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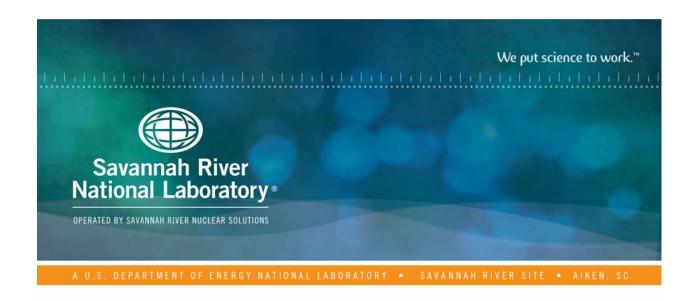
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# Summary Report for the Analysis of the Sludge Batch 8 (Macrobatch 10) DWPF Pour Stream Glass Sample

D. L. McClane

June, 2019

SRNL-STI-2019-00278

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**Retention:** Permanent

# **Summary Report for the Analysis of the Sludge Batch 8** (Macrobatch 10) DWPF Pour Stream Glass Sample

D. L. McClane

June 2019



# **REVIEWS AND APPROVALS**

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K. M. Fox, Immobilization Technologies	Date
APPROVAL:	
F. M. Pennebaker, Manager Chemical Processing Technologies	Date
S. D. Fink, Director Chemical Processing Technologies	Date
E. J. Freed, Manager Defense Waste Processing Facility & Saltstone Facility Engineering	Date

## **EXECUTIVE SUMMARY**

In order to comply with the Defense Waste Processing Facility (DWPF) Waste Form Compliance Plan for Sludge Batch 8, Savannah River National Laboratory (SRNL) personnel characterized a pour stream sample that was collected while canister S04274 was being filled. This report summarizes the results of the compositional analysis for reportable oxides and radionuclides, and the normalized Product Consistency Test (PCT) results. The PCT responses indicate that the DWPF produced glass is significantly more durable than the Environmental Assessment glass. Results and further details are documented in SRNL-STI-2018-00699, "Analysis of the Sludge Batch 8 (Macrobatch 10) DWPF Pour Stream Glass Sample."

Table 1. Measured Concentration of Major Components<sup>a</sup>

Oxide	Measured (wt%)
$Al_2O_3$	7.10
$B_2O_3$	4.71
CaO	0.76
Fe <sub>2</sub> O <sub>3</sub>	12.30
Li <sub>2</sub> O	3.88
MnO	3.34
Na <sub>2</sub> O	14.12
NiO	0.97
SiO <sub>2</sub>	46.42
$U_3O_8$	2.02
ZnO	0.64

Table 2. Normalized PCT Results (g/L)

Glass	ID	SB8 PS	EA Glass	EA Glass [Reported <sup>b</sup> ]
$NC_B$	Average	0.84	20.36	16.7
	St. Dev.	0.048	2.314	1.2
NC	Average	0.79	11.19	9.6
$NC_{Li}$	St. Dev.	0.008	1.289	0.7
NC	Average	1.26	15.12	13.3
$NC_{Na}$	St. Dev.	0.019	1.631	0.9
NCsi	Average	0.67	4.38	3.9
	St. Dev.	0.013	0.452	0.4

<sup>&</sup>lt;sup>a</sup> Greater than 0.5 wt% on an elemental basis

<sup>&</sup>lt;sup>b</sup> C. M. Jantzen, N. E. Bibler, D. C. Beam, C. L. Crawford, and M. A. Pickett, "Characterization of the Defense Waste Processing Facility (DWPF) Environmental Assessment (EA) Glass Standard Reference Material (U)," [WSRC-TR-92-346, Revision 1], Westinghouse Savannah River Co., Aiken, SC, (1993).

**Table 3. Measured Reportable Radionuclide Concentration** 

Measured		
	Concentration	
Radionuclide	in Glass	
	(Ci/kg)	
Sr-90	5.43E+00	
Zr-93	3.00E-04	
Tc-99	3.11E-05	
Sn-126	9.26E-05	
Cs-135	<5.08E-06	
Cs-137	9.25E-01	
Th-232	4.27E-07	
U-233	3.28E-05	
U-234	2.24E-05	
U-235	2.42E-07	
U-236	4.90E-07	
Np-237	1.02E-05	
Pu-238	6.85E-02	
U-238	5.62E-06	
Pu-239	3.64E-03	
Pu-240	1.25E-03	
Am-241	1.20E-02	
Pu-241	1.28E-02	
Pu-242	1.75E-06	

# **Distribution:**

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