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**Appendix 5.3.2B**  
**Potential Project Effects “Mitigated” Dry**  
**and Wet Monthly and Annual Surface**  
**Water Flow Summary Tables**

# BLACKWATER GOLD PROJECT

APPLICATION FOR AN  
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**Table 1: Estimated 1:5-year Dry Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	0.0	34	24	5.7	1.2	0.3	0.0	0.0	0.0	5.5
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	108	100	93	83	573	529	250	165	136	125	117	111	199
Construction (Year -2)	82	76	70	62	446	445	200	128	105	97	90	84	157
% Change from Baseline	-24%	-24%	-24%	-25%	-22%	-16%	-20%	-22%	-23%	-23%	-23%	-24%	-21%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	16%	25%	34%	51%	-1%	6%	-4%	-9%	-15%	-8%	-2%	13%	4%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	16%	25%	34%	51%	-1%	6%	-4%	-9%	-15%	-8%	-2%	13%	4%
Post-Closure	94	89	85	81	719	384	141	109	97	112	101	94	176
% Change from Baseline	-13%	-11%	-9%	-2%	25%	-27%	-44%	-34%	-28%	-10%	-14%	-15%	-12%
<i>H4B (WQ26)</i>													
Baseline	129	117	113	144	692	612	308	210	174	158	145	134	245
Construction (Year -2)	104	94	90	122	565	527	258	173	143	130	119	109	203
% Change from Baseline	-19%	-20%	-20%	-15%	-18%	-14%	-16%	-17%	-17%	-18%	-18%	-19%	-17%
Operations (Year 17)	129	128	128	145	666	612	273	174	133	129	123	130	231
% Change from Baseline	0%	9%	13%	1%	-4%	0%	-11%	-17%	-24%	-18%	-15%	-3%	-6%
Closure (Year 20)	129	128	129	148	712	641	282	176	134	130	125	132	239
% Change from Baseline	1%	10%	14%	3%	3%	5%	-8%	-16%	-23%	-18%	-14%	-2%	-2%
Post-Closure	108	100	99	129	814	443	179	123	124	135	120	110	207
% Change from Baseline	-16%	-14%	-13%	-10%	18%	-28%	-42%	-41%	-29%	-15%	-17%	-18%	-15%
<i>4-DC</i>													
Baseline	131	118	116	186	756	633	316	214	176	160	148	137	258
Construction (Year -2)	105	95	92	163	629	547	266	178	147	135	135	125	218
% Change from Baseline	-20%	-20%	-20%	-12%	-17%	-14%	-16%	-17%	-17%	-16%	-9%	-8%	-15%
Operations (Year 17)	129	128	130	203	730	628	281	178	135	131	128	134	245

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<i>% Change from Baseline</i>	-1%	8%	12%	9%	-4%	-1%	-11%	-17%	-23%	-18%	-14%	-2%	-5%
Closure (Year 20)	130	129	130	207	777	655	290	181	137	132	128	135	253
<i>% Change from Baseline</i>	0%	9%	13%	11%	3%	3%	-8%	-15%	-22%	-17%	-14%	-1%	-2%
Post-Closure	111	103	115	168	880	464	187	127	127	150	137	129	225
<i>% Change from Baseline</i>	-15%	-13%	-1%	-10%	16%	-27%	-41%	-41%	-28%	-6%	-7%	-5%	-13%
<b>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</b>													
Baseline	157	144	141	220	801	671	349	244	205	187	175	163	288
Construction (Year -2)	132	120	117	197	674	583	299	208	175	160	149	138	246
<i>% Change from Baseline</i>	-16%	-16%	-17%	-10%	-16%	-13%	-14%	-15%	-15%	-15%	-15%	-16%	-15%
Operations (Year 17)	153	151	157	236	771	662	313	208	164	159	154	161	274
<i>% Change from Baseline</i>	-3%	5%	11%	7%	-4%	-1%	-10%	-15%	-20%	-15%	-12%	-2%	-5%
Closure (Year 20)	154	152	153	240	819	690	322	211	166	160	153	161	282
<i>% Change from Baseline</i>	-2%	6%	9%	9%	2%	3%	-8%	-14%	-19%	-15%	-12%	-1%	-2%
Post-Closure	136	127	125	202	925	502	220	158	157	161	147	138	250
<i>% Change from Baseline</i>	-13%	-12%	-11%	-8%	15%	-25%	-37%	-35%	-24%	-14%	-16%	-15%	-13%
<b>Chedakuz Creek</b>													
<b>15-CC (outlet of Tatelkuz Lake)</b>													
Baseline	782	789	892	1,062	2,056	1,990	1,120	713	622	706	949	825	1,042
Construction (Year -2)	782	789	892	1,064	2,066	1,993	1,119	712	622	707	949	825	1,043
<i>% Change from Baseline</i>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	621	629	733	907	1,393	1,300	843	528	479	558	800	663	788
<i>% Change from Baseline</i>	-21%	-20%	-18%	-15%	-32%	-35%	-25%	-26%	-23%	-21%	-16%	-20%	-24%
Closure (Year 20)	618	627	733	902	1,369	1,268	832	523	475	552	794	660	788
<i>% Change from Baseline</i>	-21%	-21%	-18%	-15%	-33%	-36%	-26%	-27%	-24%	-22%	-16%	-20%	-24%
Post-Closure	789	796	900	1,074	2,133	1,953	1,107	710	625	713	952	831	1,049
<i>% Change from Baseline</i>	1%	1%	1%	1%	4%	-2%	-1%	0%	1%	1%	0%	1%	1%
<b>H5 (midway between Davidson Creek and Turtle Creek confluences)</b>													
Baseline	1,175	1,186	1,341	1,596	3,090	2,990	1,683	1,072	934	1,062	1,426	1,240	1,566
Construction (Year -2)	1,148	1,161	1,315	1,547	2,926	2,872	1,628	1,033	902	1,028	1,392	1,212	1,514
<i>% Change from Baseline</i>	-2%	-2%	-2%	-3%	-5%	-4%	-3%	-4%	-3%	-3%	-2%	-2%	-3%
Operations (Year 17)	1,009	1,028	1,181	1,348	2,223	2,184	1,337	837	733	853	1,224	1,064	1,252
<i>% Change from Baseline</i>	-14%	-13%	-12%	-16%	-28%	-27%	-21%	-22%	-22%	-20%	-14%	-14%	-20%
Closure (Year 20)	1,007	1,027	1,181	1,357	2,257	2,179	1,334	835	731	851	1,221	1,062	1,254
<i>% Change from Baseline</i>	-14%	-13%	-12%	-15%	-27%	-27%	-21%	-22%	-22%	-20%	-14%	-14%	-20%
Post-Closure	1,160	1,173	1,328	1,610	3,288	2,757	1,547	983	887	1,043	1,396	1,218	1,533
<i>% Change from Baseline</i>	-1%	-1%	-1%	1%	6%	-8%	-8%	-8%	-5%	-2%	-2%	-2%	-2%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 2: Estimated 1 in 5-year Wet Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	20	63	66	16	3.7	1.5	0.7	0.2	0.0	14
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	156	145	136	280	1,036	1,116	382	215	190	203	198	169	352
Construction (Year -2)	119	110	103	198	782	848	299	168	146	154	149	129	267
% Change from Baseline	-24%	-24%	-24%	-29%	-24%	-24%	-22%	-22%	-23%	-24%	-24%	-24%	-24%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-20%	-14%	-8%	-55%	-45%	-50%	-37%	-30%	-39%	-43%	-42%	-26%	-41%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-20%	-14%	-8%	-55%	-45%	-50%	-37%	-30%	-39%	-43%	-42%	-26%	-41%
Post-Closure	132	121	117	256	1,211	895	275	149	157	195	165	144	318
% Change from Baseline	-16%	-16%	-14%	-9%	17%	-20%	-28%	-31%	-17%	-4%	-16%	-15%	-10%
<i>H4B (WQ26)</i>													
Baseline	205	184	176	411	1,214	1,257	470	281	244	266	267	228	433
Construction (Year -2)	169	151	145	329	960	990	386	234	202	218	219	189	349
% Change from Baseline	-17%	-18%	-18%	-20%	-21%	-21%	-18%	-17%	-17%	-18%	-18%	-17%	-19%
Operations (Year 17)	157	150	154	239	729	683	303	194	151	157	162	165	270
% Change from Baseline	-23%	-19%	-12%	-42%	-40%	-46%	-35%	-31%	-38%	-41%	-39%	-28%	-38%
Closure (Year 20)	159	151	155	260	805	737	319	200	155	164	169	167	287
% Change from Baseline	-22%	-18%	-12%	-37%	-34%	-41%	-32%	-29%	-36%	-38%	-37%	-27%	-34%
Post-Closure	169	152	150	416	1,345	991	336	196	195	237	216	189	383
% Change from Baseline	-17%	-18%	-14%	1%	11%	-21%	-28%	-30%	-20%	-11%	-19%	-17%	-12%
<b>4-DC</b>													
Baseline	214	191	192	504	1,328	1,316	491	292	254	290	295	243	467
Construction (Year -2)	176	156	160	423	1,073	1,051	408	244	210	233	247	203	382
% Change from Baseline	-18%	-18%	-17%	-16%	-19%	-20%	-17%	-16%	-17%	-20%	-16%	-16%	-18%
Operations (Year 17)	166	156	169	330	841	745	324	204	160	179	186	178	303
% Change from Baseline	-22%	-18%	-12%	-35%	-37%	-43%	-34%	-30%	-37%	-38%	-37%	-27%	-35%

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	168	157	170	352	917	802	340	210	164	186	195	180	320
% Change from Baseline	-21%	-18%	-12%	-30%	-31%	-39%	-31%	-28%	-35%	-36%	-34%	-26%	-32%
Post-Closure	175	156	168	514	1,456	1,051	358	206	204	271	252	204	418
% Change from Baseline	-18%	-19%	-13%	2%	10%	-20%	-27%	-29%	-19%	-6%	-14%	-16%	-11%
<b>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</b>													
Baseline	246	223	225	557	1,384	1,361	527	326	287	324	330	277	506
Construction (Year -2)	211	189	194	475	1,130	1,097	444	278	245	276	283	238	422
% Change from Baseline	-14%	-15%	-14%	-15%	-18%	-19%	-16%	-15%	-15%	-15%	-14%	-14%	-17%
Operations (Year 17)	199	188	202	380	901	792	363	238	193	213	222	212	342
% Change from Baseline	-19%	-16%	-10%	-32%	-35%	-42%	-31%	-27%	-33%	-34%	-33%	-23%	-32%
Closure (Year 20)	201	189	203	402	976	849	377	244	198	220	230	215	359
% Change from Baseline	-18%	-15%	-10%	-28%	-29%	-38%	-29%	-25%	-31%	-32%	-30%	-22%	-29%
Post-Closure	211	190	200	568	1,512	1,096	394	240	237	306	288	238	457
% Change from Baseline	-14%	-15%	-11%	2%	9%	-19%	-25%	-26%	-17%	-6%	-13%	-14%	-10%
<b>Chedakuz Creek</b>													
<b>15-CC (outlet of Tatelkuz Lake)</b>													
Baseline	1,117	1,087	1,236	2,654	5,908	5,355	2,335	1,369	1,472	1,433	1,674	1,288	2,244
Construction (Year -2)	1,117	1,087	1,236	2,657	5,920	5,364	2,334	1,368	1,472	1,434	1,674	1,288	2,246
% Change from Baseline	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	955	924	1,072	2,443	5,099	4,567	1,979	1,158	1,287	1,256	1,505	1,124	1,947
% Change from Baseline	-14%	-15%	-13%	-8%	-14%	-15%	-15%	-15%	-13%	-12%	-10%	-13%	-13%
Closure (Year 20)	953	924	1,072	2,437	5,065	4,500	1,959	1,148	1,279	1,246	1,496	1,120	1,933
% Change from Baseline	-15%	-15%	-13%	-8%	-14%	-16%	-16%	-16%	-13%	-13%	-11%	-13%	-14%
Post-Closure	1,126	1,096	1,246	2,678	6,006	5,314	2,314	1,365	1,477	1,439	1,676	1,297	2,253
% Change from Baseline	1%	1%	1%	1%	2%	-1%	-1%	0%	0%	0%	0%	1%	0%
<b>H5 (midway between Davidson Creek and Turtle Creek confluences)</b>													
Baseline	1,678	1,634	1,858	3,988	8,878	8,047	3,509	2,057	2,213	2,153	2,516	1,936	3,372
Construction (Year -2)	1,644	1,603	1,830	3,918	8,669	7,811	3,427	2,009	2,168	2,109	2,473	1,899	3,297
% Change from Baseline	-2%	-2%	-2%	-2%	-2%	-3%	-2%	-2%	-2%	-2%	-2%	-2%	-2%
Operations (Year 17)	1,478	1,449	1,693	3,667	7,797	6,792	3,020	1,770	1,941	1,892	2,275	1,723	2,958
% Change from Baseline	-12%	-11%	-9%	-8%	-12%	-16%	-14%	-14%	-12%	-12%	-10%	-11%	-12%
Closure (Year 20)	1,478	1,449	1,693	3,677	7,833	6,787	3,016	1,766	1,937	1,889	2,272	1,722	2,960
% Change from Baseline	-12%	-11%	-9%	-8%	-12%	-16%	-14%	-14%	-12%	-12%	-10%	-11%	-12%
Post-Closure	1,654	1,614	1,848	4,027	9,124	7,751	3,337	1,962	2,160	2,140	2,480	1,908	3,334
% Change from Baseline	-1%	-1%	-1%	1%	3%	-4%	-5%	-5%	-2%	-1%	-1%	-1%	-1%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 3: Estimated 1:10-year Dry Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	0.0	29	19	4.3	0.9	0.2	0.0	0.0	0.0	4.4
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	98	91	84	60	491	434	224	153	124	110	102	99	173
Construction (Year -2)	74	69	64	46	385	376	180	119	96	85	79	76	137
% Change from Baseline	-24%	-24%	-25%	-23%	-22%	-14%	-20%	-22%	-23%	-23%	-23%	-24%	-20%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	28%	38%	48%	Increase	16%	29%	7%	-2%	-8%	4%	13%	26%	20%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	28%	38%	48%	Increase	16%	29%	7%	-2%	-8%	4%	13%	26%	21%
Post-Closure	86	82	78	74	626	307	118	98	88	97	90	84	152
% Change from Baseline	-12%	-9%	-7%	24%	28%	-29%	-47%	-36%	-29%	-12%	-12%	-15%	-12%
<i>H4B (WQ26)</i>													
Baseline	114	104	101	109	597	507	275	194	159	119	108	117	209
Construction (Year -2)	91	82	80	94	491	446	232	160	131	113	101	94	176
% Change from Baseline	-20%	-20%	-21%	-13%	-18%	-12%	-16%	-17%	-17%	-5%	-6%	-19%	-15%
Operations (Year 17)	126	126	126	137	650	601	266	169	128	125	120	127	225
% Change from Baseline	11%	21%	25%	26%	9%	19%	-3%	-13%	-19%	5%	12%	9%	8%
Closure (Year 20)	127	127	127	138	690	623	272	171	129	126	121	129	232
% Change from Baseline	11%	22%	26%	27%	16%	23%	-1%	-12%	-19%	6%	13%	10%	11%
Post-Closure	96	90	88	108	713	359	152	108	110	116	103	95	178
% Change from Baseline	-16%	-13%	-12%	-1%	19%	-29%	-45%	-44%	-31%	-3%	-4%	-19%	-15%
<b>4-DC</b>													
Baseline	115	104	101	143	652	522	281	197	160	136	123	118	221
Construction (Year -2)	94	85	81	127	546	460	238	164	134	117	114	108	189
% Change from Baseline	-18%	-19%	-20%	-11%	-16%	-12%	-15%	-17%	-16%	-14%	-8%	-8%	-15%
Operations (Year 17)	126	126	126	179	703	613	273	172	131	126	123	130	236
% Change from Baseline	10%	21%	25%	25%	8%	17%	-3%	-13%	-18%	-8%	0%	11%	7%

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	127	127	127	180	744	635	280	174	132	127	122	131	242
% Change from Baseline	10%	21%	26%	26%	14%	21%	-1%	-12%	-17%	-7%	-1%	12%	9%
Post-Closure	99	93	102	135	771	374	158	112	113	128	116	112	193
% Change from Baseline	-14%	-11%	1%	-5%	18%	-28%	-44%	-43%	-30%	-6%	-6%	-4%	-13%
<i>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</i>													
Baseline	140	128	124	172	694	557	313	226	188	162	148	142	250
Construction (Year -2)	117	107	103	156	588	494	269	193	160	138	125	119	214
% Change from Baseline	-16%	-17%	-17%	-9%	-15%	-11%	-14%	-15%	-15%	-15%	-15%	-16%	-14%
Operations (Year 17)	149	148	148	208	741	645	301	201	157	153	149	155	263
% Change from Baseline	7%	16%	19%	21%	7%	16%	-4%	-11%	-16%	-6%	1%	9%	5%
Closure (Year 20)	150	149	148	209	782	667	311	203	158	154	147	156	270
% Change from Baseline	8%	16%	19%	22%	13%	20%	-1%	-10%	-16%	-5%	-1%	10%	8%
Post-Closure	122	114	111	164	813	409	189	141	140	136	123	120	215
% Change from Baseline	-13%	-11%	-11%	-5%	17%	-27%	-40%	-38%	-25%	-16%	-17%	-16%	-14%
<b>Chedakuz Creek</b>													
<i>15-CC (outlet of Tatelkuz Lake)</i>													
Baseline	712	726	819	835	1,558	1,533	923	601	496	587	817	734	862
Construction (Year -2)	712	726	819	837	1,566	1,535	922	600	495	587	817	733	863
% Change from Baseline	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	554	569	664	699	990	934	673	429	370	451	678	577	632
% Change from Baseline	-22%	-22%	-19%	-16%	-36%	-39%	-27%	-29%	-25%	-23%	-17%	-21%	-27%
Closure (Year 20)	551	567	664	695	970	909	664	425	366	446	672	574	625
% Change from Baseline	-23%	-22%	-19%	-17%	-38%	-41%	-28%	-29%	-26%	-24%	-18%	-22%	-27%
Post-Closure	718	732	826	845	1,624	1,501	911	598	498	593	821	739	867
% Change from Baseline	1%	1%	1%	1%	4%	-2%	-1%	0%	1%	1%	0%	1%	1%
<i>H5 (midway between Davidson Creek and Turtle Creek confluences)</i>													
Baseline	1,070	1,090	1,230	1,255	2,341	2,304	1,387	903	745	881	1,228	1,102	1,295
Construction (Year -2)	1,045	1,067	1,205	1,212	2,198	2,207	1,338	867	716	851	1,197	1,077	1,248
% Change from Baseline	-2%	-2%	-2%	-3%	-6%	-4%	-4%	-4%	-4%	-4%	-3%	-2%	-4%
Operations (Year 17)	912	939	1,074	1,036	1,598	1,620	1,079	687	568	692	1,040	937	1,015
% Change from Baseline	-15%	-14%	-13%	-17%	-32%	-30%	-22%	-24%	-24%	-22%	-15%	-15%	-22%
Closure (Year 20)	910	938	1,075	1,044	1,627	1,616	1,077	685	566	690	1,037	935	1,017
% Change from Baseline	-15%	-14%	-13%	-17%	-30%	-30%	-22%	-24%	-24%	-22%	-16%	-15%	-21%
Post-Closure	1,057	1,079	1,217	1,265	2,513	2,100	1,264	819	702	863	1,200	1,083	1,264
% Change from Baseline	-1%	-1%	-1%	1%	7%	-9%	-9%	-9%	-6%	-2%	-2%	-2%	-2%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC. Where a % change is greater than 100% then this has been noted as an "Increase" and no numeric value is presented.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 4: Estimated 1:10-year Wet Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	29	74	86	21	5.0	2.3	2.4	0.6	0.1	18
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	172	159	150	385	1,210	1,358	427	231	207	231	227	189	412
Construction (Year -2)	131	121	113	269	907	1,005	333	180	160	174	170	144	309
% Change from Baseline	-24%	-24%	-24%	-30%	-25%	-26%	-22%	-22%	-23%	-25%	-25%	-24%	-25%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-27%	-22%	-17%	-68%	-53%	-59%	-44%	-35%	-44%	-50%	-49%	-34%	-50%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-27%	-22%	-17%	-68%	-53%	-59%	-44%	-35%	-44%	-50%	-49%	-34%	-50%
Post-Closure	144	131	127	458	1,390	1,118	328	169	181	226	190	161	385
% Change from Baseline	-16%	-17%	-15%	19%	15%	-18%	-23%	-27%	-13%	-2%	-16%	-15%	-7%
<i>H4B (WQ26)</i>													
Baseline	231	208	197	542	1,407	1,519	525	304	267	305	313	262	507
Construction (Year -2)	192	171	164	427	1,104	1,169	430	253	221	250	258	218	405
% Change from Baseline	-17%	-18%	-17%	-21%	-22%	-23%	-18%	-17%	-17%	-18%	-18%	-17%	-20%
Operations (Year 17)	172	161	167	286	746	713	312	199	156	170	182	182	287
% Change from Baseline	-26%	-22%	-15%	-47%	-47%	-53%	-41%	-35%	-42%	-44%	-42%	-31%	-43%
Closure (Year 20)	174	162	168	315	832	774	330	206	161	183	191	185	307
% Change from Baseline	-25%	-22%	-15%	-42%	-41%	-49%	-37%	-32%	-40%	-40%	-39%	-30%	-39%
Post-Closure	190	169	168	610	1,535	1,225	397	221	220	276	252	219	457
% Change from Baseline	-18%	-19%	-15%	13%	9%	-19%	-24%	-27%	-17%	-9%	-19%	-16%	-10%
<b>4-DC</b>													
Baseline	243	217	220	656	1,539	1,595	551	316	279	339	353	282	549
Construction (Year -2)	204	181	187	543	1,235	1,248	456	266	232	270	298	238	447
% Change from Baseline	-16%	-17%	-15%	-17%	-20%	-22%	-17%	-16%	-17%	-20%	-16%	-15%	-19%
Operations (Year 17)	185	170	189	375	873	797	338	211	169	206	226	204	329
% Change from Baseline	-24%	-22%	-14%	-43%	-43%	-50%	-39%	-33%	-39%	-39%	-36%	-28%	-40%



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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	186	172	190	405	958	866	357	218	173	219	228	208	348
% Change from Baseline	-23%	-21%	-14%	-38%	-38%	-46%	-35%	-31%	-38%	-35%	-35%	-26%	-37%
Post-Closure	199	176	192	717	1,662	1,303	425	234	231	327	307	239	501
% Change from Baseline	-18%	-19%	-13%	9%	8%	-18%	-23%	-26%	-17%	-3%	-13%	-15%	-9%
<i>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</i>													
Baseline	277	250	254	712	1,598	1,640	588	351	313	375	391	318	589
Construction (Year -2)	238	214	222	598	1,294	1,295	493	300	267	319	335	274	488
% Change from Baseline	-14%	-15%	-13%	-16%	-19%	-21%	-16%	-14%	-15%	-15%	-14%	-14%	-17%
Operations (Year 17)	223	207	219	431	938	851	377	246	202	241	264	240	370
% Change from Baseline	-20%	-17%	-14%	-39%	-41%	-48%	-36%	-30%	-36%	-36%	-32%	-25%	-37%
Closure (Year 20)	224	208	228	461	1,022	919	395	253	207	255	268	244	390
% Change from Baseline	-19%	-17%	-10%	-35%	-36%	-44%	-33%	-28%	-34%	-32%	-31%	-23%	-34%
Post-Closure	236	211	227	769	1,721	1,346	460	268	265	363	344	275	540
% Change from Baseline	-15%	-15%	-11%	8%	8%	-18%	-22%	-24%	-15%	-3%	-12%	-14%	-8%
<b>Chedakuz Creek</b>													
<i>15-CC (outlet of Tatelkuz Lake)</i>													
Baseline	1,227	1,183	1,347	3,377	7,798	6,948	2,833	1,625	1,847	1,726	1,944	1,449	2,775
Construction (Year -2)	1,226	1,183	1,347	3,380	7,809	6,961	2,832	1,625	1,847	1,727	1,944	1,448	2,777
% Change from Baseline	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	1,069	1,022	1,185	3,170	7,174	6,357	2,477	1,423	1,669	1,555	1,777	1,291	2,514
% Change from Baseline	-13%	-14%	-12%	-6%	-8%	-9%	-13%	-12%	-10%	-10%	-9%	-11%	-9%
Closure (Year 20)	1,068	1,023	1,185	3,164	7,147	6,281	2,454	1,413	1,659	1,544	1,767	1,287	2,499
% Change from Baseline	-13%	-14%	-12%	-6%	-8%	-10%	-13%	-13%	-10%	-11%	-9%	-11%	-10%
Post-Closure	1,237	1,193	1,357	3,405	7,886	6,914	2,810	1,620	1,852	1,731	1,945	1,458	2,784
% Change from Baseline	1%	1%	1%	1%	1%	0%	-1%	0%	0%	0%	0%	1%	0%
<i>H5 (midway between Davidson Creek and Turtle Creek confluences)</i>													
Baseline	1,843	1,778	2,025	5,074	11,719	10,442	4,257	2,443	2,776	2,594	2,921	2,177	4,171
Construction (Year -2)	1,807	1,744	1,997	5,003	11,538	10,163	4,168	2,394	2,731	2,548	2,877	2,137	4,092
% Change from Baseline	-2%	-2%	-1%	-1%	-2%	-3%	-2%	-2%	-2%	-2%	-1%	-2%	-2%
Operations (Year 17)	1,635	1,586	1,861	4,772	10,847	9,156	3,743	2,155	2,507	2,333	2,677	1,957	3,769
% Change from Baseline	-11%	-11%	-8%	-6%	-7%	-12%	-12%	-12%	-10%	-10%	-8%	-10%	-10%
Closure (Year 20)	1,635	1,587	1,861	4,780	10,867	9,152	3,738	2,151	2,502	2,329	2,675	1,955	3,769
% Change from Baseline	-11%	-11%	-8%	-6%	-7%	-12%	-12%	-12%	-10%	-10%	-8%	-10%	-10%
Post-Closure	1,815	1,755	2,016	5,126	11,936	10,174	4,086	2,354	2,730	2,586	2,884	2,148	4,134
% Change from Baseline	-2%	-1%	0%	1%	2%	-3%	-4%	-4%	-2%	0%	-1%	-1%	-1%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 5: Estimated 1:20-year Dry Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	0.0	25	15	3	0.7	0.1	0.0	0.0	0.0	3.7
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	90	84	57	46	432	369	204	145	116	99	91	65	150
Construction (Year -2)	68	63	59	36	341	327	165	112	89	77	71	69	123
% Change from Baseline	-24%	-24%	3%	-22%	-21%	-12%	-19%	-23%	-23%	-22%	-22%	5%	-18%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	38%	49%	Increase	Increase	32%	52%	18%	4%	-1%	16%	26%	91%	39%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	38%	49%	Increase	Increase	32%	52%	18%	4%	-1%	16%	26%	91%	39%
Post-Closure	80	77	73	71	560	256	102	90	81	86	81	77	136
% Change from Baseline	-11%	-8%	28%	54%	30%	-31%	-50%	-38%	-30%	-13%	-11%	17%	-9%
<i>H4B (WQ26)</i>													
Baseline	103	94	79	87	529	434	251	182	148	105	93	91	183
Construction (Year -2)	82	74	72	76	438	389	212	150	122	101	89	84	157
% Change from Baseline	-20%	-21%	-9%	-12%	-17%	-10%	-15%	-17%	-17%	-3%	-4%	-7%	-14%
Operations (Year 17)	125	125	125	134	637	594	260	165	125	123	119	126	221
% Change from Baseline	21%	33%	58%	54%	21%	37%	4%	-9%	-15%	18%	28%	39%	21%
Closure (Year 20)	126	126	126	134	672	610	265	166	125	124	120	127	227
% Change from Baseline	22%	34%	59%	54%	27%	41%	6%	-9%	-15%	19%	29%	40%	24%
Post-Closure	87	82	81	96	640	302	133	98	100	102	90	84	158
% Change from Baseline	-15%	-12%	2%	10%	21%	-31%	-47%	-46%	-32%	-2%	-3%	-7%	-14%
<i>4-DC</i>													
Baseline	104	94	91	115	577	446	256	184	148	120	106	104	195
Construction (Year -2)	87	78	74	103	487	400	217	153	126	104	99	96	169
% Change from Baseline	-16%	-17%	-18%	-10%	-16%	-10%	-15%	-17%	-15%	-13%	-7%	-7%	-14%
Operations (Year 17)	125	125	125	161	682	603	267	167	128	123	121	128	230
% Change from Baseline	21%	33%	38%	40%	18%	35%	4%	-9%	-14%	3%	14%	23%	17%

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	126	126	126	160	718	621	273	169	129	125	120	129	235
% Change from Baseline	21%	33%	39%	39%	24%	39%	7%	-9%	-13%	4%	13%	24%	20%
Post-Closure	91	86	92	117	692	314	137	101	102	112	101	100	170
% Change from Baseline	-12%	-9%	2%	1%	20%	-30%	-46%	-45%	-31%	-7%	-5%	-3%	-13%
<i>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</i>													
Baseline	127	117	112	141	617	478	286	213	175	144	129	127	222
Construction (Year -2)	105	97	92	129	526	431	247	181	149	123	109	106	191
% Change from Baseline	-17%	-17%	-18%	-8%	-15%	-10%	-14%	-15%	-15%	-15%	-15%	-16%	-14%
Operations (Year 17)	147	147	142	188	716	634	292	196	152	149	146	152	255
% Change from Baseline	16%	26%	27%	33%	16%	33%	2%	-8%	-13%	3%	13%	20%	15%
Closure (Year 20)	148	147	146	187	753	653	303	197	152	150	144	153	261
% Change from Baseline	17%	26%	30%	33%	22%	36%	6%	-7%	-13%	4%	11%	21%	18%
Post-Closure	111	105	100	142	731	345	166	129	128	118	106	107	191
% Change from Baseline	-13%	-10%	-11%	1%	19%	-28%	-42%	-39%	-27%	-18%	-18%	-16%	-14%
<b>Chedakuz Creek</b>													
<i>15-CC (outlet of Tatelkuz Lake)</i>													
Baseline	659	677	763	685	1,240	1,238	788	522	411	503	723	666	740
Construction (Year -2)	659	677	763	687	1,248	1,240	787	521	411	504	723	666	740
% Change from Baseline	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	505	523	611	564	748	712	560	362	299	378	591	515	531
% Change from Baseline	-23%	-23%	-20%	-18%	-40%	-42%	-29%	-31%	-27%	-25%	-18%	-23%	-28%
Closure (Year 20)	502	521	612	561	731	691	552	358	296	374	586	512	525
% Change from Baseline	-24%	-23%	-20%	-18%	-41%	-44%	-30%	-31%	-28%	-26%	-19%	-23%	-29%
Post-Closure	665	683	770	694	1,299	1,209	777	519	414	509	726	671	745
% Change from Baseline	1%	1%	1%	1%	5%	-2%	-1%	0%	1%	1%	0%	1%	1%
<i>H5 (midway between Davidson Creek and Turtle Creek confluences)</i>													
Baseline	991	1,018	1,147	1,029	1,864	1,860	1,184	784	618	757	1,086	1,001	1,112
Construction (Year -2)	967	995	1,122	991	1,738	1,778	1,139	751	592	728	1,057	977	1,070
% Change from Baseline	-2%	-2%	-2%	-4%	-7%	-4%	-4%	-4%	-4%	-4%	-3%	-2%	-4%
Operations (Year 17)	840	872	993	835	1,218	1,268	905	584	460	583	910	845	859
% Change from Baseline	-15%	-14%	-13%	-19%	-35%	-32%	-24%	-25%	-26%	-23%	-16%	-16%	-23%
Closure (Year 20)	838	870	994	841	1,244	1,264	903	583	459	581	907	843	861
% Change from Baseline	-15%	-14%	-13%	-18%	-33%	-32%	-24%	-26%	-26%	-23%	-17%	-16%	-23%
Post-Closure	979	1,007	1,133	1,037	2,016	1,680	1,070	706	579	739	1,060	983	1,082
% Change from Baseline	-1%	-1%	-1%	1%	8%	-10%	-10%	-10%	-6%	-2%	-2%	-2%	-3%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC. Where a % change is greater than 100% then this has been noted as an "Increase" and no numeric value is presented.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 6: Estimated 1:20-year Wet Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Creek Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.1	0.0	0.0	35	85	107	27	6.4	3.3	6.7	2.3	0.5	23
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed downstream of proposed TSF)</i>													
Baseline	186	172	162	502	1,375	1,596	468	245	222	256	254	207	471
Construction (Year -2)	142	131	123	346	1,023	1,155	363	191	171	192	190	158	349
% Change from Baseline	-24%	-24%	-24%	-31%	-26%	-28%	-22%	-22%	-23%	-25%	-25%	-24%	-26%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-33%	-28%	-23%	-75%	-59%	-65%	-49%	-39%	-48%	-55%	-55%	-40%	-56%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-33%	-28%	-23%	-75%	-59%	-65%	-49%	-39%	-48%	-55%	-55%	-40%	-56%
Post-Closure	154	140	136	653	1,556	1,342	379	188	204	256	213	177	450
% Change from Baseline	-17%	-19%	-16%	30%	13%	-16%	-19%	-23%	-8%	0%	-16%	-15%	-4%
<i>H4B (WQ26)</i>													
Baseline	256	229	217	680	1,589	1,774	575	324	287	342	358	294	577
Construction (Year -2)	213	190	181	529	1,238	1,340	469	270	238	279	294	246	457
% Change from Baseline	-17%	-17%	-16%	-22%	-22%	-24%	-18%	-17%	-17%	-18%	-18%	-16%	-21%
Operations (Year 17)	186	172	179	333	761	743	319	204	160	183	201	199	303
% Change from Baseline	-27%	-25%	-17%	-51%	-52%	-58%	-45%	-37%	-44%	-46%	-44%	-32%	-47%
Closure (Year 20)	188	173	181	371	854	810	339	212	166	203	213	202	326
% Change from Baseline	-26%	-25%	-17%	-45%	-46%	-54%	-41%	-35%	-42%	-41%	-40%	-31%	-43%
Post-Closure	210	185	184	834	1,711	1,458	454	245	243	314	287	246	531
% Change from Baseline	-18%	-19%	-15%	23%	8%	-18%	-21%	-24%	-15%	-8%	-20%	-16%	-8%
<b>4-DC</b>													
Baseline	270	241	245	814	1,739	1,869	606	338	302	386	410	319	628
Construction (Year -2)	232	205	213	668	1,386	1,437	501	284	253	306	347	271	509
% Change from Baseline	-14%	-15%	-13%	-18%	-20%	-23%	-17%	-16%	-16%	-21%	-15%	-15%	-19%
Operations (Year 17)	203	184	209	416	901	850	352	217	178	235	272	232	354
% Change from Baseline	-25%	-24%	-15%	-49%	-48%	-55%	-42%	-36%	-41%	-39%	-34%	-27%	-44%

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	205	186	210	454	993	929	373	225	182	256	262	238	376
% Change from Baseline	-24%	-23%	-14%	-44%	-43%	-50%	-38%	-33%	-40%	-34%	-36%	-25%	-40%
Post-Closure	222	195	215	938	1,853	1,555	489	259	256	382	360	272	583
% Change from Baseline	-18%	-19%	-12%	15%	7%	-17%	-19%	-23%	-15%	-1%	-12%	-15%	-7%
<b>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</b>													
Baseline	306	275	281	870	1,798	1,911	643	374	337	422	448	356	668
Construction (Year -2)	264	236	247	724	1,447	1,484	537	320	287	359	385	309	550
% Change from Baseline	-14%	-14%	-12%	-17%	-19%	-22%	-16%	-14%	-15%	-15%	-14%	-13%	-18%
Operations (Year 17)	246	225	236	478	970	910	389	254	209	271	311	270	397
% Change from Baseline	-19%	-18%	-16%	-45%	-46%	-52%	-39%	-32%	-38%	-36%	-31%	-24%	-41%
Closure (Year 20)	248	227	253	515	1,061	987	412	261	216	292	306	276	421
% Change from Baseline	-19%	-17%	-10%	-41%	-41%	-48%	-36%	-30%	-36%	-31%	-32%	-23%	-37%
Post-Closure	260	231	251	983	1,913	1,594	522	293	290	417	398	309	622
% Change from Baseline	-15%	-16%	-11%	13%	6%	-17%	-19%	-22%	-14%	-1%	-11%	-13%	-7%
<b>Chedakuz Creek</b>													
<b>15-CC (outlet of Tatelkuz Lake)</b>													
Baseline	1,325	1,268	1,446	4,115	9,796	8,606	3,320	1,872	2,226	2,011	2,197	1,595	3,315
Construction (Year -2)	1,325	1,268	1,446	4,119	9,803	8,622	3,319	1,871	2,225	2,012	2,198	1,595	3,317
% Change from Baseline	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	1,173	1,111	1,286	3,927	9,495	8,340	2,979	1,687	2,066	1,853	2,037	1,447	3,117
% Change from Baseline	-11%	-12%	-11%	-5%	-3%	-3%	-10%	-10%	-7%	-8%	-7%	-9%	-6%
Closure (Year 20)	1,173	1,112	1,286	3,922	9,482	8,258	2,953	1,675	2,055	1,841	2,027	1,443	3,102
% Change from Baseline	-11%	-12%	-11%	-5%	-3%	-4%	-11%	-11%	-8%	-8%	-8%	-10%	-6%
Post-Closure	1,336	1,278	1,456	4,148	9,862	8,583	3,296	1,866	2,231	2,015	2,198	1,606	3,323
% Change from Baseline	1%	1%	1%	1%	1%	0%	-1%	0%	0%	0%	0%	1%	0%
<b>H5 (midway between Davidson Creek and Turtle Creek confluences)</b>													
Baseline	1,991	1,905	2,173	6,184	14,721	12,933	4,989	2,813	3,344	3,022	3,302	2,398	4,981
Construction (Year -2)	1,952	1,870	2,144	6,116	14,590	12,615	4,896	2,764	3,301	2,976	3,257	2,355	4,903
% Change from Baseline	-2%	-2%	-1%	-1%	-1%	-2%	-2%	-2%	-1%	-2%	-1%	-2%	-2%
Operations (Year 17)	1,776	1,708	2,011	5,923	14,225	11,700	4,463	2,534	3,094	2,771	3,061	2,171	4,620
% Change from Baseline	-11%	-10%	-7%	-4%	-3%	-10%	-11%	-10%	-7%	-8%	-7%	-9%	-7%
Closure (Year 20)	1,777	1,710	2,012	5,929	14,219	11,699	4,458	2,529	3,088	2,767	3,058	2,170	4,618
% Change from Baseline	-11%	-10%	-7%	-4%	-3%	-10%	-11%	-10%	-8%	-8%	-7%	-9%	-7%
Post-Closure	1,960	1,880	2,165	6,249	14,881	12,721	4,824	2,733	3,308	3,020	3,265	2,366	4,948
% Change from Baseline	-2%	-1%	0%	1%	1%	-2%	-3%	-3%	-1%	0%	-1%	-1%	-1%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 7: Estimated 1:50-year Dry Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.0	0.0	0.0	0.0	22	12	2.7	0.5	0.1	0.0	0.0	0.0	3.1
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	58	53	50	34	374	308	184	136	107	88	57	57	125
Construction (Year -2)	63	58	53	27	298	279	149	105	82	69	62	62	109
% Change from Baseline	8%	10%	6%	-21%	-20%	-9%	-19%	-23%	-23%	-22%	10%	9%	-13%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	Increase	Increase	Increase	Increase	52%	82%	30%	11%	8%	30%	Increase	Increase	66%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	Increase	Increase	Increase	Increase	52%	82%	30%	11%	8%	30%	Increase	Increase	66%
Post-Closure	74	71	67	69	493	208	87	82	75	75	72	69	120
% Change from Baseline	28%	35%	34%	101%	32%	-32%	-53%	-40%	-30%	-15%	28%	22%	-4%
<i>H4B (WQ26)</i>													
Baseline	80	73	70	67	461	364	227	169	118	90	78	79	156
Construction (Year -2)	63	58	53	27	298	279	149	105	82	69	62	62	109
% Change from Baseline	-22%	-21%	-23%	-60%	-35%	-23%	-34%	-38%	-30%	-24%	-20%	-21%	-30%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	Increase	Increase	Increase	Increase	24%	54%	6%	-11%	-3%	27%	Increase	Increase	33%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	Increase	Increase	Increase	Increase	24%	54%	6%	-11%	-3%	27%	Increase	Increase	33%
Post-Closure	74	71	67	69	493	208	87	82	75	75	72	69	120
% Change from Baseline	-8%	-2%	-3%	2%	7%	-43%	-62%	-52%	-37%	-17%	-8%	-12%	-23%
<b>4-DC</b>													
Baseline	92	84	80	90	503	373	230	171	136	104	90	90	170
Construction (Year -2)	80	72	67	82	427	341	195	141	117	91	85	84	149
% Change from Baseline	-13%	-14%	-16%	-9%	-15%	-9%	-15%	-17%	-14%	-12%	-6%	-7%	-13%
Operations (Year 17)	125	125	125	153	658	594	261	162	124	121	119	126	224
% Change from Baseline	36%	49%	56%	69%	31%	59%	14%	-5%	-8%	17%	32%	40%	32%

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Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	125	125	125	152	689	609	266	163	126	122	119	127	229
% Change from Baseline	36%	49%	56%	68%	37%	63%	16%	-5%	-7%	18%	32%	41%	34%
Post-Closure	82	79	83	101	612	257	117	90	91	96	86	88	149
% Change from Baseline	-10%	-6%	3%	12%	22%	-31%	-49%	-47%	-33%	-7%	-4%	-2%	-13%
<i>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</i>													
Baseline	113	105	100	112	540	403	259	198	161	126	110	111	195
Construction (Year -2)	94	87	82	104	464	370	224	169	137	107	93	93	169
% Change from Baseline	-17%	-17%	-19%	-7%	-14%	-8%	-13%	-15%	-15%	-15%	-16%	-17%	-13%
Operations (Year 17)	146	146	136	167	690	624	281	189	146	146	143	149	247
% Change from Baseline	29%	39%	36%	49%	28%	55%	9%	-5%	-9%	16%	29%	34%	27%
Closure (Year 20)	147	147	145	165	722	639	294	190	146	147	142	150	253
% Change from Baseline	30%	40%	45%	47%	34%	59%	14%	-4%	-9%	17%	28%	35%	30%
Post-Closure	100	95	89	123	649	286	144	117	116	101	90	93	167
% Change from Baseline	-12%	-9%	-11%	10%	20%	-29%	-44%	-41%	-28%	-20%	-18%	-16%	-14%
<b>Chedakuz Creek</b>													
<i>15-CC (outlet of Tatelkuz Lake)</i>													
Baseline	604	626	705	548	959	973	659	445	334	424	630	598	625
Construction (Year -2)	604	626	705	550	966	974	658	445	333	424	630	598	626
% Change from Baseline	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	455	477	557	443	545	524	455	299	235	311	507	453	438
% Change from Baseline	-25%	-24%	-21%	-19%	-43%	-46%	-31%	-33%	-30%	-27%	-19%	-24%	-30%
Closure (Year 20)	451	474	558	440	532	508	448	296	232	306	502	450	433
% Change from Baseline	-25%	-24%	-21%	-20%	-45%	-48%	-32%	-33%	-30%	-28%	-20%	-25%	-31%
Post-Closure	610	632	712	555	1,009	948	649	443	336	429	633	602	630
% Change from Baseline	1%	1%	1%	1%	5%	-3%	-1%	0%	1%	1%	1%	1%	1%
<i>H5 (midway between Davidson Creek and Turtle Creek confluences)</i>													
Baseline	908	941	1,059	824	1,441	1,462	990	669	501	637	946	898	940
Construction (Year -2)	886	920	1,035	791	1,334	1,394	950	639	478	611	919	876	903
% Change from Baseline	-2%	-2%	-2%	-4%	-7%	-5%	-4%	-4%	-5%	-4%	-3%	-2%	-4%
Operations (Year 17)	765	802	910	654	898	962	742	487	363	480	782	751	716
% Change from Baseline	-16%	-15%	-14%	-21%	-38%	-34%	-25%	-27%	-28%	-25%	-17%	-16%	-24%
Closure (Year 20)	763	800	911	660	919	959	740	486	362	478	780	749	717
% Change from Baseline	-16%	-15%	-14%	-20%	-36%	-34%	-25%	-27%	-28%	-25%	-18%	-17%	-24%
Post-Closure	898	932	1,046	830	1,572	1,306	888	596	467	620	922	881	913
% Change from Baseline	-1%	-1%	-1%	1%	9%	-11%	-10%	-11%	-7%	-3%	-3%	-2%	-3%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC. Where a % change is greater than 100% then this has been noted as an "Increase" and no numeric value is presented.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.

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**Table 8: Estimated 1:50-year Wet Monthly and Annual Surface Water Flow Changes with Mitigation Measures in Davidson Creek and Creek Chedakuz Creek from the Project for Construction (Year -2), Operations (Year 17), Closure (Year 20), and Post-closure**

Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
<b>Davidson Creek</b>													
<i>11-DC (upper extents of watershed upstream of proposed TSF)</i>													
Baseline	0.4	0.1	0.0	41	99	136	34	8.4	5.1	21	11	2.2	30
Construction (Year -2)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Operations (Year 17)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Closure (Year 20)	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
Post-Closure	-	-	-	-	-	-	-	-	-	-	-	-	-
% Change from Baseline	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>H2 (WQ10 midpoint of watershed immediately downstream of proposed TSF)</i>													
Baseline	203	189	178	675	1,588	1,915	519	262	241	288	288	230	548
Construction (Year -2)	156	144	135	458	1,173	1,352	401	204	186	216	215	175	401
% Change from Baseline	-23%	-24%	-24%	-32%	-26%	-29%	-23%	-22%	-23%	-25%	-25%	-24%	-27%
Operations (Year 17)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-39%	-34%	-30%	-81%	-64%	-71%	-54%	-43%	-52%	-60%	-60%	-46%	-62%
Closure (Year 20)	125	125	125	125	570	560	240	150	115	115	115	125	208
% Change from Baseline	-39%	-34%	-30%	-81%	-64%	-71%	-54%	-43%	-52%	-60%	-60%	-46%	-62%
Post-Closure	168	151	147	914	1,767	1,649	446	211	233	295	243	196	535
% Change from Baseline	-18%	-20%	-17%	35%	11%	-14%	-14%	-19%	-3%	2%	-16%	-15%	-2%
<i>H4B (WQ26)</i>													
Baseline	286	256	241	878	1,822	2,113	637	348	312	388	415	334	669
Construction (Year -2)	240	213	203	673	1,409	1,563	518	290	258	317	341	281	526
% Change from Baseline	-16%	-17%	-16%	-23%	-23%	-26%	-19%	-17%	-17%	-18%	-18%	-16%	-21%
Operations (Year 17)	206	186	196	396	778	781	327	209	165	200	227	221	324
% Change from Baseline	-28%	-27%	-19%	-55%	-57%	-63%	-49%	-40%	-47%	-48%	-45%	-34%	-52%
Closure (Year 20)	208	188	198	445	880	855	350	218	172	232	242	226	351
% Change from Baseline	-27%	-27%	-18%	-49%	-52%	-60%	-45%	-37%	-45%	-40%	-42%	-32%	-48%
Post-Closure	234	205	204	1,168	1,933	1,773	529	275	271	362	333	281	631
% Change from Baseline	-18%	-20%	-15%	33%	6%	-16%	-17%	-21%	-13%	-7%	-20%	-16%	-6%
<b>4-DC</b>													
Baseline	304	270	278	1,038	1,994	2,233	675	365	330	446	485	367	732
Construction (Year -2)	268	235	246	842	1,579	1,685	555	307	278	352	413	314	590
% Change from Baseline	-12%	-13%	-11%	-19%	-21%	-25%	-18%	-16%	-16%	-21%	-15%	-14%	-19%
Operations (Year 17)	228	203	235	468	933	921	368	224	189	276	342	272	388
% Change from Baseline	-25%	-25%	-15%	-55%	-53%	-59%	-45%	-39%	-43%	-38%	-30%	-26%	-47%



# BLACKWATER GOLD PROJECT

APPLICATION FOR AN  
ENVIRONMENTAL ASSESSMENT CERTIFICATE /  
ENVIRONMENTAL IMPACT STATEMENT  
ASSESSMENT OF POTENTIAL ENVIRONMENTAL EFFECTS



Mine Phase	Estimated Monthly and Annual Surface Water Flows (L/s)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Closure (Year 20)	230	204	236	517	1,033	1,013	392	233	194	310	306	282	413
% Change from Baseline	-24%	-24%	-15%	-50%	-48%	-55%	-42%	-36%	-41%	-31%	-37%	-23%	-44%
Post-Closure	252	220	244	1,256	2,094	1,897	572	291	287	454	432	315	693
% Change from Baseline	-17%	-19%	-12%	21%	5%	-15%	-15%	-20%	-13%	2%	-11%	-14%	-5%
<b>1-DC (WQ7 upstream of confluence with Chedakuz Creek)</b>													
Baseline	341	305	315	1,091	2,053	2,270	711	401	365	482	523	405	772
Construction (Year -2)	295	263	279	897	1,641	1,731	592	343	312	411	451	352	631
% Change from Baseline	-13%	-14%	-11%	-18%	-20%	-24%	-17%	-14%	-15%	-15%	-14%	-13%	-18%
Operations (Year 17)	277	250	258	537	1,008	989	404	262	218	313	381	312	434
% Change from Baseline	-19%	-18%	-18%	-51%	-51%	-56%	-43%	-35%	-40%	-35%	-27%	-23%	-44%
Closure (Year 20)	279	251	287	585	1,107	1,078	432	270	225	345	357	321	461
% Change from Baseline	-18%	-18%	-9%	-46%	-46%	-53%	-39%	-33%	-38%	-28%	-32%	-21%	-40%
Post-Closure	289	254	281	1,284	2,156	1,927	601	324	320	488	469	353	729
% Change from Baseline	-15%	-17%	-11%	18%	5%	-15%	-15%	-19%	-12%	1%	-10%	-13%	-6%
<b>Chedakuz Creek</b>													
<b>15-CC (outlet of Tatelkuz Lake)</b>													
Baseline	1,445	1,370	1,565	5,143	12,665	10,952	3,970	2,194	2,745	2,389	2,523	1,778	4,062
Construction (Year -2)	1,445	1,370	1,565	5,147	12,667	10,972	3,970	2,193	2,745	2,390	2,523	1,778	4,064
% Change from Baseline	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Operations (Year 17)	1,303	1,220	1,410	4,999	13,022	11,324	3,667	2,042	2,627	2,258	2,375	1,645	3,991
% Change from Baseline	-10%	-11%	-10%	-3%	3%	3%	-8%	-7%	-4%	-5%	-6%	-8%	-2%
Closure (Year 20)	1,304	1,221	1,410	4,995	13,040	11,242	3,638	2,028	2,616	2,244	2,365	1,641	3,979
% Change from Baseline	-10%	-11%	-10%	-3%	3%	3%	-8%	-8%	-5%	-6%	-6%	-8%	-2%
Post-Closure	1,457	1,381	1,576	5,181	12,689	10,950	3,944	2,188	2,750	2,391	2,523	1,789	4,068
% Change from Baseline	1%	1%	1%	1%	0%	0%	-1%	0%	0%	0%	0%	1%	0%
<b>H5 (midway between Davidson Creek and Turtle Creek confluences)</b>													
Baseline	2,171	2,059	2,352	7,729	19,033	16,458	5,966	3,297	4,125	3,590	3,791	2,673	6,104
Construction (Year -2)	2,130	2,023	2,324	7,669	19,007	16,095	5,869	3,250	4,087	3,545	3,746	2,628	6,031
% Change from Baseline	-2%	-2%	-1%	-1%	0%	-2%	-2%	-1%	-1%	-1%	-1%	-2%	-1%
Operations (Year 17)	1,949	1,857	2,196	7,557	19,309	15,424	5,443	3,040	3,921	3,364	3,560	2,442	5,839
% Change from Baseline	-10%	-10%	-7%	-2%	1%	-6%	-9%	-8%	-5%	-6%	-6%	-9%	-4%
Closure (Year 20)	1,951	1,859	2,196	7,559	19,249	15,427	5,437	3,035	3,914	3,360	3,557	2,441	5,832
% Change from Baseline	-10%	-10%	-7%	-2%	1%	-6%	-9%	-8%	-5%	-6%	-6%	-9%	-4%
Post-Closure	2,136	2,032	2,347	7,812	19,079	16,361	5,817	3,234	4,108	3,598	3,755	2,639	6,077
% Change from Baseline	-2%	-1%	0%	1%	0%	-1%	-3%	-2%	0%	0%	-1%	-1%	0%

**Source:** Flows are from **Appendix 5.1.2.1B** (Knight Piésold, 2013d). % change has been determined by AMEC.

- There are no flows for Node 11-DC as this drainage area is directed towards the 705 Watershed. During post-closure Node H2 does not exist; therefore surface water flows for the TSF spillway plunge pool are used.

**Note:** L/s = litre per second; % = percent.