



APPENDIX A HYDROMETRIC STATIONS

Lake A69 - 2015

MEAN DAILY WATER DISCHARGE (m³/s)

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	2.03	0.56	0.23	-	-	-
2	-	-	-	-	-	-	1.86	0.53	0.24	-	-	-
3	-	-	-	-	-	-	1.80	0.53	0.23	-	-	-
4	-	-	-	-	-	-	1.72	0.55	0.23	-	-	-
5	-	-	-	-	-	-	1.66	0.54	0.23	-	-	-
6	-	-	-	-	-	-	1.58	0.53	0.23	-	-	-
7	-	-	-	-	-	-	1.44	0.51	0.22	-	-	-
8	-	-	-	-	-	-	1.33	0.48	0.21	-	-	-
9	-	-	-	-	-	-	1.26	0.44	0.21	-	-	-
10	-	-	-	-	-	-	1.34	0.42	0.20	-	-	-
11	-	-	-	-	-	4.96 P	1.33	0.40	0.20	-	-	-
12	-	-	-	-	-	10.12	1.28	0.38	0.24	-	-	-
13	-	-	-	-	-	8.76	1.19	0.38	0.22	-	-	-
14	-	-	-	-	-	6.82	1.18	0.38	0.20	-	-	-
15	-	-	-	-	-	5.83	1.14	0.35	0.20	-	-	-
16	-	-	-	-	-	4.59	1.11	0.33	0.21 P	-	-	-
17	-	-	-	-	-	4.13	1.06	0.29	-	-	-	-
18	-	-	-	-	-	3.44	0.99	0.28	-	-	-	-
19	-	-	-	-	-	3.23	0.91	0.29	-	-	-	-
20	-	-	-	-	-	3.13	0.89	0.29	-	-	-	-
21	-	-	-	-	-	3.14	0.85	0.28	-	-	-	-
22	-	-	-	-	-	3.14	0.82	0.28	-	-	-	-
23	-	-	-	-	-	2.91	0.79	0.28	-	-	-	-
24	-	-	-	-	-	2.81	0.73	0.28	-	-	-	-
25	-	-	-	-	-	2.73	0.68	0.28	-	-	-	-
26	-	-	-	-	-	2.78	0.67	0.27	-	-	-	-
27	-	-	-	-	-	2.66	0.68	0.27	-	-	-	-
28	-	-	-	-	-	2.57	0.68	0.25	-	-	-	-
29	-	-	-	-	-	2.41	0.67	0.25	-	-	-	-
30	-	-	-	-	-	2.25	0.64	0.25	-	-	-	-
31	-	-	-	-	-	-	0.64	0.23	-	-	-	-
MIN	-	-	-	-	-	2.25	0.64	0.23	0.20	-	-	-
MEAN	-	-	-	-	-	4.12	1.13	0.37	0.22	-	-	-
MAX	-	-	-	-	-	10.12	2.03	0.56	0.24	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE

Water Yield (m ³) =	11,424,733	7,119,611	3,017,150	985,455	302,517
Water Yield (mm) =	276.1	62%	26%	9%	3%



APPENDIX A HYDROMETRIC STATIONS

Lake A69 - 2015

MEAN DAILY WATER SURFACE ELEVATION (masl) BASED ON BENCHMARK ELEVATION 115.62 masl

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	112.406	112.253	112.174	-	-	-
2	-	-	-	-	-	-	112.394	112.248	112.178	-	-	-
3	-	-	-	-	-	-	112.389	112.247	112.176	-	-	-
4	-	-	-	-	-	-	112.383	112.251	112.176	-	-	-
5	-	-	-	-	-	-	112.378	112.250	112.175	-	-	-
6	-	-	-	-	-	-	112.372	112.248	112.174	-	-	-
7	-	-	-	-	-	-	112.359	112.243	112.171	-	-	-
8	-	-	-	-	-	-	112.349	112.237	112.167	-	-	-
9	-	-	-	-	-	-	112.343	112.229	112.167	-	-	-
10	-	-	-	-	-	-	112.350	112.226	112.166	-	-	-
11	-	-	-	-	-	112.537 P	112.349	112.221	112.164	-	-	-
12	-	-	-	-	-	112.693	112.344	112.216	112.179	-	-	-
13	-	-	-	-	-	112.661	112.336	112.217	112.171	-	-	-
14	-	-	-	-	-	112.610	112.335	112.216	112.165	-	-	-
15	-	-	-	-	-	112.579	112.330	112.210	112.166	-	-	-
16	-	-	-	-	-	112.536	112.327	112.205	112.167 P	-	-	-
17	-	-	-	-	-	112.517	112.322	112.194	-	-	-	-
18	-	-	-	-	-	112.486	112.314	112.190	-	-	-	-
19	-	-	-	-	-	112.476	112.304	112.193	-	-	-	-
20	-	-	-	-	-	112.471	112.301	112.193	-	-	-	-
21	-	-	-	-	-	112.471	112.296	112.192	-	-	-	-
22	-	-	-	-	-	112.472	112.292	112.192	-	-	-	-
23	-	-	-	-	-	112.460	112.289	112.192	-	-	-	-
24	-	-	-	-	-	112.454	112.279	112.191	-	-	-	-
25	-	-	-	-	-	112.450	112.273	112.191	-	-	-	-
26	-	-	-	-	-	112.453	112.271	112.189	-	-	-	-
27	-	-	-	-	-	112.446	112.272	112.187	-	-	-	-
28	-	-	-	-	-	112.441	112.272	112.182	-	-	-	-
29	-	-	-	-	-	112.431	112.270	112.181	-	-	-	-
30	-	-	-	-	-	112.420	112.266	112.181	-	-	-	-
31	-	-	-	-	-	-	112.266	112.174	-	-	-	-
MIN	-	-	-	-	-	112.420	112.266	112.174	112.164	-	-	-
MEAN	-	-	-	-	-	112.498	112.324	112.211	112.171	-	-	-
MAX	-	-	-	-	-	112.693	112.406	112.253	112.179	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		Amaruq - 154321			Date		11-Jun-15		
Waterbody:		A69			Start Time		1148		
Crossing ID:		A69-DS1			End Time		1213		
LDB UTM Location		Survey			Datalogger SN:				
East	598584	BM read			Transducer SN:				
North	7257210	WL read			Meter Type/SN:		Swoffer		
Elevation, Zone	14W	WL Elev			Crew:		CJ, JRL		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.70	0.00		0.00			0.154		
2	2.10	0.22		0.25		0.077	0.294		
3	3.50	0.20		0.15		0.045	0.440		
4	5.10	0.35		0.20		0.151	0.851		
5	7.80	0.28		0.60		0.336	0.358		
6	9.10	0.27		0.64		0.233	0.350		
7	10.50	0.23		0.45		0.145	0.385		
8	11.90	0.32		0.34		0.152	0.392		
9	13.30	0.24		0.10		0.037	0.442		
10	15.00	0.28		0.60		0.235	0.286		
11	16.10	0.24		0.28		0.084	0.455		
12	17.50	0.41		0.24		0.138	0.574		
13	18.90	0.41		0.45		0.258	0.469		
14	20.30	0.26		0.14		0.051	0.364		
15	21.70	0.26		0.50		0.182	0.406		
16	23.10	0.32		0.53		0.237	0.413		
17	24.50	0.27		0.50		0.189	0.441		
18	25.90	0.36		0.70		0.353	0.329		
19	27.30	0.11		0.70		0.100	0.126		
20	28.50	0.10		0.00		0.000	0.020		
21	28.90	0.00		0.00		0.000	0.000		
NOTES:					RESULTS:	Q (m3/s)	3.004		
						A(m2)	7.55		
						B(m)	28.2		



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		Amaruq - 154321				Date		15-Jun-15	
Waterbody:		A69				Start Time		1040	
Crossing ID:		A69-DS1				End Time		1106	
LDB UTM Location						Datalogger SN:			
East	598497	BM read				Transducer SN:			
North	7256995	WL read				Meter Type/SN:		Swoffer	
Elevation, Zone	14W	WL Elev				Crew:	CJ, JRL		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH	0.6/0.8 DEPTH					
			(m/s)	(m/s)					
1	3.10	0.00		0.00			0.098		
2	4.60	0.13		0.10		0.048	0.767		
3	10.50	0.13		0.16		0.067	0.083		
4	11.00	0.20		0.37		0.052	0.162		
5	11.90	0.16		0.40		0.051	0.130		
6	12.60	0.21		0.77		0.081	0.074		
7	12.90	0.28		0.57		0.080	0.235		
8	13.60	0.39		0.56		0.126	0.155		
9	14.05	0.30		0.88		0.323	0.530		
10	16.05	0.23		0.69		0.286	0.440		
11	17.65	0.32		0.94		0.526	0.637		
12	19.55	0.35		1.15		0.785	0.774		
13	21.55	0.42		0.96		0.814	0.714		
14	23.55	0.29		0.35		0.178	0.428		
15	25.05	0.28		0.93		0.326	0.195		
16	26.05	0.11		0.27		0.027	0.148		
17	26.85	0.26		0.81		0.211	0.198		
18	28.05	0.07		0.00		0.000	0.132		
19	29.25	0.15		0.85		0.223	0.564		
20	31.55	0.34		0.31		0.221	0.561		
21	33.45	0.25		0.72		0.450	0.542		
22	36.55	0.10		0.45		0.113	0.295		
23	38.45	0.21		0.20		0.084	0.462		
24	40.55	0.23		0.58		0.260	0.387		
25	42.35	0.20		0.42		0.143	0.384		
26	43.95	0.28		0.52		0.262	0.570		
27	45.95	0.29		0.52		0.309	0.535		
28	48.05	0.22		0.61		0.242	0.285		
29	49.55	0.16		0.49		0.098	0.125		
30	50.55	0.09		0.49		0.119	0.682		
31	54.95	0.22		0.22		0.230	0.561		
32	60.05	0.00		0.00		0.000	0.000		
NOTES:					RESULTS:	Q (m3/s)	6.732		
						A(m2)	11.85		
						B(m)	57.0		



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		Amaruq - trip 2			Date		04-Aug-15		
Waterbody:		A69			Start Time		9:20		
Crossing ID:		A69-DS1			End Time		9:45		
LDB UTM Location		Survey			Datalogger SN:				
East	598452	BM read			Transducer SN:				
North	7256756	WL read			Meter Type/SN:		Marsh McBirney		
Elevation, Zone	14W	WL Elev			Crew:		JRL, JN		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00			0.025		
2	1.00	0.05		0.00		0.000	0.050		
3	2.00	0.05		0.00		0.000	0.025		
4	2.50	0.05		0.08		0.003	0.075		
5	3.50	0.10		0.12		0.012	0.050		
6	4.50	0.00		0.00		0.000	0.090		
7	5.50	0.18		0.15		0.027	0.190		
8	6.50	0.20		0.11		0.022	0.200		
9	7.50	0.20		0.22		0.044	0.245		
10	8.50	0.29		0.00		0.000	0.073		
11	9.00	0.00		0.00		0.000	0.000		
12	9.40	0.00		0.00		0.000	0.013		
13	9.50	0.25		0.16		0.022	0.270		
14	10.50	0.29		0.09		0.026	0.295		
15	11.50	0.30		0.09		0.027	0.270		
16	12.50	0.24		0.10		0.023	0.234		
17	13.40	0.28		0.10		0.028	0.281		
18	14.50	0.23		0.05		0.012	0.245		
19	15.50	0.26		0.04		0.010	0.245		
20	16.50	0.23		0.04		0.009	0.280		
21	17.50	0.33		0.03		0.010	0.320		
22	18.50	0.31		0.02		0.006	0.250		
23	19.50	0.19		0.06		0.011	0.165		
24	20.50	0.14		0.15		0.021	0.095		
25	21.50	0.05		0.14		0.007	0.125		
26	22.50	0.20		0.15		0.030	0.160		
27	23.50	0.12		0.12		0.014	0.120		
28	24.50	0.12		0.11		0.013	0.085		
29	25.50	0.05		0.14		0.007	0.050		
30	26.50	0.05		0.11		0.006	0.065		
31	27.50	0.08		0.07		0.006	0.065		
32	28.50	0.05		0.00		0.000	0.008		
33	28.80	0.00		0.00		0.000	0.021		
34	29.50	0.06		0.04		0.001	0.015		
35	30.00	0.00		0.00		0.000	0.000		
36	35.00	0.00		0.00		0.000	0.000		
NOTES:					RESULTS:	Q (m3/s)	0.398		
						A(m2)	4.70		
						B(m)	35.0		



APPENDIX A HYDROMETRIC STATIONS

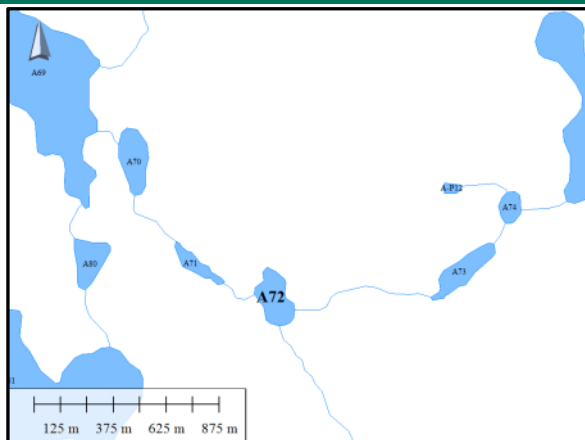
OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		1524321 - Amaruq Trip 3			Date		16-Sep-15		
Waterbody:		A69			Start Time		9:30		
Crossing ID:		A69-DS1			End Time		9:50		
LDB UTM Location		Survey			Datalogger SN:				
East	598438	BM read			Transducer SN:				
North	7256752	WL read			Meter Type/SN:				
Elevation, Zone	14W	WL Elev			Crew:		JRL, DC		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.000			0.060		
2	2.00	0.06		0.070		0.006	0.070		
3	3.00	0.08		0.079		0.006	0.095		
4	4.00	0.11		0.073		0.008	0.085		
5	5.00	0.06		0.101		0.006	0.075		
6	6.00	0.09		0.070		0.006	0.120		
7	7.00	0.15		0.061		0.009	0.155		
8	8.00	0.16		0.076		0.012	0.185		
9	9.00	0.21		0.052		0.011	0.195		
10	10.00	0.18		0.046		0.008	0.165		
11	11.00	0.15		0.073		0.011	0.150		
12	12.00	0.15		0.101		0.015	0.200		
13	13.00	0.25		0.061		0.009	0.025		
14	13.20	0.00		0.000		0.000	0.000		
15	13.21	0.00		0.000		0.000	0.100		
16	14.21	0.20		0.021		0.004	0.190		
17	15.21	0.18		0.055		0.010	0.190		
18	16.21	0.20		0.061		0.012	0.190		
19	17.21	0.18		0.061		0.011	0.210		
20	18.21	0.24		0.034		0.008	0.205		
21	19.21	0.17		0.058		0.010	0.175		
22	20.21	0.18		0.070		0.013	0.165		
23	21.21	0.15		0.055		0.008	0.175		
24	22.21	0.20		0.052		0.010	0.190		
25	23.21	0.18		0.049		0.005	0.009		
26	23.31	0.00		0.000		0.000	0.000		
27	23.32	0.00		0.000		0.000	0.027		
28	23.62	0.18		0.073		0.004	0.027		
29	23.92	0.00		0.000		0.000	0.000		
30	23.93	0.00		0.000		0.000	0.020		
31	24.73	0.05		0.046		0.002	0.020		
32	25.53	0.00		0.000		0.000	0.000		
NOTES:					RESULTS:	Q (m3/s)	0.206		
						A(m2)	3.47		
						B(m)	25.5		



APPENDIX A HYDROMETRIC STATIONS

A18.0 LAKE A72 & OUTLET (STREAM A72-D71)

Parameter	Value	Note
Drainage Area (km ²)	7.1	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	15	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	0.75	Measured in the field, based on vegetation
Wetted Width (m)	14.2	Measured in the field on 11 June 2015
Max. Wetted Depth (m)	0.40	Measured in the field on 11 June 2015
Channel Length (km)	0.19	Measured from CanVec data
Outlet Channel Slope (m/m)	0.003	Average slope, measured in the field 18 September 2015
Bed Material	Sand, silt, organics	
Bank Material	Sand, silt, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	N/A	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Well defined channel. Cross-sectional data are available in discharge calculation sheets.	



Lake A72.



APPENDIX A HYDROMETRIC STATIONS

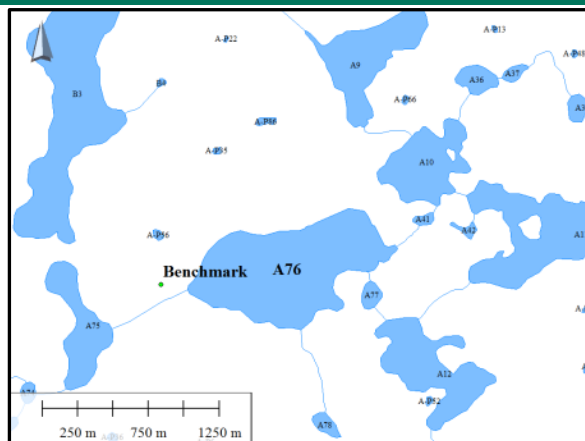
OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:			1524321 - Amaruq Trip 3			Date		18-Sep-15	
Waterbody:			A72			Start Time		14:30	
Crossing ID:			A72-A71			End Time		14:50	
LDB UTM Location			Survey			Datalogger SN:			
East	598988	BM read				Transducer SN:			
North	7255622	WL read				Meter Type/SN:			
Elevation, Zone	14W	WL Elev				Crew:		JRL, DC	
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00			0.112		
2	1.60	0.14		0.00		0.000	0.111		
3	2.20	0.23		0.03		0.003	0.068		
4	2.50	0.22		0.04		0.003	0.065		
5	2.80	0.21		0.03		0.002	0.068		
6	3.10	0.24		0.02		0.001	0.072		
7	3.40	0.24		0.04		0.003	0.071		
8	3.70	0.23		0.03		0.002	0.072		
9	4.00	0.25		0.02		0.002	0.086		
10	4.30	0.32		0.03		0.003	0.101		
11	4.60	0.35		0.03		0.003	0.083		
12	4.90	0.20		0.01		0.001	0.089		
13	5.20	0.39		0.03		0.004	0.113		
14	5.50	0.36		0.04		0.004	0.108		
15	5.80	0.36		0.05		0.005	0.097		
16	6.10	0.29		0.05		0.004	0.087		
17	6.40	0.29		0.06		0.005	0.083		
18	6.70	0.26		0.05		0.004	0.084		
19	7.00	0.30		0.03		0.003	0.090		
20	7.30	0.30		0.02		0.002	0.096		
21	7.60	0.34		0.05		0.006	0.148		
22	8.00	0.40		0.04		0.006	0.156		
23	8.40	0.38		0.01		0.002	0.150		
24	8.80	0.37		0.04		0.006	0.150		
25	9.20	0.38		0.03		0.005	0.152		
26	9.60	0.38		0.04		0.006	0.144		
27	10.00	0.34		0.04		0.005	0.136		
28	10.40	0.34		0.04		0.005	0.140		
29	10.80	0.36		0.04		0.006	0.136		
30	11.20	0.32		0.02		0.003	0.124		
31	11.60	0.30		0.05		0.006	0.104		
32	12.00	0.22		0.04		0.004	0.092		
33	12.40	0.24		0.02		0.002	0.072		
34	12.80	0.12		0.03		0.001	0.042		
35	13.20	0.09		0.03		0.001	0.030		
36	13.60	0.06		0.01		0.000	0.018		
37	14.20	0.00		0.00		0.000	0.000		
NOTES:						RESULTS:			
						Q (m3/s)		0.117	
						A(m2)		3.55	
						B(m)		14.2	



APPENDIX A HYDROMETRIC STATIONS

A19.0 LAKE A76 & EAST OUTLET (STREAM A76-A11)

Parameter	Value	Note
Drainage Area (km ²)	2.9	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	65	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	1.0	Measured in the field, based on vegetation
Wetted Width (m)	60.0	Measured in the field 6 August 2015
Max. Wetted Depth (m)	0.31	Measured in the field 6 August 2015
Channel Length (km)	0.28	Measured from CanVec data
Outlet Channel Slope (m/m)	0.0035	Average slope, measured in the field
Bed Material	Boulders, cobbles	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	601213 m E, 7256820 m N, 154.00 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Boulder channel. Cross-sectional data are available in discharge calculation sheets and Section 3.3. See Stream A12 for more photos relating to Lake A76.	



Lake A76: Benchmark location.



6 August 2015. Downstream view of the watercourse (northeast).



19 September 2015. Upstream view of the watercourse and Lake A76 (southwest)



APPENDIX A HYDROMETRIC STATIONS

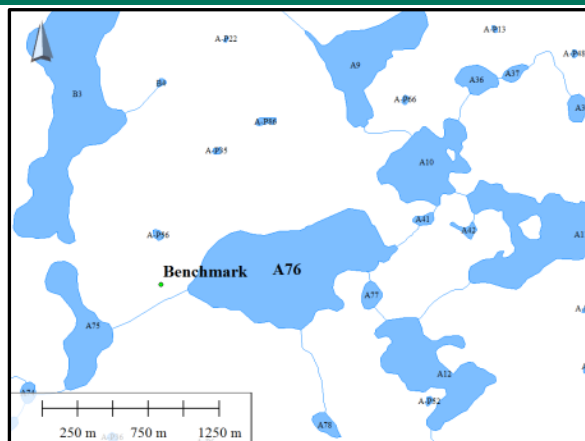
OPEN WATER DISCHARGE CALCULATION SPREADSHEET							
Project Name, Number:		Amaruq - Trip 2			Date	06-Aug-15	
Waterbody:		A76			Start Time	1:15	
Crossing ID:		A76-A41			End Time	1:45	
LDB UTM Location		Survey			Datalogger SN:		
East	602921	BM read			Transducer SN:		
North	7257158	WL read			Meter Type/SN:	Marsh McBirney	
Elevation, Zone	14W	WL Elev			Crew:	JRL, JN	
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)			
1	0.00	0.00		0.00		0.000	0.051
2	0.60	0.17		0.00		0.000	0.243
3	1.50	0.37		0.00		0.000	0.123
4	2.00	0.12		0.00		0.000	0.036
5	2.60	0.00		0.00		0.000	0.000
6	3.40	0.00		0.00		0.000	0.027
7	4.00	0.09		0.00		0.000	0.014
8	4.30	0.00		0.00		0.000	0.000
9	6.00	0.00		0.00		0.000	0.007
10	6.10	0.15		0.00		0.000	0.030
11	6.50	0.00		0.00		0.000	0.000
12	6.90	0.00		0.00		0.000	0.012
13	7.00	0.24		0.00		0.000	0.495
14	8.50	0.42		0.00		0.000	0.750
15	10.00	0.58		0.02		0.017	0.855
16	11.50	0.56		0.02		0.011	0.112
17	11.90	0.00		0.00		0.000	0.000
18	12.70	0.00		0.00		0.000	0.074
19	13.00	0.49		0.00		0.000	0.264
20	13.60	0.39		0.03		0.012	0.560
21	15.00	0.41		0.01		0.006	1.029
22	16.70	0.80		0.01		0.012	0.722
23	18.00	0.31		0.02		0.009	0.330
24	19.50	0.13		0.00		0.000	0.323
25	21.00	0.30		0.00		0.000	0.488
26	22.50	0.35		0.01		0.005	0.503
27	24.00	0.32		0.01		0.005	0.360
28	25.50	0.16		0.01		0.001	0.008
29	25.60	0.00		0.00		0.000	0.000
30	26.90	0.00		0.00		0.000	0.064
31	27.70	0.16		0.01		0.001	0.232
32	28.50	0.42		0.00		0.000	0.380
33	29.60	0.27		0.00		0.000	0.054
34	30.00	0.00		0.00		0.000	0.000
NOTES:		15 m of no/low depth wetted width on RDB & LDB			RESULTS:	Q (m3/s)	0.079
						A(m2)	8.14
						B(m)	30.0



APPENDIX A HYDROMETRIC STATIONS

A20.0 LAKE A76 & WEST OUTLET (STREAM A76-A75)

Parameter	Value	Note
Drainage Area (km ²)	2.9	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	35	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	N/A	Measured in the field, based on vegetation
Wetted Width (m)	N/A	Observed no surface flow in the field 5 August 2015
Max. Wetted Depth (m)	0	Observed no surface flow in the field 5 August 2015
Channel Length (km)	0.58	Measured from CanVec data
Outlet Channel Slope (m/m)	0.017	Average slope, measured in the field
Bed Material	Boulders, cobbles	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	601213 m E, 7256820 m N, 154.00 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Boulder channel. Some visible flow through boulders but not measureable. See Section 3.3 and discharge sheets for cross-sections, and Stream A12 for more photos relating to Lake A76.	



Lake A76: Benchmark location.



6 August 2015. Downstream view of watercourse (west). No visible flow through channel at time of photo.



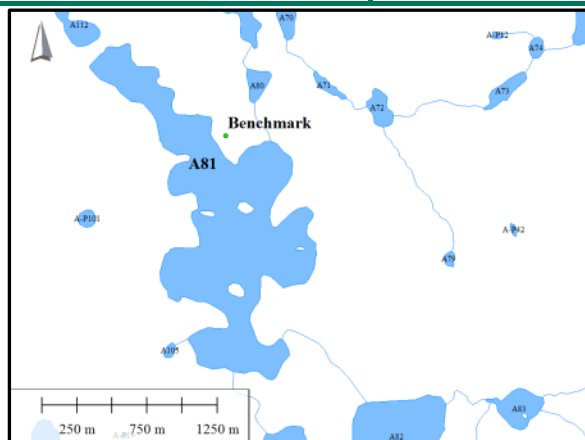
17 September 2015. View looking west towards Lake A76 and watercourse.



APPENDIX A HYDROMETRIC STATIONS

A21.0 LAKE A81 & OUTLET (STREAM A81-A80)

Parameter	Value	Note
Drainage Area (km ²)	30.1	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	50	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	0.5	Measured in the field, based on vegetation
Wetted Width (m)	48.7	Measured in the field 8 August 2015
Max. Wetted Depth (m)	0.42	Measured in the field 8 August 2015
Channel Length (km)	0.30	Measured from CanVec data
Outlet Channel Slope (m/m)	0.011	Average slope, based on DEM (PhotoSat 2015)
Bed Material	Boulders, cobbles	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	598067 m E, 7255436 m N, 129.65 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Poorly defined boulder channel. See discharge sheets for cross-sections.	



Lake A81: Benchmark location.



8 August 2015. Downstream view of the watercourse (north).



17 September 2015. View looking east at Lake A81 and watercourse.



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET							
Project Name, Number:		1524321 - Amaruq			Date		12-Jul-15
Waterbody:		A81			Start Time		
Crossing ID:		A81-A80			End Time		
LDB UTM Location		Survey			Datalogger SN:		
East	598366	BM read			Transducer SN:		
North	7255457	WL read			Meter Type/SN:		Swoffer
Elevation, Zone	14W	WL Elev			Crew:	AEM: RV, LG, RD	
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)			
1	0.00	0.00		0.00			0.000
2	0.50	0.00		0.00		0.000	0.013
3	1.00	0.05		0.18		0.005	0.030
4	1.50	0.07		0.26		0.009	0.025
5	2.00	0.03		0.15		0.002	0.015
6	2.50	0.03		0.15		0.002	0.058
7	3.00	0.20		0.40		0.040	0.050
8	3.50	0.00		0.00		0.000	0.030
9	4.00	0.12		0.39		0.023	0.055
10	4.50	0.10		0.41		0.021	0.068
11	5.00	0.17		0.14		0.012	0.073
12	5.50	0.12		0.62		0.037	0.043
13	6.00	0.05		0.25		0.006	0.065
14	6.50	0.21		0.44		0.046	0.078
15	7.00	0.10		0.37		0.019	0.071
16	7.50	0.19		0.10		0.009	0.116
17	8.00	0.28		0.44		0.062	0.120
18	8.50	0.20		0.41		0.041	0.163
19	9.00	0.45		0.12		0.027	0.173
20	9.50	0.24		0.26		0.031	0.105
21	10.00	0.18		0.42		0.038	0.100
22	10.50	0.22		0.37		0.041	0.100
23	11.00	0.18		0.05		0.005	0.100
24	11.50	0.22		0.25		0.028	0.105
25	12.00	0.20		0.02		0.002	0.100
26	12.50	0.20		0.00		0.000	0.105
27	13.00	0.22		0.28		0.031	0.090
28	13.50	0.14		0.02		0.001	0.073
29	14.00	0.15		0.00		0.000	0.088
30	14.50	0.20		0.06		0.006	0.095
31	15.00	0.18		0.27		0.024	0.075
32	15.50	0.12		0.12		0.007	0.068
33	16.00	0.15		0.43		0.032	0.080
34	16.50	0.17		0.65		0.055	0.043
35	17.00	0.00		0.00		0.000	0.000
36	17.50	0.00		0.00		0.000	0.000
37	18.00	0.00		0.00		0.000	0.000
38	18.50	0.00		0.00		0.000	0.025
39	19.00	0.10		0.00		0.000	0.100
40	19.50	0.30		0.57		0.086	0.113
41	20.00	0.15		0.12		0.009	0.058
42	20.50	0.08		0.23		0.000	0.060
43	21.00	0.16		0.71		0.000	0.040
44	21.50	0.00		0.00		0.000	0.000
45	22.00	0.00		0.00		0.000	0.000
46	22.50	0.00		0.00		0.000	0.038
47	23.00	0.15		0.41		0.031	0.075
48	23.50	0.15		0.22		0.017	0.038
49	24.00	0.00		0.00		0.000	0.025
50	24.50	0.10		0.33		0.017	0.038
51	25.00	0.05		0.01		0.000	0.013
52	25.50	0.00		0.00		0.000	0.030
53	26.00	0.12		0.08		0.005	0.030
54	26.50	0.00		0.00		0.000	0.040
55	27.00	0.16		0.39		0.031	0.085
56	27.50	0.18		0.33		0.030	0.083
57	28.00	0.15		0.19		0.014	0.038



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		1524321 - Amaruq			Date		12-Jul-15		
Waterbody:		A81			Start Time				
Crossing ID:		A81-A80			End Time				
LDB UTM Location		Survey			Datalogger SN:				
East	598366	BM read			Transducer SN:				
North	7255457	WL read			Meter Type/SN:		Swoffer		
Elevation, Zone	14W	WL Elev			Crew:		AEM: RV, LG, RD		
STATION	DISTANCE	DEPTH	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
Start LDB	FROM LDB (m)		0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
58	28.50	0.00		0.00		0.000	0.000		
59	29.00	0.00		0.00		0.000	0.000		
60	29.50	0.00		0.00		0.000	0.000		
61	30.00	0.00		0.00		0.000	0.020		
62	30.50	0.08		0.22		0.044	0.180		
63	31.00	0.00		0.00		0.000	0.000		
64	31.50	0.10		0.15		0.008	0.025		
65	32.00	0.00		0.00		0.000	0.000		
66	33.00	0.08		0.10		0.136	1.320		
67	34.00	0.00		0.00		0.000	0.000		
68	35.00	0.00		0.00		0.000	0.000		
NOTES:					RESULTS:	Q (m3/s)	1.088		
						A(m2)	5.04		
						B(m)	35.0		



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET								
Project Name, Number:			Amaruq - Trip 2			Date		08-Aug-15
Waterbody:			A81			Start Time		11:51
Crossing ID:			A81-A80			End Time		12:20
LDB UTM Location			Survey			Datalogger SN:		
East	598343	BM read				Transducer SN:		
North	7255414	WL read				Meter Type/SN:		Marsh McBirney
Elevation, Zone	14W	WL Elev				Crew:		JL, Laren (wildlife monitor took notes)
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)	
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)				
1	0.00	0.00		0.00			0.000	0.000
2	2.50	0.00		0.00		0.000	0.006	
3	2.60	0.12		0.13		0.002	0.006	
4	2.70	0.00		0.00		0.000	0.000	
5	5.60	0.00		0.00		0.000	0.002	
6	5.70	0.04		0.10		0.000	0.002	
7	5.80	0.00		0.00		0.000	0.000	
8	6.70	0.00		0.00		0.000	0.003	
9	6.90	0.03		0.08		0.000	0.001	
10	7.00	0.00		0.00		0.000	0.000	
11	7.30	0.00		0.00		0.000	0.002	
12	7.40	0.04		0.00		0.000	0.004	
13	7.60	0.00		0.00		0.000	0.000	
14	7.70	0.00		0.00		0.000	0.002	
15	7.80	0.04		0.08		0.000	0.001	
16	7.85	0.00		0.00		0.000	0.000	
17	10.20	0.00		0.00		0.000	0.003	
18	10.40	0.03		0.12		0.001	0.036	
19	11.00	0.09		0.01		0.001	0.057	
20	11.60	0.10		0.11		0.012	0.165	
21	13.10	0.12		0.16		0.017	0.018	
22	13.40	0.00		0.00		0.000	0.004	
23	13.80	0.02		0.02		0.000	0.022	
24	14.20	0.09		0.09		0.002	0.000	
25	14.20	0.00		0.00		0.000	0.010	
26	15.20	0.02		0.09		0.001	0.003	
27	15.50	0.00		0.00		0.000	0.000	
28	15.80	0.00		0.00		0.000	0.010	
29	16.00	0.10		0.00		0.000	0.063	
30	16.70	0.08		0.10		0.004	0.008	
31	16.90	0.00		0.00		0.000	0.000	
32	18.50	0.00		0.00		0.000	0.004	
33	18.70	0.04		0.22		0.004	0.096	
34	19.50	0.20		0.06		0.009	0.080	
35	20.20	0.03		0.17		0.003	0.009	
36	20.80	0.00		0.00		0.000	0.000	
37	21.90	0.00		0.00		0.000	0.006	
38	22.10	0.06		0.10		0.002	0.040	
39	22.60	0.10		0.05		0.002	0.005	
40	22.70	0.00		0.00		0.000	0.000	
41	26.50	0.00		0.00		0.000	0.030	
42	27.50	0.06		0.05		0.000	0.035	
43	28.20	0.04		0.22		0.000	0.006	
44	28.50	0.00		0.00		0.000	0.000	
45	28.80	0.00		0.00		0.000	0.003	
46	28.90	0.06		0.10		0.001	0.006	
47	29.10	0.00		0.00		0.000	0.000	
48	31.70	0.00		0.00		0.000	0.006	
49	31.80	0.12		0.01		0.000	0.018	
50	32.10	0.00		0.00		0.000	0.000	
51	32.50	0.00		0.00		0.000	0.004	
52	32.60	0.08		0.16		0.009	0.098	
53	33.90	0.07		0.01		0.001	0.084	
54	35.10	0.07		0.17		0.011	0.042	
55	35.70	0.07		0.01		0.000	0.049	
56	36.40	0.07		0.18		0.009	0.036	
57	37.20	0.02		0.00		0.000	0.018	
58	37.80	0.04		0.11		0.018	0.370	
59	45.20	0.06		0.06		0.014	0.015	
60	45.70	0.00		0.00		0.000	0.000	



APPENDIX A HYDROMETRIC STATIONS

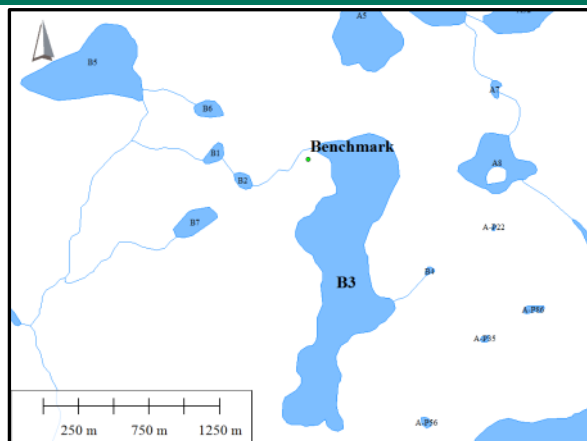
OPEN WATER DISCHARGE CALCULATION SPREADSHEET							
Project Name, Number:		Amaruq - Trip 2		Date		08-Aug-15	
Waterbody:		A81		Start Time		11:51	
Crossing ID:		A81-A80		End Time		12:20	
LDB UTM Location		Survey		Datalogger SN:			
East	598343	BM read		Transducer SN:			
North	7255414	WL read		Meter Type/SN:		Marsh McBirney	
Elevation, Zone	14W	WL Elev		Crew:		JL, Laren (wildlife monitor took notes)	
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)			
NOTES:				RESULTS:	Q (m3/s)	0.124	
					A(m2)	1.49	
					B(m)	45.7	



APPENDIX A HYDROMETRIC STATIONS

A22.0 LAKE B3 & OUTLET (STREAM B3-B2)

Parameter	Value	Note
Drainage Area (km ²)	2.8	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	15	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	0.3	Measured in the field, based on vegetation
Wetted Width (m)	12.8	Measured in the field 8 August 2015
Max. Wetted Depth (m)	0.25	Measured in the field 8 August 2015
Channel Length (km)	0.38	Measured from CanVec data
Outlet Channel Slope (m/m)	0.007	Average slope, based on DEM (PhotoSat 2015)
Bed Material	Boulders, cobbles, with some gravel, sand	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	600357 m E, 7259028 m N, 144.86 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Poorly defined, braided bouldery channel. Cross-sectional data are available in discharge calculation sheets.	



Lake B3: Benchmark location.



8 August 2015. Upstream view of the Lake B3 outlet (east).



8 August 2015. Downstream view of the Lake B3 outlet (west).



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET							
Project Name, Number:		Amaruq - trip 2		Date		08-Aug-15	
Waterbody:		B3		Start Time		7:45	
Crossing ID:		B3-B2		End Time		8:05	
LDB UTM Location		Survey		Datalogger SN:			
East	600126	BM_read		Transducer SN:			
North	7258966	WL_read		Meter Type/SN:		Marsh McBirney	
Elevation, Zone	14W	WL Elev		Crew:	JRL, JN		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)			
1	0.00	0.00		0.00			0.135
2	1.50	0.18		0.04		0.006	0.009
3	1.60	0.00		0.00		0.000	0.000
4	2.00	0.00		0.00		0.000	0.008
5	2.10	0.15		0.03		0.001	0.023
6	2.40	0.00		0.00		0.000	0.000
7	3.10	0.00		0.00		0.000	0.011
8	3.30	0.11		0.04		0.001	0.054
9	3.70	0.16		0.03		0.002	0.068
10	4.20	0.11		0.09		0.006	0.092
11	5.00	0.12		0.06		0.005	0.058
12	5.50	0.11		0.02		0.001	0.098
13	6.20	0.17		0.03		0.003	0.026
14	6.50	0.00		0.00		0.000	0.000
15	7.80	0.00		0.00		0.000	0.008
16	7.90	0.16		0.05		0.003	0.087
17	8.50	0.13		0.02		0.001	0.058
18	9.00	0.10		0.02		0.001	0.058
19	9.50	0.13		0.09		0.004	0.013
20	9.70	0.00		0.00		0.000	0.000
21	11.10	0.00		0.00		0.000	0.012
22	11.20	0.24		0.01		0.001	0.048
23	11.60	0.00		0.00		0.000	0.000
24	12.60	0.00		0.00		0.000	0.008
25	12.70	0.16		0.03		0.000	0.008
26	12.80	0.00		0.00		0.000	0.000
NOTES:				RESULTS:		Q (m3/s)	0.036
						A(m2)	0.88
						B(m)	12.8



Parameter	Value	Note
Drainage Area (km ²)	11.2	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	30	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	0.3	Measured in the field, based on vegetation
Wetted Width (m)	16.6	Measured in the field on 8 August 2015
Max. Wetted Depth (m)	0.14	Measured in the field on 8 August 2015
Channel Length (km)	0.05	Measured from CanVec data
Outlet Channel Slope (m/m)	0.005	Average slope, measured in the field
Bed Material	Cobbles, gravel, sand	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	604219 m E, 7260840 m N	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	N/A	
Comment	Well defined channel. Cross-sectional data are available in discharge calculation sheets.	



8 August 2015. Southwest view of Lake C8 flowing into C7.



8 August 2015. View looking south at Lake C8.



APPENDIX A HYDROMETRIC STATIONS

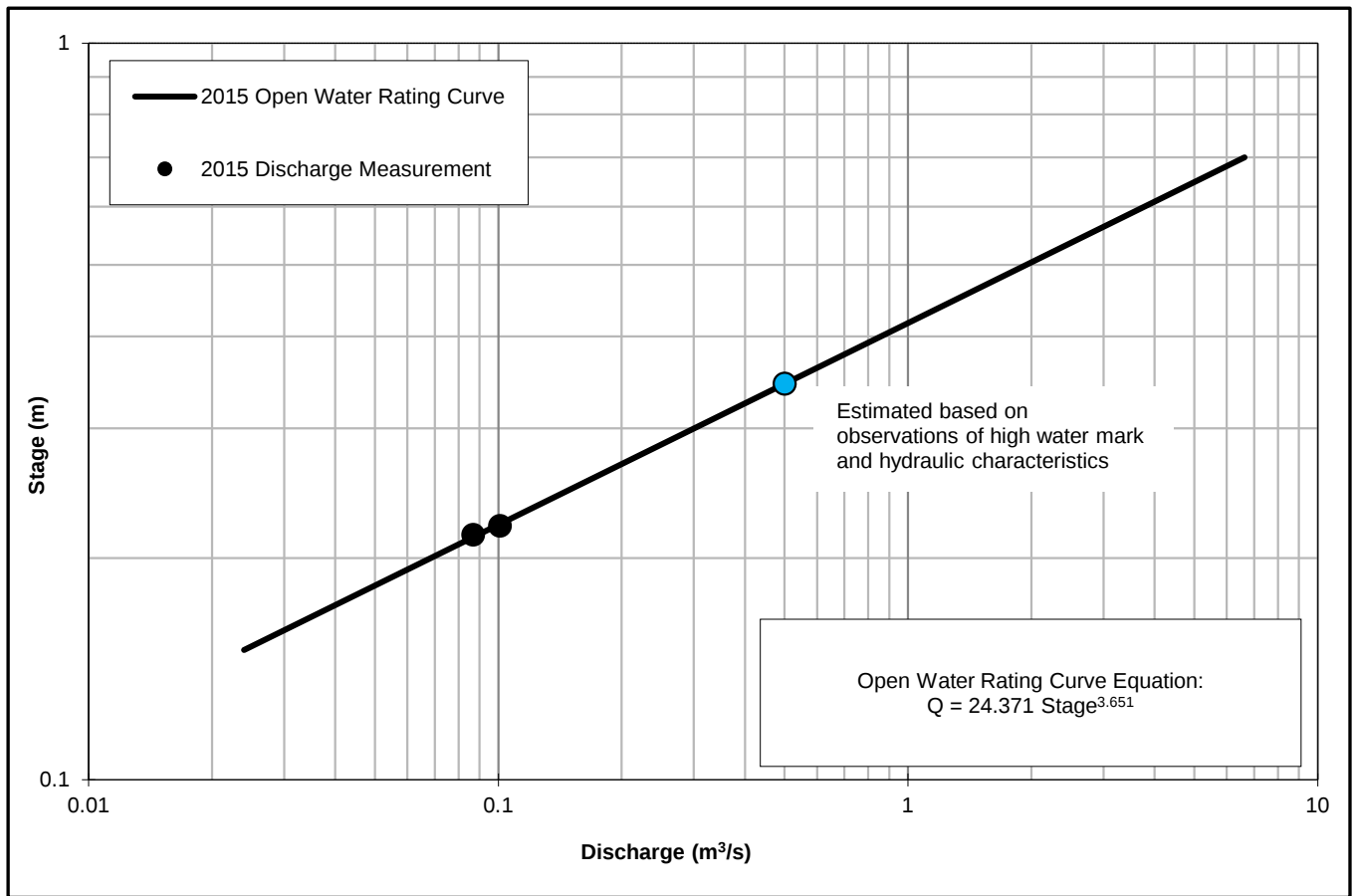


Figure 6: 2015 Stage-Discharge Rating Curve (Lake C8)



APPENDIX A HYDROMETRIC STATIONS

Lake C8 - 2015

MEAN DAILY DISCHARGE (m³/s)

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	-	-	0.08	-	-	-
2	-	-	-	-	-	-	-	-	0.08	-	-	-
3	-	-	-	-	-	-	-	-	0.09	-	-	-
4	-	-	-	-	-	-	-	-	0.09	-	-	-
5	-	-	-	-	-	-	-	-	0.08	-	-	-
6	-	-	-	-	-	-	-	-	0.08	-	-	-
7	-	-	-	-	-	-	-	-	0.08	-	-	-
8	-	-	-	-	-	-	-	0.09 P	0.08	-	-	-
9	-	-	-	-	-	-	-	0.09	0.08	-	-	-
10	-	-	-	-	-	-	-	0.08	0.08	-	-	-
11	-	-	-	-	-	-	-	0.09	0.07	-	-	-
12	-	-	-	-	-	-	-	0.07	0.08	-	-	-
13	-	-	-	-	-	-	-	0.08	0.08	-	-	-
14	-	-	-	-	-	-	-	0.09	0.08	-	-	-
15	-	-	-	-	-	-	-	0.08	0.08	-	-	-
16	-	-	-	-	-	-	-	0.08	0.08 P	-	-	-
17	-	-	-	-	-	-	-	0.08	-	-	-	-
18	-	-	-	-	-	-	-	0.08	-	-	-	-
19	-	-	-	-	-	-	-	0.08	-	-	-	-
20	-	-	-	-	-	-	-	0.08	-	-	-	-
21	-	-	-	-	-	-	-	0.08	-	-	-	-
22	-	-	-	-	-	-	-	0.08	-	-	-	-
23	-	-	-	-	-	-	-	0.08	-	-	-	-
24	-	-	-	-	-	-	-	0.09	-	-	-	-
25	-	-	-	-	-	-	-	0.09	-	-	-	-
26	-	-	-	-	-	-	-	0.09	-	-	-	-
27	-	-	-	-	-	-	-	0.09	-	-	-	-
28	-	-	-	-	-	-	-	0.08	-	-	-	-
29	-	-	-	-	-	-	-	0.08	-	-	-	-
30	-	-	-	-	-	-	-	0.08	-	-	-	-
31	-	-	-	-	-	-	-	0.08	-	-	-	-
MIN	-	-	-	-	-	-	-	0.073	0.072	-	-	-
MEAN	-	-	-	-	-	-	-	0.083	0.080	-	-	-
MAX	-	-	-	-	-	-	-	0.089	0.086	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE

Water Yield (m ³) =	282,794	171,934	110,860
Water Yield (mm) =	24.0	61%	39%



APPENDIX A HYDROMETRIC STATIONS

Lake C8 - 2015

MEAN DAILY WATER SURFACE ELEVATION (masl)

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	-	-	139.008	-	-	-
2	-	-	-	-	-	-	-	-	139.012	-	-	-
3	-	-	-	-	-	-	-	-	139.013	-	-	-
4	-	-	-	-	-	-	-	-	139.012	-	-	-
5	-	-	-	-	-	-	-	-	139.011	-	-	-
6	-	-	-	-	-	-	-	-	139.010	-	-	-
7	-	-	-	-	-	-	-	-	139.009	-	-	-
8	-	-	-	-	-	-	-	139.014 P	139.006	-	-	-
9	-	-	-	-	-	-	-	139.015	139.005	-	-	-
10	-	-	-	-	-	-	-	139.012	139.005	-	-	-
11	-	-	-	-	-	-	-	139.012	139.003	-	-	-
12	-	-	-	-	-	-	-	139.004	139.009	-	-	-
13	-	-	-	-	-	-	-	139.012	139.025	-	-	-
14	-	-	-	-	-	-	-	139.013	139.020	-	-	-
15	-	-	-	-	-	-	-	139.011	139.021	-	-	-
16	-	-	-	-	-	-	-	139.008	139.022 P	-	-	-
17	-	-	-	-	-	-	-	139.007	-	-	-	-
18	-	-	-	-	-	-	-	139.008	-	-	-	-
19	-	-	-	-	-	-	-	139.007	-	-	-	-
20	-	-	-	-	-	-	-	139.009	-	-	-	-
21	-	-	-	-	-	-	-	139.011	-	-	-	-
22	-	-	-	-	-	-	-	139.010	-	-	-	-
23	-	-	-	-	-	-	-	139.011	-	-	-	-
24	-	-	-	-	-	-	-	139.013	-	-	-	-
25	-	-	-	-	-	-	-	139.013	-	-	-	-
26	-	-	-	-	-	-	-	139.013	-	-	-	-
27	-	-	-	-	-	-	-	139.013	-	-	-	-
28	-	-	-	-	-	-	-	139.010	-	-	-	-
29	-	-	-	-	-	-	-	139.011	-	-	-	-
30	-	-	-	-	-	-	-	139.011	-	-	-	-
31	-	-	-	-	-	-	-	139.010	-	-	-	-
MIN	-	-	-	-	-	-	-	139.004	139.003	-	-	-
MEAN	-	-	-	-	-	-	-	139.011	139.012	-	-	-
MAX	-	-	-	-	-	-	-	139.015	139.025	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		Amaruq - Trip 2			Date		08-Aug-15		
Waterbody:		C8			Start Time		9:45		
Crossing ID:		C8-C7			End Time		10:00		
LDB UTM Location		Survey			Datalogger SN:				
East	604259	BM read			Transducer SN:				
North	7260865	WL read			Meter Type/SN:		Marsh McBirney		
Elevation, Zone	14W	WL Elev			Crew:		JRL, JN		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.40	0.00		0.00				0.002	
2	0.50	0.04		0.00		0.000		0.028	
3	1.20	0.04		0.00		0.000		0.066	
4	2.40	0.07		0.01		0.001		0.065	
5	3.40	0.06		0.05		0.003		0.084	
6	4.60	0.08		0.06		0.006		0.132	
7	5.80	0.14		0.08		0.013		0.150	
8	7.00	0.11		0.07		0.009		0.138	
9	8.20	0.12		0.08		0.012		0.144	
10	9.40	0.12		0.07		0.010		0.144	
11	10.60	0.12		0.04		0.006		0.108	
12	11.80	0.06		0.07		0.005		0.096	
13	13.00	0.10		0.05		0.006		0.102	
14	14.20	0.07		0.05		0.004		0.114	
15	15.40	0.12		0.08		0.012		0.108	
16	16.60	0.06		0.01		0.000		0.012	
17	17.00	0.00		0.00		0.000		0.000	
NOTES:					RESULTS:	Q (m3/s)	0.087		
						A(m2)	1.49		
						B(m)	16.6		



APPENDIX A HYDROMETRIC STATIONS

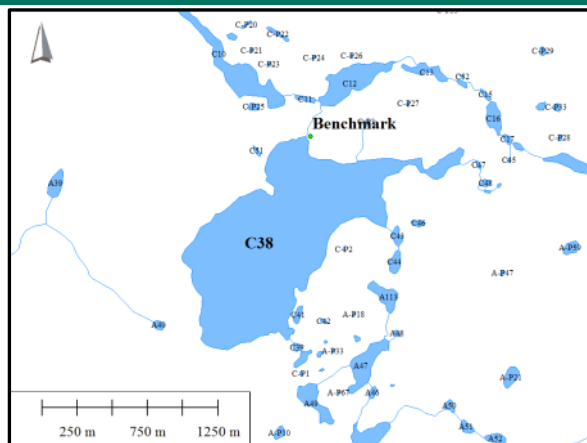
OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:			1524321 - Amaruq Trip 3			Date		16-Sep-15	
Waterbody:			C8			Start Time		11:40	
Crossing ID:			C8-C7			End Time		11:50	
LDB UTM Location			Survey			Datalogger SN:			
East	604255	BM read				Transducer SN:			
North	7260877	WL read				Meter Type/SN:			
Elevation, Zone		14W	WL Elev				Crew:		JRL, DC
STATION	DISTANCE	DEPTH	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
Start LDB	FROM LDB (m)		0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0				0.100	
2	2.00	0.10		0.02		0.003		0.080	
3	3.00	0.06		0.06		0.004		0.090	
4	4.00	0.12		0.1		0.012		0.135	
5	5.00	0.15		0.07		0.011		0.135	
6	6.00	0.12		0.07		0.008		0.145	
7	7.00	0.17		0.05		0.009		0.180	
8	8.00	0.19		0.02		0.004		0.195	
9	9.00	0.20		0.04		0.008		0.180	
10	10.00	0.16		0.06		0.010		0.160	
11	11.00	0.16		0.04		0.006		0.150	
12	12.00	0.14		0.07		0.010		0.130	
13	13.00	0.12		0.07		0.008		0.125	
14	14.00	0.13		0.05		0.007		0.115	
15	15.00	0.10		0.03		0.002		0.030	
16	15.60	0.00		0		0.000		0.000	
NOTES:						RESULTS:	Q (m3/s)	0.101	
							A(m2)	1.95	
							B(m)	15.6	



APPENDIX A HYDROMETRIC STATIONS

A24.0 LAKE C38 (NEMO LAKE) & OUTLET (STREAM C38-C12)

Parameter	Value	Note
Drainage Area (km ²)	3.5	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	3	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	0.2	Measured in the field, based on vegetation
Wetted Width (m)	1.4	Measured in the field 4 August 2015
Max. Wetted Depth (m)	0.12	Measured in the field 4 August 2015
Channel Length (km)	0.22	Measured from CanVec data
Outlet Channel Slope (m/m)	0.024	Average slope, measured in the field
Bed Material	Boulders, cobble, gravel	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	606646 m E, 7258165 m N, 157.42 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	606615 m E, 7258148 m N	
Comment	Poorly defined boulder channel with some well-defined portions. Cross-sectional data are available in discharge calculation sheets.	



Lake C38: Benchmark location.



14 June 2015. View from outlet looking south at Lake C38.



17 September 2015. Upstream view of the watercourse and Lake C38 (south)



4 August 2015. Upstream view of the watercourse and Lake C38 (south).



APPENDIX A HYDROMETRIC STATIONS



4 August 2015. Downstream view of the watercourse (north).

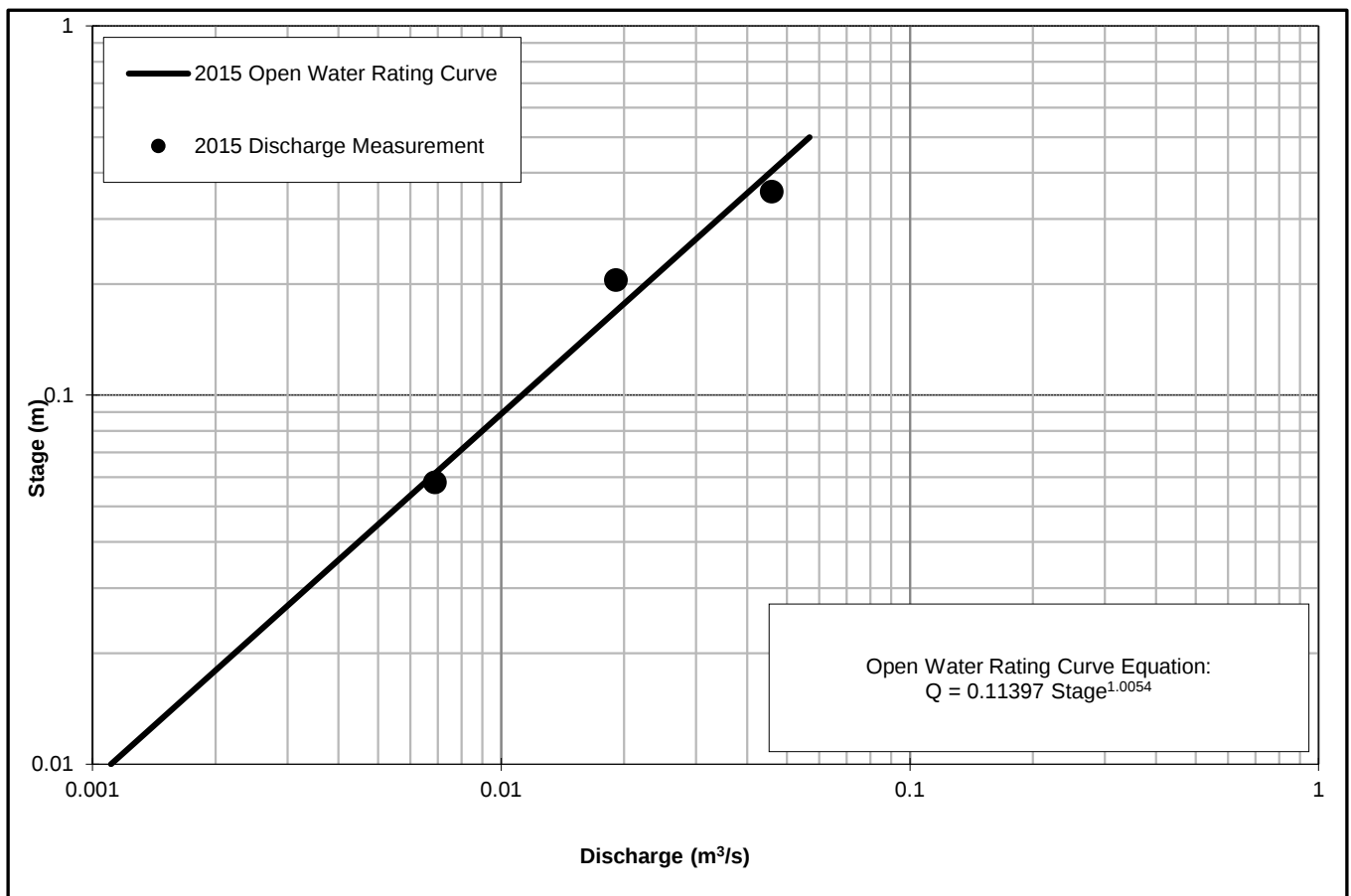


Figure 7: 2015 Stage-Discharge Rating Curve (Lake C38)



APPENDIX A HYDROMETRIC STATIONS

Lake C38 (Nemo Lake) - 2015

MEAN DAILY DISCHARGE (m³/s)

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	0.04	0.02	0.01	-	-	-
2	-	-	-	-	-	-	0.04	0.02	0.01	-	-	-
3	-	-	-	-	-	-	0.03	0.02	0.01	-	-	-
4	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
5	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
6	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
7	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
8	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
9	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
10	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
11	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
12	-	-	-	-	-	-	0.03	0.02	0.00	-	-	-
13	-	-	-	-	-	0.04	0.03	0.02	0.00	-	-	-
14	-	-	-	-	-	0.04	0.03	0.02	0.01	-	-	-
15	-	-	-	-	-	0.04	0.03	0.01	0.01	-	-	-
16	-	-	-	-	-	0.04	0.03	0.01	0.01	-	-	-
17	-	-	-	-	-	0.04	0.03	0.01	0.01	-	-	-
18	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
19	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
20	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
21	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
22	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
23	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
24	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
25	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
26	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
27	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
28	-	-	-	-	-	0.04	0.03	0.01	-	-	-	-
29	-	-	-	-	-	0.04	0.02	0.01	-	-	-	-
30	-	-	-	-	-	0.04	0.02	0.01	-	-	-	-
31	-	-	-	-	-	-	0.02	0.01	-	-	-	-
MIN	-	-	-	-	-	0.035	0.025	0.006	0.002	-	-	-
MEAN	-	-	-	-	-	0.038	0.030	0.014	0.004	-	-	-
MAX	-	-	-	-	-	0.039	0.036	0.024	0.006	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE

Water Yield (m ³) =	185,489	59,834	81,074	38,325	6,256
Water Yield (mm) =	52.3	32%	44%	21%	3%



APPENDIX A HYDROMETRIC STATIONS

Lake C38 (Nemo Lake) - 2015

MEAN DAILY WATER SURFACE ELEVATION (masl) BASED ON BENCHMARK ELEVATION 157.42 masl

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	155.949	155.841	155.677	-	-	-
2	-	-	-	-	-	-	155.942	155.833	155.677	-	-	-
3	-	-	-	-	-	-	155.938	155.827	155.675	-	-	-
4	-	-	-	-	-	-	155.930	155.827	155.672	-	-	-
5	-	-	-	-	-	-	155.928	155.828	155.669	-	-	-
6	-	-	-	-	-	-	155.925	155.821	155.664	-	-	-
7	-	-	-	-	-	-	155.921	155.815	155.661	-	-	-
8	-	-	-	-	-	-	155.917	155.808	155.657	-	-	-
9	-	-	-	-	-	-	155.918	155.800	155.654	-	-	-
10	-	-	-	-	-	-	155.924	155.794	155.650	-	-	-
11	-	-	-	-	-	-	155.922	155.787	155.647	-	-	-
12	-	-	-	-	-	-	155.918	155.773	155.660	-	-	-
13	-	-	-	-	-	155.940 P	155.923	155.772	155.671	-	-	-
14	-	-	-	-	-	155.957	155.917	155.765	155.676	-	-	-
15	-	-	-	-	-	155.967	155.911	155.760	155.679	-	-	-
16	-	-	-	-	-	155.973	155.906	155.750	155.683	-	-	-
17	-	-	-	-	-	155.977	155.901	155.743	155.684 P	-	-	-
18	-	-	-	-	-	155.977	155.895	155.738	-	-	-	-
19	-	-	-	-	-	155.976	155.888	155.734	-	-	-	-
20	-	-	-	-	-	155.976	155.885	155.730	-	-	-	-
21	-	-	-	-	-	155.978	155.881	155.723	-	-	-	-
22	-	-	-	-	-	155.977	155.876	155.716	-	-	-	-
23	-	-	-	-	-	155.973	155.873	155.712	-	-	-	-
24	-	-	-	-	-	155.974	155.866	155.709	-	-	-	-
25	-	-	-	-	-	155.974	155.860	155.705	-	-	-	-
26	-	-	-	-	-	155.977	155.856	155.700	-	-	-	-
27	-	-	-	-	-	155.972	155.855	155.696	-	-	-	-
28	-	-	-	-	-	155.966	155.853	155.692	-	-	-	-
29	-	-	-	-	-	155.962	155.849	155.691	-	-	-	-
30	-	-	-	-	-	155.956	155.847	155.690	-	-	-	-
31	-	-	-	-	-	-	155.847	155.683	-	-	-	-
MIN	-	-	-	-	-	155.940	155.847	155.683	155.647	-	-	-
MEAN	-	-	-	-	-	155.969	155.898	155.757	155.668	-	-	-
MAX	-	-	-	-	-	155.978	155.949	155.841	155.684	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		1524321 - Amaruq			Date		14-Jun-15		
Waterbody:		C38			Start Time		13:00		
Crossing ID:		C38-C12			End Time		13:30		
LDB UTM Location		Survey			Datalogger SN:				
East	606634	BM read			Transducer SN:				
North	7258188	WL read			Meter Type/SN:		Swoffer		
Elevation, Zone	14W	WL Elev			Crew:		CJ, JRL		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	1.40	0.00		0.00				0.016	
2	1.60	0.16		0.23		0.007		0.026	
3	1.80	0.10		0.38		0.008		0.018	
4	2.00	0.08		0.40		0.006		0.017	
5	2.20	0.09		0.05		0.001		0.034	
6	2.60	0.08		0.30		0.007		0.014	
7	2.80	0.06		0.20		0.003		0.018	
8	3.05	0.08		0.30		0.005		0.014	
9	3.20	0.10		0.30		0.005		0.021	
10	3.40	0.11		0.03		0.001		0.024	
11	3.60	0.13		0.09		0.002		0.024	
12	3.80	0.11		0.00		0.000		0.022	
13	4.00	0.11		0.01		0.000		0.017	
14	4.30	0.00		0.00		0.000		0.000	
NOTES:					RESULTS:	Q (m3/s)	0.046		
						A(m2)	0.26		
						B(m)	2.9		



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		Amaruq - trip 2			Date		04-Aug-15		
Waterbody:		C38			Start Time		16:45		
Crossing ID:		C38-C12			End Time		17:00		
LDB UTM Location		Survey			Datalogger SN:				
East	606635	BM read			Transducer SN:				
North	7258187	WL read			Meter Type/SN:		Marsh McBirney		
Elevation, Zone	14W	WL Elev			Crew:		JRL, JN		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00				0.003	
2	0.15	0.04		0.00		0.000		0.011	
3	0.30	0.10		0.17		0.003		0.022	
4	0.50	0.12		0.02		0.000		0.015	
5	0.70	0.03		0.00		0.000		0.000	
6	0.71	0.00		0.00		0.000		0.010	
7	0.90	0.10		0.36		0.005		0.010	
8	1.00	0.10		0.36		0.005		0.020	
9	1.20	0.10		0.36		0.004		0.001	
10	1.21	0.09		0.07		0.001		0.017	
11	1.40	0.09		0.07		0.001		0.000	
12	1.41	0.00		0.00		0.000		0.000	
NOTES:					RESULTS:	Q (m3/s)	0.019		
						A(m2)	0.11		
						B(m)	1.4		



APPENDIX A HYDROMETRIC STATIONS

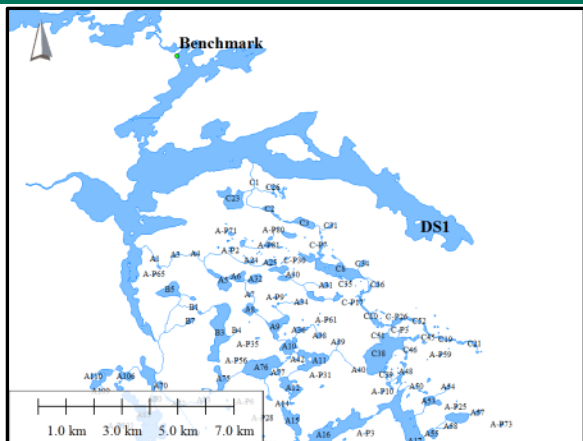
OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:			1524321 - Amaruq Trip 3			Date		17-Sep-15	
Waterbody:			C38			Start Time		9:20	
Crossing ID:			C38-C12			End Time		9:25	
LDB UTM Location			Survey			Datalogger SN:			
East	606634	BM read				Transducer SN:			
North	7258188	WL read				Meter Type/SN:			
Elevation, Zone		14W	WL Elev				Crew:		JRL, DC
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00				0.002	
2	0.20	0.02		0.11		0.001		0.006	
3	0.50	0.02		0.12		0.001		0.006	
4	0.80	0.02		0.12		0.001		0.007	
5	1.00	0.05		0.17		0.003		0.012	
6	1.40	0.01		0.15		0.001		0.009	
7	1.70	0.05		0.13		0.002		0.007	
8	2.00	0.00		0.00		0.000		0.000	
NOTES:						RESULTS:	Q (m3/s)	0.007	
							A(m2)	0.05	
							B(m)	2.0	



APPENDIX A HYDROMETRIC STATIONS

A25.0 LAKE DS1 & OUTLET (STREAM DS1)

Parameter	Value	Note
Drainage Area (km ²)	898	Based on DEM (PhotoSat 2015)
Bankfull Width (m)	77	Measured in the field, based on vegetation
Max. Bankfull Depth (m)	1.4	Measured in the field, based on vegetation
Wetted Width (m)	45.5	Measured in the field 5 August 2015
Max. Wetted Depth (m)	0.74	Measured in the field 5 August 2015
Channel Length (km)	0.10	Measured from CanVec data
Outlet Channel Slope (m/m)	0.006	Average slope, measured in the field
Bed Material	Boulders, cobbles	
Bank Material	Boulders, cobbles, organics	
Bank Vegetation	Grass	
Benchmark Coordinates	599092 m E, 7268034 m N, 107.31 masl	NAD83 Zone 14
Logger/ Staff Gauge Coordinates	599253 m E, 7268300 m N	
Comment	Well defined boulder channel. Cross-sectional data are available in discharge calculation sheets.	



Lake DS1: Benchmark location.



12 June 2015. View looking east at Lake DS1 and staff gauge.



16 September 2015. View looking south east at Lake DS1 and outlet.



5 August 2015. Looking north-west at the watercourse.



APPENDIX A HYDROMETRIC STATIONS



5 August 2015. Looking north at the watercourse.

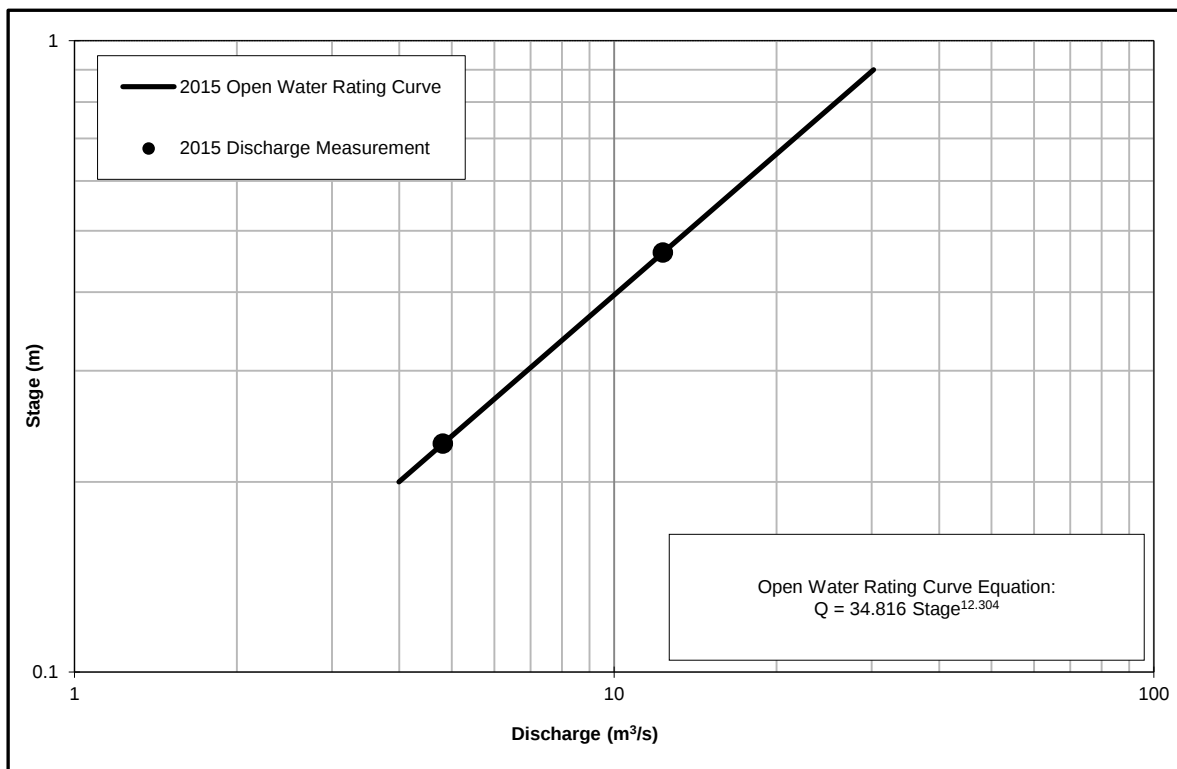


Figure 8: 2015 Stage-Discharge Rating Curve (Lake DS1)



APPENDIX A HYDROMETRIC STATIONS

Lake DS1 - 2015

MEAN DAILY DISCHARGE (m³/s)

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	43.03	15.09	3.96	-	-	-
2	-	-	-	-	-	-	41.25	14.46	3.88	-	-	-
3	-	-	-	-	-	-	39.73	13.75	3.81	-	-	-
4	-	-	-	-	-	-	37.94	13.23	3.67	-	-	-
5	-	-	-	-	-	-	36.10	12.65	3.54	-	-	-
6	-	-	-	-	-	-	34.74	12.12	3.41	-	-	-
7	-	-	-	-	-	-	33.49	11.52	3.32	-	-	-
8	-	-	-	-	-	-	32.25	11.12	3.17	-	-	-
9	-	-	-	-	-	-	31.35	10.68	3.07	-	-	-
10	-	-	-	-	-	-	30.68	10.03	2.99	-	-	-
11	-	-	-	-	-	-	30.33	9.57	2.89	-	-	-
12	-	-	-	-	-	15.99 P	30.14	8.88	3.04	-	-	-
13	-	-	-	-	-	24.84	29.74	8.73	3.31	-	-	-
14	-	-	-	-	-	38.71	28.90	8.29	3.83	-	-	-
15	-	-	-	-	-	51.45	27.87	7.83	4.41	-	-	-
16	-	-	-	-	-	57.22	26.89	7.36	4.82 P	-	-	-
17	-	-	-	-	-	58.86	25.93	7.00	-	-	-	-
18	-	-	-	-	-	58.67	24.91	6.73	-	-	-	-
19	-	-	-	-	-	57.53	23.87	6.42	-	-	-	-
20	-	-	-	-	-	55.81	23.02	6.28	-	-	-	-
21	-	-	-	-	-	54.29	22.12	6.08	-	-	-	-
22	-	-	-	-	-	54.06	21.29	5.64	-	-	-	-
23	-	-	-	-	-	52.48	20.62	5.40	-	-	-	-
24	-	-	-	-	-	50.73	19.84	5.20	-	-	-	-
25	-	-	-	-	-	49.52	18.82	5.03	-	-	-	-
26	-	-	-	-	-	50.07	18.00	4.79	-	-	-	-
27	-	-	-	-	-	50.95	17.50	4.59	-	-	-	-
28	-	-	-	-	-	48.21	16.93	4.42	-	-	-	-
29	-	-	-	-	-	46.60	16.44	4.32	-	-	-	-
30	-	-	-	-	-	44.89	15.97	4.24	-	-	-	-
31	-	-	-	-	-	-	15.66	4.14	-	-	-	-
MIN	-	-	-	-	-	15.988	15.661	4.140	2.888	-	-	-
MEAN	-	-	-	-	-	48.468	26.947	8.245	3.570	-	-	-
MAX	-	-	-	-	-	58.864	43.030	15.093	4.821	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE

Water Yield (m³) =	178,758,458	79,565,618	72,173,563	22,083,501	4,935,776
Water Yield (mm) =	199.2	45%	40%	12%	3%



APPENDIX A HYDROMETRIC STATIONS

Lake DS1 - 2015

MEAN DAILY WATER SURFACE ELEVATION (m) BASED ON BENCHMARK ELEVATION 107.31 masl

DATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	-	-	-	-	-	-	100.170	99.537	99.199	-	-	-
2	-	-	-	-	-	-	100.134	99.520	99.196	-	-	-
3	-	-	-	-	-	-	100.102	99.501	99.193	-	-	-
4	-	-	-	-	-	-	100.065	99.487	99.188	-	-	-
5	-	-	-	-	-	-	100.027	99.471	99.183	-	-	-
6	-	-	-	-	-	-	99.998	99.456	99.178	-	-	-
7	-	-	-	-	-	-	99.971	99.439	99.174	-	-	-
8	-	-	-	-	-	-	99.944	99.428	99.168	-	-	-
9	-	-	-	-	-	-	99.925	99.415	99.164	-	-	-
10	-	-	-	-	-	-	99.910	99.397	99.161	-	-	-
11	-	-	-	-	-	-	99.902	99.383	99.157	-	-	-
12	-	-	-	-	-	99.560 P	99.898	99.362	99.163	-	-	-
13	-	-	-	-	-	99.776	99.889	99.357	99.174	-	-	-
14	-	-	-	-	-	100.080	99.870	99.344	99.194	-	-	-
15	-	-	-	-	-	100.336	99.847	99.330	99.215	-	-	-
16	-	-	-	-	-	100.446	99.825	99.315	99.230 P	-	-	-
17	-	-	-	-	-	100.477	99.803	99.303	-	-	-	-
18	-	-	-	-	-	100.473	99.779	99.295	-	-	-	-
19	-	-	-	-	-	100.452	99.755	99.285	-	-	-	-
20	-	-	-	-	-	100.419	99.735	99.280	-	-	-	-
21	-	-	-	-	-	100.390	99.713	99.273	-	-	-	-
22	-	-	-	-	-	100.386	99.694	99.259	-	-	-	-
23	-	-	-	-	-	100.356	99.677	99.250	-	-	-	-
24	-	-	-	-	-	100.322	99.658	99.243	-	-	-	-
25	-	-	-	-	-	100.299	99.633	99.237	-	-	-	-
26	-	-	-	-	-	100.309	99.612	99.229	-	-	-	-
27	-	-	-	-	-	100.326	99.599	99.222	-	-	-	-
28	-	-	-	-	-	100.273	99.585	99.216	-	-	-	-
29	-	-	-	-	-	100.241	99.572	99.212	-	-	-	-
30	-	-	-	-	-	100.207	99.560	99.209	-	-	-	-
31	-	-	-	-	-	-	99.552	99.205	-	-	-	-
MIN	-	-	-	-	-	99.560	99.552	99.205	99.157	-	-	-
MEAN	-	-	-	-	-	100.265	99.820	99.337	99.184	-	-	-
MAX	-	-	-	-	-	100.477	100.170	99.537	99.230	-	-	-

NOTES: P - PARTIAL DAILY AVERAGE



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:			Amaruq - Trip 2			Date		05-Aug-15	
Waterbody:			DS1			Start Time		13:10	
Crossing ID:						End Time		13:45	
LDB UTM Location			Survey			Datalogger SN:			
East	599152	BM read				Transducer SN:			
North	7268331	WL read				Meter Type/SN:		Marsh McBirney	
Elevation, Zone	14W	WL Elev				Crew:		JRL, JN	
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00			1.000		
2	8.00	0.25		0.25		0.297	0.293		
3	9.50	0.14		0.44		0.092	0.330		
4	11.00	0.30		0.50		0.225	0.488		
5	12.50	0.35		0.65		0.341	0.578		
6	14.00	0.42		0.80		0.504	0.765		
7	15.50	0.60		1.06		0.954	0.915		
8	17.00	0.62		0.87		0.809	0.953		
9	18.50	0.65		0.95		0.926	0.968		
10	20.00	0.64		0.87		0.835	0.945		
11	21.50	0.62		0.95		0.884	0.990		
12	23.00	0.70		1.00		1.050	1.080		
13	24.50	0.74		1.00		1.110	0.960		
14	26.00	0.54		1.08		0.875	0.885		
15	27.50	0.64		1.00		0.960	0.810		
16	29.00	0.44		0.85		0.561	0.630		
17	30.50	0.40		0.80		0.480	0.698		
18	32.00	0.53		0.50		0.331	0.470		
19	33.00	0.41		0.60		0.308	0.660		
20	34.50	0.47		0.51		0.360	0.615		
21	36.00	0.35		0.55		0.289	0.375		
22	37.50	0.15		0.40		0.090	0.150		
23	39.00	0.05		0.22		0.017	0.068		
24	40.50	0.04		0.12		0.016	0.100		
25	45.50	0.00		0.00		0.000	0.000		
NOTES:			RESULTS:		Q (m3/s)	12.313			
					A(m2)	15.72			
					B(m)	45.5			



APPENDIX A HYDROMETRIC STATIONS

OPEN WATER DISCHARGE CALCULATION SPREADSHEET									
Project Name, Number:		1524321 - Amaruq Trip 3			Date		16-Sep-15		
Waterbody:		DS1			Start Time		14:10		
Crossing ID:					End Time		14:35		
LDB UTM Location		Survey			Datalogger SN:				
East	599158	BM read			Transducer SN:				
North	7268338	WL read			Meter Type/SN:				
Elevation, Zone	14W	WL Elev			Crew:		JRL, DC		
STATION Start LDB	DISTANCE FROM LDB (m)	DEPTH (m)	Velocity		Optional ANGLE OF FLOW (°)	Qi (m3/s)	Ai (m2)		
			0.2 DEPTH (m/s)	0.6/0.8 DEPTH (m/s)					
1	0.00	0.00		0.00				0.110	
2	1.00	0.22		0.34		0.075		0.250	
3	2.00	0.28		0.37		0.104		0.270	
4	3.00	0.26		0.59		0.153		0.320	
5	4.00	0.38		0.56		0.213		0.375	
6	5.00	0.37		0.71		0.263		0.350	
7	6.00	0.33		0.43		0.142		0.370	
8	7.00	0.41		0.60		0.246		0.435	
9	8.00	0.46		0.61		0.281		0.470	
10	9.00	0.48		0.60		0.288		0.530	
11	10.00	0.58		0.61		0.354		0.590	
12	11.00	0.60		0.70		0.420		0.605	
13	12.00	0.61		0.75		0.458		0.585	
14	13.00	0.56		0.56		0.314		0.570	
15	14.00	0.58		0.58		0.336		0.540	
16	15.00	0.50		0.50		0.250		0.460	
17	16.00	0.42		0.42		0.176		0.440	
18	17.00	0.46		0.46		0.212		0.440	
19	18.00	0.42		0.42		0.176		0.405	
20	19.00	0.39		0.39		0.152		0.350	
21	20.00	0.31		0.31		0.096		0.270	
22	21.00	0.23		0.23		0.053		0.215	
23	22.00	0.20		0.20		0.040		0.155	
24	23.00	0.11		0.11		0.012		0.105	
25	24.00	0.10		0.10		0.008		0.030	
26	24.60	0.00		0.00		0.000		0.000	
NOTES:					RESULTS:	Q (m3/s)	4.821		
						A(m2)	9.24		
						B(m)	24.6		



APPENDIX B

Shoreline Baseline Characterization



APPENDIX B

Shoreline Baseline Characterization

B1.0 LAKE A12



Figure B-1: Shoreline with boulders (looking southwest)



Figure B-2: Lake A12 main outlet channel with boulder gardens (looking northeast)



Figure B-3: Lake A12 main outlet towards Lake A11, mostly subsurface (looking northeast)



Figure B-4: Shoreline at the lake outlet with shallow and bouldery beach (looking west)



APPENDIX B

Shoreline Baseline Characterization

B2.0 LAKE A15



Figure B-5: Shoreline with boulder garden beaches (looking south)



Figure B-6: Eastern shoreline with boulder garden beaches (looking north)



Figure B-7: Lake A15 outlet channel, right bank looking downstream



Figure B-8: Shoreline with boulder gardens at the lake inlet (looking north)



B3.0 LAKE A16 (MAMMOTH LAKE)



Figure B-9: Lake A16 outlet channel, left bank looking upstream



Figure B-10: Lake A16 outlet channel, large boulders with the flow through the boulders, looking downstream

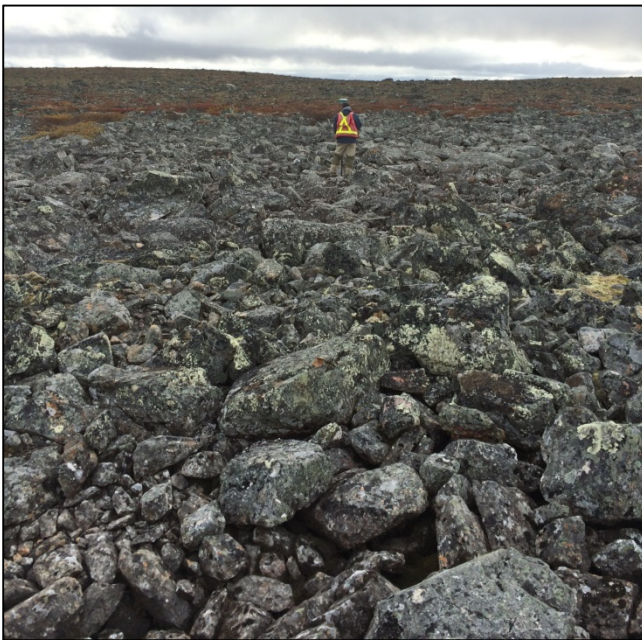


Figure B-11: Lake A16 outlet channel, with boulder gardens, view towards right bank

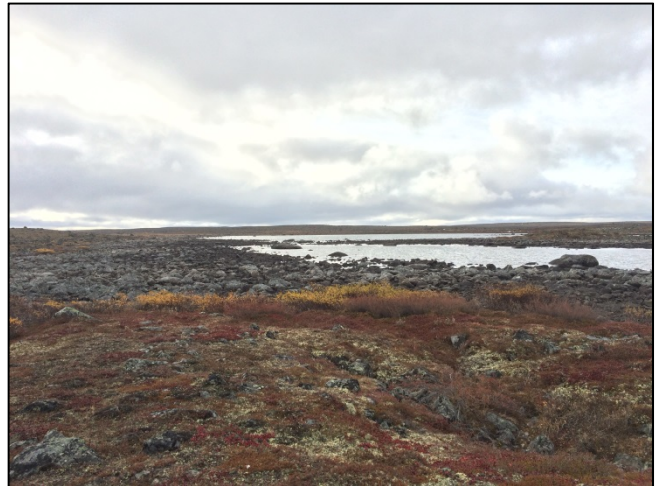


Figure B-12: Shallow shoreline extending into the lake with large boulders as the main material (looking south)