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Subject: Items # 59, 71, 72 and PDC Emissions

Attachments: Appendix B Tables bcb.doc

I checked the emissions listed in Appendix B and they are based on the Radionuclide NESHAP calculated emissions, which by regulation, use very conservative control factors for control device efficiencies. I have provided in the attachment new emission values for those sources with more realistic control device efficiencies. We will but these tables in the NEPA Source Doc, so except for Table B-12 (PDCF Emissions) you can use that as the reference.

As an example, under the Rad NESHAP rule SRS uses a Control Factor of 100 for any number of HEPAs, but based on their measured efficiencies a more realistic factor is 3333. This assumes an efficiency of 99.97%

I also looked at the PDC emissions and based on using more realistic control efficiencies, we should use the same values for PDC/PuP as those used in the original SPD EIS for the PDCF project. Air emissions from the two facilities should really be about the same. They have the same processes and similar process rates. So use the Table B-12 rates given in the attachment for both PDCF and PDC/PuP.

1 **Table B-6 All Alternatives – Estimated Incident-Free Annual Radiological Releases**
 2 **from K-Area Interim Surveillance Activities**

<i>Isotope (microcuries per year)</i>	<i>All Alternatives</i>
Plutonium-238	3.18E-02 24.8
Plutonium-239	1.05E-01 2.65
Plutonium-240	2.46E-02 2.96
Plutonium-241	1.88E-01 1.190
Plutonium-242	7.20E-06 0.000144
Neptunium-237	3.05E-06
Americium-241	1.51E-03

Source: NEPA Source Doc ~~SRNS 2010a~~; WSRC 2008a.

3 **Table B-7 MOX Fuel and WIPP Alternatives – Estimated Incident-Free Annual**
 4 **Radiological Releases from the Plutonium Preparation Capability**

<i>Isotope (microcuries per year)</i>	<i>MOX Fuel Alternative and WIPP Alternative</i>
Plutonium-238	14.94 4.46E-03
Plutonium-239	4.77E-04 1.59
Plutonium-240	5.33E-04 1.78
Plutonium-241	1.34E-02 44.6
Plutonium-242	2.59E-06 0.00862
Neptunium-237	1.09E-06 0.00363
Americium-241	1.65E-04 0.568

MOX = mixed oxide; WIPP = Waste Isolation Pilot Plant.

Source: NEPA Source Doc ~~SRNS 2010a~~.

5 **Table B-8 Immobilization Alternative – Estimated Incident-Free Annual**
 6 **Radiological Releases from the Immobilization Capability**

<i>Isotope (microcuries per year)</i>	<i>Immobilization Alternative</i>
Plutonium-238	1.42E-01 147.5
Plutonium-239	1.52E-02 5.08
Plutonium-240	1.71E-02 5.68
Plutonium-241	4.28E-01 143
Plutonium-242	8.27E-05 0.0276
Neptunium-237	2.56E-03 0.853
Americium-241	2.03E+00 678

Source: NEPA Source Doc ~~SRNS 2010a~~.

7 **Table B-9 All Alternatives – Estimated Incident-Free Annual Radiological Releases**
 8 **from the**
 9 **H-Canyon/HB-Line – Low Loading**

<i>Isotope (microcuries per year)</i>	<i>All Alternatives</i>
Plutonium-238	0.208
Plutonium-239	2.76
Americium-241	0.42

Source: SRNS 2010a; WSRC 2008a.

Table B-10 MOX Fuel and H-Canyon/HB-Line Alternatives – Estimated Incident-Free Annual Radiological Releases from the H-Canyon/HB-Line – High Loading

<i>Isotope (microcuries per year)</i>	<i>MOX Fuel Alternative</i>	<i>H-Canyon/HB-Line Alternative</i>
Plutonium-238	0.486	0.764
Plutonium-239	6.43	10.1
Americium-241	0.98	1.54

MOX = mixed oxide.

Source: SRNS 2010a; WSRC 2008a.

Table B-11 All Alternatives – Estimated Incident-Free Annual Radiological Releases from the Mixed Oxide Fuel Fabrication Facility

<i>Isotope (microcuries per year)</i>	<i>Alternative</i>		
	<i>No Action</i>	<i>Immobilization, H-Canyon/HB-Line, WIPP Alternatives</i>	<i>MOX Fuel</i>
Plutonium-238	5.3	5.8	6.3
Plutonium-239	56	62	68
Plutonium-240	14	16	17
Plutonium-241	62	69	75
Plutonium-242	0.0038	0.0042	0.0046
Americium-241	30	33	36
Uranium-234	0.0032	0.0035	0.0039
Uranium-235	0.00013	0.00014	0.00016
Uranium-238	0.0074	0.0081	0.0089

MOX = mixed oxide; WIPP = Waste Isolation Pilot Plant.

Source: SRNS 2010a; WSRC 2008a.

Table B-12 All Alternatives – Estimated Incident-Free Annual Radiological Releases from the Pit Disassembly and Conversion Facility

<i>Isotope (microcuries per year)</i>	<i>Alternative</i>	
	<i>No Action</i>	<i>Immobilization, MOX Fuel, H-Canyon/HB-Line, WIPP Alternatives</i>
Plutonium-236	9.3E-117.4 × 10 ⁺¹	9.3E-117.8 × 10 ⁺¹
Plutonium-238	6.52E-020.052	6.52E-020.054
Plutonium-239	6.9E-010.55	6.9E-010.58
Plutonium-240	1.8E-010.14	1.8E-010.15
Plutonium-241	6.9E-010.55	6.9E-010.58
Plutonium-242	4.8E-050.000038	4.8E-050.000040
Americium-241	3.7E-010.30	3.7E-010.34
Hydrogen-3 (Tritium)	1.1E+098.8 × 10 ⁸	1.1E+099.2 × 10 ⁸

MOX = mixed oxide; WIPP = Waste Isolation Pilot Plant.

Source: DOE 1999b; SRNS 2010a; WSRC 2008a. Original SPD EIS

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Table B-13 All Alternatives – Estimated Incident-Free Annual Radiological Releases from the Waste Solidification Building

<i>Isotope (microcuries per year)</i>	<i>Alternative</i>
	<i>No Action, Immobilization, MOX Fuel, H-Canyon/HB-Line, WIPP Alternatives</i>
Plutonium-238	8.2819
Plutonium-239	40.3513
Plutonium-240	10.4534
Plutonium-241	688236
Plutonium-242	0.0028000091
Americium-241	25.5684
Uranium-234	0.111661 × 10 ⁻⁶
Uranium-235	0.003700072
Uranium-236	0.000632 × 10 ⁻⁸
Uranium-238	0.002011
Neptunium-237	1.52071

MOX = mixed oxide; WIPP = Waste Isolation Pilot Plant.

Source: NEPA Source Doc SRNS 2010a; WSRC 2008a.

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