APPENDIX B-5

Ambient Surface Water Data

TABLE B-5A
2007 Radioactivity and pH in Surface Water Downstream of the WVDP in Cattaraugus Creek at Felton Bridge (WFFELBR)

Analyte	Units	N	WFFELBR Concentrations		N	Reference Values	
			Average	Maximum		WFBIGBR [a] Background Range	Guideline [b] or Standard [c]
Gross Alpha	µCi/mL	12	1.71±1.83E-09[d]	6.00E-09[d]	4	<7.02E-10–2.16E-09	3E-08[e]
Gross Beta	µCi/mL	12	3.54±1.81E-09[d]	5.20E-09[d]	5	1.64E-09–1.37E-08	1E-06[f]
Tritium	µCi/mL	12	0.03±5.69E-08[d]	1.78E-07[d]	4	<4.46E-08–4.78E-08	2E-03
Sr-90	µCi/mL	12	2.16±6.47E-10	1.01E-09	4	<3.57E-10–<1.03E-09	1E-06
Tc-99	µCi/mL	2	5.45±2.16E-09	1.14E-08	0	NA	1E-04
Cs-137	µCi/mL	12	0.72±1.83E-09	2.09E-09	4	<1.85E-09–<2.05E-09	3E-06
pH	SU	35	7.87	8.31	4	8.08–8.27	6.5–8.5

N - Number of samples
NA - Data not available
[a] Background location
[b] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results in the absence of water quality standards.
[c] New York State Water Quality Standards, Class "B" as a comparative reference for nonradiological results
[d] Values represent composite concentrations weighted to monthly stream flow.
[e] Alpha as Am-241
[f] Beta as Sr-90

TABLE B-5B
2007 Water Quality of Surface Water Downstream of the WVDP in Buttermilk Creek at Thomas Corners Bridge (WFBCTCB)

RADIOACTIVITY CONCENTRATIONS

Analyte	Units	N	WFBCTCB Concentrations		N	Reference Values	
			Average	Maximum		WFBCBKG [a] Background Range	Guideline [b]
Gross Alpha	µCi/mL	12	1.99±1.52E-09	1.60E-08	12	<5.74E-10–7.63E-10	3E-08[c]
Gross Beta	µCi/mL	12	9.18±1.97E-09	1.64E-08	12	9.78E-10–3.87E-09	1E-06[d]
Tritium	µCi/mL	12	1.47±5.30E-08	1.36E-07	12	<3.13E-08–9.75E-08	2E-03
Sr-90	µCi/mL	2	1.58±1.09E-09	1.82E-09	4	<3.27E-10–<5.63E-10	1E-06
Tc-99	µCi/mL	2	0.88±1.88E-09	<2.01E-09	4	<1.72E-09–<2.82E-09	1E-04
Cs-137	µCi/mL	2	0.83±1.86E-09	<1.91E-09	4	<1.82E-09–<2.04E-09	3E-06

N - Number of samples
[a] Background location
[b] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results in the absence of water quality standards.
[c] Alpha as Am-241
[d] Beta as Sr-90

TABLE B-5B *(continued)*
2007 Water Quality of Surface Water Downstream of the WVDP in Buttermilk Creek at Thomas Corners Bridge (WFBCTCB)

CHEMICAL CONSTITUENTS

Analyte	*Units*	*N*	*WFBCTCB Concentrations*		*N*	*Reference Values*	
			Average	*Maximum*		*WFBCBKG [a] Background Range*	*Standard [b]*
Alpha-BHC	µg/L	2	<0.009	<0.010	2	<0.009–<0.011	0.002
Aluminum, Dissolved	mg/L	2	<0.10	<0.10	2	<0.10–<0.10	0.10
Ammonia-N	mg/L	2	<0.02	<0.02	2	<0.02–<0.02	0.09–2.1
Antimony, Total	mg/L	2	<0.003	<0.003	2	<0.003–<0.003	--
Arsenic, Dissolved	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.150
Barium, Total	mg/L	2	0.08	0.08	2	0.10–0.12	--
Boron, Total	mg/L	2	0.03	0.03	2	0.02–0.04	10.0
Bromide	mg/L	2	<0.50	<0.50	2	<0.50–<0.50	--
Cadmium, Dissolved	mg/L	2	<0.001	<0.001	2	<0.001–<0.001	0.003[c]
Calcium, Total	mg/L	12	40.3	58.6	12	17.3–53.3	--
Chloride	mg/L	2	32	32	2	17–27	--
Chromium, Dissolved	mg/L	2	<0.01	<0.01	2	<0.01–<0.01	0.122[c]
Cobalt, Total	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.005[d]
Copper, Dissolved	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.015[c]
Dissolved, Oxygen	mg/L	2	9.6	10.4	2	8.8–11.0	4.0 (min)
Fluoride	mg/L	2	<0.10	<0.10	2	<0.10–<0.10	3.69[c]
Hardness	mg/L	12	128	184	12	56–164	--
Iron, Total	mg/L	2	0.3	0.5	2	0.29–0.44	0.30
Lead, Dissolved	mg/L	2	<0.0005	<0.0005	2	<0.0005–<0.0005	0.007[c]
Magnesium, Total	mg/L	12	6.68	9.24	12	3.05–7.55	--
Manganese, Total	mg/L	2	0.03	0.04	2	0.03–0.04	--
Mercury, Dissolved, Method 1631	µg/L	2	<0.000610	0.000721	2	<0.000500–0.000776	--
Nickel, Dissolved	mg/L	2	<0.04	<0.04	2	<0.04–<0.04	0.087[c]
Nitrate-N	mg/L	2	0.47	0.6	2	0.14–0.22	--
Nitrite-N	mg/L	2	<0.05	<0.05	2	<0.05–<0.05	0.10
NPOC	mg/L	2	2	2.2	2	1.9–2.9	--

N - Number of samples
-- No reference standard available for this analyte
[a] Background location
[b] New York State Water Quality Standards, Class "C" as a comparative reference for nonradiological results
[c] Calculated from maximum measurement of hardness of surface water stream at WFBCTCB
[d] Standards for cobalt, thallium, and vanadium are applicable to the acid-soluble fraction.

TABLE B-5B *(concluded)*
2007 Water Quality of Surface Water Downstream of the WVDP in Buttermilk Creek at Thomas Corners Bridge (WFBCTCB)

CHEMICAL CONSTITUENTS *(concluded)*

Analyte	*Units*	*N*	*WFBCTCB Concentrations*		*N*	*Reference Values*	
			Average	*Maximum*		*WFBCBKG [a] Background Range*	*Standard [b]*
Oil & Grease	mg/L	2	<5	<5	2	<5–<5	--
pH	SU	2	7.42	8.08	2	7.92–7.98	6.5–8.5
Selenium, Dissolved	mg/L	2	<0.001	<0.001	2	<0.001–<0.001	0.0046
Sodium, Total	mg/L	2	19.6	19.7	2	11.6–16.0	--
Solids, Total Dissolved	mg/L	2	206	210	2	196–226	500
Solids, Total Suspended	mg/L	2	<8	12	2	<4–<4	--
Sulfate	mg/L	2	31.7	35.4	2	20.1–47.2	--
Sulfide (as S)	mg/L	2	<0.04	<0.04	2	<0.04–<0.04	0.002
Surfactant	mg/L	2	<0.06	<0.10	2	<0.02–<0.10	0.04
Thallium, Total	mg/L	2	<0.008	<0.008	2	<0.008–<0.008	0.008[d]
Titanium, Total	mg/L	2	<0.050	<0.050	2	<0.050–<0.050	--
TOX	mg/L	2	<0.01	0.02	2	0.05–0.13	--
Vanadium, Total	mg/L	2	<0.010	<0.010	2	<0.010–<0.010	0.014[d]
Zinc, Dissolved	mg/L	2	<0.02	<0.02	2	<0.02–<0.02	0.139[c]

N - Number of samples
-- No reference standard available for this analyte
[a] Background location
[b] New York State Water Quality Standards, Class "C" as a comparative reference for nonradiological results
[c] Calculated from maximum measurement of hardness of surface water stream at WFBCTCB
[d] Standards for cobalt, thallium, and vanadium are applicable to the acid-soluble fraction.

TABLE B-5C
2007 Water Quality of Surface Water Downstream of the WVDP at Franks Creek (WNSP006)

RADIOACTIVITY CONCENTRATIONS

Analyte	Units	N	WNSP006 Concentrations		N	Reference Values	
			Average	Maximum		WFBCBKG [a] Background Range	Guideline [b]
Gross Alpha	µCi/mL	35	1.14±2.53E-09	9.96E-09	12	<5.74E-10–7.63E-10	3E-08[c]
Gross Beta	µCi/mL	35	4.20±0.49E-08	7.70E-08	12	9.78E-10–3.87E-09	1E-06[d]
Tritium	µCi/mL	35	8.32±5.90E-08	3.72E-07	12	<3.13E-08–9.75E-08	2E-03
C-14	µCi/mL	4	-1.06±2.99E-08	<3.88E-08	4	<1.68E-08–<3.20E-08	7E-05
Sr-90	µCi/mL	12	1.72±0.18E-08	2.51E-08	4	<3.27E-10–<5.63E-10	1E-06
Tc-99	µCi/mL	4	-0.54±2.13E-09	<2.75E-09	4	<1.72E-09–<2.82E-09	1E-04
I-129	µCi/mL	4	-2.04±6.18E-10	<8.10E-10	4	<3.28E-10–<1.20E-09	5E-07
Cs-137	µCi/mL	12	3.86±2.91E-09	9.90E-09	4	<1.82E-09–<2.04E-09	3E-06
U-232	µCi/mL	4	1.28±0.84E-10	2.70E-10	4	<3.68E-11–<5.43E-11	1E-07
U-233/234	µCi/mL	4	2.65±1.15E-10	3.40E-10	4	<7.35E-11–1.12E-10	5E-07
U-235/236	µCi/mL	4	2.64±4.65E-11	3.70E-11	4	<1.98E-11–7.01E-11	5E-07[e]
U-238	µCi/mL	4	2.16±1.01E-10	2.67E-10	4	<2.62E-11–8.77E-11	6E-07
Total U	µg/mL	4	5.67±0.25E-04	6.83E-04	4	<2.29E-06–1.96E-04	--
Pu-238	µCi/mL	4	0.56±2.98E-11	<3.89E-11	4	<7.59E-12–<2.79E-11	4E-08
Pu-239/240	µCi/mL	4	2.42±3.18E-11	4.75E-11	4	<1.53E-11–<3.16E-11	3E-08
Am-241	µCi/mL	4	1.80±4.06E-11	<5.63E-11	4	<1.36E-11–<3.98E-11	3E-08

N - Number of samples
-- No guideline or standard available for these analytes
[a] Background location
[b] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results.
[c] Alpha as Am-241
[d] Beta as Sr-90
[e] DCG for U-236 is used for this comparison.

TABLE B-5C *(continued)*
2007 Water Quality of Surface Water Downstream of the WVDP at Franks Creek (WNSP006)

CHEMICAL CONSTITUENTS

Analyte	Units	N	WNSP006 Concentrations		N	Reference Values	
			Average	Maximum		WFBCBKG [a] Background Range	Standard [b]
Alpha-BHC	µg/L	2	<0.013	0.017	2	<0.009–<0.011	0.002
Aluminum, Dissolved	mg/L	2	<0.10	<0.10	2	<0.10–<0.10	0.10
Ammonia-N	mg/L	2	<0.02	<0.02	2	<0.02–<0.02	0.09–2.1
Antimony, Total	mg/L	2	<0.003	<0.003	2	<0.003–<0.003	--
Arsenic, Dissolved	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.150

N - Number of samples
-- No guideline or standard available for these analytes
[a] Background location
[b] New York Water Quality Standards for Class "C" surface waters as a comparative reference for nonradiological results.

TABLE B-5C *(concluded)*
2007 Water Quality of Surface Water Downstream of the WVDP at Franks Creek (WNSP006)

CHEMICAL CONSTITUENTS *(concluded)*

Analyte	*Units*	*N*	*WNSP006 Concentrations*		*N*	*Reference Values*	
			Average	*Maximum*		*WFBCBKG [a] Background Range*	*Standard [b]*
Barium, Total	mg/L	2	0.05	0.05	2	0.10–0.12	--
Boron, Total	mg/L	2	0.03	0.04	2	0.02–0.04	10.0
Bromide	mg/L	2	<0.50	<0.50	2	<0.50–<0.50	--
Cadmium, Dissolved	mg/L	2	<0.001	<0.001	2	<0.001–<0.001	0.004[c]
Calcium, Total	mg/L	12	47.1	67.6	12	17.3–53.3	--
Chloride	mg/L	2	110	122	2	17–27	--
Chromium, Dissolved	mg/L	2	<0.01	<0.01	2	<0.01–<0.01	0.137[c]
Cobalt, Total	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.005[d]
Copper, Dissolved	mg/L	2	<0.005	<0.005	2	<0.005–<0.005	0.017[c]
Dissolved Oxygen	mg/L	2	10.2	10.4	2	8.8–11.0	4.0 (min)
Fluoride	mg/L	2	<0.11	0.12	2	<0.10–<0.10	4.19[c]
Hardness	mg/L	12	150	212	12	56–164	--
Iron, Total	mg/L	2	1.92	2	2	0.29–0.44	0.30
Lead, Dissolved	mg/L	2	<0.0005	<0.0005	2	<0.0005–<0.0005	0.008[c]
Magnesium, Total	mg/L	12	7.78	10.4	12	3.05–7.55	--
Manganese, Total	mg/L	2	0.12	0.13	2	0.03–0.04	--
Mercury, Dissolved, Method 1631	µg/L	1	0.012	0.012	2	<0.000500–0.000776	--
Nickel, Dissolved	mg/L	2	<0.04	<0.04	2	<0.04–<0.04	0.098[c]
Nitrate-N	mg/L	2	0.98	1.6	2	0.14–0.22	--
Nitrite-N	mg/L	2	<0.05	<0.05	2	<0.05–<0.05	0.10
NPOC	mg/L	2	4	4.4	2	1.9–2.9	--
Oil & Grease	mg/L	2	<5	<5	2	<5–<5	--
pH	SU	2	7.48	7.74	2	7.92–7.98	6.5–8.5
Selenium, Dissolved	mg/L	2	<0.001	<0.001	2	<0.001–<0.001	0.0046
Sodium, Total	mg/L	2	91.8	93.5	2	11.6–16.0	--
Solids, Total Dissolved	mg/L	31	419	2,238	2	196–226	500
Solids, Total Suspended	mg/L	2	22	23	2	<4–<4	--
Sulfate	mg/L	2	61.2	75	2	20.1–47.2	--
Sulfide (as S)	mg/L	2	<0.04	<0.04	2	<0.04–<0.04	0.002
Surfactants	mg/L	2	<0.02	<0.02	2	<0.02–<0.10	0.40
Thallium, Total	mg/L	2	<0.008	<0.008	2	<0.008–<0.008	0.008[d]
Titanium, Total	mg/L	2	<0.050	<0.050	2	<0.050–<0.050	--
TOX	mg/L	2	0.04	0.05	2	0.05–0.13	--
Vanadium, Total	mg/L	2	<0.010	<0.010	2	<0.010–<0.010	0.014[d]
Zinc, Dissolved	mg/L	2	<0.02	<0.02	2	<0.02–<0.02	0.157[c]

N - Number of samples
-- No guideline or standard available for these analytes
[a] Background location
[b] New York Water Quality Standards for Class "C" surface waters as a comparative reference for nonradiological results.
[c] Calculated from maximum measured hardness of surface water stream at WNSP006.
[d] Standards for cobalt, thallium, and vanadium are applicable to the acid-soluble fraction.

TABLE B-5D
2007 Radioactivity and pH in Surface Water at Erdman Brook (WNERB53)

Analyte	Units	N	WNERB53 Concentrations			Reference Guideline [a] or Standard [b]
			Minimum	Average	Maximum	
Gross Alpha	µCi/mL	4	<1.18E-09	0.80±2.84E-09	<4.42E-09	3E-08[c]
Gross Beta	µCi/mL	4	1.51E-08	1.77±0.33E-08	1.99E-08	1E-06[d]
Tritium	µCi/mL	4	<4.56E-08	5.33±6.37E-08	1.60E-07	2E-03
Sr-90	µCi/mL	2	7.99E-09	8.78±1.60E-09	9.58E-09	1E-06
Cs-137	µCi/mL	2	<1.35E-09	0.05±1.71E-09	<2.00E-09	3E-06
pH	SU	4	7.48	7.71	7.92	6.0–9.5

N - Number of samples
[a] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results.
[b] New York State Water Quality Standards, Class "D" for surface waters as a standard for nonradiological results
[c] Alpha as Am-241
[d] Beta as Sr-90

TABLE B-5E
2007 Radioactivity and pH in Surface Water at Franks Creek East of the SDA (WNFRC67)

Analyte	Units	N	WNFRC67 Concentrations			Reference Guideline [a] or Standard [b]
			Minimum	Average	Maximum	
Gross Alpha	µCi/mL	4	<6.35E-10	0.09±1.17E-09	<1.70E-09	3E-08[c]
Gross Beta	µCi/mL	4	1.72E-09	2.57±1.45E-09	3.26E-09	1E-06[d]
Tritium	µCi/mL	4	<4.60E-08	4.75±6.13E-08	1.74E-07	2E-03
Sr-90	µCi/mL	4	<5.66E-10	1.08±7.93E-10	7.55E-10	1E-06
Cs-137	µCi/mL	4	<1.86E-09	0.86±1.91E-09	<1.98E-09	3E-06
pH	SU	4	7.07	7.33	7.93	6.5–8.5

N - Number of samples
[a] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results in the absence of water quality standards.
[b] New York State Water Quality Standards for Class "C" surface waters as a comparative reference for nonradiological results.
[c] Alpha as Am-241
[d] Beta as Sr-90

TABLE B-5F
2007 Radioactivity and pH in Surface Water at Drum Cell Drainage (WNDCELD)

Analyte	Units	N	WNDCELD Concentrations			Reference Guideline [a] or Standard [b]
			Minimum	Average	Maximum	
Gross Alpha	µCi/mL	6	<6.54E-10	0.18±1.77E-09	<2.76E-09	3E-08[c]
Gross Beta	µCi/mL	6	1.43E-09	2.83±1.93E-09	5.91E-09	1E-06[d]
Tritium	µCi/mL	6	<4.55E-08	1.13±5.82E-08	<9.80E-08	2E-03
Sr-90	µCi/mL	2	<6.20E-10	3.22±6.73E-10	<7.22E-10	1E-06
I-129	µCi/mL	2	<3.59E-10	-0.93±8.27E-10	<1.11E-09	5E-07
Cs-137	µCi/mL	2	<1.92E-09	0.85±1.91E-09	2.70E-09	3E-06
pH	SU	6	7.34	7.5	7.74	6.5–8.5

N - Number of samples
[a] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results in the absence of water quality standards.
[b] New York State Water Quality Standards for Class "C" surface waters as a comparative reference for nonradiological results.
[c] Alpha as Am-241
[d] Beta as Sr-90

TABLE B-5G
2007 Water Quality of Surface Water at the Standing Water Location (WNSTAW9)

Analyte	Units	N	WNSTAW9	Reference Values Guideline [a] or Standard [b]
Gross Alpha	µCi/mL	1	0.63±6.06E-10	3E-08[c]
Gross Beta	µCi/mL	1	2.40±0.98E-09	1E-06[d]
Tritium	µCi/mL	1	-0.56±4.53E-08	2E-03
Sr-90	µCi/mL	1	4.94±7.02E-10	1E-06
Cs-137	µCi/mL	1	-0.08±1.92E-09	3E-06
Chloride	mg/L	1	13	--
Conductivity	µmhos/cm@25°C	1	276	--
Iron, Total	mg/L	1	0.11	0.3
Manganese, Total	mg/L	1	0.03	--
Nitrate+Nitrite	mg/L	1	<0.05	--
pH	SU	1	7.94	6.5- 8.5
Sodium, Total	mg/L	1	9.8	--
Sulfate	mg/L	1	17.6	--

N - Number of samples
-- No guideline or standard available for these analytes
[a] DOE ingestion-based DCGs for 100 mrem/yr dose limit are provided as a guideline for radiological results.
[b] New York State Water Quality Standards Class "D" surface waters as a comparative standard for nonradiological results
[c] Alpha as Am-241
[d] Beta as Sr-90

This page intentionally left blank