy or radiochemistry data supporting the radionuclide information listed below.

1. Does the waste material contain accessible surfaces with contact dose rates greater than 500 mR/hr? Y N
2. Please list the following information for each isotope associated with the waste. Provide an explanation in the narrative description if the waste contains localized "hot spots" or elevated concentrations that significantly exceed the upper concentration range. If additional space is needed, provide an attachment to this profile record formatted as below.

Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)	Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)
AM-241	1.000E0	4.750E-3			
CM-243	1.000E0	8.220E-4			
CM-245	1.000E0	6.470E-4			
CS-137	5.000E0	2.050E0			
PU-239	1.000E0	6.120E-2			
RA-226	1.000E0	1.820E-2			
RA-228	1.000E0	2.570E-2			
SR-90	1.000E0	6.340E-1			
U-234	1.000E0	1.980E-2			
U-235	1.000E0	4.140E-3			
U-238	1.000E0	6.500E-3			

- Five waste streams profiled using identical limited historical data
- However, five different sets of manifested upper concentrations and weighted average concentrations were profiled
- Same radionuclides as 7332-01
- 7332-02 comprised 405 of 408 manifested shipments

Energy Solutions

Radioactive Waste Profile 7332-03



RADIOACTIVE WASTE PROFILE RECORD

Waste Stream ID: 7332-03 Revision: 0 Date of Revision: 4/15/2020

C. RADIOLOGICAL INFORMATION

Obtain sufficient samples to adequately determine a range and weighted average of activity in the waste. Attach the gamma spectroscopy or radiochemistry data supporting the radionuclide information listed below.

- Does the waste material contain accessible surfaces with contact dose rates greater than 500 mR/hr? Y N
- Please list the following information for each isotope associated with the waste. Provide an explanation in the narrative description if the waste contains localized "hot spots" or elevated concentrations that significantly exceed the upper concentration range. If additional space is needed, provide an attachment to this profile record formatted as below.

Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)	Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)
AM-241	1.000E1	1.000E0			
BA-133	1.000E0	3.030E-1			
CM-243	1.000E1	1.000E0			
CM-245	1.000E1	1.000E0			
CO-57	2.000E1	1.730E1			
CO-60	5.000E0	1.530E0			
CS-137	1.000E1	1.000E0			
EU-152	6.000E1	5.280E1			
EU-154	1.000E1	9.100E0			
EU-155	2.000E0	4.880E-1			
H-3	2.000E2	9.430E1			
PU-238	1.000E0	1.180E-1			
PU-239	1.000E0	1.810E-1			
PU-241	3.500E2	3.250E2			
RA-226	1.000E1	1.000E0			
RA-228	1.000E1	1.000E0			
SR-90	5.000E0	1.190E0			
TH-228	1.000E1	2.800E0			
TH-230	1.000E1	2.580E0			
TH-232	5.000E0	2.440E0			
U-232	2.000E0	6.950E-1			
U-234	1.000E1	2.680E0			
U-235	1.000E0	2.900E-1			
U-238	1.000E0	7.000E0			

- Five waste streams profiled using identical limited historical data
- However, five different sets of manifested upper concentrations and weighted average concentrations were derived
- Why does 7332-03 include 13 additional radionuclides?

Energy Solutions Radioactive Waste Profile 7332-05



RADIOACTIVE WASTE PROFILE RECORD

Waste Stream ID: 7332-05 Revision: 0 Date of Revision: 8/20/2021

C. RADIOLOGICAL INFORMATION

Obtain sufficient samples to adequately determine a range and weighted average of activity in the waste. Attach the gamma spectroscopy or radiochemistry data supporting the radionuclide information listed below.

- Does the waste material contain accessible surfaces with contact dose rates greater than 500 mR/hr? Y N
- Please list the following information for each isotope associated with the waste. Provide an explanation in the narrative description if the waste contains localized "hot spots" or elevated concentrations that significantly exceed the upper concentration range. If additional space is needed, provide an attachment to this profile record formatted as below.

Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)	Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)
CS-137	3.000E2	2.050E0			
H-3	7.500E3	3.770E0			

- Five waste streams profiled using identical limited historical data
- However, five different sets of manifested upper concentrations and weighted average concentrations were derived
- Only 2 radionuclides profiled
- Extremely large upper bound concentrations for non-aqueous oil

Energy Solutions

Radioactive Waste Profile 9732-01



RADIOACTIVE WASTE PROFILE RECORD

Waste Stream ID: 9732-01 Revision: 1 Date of Revision: 4/29/2020

C. RADIOLOGICAL INFORMATION

Obtain sufficient samples to adequately determine a range and weighted average of activity in the waste. Attach the gamma spectroscopy or radiochemistry data supporting the radionuclide information listed below.

- Does the waste material contain accessible surfaces with contact dose rates greater than 500 mR/hr? Y N
- Please list the following information for each isotope associated with the waste. Provide an explanation in the narrative description if the waste contains localized "hot spots" or elevated concentrations that significantly exceed the upper concentration range. If additional space is needed, provide an attachment to this profile record formatted as below.

Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)	Isotope	Manifested Upper Concentration (pCi/g)	Weighted Avg. per Container (pCi/g)
AM-241	1.000E1	1.000E0			
BA-133	1.000E0	3.030E-1			
CM-243	1.000E1	1.000E0			
CM-245	1.000E1	1.000E0			
CO-57	2.000E1	1.730E1			
CO-60	5.000E0	1.530E0			
CS-137	5.000E0	5.130E-1			
EU-152	6.000E1	5.280E1			
EU-154	1.200E1	9.100E0			
EU-155	1.000E0	4.880E-1			
H-3	1.000E2	9.430E1			
K-40	1.000E1	6.450E0			
PU-238	1.000E0	1.180E-1			
PU-239	1.000E0	1.810E-1			
PU-241	3.500E2	3.250E2			
RA-226	1.000E1	1.000E0			
RA-228	1.000E1	1.000E0			
SR-90	5.000E0	1.190E0			
TH-228	8.000E0	2.800E0			
TH-230	6.000E0	2.580E0			
TH-232	6.000E0	2.440E0			
U-232	3.000E0	6.950E-1			
U-234	7.000E0	2.680E0			
U-235	1.000E0	2.900E-1			
U-238	1.000E1	7.000E0			

- Five waste streams profiled using identical limited historical data
- However, five different sets of manifested upper concentrations and weighted average concentrations were profiled
- One additional radionuclide, K-40, at concentrations less than dirt?

Inspection of Weighted Average Concentrations

- Radionuclide concentrations ratioed/normalized to Cs-137
- Most radionuclides far less than background threshold values (BTV) for soil

Waste Stream 7332-02				
Nuclide	Weighted Ave. Concentration per Container*	Nuclide ratio per Cs-137	EPA Area IV Soil BTV	Waste < BTV or Waste > BTV
	pCi/g	-	pCi/g	
Am-241	4.750E-03	0.0023	1.42E-02	Waste < BTV
Cm-243	8.220E-04	0.0004	1.47E-02	Waste < BTV
Cm-245	6.470E-04	0.0003	1.47E-02	Waste < BTV
Cs-137	2.050E+00	1.0000	1.57E-01	Waste > BTV
Pu-239	6.120E-02	0.0299	9.36E-03	Waste > BTV
Ra-226	1.820E-02	0.0089	1.82E+00	Waste < BTV
Ra-228	2.570E-02	0.0125	2.10E+00	Waste < BTV
Sr-90	6.340E-01	0.3093	5.12E-02	Waste > BTV
U-234	1.980E-02	0.0097	1.55E+00	Waste < BTV
U-235	4.140E-03	0.0020	1.01E-01	Waste < BTV
U-238	6.500E-03	0.0032	1.52E+00	Waste < BTV

* EnergySolutions Waste Profile Record

NRC 540/541 Uniform LLRW Manifests

- 408 manifests, one for each shipment
 - 2 x 20 cu. yd. rolloff containers per shipment
 - 1 x 20 cu. yd. rolloff container per shipment
 - 8,000 to 16,000 cu. yds of building demolition debris
- 405 of 408 manifests are for a single waste stream 7332-02
- Many multiple containers have identical total activities yet have different waste weights
- Concentrations incorrectly calculated by activity / weight
- Activities should be calculated by concentration x weight
- Many single container manifests have identical total weights and identical activities
- Many container weights are 0 kgs

Shipments 7332-02-0004 and 7332-02-0007

- Why do containers have different weighted average concentrations than waste stream profile 7332-02?
- How do three separate containers with dissimilar weights have identical total activities (0.044861 mCi) and individual radionuclide activities?
- Concentration = activity/weight

NRC 541 Manifest 7332-02-004 (PDF pages 852-853)

Shipping Date: July 29, 2020

Container ID 6090-024/7332

Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight
	pCi/g	-	mCi	kgs
Am-241	1.93314E-02	0.0023	7.5409E-05	3,900.89
Cm-243	3.34535E-03	0.0004	1.3050E-05	3,900.89
Cm-245	2.63314E-03	0.0003	1.0272E-05	3,900.89
Cs-137	8.34302E+00	1.0000	3.2545E-02	3,900.89
Pu-239	2.49070E-01	0.0299	9.7159E-04	3,900.89
Ra-226	7.40698E-02	0.0089	2.8894E-04	3,900.89
Ra-228	1.04593E-01	0.0125	4.0800E-04	3,900.89
Sr-90	2.58023E+00	0.3093	1.0065E-02	3,900.89
U-234	8.05814E-02	0.0097	3.1434E-04	3,900.89
U-235	1.68488E-02	0.0020	6.5725E-05	3,900.89
U-238	2.64535E-02	0.0032	1.0319E-04	3,900.89
Subtotal			4.4861E-02	3,900.89

Container ID 6303-025/7332

Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight
	pCi/g	-	mCi	kgs
Am-241	1.93314E-02	0.0023	9.7818E-05	4,907.87
Cm-243	3.34535E-03	0.0004	1.6419E-05	4,907.87
Cm-245	2.63314E-03	0.0003	1.2923E-05	4,907.87
Cs-137	8.34302E+00	1.0000	4.0946E-02	4,907.87
Pu-239	2.49070E-01	0.0299	1.2224E-03	4,907.87
Ra-226	7.40698E-02	0.0089	3.6665E-04	4,907.87
Ra-228	1.04593E-01	0.0125	5.1331E-04	4,907.87
Sr-90	2.58023E+00	0.3093	1.2663E-02	4,907.87
U-234	8.05814E-02	0.0097	3.9548E-04	4,907.87
U-235	1.68488E-02	0.0020	8.2692E-05	4,907.87
U-238	2.64535E-02	0.0032	1.2983E-04	4,907.87
Subtotal			5.6447E-02	4,907.87

Container ID	Weight
6090-024/7332	6,531.73
6303-025/7332	7,538.71
Total Waste & Container (kgs)	14,070.44
Net Waste (kgs)	8,808.76
2 Containers (kgs)	5,261.67
1 Container (kgs)	2,630.84
6090-024/7332	3,900.89
6303-025/7332	4,907.87

NRC 541 Manifest 7332-02-007 (PDF pages 865-866)

Shipping Date: August 5, 2020

Container ID 6087-031/7332

Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight
	pCi/g	-	mCi	kgs
Am-241	9.10460E-03	0.0023	7.5409E-05	8,282.60
Cm-243	1.57558E-03	0.0004	1.3050E-05	8,282.60
Cm-245	1.24014E-03	0.0003	1.0272E-05	8,282.60
Cs-137	3.92935E+00	1.0000	3.2545E-02	8,282.60
Pu-239	1.17306E-01	0.0299	9.7159E-04	8,282.60
Ra-226	3.48860E-02	0.0089	2.8894E-04	8,282.60
Ra-228	4.92607E-02	0.0125	4.0800E-04	8,282.60
Sr-90	1.21522E+00	0.3093	1.0065E-02	8,282.60
U-234	3.79518E-02	0.0097	3.1434E-04	8,282.60
U-235	7.92538E-03	0.0020	6.5725E-05	8,282.60
U-238	1.24589E-02	0.0032	1.0319E-04	8,282.60
Subtotal			4.4861E-02	8,282.60

Container ID 6271-030/7332

Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight
	pCi/g	-	mCi	kgs
Am-241	2.10977E-02	0.0023	7.5409E-05	3,574.31
Cm-243	3.65102E-03	0.0004	1.3050E-05	3,574.31
Cm-245	2.87373E-03	0.0003	1.0272E-05	3,574.31
Cs-137	9.10533E+00	1.0000	3.2545E-02	3,574.31
Pu-239	2.71827E-01	0.0299	9.7159E-04	3,574.31
Ra-226	8.08376E-02	0.0089	2.8894E-04	3,574.31
Ra-228	1.14150E-01	0.0125	4.0800E-04	3,574.31
Sr-90	2.81599E+00	0.3093	1.0065E-02	3,574.31
U-234	8.79442E-02	0.0097	3.1434E-04	3,574.31
U-235	1.83883E-02	0.0020	6.5725E-05	3,574.31
U-238	2.88706E-02	0.0032	1.0319E-04	3,574.31
Subtotal			4.4861E-02	3,574.31

Container ID	Weight
6087-031/7332	10,913.43
6271-030/7332	6,205.14
Total Waste & Container (kgs)	17,118.58
Net Waste (kgs)	11,856.91
2 Containers (kgs)	5,261.67
1 Container (kgs)	2,630.84
6087-031/7332	8,282.60
6271-030/7332	3,574.31

Shipments 7332-02-0174 and 7332-02-0238

- Why do containers have different weighted average concentrations than waste stream profile 7332-02?
- How do two separate containers with dissimilar weights have identical total (0.044148 mCi) and individual radionuclide activities?
- Five radionuclides disappeared
- Concentration = activity/weight
- Container weight is 0 kgs

NRC 541 Manifest 7332-02-0174 (PDF page 276)					NRC 541 Manifest 7332-02-0238 (PDF page 402)						
Shipping Date: October 20, 2021					Shipping Date: November 15, 2021						
Container ID 234MS/7332					Container ID 234MS/7332						
Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight	Nuclide	Weighted Averaged Conc.	Nuclide ratio per Cs-137	Total Activity	Weight		
	pCi/g	-	mCi	kgs		pCi/g	-	mCi	kgs		
Am-241	4.68252E-03	0.0023	7.5400E-05	16,102.53	Am-241	7.07369E-03	0.0023	7.5400E-05	10,659.42		
Cm-243	-	-	-	-	Cm-243	-	-	-	-		
Cm-245	-	-	-	-	Cm-245	-	-	-	-		
Cs-137	2.01833E+00	1.0000	3.2500E-02	16,102.53	Cs-137	3.04896E+00	1.0000	3.2500E-02	10,659.42		
Pu-239	6.02393E-02	0.0298	9.7000E-04	16,102.53	Pu-239	9.09998E-02	0.0298	9.7000E-04	10,659.42		
Ra-226	1.79476E-02	0.0089	2.8900E-04	16,102.53	Ra-226	2.71123E-02	0.0089	2.8900E-04	10,659.42		
Ra-228	-	-	-	-	Ra-228	-	-	-	-		
Sr-90	6.21024E-01	0.3077	1.0000E-02	16,102.53	Sr-90	9.38142E-01	0.3077	1.0000E-02	10,659.42		
U-234	1.95001E-02	0.0097	3.1400E-04	16,102.53	U-234	2.94577E-02	0.0097	3.1400E-04	10,659.42		
U-235	-	-	-	-	U-235	-	-	-	-		
U-238	-	-	-	-	U-238	-	-	-	-		
Subtotal				4.4148E-02	16,102.53	Subtotal				4.4148E-02	10,659.42
Container ID 234MS/7332					Container ID 234MS/7332						
Waste & Container (kgs)				16,102.53	Waste & Container (kgs)				10,659.42		
Net Waste (kgs)				16,102.53	Net Waste (kgs)				10,659.42		
Container (kgs)				0.00	1 Container (kgs)				0.00		

Weighted Average Concentrations of Waste Stream Profiles are Different

Weighted Average Concentrations of Shipment/Container Manifests are Different

Weighted Average Concentration (pCi/g)

Nuclide	Waste Stream Profile					Nuclide	Waste Stream Profile 7332-02	Manifest Container	7332-02-004		7332-02-007		7332-02-0174	7332-02-0238
	7332-01	7332-02	7332-03	7332-05	9732-01				6090-024 /7332	6303-025 /7332	6087-031 /7332	6271-030 /7332	234MS /7332	234MS /7332
Am-241	1	0.00475	1		1	Am-241	0.00475		0.0193	0.0193	0.091	0.0211	0.00468	0.00707
Ba-133			0.303		0.303	Ba-133								
Cm-243	1	0.000822	1		1	Cm-243	0.000822		0.00335	0.00335	0.00158	0.00365		
Cm-245	1	0.000647	1		1	Cm-245	0.000647		0.00263	0.00263	0.00124	0.00287		
Co-57			17.3		17.3	Co-57								
Co-60			1.53		1.53	Co-60								
Cs-137	2.05	2.05	1	2.05	0.513	Cs-137	2.05		8.34	8.34	3.93	9.11	2.02	3.05
Eu-152			52.8		52.8	Eu-152								
Eu-154			9.1		9.1	Eu-154								
Eu-155			0.488		0.488	Eu-155								
H-3			94.3	3.77	94.3	H-3								
K-40					6.45	K-40								
Pu-238			0.118		0.118	Pu-238								
Pu-239	0.0612	0.0612	0.181		0.181	Pu-239	0.0612		0.249	0.249	0.117	0.272	0.0602	0.091
Pu-241			325		325	Pu-241								
Ra-226	0.0182	0.0182	1		1	Ra-226	0.0182		0.0741	0.0741	0.0349	0.0808	0.0179	0.0271
Ra-228	0.0257	0.0257	1		1	Ra-228	0.0257		0.105	0.105	0.0493	0.114		
Sr-90	0.634	0.634	1.19		1.19	Sr-90	0.634		2.58	2.58	1.22	2.82	0.621	0.938
Th-228			2.8		2.8	Th-228								
Th-230			2.58		2.58	Th-230								
Th-232			2.44		2.44	Th-232								
U-232			0.695		0.695	U-232								
U-234	0.0198	0.0198	2.68		2.68	U-234	0.0198		0.0806	0.0806	0.038	0.0879	0.0195	0.0295
U-235	0.00414	0.00414	0.29		0.29	U-235	0.00414		0.0168	0.0168	0.00793	0.0184		
U-238	0.0065	0.0065	7		7	U-238	0.0065		0.0265	0.0265	0.0125	0.0289		

Shipments with Identical Activities and Weights

- Numerous single container shipments have identical weights and identical activities which is obviously physically impossible
- NRC 540/541 manifests contain identical weights (**10,659.42 kgs**) and total activity (**0.044148 mCi**)

7332-02-0214 7332-02-0215 7332-02-0216 7332-02-0217 7332-02-0218
7332-02-0219 7332-02-0220 7332-02-0221 7332-02-0222 7332-02-0223
7332-02-0224 7332-02-0225 7332-02-0226 7332-02-0227 7332-02-0238
7332-02-0239 7332-02-0240 etc.

- NRC 540/541 manifests contain identical weights (**16,102.53 kgs**) and total activity (**0.044148 mCi**)

7332-02-0164 7332-02-0169 7332-02-0170 7332-02-0171 7332-02-0172
7332-02-0173 7332-02-0174 7332-02-0175 7332-02-0176 7332-02-0177
7332-02-0178 7332-02-0179 7332-02-0180 7332-02-0181 7332-02-0182
7332-02-0183 7332-02-0184 7332-02-0185 etc.

DOE Public Relations

- DOE rightly claims in its EM public relations pages that demolition of the final 18 DOE-owned buildings at ETEC was a major milestone.
- However, what is omitted is perhaps more significant.
- Subsurface fuel storage vaults and basements in RMHF, subsurface reactor vaults in SNAP building 4024 and the subsurface reactor vaults in 4019 remain in place awaiting future removal. These removal actions will be more complex and are rarely mentioned.
- Ultimate destination of the clean, unregulated building debris is referred to as being “shipped to a licensed facility out of the state of California.” The significance of a “licensed facility” is glossed over, as is the reason why it is “safe” outside of California but “not safe” inside of California.

You Can't Fight City Hall ... or Can You?

Date	Subject	Addressees
January 9, 2023	Comments on FOIA EMCBC-2022-000149-F	ETEC, DOE-EM1, Secretary of Energy, North Wind, EnergySolutions, DTSC
February 9, 2023	Shipments of Waste from the former ETEC	Utah Division of Waste Management and Radiation Control
February 10, 2023	Shipments of Waste from the former ETEC	DOE Inspector General
April 9, 2023	Irregularities in DOE's Waste Shipments from ETEC to EnergySolutions	DOE Inspector General and Utah Division of Waste Management
May 23, 2023	Complaint DRC-2023-001509	Utah Division of Waste Management and Radiation Control
June 6, 2023	Complaint #23-0160-C	DOE Inspector General

Utah Division of Waste Management and Radiation Control

- UDWMRC is the licensor of the *EnergySolutions* license
- In a [May 16, 2023 letter](#) DWMRC determined that *EnergySolutions* did not violate its license and did not accept LLRW exceeding Class A limits from ETEC and therefore they considered the case closed
- This of course was not the issue
- In a May 23, 2023, telecon with DWMRC management, I explained the issue, and they committed to take a second look at the complaint, including the falsified NRC 540/541 manifests
- **As of July 25, we still are awaiting a response after 5 ½ months**

DOE Inspector General

- The DOE IG invites reports of Fraud, Waste, Abuse and Mis-management
- However, DOE IG proved to be less open and transparent than Utah
- Repeated attempts to communicate with the DOE IG proved fruitless
- Assigned a complaint, #23-0160-C
- Repeated calls were never answered directly
- Only information provided is if case is OPEN or CLOSED
- No possibility of talking with an investigator, or investigation team about the status or ECD
- **As of July 25, the case is still OPEN after 5 ½ months**

DOE-STD-1241-2023

- In March 2023 DOE issued DOE-STD-1241-2023, “Implementing Release and Clearance of Property Requirements”, that finalized DOE G 441.1-XX (Draft, April 2002), “Control and Release of Property with Residual Radioactive Material.”
 - 25 mrem/y + ALARA for real property
 - 1 mrem/y for personal property
 - Surface contamination limits identical to R.G. 1.86
 - Volume contamination limits based on ANSI/HPS N13.12-2013
 - 5 pCi/g of Ra-226 in surface soil based on UMTRCA
 - **Nowhere is there any mention of ...**
 - **LNT-based risk limits**
 - **“cleanup to background”**
 - **“out of an abundance of caution”**

Litigation: Physicians for Social Responsibility - LA

- On May 2, 2023, the [California Court of Appeals found in favor of the Defendants](#), DTSC, CDPH and Boeing in the 2013 Petition by PSR-LA, CBG, SCFS and Consumer Watchdog. Petitioners had alleged that Boeing's plans to demolish and dispose of decommissioned building debris to a Class I hazardous waste disposal site in compliance with E.O. D-62-02 (2002) would **violate CEQA and APA, and be sending LLRW to a facility not licensed to accept LLRW.**
- The Court agreed with defendants that Boeing buildings that had been decommissioned, released for unrestrictive use, and removed from an NRC and/or State license, were no longer "*regulated radioactive material*" and cannot be arbitrarily alleged to be "*low-level radioactive waste*" and by implication **need not be sent to a LLRW disposal site.**
- It is ironic that **DTSC, one of the defendants in this lawsuit, violated the court's decision** in the 2020 AOC by forcing DOE to send the subject DOE building debris to EnergySolutions as LLRW.

Summary

- FOIA Request EMCBC-2022-00149-F requested waste characterization, shipping, and disposal data for all eighteen DOE buildings demolished and disposed during 2020, 2021 and 2022. The intent was to investigate **how DOE characterized decommissioned and non-radiological buildings as LLRW**. Based on the lack of any reference to specific building names/numbers, and the questionable data provided, this proved an impossible task.
- Although building identification may not be a regulatory requirement on the subject shipping forms, **the lack of any building identification for any waste streams, radioactive waste profiles or manifests suggests an intentional cover-up of what is real LLRW and what is fake LLRW**, designed to obfuscate DOE's and DTSC's commitment to dispose of non-radiologically impacted waste as LLRW "out of an abundance of caution."
- Liberal use is made of arbitrary conservative upper bound estimates for SNM, TRU, fission products and NORM in order to estimate total manifest activities. This may be an acceptable conservative process for waste from the non-decommissioned, potentially contaminated RMHF buildings since these upper bound measurements were taken at the RMHF. **However, it is not appropriate to use upper bound RMHF data for non-RMHF buildings that have been decommissioned and released for unrestricted use. And it is totally unacceptable for non-radiological buildings with no history of radiological use.** Using questionable upper bound scan contamination data from RMHF to falsify data for non-radiological buildings in order to justify disposal at *EnergySolutions* as LLRW is dishonest.
- **Data in the NRC Forms 540/541 is systematically inconsistent and illogical.** The apparent lack of any quality control of manifest data by all participants is troubling and warrants investigation by the DOE IG and the Utah Division of Waste Management and Radiation Control.
- The preceding comments are those of the author and do not represent the views or opinions of the landowner, The Boeing Company. **Boeing terminated its contract with the DOE in September 2014 and was not a party to the DOE-owned building demolition program described here.**
- The preceding material was obviously NOT approved by DOE or DTSC, nor was their approval sought.

Additional Information

- FOIA Data Package
https://philrutherford.com/SSFL/doe_building_demolition/FOIA/Data_Package/
- Comments on FOIA Data Package
[https://philrutherford.com/SSFL/doe_building_demolition/FOIA/Response to FOIA Data Package Revised.pdf](https://philrutherford.com/SSFL/doe_building_demolition/FOIA/Response_to_FOIA_Data_Package_Revised.pdf)
- Nuclear Decommissioning at SSFL, Section 23.0, 2020 Amendment to Order on Consent
[https://www.philrutherford.com/SSFL/Nuclear Decommissioning at SSFL.pdf#page=84](https://www.philrutherford.com/SSFL/Nuclear_Decommissioning_at_SSFL.pdf#page=84)
- Nuclear Decommissioning at SSFL, Section 19.4, PSR-LA Litigation Court of Appeals' Decision
[https://philrutherford.com/SSFL/Nuclear Decommissioning at SSFL.pdf#page=71-73](https://philrutherford.com/SSFL/Nuclear_Decommissioning_at_SSFL.pdf#page=71-73)
- Questions, comments, provision of PowerPoint
818-912-1501
email@philrutherford.com