

## *Appendix 12-C*

### *Monthly Flow Effects Assessment Tables*

HARPER CREEK PROJECT

**Application for an Environmental Assessment Certificate /  
Environmental Impact Statement**

**Appendix 12-C1a. Average Monthly Flows at Node 1 (Harper Creek at the WSC Station) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	166.4	Discharge	m <sup>3</sup> /s	0.68	0.57	0.54	3.30	11.39	11.36	5.15	2.28	1.71	1.90	1.18	0.84	3.41
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.4	3.2	19.9	68.5	68.3	31.0	13.7	10.3	11.4	7.1	5.1	20.5
-1	End of Construction	150.9	Discharge	m <sup>3</sup> /s	0.70	0.59	0.57	3.37	10.76	10.32	4.63	2.23	1.65	1.85	1.14	0.79	3.22
			Unit Runoff	l/s/km <sup>2</sup>	4.7	3.9	3.8	22.3	71.3	68.4	30.7	14.8	11.0	12.3	7.6	5.3	21.3
			Change from Pre-Mine	m <sup>3</sup> /s %	0.02 3%	0.02 4%	0.03 5%	0.06 2%	-0.63 -6%	-1.04 -9%	-0.53 -10%	-0.05 -2%	-0.06 -3%	-0.05 -2%	-0.04 -3%	-0.05 -6%	-0.19 -6%
10	Operations I	148.1	Discharge	m <sup>3</sup> /s	0.63	0.51	0.49	3.06	9.94	9.49	4.39	2.13	1.57	1.76	1.14	0.80	2.99
			Unit Runoff	l/s/km <sup>2</sup>	4.3	3.4	3.3	20.7	67.1	64.1	29.6	14.4	10.6	11.9	7.7	5.4	20.2
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -8%	-0.06 -10%	-0.05 -9%	-0.24 -7%	-1.45 -13%	-1.87 -16%	-0.77 -15%	-0.16 -7%	-0.14 -8%	-0.14 -7%	-0.05 -4%	-0.04 -5%	-0.42 -12%
22	Operations I	147.1	Discharge	m <sup>3</sup> /s	0.62	0.50	0.48	3.07	9.90	9.38	4.30	2.10	1.56	1.75	1.13	0.80	2.97
			Unit Runoff	l/s/km <sup>2</sup>	4.2	3.4	3.3	20.9	67.3	63.8	29.3	14.3	10.6	11.9	7.7	5.4	20.2
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.06 -8%	-0.07 -11%	-0.05 -10%	-0.24 -7%	-1.49 -13%	-1.98 -17%	-0.85 -17%	-0.18 -8%	-0.16 -9%	-0.15 -8%	-0.05 -4%	-0.05 -6%	-0.44 -13%
27	Operations II	147.4	Discharge	m <sup>3</sup> /s	0.62	0.50	0.47	3.03	9.91	9.47	4.37	2.13	1.57	1.73	1.13	0.80	2.98
			Unit Runoff	l/s/km <sup>2</sup>	4.2	3.4	3.2	20.5	67.2	64.2	29.7	14.4	10.7	11.7	7.7	5.4	20.2
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.06 -9%	-0.07 -12%	-0.07 -13%	-0.27 -8%	-1.48 -13%	-1.89 -17%	-0.78 -15%	-0.16 -7%	-0.14 -8%	-0.17 -9%	-0.05 -4%	-0.05 -5%	-0.43 -13%
30	Closure	162.5	Discharge	m <sup>3</sup> /s	0.65	0.53	0.51	3.18	10.40	9.95	4.52	2.16	1.62	1.82	1.17	0.83	3.11
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.3	3.2	19.5	64.0	61.2	27.8	13.3	9.9	11.2	7.2	5.1	19.2
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.03 -4%	-0.04 -6%	-0.03 -5%	-0.13 -4%	-0.99 -9%	-1.40 -12%	-0.63 -12%	-0.12 -5%	-0.10 -6%	-0.08 -4%	-0.01 -1%	-0.01 -1%	-0.30 -9%
50	Post-Closure	162.7	Discharge	m <sup>3</sup> /s	0.70	0.64	0.68	3.46	11.35	11.00	4.81	2.26	1.69	1.97	1.21	0.87	3.39
			Unit Runoff	l/s/km <sup>2</sup>	4.3	3.9	4.2	21.3	69.8	67.6	29.6	13.9	10.4	12.1	7.4	5.3	20.8
			Change from Pre-Mine	m <sup>3</sup> /s %	0.01 2%	0.07 13%	0.14 25%	0.16 5%	-0.04 0%	-0.36 -3%	-0.35 -7%	-0.02 -1%	-0.02 -1%	0.07 4%	0.03 2%	0.03 3%	-0.02 -1%

**Appendix 12-C1b. Sensitivity Analysis for Monthly Flows at Node 1 (Harper Creek at the WSC Station) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.68	n/a	n/a	0.57	n/a	n/a	0.54	n/a	n/a	3.30	n/a	n/a	11.39	n/a	n/a	11.36	n/a	n/a	5.15	n/a	n/a
	Construction (Year -1)	0.70	0.02	3%	0.59	0.02	4%	0.57	0.03	5%	3.37	0.06	2%	10.76	-0.63	-6%	10.32	-1.04	-9%	4.63	-0.53	-10%
	Operations 1 (Year 10)	0.63	-0.05	-8%	0.51	-0.06	-10%	0.49	-0.05	-9%	3.06	-0.24	-7%	9.94	-1.45	-13%	9.49	-1.87	-16%	4.39	-0.77	-15%
	Operations 1 (Year 22)	0.62	-0.06	-8%	0.50	-0.07	-11%	0.48	-0.05	-10%	3.07	-0.24	-7%	9.90	-1.49	-13%	9.38	-1.98	-17%	4.30	-0.85	-17%
	Operations 2 (Year 27)	0.62	-0.06	-9%	0.50	-0.07	-12%	0.47	-0.07	-13%	3.03	-0.27	-8%	9.91	-1.48	-13%	9.47	-1.89	-17%	4.37	-0.78	-15%
	Closure (Year 30)	0.65	-0.03	-4%	0.53	-0.04	-6%	0.51	-0.03	-5%	3.18	-0.13	-4%	10.40	-0.99	-9%	9.95	-1.40	-12%	4.52	-0.63	-12%
	Post-closure (Year 50)	0.70	0.01	2%	0.64	0.07	13%	0.68	0.14	25%	3.46	0.16	5%	11.35	-0.04	0%	11.00	-0.36	-3%	4.81	-0.35	-7%
50 Year Wet	Pre-Mine	0.90	n/a	n/a	0.75	n/a	n/a	1.10	n/a	n/a	8.79	n/a	n/a	18.02	n/a	n/a	20.96	n/a	n/a	15.01	n/a	n/a
	Construction (Year -1)	0.82	-0.08	-9%	0.68	-0.07	-9%	1.14	0.04	3%	8.26	-0.52	-6%	16.53	-1.49	-8%	18.50	-2.47	-12%	10.56	-4.45	-30%
	Operations 1	0.78	-0.12	-13%	0.63	-0.12	-16%	0.94	-0.16	-14%	7.57	-1.21	-14%	14.64	-3.38	-19%	15.93	-5.03	-24%	10.69	-4.33	-29%
	Operations 1 (Year 22)	0.78	-0.12	-14%	0.63	-0.12	-16%	0.94	-0.16	-15%	7.56	-1.23	-14%	14.59	-3.43	-19%	15.86	-5.10	-24%	10.63	-4.38	-29%
	Operations 2 (Year 27)	0.77	-0.13	-14%	0.63	-0.12	-16%	0.92	-0.18	-17%	7.56	-1.23	-14%	14.61	-3.41	-19%	15.90	-5.06	-24%	10.66	-4.35	-29%
	Closure (Year 30)	0.84	-0.06	-7%	0.69	-0.06	-7%	1.06	-0.04	-3%	7.57	-1.22	-14%	14.78	-3.24	-18%	18.01	-2.96	-14%	11.69	-3.33	-22%
	Post-closure (Year 50)	0.85	-0.05	-5%	0.77	0.02	3%	1.17	0.07	6%	8.64	-0.14	-2%	16.67	-1.35	-7%	18.08	-2.88	-14%	11.76	-3.25	-22%
50 Year Dry	Pre-Mine	0.43	n/a	n/a	0.36	n/a	n/a	0.33	n/a	n/a	0.48	n/a	n/a	5.87	n/a	n/a	3.52	n/a	n/a	1.44	n/a	n/a
	Construction (Year -1)	0.57	0.14	32%	0.48	0.12	32%	0.41	0.08	24%	0.60	0.12	25%	6.49	0.62	11%	4.07	0.55	16%	1.59	0.15	10%
	Operations 1 (Year 10)	0.42	-0.01	-2%	0.34	-0.02	-6%	0.29	-0.04	-13%	0.43	-0.05	-10%	5.70	-0.17	-3%	3.80	0.28	8%	1.46	0.02	1%
	Operations 1 (Year 22)	0.42	-0.01	-2%	0.34	-0.02	-7%	0.29	-0.05	-14%	0.43	-0.05	-11%	5.68	-0.19	-3%	3.78	0.26	7%	1.46	0.02	1%
	Operations 2 (Year 27)	0.42	-0.01	-3%	0.34	-0.03	-7%	0.28	-0.06	-17%	0.43	-0.05	-11%	5.69	-0.18	-3%	3.78	0.26	7%	1.46	0.02	1%
	Closure (Year 30)	0.42	-0.01	-1%	0.34	-0.02	-6%	0.29	-0.05	-14%	0.43	-0.05	-11%	5.69	-0.18	-3%	3.87	0.34	10%	1.46	0.02	1%
	Post-closure (Year 50)	0.48	0.05	13%	0.47	0.11	29%	0.5	0.1	40%	0.62	0.14	30%	6.71	0.84	14%	4.26	0.74	21%	1.57	0.13	9%

**Appendix 12-C1b. Sensitivity Analysis for Monthly Flows at Node 1 (Harper Creek at the WSC Station) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	2.28	n/a	n/a	1.71	n/a	n/a	1.90	n/a	n/a	1.18	n/a	n/a	0.84	n/a	n/a	3.41	n/a	n/a
	Construction (Year -1)	2.23	-0.05	-2%	1.65	-0.06	-3%	1.85	-0.05	-2%	1.14	-0.04	-3%	0.79	-0.05	-6%	3.22	-0.19	-6%
	Operations 1 (Year 10)	2.13	-0.16	-7%	1.57	-0.14	-8%	1.76	-0.14	-7%	1.14	-0.05	-4%	0.80	-0.04	-5%	2.99	-0.42	-12%
	Operations 1 (Year 22)	2.10	-0.18	-8%	1.56	-0.16	-9%	1.75	-0.15	-8%	1.13	-0.05	-4%	0.80	-0.05	-6%	2.97	-0.44	-13%
	Operations 2 (Year 27)	2.13	-0.16	-7%	1.57	-0.14	-8%	1.73	-0.17	-9%	1.13	-0.05	-4%	0.80	-0.05	-5%	2.98	-0.43	-13%
	Closure (Year 30)	2.16	-0.12	-5%	1.62	-0.10	-6%	1.82	-0.08	-4%	1.17	-0.01	-1%	0.83	-0.01	-1%	3.11	-0.30	-9%
	Post-closure (Year 50)	2.26	-0.02	-1%	1.69	-0.02	-1%	1.97	0.07	4%	1.21	0.03	2%	0.87	0.03	3%	3.39	-0.02	-1%
50 Year Wet	Pre-Mine	8.79	n/a	n/a	5.18	n/a	n/a	5.93	n/a	n/a	1.78	n/a	n/a	1.12	n/a	n/a	5.38	n/a	n/a
	Construction (Year -1)	5.60	-3.19	-36%	4.97	-0.21	-4%	5.22	-0.70	-12%	1.56	-0.22	-12%	0.96	-0.16	-15%	4.41	-0.97	-18%
	Operations 1	5.30	-3.49	-40%	3.56	-1.63	-31%	4.02	-1.90	-32%	1.59	-0.18	-10%	0.99	-0.13	-12%	4.12	-1.26	-23%
	Operations 1 (Year 22)	5.28	-3.51	-40%	3.52	-1.66	-32%	4.01	-1.91	-32%	1.59	-0.19	-11%	0.99	-0.14	-12%	4.10	-1.27	-24%
	Operations 2 (Year 27)	5.31	-3.48	-40%	3.94	-1.25	-24%	4.01	-1.92	-32%	1.61	-0.17	-9%	1.04	-0.08	-7%	4.11	-1.27	-24%
	Closure (Year 30)	5.31	-3.48	-40%	3.92	-1.26	-24%	4.23	-1.69	-29%	1.66	-0.12	-7%	1.09	-0.04	-3%	4.50	-0.88	-16%
	Post-closure (Year 50)	5.40	-3.39	-39%	3.90	-1.28	-25%	4.71	-1.22	-21%	1.69	-0.09	-5%	1.08	-0.05	-4%	4.57	-0.80	-15%
50 Year Dry	Pre-Mine	0.88	n/a	n/a	0.76	n/a	n/a	0.68	n/a	n/a	0.62	n/a	n/a	0.51	n/a	n/a	1.73	n/a	n/a
	Construction (Year -1)	1.18	0.30	34%	0.93	0.17	22%	0.86	0.18	26%	0.72	0.10	16%	0.59	0.08	15%	2.11	0.39	23%
	Operations 1 (Year 10)	1.06	0.19	21%	0.90	0.14	18%	0.81	0.13	18%	0.65	0.04	6%	0.52	0.01	2%	1.78	0.05	3%
	Operations 1 (Year 22)	1.06	0.18	21%	0.90	0.14	18%	0.80	0.12	18%	0.65	0.04	6%	0.52	0.01	2%	1.77	0.04	2%
	Operations 2 (Year 27)	1.06	0.18	21%	0.90	0.14	18%	0.80	0.12	18%	0.65	0.04	6%	0.52	0.01	2%	1.77	0.04	3%
	Closure (Year 30)	1.06	0.18	21%	0.91	0.14	19%	0.82	0.14	20%	0.67	0.06	10%	0.55	0.04	8%	1.95	0.22	13%
	Post-closure (Year 50)	1.10	0.22	25%	0.93	0.16	22%	0.87	0.19	29%	0.72	0.11	18%	0.59	0.08	15%	2.00	0.27	16%

Appendix 12-C2a. Average Monthly Flows at Node 2 (Harper Creek above T-Creek Confluence) during Different Phases of the Project

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	47.0	Discharge	m <sup>3</sup> /s	0.24	0.20	0.18	0.82	3.42	3.32	1.45	0.70	0.53	0.59	0.41	0.29	1.01
			Unit Runoff	l/s/km <sup>2</sup>	5.1	4.3	3.8	17.5	72.8	70.5	30.9	14.9	11.3	12.6	8.8	6.1	21.6
-1	End of Construction	46.7	Discharge	m <sup>3</sup> /s	0.30	0.26	0.23	0.83	3.25	3.13	1.38	0.70	0.53	0.58	0.44	0.33	1.00
			Unit Runoff	l/s/km <sup>2</sup>	6.5	5.6	4.9	17.7	69.5	67.1	29.6	15.0	11.3	12.5	9.5	7.0	21.3
		-1%	Change from Pre-Mine	m <sup>3</sup> /s %	0.06 26%	0.06 27%	0.05 28%	0.00 0%	-0.18 -5%	-0.18 -5%	-0.07 -5%	0.00 0%	0.00 -1%	-0.01 -2%	0.03 8%	0.04 13%	-0.02 -2%
10	Operations I	44.4	Discharge	m <sup>3</sup> /s	0.25	0.21	0.19	0.69	2.92	2.85	1.29	0.65	0.48	0.52	0.40	0.29	0.89
			Unit Runoff	l/s/km <sup>2</sup>	5.5	4.7	4.2	15.5	65.9	64.1	29.1	14.7	10.9	11.7	9.1	6.6	20.2
		-6%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 2%	0.00 1%	0.01 3%	-0.14 -17%	-0.50 -15%	-0.47 -14%	-0.16 -11%	-0.05 -7%	-0.05 -9%	-0.08 -13%	-0.01 -2%	0.01 2%	-0.12 -12%
22	Operations I	43.6	Discharge	m <sup>3</sup> /s	0.24	0.20	0.18	0.70	2.90	2.82	1.28	0.65	0.48	0.52	0.40	0.29	0.89
			Unit Runoff	l/s/km <sup>2</sup>	5.6	4.7	4.2	16.1	66.5	64.6	29.4	14.8	11.0	11.9	9.2	6.7	20.4
		-7%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 1%	0.00 0%	0.00 2%	-0.12 -15%	-0.52 -15%	-0.50 -15%	-0.17 -12%	-0.06 -8%	-0.05 -10%	-0.08 -13%	-0.01 -2%	0.00 1%	-0.12 -12%
27	Operations II	43.9	Discharge	m <sup>3</sup> /s	0.24	0.20	0.18	0.71	2.91	2.82	1.29	0.65	0.48	0.52	0.40	0.29	0.89
			Unit Runoff	l/s/km <sup>2</sup>	5.5	4.6	4.0	16.2	66.2	64.3	29.3	14.8	10.9	11.8	9.2	6.6	20.3
		-7%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 1%	0.00 0%	0.00 -1%	-0.11 -14%	-0.52 -15%	-0.49 -15%	-0.16 -11%	-0.05 -8%	-0.05 -9%	-0.08 -13%	-0.01 -2%	0.00 1%	-0.12 -12%
30	Closure	44.0	Discharge	m <sup>3</sup> /s	0.24	0.20	0.18	0.71	2.91	2.82	1.28	0.64	0.48	0.52	0.40	0.29	0.89
			Unit Runoff	l/s/km <sup>2</sup>	5.5	4.6	4.1	16.1	66.1	64.2	29.2	14.6	10.9	11.8	9.1	6.6	20.2
		-7%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 1%	-0.11 -14%	-0.52 -15%	-0.49 -15%	-0.17 -12%	-0.06 -8%	-0.05 -10%	-0.08 -13%	-0.01 -2%	0.00 1%	-0.12 -12%
50	Post-Closure	44.0	Discharge	m <sup>3</sup> /s	0.24	0.20	0.18	0.70	2.91	2.82	1.28	0.65	0.48	0.52	0.40	0.29	0.89
			Unit Runoff	l/s/km <sup>2</sup>	5.5	4.6	4.1	16.0	66.2	64.1	29.1	14.7	10.9	11.8	9.1	6.6	20.2
		-6%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 -1%	0.00 1%	-0.12 -15%	-0.51 -15%	-0.50 -15%	-0.17 -12%	-0.06 -8%	-0.05 -10%	-0.08 -13%	-0.01 -2%	0.00 1%	-0.12 -12%

**Appendix 12-C2b. Sensitivity Analysis for Monthly Flows at Node 2 (Harper Creek above T-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.24	n/a	n/a	0.21	n/a	n/a	0.18	n/a	n/a	0.76	n/a	n/a	3.20	n/a	n/a	2.95	n/a	n/a	1.27	n/a	n/a
	Construction (Year -1)	0.27	0.03	13%	0.23	0.03	13%	0.20	0.02	12%	0.83	0.08	10%	3.40	0.20	6%	3.19	0.24	8%	1.30	0.03	3%
	Operations 1 (Year 10)	0.22	-0.02	-8%	0.19	-0.02	-10%	0.16	-0.02	-10%	0.71	-0.05	-7%	2.84	-0.36	-11%	2.58	-0.37	-12%	1.15	-0.11	-9%
	Operations 1 (Year 22)	0.22	-0.02	-10%	0.18	-0.03	-13%	0.16	-0.02	-13%	0.69	-0.06	-9%	2.82	-0.38	-12%	2.56	-0.39	-13%	1.14	-0.12	-10%
	Operations 2 (Year 27)	0.22	-0.03	-10%	0.18	-0.03	-13%	0.15	-0.03	-17%	0.68	-0.08	-10%	2.86	-0.34	-11%	2.60	-0.35	-12%	1.15	-0.12	-9%
	Closure (Year 30)	0.22	-0.03	-11%	0.18	-0.03	-13%	0.16	-0.03	-14%	0.68	-0.08	-10%	2.86	-0.34	-11%	2.59	-0.36	-12%	1.15	-0.12	-9%
	Post-closure (Year 50)	0.22	-0.03	-11%	0.18	-0.03	-14%	0.16	-0.03	-15%	0.70	-0.06	-8%	2.86	-0.35	-11%	2.58	-0.37	-12%	1.14	-0.12	-10%
50 Year Wet	Pre-Mine	0.33	n/a	n/a	0.28	n/a	n/a	0.26	n/a	n/a	2.29	n/a	n/a	5.15	n/a	n/a	5.80	n/a	n/a	3.68	n/a	n/a
	Construction (Year -1)	0.32	-0.01	-3%	0.27	-0.01	-3%	0.25	0.00	-2%	2.36	0.07	3%	5.18	0.03	1%	6.01	0.21	4%	3.08	-0.60	-16%
	Operations 1	0.30	-0.03	-10%	0.25	-0.03	-12%	0.23	-0.02	-9%	1.94	-0.35	-15%	4.16	-0.99	-19%	4.68	-1.12	-19%	2.82	-0.86	-23%
	Operations 1 (Year 22)	0.29	-0.04	-12%	0.24	-0.04	-14%	0.23	-0.03	-11%	1.93	-0.36	-16%	4.14	-1.01	-20%	4.64	-1.16	-20%	2.80	-0.88	-24%
	Operations 2 (Year 27)	0.29	-0.04	-12%	0.24	-0.04	-14%	0.22	-0.04	-15%	1.93	-0.36	-16%	4.17	-0.98	-19%	4.68	-1.12	-19%	2.83	-0.85	-23%
	Closure (Year 30)	0.29	-0.04	-12%	0.24	-0.04	-15%	0.23	-0.03	-12%	1.93	-0.36	-16%	4.17	-0.98	-19%	4.69	-1.11	-19%	2.84	-0.84	-23%
	Post-closure (Year 50)	0.29	-0.04	-13%	0.24	-0.04	-15%	0.23	-0.03	-12%	1.93	-0.36	-16%	4.17	-0.98	-19%	4.69	-1.11	-19%	2.83	-0.85	-23%
50 Year Dry	Pre-Mine	0.14	n/a	n/a	0.12	n/a	n/a	0.11	n/a	n/a	0.13	n/a	n/a	1.58	n/a	n/a	0.82	n/a	n/a	0.46	n/a	n/a
	Construction (Year -1)	0.22	0.08	53%	0.19	0.06	52%	0.16	0.06	54%	0.18	0.05	41%	2.08	0.50	32%	1.13	0.31	38%	0.56	0.11	23%
	Operations 1 (Year 10)	0.14	0.00	-1%	0.12	-0.01	-5%	0.10	-0.01	-6%	0.12	-0.01	-7%	1.44	-0.14	-9%	0.97	0.14	17%	0.48	0.02	4%
	Operations 1 (Year 22)	0.14	-0.01	-4%	0.11	-0.01	-8%	0.10	-0.01	-10%	0.12	-0.01	-9%	1.44	-0.14	-9%	0.96	0.14	17%	0.47	0.01	3%
	Operations 2 (Year 27)	0.14	-0.01	-5%	0.11	-0.01	-9%	0.09	-0.01	-13%	0.12	-0.01	-9%	1.46	-0.12	-8%	0.99	0.16	20%	0.47	0.01	3%
	Closure (Year 30)	0.14	-0.01	-5%	0.11	-0.01	-9%	0.10	-0.01	-10%	0.12	-0.01	-10%	1.45	-0.13	-8%	0.98	0.16	19%	0.47	0.01	3%
	Post-closure (Year 50)	0.13	-0.01	-5%	0.11	-0.01	-10%	0.1	0.0	-11%	0.12	-0.01	-10%	1.45	-0.13	-8%	0.97	0.15	18%	0.47	0.01	2%

**Appendix 12-C2b. Sensitivity Analysis for Monthly Flows at Node 2 (Harper Creek above T-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.64	n/a	n/a	0.49	n/a	n/a	0.53	n/a	n/a	0.40	n/a	n/a	0.29	n/a	n/a	0.93	n/a	n/a
	Construction (Year -1)	0.68	0.05	7%	0.51	0.03	6%	0.57	0.04	8%	0.44	0.04	9%	0.32	0.03	9%	1.00	0.07	7%
	Operations 1 (Year 10)	0.61	-0.03	-5%	0.45	-0.03	-7%	0.49	-0.04	-8%	0.38	-0.02	-4%	0.27	-0.02	-6%	0.84	-0.09	-10%
	Operations 1 (Year 22)	0.60	-0.04	-6%	0.45	-0.04	-8%	0.48	-0.05	-9%	0.38	-0.02	-6%	0.27	-0.02	-8%	0.83	-0.10	-11%
	Operations 2 (Year 27)	0.61	-0.03	-5%	0.44	-0.04	-9%	0.47	-0.06	-11%	0.37	-0.03	-6%	0.27	-0.02	-8%	0.83	-0.10	-10%
	Closure (Year 30)	0.60	-0.04	-6%	0.44	-0.04	-9%	0.47	-0.05	-10%	0.37	-0.03	-6%	0.27	-0.02	-8%	0.83	-0.10	-10%
	Post-closure (Year 50)	0.60	-0.04	-6%	0.44	-0.04	-8%	0.48	-0.05	-10%	0.37	-0.02	-6%	0.27	-0.02	-9%	0.83	-0.10	-10%
50 Year Wet	Pre-Mine	2.24	n/a	n/a	1.27	n/a	n/a	1.52	n/a	n/a	0.64	n/a	n/a	0.40	n/a	n/a	1.48	n/a	n/a
	Construction (Year -1)	1.49	-0.75	-33%	1.39	0.12	9%	1.58	0.06	4%	0.66	0.01	2%	0.40	0.00	1%	1.37	-0.11	-7%
	Operations 1	1.46	-0.78	-35%	1.00	-0.26	-21%	1.09	-0.43	-28%	0.59	-0.05	-8%	0.36	-0.04	-9%	1.18	-0.29	-20%
	Operations 1 (Year 22)	1.45	-0.79	-35%	0.99	-0.28	-22%	1.08	-0.44	-29%	0.59	-0.06	-9%	0.36	-0.04	-10%	1.17	-0.30	-21%
	Operations 2 (Year 27)	1.47	-0.77	-34%	1.00	-0.27	-21%	1.01	-0.52	-34%	0.57	-0.07	-11%	0.36	-0.04	-11%	1.18	-0.30	-20%
	Closure (Year 30)	1.47	-0.76	-34%	1.00	-0.26	-21%	1.08	-0.44	-29%	0.57	-0.07	-11%	0.36	-0.04	-11%	1.19	-0.29	-20%
	Post-closure (Year 50)	1.47	-0.76	-34%	1.00	-0.27	-21%	1.07	-0.45	-29%	0.58	-0.06	-9%	0.36	-0.04	-11%	1.18	-0.30	-20%
50 Year Dry	Pre-Mine	0.28	n/a	n/a	0.24	n/a	n/a	0.23	n/a	n/a	0.20	n/a	n/a	0.17	n/a	n/a	0.47	n/a	n/a
	Construction (Year -1)	0.37	0.09	33%	0.33	0.09	37%	0.31	0.08	37%	0.27	0.08	39%	0.23	0.06	38%	0.66	0.19	40%
	Operations 1 (Year 10)	0.30	0.02	8%	0.27	0.03	12%	0.25	0.02	9%	0.21	0.01	7%	0.17	0.00	3%	0.51	0.04	8%
	Operations 1 (Year 22)	0.30	0.02	6%	0.27	0.02	10%	0.25	0.02	8%	0.21	0.01	5%	0.17	0.00	0%	0.50	0.03	7%
	Operations 2 (Year 27)	0.30	0.02	7%	0.27	0.02	10%	0.25	0.02	7%	0.21	0.01	5%	0.17	0.00	0%	0.50	0.03	7%
	Closure (Year 30)	0.30	0.02	6%	0.26	0.02	10%	0.25	0.02	7%	0.21	0.01	4%	0.17	0.00	0%	0.50	0.03	7%
	Post-closure (Year 50)	0.30	0.02	6%	0.26	0.02	9%	0.25	0.02	7%	0.20	0.01	4%	0.17	0.00	-1%	0.50	0.03	7%

Appendix 12-C3a. Average Monthly Flows at Node 3 (T-Creek at Harper Creek Confluence) during Different Phases of the Project

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	23.4	Discharge	m <sup>3</sup> /s	0.02	0.01	0.01	0.22	1.57	2.03	0.85	0.24	0.14	0.13	0.05	0.02	0.44
			Unit Runoff	l/s/km <sup>2</sup>	0.8	0.6	0.5	9.4	67.1	86.8	36.2	10.3	6.1	5.7	2.2	1.0	18.9
-1	End of Construction	8.2	Discharge	m <sup>3</sup> /s	0.03	0.00	0.00	0.10	0.57	0.65	0.24	0.09	0.07	0.05	0.01	0.00	0.15
			Unit Runoff	l/s/km <sup>2</sup>	3.3	0.3	0.1	12.2	69.0	79.2	29.2	10.4	8.5	6.5	0.8	0.0	18.3
			Change from Pre-Mine	m <sup>3</sup> /s %	0.01 46%	-0.01 -83%	-0.01 -95%	-0.12 -55%	-1.00 -64%	-1.38 -68%	-0.61 -72%	-0.16 -65%	-0.07 -51%	-0.08 -60%	-0.05 -88%	-0.02 -99%	-0.29 -66%
10	Operations I	7.8	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.09	0.55	0.61	0.18	0.04	0.02	0.03	0.01	0.00	0.13
			Unit Runoff	l/s/km <sup>2</sup>	0.0	0.0	0.0	10.9	70.3	77.9	23.2	5.4	2.7	4.3	0.8	0.0	16.3
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -100%	-0.01 -100%	-0.01 -100%	-0.14 -61%	-1.02 -65%	-1.43 -70%	-0.67 -79%	-0.20 -82%	-0.12 -85%	-0.10 -75%	-0.05 -88%	-0.02 -99%	-0.32 -71%
22	Operations I	7.5	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.08	0.53	0.57	0.17	0.04	0.02	0.03	0.01	0.00	0.12
			Unit Runoff	l/s/km <sup>2</sup>	0.0	0.0	0.0	11.1	70.5	76.4	22.0	5.2	2.6	4.3	0.8	0.0	16.1
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -100%	-0.01 -100%	-0.01 -100%	-0.14 -62%	-1.04 -66%	-1.46 -72%	-0.68 -80%	-0.20 -84%	-0.12 -87%	-0.10 -76%	-0.05 -88%	-0.02 -99%	-0.32 -73%
27	Operations II	7.6	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.08	0.53	0.58	0.18	0.05	0.03	0.04	0.01	0.01	0.13
			Unit Runoff	l/s/km <sup>2</sup>	0.0	0.0	0.0	10.4	69.6	76.8	23.3	6.6	4.3	5.4	1.6	0.7	16.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -100%	-0.01 -100%	-0.01 -100%	-0.14 -64%	-1.04 -66%	-1.45 -71%	-0.67 -79%	-0.19 -79%	-0.11 -77%	-0.09 -69%	-0.04 -77%	-0.02 -78%	-0.32 -72%
30	Closure	22.6	Discharge	m <sup>3</sup> /s	0.03	0.03	0.03	0.21	0.98	1.11	0.35	0.09	0.08	0.12	0.05	0.04	0.26
			Unit Runoff	l/s/km <sup>2</sup>	1.2	1.1	1.2	9.3	43.5	49.0	15.4	4.1	3.4	5.2	2.0	1.6	11.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.01 44%	0.01 78%	0.02 >100%	-0.01 -4%	-0.59 -37%	-0.92 -45%	-0.50 -59%	-0.15 -62%	-0.07 -47%	-0.01 -11%	-0.01 -13%	0.01 50%	-0.18 -42%
50	Post-Closure	22.8	Discharge	m <sup>3</sup> /s	0.07	0.13	0.18	0.54	1.95	2.12	0.62	0.19	0.14	0.27	0.09	0.07	0.53
			Unit Runoff	l/s/km <sup>2</sup>	2.9	5.7	8.1	23.7	85.7	93.2	27.3	8.2	6.0	11.7	3.7	3.1	23.3
			Change from Pre-Mine	m <sup>3</sup> /s %	0.05 >100%	0.12 >100%	0.17 >100%	0.32 >100%	0.38 24%	0.09 4%	-0.23 -27%	-0.05 -22%	-0.01 -4%	0.13 >100%	0.03 63%	0.05 >100%	0.09 20%



**Appendix 12-C3b. Sensitivity Analysis for Monthly Flows at Node 3 (T-Creek at Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.02	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.22	n/a	n/a	1.57	n/a	n/a	2.03	n/a	n/a	0.85	n/a	n/a
	Construction (Year -1)	0.03	0.01	46%	0.00	-0.01	-83%	0.00	-0.01	-95%	0.10	-0.12	-55%	0.57	-1.00	-64%	0.65	-1.38	-68%	0.24	-0.61	-72%
	Operations 1 (Year 10)	0.00	-0.02	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.09	-0.14	-61%	0.55	-1.02	-65%	0.61	-1.43	-70%	0.18	-0.67	-79%
	Operations 1 (Year 22)	0.00	-0.02	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.08	-0.14	-62%	0.53	-1.04	-66%	0.57	-1.46	-72%	0.17	-0.68	-80%
	Operations 2 (Year 27)	0.00	-0.02	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.08	-0.14	-64%	0.53	-1.04	-66%	0.58	-1.45	-71%	0.18	-0.67	-79%
	Closure (Year 30)	0.03	0.01	44%	0.03	0.01	78%	0.03	0.02	>100%	0.21	-0.01	-4%	0.98	-0.59	-37%	1.11	-0.92	-45%	0.35	-0.50	-59%
	Post-closure (Year 50)	0.07	0.05	>100%	0.13	0.12	>100%	0.18	0.17	>100%	0.54	0.32	>100%	1.95	0.38	24%	2.12	0.09	4%	0.62	-0.23	-27%
50 Year Wet	Pre-Mine	0.04	n/a	n/a	0.03	n/a	n/a	0.03	n/a	n/a	1.03	n/a	n/a	2.69	n/a	n/a	3.39	n/a	n/a	2.86	n/a	n/a
	Construction (Year -1)	0.03	0.00	-9%	0.01	-0.02	-76%	0.00	-0.03	-94%	0.42	-0.60	-59%	0.87	-1.81	-67%	1.13	-2.25	-67%	0.66	-2.20	-77%
	Operations 1	0.00	-0.04	-100%	0.00	-0.03	-100%	0.00	-0.03	-100%	0.36	-0.67	-65%	0.84	-1.85	-69%	1.07	-2.31	-68%	0.57	-2.30	-80%
	Operations 1 (Year 22)	0.00	-0.04	-100%	0.00	-0.03	-100%	0.00	-0.03	-100%	0.35	-0.68	-66%	0.81	-1.88	-70%	1.04	-2.35	-69%	0.53	-2.34	-82%
	Operations 2 (Year 27)	0.00	-0.04	-100%	0.00	-0.03	-100%	0.00	-0.03	-100%	0.34	-0.69	-67%	0.81	-1.88	-70%	1.04	-2.35	-69%	0.60	-2.27	-79%
	Closure (Year 30)	0.10	0.06	>100%	0.10	0.06	>100%	0.10	0.07	>100%	1.13	0.10	10%	2.57	-0.12	-4%	3.30	-0.09	-3%	1.92	-0.94	-33%
	Post-closure (Year 50)	0.08	0.04	>100%	0.14	0.11	>100%	0.20	0.18	>100%	1.34	0.31	31%	3.00	0.32	12%	4.05	0.66	19%	2.00	-0.86	-30%
50 Year Dry	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.68	n/a	n/a	0.47	n/a	n/a	0.10	n/a	n/a
	Construction (Year -1)	0.02	0.02	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.30	-0.37	-55%	0.21	-0.26	-55%	0.02	-0.08	-77%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.30	-0.38	-56%	0.17	-0.30	-64%	0.02	-0.09	-82%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.29	-0.38	-57%	0.15	-0.32	-67%	0.02	-0.09	-82%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.29	-0.39	-57%	0.15	-0.32	-67%	0.02	-0.09	-82%
	Closure (Year 30)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.31	-0.37	-55%	0.17	-0.31	-65%	0.02	-0.09	-82%
	Post-closure (Year 50)	0.06	0.06	n/a*	0.12	0.12	n/a*	0.2	0.2	n/a*	0.18	0.18	n/a*	1.13	0.45	67%	0.55	0.08	17%	0.06	-0.05	-43%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C3b. Sensitivity Analysis for Monthly Flows at Node 3 (T-Creek at Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.24	n/a	n/a	0.14	n/a	n/a	0.13	n/a	n/a	0.05	n/a	n/a	0.02	n/a	n/a	0.44	n/a	n/a
	Construction (Year -1)	0.09	-0.16	-65%	0.07	-0.07	-51%	0.05	-0.08	-60%	0.01	-0.05	-88%	0.00	-0.02	-99%	0.15	-0.29	-66%
	Operations 1 (Year 10)	0.04	-0.20	-82%	0.02	-0.12	-85%	0.03	-0.10	-75%	0.01	-0.05	-88%	0.00	-0.02	-99%	0.13	-0.32	-71%
	Operations 1 (Year 22)	0.04	-0.20	-84%	0.02	-0.12	-87%	0.03	-0.10	-76%	0.01	-0.05	-88%	0.00	-0.02	-99%	0.12	-0.32	-73%
	Operations 2 (Year 27)	0.05	-0.19	-79%	0.03	-0.11	-77%	0.04	-0.09	-69%	0.01	-0.04	-77%	0.01	-0.02	-78%	0.13	-0.32	-72%
	Closure (Year 30)	0.09	-0.15	-62%	0.08	-0.07	-47%	0.12	-0.01	-11%	0.05	-0.01	-13%	0.04	0.01	50%	0.26	-0.18	-42%
	Post-closure (Year 50)	0.19	-0.05	-22%	0.14	-0.01	-4%	0.27	0.13	>100%	0.09	0.03	63%	0.07	0.05	>100%	0.53	0.09	20%
50 Year Wet	Pre-Mine	1.26	n/a	n/a	0.82	n/a	n/a	0.68	n/a	n/a	0.13	n/a	n/a	0.04	n/a	n/a	0.74	n/a	n/a
	Construction (Year -1)	0.36	-0.90	-72%	0.48	-0.34	-41%	0.32	-0.36	-53%	0.02	-0.11	-85%	0.00	-0.04	-99%	0.23	-0.51	-69%
	Operations 1	0.21	-1.05	-84%	0.19	-0.63	-77%	0.21	-0.47	-69%	0.02	-0.11	-85%	0.00	-0.04	-99%	0.19	-0.54	-74%
	Operations 1 (Year 22)	0.20	-1.06	-84%	0.18	-0.64	-78%	0.20	-0.47	-70%	0.02	-0.11	-85%	0.00	-0.04	-99%	0.18	-0.55	-75%
	Operations 2 (Year 27)	0.23	-1.03	-82%	0.35	-0.46	-57%	0.24	-0.44	-65%	0.11	-0.02	-17%	0.10	0.06	>100%	0.22	-0.51	-70%
	Closure (Year 30)	0.63	-0.63	-50%	0.48	-0.33	-41%	0.57	-0.10	-15%	0.14	0.00	3%	0.11	0.06	>100%	0.73	0.00	0%
	Post-closure (Year 50)	0.87	-0.39	-31%	0.50	-0.32	-39%	0.81	0.13	19%	0.13	0.00	-2%	0.08	0.04	86%	0.78	0.04	6%
50 Year Dry	Pre-Mine	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.19	n/a	n/a
	Construction (Year -1)	0.00	-0.01	-75%	0.00	-0.01	-98%	0.00	-0.01	-100%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.09	-0.11	-56%
	Operations 1 (Year 10)	0.00	-0.01	-98%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	-0.12	-61%
	Operations 1 (Year 22)	0.00	-0.01	-98%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	-0.12	-63%
	Operations 2 (Year 27)	0.00	-0.01	-98%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	-0.12	-63%
	Closure (Year 30)	0.00	-0.01	-98%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	-0.12	-63%
	Post-closure (Year 50)	0.01	0.00	30%	0.01	0.01	>100%	0.07	0.06	>100%	0.06	0.06	n/a*	0.06	0.06	n/a*	0.35	0.15	80%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C4a. Average Monthly Flows at Node 4 (T-Creek Upstream of Harper Creek Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	15.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.12	1.01	1.37	0.57	0.14	0.08	0.07	0.02	0.00	0.28
			Unit Runoff	l/s/km <sup>2</sup>	0.0	0.0	0.0	8.2	67.3	91.2	37.9	9.4	5.0	4.4	1.2	0.0	18.7
-1	End of Construction	0.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Unit Runoff	l/s/km <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
		-100%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.12 -100%	-1.01 -100%	-1.37 -100%	-0.57 -100%	-0.14 -100%	-0.08 -100%	-0.07 -100%	-0.02 -100%	0.00 0%	-0.28 -100%
10	Operations I	0.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Unit Runoff	l/s/km <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
		-100%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.12 -100%	-1.01 -100%	-1.37 -100%	-0.57 -100%	-0.14 -100%	-0.08 -100%	-0.07 -100%	-0.02 -100%	0.00 0%	-0.28 -100%
22	Operations I	0.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Unit Runoff	l/s/km <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
		-100%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.12 -100%	-1.01 -100%	-1.37 -100%	-0.57 -100%	-0.14 -100%	-0.08 -100%	-0.07 -100%	-0.02 -100%	0.00 0%	-0.28 -100%
27	Operations II	0.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.00
			Unit Runoff	l/s/km <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
		-100%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.12 -100%	-1.01 -100%	-1.37 -100%	-0.56 -98%	-0.13 -92%	-0.06 -83%	-0.05 -84%	-0.01 -68%	0.00 0%	-0.28 -98%
30	Closure	15.0	Discharge	m <sup>3</sup> /s	0.03	0.03	0.03	0.13	0.46	0.53	0.18	0.05	0.06	0.09	0.04	0.04	0.14
			Unit Runoff	l/s/km <sup>2</sup>	1.8	1.7	1.8	8.6	30.6	35.6	12.0	3.5	3.8	5.8	2.6	2.4	9.2
		0%	Change from Pre-Mine	m <sup>3</sup> /s %	0.03 >100%	0.03 >100%	0.03 >100%	0.01 4%	-0.55 -54%	-0.83 -61%	-0.39 -68%	-0.09 -63%	-0.02 -25%	0.02 33%	0.02 >100%	0.04 >100%	-0.14 -51%
50	Post-Closure	15.0	Discharge	m <sup>3</sup> /s	0.05	0.12	0.17	0.43	1.35	1.47	0.42	0.13	0.11	0.21	0.07	0.06	0.38
			Unit Runoff	l/s/km <sup>2</sup>	3.5	7.7	11.4	28.5	89.8	97.7	28.2	8.9	7.1	14.1	4.4	3.8	25.4
		0%	Change from Pre-Mine	m <sup>3</sup> /s %	0.05 >100%	0.12 >100%	0.17 >100%	0.30 >100%	0.34 33%	0.10 7%	-0.15 -26%	-0.01 -5%	0.03 41%	0.15 >100%	0.05 >100%	0.06 >100%	0.10 36%

**Appendix 12-C4b. Sensitivity Analysis for Monthly Flows at Node 4 (T-Creek Upstream of Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.12	n/a	n/a	1.01	n/a	n/a	1.37	n/a	n/a	0.57	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.12	-100%	0.00	-1.01	-100%	0.00	-1.37	-100%	0.00	-0.57	-100%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.12	-100%	0.00	-1.01	-100%	0.00	-1.37	-100%	0.00	-0.57	-100%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.12	-100%	0.00	-1.01	-100%	0.00	-1.37	-100%	0.00	-0.57	-100%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.12	-100%	0.00	-1.01	-100%	0.00	-1.37	-100%	0.01	-0.56	-98%
	Closure (Year 30)	0.03	0.03	n/a*	0.03	0.03	n/a*	0.03	0.03	n/a*	0.13	0.01	4%	0.46	-0.55	-54%	0.53	-0.83	-61%	0.18	-0.39	-68%
	Post-closure (Year 50)	0.05	0.05	n/a*	0.12	0.12	n/a*	0.17	0.17	n/a*	0.43	0.30	>100%	1.35	0.34	33%	1.47	0.10	7%	0.42	-0.15	-26%
50 Year Wet	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.66	n/a	n/a	1.76	n/a	n/a	2.27	n/a	n/a	1.96	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.66	-100%	0.00	-1.76	-100%	0.00	-2.27	-100%	0.00	-1.96	-100%
	Operations 1	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.66	-100%	0.00	-1.76	-100%	0.00	-2.27	-100%	0.00	-1.96	-100%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.66	-100%	0.00	-1.76	-100%	0.00	-2.27	-100%	0.00	-1.96	-100%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.66	-100%	0.00	-1.76	-100%	0.00	-2.27	-100%	0.08	-1.88	-96%
	Closure (Year 30)	0.10	0.10	n/a*	0.10	0.10	n/a*	0.10	0.10	n/a*	0.79	0.13	20%	1.91	0.15	8%	2.54	0.28	12%	1.41	-0.55	-28%
	Post-closure (Year 50)	0.07	0.07	n/a*	0.13	0.13	n/a*	0.19	0.19	n/a*	0.96	0.30	46%	1.94	0.18	10%	2.92	0.66	29%	1.43	-0.53	-27%
50 Year Dry	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.41	n/a	n/a	0.30	n/a	n/a	0.07	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.41	-100%	0.00	-0.30	-100%	0.00	-0.07	-100%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.41	-100%	0.00	-0.30	-100%	0.00	-0.07	-100%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.41	-100%	0.00	-0.30	-100%	0.00	-0.07	-100%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.41	-100%	0.00	-0.30	-100%	0.00	-0.07	-100%
	Closure (Year 30)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.41	-100%	0.00	-0.30	-100%	0.00	-0.07	-100%
	Post-closure (Year 50)	0.04	0.04	n/a*	0.11	0.11	n/a*	0.2	0.2	n/a*	0.17	0.17	n/a*	0.78	0.37	90%	0.36	0.06	19%	0.03	-0.04	-59%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C4b. Sensitivity Analysis for Monthly Flows at Node 4 (T-Creek Upstream of Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.14	n/a	n/a	0.08	n/a	n/a	0.07	n/a	n/a	0.02	n/a	n/a	0.00	n/a	n/a	0.28	n/a	n/a
	Construction (Year -1)	0.00	-0.14	-100%	0.00	-0.08	-100%	0.00	-0.07	-100%	0.00	-0.02	-100%	0.00	0.00	n/a*	0.00	-0.28	-100%
	Operations 1 (Year 10)	0.00	-0.14	-100%	0.00	-0.08	-100%	0.00	-0.07	-100%	0.00	-0.02	-100%	0.00	0.00	n/a*	0.00	-0.28	-100%
	Operations 1 (Year 22)	0.00	-0.14	-100%	0.00	-0.08	-100%	0.00	-0.07	-100%	0.00	-0.02	-100%	0.00	0.00	n/a*	0.00	-0.28	-100%
	Operations 2 (Year 27)	0.01	-0.13	-92%	0.01	-0.06	-83%	0.01	-0.05	-84%	0.01	-0.01	-68%	0.01	0.00	n/a*	0.00	-0.28	-98%
	Closure (Year 30)	0.05	-0.09	-63%	0.06	-0.02	-25%	0.09	0.02	33%	0.04	0.02	>100%	0.04	0.04	n/a*	0.14	-0.14	-51%
	Post-closure (Year 50)	0.13	-0.01	-5%	0.11	0.03	41%	0.21	0.15	>100%	0.07	0.05	>100%	0.06	0.06	n/a*	0.38	0.10	36%
50 Year Wet	Pre-Mine	0.79	n/a	n/a	0.53	n/a	n/a	0.40	n/a	n/a	0.07	n/a	n/a	0.00	n/a	n/a	0.47	n/a	n/a
	Construction (Year -1)	0.00	-0.79	-100%	0.00	-0.53	-100%	0.00	-0.40	-100%	0.00	-0.07	-100%	0.00	0.00	n/a*	0.00	-0.47	-100%
	Operations 1	0.00	-0.79	-100%	0.00	-0.53	-100%	0.00	-0.40	-100%	0.00	-0.07	-100%	0.00	0.00	n/a*	0.00	-0.47	-100%
	Operations 1 (Year 22)	0.00	-0.79	-100%	0.00	-0.53	-100%	0.00	-0.40	-100%	0.00	-0.07	-100%	0.00	0.00	n/a*	0.00	-0.47	-100%
	Operations 2 (Year 27)	0.17	-0.63	-79%	0.31	-0.22	-42%	0.20	-0.21	-52%	0.11	0.04	54%	0.10	0.10	n/a*	0.11	-0.36	-77%
	Closure (Year 30)	0.48	-0.32	-40%	0.36	-0.17	-32%	0.54	0.14	35%	0.12	0.05	69%	0.11	0.10	n/a*	0.58	0.11	24%
	Post-closure (Year 50)	0.65	-0.14	-18%	0.37	-0.16	-31%	0.71	0.30	75%	0.10	0.03	36%	0.07	0.07	n/a*	0.58	0.11	24%
50 Year Dry	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.13	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.13	-100%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.13	-100%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.13	-100%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.13	-100%
	Closure (Year 30)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	-0.13	-100%
	Post-closure (Year 50)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.04	0.04	n/a*	0.05	0.05	n/a*	0.05	0.05	n/a*	0.25	0.12	91%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C5a. Average Monthly Flows at Node 5 (P-Creek at Harper Creek Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	7.6	Discharge	m <sup>3</sup> /s	0.01	0.01	0.01	0.09	0.55	0.52	0.15	0.05	0.03	0.04	0.02	0.01	0.12
			Unit Runoff	l/s/km <sup>2</sup>	1.7	1.6	1.6	12.4	71.8	68.3	19.4	6.2	3.7	5.1	2.8	1.9	16.4
-1	End of Construction	7.3	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.08	0.60	0.55	0.10	0.03	0.02	0.02	0.01	0.02	0.12
			Unit Runoff	l/s/km <sup>2</sup>	2.3	2.3	2.3	10.6	81.5	74.7	13.5	4.5	2.1	3.2	1.7	2.3	16.7
		-4%	Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.02 -18%	0.05 9%	0.02 5%	-0.05 -33%	-0.01 -31%	-0.01 -47%	-0.02 -41%	-0.01 -41%	0.00 0%	0.00
10	Operations I	5.0	Discharge	m <sup>3</sup> /s	0.00	0.00	0.01	0.02	0.23	0.17	0.03	0.01	0.00	0.01	0.05	0.02	0.05
			Unit Runoff	l/s/km <sup>2</sup>	0.6	0.1	1.2	3.1	45.6	34.4	6.0	1.7	0.5	2.2	9.7	3.9	9.1
		-35%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -77%	-0.01 -96%	-0.01 -53%	-0.08 -84%	-0.32 -59%	-0.35 -67%	-0.12 -80%	-0.04 -82%	-0.03 -91%	-0.03 -72%	0.03 >100%	0.01 37%	-0.08
22	Operations I	4.2	Discharge	m <sup>3</sup> /s	0.00	0.00	0.01	0.02	0.22	0.16	0.03	0.01	0.00	0.01	0.05	0.02	0.04
			Unit Runoff	l/s/km <sup>2</sup>	0.8	0.1	1.5	3.6	52.7	38.6	6.6	1.9	0.6	2.7	12.2	4.9	10.5
		-45%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -75%	-0.01 -96%	-0.01 -49%	-0.08 -84%	-0.33 -60%	-0.36 -69%	-0.12 -81%	-0.04 -83%	-0.03 -91%	-0.03 -71%	0.03 >100%	0.01 46%	-0.08
27	Operations II	4.5	Discharge	m <sup>3</sup> /s	0.00	0.00	0.01	0.02	0.24	0.19	0.03	0.01	0.00	0.01	0.04	0.02	0.05
			Unit Runoff	l/s/km <sup>2</sup>	0.6	0.1	1.1	3.4	53.3	42.4	7.2	2.3	0.7	2.7	8.8	3.5	10.5
		-41%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -79%	-0.01 -96%	-0.01 -59%	-0.08 -84%	-0.31 -56%	-0.33 -63%	-0.12 -78%	-0.04 -78%	-0.03 -90%	-0.03 -69%	0.02 81%	0.00 0%	-0.08
30	Closure	4.5	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.02	0.25	0.20	0.03	0.01	0.00	0.01	0.04	0.02	0.05
			Unit Runoff	l/s/km <sup>2</sup>	0.6	0.1	1.0	3.5	53.9	44.0	7.6	2.4	0.7	3.0	8.7	3.5	10.7
		-40%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -79%	-0.01 -96%	-0.01 -63%	-0.08 -83%	-0.30 -55%	-0.32 -62%	-0.11 -77%	-0.04 -77%	-0.03 -89%	-0.03 -65%	0.02 82%	0.00 0%	-0.08
50	Post-Closure	4.6	Discharge	m <sup>3</sup> /s	0.00	0.00	0.00	0.02	0.25	0.20	0.03	0.01	0.00	0.02	0.04	0.02	0.05
			Unit Runoff	l/s/km <sup>2</sup>	0.6	0.1	1.0	3.5	54.0	43.7	7.5	2.3	0.7	3.6	8.7	3.5	10.8
		-40%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -79%	-0.01 -96%	-0.01 -63%	-0.08 -83%	-0.30 -55%	-0.32 -62%	-0.11 -77%	-0.04 -78%	-0.03 -89%	-0.02 -57%	0.02 84%	0.00 0%	-0.08

**Appendix 12-C5b. Sensitivity Analysis for Monthly Flows at Node 5 (P-Creek at Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.09	n/a	n/a	0.55	n/a	n/a	0.52	n/a	n/a	0.15	n/a	n/a
	Construction (Year -1)	0.02	0.00	32%	0.02	0.00	33%	0.02	0.00	34%	0.08	-0.02	-18%	0.60	0.05	9%	0.55	0.02	5%	0.10	-0.05	-33%
	Operations 1 (Year 10)	0.00	-0.01	-77%	0.00	-0.01	-96%	0.01	-0.01	-53%	0.02	-0.08	-84%	0.23	-0.32	-59%	0.17	-0.35	-67%	0.03	-0.12	-80%
	Operations 1 (Year 22)	0.00	-0.01	-75%	0.00	-0.01	-96%	0.01	-0.01	-49%	0.02	-0.08	-84%	0.22	-0.33	-60%	0.16	-0.36	-69%	0.03	-0.12	-81%
	Operations 2 (Year 27)	0.00	-0.01	-79%	0.00	-0.01	-96%	0.01	-0.01	-59%	0.02	-0.08	-84%	0.24	-0.31	-56%	0.19	-0.33	-63%	0.03	-0.12	-78%
	Closure (Year 30)	0.00	-0.01	-79%	0.00	-0.01	-96%	0.00	-0.01	-63%	0.02	-0.08	-83%	0.25	-0.30	-55%	0.20	-0.32	-62%	0.03	-0.11	-77%
	Post-closure (Year 50)	0.00	-0.01	-79%	0.00	-0.01	-96%	0.00	-0.01	-63%	0.02	-0.08	-83%	0.25	-0.30	-55%	0.20	-0.32	-62%	0.03	-0.11	-77%
50 Year Wet	Pre-Mine	0.02	n/a	n/a	0.02	n/a	n/a	0.02	n/a	n/a	0.35	n/a	n/a	0.91	n/a	n/a	1.05	n/a	n/a	0.58	n/a	n/a
	Construction (Year -1)	0.02	0.00	0%	0.02	0.00	1%	0.02	0.00	11%	0.22	-0.13	-38%	0.86	-0.05	-5%	0.99	-0.06	-6%	0.22	-0.36	-62%
	Operations 1	0.01	0.00	-29%	0.00	-0.01	-88%	0.01	-0.01	-62%	0.06	-0.30	-84%	0.36	-0.54	-60%	0.36	-0.70	-66%	0.11	-0.48	-82%
	Operations 1 (Year 22)	0.01	0.00	-22%	0.00	-0.01	-87%	0.01	-0.01	-59%	0.06	-0.30	-84%	0.35	-0.56	-62%	0.32	-0.73	-69%	0.10	-0.48	-83%
	Operations 2 (Year 27)	0.01	-0.01	-32%	0.00	-0.01	-88%	0.01	-0.01	-66%	0.06	-0.29	-83%	0.37	-0.53	-59%	0.37	-0.68	-65%	0.12	-0.47	-80%
	Closure (Year 30)	0.01	-0.01	-34%	0.00	-0.01	-89%	0.00	-0.01	-70%	0.06	-0.29	-83%	0.38	-0.52	-58%	0.39	-0.67	-63%	0.13	-0.45	-78%
	Post-closure (Year 50)	0.01	-0.01	-33%	0.00	-0.01	-88%	0.00	-0.01	-70%	0.06	-0.29	-82%	0.38	-0.52	-58%	0.39	-0.66	-63%	0.13	-0.45	-77%
50 Year Dry	Pre-Mine	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.24	n/a	n/a	0.07	n/a	n/a	0.03	n/a	n/a
	Construction (Year -1)	0.02	0.01	77%	0.02	0.01	77%	0.02	0.01	77%	0.02	0.00	46%	0.38	0.14	58%	0.18	0.11	>100%	0.03	0.00	9%
	Operations 1 (Year 10)	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.09	-0.15	-62%	0.04	-0.03	-47%	0.01	-0.03	-82%
	Operations 1 (Year 22)	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.09	-0.15	-62%	0.04	-0.03	-47%	0.01	-0.03	-82%
	Operations 2 (Year 27)	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.11	-0.14	-56%	0.04	-0.03	-46%	0.01	-0.02	-76%
	Closure (Year 30)	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.00	-0.01	-100%	0.11	-0.13	-53%	0.04	-0.03	-45%	0.01	-0.02	-75%
	Post-closure (Year 50)	0.00	-0.01	-100%	0.00	-0.01	-100%	0.0	0.0	-100%	0.00	-0.01	-100%	0.11	-0.13	-54%	0.04	-0.03	-47%	0.01	-0.02	-77%

**Appendix 12-C5b. Sensitivity Analysis for Monthly Flows at Node 5 (P-Creek at Harper Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.05	n/a	n/a	0.03	n/a	n/a	0.04	n/a	n/a	0.02	n/a	n/a	0.01	n/a	n/a	0.12	n/a	n/a
	Construction (Year -1)	0.03	-0.01	-31%	0.02	-0.01	-47%	0.02	-0.02	-41%	0.01	-0.01	-41%	0.02	0.00	17%	0.12	0.00	-2%
	Operations 1 (Year 10)	0.01	-0.04	-82%	0.00	-0.03	-91%	0.01	-0.03	-72%	0.05	0.03	>100%	0.02	0.01	37%	0.05	-0.08	-64%
	Operations 1 (Year 22)	0.01	-0.04	-83%	0.00	-0.03	-91%	0.01	-0.03	-71%	0.05	0.03	>100%	0.02	0.01	46%	0.04	-0.08	-65%
	Operations 2 (Year 27)	0.01	-0.04	-78%	0.00	-0.03	-90%	0.01	-0.03	-69%	0.04	0.02	81%	0.02	0.00	12%	0.05	-0.08	-62%
	Closure (Year 30)	0.01	-0.04	-77%	0.00	-0.03	-89%	0.01	-0.03	-65%	0.04	0.02	82%	0.02	0.00	12%	0.05	-0.08	-61%
	Post-closure (Year 50)	0.01	-0.04	-78%	0.00	-0.03	-89%	0.02	-0.02	-57%	0.04	0.02	84%	0.02	0.00	14%	0.05	-0.08	-61%
50 Year Wet	Pre-Mine	0.30	n/a	n/a	0.13	n/a	n/a	0.20	n/a	n/a	0.05	n/a	n/a	0.02	n/a	n/a	0.21	n/a	n/a
	Construction (Year -1)	0.10	-0.21	-69%	0.05	-0.08	-60%	0.08	-0.12	-61%	0.02	-0.03	-64%	0.02	0.00	-14%	0.17	-0.04	-19%
	Operations 1	0.04	-0.26	-85%	0.01	-0.12	-91%	0.06	-0.15	-73%	0.20	0.14	>100%	0.08	0.06	>100%	0.08	-0.13	-63%
	Operations 1 (Year 22)	0.04	-0.26	-86%	0.01	-0.12	-91%	0.06	-0.15	-72%	0.20	0.15	>100%	0.08	0.06	>100%	0.07	-0.14	-65%
	Operations 2 (Year 27)	0.06	-0.24	-80%	0.02	-0.12	-88%	0.07	-0.14	-67%	0.17	0.12	>100%	0.07	0.05	>100%	0.08	-0.13	-63%
	Closure (Year 30)	0.07	-0.24	-78%	0.02	-0.12	-87%	0.08	-0.13	-62%	0.17	0.11	>100%	0.07	0.05	>100%	0.08	-0.13	-62%
	Post-closure (Year 50)	0.07	-0.24	-78%	0.02	-0.12	-87%	0.08	-0.12	-61%	0.18	0.12	>100%	0.07	0.05	>100%	0.08	-0.13	-61%
50 Year Dry	Pre-Mine	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.06	n/a	n/a
	Construction (Year -1)	0.01	0.00	-2%	0.01	0.00	-26%	0.01	0.00	-17%	0.01	0.00	-17%	0.02	0.01	66%	0.08	0.02	43%
	Operations 1 (Year 10)	0.00	-0.01	-91%	0.00	-0.01	-98%	0.00	-0.01	-93%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.02	-0.04	-64%
	Operations 1 (Year 22)	0.00	-0.01	-91%	0.00	-0.01	-98%	0.00	-0.01	-93%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.02	-0.04	-64%
	Operations 2 (Year 27)	0.00	-0.01	-89%	0.00	-0.01	-98%	0.00	-0.01	-95%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.02	-0.03	-59%
	Closure (Year 30)	0.00	-0.01	-89%	0.00	-0.01	-98%	0.00	-0.01	-96%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.02	-0.03	-58%
	Post-closure (Year 50)	0.00	-0.01	-91%	0.00	-0.01	-98%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.00	-0.01	-99%	0.02	-0.03	-59%



**Appendix 12-C6a. Average Monthly Flows at Node 6 (Jones Creek above North Thompson River Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	17.6	Discharge	m <sup>3</sup> /s	0.01	0.01	0.01	0.25	0.74	0.86	0.47	0.16	0.07	0.10	0.10	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.7	0.3	0.8	14.0	42.1	48.7	26.8	9.2	4.2	6.0	5.6	1.8	13.3
-1	End of Construction	17.5	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.26	0.80	0.91	0.45	0.10	0.04	0.09	0.09	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.5	0.0	0.0	14.8	45.6	51.8	25.6	6.0	2.1	4.9	5.3	1.6	13.2
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -37%	-0.01 -95%	-0.01 -100%	0.01 6%	0.06 8%	0.05 6%	-0.02 -5%	-0.06 -35%	-0.04 -49%	-0.02 -18%	-0.01 -6%	0.00 -10%	0.00
10	Operations I	17.1	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.26	0.78	0.87	0.43	0.10	0.04	0.09	0.09	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.7	0.1	0.0	14.9	45.5	51.1	25.3	6.1	2.3	5.1	5.5	1.8	13.2
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -8%	0.00 -56%	-0.01 -100%	0.01 4%	0.04 5%	0.02 2%	-0.04 -8%	-0.06 -36%	-0.03 -47%	-0.02 -17%	0.00 -4%	0.00	-4%
22	Operations I	17.0	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.25	0.80	0.91	0.45	0.10	0.04	0.09	0.09	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.7	0.2	0.0	15.0	47.1	53.9	26.6	6.1	2.4	5.2	5.6	1.8	13.7
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -1%	0.00 -43%	-0.01 -100%	0.01 4%	0.06 8%	0.06 7%	-0.02 -4%	-0.06 -35%	-0.03 -45%	-0.02 -16%	0.00 -4%	0.00	-1%
27	Operations II	17.2	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.26	0.80	0.91	0.45	0.10	0.04	0.09	0.10	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.7	0.2	0.0	15.0	46.5	52.9	26.1	6.1	2.3	5.1	5.5	1.8	13.5
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -4%	0.00 -50%	-0.01 -100%	0.01 5%	0.06 8%	0.06 7%	-0.02 -4%	-0.06 -35%	-0.03 -46%	-0.02 -16%	0.00 -3%	0.00	-3%
30	Closure	17.4	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.26	0.80	0.91	0.45	0.11	0.04	0.09	0.10	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.7	0.1	0.0	15.0	45.9	52.2	25.9	6.0	2.2	5.1	5.5	1.7	13.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -10%	0.00 -63%	-0.01 -99%	0.02 7%	0.06 8%	0.05 6%	-0.02 -4%	-0.06 -35%	-0.03 -47%	-0.02 -15%	0.00 -3%	0.00	-5%
50	Post-Closure	17.6	Discharge	m <sup>3</sup> /s	0.01	0.00	0.00	0.26	0.80	0.91	0.45	0.11	0.04	0.09	0.09	0.03	0.23
			Unit Runoff	l/s/km <sup>2</sup>	0.6	0.1	0.0	14.7	45.6	52.0	25.7	6.0	2.2	5.0	5.4	1.6	13.2
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 -19%	0.00 -82%	-0.01 -98%	0.01 5%	0.06 8%	0.06 7%	-0.02 -4%	-0.06 -34%	-0.04 -48%	-0.02 -17%	0.00 -4%	0.00	-9%

**Appendix 12-C6b. Sensitivity Analysis for Monthly Flows at Node 6 (Jones Creek above North Thompson River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.01	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.25	n/a	n/a	0.74	n/a	n/a	0.86	n/a	n/a	0.47	n/a	n/a
	Construction (Year -1)	0.01	0.00	-37%	0.00	-0.01	-95%	0.00	-0.01	-100%	0.26	0.01	6%	0.80	0.06	8%	0.91	0.05	6%	0.45	-0.02	-5%
	Operations 1 (Year 10)	0.01	0.00	-8%	0.00	0.00	-56%	0.00	-0.01	-100%	0.26	0.01	4%	0.78	0.04	5%	0.87	0.02	2%	0.43	-0.04	-8%
	Operations 1 (Year 22)	0.01	0.00	-1%	0.00	0.00	-43%	0.00	-0.01	-100%	0.25	0.01	4%	0.80	0.06	8%	0.91	0.06	7%	0.45	-0.02	-4%
	Operations 2 (Year 27)	0.01	0.00	-4%	0.00	0.00	-50%	0.00	-0.01	-100%	0.26	0.01	5%	0.80	0.06	8%	0.91	0.06	7%	0.45	-0.02	-4%
	Closure (Year 30)	0.01	0.00	-10%	0.00	0.00	-63%	0.00	-0.01	-99%	0.26	0.02	7%	0.80	0.06	8%	0.91	0.05	6%	0.45	-0.02	-4%
	Post-closure (Year 50)	0.01	0.00	-19%	0.00	0.00	-82%	0.00	-0.01	-98%	0.26	0.01	5%	0.80	0.06	8%	0.91	0.06	7%	0.45	-0.02	-4%
50 Year Wet	Pre-Mine	0.04	n/a	n/a	0.03	n/a	n/a	0.13	n/a	n/a	0.51	n/a	n/a	1.25	n/a	n/a	1.74	n/a	n/a	1.19	n/a	n/a
	Construction (Year -1)	0.02	-0.03	-64%	0.00	-0.03	-97%	0.00	-0.13	-100%	0.52	0.01	2%	1.17	-0.07	-6%	1.62	-0.12	-7%	0.96	-0.23	-19%
	Operations 1	0.03	-0.02	-35%	0.01	-0.02	-71%	0.00	-0.13	-100%	0.51	0.00	0%	1.14	-0.10	-8%	1.57	-0.17	-10%	0.94	-0.25	-21%
	Operations 1 (Year 22)	0.03	-0.01	-32%	0.01	-0.02	-64%	0.00	-0.13	-100%	0.52	0.01	1%	1.17	-0.08	-6%	1.61	-0.13	-8%	1.00	-0.18	-16%
	Operations 2 (Year 27)	0.03	-0.01	-32%	0.01	-0.02	-67%	0.00	-0.13	-100%	0.52	0.01	2%	1.18	-0.07	-6%	1.62	-0.12	-7%	1.00	-0.19	-16%
	Closure (Year 30)	0.03	-0.02	-35%	0.01	-0.02	-74%	0.00	-0.12	-100%	0.53	0.02	5%	1.18	-0.07	-5%	1.63	-0.11	-7%	0.98	-0.20	-17%
	Post-closure (Year 50)	0.03	-0.02	-40%	0.00	-0.03	-87%	0.00	-0.12	-98%	0.52	0.02	3%	1.19	-0.06	-5%	1.64	-0.10	-6%	0.97	-0.22	-18%
50 Year Dry	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.02	n/a	n/a	0.37	n/a	n/a	0.28	n/a	n/a	0.07	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.04	0.02	>100%	0.48	0.11	31%	0.42	0.14	51%	0.12	0.05	79%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.05	>100%	0.48	0.11	30%	0.40	0.12	43%	0.11	0.04	63%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.04	0.02	>100%	0.47	0.10	28%	0.42	0.15	53%	0.11	0.04	60%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.04	0.02	>100%	0.48	0.11	29%	0.42	0.15	53%	0.11	0.04	65%
	Closure (Year 30)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.03	0.02	>100%	0.48	0.11	29%	0.42	0.14	52%	0.11	0.04	67%
	Post-closure (Year 50)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.0	0.0	n/a*	0.03	0.02	>100%	0.48	0.11	30%	0.42	0.14	51%	0.11	0.05	71%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C6b. Sensitivity Analysis for Monthly Flows at Node 6 (Jones Creek above North Thompson River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.16	n/a	n/a	0.07	n/a	n/a	0.10	n/a	n/a	0.10	n/a	n/a	0.03	n/a	n/a	0.23	n/a	n/a
	Construction (Year -1)	0.10	-0.06	-35%	0.04	-0.04	-49%	0.09	-0.02	-18%	0.09	-0.01	-6%	0.03	0.00	-10%	0.23	0.00	-2%
	Operations 1 (Year 10)	0.10	-0.06	-36%	0.04	-0.03	-47%	0.09	-0.02	-17%	0.09	0.00	-4%	0.03	0.00	-4%	0.23	-0.01	-4%
	Operations 1 (Year 22)	0.10	-0.06	-35%	0.04	-0.03	-45%	0.09	-0.02	-16%	0.09	0.00	-4%	0.03	0.00	-1%	0.23	0.00	-1%
	Operations 2 (Year 27)	0.10	-0.06	-35%	0.04	-0.03	-46%	0.09	-0.02	-16%	0.10	0.00	-3%	0.03	0.00	-3%	0.23	0.00	-1%
	Closure (Year 30)	0.11	-0.06	-35%	0.04	-0.03	-47%	0.09	-0.02	-15%	0.10	0.00	-3%	0.03	0.00	-5%	0.23	0.00	-1%
	Post-closure (Year 50)	0.11	-0.06	-34%	0.04	-0.04	-48%	0.09	-0.02	-17%	0.09	0.00	-4%	0.03	0.00	-9%	0.23	0.00	-1%
50 Year Wet	Pre-Mine	0.57	n/a	n/a	0.37	n/a	n/a	0.38	n/a	n/a	0.34	n/a	n/a	0.09	n/a	n/a	0.42	n/a	n/a
	Construction (Year -1)	0.28	-0.29	-51%	0.13	-0.24	-66%	0.29	-0.08	-22%	0.31	-0.03	-8%	0.07	-0.02	-24%	0.35	-0.07	-16%
	Operations 1	0.27	-0.29	-52%	0.13	-0.23	-64%	0.30	-0.08	-21%	0.32	-0.03	-8%	0.07	-0.02	-18%	0.34	-0.08	-19%
	Operations 1 (Year 22)	0.27	-0.30	-53%	0.14	-0.23	-63%	0.30	-0.08	-20%	0.31	-0.03	-8%	0.08	-0.01	-16%	0.36	-0.06	-15%
	Operations 2 (Year 27)	0.27	-0.29	-52%	0.14	-0.23	-63%	0.31	-0.07	-19%	0.32	-0.02	-6%	0.08	-0.01	-16%	0.36	-0.06	-15%
	Closure (Year 30)	0.28	-0.29	-51%	0.14	-0.23	-63%	0.32	-0.06	-17%	0.29	-0.05	-15%	0.08	-0.01	-16%	0.36	-0.06	-15%
	Post-closure (Year 50)	0.28	-0.29	-50%	0.14	-0.23	-63%	0.27	-0.11	-30%	0.29	-0.05	-15%	0.07	-0.02	-23%	0.36	-0.07	-16%
50 Year Dry	Pre-Mine	0.02	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.08	n/a	n/a
	Construction (Year -1)	0.02	0.00	19%	0.01	0.00	n/a*	0.01	0.01	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.04	46%
	Operations 1 (Year 10)	0.02	0.00	4%	0.01	0.00	n/a*	0.01	0.01	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.03	39%
	Operations 1 (Year 22)	0.02	0.00	12%	0.01	0.00	n/a*	0.01	0.01	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.04	44%
	Operations 2 (Year 27)	0.02	0.00	5%	0.01	0.00	n/a*	0.01	0.01	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.04	45%
	Closure (Year 30)	0.02	0.00	2%	0.01	0.00	n/a*	0.01	0.01	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.04	45%
	Post-closure (Year 50)	0.02	0.00	0%	0.00	0.00	n/a*	0.01	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.12	0.04	45%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C7a. Average Monthly Flows at Node 7 (Baker Creek at North Thompson River Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	14.0	Discharge	m <sup>3</sup> /s	0.01	0.00	0.03	0.26	0.56	0.62	0.32	0.10	0.04	0.08	0.07	0.02	0.18
			Unit Runoff	l/s/km <sup>2</sup>	0.4	0.2	2.1	18.8	40.5	44.2	23.2	7.1	3.1	5.5	5.2	1.4	12.6
-1	End of Construction	13.8	Discharge	m <sup>3</sup> /s	0.00	0.00	0.01	0.26	0.55	0.60	0.31	0.08	0.02	0.06	0.07	0.02	0.17
			Unit Runoff	l/s/km <sup>2</sup>	0.1	0.0	1.1	18.5	39.8	43.6	22.4	6.1	1.7	4.6	4.8	1.2	12.0
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	-0.01 -50%	-0.01 -3%	-0.01 -2%	-0.01 -2%	-0.01 -4%	-0.02 -15%	-0.02 -44%	-0.01 -16%	-0.01 -9%	0.00 0%	-0.01 -6%
10	Operations I	13.2	Discharge	m <sup>3</sup> /s	0.00	0.00	0.03	0.26	0.52	0.55	0.28	0.08	0.03	0.06	0.06	0.02	0.16
			Unit Runoff	l/s/km <sup>2</sup>	0.3	0.3	2.4	19.3	39.6	41.8	21.0	5.9	1.9	4.7	4.9	1.3	11.9
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.01 -2%	-0.04 -7%	-0.06 -10%	-0.05 -15%	-0.02 -22%	-0.02 -41%	-0.01 -19%	-0.01 -12%	0.00 0%	-0.02 -10%
22	Operations I	12.8	Discharge	m <sup>3</sup> /s	0.00	0.00	0.03	0.25	0.50	0.52	0.25	0.07	0.03	0.06	0.06	0.02	0.15
			Unit Runoff	l/s/km <sup>2</sup>	0.3	0.3	2.3	19.5	39.3	40.9	20.0	5.4	2.0	4.3	4.6	1.2	11.7
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.01 -5%	-0.06 -11%	-0.10 -16%	-0.07 -21%	-0.03 -30%	-0.02 -42%	-0.02 -28%	-0.01 -20%	0.00 0%	-0.03 -16%
27	Operations II	12.8	Discharge	m <sup>3</sup> /s	0.00	0.00	0.03	0.25	0.50	0.52	0.26	0.07	0.02	0.06	0.06	0.02	0.15
			Unit Runoff	l/s/km <sup>2</sup>	0.3	0.3	2.4	19.6	39.2	40.8	20.1	5.5	1.9	4.5	4.7	1.3	11.7
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.01 -4%	-0.06 -11%	-0.10 -15%	-0.07 -21%	-0.03 -29%	-0.02 -43%	-0.02 -25%	-0.01 -17%	0.00 0%	-0.03 -15%
30	Closure	12.8	Discharge	m <sup>3</sup> /s	0.00	0.00	0.03	0.25	0.50	0.53	0.26	0.07	0.02	0.06	0.06	0.02	0.15
			Unit Runoff	l/s/km <sup>2</sup>	0.3	0.3	2.5	19.5	39.2	40.9	20.1	5.5	1.9	4.5	4.8	1.3	11.7
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.01 -5%	-0.06 -11%	-0.09 -15%	-0.07 -20%	-0.03 -29%	-0.02 -43%	-0.02 -24%	-0.01 -17%	0.00 0%	-0.03 -15%
50	Post-Closure	12.9	Discharge	m <sup>3</sup> /s	0.00	0.00	0.03	0.25	0.50	0.52	0.26	0.07	0.02	0.06	0.06	0.02	0.15
			Unit Runoff	l/s/km <sup>2</sup>	0.3	0.3	2.5	19.4	39.1	40.8	20.0	5.5	1.9	4.5	4.7	1.3	11.7
			Change from Pre-Mine	m <sup>3</sup> /s %	0.00 0%	0.00 0%	0.00 0%	-0.01 -5%	-0.06 -11%	-0.09 -15%	-0.07 -21%	-0.03 -29%	-0.02 -44%	-0.02 -25%	-0.01 -17%	0.00 0%	-0.03 -15%

**Appendix 12-C7b. Sensitivity Analysis for Monthly Flows at Node 7 (Baker Creek at North Thompson River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.01	n/a	n/a	0.00	n/a	n/a	0.03	n/a	n/a	0.26	n/a	n/a	0.56	n/a	n/a	0.62	n/a	n/a	0.32	n/a	n/a
	Construction (Year -1)	0.00	0.00	-75%	0.00	0.00	n/a*	0.01	-0.01	-50%	0.26	-0.01	-3%	0.55	-0.01	-2%	0.60	-0.01	-2%	0.31	-0.01	-4%
	Operations 1 (Year 10)	0.00	0.00	-22%	0.00	0.00	n/a*	0.03	0.00	7%	0.26	-0.01	-2%	0.52	-0.04	-7%	0.55	-0.06	-10%	0.28	-0.05	-15%
	Operations 1 (Year 22)	0.00	0.00	-36%	0.00	0.00	n/a*	0.03	0.00	-1%	0.25	-0.01	-5%	0.50	-0.06	-11%	0.52	-0.10	-16%	0.25	-0.07	-21%
	Operations 2 (Year 27)	0.00	0.00	-38%	0.00	0.00	n/a*	0.03	0.00	4%	0.25	-0.01	-4%	0.50	-0.06	-11%	0.52	-0.10	-15%	0.26	-0.07	-21%
	Closure (Year 30)	0.00	0.00	-36%	0.00	0.00	n/a*	0.03	0.00	7%	0.25	-0.01	-5%	0.50	-0.06	-11%	0.53	-0.09	-15%	0.26	-0.07	-20%
	Post-closure (Year 50)	0.00	0.00	-40%	0.00	0.00	n/a*	0.03	0.00	7%	0.25	-0.01	-5%	0.50	-0.06	-11%	0.52	-0.09	-15%	0.26	-0.07	-21%
50 Year Wet	Pre-Mine	0.02	n/a	n/a	0.01	n/a	n/a	0.18	n/a	n/a	0.49	n/a	n/a	0.92	n/a	n/a	1.27	n/a	n/a	0.84	n/a	n/a
	Construction (Year -1)	0.00	-0.02	-80%	0.00	-0.01	-96%	0.08	-0.09	-53%	0.46	-0.03	-7%	0.78	-0.14	-16%	1.04	-0.23	-18%	0.67	-0.17	-20%
	Operations 1	0.02	-0.01	-31%	0.02	0.00	33%	0.18	0.00	2%	0.45	-0.04	-9%	0.74	-0.18	-19%	0.97	-0.30	-23%	0.62	-0.21	-26%
	Operations 1 (Year 22)	0.01	-0.01	-41%	0.02	0.00	30%	0.16	-0.02	-10%	0.43	-0.06	-12%	0.71	-0.21	-23%	0.93	-0.34	-27%	0.58	-0.26	-31%
	Operations 2 (Year 27)	0.01	-0.01	-43%	0.02	0.00	31%	0.18	0.00	-1%	0.44	-0.06	-12%	0.72	-0.21	-22%	0.93	-0.34	-26%	0.58	-0.26	-31%
	Closure (Year 30)	0.01	-0.01	-42%	0.02	0.00	32%	0.18	0.00	2%	0.43	-0.06	-12%	0.72	-0.21	-22%	0.94	-0.33	-26%	0.58	-0.25	-30%
	Post-closure (Year 50)	0.01	-0.01	-45%	0.02	0.00	31%	0.18	0.00	2%	0.44	-0.06	-11%	0.71	-0.21	-23%	0.94	-0.33	-26%	0.59	-0.25	-30%
50 Year Dry	Pre-Mine	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.04	n/a	n/a	0.30	n/a	n/a	0.19	n/a	n/a	0.04	n/a	n/a
	Construction (Year -1)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.02	69%	0.36	0.06	19%	0.23	0.04	21%	0.06	0.02	47%
	Operations 1 (Year 10)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.02	65%	0.34	0.03	11%	0.19	0.00	2%	0.04	0.00	9%
	Operations 1 (Year 22)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.02	63%	0.32	0.02	7%	0.18	-0.01	-5%	0.04	0.00	5%
	Operations 2 (Year 27)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.02	64%	0.32	0.02	6%	0.18	-0.01	-7%	0.04	0.00	0%
	Closure (Year 30)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.06	0.02	64%	0.32	0.02	6%	0.18	-0.01	-6%	0.04	0.00	0%
	Post-closure (Year 50)	0.00	0.00	n/a*	0.00	0.00	n/a*	0.0	0.0	n/a*	0.06	0.02	64%	0.32	0.02	7%	0.18	-0.01	-6%	0.04	0.00	1%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C7b. Sensitivity Analysis for Monthly Flows at Node 7 (Baker Creek at North Thompson River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.10	n/a	n/a	0.04	n/a	n/a	0.08	n/a	n/a	0.07	n/a	n/a	0.02	n/a	n/a	0.18	n/a	n/a
	Construction (Year -1)	0.08	-0.02	-15%	0.02	-0.02	-44%	0.06	-0.01	-16%	0.07	-0.01	-9%	0.02	0.00	-14%	0.17	-0.01	-6%
	Operations 1 (Year 10)	0.08	-0.02	-22%	0.03	-0.02	-41%	0.06	-0.01	-19%	0.06	-0.01	-12%	0.02	0.00	-7%	0.16	-0.02	-10%
	Operations 1 (Year 22)	0.07	-0.03	-30%	0.03	-0.02	-42%	0.06	-0.02	-28%	0.06	-0.01	-20%	0.02	0.00	-18%	0.15	-0.03	-16%
	Operations 2 (Year 27)	0.07	-0.03	-29%	0.02	-0.02	-43%	0.06	-0.02	-25%	0.06	-0.01	-17%	0.02	0.00	-13%	0.15	-0.03	-15%
	Closure (Year 30)	0.07	-0.03	-29%	0.02	-0.02	-43%	0.06	-0.02	-24%	0.06	-0.01	-17%	0.02	0.00	-12%	0.15	-0.03	-15%
	Post-closure (Year 50)	0.07	-0.03	-29%	0.02	-0.02	-44%	0.06	-0.02	-25%	0.06	-0.01	-17%	0.02	0.00	-14%	0.15	-0.03	-15%
50 Year Wet	Pre-Mine	0.39	n/a	n/a	0.26	n/a	n/a	0.30	n/a	n/a	0.25	n/a	n/a	0.06	n/a	n/a	0.32	n/a	n/a
	Construction (Year -1)	0.26	-0.13	-33%	0.09	-0.17	-64%	0.23	-0.07	-23%	0.19	-0.06	-24%	0.05	-0.01	-19%	0.26	-0.06	-19%
	Operations 1	0.24	-0.14	-37%	0.10	-0.16	-61%	0.23	-0.07	-23%	0.18	-0.07	-28%	0.05	-0.01	-9%	0.25	-0.08	-23%
	Operations 1 (Year 22)	0.22	-0.17	-43%	0.10	-0.16	-60%	0.18	-0.12	-40%	0.17	-0.08	-33%	0.05	-0.01	-16%	0.23	-0.09	-27%
	Operations 2 (Year 27)	0.22	-0.16	-42%	0.10	-0.16	-62%	0.22	-0.08	-27%	0.17	-0.08	-32%	0.05	-0.01	-14%	0.24	-0.09	-27%
	Closure (Year 30)	0.22	-0.16	-42%	0.10	-0.16	-61%	0.22	-0.08	-26%	0.17	-0.08	-31%	0.05	-0.01	-14%	0.24	-0.09	-27%
	Post-closure (Year 50)	0.22	-0.16	-42%	0.10	-0.16	-63%	0.22	-0.08	-27%	0.17	-0.08	-31%	0.05	-0.01	-14%	0.24	-0.09	-27%
50 Year Dry	Pre-Mine	0.01	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.00	n/a	n/a	0.06	n/a	n/a
	Construction (Year -1)	0.01	0.01	80%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.09	0.02	37%
	Operations 1 (Year 10)	0.01	0.00	10%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	0.01	15%
	Operations 1 (Year 22)	0.01	0.00	-11%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	0.00	8%
	Operations 2 (Year 27)	0.01	0.00	-9%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	0.01	8%
	Closure (Year 30)	0.01	0.00	-8%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	0.01	9%
	Post-closure (Year 50)	0.01	0.00	-7%	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.00	0.00	n/a*	0.07	0.01	9%

\*: Pre-mine flow is very low (less than 0.005 m<sup>3</sup>/s); therefore, flow changes are not representative if provided as percent of pre-mine flows

**Appendix 12-C8a. Average Monthly Flows at Node 8 (Harper Creek below P-Creek Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	16.6	Discharge	m <sup>3</sup> /s	0.04	0.03	0.03	0.25	1.14	0.87	0.24	0.10	0.07	0.11	0.07	0.04	0.25
			Unit Runoff	l/s/km <sup>2</sup>	2.2	1.9	1.7	14.9	68.6	52.7	14.6	5.9	4.2	6.4	4.0	2.5	15.0
-1	End of Construction	16.3	Discharge	m <sup>3</sup> /s	0.05	0.05	0.04	0.28	1.19	0.85	0.24	0.11	0.07	0.11	0.08	0.05	0.26
			Unit Runoff	l/s/km <sup>2</sup>	3.1	2.8	2.6	17.4	72.8	52.3	14.6	6.7	4.5	6.5	4.7	3.1	15.9
		-2%	Change from Pre-Mine	m <sup>3</sup> /s %	0.01 40%	0.01 43%	0.01 44%	0.04 14%	0.05 4%	-0.02 -3%	0.00 0%	0.01 11%	0.00 0%	0.00 0%	0.01 14%	0.01 20%	0.01 4%
10	Operations I	13.9	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.21	0.83	0.54	0.16	0.07	0.05	0.08	0.05	0.03	0.17
			Unit Runoff	l/s/km <sup>2</sup>	1.7	1.4	1.2	14.8	59.5	38.9	11.3	5.1	3.5	5.7	3.6	2.1	12.4
		-16%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -35%	-0.01 -39%	-0.01 -40%	-0.04 -16%	-0.31 -27%	-0.33 -38%	-0.08 -35%	-0.03 -28%	-0.02 -30%	-0.03 -25%	-0.02 -24%	-0.01 -31%	-0.08 -30%
22	Operations I	13.2	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.21	0.82	0.53	0.15	0.07	0.05	0.08	0.05	0.03	0.17
			Unit Runoff	l/s/km <sup>2</sup>	1.8	1.5	1.3	15.6	62.4	40.3	11.6	5.3	3.7	6.0	3.8	2.2	12.9
		-21%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -36%	-0.01 -40%	-0.01 -41%	-0.04 -17%	-0.32 -28%	-0.34 -39%	-0.09 -37%	-0.03 -29%	-0.02 -31%	-0.03 -26%	-0.02 -25%	-0.01 -32%	-0.08 -31%
27	Operations II	13.5	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.21	0.83	0.56	0.16	0.07	0.05	0.08	0.05	0.03	0.18
			Unit Runoff	l/s/km <sup>2</sup>	1.7	1.4	1.2	15.5	61.9	41.4	12.0	5.5	3.7	5.7	3.7	2.1	13.0
		-19%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -35%	-0.01 -39%	-0.01 -42%	-0.04 -16%	-0.30 -27%	-0.32 -36%	-0.08 -33%	-0.02 -24%	-0.02 -29%	-0.03 -27%	-0.02 -25%	-0.01 -32%	-0.07 -29%
30	Closure	13.5	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.21	0.85	0.57	0.17	0.08	0.05	0.08	0.05	0.03	0.18
			Unit Runoff	l/s/km <sup>2</sup>	1.7	1.4	1.3	15.6	62.7	42.0	12.3	5.6	3.7	5.9	3.7	2.1	13.2
		-19%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -35%	-0.01 -39%	-0.01 -40%	-0.04 -15%	-0.29 -26%	-0.31 -35%	-0.08 -31%	-0.02 -23%	-0.02 -29%	-0.03 -25%	-0.02 -24%	-0.01 -31%	-0.07 -28%
50	Post-Closure	13.5	Discharge	m <sup>3</sup> /s	0.02	0.02	0.02	0.21	0.85	0.57	0.17	0.07	0.05	0.08	0.05	0.03	0.18
			Unit Runoff	l/s/km <sup>2</sup>	1.7	1.4	1.3	15.6	62.5	42.3	12.3	5.5	3.6	5.8	3.8	2.1	13.2
		-18%	Change from Pre-Mine	m <sup>3</sup> /s %	-0.01 -35%	-0.01 -40%	-0.01 -41%	-0.04 -15%	-0.29 -26%	-0.30 -35%	-0.08 -31%	-0.02 -23%	-0.02 -29%	-0.03 -25%	-0.02 -24%	-0.01 -31%	-0.07 -28%

**Appendix 12-C8b. Sensitivity Analysis for Monthly Flows at Node 8 (Harper Creek below P-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.04	n/a	n/a	0.03	n/a	n/a	0.03	n/a	n/a	0.25	n/a	n/a	1.14	n/a	n/a	0.87	n/a	n/a	0.24	n/a	n/a
	Construction (Year -1)	0.05	0.01	40%	0.05	0.01	43%	0.04	0.01	44%	0.28	0.04	14%	1.19	0.05	4%	0.85	-0.02	-3%	0.24	0.00	-2%
	Operations 1 (Year 10)	0.02	-0.01	-35%	0.02	-0.01	-39%	0.02	-0.01	-40%	0.21	-0.04	-16%	0.83	-0.31	-27%	0.54	-0.33	-38%	0.16	-0.08	-35%
	Operations 1 (Year 22)	0.02	-0.01	-36%	0.02	-0.01	-40%	0.02	-0.01	-41%	0.21	-0.04	-17%	0.82	-0.32	-28%	0.53	-0.34	-39%	0.15	-0.09	-37%
	Operations 2 (Year 27)	0.02	-0.01	-35%	0.02	-0.01	-39%	0.02	-0.01	-42%	0.21	-0.04	-16%	0.83	-0.30	-27%	0.56	-0.32	-36%	0.16	-0.08	-33%
	Closure (Year 30)	0.02	-0.01	-35%	0.02	-0.01	-39%	0.02	-0.01	-40%	0.21	-0.04	-15%	0.85	-0.29	-26%	0.57	-0.31	-35%	0.17	-0.08	-31%
	Post-closure (Year 50)	0.02	-0.01	-35%	0.02	-0.01	-40%	0.02	-0.01	-41%	0.21	-0.04	-15%	0.85	-0.29	-26%	0.57	-0.30	-35%	0.17	-0.08	-31%
50 Year Wet	Pre-Mine	0.06	n/a	n/a	0.05	n/a	n/a	0.05	n/a	n/a	0.81	n/a	n/a	1.85	n/a	n/a	2.08	n/a	n/a	0.86	n/a	n/a
	Construction (Year -1)	0.07	0.01	15%	0.06	0.01	15%	0.06	0.01	19%	0.81	0.00	0%	1.76	-0.09	-5%	2.07	0.00	0%	0.91	0.05	6%
	Operations 1	0.04	-0.01	-24%	0.04	-0.01	-27%	0.04	-0.01	-16%	0.63	-0.18	-22%	1.25	-0.59	-32%	1.36	-0.71	-34%	0.60	-0.25	-30%
	Operations 1 (Year 22)	0.04	-0.01	-24%	0.04	-0.01	-27%	0.04	-0.01	-16%	0.63	-0.18	-22%	1.23	-0.61	-33%	1.34	-0.74	-35%	0.59	-0.26	-31%
	Operations 2 (Year 27)	0.04	-0.01	-25%	0.04	-0.01	-27%	0.04	-0.01	-18%	0.64	-0.17	-21%	1.23	-0.61	-33%	1.40	-0.68	-33%	0.63	-0.22	-26%
	Closure (Year 30)	0.04	-0.01	-24%	0.04	-0.01	-27%	0.04	-0.01	-16%	0.64	-0.17	-21%	1.27	-0.57	-31%	1.42	-0.66	-32%	0.66	-0.20	-23%
	Post-closure (Year 50)	0.04	-0.01	-24%	0.04	-0.01	-27%	0.04	-0.01	-16%	0.64	-0.17	-21%	1.27	-0.57	-31%	1.42	-0.65	-32%	0.66	-0.20	-23%
50 Year Dry	Pre-Mine	0.02	n/a	n/a	0.01	n/a	n/a	0.01	n/a	n/a	0.02	n/a	n/a	0.49	n/a	n/a	0.14	n/a	n/a	0.06	n/a	n/a
	Construction (Year -1)	0.04	0.02	>100%	0.04	0.02	>100%	0.03	0.02	>100%	0.05	0.03	>100%	0.46	-0.03	-7%	0.19	0.05	40%	0.08	0.02	41%
	Operations 1 (Year 10)	0.00	-0.01	-71%	0.00	-0.01	-82%	0.00	-0.01	-97%	0.01	-0.01	-68%	0.27	-0.22	-44%	0.11	-0.03	-23%	0.04	-0.02	-39%
	Operations 1 (Year 22)	0.00	-0.01	-71%	0.00	-0.01	-82%	0.00	-0.01	-97%	0.01	-0.01	-68%	0.27	-0.22	-44%	0.11	-0.03	-23%	0.03	-0.02	-42%
	Operations 2 (Year 27)	0.00	-0.01	-71%	0.00	-0.01	-83%	0.00	-0.01	-97%	0.01	-0.01	-68%	0.29	-0.20	-42%	0.11	-0.03	-22%	0.04	-0.02	-37%
	Closure (Year 30)	0.00	-0.01	-71%	0.00	-0.01	-82%	0.00	-0.01	-97%	0.01	-0.01	-68%	0.29	-0.20	-40%	0.11	-0.03	-22%	0.04	-0.02	-37%
	Post-closure (Year 50)	0.00	-0.01	-71%	0.00	-0.01	-82%	0.0	0.0	-97%	0.01	-0.01	-68%	0.29	-0.20	-40%	0.10	-0.03	-24%	0.03	-0.02	-41%



**Appendix 12-C8b. Sensitivity Analysis for Monthly Flows at Node 8 (Harper Creek below P-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.10	n/a	n/a	0.07	n/a	n/a	0.11	n/a	n/a	0.07	n/a	n/a	0.04	n/a	n/a	0.25	n/a	n/a
	Construction (Year -1)	0.11	0.01	11%	0.07	0.00	5%	0.11	0.00	0%	0.08	0.01	14%	0.05	0.01	20%	0.26	0.01	4%
	Operations 1 (Year 10)	0.07	-0.03	-28%	0.05	-0.02	-30%	0.08	-0.03	-25%	0.05	-0.02	-24%	0.03	-0.01	-31%	0.17	-0.08	-30%
	Operations 1 (Year 22)	0.07	-0.03	-29%	0.05	-0.02	-31%	0.08	-0.03	-26%	0.05	-0.02	-25%	0.03	-0.01	-32%	0.17	-0.08	-31%
	Operations 2 (Year 27)	0.07	-0.02	-24%	0.05	-0.02	-29%	0.08	-0.03	-27%	0.05	-0.02	-25%	0.03	-0.01	-32%	0.18	-0.07	-29%
	Closure (Year 30)	0.08	-0.02	-23%	0.05	-0.02	-29%	0.08	-0.03	-25%	0.05	-0.02	-24%	0.03	-0.01	-31%	0.18	-0.07	-28%
	Post-closure (Year 50)	0.07	-0.02	-23%	0.05	-0.02	-29%	0.08	-0.03	-25%	0.05	-0.02	-24%	0.03	-0.01	-31%	0.18	-0.07	-28%
50 Year Wet	Pre-Mine	0.58	n/a	n/a	0.23	n/a	n/a	0.47	n/a	n/a	0.14	n/a	n/a	0.06	n/a	n/a	0.43	n/a	n/a
	Construction (Year -1)	0.47	-0.11	-19%	0.17	-0.06	-26%	0.31	-0.16	-34%	0.14	0.00	1%	0.07	0.00	6%	0.43	0.01	1%
	Operations 1	0.36	-0.22	-38%	0.14	-0.08	-38%	0.26	-0.21	-45%	0.11	-0.03	-21%	0.05	-0.01	-21%	0.29	-0.13	-31%
	Operations 1 (Year 22)	0.36	-0.22	-38%	0.14	-0.09	-38%	0.26	-0.21	-45%	0.11	-0.03	-21%	0.05	-0.01	-21%	0.29	-0.14	-33%
	Operations 2 (Year 27)	0.39	-0.19	-33%	0.15	-0.08	-35%	0.25	-0.22	-46%	0.11	-0.03	-21%	0.05	-0.01	-21%	0.30	-0.13	-30%
	Closure (Year 30)	0.39	-0.18	-32%	0.15	-0.08	-34%	0.26	-0.21	-44%	0.11	-0.03	-21%	0.05	-0.01	-21%	0.31	-0.12	-29%
	Post-closure (Year 50)	0.39	-0.18	-32%	0.15	-0.08	-33%	0.26	-0.21	-44%	0.11	-0.03	-21%	0.05	-0.01	-21%	0.31	-0.12	-29%
50 Year Dry	Pre-Mine	0.03	n/a	n/a	0.03	n/a	n/a	0.03	n/a	n/a	0.02	n/a	n/a	0.02	n/a	n/a	0.12	n/a	n/a
	Construction (Year -1)	0.05	0.02	53%	0.04	0.01	54%	0.04	0.02	74%	0.04	0.02	79%	0.03	0.01	75%	0.14	0.03	23%
	Operations 1 (Year 10)	0.02	-0.01	-40%	0.02	-0.01	-43%	0.02	-0.01	-25%	0.02	-0.01	-32%	0.01	-0.01	-41%	0.09	-0.03	-25%
	Operations 1 (Year 22)	0.02	-0.02	-47%	0.01	-0.01	-50%	0.01	-0.01	-42%	0.01	-0.01	-52%	0.01	-0.01	-62%	0.08	-0.04	-32%
	Operations 2 (Year 27)	0.02	-0.02	-45%	0.01	-0.01	-51%	0.01	-0.01	-43%	0.01	-0.01	-52%	0.01	-0.01	-61%	0.08	-0.03	-30%
	Closure (Year 30)	0.02	-0.02	-45%	0.01	-0.01	-52%	0.01	-0.01	-44%	0.01	-0.01	-52%	0.01	-0.01	-62%	0.08	-0.03	-30%
	Post-closure (Year 50)	0.02	-0.02	-46%	0.01	-0.01	-53%	0.01	-0.01	-44%	0.01	-0.01	-52%	0.01	-0.01	-62%	0.08	-0.03	-30%

**Appendix 12-C9a. Average Monthly Flows at Node 9 (Harper Creek below T-Creek Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	70.4	Discharge	m <sup>3</sup> /s	0.26	0.22	0.19	0.98	4.77	4.98	2.11	0.88	0.63	0.66	0.45	0.32	1.37
			Unit Runoff	l/s/km <sup>2</sup>	3.7	3.2	2.8	13.9	67.8	70.7	30.0	12.5	8.9	9.4	6.4	4.5	19.5
-1	End of Construction	54.9	Discharge	m <sup>3</sup> /s	0.30	0.26	0.22	0.93	3.98	3.85	1.56	0.76	0.56	0.61	0.45	0.32	1.15
			Unit Runoff	l/s/km <sup>2</sup>	5.5	4.7	4.0	16.9	72.5	70.1	28.3	13.9	10.1	11.1	8.1	5.8	20.9
			Change from Pre-Mine	m <sup>3</sup> /s %	0.04 15%	0.04 16%	0.03 14%	-0.05 -5%	-0.79 -17%	-1.13 -23%	-0.56 -26%	-0.12 -13%	-0.07 -11%	-0.05 -8%	-0.01 -1%	0.00 0%	-0.22 -16%
10	Operations I	52.2	Discharge	m <sup>3</sup> /s	0.23	0.19	0.16	0.78	3.39	3.18	1.34	0.66	0.48	0.52	0.39	0.27	0.97
			Unit Runoff	l/s/km <sup>2</sup>	4.3	3.6	3.2	15.0	65.0	60.9	25.7	12.6	9.1	10.0	7.4	5.3	18.5
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.04 -14%	-0.04 -16%	-0.03 -15%	-0.20 -20%	-1.38 -29%	-1.80 -36%	-0.77 -36%	-0.22 -25%	-0.15 -24%	-0.14 -21%	-0.06 -14%	-0.04 -13%	-0.41 -30%
22	Operations I	51.1	Discharge	m <sup>3</sup> /s	0.22	0.18	0.16	0.78	3.36	3.11	1.31	0.64	0.47	0.51	0.38	0.27	0.95
			Unit Runoff	l/s/km <sup>2</sup>	4.3	3.5	3.1	15.2	65.7	60.8	25.5	12.6	9.1	10.0	7.5	5.3	18.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.04 -16%	-0.04 -19%	-0.04 -18%	-0.20 -20%	-1.41 -30%	-1.87 -38%	-0.81 -38%	-0.24 -27%	-0.16 -26%	-0.15 -23%	-0.07 -15%	-0.05 -15%	-0.42 -31%
27	Operations II	51.5	Discharge	m <sup>3</sup> /s	0.22	0.18	0.15	0.79	3.36	3.17	1.34	0.65	0.48	0.52	0.39	0.27	0.96
			Unit Runoff	l/s/km <sup>2</sup>	4.2	3.5	3.0	15.3	65.4	61.5	26.1	12.6	9.3	10.2	7.6	5.3	18.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.04 -17%	-0.04 -19%	-0.04 -21%	-0.19 -20%	-1.41 -30%	-1.82 -36%	-0.77 -36%	-0.23 -26%	-0.15 -24%	-0.14 -21%	-0.06 -14%	-0.04 -13%	-0.41 -30%
30	Closure	66.6	Discharge	m <sup>3</sup> /s	0.25	0.21	0.19	0.93	3.84	3.68	1.50	0.69	0.52	0.60	0.42	0.31	1.09
			Unit Runoff	l/s/km <sup>2</sup>	3.7	3.1	2.8	13.9	57.7	55.2	22.5	10.4	7.9	9.0	6.4	4.6	16.4
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -6%	-0.01 -6%	-0.01 -4%	-0.05 -5%	-0.93 -20%	-1.30 -26%	-0.61 -29%	-0.18 -21%	-0.11 -17%	-0.06 -9%	-0.03 -6%	-0.01 -3%	-0.28 -20%
50	Post-Closure	66.7	Discharge	m <sup>3</sup> /s	0.29	0.32	0.35	1.24	4.76	4.65	1.75	0.80	0.60	0.76	0.47	0.35	1.36
			Unit Runoff	l/s/km <sup>2</sup>	4.4	4.8	5.2	18.5	71.3	69.7	26.3	11.9	8.9	11.4	7.0	5.2	20.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.03 11%	0.10 43%	0.16 80%	0.26 26%	-0.01 0%	-0.33 -7%	-0.36 -17%	-0.08 -10%	-0.03 -5%	0.10 15%	0.02 4%	0.03 9%	-0.01 -1%

**Appendix 12-C9b. Sensitivity Analysis for Monthly Flows at Node 9 (Harper Creek below T-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.26	n/a	n/a	0.22	n/a	n/a	0.19	n/a	n/a	0.98	n/a	n/a	4.77	n/a	n/a	4.98	n/a	n/a	2.11	n/a	n/a
	Construction (Year -1)	0.30	0.04	15%	0.26	0.04	16%	0.22	0.03	14%	0.93	-0.05	-5%	3.98	-0.79	-17%	3.85	-1.13	-23%	1.56	-0.56	-26%
	Operations 1 (Year 10)	0.23	-0.04	-14%	0.19	-0.04	-16%	0.16	-0.03	-15%	0.78	-0.20	-20%	3.39	-1.38	-29%	3.18	-1.80	-36%	1.34	-0.77	-36%
	Operations 1 (Year 22)	0.22	-0.04	-16%	0.18	-0.04	-19%	0.16	-0.04	-18%	0.78	-0.20	-20%	3.36	-1.41	-30%	3.11	-1.87	-38%	1.31	-0.81	-38%
	Operations 2 (Year 27)	0.22	-0.04	-17%	0.18	-0.04	-19%	0.15	-0.04	-21%	0.79	-0.19	-20%	3.36	-1.41	-30%	3.17	-1.82	-36%	1.34	-0.77	-36%
	Closure (Year 30)	0.25	-0.02	-6%	0.21	-0.01	-6%	0.19	-0.01	-4%	0.93	-0.05	-5%	3.84	-0.93	-20%	3.68	-1.30	-26%	1.50	-0.61	-29%
	Post-closure (Year 50)	0.29	0.03	11%	0.32	0.10	43%	0.35	0.16	80%	1.24	0.26	26%	4.76	-0.01	0%	4.65	-0.33	-7%	1.75	-0.36	-17%
50 Year Wet	Pre-Mine	0.37	n/a	n/a	0.31	n/a	n/a	0.28	n/a	n/a	3.25	n/a	n/a	7.49	n/a	n/a	8.79	n/a	n/a	6.55	n/a	n/a
	Construction (Year -1)	0.36	-0.01	-3%	0.30	-0.01	-4%	0.27	0.00	-1%	2.75	-0.50	-15%	6.02	-1.47	-20%	7.11	-1.67	-19%	3.74	-2.81	-43%
	Operations 1	0.30	-0.07	-19%	0.25	-0.07	-21%	0.23	-0.04	-15%	2.28	-0.96	-30%	5.05	-2.44	-33%	5.70	-3.09	-35%	3.40	-3.14	-48%
	Operations 1 (Year 22)	0.29	-0.08	-21%	0.24	-0.07	-23%	0.23	-0.05	-17%	2.26	-0.99	-30%	5.00	-2.49	-33%	5.62	-3.17	-36%	3.35	-3.20	-49%
	Operations 2 (Year 27)	0.29	-0.08	-21%	0.24	-0.07	-23%	0.22	-0.05	-20%	2.28	-0.97	-30%	5.01	-2.48	-33%	5.66	-3.13	-36%	3.38	-3.17	-48%
	Closure (Year 30)	0.37	0.00	1%	0.32	0.01	3%	0.31	0.04	14%	2.88	-0.37	-11%	6.03	-1.46	-20%	7.58	-1.20	-14%	4.40	-2.14	-33%
	Post-closure (Year 50)	0.37	0.00	0%	0.38	0.07	23%	0.43	0.16	57%	3.34	0.09	3%	7.15	-0.34	-4%	7.94	-0.84	-10%	4.77	-1.77	-27%
50 Year Dry	Pre-Mine	0.14	n/a	n/a	0.12	n/a	n/a	0.11	n/a	n/a	0.13	n/a	n/a	2.10	n/a	n/a	1.31	n/a	n/a	0.58	n/a	n/a
	Construction (Year -1)	0.24	0.10	67%	0.20	0.08	67%	0.18	0.07	65%	0.19	0.06	42%	2.38	0.28	13%	1.34	0.04	3%	0.60	0.02	3%
	Operations 1 (Year 10)	0.14	0.00	2%	0.12	0.00	-2%	0.10	0.00	-4%	0.12	-0.01	-7%	1.78	-0.32	-15%	1.16	-0.15	-11%	0.50	-0.09	-15%
	Operations 1 (Year 22)	0.14	-0.01	-4%	0.11	-0.01	-8%	0.10	-0.01	-10%	0.12	-0.01	-9%	1.77	-0.34	-16%	1.14	-0.17	-13%	0.49	-0.09	-15%
	Operations 2 (Year 27)	0.14	-0.01	-5%	0.11	-0.01	-9%	0.09	-0.01	-13%	0.12	-0.01	-9%	1.78	-0.33	-16%	1.15	-0.15	-12%	0.49	-0.09	-15%
	Closure (Year 30)	0.14	0.00	-2%	0.12	-0.01	-6%	0.10	-0.01	-8%	0.12	-0.01	-10%	1.78	-0.32	-15%	1.18	-0.13	-10%	0.49	-0.09	-16%
	Post-closure (Year 50)	0.20	0.05	39%	0.24	0.12	94%	0.3	0.2	>100%	0.32	0.19	>100%	2.99	0.89	42%	1.64	0.33	26%	0.56	-0.02	-3%

**Appendix 12-C9b. Sensitivity Analysis for Monthly Flows at Node 9 (Harper Creek below T-Creek Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.88	n/a	n/a	0.63	n/a	n/a	0.66	n/a	n/a	0.45	n/a	n/a	0.32	n/a	n/a	1.37	n/a	n/a
	Construction (Year -1)	0.76	-0.12	-13%	0.56	-0.07	-11%	0.61	-0.05	-8%	0.45	-0.01	-1%	0.32	0.00	1%	1.15	-0.22	-16%
	Operations 1 (Year 10)	0.66	-0.22	-25%	0.48	-0.15	-24%	0.52	-0.14	-21%	0.39	-0.06	-14%	0.27	-0.04	-13%	0.97	-0.41	-30%
	Operations 1 (Year 22)	0.64	-0.24	-27%	0.47	-0.16	-26%	0.51	-0.15	-23%	0.38	-0.07	-15%	0.27	-0.05	-15%	0.95	-0.42	-31%
	Operations 2 (Year 27)	0.65	-0.23	-26%	0.48	-0.15	-24%	0.52	-0.14	-21%	0.39	-0.06	-14%	0.27	-0.04	-13%	0.96	-0.41	-30%
	Closure (Year 30)	0.69	-0.18	-21%	0.52	-0.11	-17%	0.60	-0.06	-9%	0.42	-0.03	-6%	0.31	-0.01	-3%	1.09	-0.28	-20%
	Post-closure (Year 50)	0.80	-0.08	-10%	0.60	-0.03	-5%	0.76	0.10	15%	0.47	0.02	4%	0.35	0.03	9%	1.36	-0.01	-1%
50 Year Wet	Pre-Mine	3.49	n/a	n/a	2.09	n/a	n/a	2.20	n/a	n/a	0.76	n/a	n/a	0.44	n/a	n/a	2.19	n/a	n/a
	Construction (Year -1)	1.77	-1.72	-49%	1.61	-0.48	-23%	1.78	-0.42	-19%	0.67	-0.09	-12%	0.41	-0.03	-7%	1.59	-0.61	-28%
	Operations 1	1.66	-1.83	-52%	1.14	-0.95	-46%	1.27	-0.93	-42%	0.61	-0.15	-19%	0.36	-0.08	-18%	1.38	-0.82	-37%
	Operations 1 (Year 22)	1.64	-1.85	-53%	1.11	-0.99	-47%	1.26	-0.94	-43%	0.61	-0.15	-20%	0.36	-0.08	-19%	1.36	-0.83	-38%
	Operations 2 (Year 27)	1.51	-1.99	-57%	1.23	-0.87	-41%	1.26	-0.94	-43%	0.63	-0.13	-18%	0.43	-0.02	-4%	1.37	-0.83	-38%
	Closure (Year 30)	1.67	-1.82	-52%	1.50	-0.60	-29%	1.33	-0.87	-40%	0.70	-0.06	-9%	0.46	0.02	4%	1.83	-0.36	-17%
	Post-closure (Year 50)	1.76	-1.73	-50%	1.48	-0.61	-29%	1.90	-0.30	-13%	0.72	-0.04	-5%	0.44	0.00	0%	1.87	-0.33	-15%
50 Year Dry	Pre-Mine	0.30	n/a	n/a	0.26	n/a	n/a	0.24	n/a	n/a	0.20	n/a	n/a	0.17	n/a	n/a	0.65	n/a	n/a
	Construction (Year -1)	0.38	0.09	30%	0.33	0.08	30%	0.32	0.07	31%	0.27	0.07	35%	0.23	0.06	37%	0.75	0.10	15%
	Operations 1 (Year 10)	0.31	0.01	4%	0.27	0.01	5%	0.25	0.01	4%	0.21	0.01	4%	0.17	0.00	1%	0.57	-0.08	-13%
	Operations 1 (Year 22)	0.30	0.01	2%	0.27	0.01	3%	0.25	0.01	3%	0.21	0.00	2%	0.17	0.00	-1%	0.56	-0.09	-14%
	Operations 2 (Year 27)	0.30	0.01	3%	0.27	0.01	3%	0.25	0.01	2%	0.21	0.00	2%	0.17	0.00	-1%	0.56	-0.09	-14%
	Closure (Year 30)	0.30	0.01	3%	0.27	0.01	3%	0.25	0.01	3%	0.21	0.01	3%	0.17	0.00	1%	0.62	-0.03	-5%
	Post-closure (Year 50)	0.34	0.05	17%	0.32	0.06	23%	0.32	0.07	31%	0.27	0.07	34%	0.23	0.06	37%	0.79	0.14	21%

**Appendix 12-C10a. Average Monthly Flows at Node 10 (Harper Creek at Barrière River Confluence) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	185.6	Discharge	m <sup>3</sup> /s	0.73	0.61	0.65	4.09	12.42	12.02	5.40	2.43	1.82	2.12	1.30	0.91	3.71
			Unit Runoff	l/s/km <sup>2</sup>	3.9	3.3	3.5	22.0	66.9	64.7	29.1	13.1	9.8	11.4	7.0	4.9	20.0
-1	End of Construction	170.1	Discharge	m <sup>3</sup> /s	0.76	0.64	0.69	4.16	11.83	11.09	4.87	2.38	1.78	2.08	1.27	0.87	3.53
			Unit Runoff	l/s/km <sup>2</sup>	4.5	3.7	4.0	24.5	69.5	65.2	28.7	14.0	10.5	12.2	7.4	5.1	20.8
			Change from Pre-Mine	m <sup>3</sup> /s %	0.03 4%	0.03 4%	0.04 6%	0.08 2%	-0.60 -5%	-0.92 -8%	-0.52 -10%	-0.05 -2%	-0.04 -2%	-0.05 -2%	-0.03 -2%	-0.04 -5%	-0.17 -5%
10	Operations I	167.3	Discharge	m <sup>3</sup> /s	0.68	0.56	0.61	3.79	10.97	10.13	4.61	2.26	1.68	1.98	1.26	0.87	3.28
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.3	3.6	22.6	65.6	60.6	27.6	13.5	10.0	11.8	7.5	5.2	19.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -6%	-0.06 -9%	-0.04 -6%	-0.30 -7%	-1.45 -12%	-1.88 -16%	-0.79 -15%	-0.16 -7%	-0.15 -8%	-0.15 -7%	-0.04 -3%	-0.04 -4%	-0.42 -11%
22	Operations I	166.3	Discharge	m <sup>3</sup> /s	0.68	0.55	0.60	3.77	10.96	10.09	4.58	2.24	1.66	1.95	1.25	0.87	3.27
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.3	3.6	22.7	65.9	60.7	27.6	13.5	10.0	11.7	7.5	5.2	19.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -7%	-0.06 -10%	-0.05 -7%	-0.31 -8%	-1.47 -12%	-1.93 -16%	-0.81 -15%	-0.19 -8%	-0.17 -9%	-0.18 -8%	-0.05 -4%	-0.05 -5%	-0.44 -12%
27	Operations II	166.6	Discharge	m <sup>3</sup> /s	0.68	0.55	0.59	3.80	10.98	10.14	4.62	2.26	1.68	1.98	1.26	0.88	3.28
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.3	3.5	22.8	65.9	60.8	27.7	13.6	10.1	11.9	7.6	5.3	19.7
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -7%	-0.06 -10%	-0.06 -10%	-0.28 -7%	-1.45 -12%	-1.88 -16%	-0.78 -14%	-0.17 -7%	-0.14 -8%	-0.14 -7%	-0.03 -3%	-0.04 -4%	-0.42 -11%
30	Closure	181.8	Discharge	m <sup>3</sup> /s	0.71	0.58	0.63	3.97	11.41	10.59	4.75	2.31	1.73	2.06	1.30	0.91	3.41
			Unit Runoff	l/s/km <sup>2</sup>	3.9	3.2	3.5	21.8	62.8	58.3	26.1	12.7	9.5	11.3	7.1	5.0	18.8
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -3%	-0.03 -5%	-0.02 -3%	-0.12 -3%	-1.01 -8%	-1.43 -12%	-0.65 -12%	-0.12 -5%	-0.09 -5%	-0.06 -3%	0.00 0%	0.00 0%	-0.30 -8%
50	Post-Closure	181.9	Discharge	m <sup>3</sup> /s	0.75	0.69	0.80	4.30	12.29	11.52	5.00	2.41	1.80	2.22	1.34	0.95	3.67
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.8	4.4	23.7	67.6	63.3	27.5	13.2	9.9	12.2	7.4	5.2	20.2
			Change from Pre-Mine	m <sup>3</sup> /s %	0.02 3%	0.08 12%	0.15 22%	0.22 5%	-0.13 -1%	-0.49 -4%	-0.40 -7%	-0.02 -1%	-0.02 -1%	0.09 4%	0.04 3%	0.03 4%	-0.04 -1%

**Appendix 12-C10b. Sensitivity Analysis for Monthly Flows at Node 10 (Harper Creek at Barrière River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	0.73	n/a	n/a	0.61	n/a	n/a	0.65	n/a	n/a	4.09	n/a	n/a	12.42	n/a	n/a	12.02	n/a	n/a	5.40	n/a	n/a
	Construction (Year -1)	0.76	0.03	4%	0.64	0.03	4%	0.69	0.04	6%	4.16	0.08	2%	11.83	-0.60	-5%	11.09	-0.92	-8%	4.87	-0.52	-10%
	Operations 1 (Year 10)	0.68	-0.05	-6%	0.56	-0.06	-9%	0.61	-0.04	-6%	3.79	-0.30	-7%	10.97	-1.45	-12%	10.13	-1.88	-16%	4.61	-0.79	-15%
	Operations 1 (Year 22)	0.68	-0.05	-7%	0.55	-0.06	-10%	0.60	-0.05	-7%	3.77	-0.31	-8%	10.96	-1.47	-12%	10.09	-1.93	-16%	4.58	-0.81	-15%
	Operations 2 (Year 27)	0.68	-0.05	-7%	0.55	-0.06	-10%	0.59	-0.06	-10%	3.80	-0.28	-7%	10.98	-1.45	-12%	10.14	-1.88	-16%	4.62	-0.78	-14%
	Closure (Year 30)	0.71	-0.02	-3%	0.58	-0.03	-5%	0.63	-0.02	-3%	3.97	-0.12	-3%	11.41	-1.01	-8%	10.59	-1.43	-12%	4.75	-0.65	-12%
	Post-closure (Year 50)	0.75	0.02	3%	0.69	0.08	12%	0.80	0.15	22%	4.30	0.22	5%	12.29	-0.13	-1%	11.52	-0.49	-4%	5.00	-0.40	-7%
50 Year Wet	Pre-Mine	0.97	n/a	n/a	0.80	n/a	n/a	1.70	n/a	n/a	9.98	n/a	n/a	19.95	n/a	n/a	22.86	n/a	n/a	15.77	n/a	n/a
	Construction (Year -1)	0.89	-0.08	-9%	0.74	-0.06	-8%	1.62	-0.07	-4%	9.50	-0.48	-5%	18.17	-1.79	-9%	19.90	-2.96	-13%	11.15	-4.63	-29%
	Operations 1	0.86	-0.11	-12%	0.69	-0.11	-14%	1.55	-0.14	-8%	8.84	-1.14	-11%	16.05	-3.90	-20%	17.20	-5.65	-25%	11.40	-4.37	-28%
	Operations 1 (Year 22)	0.85	-0.12	-12%	0.69	-0.12	-15%	1.54	-0.15	-9%	8.82	-1.16	-12%	16.02	-3.94	-20%	17.13	-5.73	-25%	11.35	-4.42	-28%
	Operations 2 (Year 27)	0.85	-0.12	-13%	0.68	-0.12	-15%	1.51	-0.19	-11%	8.83	-1.15	-12%	16.04	-3.92	-20%	17.17	-5.68	-25%	11.38	-4.39	-28%
	Closure (Year 30)	0.90	-0.07	-7%	0.75	-0.06	-7%	1.67	-0.03	-2%	8.84	-1.14	-11%	16.72	-3.24	-16%	19.21	-3.65	-16%	12.29	-3.48	-22%
	Post-closure (Year 50)	0.93	-0.04	-5%	0.83	0.02	3%	1.77	0.08	5%	9.91	-0.07	-1%	18.05	-1.90	-10%	19.25	-3.61	-16%	12.37	-3.40	-22%
50 Year Dry	Pre-Mine	0.46	n/a	n/a	0.39	n/a	n/a	0.35	n/a	n/a	0.70	n/a	n/a	6.52	n/a	n/a	3.70	n/a	n/a	1.56	n/a	n/a
	Construction (Year -1)	0.60	0.14	31%	0.51	0.12	30%	0.44	0.09	24%	0.91	0.20	29%	7.03	0.51	8%	4.25	0.55	15%	1.72	0.16	10%
	Operations 1 (Year 10)	0.46	0.00	0%	0.37	-0.02	-5%	0.31	-0.04	-11%	0.67	-0.03	-4%	6.15	-0.37	-6%	3.98	0.28	8%	1.59	0.04	2%
	Operations 1 (Year 22)	0.46	0.00	0%	0.37	-0.02	-6%	0.31	-0.04	-12%	0.67	-0.03	-5%	6.14	-0.39	-6%	3.96	0.26	7%	1.59	0.03	2%
	Operations 2 (Year 27)	0.46	0.00	-1%	0.37	-0.02	-6%	0.30	-0.05	-15%	0.67	-0.03	-4%	6.14	-0.38	-6%	3.96	0.27	7%	1.59	0.03	2%
	Closure (Year 30)	0.46	0.00	0%	0.37	-0.02	-6%	0.31	-0.04	-12%	0.67	-0.03	-5%	6.14	-0.38	-6%	4.11	0.41	11%	1.59	0.03	2%
	Post-closure (Year 50)	0.52	0.06	13%	0.50	0.11	27%	0.5	0.1	39%	0.90	0.20	28%	7.50	0.98	15%	4.42	0.73	20%	1.69	0.14	9%

**Appendix 12-C10b. Sensitivity Analysis for Monthly Flows at Node 10 (Harper Creek at Barrière River Confluence) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	2.43	n/a	n/a	1.82	n/a	n/a	2.12	n/a	n/a	1.30	n/a	n/a	0.91	n/a	n/a	3.71	n/a	n/a
	Construction (Year -1)	2.38	-0.05	-2%	1.78	-0.04	-2%	2.08	-0.05	-2%	1.27	-0.03	-2%	0.87	-0.04	-5%	3.53	-0.17	-5%
	Operations 1 (Year 10)	2.26	-0.16	-7%	1.68	-0.15	-8%	1.98	-0.15	-7%	1.26	-0.04	-3%	0.87	-0.04	-4%	3.28	-0.42	-11%
	Operations 1 (Year 22)	2.24	-0.19	-8%	1.66	-0.17	-9%	1.95	-0.18	-8%	1.25	-0.05	-4%	0.87	-0.05	-5%	3.27	-0.44	-12%
	Operations 2 (Year 27)	2.26	-0.17	-7%	1.68	-0.14	-8%	1.98	-0.14	-7%	1.26	-0.03	-3%	0.88	-0.04	-4%	3.28	-0.42	-11%
	Closure (Year 30)	2.31	-0.12	-5%	1.73	-0.09	-5%	2.06	-0.06	-3%	1.30	0.00	0%	0.91	0.00	-1%	3.41	-0.30	-8%
	Post-closure (Year 50)	2.41	-0.02	-1%	1.80	-0.02	-1%	2.22	0.09	4%	1.34	0.04	3%	0.95	0.03	4%	3.67	-0.04	-1%
50 Year Wet	Pre-Mine	9.52	n/a	n/a	5.49	n/a	n/a	6.62	n/a	n/a	1.98	n/a	n/a	1.23	n/a	n/a	5.88	n/a	n/a
	Construction (Year -1)	5.99	-3.53	-37%	5.42	-0.07	-1%	5.89	-0.73	-11%	1.70	-0.28	-14%	1.07	-0.16	-13%	4.82	-1.06	-18%
	Operations 1	5.74	-3.78	-40%	3.76	-1.73	-32%	4.53	-2.09	-32%	1.76	-0.23	-11%	1.12	-0.11	-9%	4.55	-1.34	-23%
	Operations 1 (Year 22)	5.72	-3.80	-40%	3.72	-1.76	-32%	4.52	-2.10	-32%	1.74	-0.24	-12%	1.12	-0.11	-9%	4.53	-1.35	-23%
	Operations 2 (Year 27)	5.74	-3.77	-40%	4.14	-1.35	-25%	4.52	-2.10	-32%	1.76	-0.23	-11%	1.12	-0.11	-9%	4.54	-1.35	-23%
	Closure (Year 30)	5.75	-3.77	-40%	4.12	-1.37	-25%	4.76	-1.87	-28%	1.80	-0.18	-9%	1.20	-0.03	-2%	4.91	-0.98	-17%
	Post-closure (Year 50)	5.84	-3.68	-39%	4.11	-1.38	-25%	5.15	-1.47	-22%	1.86	-0.12	-6%	1.20	-0.03	-3%	5.00	-0.88	-15%
50 Year Dry	Pre-Mine	0.94	n/a	n/a	0.81	n/a	n/a	0.74	n/a	n/a	0.66	n/a	n/a	0.55	n/a	n/a	1.87	n/a	n/a
	Construction (Year -1)	1.26	0.32	34%	1.02	0.21	26%	0.94	0.20	27%	0.77	0.12	18%	0.64	0.09	17%	2.35	0.48	25%
	Operations 1 (Year 10)	1.14	0.20	22%	0.97	0.16	20%	0.87	0.13	17%	0.72	0.06	9%	0.57	0.03	5%	1.94	0.07	4%
	Operations 1 (Year 22)	1.14	0.20	21%	0.97	0.16	19%	0.86	0.12	17%	0.71	0.05	8%	0.57	0.02	4%	1.93	0.06	3%
	Operations 2 (Year 27)	1.14	0.20	21%	0.97	0.16	19%	0.86	0.12	17%	0.71	0.05	8%	0.57	0.02	4%	1.94	0.06	3%
	Closure (Year 30)	1.14	0.20	21%	0.97	0.16	19%	0.87	0.14	19%	0.72	0.06	9%	0.59	0.04	8%	2.11	0.24	13%
	Post-closure (Year 50)	1.16	0.23	24%	0.99	0.18	22%	0.94	0.20	27%	0.78	0.12	19%	0.64	0.09	16%	2.16	0.29	16%

Appendix 12-C11a. Average Monthly Flows at Node 11 (Barrière River below Sprague Creek WSC 08LB069) during Different Phases of the Project

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	624.0	Discharge	m <sup>3</sup> /s	2.49	2.32	2.81	9.66	38.41	43.89	16.45	5.45	4.12	4.56	4.61	3.07	11.48
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.7	4.5	15.5	61.5	70.3	26.4	8.7	6.6	7.3	7.4	4.9	18.4
-1	End of Construction	608.5	Discharge	m <sup>3</sup> /s	2.52	2.35	2.84	9.73	37.81	42.96	15.93	5.40	4.07	4.51	4.58	3.02	11.31
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.9	4.7	16.0	62.1	70.6	26.2	8.9	6.7	7.4	7.5	5.0	18.6
			Change from Pre-Mine	m <sup>3</sup> /s %	0.03 1%	0.03 1%	0.04 1%	0.08 1%	-0.60 -2%	-0.92 -2%	-0.52 -3%	-0.05 -1%	-0.04 -1%	-0.05 -1%	-0.03 -1%	-0.04 -1%	-0.17 -2%
10	Operations I	605.7	Discharge	m <sup>3</sup> /s	2.45	2.27	2.77	9.36	36.96	42.00	15.66	5.28	3.97	4.41	4.57	3.03	11.06
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.7	4.6	15.4	61.0	69.3	25.9	8.7	6.6	7.3	7.6	5.0	18.3
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -2%	-0.06 -2%	-0.04 -1%	-0.30 -3%	-1.45 -4%	-1.88 -4%	-0.79 -5%	-0.16 -3%	-0.15 -4%	-0.15 -3%	-0.04 -1%	-0.04 -1%	-0.42 -4%
22	Operations I	604.7	Discharge	m <sup>3</sup> /s	2.44	2.26	2.76	9.34	36.94	41.96	15.64	5.26	3.95	4.38	4.56	3.02	11.04
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.7	4.6	15.5	61.1	69.4	25.9	8.7	6.5	7.2	7.5	5.0	18.3
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -2%	-0.06 -3%	-0.05 -2%	-0.31 -3%	-1.47 -4%	-1.93 -4%	-0.81 -5%	-0.19 -3%	-0.17 -4%	-0.18 -4%	-0.05 -1%	-0.05 -2%	-0.44 -4%
27	Operations II	605.0	Discharge	m <sup>3</sup> /s	2.44	2.26	2.74	9.38	36.96	42.01	15.67	5.28	3.97	4.41	4.58	3.03	11.06
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.7	4.5	15.5	61.1	69.4	25.9	8.7	6.6	7.3	7.6	5.0	18.3
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -2%	-0.06 -3%	-0.06 -2%	-0.28 -3%	-1.45 -4%	-1.88 -4%	-0.78 -5%	-0.17 -3%	-0.14 -3%	-0.14 -3%	-0.03 -1%	-0.04 -1%	-0.42 -4%
30	Closure	620.2	Discharge	m <sup>3</sup> /s	2.47	2.29	2.79	9.54	37.39	42.46	15.80	5.33	4.02	4.49	4.61	3.06	11.19
			Unit Runoff	l/s/km <sup>2</sup>	4.0	3.7	4.5	15.4	60.3	68.5	25.5	8.6	6.5	7.2	7.4	4.9	18.0
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -1%	-0.03 -1%	-0.02 -1%	-0.12 -1%	-1.01 -3%	-1.43 -3%	-0.65 -4%	-0.12 -2%	-0.09 -2%	-0.06 -1%	0.00 0%	0.00 0%	-0.30 -3%
50	Post-Closure	620.3	Discharge	m <sup>3</sup> /s	2.51	2.40	2.95	9.87	38.27	43.39	16.05	5.43	4.09	4.65	4.66	3.10	11.45
			Unit Runoff	l/s/km <sup>2</sup>	4.1	3.9	4.8	15.9	61.7	70.0	25.9	8.7	6.6	7.5	7.5	5.0	18.5
			Change from Pre-Mine	m <sup>3</sup> /s %	0.02 1%	0.08 3%	0.15 5%	0.22 2%	-0.13 0%	-0.49 -1%	-0.40 -2%	-0.02 0%	-0.02 -1%	0.09 2%	0.04 1%	0.03 1%	-0.04 0%



**Appendix 12-C11b. Sensitivity Analysis for Monthly Flows at Node 11 (Barrière River below Sprague Creek WSC 08LB069) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	2.49	n/a	n/a	2.32	n/a	n/a	2.81	n/a	n/a	9.66	n/a	n/a	38.41	n/a	n/a	43.89	n/a	n/a	16.45	n/a	n/a
	Construction (Year -1)	2.52	0.03	1%	2.35	0.03	1%	2.84	0.04	1%	9.73	0.08	1%	37.81	-0.60	-2%	42.96	-0.92	-2%	15.93	-0.52	-3%
	Operations 1 (Year 10)	2.45	-0.05	-2%	2.27	-0.06	-2%	2.77	-0.04	-1%	9.36	-0.30	-3%	36.96	-1.45	-4%	42.00	-1.88	-4%	15.66	-0.79	-5%
	Operations 1 (Year 22)	2.44	-0.05	-2%	2.26	-0.06	-3%	2.76	-0.05	-2%	9.34	-0.31	-3%	36.94	-1.47	-4%	41.96	-1.93	-4%	15.64	-0.81	-5%
	Operations 2 (Year 27)	2.44	-0.05	-2%	2.26	-0.06	-3%	2.74	-0.06	-2%	9.38	-0.28	-3%	36.96	-1.45	-4%	42.01	-1.88	-4%	15.67	-0.78	-5%
	Closure (Year 30)	2.47	-0.02	-1%	2.29	-0.03	-1%	2.79	-0.02	-1%	9.54	-0.12	-1%	37.39	-1.01	-3%	42.46	-1.43	-3%	15.80	-0.65	-4%
	Post-closure (Year 50)	2.51	0.02	1%	2.40	0.08	3%	2.95	0.15	5%	9.87	0.22	2%	38.27	-0.13	0%	43.39	-0.49	-1%	16.05	-0.40	-2%
50 Year Wet	Pre-Mine	6.42	n/a	n/a	7.38	n/a	n/a	10.89	n/a	n/a	22.48	n/a	n/a	63.00	n/a	n/a	90.30	n/a	n/a	70.90	n/a	n/a
	Construction (Year -1)	6.34	-0.08	-1%	7.32	-0.06	-1%	10.82	-0.07	-1%	22.00	-0.48	-2%	61.21	-1.79	-3%	87.34	-2.96	-3%	66.27	-4.63	-7%
	Operations 1	6.31	-0.11	-2%	7.27	-0.11	-2%	10.75	-0.14	-1%	21.34	-1.14	-5%	59.10	-3.90	-6%	84.65	-5.65	-6%	66.53	-4.37	-6%
	Operations 1 (Year 22)	6.30	-0.12	-2%	7.26	-0.12	-2%	10.74	-0.15	-1%	21.32	-1.16	-5%	59.06	-3.94	-6%	84.57	-5.73	-6%	66.48	-4.42	-6%
	Operations 2 (Year 27)	6.30	-0.12	-2%	7.26	-0.12	-2%	10.70	-0.19	-2%	21.33	-1.15	-5%	59.08	-3.92	-6%	84.62	-5.68	-6%	66.51	-4.39	-6%
	Closure (Year 30)	6.35	-0.07	-1%	7.32	-0.06	-1%	10.86	-0.03	0%	21.34	-1.14	-5%	59.76	-3.24	-5%	86.65	-3.65	-4%	67.42	-3.48	-5%
	Post-closure (Year 50)	6.38	-0.04	-1%	7.40	0.02	0%	10.97	0.08	1%	22.41	-0.07	0%	61.10	-1.90	-3%	86.69	-3.61	-4%	67.50	-3.40	-5%
50 Year Dry	Pre-Mine	1.22	n/a	n/a	1.20	n/a	n/a	1.35	n/a	n/a	2.18	n/a	n/a	20.20	n/a	n/a	18.10	n/a	n/a	5.30	n/a	n/a
	Construction (Year -1)	1.36	0.14	12%	1.32	0.12	10%	1.44	0.09	6%	2.38	0.20	9%	20.71	0.51	3%	18.65	0.55	3%	5.46	0.16	3%
	Operations 1 (Year 10)	1.22	0.00	0%	1.18	-0.02	-2%	1.31	-0.04	-3%	2.15	-0.03	-1%	19.83	-0.37	-2%	18.38	0.28	2%	5.34	0.04	1%
	Operations 1 (Year 22)	1.22	0.00	0%	1.18	-0.02	-2%	1.31	-0.04	-3%	2.15	-0.03	-2%	19.81	-0.39	-2%	18.36	0.26	1%	5.33	0.03	1%
	Operations 2 (Year 27)	1.22	0.00	0%	1.18	-0.02	-2%	1.30	-0.05	-4%	2.15	-0.03	-1%	19.82	-0.38	-2%	18.37	0.27	1%	5.33	0.03	1%
	Closure (Year 30)	1.22	0.00	0%	1.18	-0.02	-2%	1.31	-0.04	-3%	2.15	-0.03	-2%	19.82	-0.38	-2%	18.51	0.41	2%	5.33	0.03	1%
	Post-closure (Year 50)	1.28	0.06	5%	1.31	0.11	9%	1.5	0.1	10%	2.38	0.20	9%	21.18	0.98	5%	18.83	0.73	4%	5.44	0.14	3%

**Appendix 12-C11b. Sensitivity Analysis for Monthly Flows at Node 11 (Barrière River below Sprague Creek WSC 08LB069) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	5.45	n/a	n/a	4.12	n/a	n/a	4.56	n/a	n/a	4.61	n/a	n/a	3.07	n/a	n/a	11.51	n/a	n/a
	Construction (Year -1)	5.40	-0.05	-1%	4.07	-0.04	-1%	4.51	-0.05	-1%	4.58	-0.03	-1%	3.02	-0.04	-1%	11.34	-0.17	-2%
	Operations 1 (Year 10)	5.28	-0.16	-3%	3.97	-0.15	-4%	4.41	-0.15	-3%	4.57	-0.04	-1%	3.03	-0.04	-1%	11.09	-0.42	-4%
	Operations 1 (Year 22)	5.26	-0.19	-3%	3.95	-0.17	-4%	4.38	-0.18	-4%	4.56	-0.05	-1%	3.02	-0.05	-2%	11.07	-0.44	-4%
	Operations 2 (Year 27)	5.28	-0.17	-3%	3.97	-0.14	-3%	4.41	-0.14	-3%	4.58	-0.03	-1%	3.03	-0.04	-1%	11.09	-0.42	-4%
	Closure (Year 30)	5.33	-0.12	-2%	4.02	-0.09	-2%	4.49	-0.06	-1%	4.61	0.00	0%	3.06	0.00	0%	11.21	-0.30	-3%
	Post-closure (Year 50)	5.43	-0.02	0%	4.09	-0.02	-1%	4.65	0.09	2%	4.66	0.04	1%	3.10	0.03	1%	11.47	-0.04	0%
50 Year Wet	Pre-Mine	17.71	n/a	n/a	13.69	n/a	n/a	14.47	n/a	n/a	20.90	n/a	n/a	11.30	n/a	n/a	19.31	n/a	n/a
	Construction (Year -1)	14.18	-3.53	-20%	13.62	-0.07	-1%	13.74	-0.73	-5%	20.62	-0.28	-1%	11.14	-0.16	-1%	18.25	-1.06	-5%
	Operations 1	13.93	-3.78	-21%	11.96	-1.73	-13%	12.38	-2.09	-14%	20.67	-0.23	-1%	11.19	-0.11	-1%	17.97	-1.34	-7%
	Operations 1 (Year 22)	13.91	-3.80	-21%	11.93	-1.76	-13%	12.37	-2.10	-15%	20.66	-0.24	-1%	11.19	-0.11	-1%	17.96	-1.35	-7%
	Operations 2 (Year 27)	13.94	-3.77	-21%	12.34	-1.35	-10%	12.37	-2.10	-15%	20.67	-0.23	-1%	11.19	-0.11	-1%	17.96	-1.35	-7%
	Closure (Year 30)	13.94	-3.77	-21%	12.32	-1.37	-10%	12.60	-1.87	-13%	20.72	-0.18	-1%	11.27	-0.03	0%	18.33	-0.98	-5%
	Post-closure (Year 50)	14.03	-3.68	-21%	12.31	-1.38	-10%	13.00	-1.47	-10%	20.78	-0.12	-1%	11.27	-0.03	0%	18.43	-0.88	-5%
50 Year Dry	Pre-Mine	1.79	n/a	n/a	1.25	n/a	n/a	1.32	n/a	n/a	1.77	n/a	n/a	1.58	n/a	n/a	6.93	n/a	n/a
	Construction (Year -1)	2.11	0.32	18%	1.46	0.21	17%	1.52	0.20	15%	1.89	0.12	7%	1.67	0.09	6%	7.41	0.48	7%
	Operations 1 (Year 10)	1.99	0.20	11%	1.41	0.16	13%	1.45	0.13	10%	1.83	0.06	3%	1.61	0.03	2%	7.00	0.07	1%
	Operations 1 (Year 22)	1.99	0.20	11%	1.41	0.16	13%	1.44	0.12	9%	1.82	0.05	3%	1.60	0.02	1%	6.99	0.06	1%
	Operations 2 (Year 27)	1.99	0.20	11%	1.41	0.16	13%	1.44	0.12	9%	1.82	0.05	3%	1.60	0.02	1%	6.99	0.06	1%
	Closure (Year 30)	1.99	0.20	11%	1.41	0.16	13%	1.46	0.14	10%	1.83	0.06	3%	1.62	0.04	3%	7.17	0.24	3%
	Post-closure (Year 50)	2.02	0.23	13%	1.43	0.18	14%	1.52	0.20	15%	1.89	0.12	7%	1.67	0.09	6%	7.22	0.29	4%

**Appendix 12-C12a. Average Monthly Flows at Node 12 (Barrière River at the Mouth WSC 08LB020) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	1140	Discharge	m <sup>3</sup> /s	3.57	3.43	4.32	14.41	49.09	52.87	20.35	6.96	5.26	5.60	5.96	4.17	14.66
			Unit Runoff	l/s/km <sup>2</sup>	3.1	3.0	3.8	12.6	43.1	46.4	17.9	6.1	4.6	4.9	5.2	3.7	12.9
-1	End of Construction	1124	Discharge	m <sup>3</sup> /s	3.60	3.45	4.35	14.49	48.49	51.95	19.83	6.91	5.22	5.55	5.93	4.13	14.49
			Unit Runoff	l/s/km <sup>2</sup>	3.2	3.1	3.9	12.9	43.1	46.2	17.6	6.1	4.6	4.9	5.3	3.7	12.9
			Change from Pre-Mine	m <sup>3</sup> /s %	0.03 1%	0.03 1%	0.04 1%	0.08 1%	-0.60 -1%	-0.92 -2%	-0.52 -3%	-0.05 -1%	-0.04 -1%	-0.05 -1%	-0.03 0%	-0.04 -1%	-0.17 -1%
10	Operations I	1122	Discharge	m <sup>3</sup> /s	3.52	3.37	4.28	14.11	47.64	50.98	19.56	6.80	5.11	5.45	5.92	4.13	14.24
			Unit Runoff	l/s/km <sup>2</sup>	3.1	3.0	3.8	12.6	42.5	45.5	17.4	6.1	4.6	4.9	5.3	3.7	12.7
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -1%	-0.06 -2%	-0.04 -1%	-0.30 -2%	-1.45 -3%	-1.88 -4%	-0.79 -4%	-0.16 -2%	-0.15 -3%	-0.15 -3%	-0.04 -1%	-0.04 -1%	-0.42 -3%
22	Operations I	1121	Discharge	m <sup>3</sup> /s	3.51	3.37	4.27	14.10	47.62	50.94	19.54	6.78	5.09	5.42	5.91	4.12	14.22
			Unit Runoff	l/s/km <sup>2</sup>	3.1	3.0	3.8	12.6	42.5	45.5	17.4	6.0	4.5	4.8	5.3	3.7	12.7
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -1%	-0.06 -2%	-0.05 -1%	-0.31 -2%	-1.47 -3%	-1.93 -4%	-0.81 -4%	-0.19 -3%	-0.17 -3%	-0.18 -3%	-0.05 -1%	-0.05 -1%	-0.44 -3%
27	Operations II	1121	Discharge	m <sup>3</sup> /s	3.51	3.36	4.25	14.13	47.64	50.99	19.57	6.79	5.12	5.45	5.93	4.13	14.24
			Unit Runoff	l/s/km <sup>2</sup>	3.1	3.0	3.8	12.6	42.5	45.5	17.5	6.1	4.6	4.9	5.3	3.7	12.7
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.05 -2%	-0.06 -2%	-0.06 -1%	-0.28 -2%	-1.45 -3%	-1.88 -4%	-0.78 -4%	-0.17 -2%	-0.14 -3%	-0.14 -3%	-0.03 -1%	-0.04 -1%	-0.42 -3%
30	Closure	1136	Discharge	m <sup>3</sup> /s	3.54	3.40	4.30	14.29	48.07	51.44	19.70	6.84	5.17	5.53	5.96	4.16	14.37
			Unit Runoff	l/s/km <sup>2</sup>	3.1	3.0	3.8	12.6	42.3	45.3	17.3	6.0	4.5	4.9	5.2	3.7	12.6
			Change from Pre-Mine	m <sup>3</sup> /s %	-0.02 -1%	-0.03 -1%	-0.02 0%	-0.12 -1%	-1.01 -2%	-1.43 -3%	-0.65 -3%	-0.12 -2%	-0.09 -2%	-0.06 -1%	0.00 0%	0.00 0%	-0.30 -2%
50	Post-Closure	1136	Discharge	m <sup>3</sup> /s	3.59	3.50	4.46	14.63	48.95	52.37	19.95	6.94	5.24	5.69	6.01	4.20	14.63
			Unit Runoff	l/s/km <sup>2</sup>	3.2	3.1	3.9	12.9	43.1	46.1	17.6	6.1	4.6	5.0	5.3	3.7	12.9
			Change from Pre-Mine	m <sup>3</sup> /s %	0.02 1%	0.08 2%	0.15 3%	0.22 2%	-0.13 0%	-0.49 -1%	-0.40 -2%	-0.02 0%	-0.02 0%	0.09 2%	0.04 1%	0.03 1%	-0.04 0%

**Appendix 12-C12b. Sensitivity Analysis for Monthly Flows at Node 12 (Barrière River at the Mouth WSC 08LB020) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	3.57	n/a	n/a	3.43	n/a	n/a	4.32	n/a	n/a	14.41	n/a	n/a	49.09	n/a	n/a	52.87	n/a	n/a	20.35	n/a	n/a
	Construction (Year -1)	3.60	0.03	1%	3.45	0.03	1%	4.35	0.04	1%	14.49	0.08	1%	48.49	-0.60	-1%	51.95	-0.92	-2%	19.83	-0.52	-3%
	Operations 1 (Year 10)	3.52	-0.05	-1%	3.37	-0.06	-2%	4.28	-0.04	-1%	14.11	-0.30	-2%	47.64	-1.45	-3%	50.98	-1.88	-4%	19.56	-0.79	-4%
	Operations 1 (Year 22)	3.51	-0.05	-1%	3.36	-0.06	-2%	4.27	-0.05	-1%	14.10	-0.31	-2%	47.62	-1.47	-3%	50.94	-1.93	-4%	19.54	-0.81	-4%
	Operations 2 (Year 27)	3.51	-0.05	-2%	3.36	-0.06	-2%	4.25	-0.06	-1%	14.13	-0.28	-2%	47.64	-1.45	-3%	50.99	-1.88	-4%	19.57	-0.78	-4%
	Closure (Year 30)	3.54	-0.02	-1%	3.39	-0.03	-1%	4.30	-0.02	0%	14.29	-0.12	-1%	48.07	-1.01	-2%	51.44	-1.43	-3%	19.70	-0.65	-3%
	Post-closure (Year 50)	3.59	0.02	1%	3.50	0.08	2%	4.46	0.15	3%	14.63	0.22	2%	48.95	-0.13	0%	52.37	-0.49	-1%	19.95	-0.40	-2%
50 Year Wet	Pre-Mine	9.23	n/a	n/a	9.46	n/a	n/a	17.07	n/a	n/a	32.25	n/a	n/a	81.70	n/a	n/a	122.70	n/a	n/a	92.70	n/a	n/a
	Construction (Year -1)	9.15	-0.08	-1%	9.40	-0.06	-1%	17.00	-0.07	0%	31.77	-0.48	-1%	79.91	-1.79	-2%	119.74	-2.96	-2%	88.07	-4.63	-5%
	Operations 1	9.12	-0.11	-1%	9.35	-0.11	-1%	16.93	-0.14	-1%	31.11	-1.14	-4%	77.80	-3.90	-5%	117.05	-5.65	-5%	88.33	-4.37	-5%
	Operations 1 (Year 22)	9.11	-0.12	-1%	9.34	-0.12	-1%	16.92	-0.15	-1%	31.09	-1.16	-4%	77.76	-3.94	-5%	116.97	-5.73	-5%	88.28	-4.42	-5%
	Operations 2 (Year 27)	9.11	-0.12	-1%	9.34	-0.12	-1%	16.88	-0.19	-1%	31.10	-1.15	-4%	77.78	-3.92	-5%	117.02	-5.68	-5%	88.31	-4.39	-5%
	Closure (Year 30)	9.16	-0.07	-1%	9.40	-0.06	-1%	17.04	-0.03	0%	31.11	-1.14	-4%	78.46	-3.24	-4%	119.05	-3.65	-3%	89.22	-3.48	-4%
	Post-closure (Year 50)	9.19	-0.04	0%	9.48	0.02	0%	17.15	0.08	0%	32.18	-0.07	0%	79.80	-1.90	-2%	119.09	-3.61	-3%	89.30	-3.40	-4%
50 Year Dry	Pre-Mine	1.67	n/a	n/a	1.75	n/a	n/a	2.05	n/a	n/a	3.26	n/a	n/a	28.50	n/a	n/a	22.20	n/a	n/a	6.50	n/a	n/a
	Construction (Year -1)	1.81	0.14	9%	1.87	0.12	7%	2.14	0.09	4%	3.46	0.20	6%	29.01	0.51	2%	22.75	0.55	2%	6.66	0.16	2%
	Operations 1 (Year 10)	1.67	0.00	0%	1.73	-0.02	-1%	2.01	-0.04	-2%	3.23	-0.03	-1%	28.13	-0.37	-1%	22.48	0.28	1%	6.54	0.04	1%
	Operations 1 (Year 22)	1.67	0.00	0%	1.73	-0.02	-1%	2.01	-0.04	-2%	3.23	-0.03	-1%	28.11	-0.39	-1%	22.46	0.26	1%	6.53	0.03	0%
	Operations 2 (Year 27)	1.67	0.00	0%	1.73	-0.02	-1%	2.00	-0.05	-3%	3.23	-0.03	-1%	28.12	-0.38	-1%	22.47	0.27	1%	6.53	0.03	1%
	Closure (Year 30)	1.67	0.00	0%	1.73	-0.02	-1%	2.01	-0.04	-2%	3.23	-0.03	-1%	28.12	-0.38	-1%	22.61	0.41	2%	6.53	0.03	0%
	Post-closure (Year 50)	1.73	0.06	4%	1.86	0.11	6%	2.2	0.1	7%	3.46	0.20	6%	29.48	0.98	3%	22.93	0.73	3%	6.64	0.14	2%

**Appendix 12-C12b. Sensitivity Analysis for Monthly Flows at Node 12 (Barrière River at the Mouth WSC 08LB020) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	6.96	n/a	n/a	5.26	n/a	n/a	5.60	n/a	n/a	5.96	n/a	n/a	4.17	n/a	n/a	14.70	n/a	n/a
	Construction (Year -1)	6.91	-0.05	-1%	5.22	-0.04	-1%	5.55	-0.05	-1%	5.93	-0.03	0%	4.13	-0.04	-1%	14.52	-0.17	-1%
	Operations 1 (Year 10)	6.80	-0.16	-2%	5.11	-0.15	-3%	5.45	-0.15	-3%	5.92	-0.04	-1%	4.13	-0.04	-1%	14.27	-0.42	-3%
	Operations 1 (Year 22)	6.78	-0.19	-3%	5.09	-0.17	-3%	5.42	-0.18	-3%	5.91	-0.05	-1%	4.12	-0.05	-1%	14.25	-0.44	-3%
	Operations 2 (Year 27)	6.79	-0.17	-2%	5.12	-0.14	-3%	5.45	-0.14	-3%	5.93	-0.03	-1%	4.13	-0.04	-1%	14.27	-0.42	-3%
	Closure (Year 30)	6.84	-0.12	-2%	5.17	-0.09	-2%	5.53	-0.06	-1%	5.96	0.00	0%	4.16	0.00	0%	14.40	-0.30	-2%
	Post-closure (Year 50)	6.94	-0.02	0%	5.24	-0.02	0%	5.69	0.09	2%	6.01	0.04	1%	4.20	0.03	1%	14.66	-0.04	0%
50 Year Wet	Pre-Mine	25.95	n/a	n/a	18.75	n/a	n/a	16.91	n/a	n/a	23.22	n/a	n/a	13.28	n/a	n/a	26.63	n/a	n/a
	Construction (Year -1)	22.42	-3.53	-14%	18.68	-0.07	0%	16.18	-0.73	-4%	22.94	-0.28	-1%	13.12	-0.16	-1%	25.57	-1.06	-4%
	Operations 1	22.17	-3.78	-15%	17.02	-1.73	-9%	14.82	-2.09	-12%	22.99	-0.23	-1%	13.17	-0.11	-1%	25.29	-1.34	-5%
	Operations 1 (Year 22)	22.15	-3.80	-15%	16.99	-1.76	-9%	14.81	-2.10	-12%	22.98	-0.24	-1%	13.17	-0.11	-1%	25.28	-1.35	-5%
	Operations 2 (Year 27)	22.18	-3.77	-15%	17.40	-1.35	-7%	14.81	-2.10	-12%	22.99	-0.23	-1%	13.17	-0.11	-1%	25.28	-1.35	-5%
	Closure (Year 30)	22.18	-3.77	-15%	17.38	-1.37	-7%	15.04	-1.87	-11%	23.04	-0.18	-1%	13.25	-0.03	0%	25.65	-0.98	-4%
	Post-closure (Year 50)	22.27	-3.68	-14%	17.37	-1.38	-7%	15.44	-1.47	-9%	23.10	-0.12	-1%	13.25	-0.03	0%	25.75	-0.88	-3%
50 Year Dry	Pre-Mine	2.38	n/a	n/a	1.73	n/a	n/a	1.59	n/a	n/a	1.96	n/a	n/a	1.89	n/a	n/a	8.64	n/a	n/a
	Construction (Year -1)	2.70	0.32	14%	1.94	0.21	12%	1.79	0.20	13%	2.08	0.12	6%	1.98	0.09	5%	9.12	0.48	6%
	Operations 1 (Year 10)	2.58	0.20	9%	1.89	0.16	9%	1.72	0.13	8%	2.02	0.06	3%	1.92	0.03	1%	8.71	0.07	1%
	Operations 1 (Year 22)	2.58	0.20	8%	1.89	0.16	9%	1.71	0.12	8%	2.01	0.05	3%	1.91	0.02	1%	8.70	0.06	1%
	Operations 2 (Year 27)	2.58	0.20	8%	1.89	0.16	9%	1.71	0.12	8%	2.01	0.05	3%	1.91	0.02	1%	8.70	0.06	1%
	Closure (Year 30)	2.58	0.20	8%	1.89	0.16	9%	1.73	0.14	9%	2.02	0.06	3%	1.93	0.04	2%	8.88	0.24	3%
	Post-closure (Year 50)	2.61	0.23	9%	1.91	0.18	10%	1.79	0.20	12%	2.08	0.12	6%	1.98	0.09	5%	8.93	0.29	3%

**Appendix 12-C13a. Average Monthly Flows at Node 13 (North Thompson River at Birch Island WSC 08LB047) during Different Phases of the Project**

Mine Stage		Drainage Area (km <sup>2</sup> )	Parameter	Units	Mean Monthly												Average Annual
Year	Description				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
-	Pre-Mine	4490	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	92	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
-1	End of Construction	4490	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%
10	Operations I	4489	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%
22	Operations I	4488	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%
27	Operations II	4489	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%
30	Closure	4489	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%
50	Post-Closure	4489	Discharge	m <sup>3</sup> /s	30	28	34	90	295	437	345	217	130	91	65	35	150
			Unit Runoff	l/s/km <sup>2</sup>	6.6	6.2	7.5	20.1	65.8	97.3	76.9	48.3	29.0	20.4	14.4	7.8	33.4
			Change from Pre-Mine	m <sup>3</sup> /s %	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	0.0 0%	-0.1 0%	-0.1 0%	-0.1 0%	0.0 0%	0.0 0%	0.0 0%

**Appendix 12-C13b. Sensitivity Analysis for Monthly Flows at Node 13 (North Thompson River at Birch Island WSC 08LB047) during Different Phases of the Project**

Scenarios	Project Phase	January			February			March			April			May			June			July		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	29.6	n/a	n/a	28.0	n/a	n/a	33.5	n/a	n/a	90.4	n/a	n/a	295.3	n/a	n/a	436.8	n/a	n/a	345.1	n/a	n/a
	Construction (Year -1)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.4	0.0	0%	436.9	0.0	0%	345.1	0.0	0%
	Operations 1 (Year 10)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.3	0.0	0%	436.8	0.0	0%	345.0	-0.1	0%
	Operations 1 (Year 22)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.3	0.0	0%	436.8	0.0	0%	345.0	-0.1	0%
	Operations 2 (Year 27)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.3	0.0	0%	436.8	0.0	0%	345.0	-0.1	0%
	Closure (Year 30)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.3	0.0	0%	436.8	0.0	0%	345.0	-0.1	0%
	Post-closure (Year 50)	29.6	0.0	0%	28.0	0.0	0%	33.5	0.0	0%	90.4	0.0	0%	295.3	0.0	0%	436.8	0.0	0%	345.0	-0.1	0%
50 Year Wet	Pre-Mine	60.4	n/a	n/a	52.1	n/a	n/a	70.4	n/a	n/a	164.6	n/a	n/a	416.3	n/a	n/a	609.1	n/a	n/a	535.0	n/a	n/a
	Construction (Year -1)	60.4	0.0	0%	52.1	0.0	0%	70.2	-0.2	0%	164.6	0.0	0%	416.1	-0.2	0%	608.8	-0.3	0%	534.6	-0.4	0%
	Operations 1	60.4	0.0	0%	52.1	0.0	0%	70.3	-0.1	0%	164.6	0.0	0%	416.0	-0.3	0%	608.6	-0.5	0%	534.5	-0.5	0%
	Operations 1 (Year 22)	60.4	0.0	0%	52.1	0.0	0%	70.3	-0.1	0%	164.5	-0.1	0%	416.0	-0.3	0%	608.6	-0.5	0%	534.6	-0.4	0%
	Operations 2 (Year 27)	60.4	0.0	0%	52.1	0.0	0%	70.3	-0.1	0%	164.6	0.0	0%	416.0	-0.3	0%	608.6	-0.5	0%	534.6	-0.4	0%
	Closure (Year 30)	60.4	0.0	0%	52.1	0.0	0%	70.3	-0.1	0%	164.6	0.0	0%	416.0	-0.3	0%	608.7	-0.4	0%	534.5	-0.5	0%
	Post-closure (Year 50)	60.4	0.0	0%	52.1	0.0	0%	70.3	-0.1	0%	164.6	0.0	0%	416.0	-0.3	0%	608.7	-0.4	0%	534.5	-0.5	0%
50 Year Dry	Pre-Mine	14.3	n/a	n/a	16.2	n/a	n/a	18.4	n/a	n/a	35.0	n/a	n/a	178.1	n/a	n/a	309.3	n/a	n/a	223.5	n/a	n/a
	Construction (Year -1)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.0	0.0	0%	178.3	0.2	0%	309.5	0.2	0%	223.6	0.1	0%
	Operations 1 (Year 10)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.1	0.1	0%	178.2	0.1	0%	309.4	0.1	0%	223.5	0.0	0%
	Operations 1 (Year 22)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.0	0.0	0%	178.2	0.1	0%	309.4	0.1	0%	223.5	0.0	0%
	Operations 2 (Year 27)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.0	0.0	0%	178.2	0.1	0%	309.4	0.1	0%	223.5	0.0	0%
	Closure (Year 30)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.0	0.0	0%	178.2	0.1	0%	309.4	0.1	0%	223.5	0.0	0%
	Post-closure (Year 50)	14.3	0.0	0%	16.2	0.0	0%	18.4	0.0	0%	35.0	0.0	0%	178.2	0.1	0%	309.4	0.1	0%	223.5	0.0	0%

**Appendix 12-C13b. Sensitivity Analysis for Monthly Flows at Node 13 (North Thompson River at Birch Island WSC 08LB047) during Different Phases of the Project**

Scenarios	Project Phase	August			September			October			November			December			Annual		
		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine		Flow	Change from Pre-mine	
		(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)	(m <sup>3</sup> /s)	(m <sup>3</sup> /s)	(%)
Base Case	Pre-Mine	216.9	n/a	n/a	130.2	n/a	n/a	91.5	n/a	n/a	64.7	n/a	n/a	35.1	n/a	n/a	150.4	n/a	n/a
	Construction (Year -1)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
	Operations 1 (Year 10)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
	Operations 1 (Year 22)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
	Operations 2 (Year 27)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
	Closure (Year 30)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
	Post-closure (Year 50)	216.8	-0.1	0%	130.1	-0.1	0%	91.5	0.0	0%	64.7	0.0	0%	35.1	0.0	0%	150.3	0.0	0%
50 Year Wet	Pre-Mine	348.8	n/a	n/a	227.5	n/a	n/a	191.5	n/a	n/a	137.6	n/a	n/a	67.7	n/a	n/a	190.6	n/a	n/a
	Construction (Year -1)	348.4	-0.4	0%	227.1	-0.4	0%	191.3	-0.2	0%	137.5	-0.1	0%	67.7	0.0	0%	190.5	-0.1	0%
	Operations 1	348.4	-0.4	0%	227.1	-0.4	0%	191.4	-0.1	0%	137.5	-0.1	0%	67.7	0.0	0%	190.4	-0.2	0%
	Operations 1 (Year 22)	348.3	-0.5	0%	227.1	-0.4	0%	191.3	-0.2	0%	137.5	-0.1	0%	67.7	0.0	0%	190.5	-0.1	0%
	Operations 2 (Year 27)	348.3	-0.5	0%	227.1	-0.4	0%	191.3	-0.2	0%	137.5	-0.1	0%	67.7	0.0	0%	190.5	-0.1	0%
	Closure (Year 30)	348.3	-0.5	0%	227.1	-0.4	0%	191.4	-0.1	0%	137.5	-0.1	0%	67.7	0.0	0%	190.4	-0.2	0%
	Post-closure (Year 50)	348.4	-0.4	0%	227.1	-0.4	0%	191.3	-0.2	0%	137.5	-0.1	0%	67.7	0.0	0%	190.4	-0.2	0%
50 Year Dry	Pre-Mine	148.6	n/a	n/a	79.6	n/a	n/a	48.2	n/a	n/a	30.5	n/a	n/a	19.7	n/a	n/a	120.0	n/a	n/a
	Construction (Year -1)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.1	0.1	0%
	Operations 1 (Year 10)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.0	0.0	0%
	Operations 1 (Year 22)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.0	0.0	0%
	Operations 2 (Year 27)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.0	0.0	0%
	Closure (Year 30)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.0	0.0	0%
	Post-closure (Year 50)	148.6	0.0	0%	79.6	0.0	0%	48.2	0.0	0%	30.5	0.0	0%	19.7	0.0	0%	120.0	0.0	0%