SRNL-STI-2012-00056
Revision 0

Summary Report for the Analysis of the Sludge Batch 7a (Macrobatch 8) DWPF Pour Stream Glass Sample for Canister S03619

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May 2012

Savannah River National Laboratory
Savannah River Nuclear Solutions, LLC
Aiken, SC 29808

Prepared for the U.S. Department of Energy under contract number DE-AC09-08SR22470.

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Prepared for
U.S. Department of Energy

SRNL-STI-2012-00056
Revision 0

Keywords: *DWPF, Glass, Waste Compliance, Sludge Batch 7a*

Retention: *Permanent*

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REVIEWS AND APPROVALS

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SUMMARY

In order to comply with the Waste Acceptance Specifications in Sludge Batch 7a (Macrobatch 8), Savannah River National Laboratory personnel characterized the Defense Waste Processing Facility (DWPF) pour stream glass sample collected while filling canister S03619. 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 that is significantly more durable than the Environmental Assessment glass. Results and further details are documented in "Analysis of DWPF Sludge Batch 7a (Macrobatch 8) Pour Stream Samples," SRNL-STI-2012-00017.

Table 1. Measured Reportable Oxides[a]

Oxide	Concentration (wt%)
Al_2O_3	8.59
B_2O_3	4.27
Fe_2O_3	8.37
Li_2O	4.56
MnO	2.01
Na_2O	12.45
NiO	1.22
SiO_2	47.07
ThO_2	0.69
U_3O_8	2.43

Table 2. Normalized PCT Results (g/L)

Glass ID	NL B	NL Li	NL Na	NL Si	NL U
EA[b] - Measured	17.06	9.52	13.36	4.10	---
St. Dev.	0.10	0.13	0.04	0.01	---
% RSD	0.6	1.3	0.3	0.2	---
EA[c] - Published	16.7	9.6	13.3	3.9	---
St. Dev.	1.2	0.7	0.9	0.4	---
% RSD	7	7	7	10	---
SB7a[d]	0.64	0.71	0.97	0.48	0.15
St. Dev.	0.01	0.01	0.03	0.01	0.01
% RSD	2.2	2.0	3.4	2.1	5.0

[a] Greater than 0.5 wt% on an elemental basis. Note that only the mixed acid data were used for Ca, K, Na and Zr. Peroxide fusion data was used for all other elements.
[b] Average of triplicate results.
[c] 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," Westinghouse Savannah River Company, Aiken, SC, WSRC-TR-92-346, Rev. 1, 1993.
[d] Average of quadruplicate results.

Table 3. Measured Reportable Radionuclides

Radionuclide	Concentration (Ci/kg)
Sr-90	3.9E+00
Zr-93	5.4E-04
Tc-99	1.8E-05
Cs-137	4.3E-01
Th-232	6.5E-07
U-233	<2.4E-04
U-234	<1.4E-04
U-235	2.9E-07
U-236	<7.9E-07
U-238	7.0E-06
Np-237	<1.9E-05
Pu-238	7.9E-02
Pu-239	6.1E-03
Pu-240	<4.5E-03
Pu-241	2.4E-02
Pu-242	<5.6E-05
Am-241	1.5E-02

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