Photo 7: Gold Brook Sample Point 7A (June 7, 2017).

Photo 8: Gold Brook Sample Point 7B (June 7, 2017).

Photo 9: Gold Brook Sample Point 7C (June 7, 2017).

Photo 10: Gold Brook Sample Point 8A (June 7, 2017).

Photo 11: Gold Brook Sample Point 8B (June 7, 2017).

Photo 12: Gold Brook Sample Point 8C (June 7, 2017).

Photo 13: Gold Brook Sample Point 8D (June 7, 2017).

Photo 14: Gold Brook Sample Point 9 (June 7, 2017).

Photo 15: Gold Brook Sample Point 10A (June 7, 2017).

Photo 16: Gold Brook Sample Point 10B (June 7, 2017).

Photo 17: Gold Brook Sample Point 11A (June 7, 2017).

Photo 18: Gold Brook Sample Point 11B (June 7, 2017).

Photo 19: Gold Brook Sample Point 11C (June 7, 2017).

Photo 20: Gold Brook Sample Point 12A (June 7, 2017).

Photo 21: Gold Brook Sample Point 12B (June 7, 2017).

Photo 22: Gold Brook Sample Point 12C (June 7, 2017).

Photo 23: Brook Trout captured in Gold Brook using a backpack electrofisher (June 5, 2017).

Photo 24: American Eel captured in Gold Brook using a backpack electrofisher (June 5, 2017).

Photo 25: Banded Killifish captured in Gold Brook using a backpack electrofisher (June 5, 2017).

Appendix E

Stream Inventory Forms

DNR&E / DFO - NEW BRUNSWICK
STREAM HABITAT INVENTORY

River: Gold Brook
Personnel: Jennifer Hachey & Jenna McCoy (GEMTEC Limited)

Start Point: 45.202286ºN, -61.636866ºW
Date: June 7, 2017

End Point: 45.195121ºN, -61.635686ºW
GIS Map No. Figure 3

Drainage Code -
Drainage Name -

******Right and Left are looking DOWNSTREAM******

REACH NO.	UNIT NO.	STREAM TYPE	CHANNEL TYPE	LENGTH (m)	AVG WIDTH (m) WET	AVG WIDTH (m) BANK CHANNEL	SUBSTRATE (%) BED-ROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES	AVG DEPTH WET WIDTH (cm)	0 - 50% UNDERCUT BANK L	0 - 50% UNDERCUT BANK R	0 - 50% OVERHANGING VEGETATION L	0 - 50% OVERHANGING VEGETATION R	LARGE WOODY DEMRIS IN STREAM (m)	FLOWS TYPE	FLOWS (cm/s)	TIME (s)	TEMP (ºC) W	TEMP (ºC) A	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20%-35% 3: 35%-50% 4: >50%	COMMENTS
1	1	4	1	0	12.9	34	0	10	60	15	10	5	0	14	0	0	0	2	1	3	29.1	3.4	13.3	22	1	40, 47
1	2	4	1	100	3.5	3.5	0	30	20	30	15	5	0	24	0	0	5	5	0	3	29.3	3.4	13.4	22	1	-
1	3	8	1	200	3.6	4.2	0	40	10	5	5	5	35	29.7	0	0	2	2	0	3	14.6	6.9	13.8	22	1	-
1	4	8	1	300	11.5	12.1	0	20	20	20	5	5	30	26	0	0	2	2	6	3	14.7	6.8	14	22	2	-
1	5	8	1	400	8.2	17.3	0	20	50	5	0	0	25	19.3	0	0	1	1	0	3	17.4	5.8	14.5	22	2	-
1	6	8	1	500	19.7	28.4	0	15	40	10	0	5	30	13.7	0	0	3	0	0	3	18.5	5.4	15.2	22	2	-
1	7A	8	3	600	1.5	5.4	0	30	30	10	0	0	30	18	0	0	2	2	0	3	N/A	N/A	15.6	22	2	6
1	7B	4	3	600	6.6	8.6	0	50	30	10	0	5	5	24.3	0	0	5	5	0	3	25.7	3.9	17	22	1	6
1	7C	8	3	600	6	7.2	0	20	60	10	0	5	5	20	0	0	2	2	0	3	11.1	9.0	17.1	22	1	6
1	8A	8	3	700	3.9	8.9	0	10	60	5	0	0	25	11	0	0	5	5	0	3	N/A	N/A	20.7	22	1	6
1	8B	8	3	700	1.9	1.9	0	10	60	5	0	0	25	11	0	0	20	25	0	3	18.1	5.5	18.3	22	2	6

CHECKLIST OF LANDUSE ATTRIBUTES (COMMENTS)

2. INACTIVE BEAVER DAM
3. WOODY DEBRIS (OBSTRUCTION)
4. MAN-MADE DAM OBSTRUCTUION
5. ROCK DAM (SWIMMING POOL)
6. BRAIDED STREAM CHANNELS
7. OBSTRUCTION IN STREAM
8. ROAD FORD

POLLUTION CAUSED BY:

9. FOOD PROCESSING INDUSTRY
10. FOREST INDUSTRY
11. CAMPSITE OR RESIDENTIAL
12. MINING
13. LITTER
14. OIL
15. AGRICULTURE WASTE
16. HEALTH HAZARD
17. CLEAR CUT TO STREAM EDGE
18. SELECTIVE CUT
19. BUFFER STRIP PRESENT
20. CATTLE CROSSING
21. EROSION FROM AGRICULTURE
22. SUSPENDED SILT NOTED
23. UNUSUAL STREAM SCOURING
24. LARGE BEDLOAD DEPOSIT
25. BANK EROSION - MODERATE
26. BANK EROSION - EXCESSIVE
27. STREAM DREDGING/BULLDOZONG
28. GRAVEL REMOVAL
29. CHANNELIZATION (RIPRAP, ETC)
30. STREAM DIVERSION
31. WATER WITHDRAWAL
32. REGULATED STREAM FLOW
33. CAMP/COTTAGE PRESENT
34. RESIDENTIAL AREA
35. ACCESS - ATV'S
36. ACCESS - TRAILS
37. ACCESS - TRUCK/CAR
38. ACCESS - BOAT
39. ROAD CROSSING (BRIDGE)
40. ROAD CROSSING (CULVERT)
41. BOAT LANDING
42. ORGANIC LITTER
43. AQUATIC PLANTS ABUNDANT
44. GOOD SPAWNING
45. GOOD NURSERY
46. ATLANTIC SALMON OBSERVED
47. BROOK TROUT OBSERVED

STREAM TYPE

FASTWATER

1. Fall
2. Cascade
3. Riffle (GR/RB)
4. Riffle (R/B)
5. Riffle (Sand)
6. Sheet
7. Chute
8. Run
9. Rapid

POOLS

10. Midchannel
11. Convergenc
12. Lateral
13. Beaver
14. Trench
15. Plunge
16
17. Bogan
18. Eddy
19. Gabion
20. Log Structure
21. Road Crossing
22. Wood Debris
23. Man-Made Dam
24. Natural Deadwater

CHANNEL TYPE

1. Main (if measurement refers to main area of river)
*2. Side Channel (water diverted by islands)
*3. Split (if river is split into various different stream types)
*4. Bogan (backwater/narrow stretch of water)
*Specify Left (L), Right (R) or Middle (M)

SUBSTRATE (representing at least 25% of habitat type)

1. Bedrock, Ledge
2. Boulder = >461 mm
3. Rock = 180 - 460 mm
4. Rubble = 54 - 179 mm
5. Gravel = 2.6 - 53 mm
6. Sand = 0.06 - 2.5 mm
7. Fines = 0.0005 - 0.05 mm

FLOW TYPE

1. Survey
2. Spring
3. Brook / River Tributary
4. Spring Seep

POOL RATING (reverse side)

CRITERIA NO.	% OF POOLS IN SITE (LETTER)
POOL DEPTH ≥ 1.5m	a - > 30%
1 - Instream Cover ≥ 30%	b - > 10 to
2 - Instream Cover < 30%	c - < 10%
POOL DEPTH .5 - 1.5m	a - > 50%
3 - Instream Cover 5-30%	b - < 50%
4 - Instream Cover > 30%	

DNR&E / DFO - NEW BRUNSWICK

River: Gold Brook | Start Point: 45.202286ºN, -61.636866ºW | End Point: 45.195121ºN, -61.635686ºW | Drainage Code -

Personnel: Jennifer Hachey & Jenna McCoy | Date: June 7, 2017 | GIS Map No. Figure 3 | Drainage Name -

******Right and Left are looking DOWNSTREAM******

REACH NO.	SITE (50m - interval)	% SITE		SHADE (%)	STREAM BANKS										O_2 (mg/l)	pH	DEPTH						POOL RATING (CRITERIA ON OTHER SIDE)		POOL TAIL			% TURBULENCE
					VEGETATION (%)				EROSION (%)								1/4 (m)		1/2 (m)		3/4 (m)				EMBEDDEDNESS CRITERIA 1: ≤ 20% 2: 20% - 35% 3: 35% -50% 4: ≥ 50%	MEAN SUBSTRATE SIZE (cm)	% FINE	
		RIFFLE/ RUN	POOLS		BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0 - 50%) STABLE	LEFT BANK BARE STABLE	LEFT BANK ERODING	RIGHT BANK (0 - 5-%) STABLE	RIGHT BANK BARE STABLE	RIGHT BANK ERODING			Wet	CHANNEL	Wet	CHANNEL	Wet	CHANNEL	NO.	LETTER				
1	1	100	0	0	10	30	30	30	50	0	0	50	0	0	9.6	5.1	15	39	10	24	17	29	N/A	N/A	N/A	N/A	N/A	40
1	2	100	0	0	5	80	10	5	50	0	0	50	0	0	10.4	4.9	21	31	28	40	23	38	N/A	N/A	N/A	N/A	N/A	0
1	3	5	0	2	8	77	10	5	50	0	0	50	0	0	10.5	5	28	49	38	58	23	28	N/A	N/A	N/A	N/A	N/A	0
1	4	30	0	0	5	85	5	5	50	0	0	50	0	0	10.3	5	24	44	26	41	28	46	N/A	N/A	N/A	N/A	N/A	0
1	5	10	0	0	5	80	5	10	50	0	0	50	0	0	11.6	5	14	19	21	27	23	33	N/A	N/A	N/A	N/A	N/A	0
1	6	5	0	0	5	50	10	35	50	0	0	50	0	0	10.2	5	16	28	7	13	18	30	N/A	N/A	N/A	N/A	N/A	0
1	7A	5	0	0	3	87	5	5	50	0	0	50	0	0	10.4	5	17	27	16	24	21	27	N/A	N/A	N/A	N/A	N/A	0
1	7B	50	0	0	5	25	15	55	50	0	0	50	0	0	11	4.8	19	26	23	36	31	41	N/A	N/A	N/A	N/A	N/A	0
1	7C	10	0	0	10	45	10	35	50	0	0	50	0	0	10.2	4.9	14	21	24	30	22	30	N/A	N/A	N/A	N/A	N/A	0
1	8A	0	0	0	20	25	15	40	50	0	0	50	0	0	8.9	5	9	22	13	21	11	27	N/A	N/A	N/A	N/A	N/A	0
1	8B	100	0	40	5	45	0	50	25	25	0	50	0	0	10.3	5	10	13	15	18	8	13	N/A	N/A	N/A	N/A	N/A	10

REACH NO.	UNIT NO.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM/4		COEFFICIENT (0.9 - SMOOTH) (0.8 - ROUGH	LENGTH (m)	FLOAT TIME (sec)										COMMENTS (LOCATION)
											1/4 WAY			1/2 WAY			3/4 WAY			AVERAGE	
				1/4 WAY	1/2 WAY	3/4 WAY	CENTIMETERS	METERS (m)			T1	T2	T3	T1	T2	T3	T1	T2	T3		
1	1	4	12.9	15	10	17	14	0.14	0.9	1	-	-	-	2.76	3.93	3.61	-	-	-	3.43	Directly at outlet of Gold Brook Lake
1	2	4	3.5	21	28	23	24	0.24	0.9	1	-	-	-	3.47	3.28	3.48	-	-	-	3.41	~200m downstream of Gold Brook Lake
1	3	8	3.6	28	38	23	30	0.30	0.9	1	-	-	-	6.61	6.48	7.52	-	-	-	6.87	~300m downstream of Gold Brook Lake
1	4	8	11.5	24	26	28	26	0.26	0.9	1	-	-	-	6.28	7.32	6.80	-	-	-	6.80	~400m downstream of Gold Brook Lake
1	5	8	8.2	14	21	23	19	0.19	0.9	1	-	-	-	6.61	5.18	5.49	-	-	-	5.76	~500m downstream of Gold Brook Lake
1	6	8	19.7	16	7	18	14	0.14	0.9	1	-	-	-	5.18	4.58	6.43	-	-	-	5.40	~600m downstream of Gold Brook Lake
1	7A	8	1.5	17	16	21	18	0.18	0.9	1	-	-	-	N/A	N/A	N/A	-	-	-	N/A	~700m downstream of Gold Brook Lake
1	7B	4	6.6	19	23	31	24	0.24	0.9	1	-	-	-	4.58	4.39	2.69	-	-	-	3.89	~700m downstream of Gold Brook Lake
1	7C	8	6	14	24	22	20	0.20	0.9	1	-	-	-	7.27	7.67	10.06	-	-	-	8.33	~700m downstream of Gold Brook Lake
1	8A	8	3.9	9	13	11	11	0.11	0.9	1	-	-	-	N/A	N/A	N/A	-	-	-	N/A	~800m downstream of Gold Brook Lake
1	8B	8	1.9	10	15	8	11	0.11	0.9	1	-	-	-	6.53	4.64	5.43	-	-	-	5.53	~800m downstream of Gold Brook Lake

FORMULA (CMS) = W (m) x D (m) x A x L (m) / T (sec)

WHERE: W =width, D = depth, L = length, A is coefficient for the stream bottom

DNR&E / DFO - NEW BRUNSWICK
STREAM HABITAT INVENTORY

River: Gold Brook
Personnel: Jennifer Hachey & Jenna McCoy (GEMTEC Limited)

Start Point: 45.202286ºN, -61.636866ºW
Date: June 7, 2017

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GIS Map No. Figure 3

Drainage Code -
Drainage Name -

******Right and Left are looking DOWNSTREAM******

REACH NO.	UNIT NO.	STREAM TYPE	CHANNEL TYPE	LENGTH (m)	AVG WIDTH (m) WET	AVG WIDTH (m) BANK CHANNEL	SUBSTRATE (%) BED-ROCK	BOULDER	ROCK	RUBBLE	GRAVEL	SAND	FINES	AVG DEPTH WET WIDTH (cm)	0 - 50% UNDERCUT BANK L	0 - 50% UNDERCUT BANK R	0 - 50% OVERHANGING VEGETATION L	0 - 50% OVERHANGING VEGETATION R	LARGE WOODY DEMRIS IN STREAM (m)	FLOWS TYPE	FLOWS (cm/s)	TIME (s)	TEMP (ºC) W	TEMP (ºC) A	EMBEDDEDNESS (CRITERIA) 1: <20% 2: 20%-35% 3: 35%-50% 4: >50%	COMMENTS
1	8C	4	3	700	3.5	4.6	0	10	80	5	0	0	5	14.7	0	0	5	5	0	3	18.4	5.4	18.3	22	1	6
1	8D	4	3	700	5.1	7.6	0	10	75	5	0	0	10	19.3	0	0	0	2	1	3	N/A	N/A	18.3	22	1	6, 47
1	9	8	1	800	9.2	9.2	0	10	75	0	0	0	15	27	0	0	0	0	0	3	12.0	8.3	19	22	2	6
1	10A	8	2	900	5.5	14	0	10	70	5	0	0	15	17.7	0	0	1	1	0	3	16.9	5.9	20	22	2	6
1	10B	8	2	900	3.9	10.5	0	5	80	0	0	0	15	18.7	0	0	0	0	1	3	14.0	7.1	20.1	22	3	6
1	11A	8	3	1000	3.1	7.9	0	15	50	5	5	5	20	17.3	0	0	0	0	0	3	30.4	3.3	20.5	22	3	6
1	11B	8	3	1000	4.3	9.1	0	30	40	5	0	0	25	19.7	0	0	0	0	0	3	32.5	3.1	20.7	22	1	6
1	11C	8	3	1000	2.9	9.4	0	25	65	5	0	0	5	28	0	0	2	0	0	3	17.8	5.6	20.7	22	1	6
1	12A	8	3	1100	5.5	16.8	0	10	60	5	0	0	25	32	0	0	0	0	3	3	31.2	3.2	21	22	1	6
1	12B	8	3	1100	28	5.7	0	10	60	10	0	0	20	27.3	0	0	20	25	0	3	21.6	4.6	21.2	22	1	6
1	12C	8	3	1100	3.6	4.8	0	35	50	5	0	0	10	29.3	0	0	5	0	0	3	24.9	4.0	21	22	2	6

CHECKLIST OF LANDUSE ATTRIBUTES (COMMENTS)

1. ACTIVE BEAVER DAM
2. INACTIVE BEAVER DAM
3. WOODY DEBRIS (OBSTRUCTION)
4. MAN-MADE DAM OBSTRUCTUION
5. ROCK DAM (SWIMMING POOL)
6. BRAIDED STREAM CHANNELS
7. OBSTRUCTION IN STREAM
8. ROAD FORD

POLLUTION CAUSED BY:

9. FOOD PROCESSING INDUSTRY
10. FOREST INDUSTRY
11. CAMPSITE OR RESIDENTIAL
12. MINING
13. LITTER
14. OIL
15. AGRICULTURE WASTE
16. HEALTH HAZARD
17. CLEAR CUT TO STREAM EDGE
18. SELECTIVE CUT
19. BUFFER STRIP PRESENT
20. CATTLE CROSSING
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22. SUSPENDED SILT NOTED
23. UNUSUAL STREAM SCOURING
24. LARGE BEDLOAD DEPOSIT
25. BANK EROSION - MODERATE
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44. GOOD SPAWNING
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47. BROOK TROUT OBSERVED

STREAM TYPE

FASTWATER

1. Fall
2. Cascade
3. Riffle (GR/RB)
4. Riffle (R/B)
5. Riffle (Sand)
6. Sheet
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8. Run
9. Rapid
10. Midchannel
11. Convergenc
12. Lateral
13. Beaver
14. Trench
15. Plunge
16
17. Bogan

POOLS

18. Eddy
19. Gabion
20. Log Structure
21. Road Crossing
22. Wood Debris
23. Man-Made Dam
24. Natural Deadwater

CHANNEL TYPE

1. Main (if measurement refers to main area of river)
*2. Side Channel (water diverted by islands)
*3. Split (if river is split into various different stream types)
*4. Bogan (backwater/narrow stretch of water)
*Specify Left (L), Right (R) or Middle (M)

SUBSTRATE (representing at least 25% of habitat type)

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2. Boulder = >461 mm
3. Rock = 180 - 460 mm
4. Rubble = 54 - 179 mm
5. Gravel = 2.6 - 53 mm
6. Sand = 0.06 - 2.5 mm
7. Fines = 0.0005 - 0.05 mm

FLOW TYPE

1. Survey
2. Spring
3. Brook / River Tributary
4. Spring Seep

POOL RATING (reverse side)

CRITERIA NO.	% OF POOLS IN SITE (LETTER)
POOL DEPTH ≥ 1.5m	a - > 30%
1 - Instream Cover ≥ 30%	b - > 10 to
2 - Instream Cover < 30%	c - < 10%
POOL DEPTH .5 - 1.5m	a - > 50%
3 - Instream Cover 5-30%	b - < 50%
4 - Instream Cover > 30%	

DNR&E / DFO - NEW BRUNSWICK

River: Gold Brook
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GIS Map No. Figure 3

Drainage Code -
Drainage Name -

******Right and Left are looking DOWNSTREAM******

REACH NO.	SITE (50m - interval)	% SITE		SHADE (%)	STREAM BANKS										O_2 (mg/l)	pH	DEPTH						POOL RATING (CRITERIA ON OTHER SIDE)		POOL TAIL			% TURBULENCE
					VEGETATION (%)				EROSION (%)								1/4 (m)		1/2 (m)		3/4 (m)				EMBEDDEDNESS CRITERIA 1: ≤ 20% 2: 20% - 35% 3: 35% -50% 4: ≥ 50%	MEAN SUBSTRATE SIZE (cm)	% FINE	
		RIFFLE/ RUN	POOLS		BARE GROUND	GRASSES	SHRUBS	TREES	LEFT BANK (0 - 50%) STABLE	LEFT BANK (0 - 50%) BARE STABLE	LEFT BANK (0 - 50%) ERODING	RIGHT BANK (0 - 5-%) STABLE	RIGHT BANK (0 - 5-%) BARE STABLE	RIGHT BANK (0 - 5-%) ERODING			Wet	CHANNEL	Wet	CHANNEL	Wet	CHANNEL	NO.	LETTER				
1	8C	100	0	5	5	35	10	50	50	0	0	50	0	0	10.4	5	14	19	15	20	15	21	N/A	N/A	N/A	N/A	N/A	0
1	8D	100	0	0	0	20	40	40	50	0	0	50	0	0	9.8	5	18	27	19	30	21	33	N/A	N/A	N/A	N/A	N/A	10
1	9	5	0	0	30	50	10	10	50	0	0	40	10	0	10.1	5	21	23	28	30	32	33	N/A	N/A	N/A	N/A	N/A	0
1	10A	5	0	0	10	85	5	0	50	0	0	50	0	0	9.6	5	14	30	16	29	23	39	N/A	N/A	N/A	N/A	N/A	0
1	10B	50	0	0	15	25	50	10	50	0	0	50	0	0	7.9	5	22	33	17	24	17	28	N/A	N/A	N/A	N/A	N/A	0
1	11A	10	0	0	15	45	10	0	50	0	0	50	0	0	9.4	5.7	16	27	17	28	19	29	N/A	N/A	N/A	N/A	N/A	0
1	11B	10	0	0	20	55	5	20	50	0	0	50	0	0	9.2	5.2	19	31	22	29	18	25	N/A	N/A	N/A	N/A	N/A	0
1	11C	50	0	0	20	35	5	40	50	0	0	45	5	0	8.5	5	20	32	23	41	25	38	N/A	N/A	N/A	N/A	N/A	0
1	12A	30	0	0	20	45	5	30	50	0	0	50	0	0	8.6	5.7	33	52	34	50	29	42	N/A	N/A	N/A	N/A	N/A	0
1	12B	70	0	50	30	30	5	35	50	0	0	50	0	0	9.2	5.2	26	36	34	46	22	41	N/A	N/A	N/A	N/A	N/A	0
1	12C	20	0	0	15	50	5	30	50	0	0	25	25	0	8.3	5	31	39	27	35	30	34	N/A	N/A	N/A	N/A	N/A	5

REACH NO.	UNIT NO.	STREAM TYPE	WET WIDTH (m)	DEPTH (cm)			AVERAGE DEPTH SUM/4		COEFFICIENT (0.9 - SMOOTH) (0.8 - ROUGH	LENGTH (m)	FLOAT TIME (sec)										COMMENTS (LOCATION)
											1/4 WAY			1/2 WAY			3/4 WAY			AVERAGE	
				1/4 WAY	1/2 WAY	3/4 WAY	CENTIMETERS	METERS (m)			T1	T2	T3	T1	T2	T3	T1	T2	T3		
1	8C	4	3.5	14	15	15	15	0.15	0.9	1	-	-	-	6.53	4.64	5.1	-	-	-	5.42	~800m downstream of Gold Brook Lake
1	8D	4	5.1	18	19	21	19	0.19	0.9	1	-	-	-	N/A	N/A	N/A	-	-	-	N/A	~800m downstream of Gold Brook Lake
1	9	8	9.2	21	28	32	27	0.27	0.9	1	-	-	-	7.12	9.1	8.7	-	-	-	8.31	~900m downstream of Gold Brook Lake
1	10A	8	5.5	14	16	23	18	0.18	0.9	1	-	-	-	6.99	5.56	5.23	-	-	-	5.93	~1000m downstream of Gold Brook Lake
1	10B	8	3.9	22	17	17	19	0.19	0.9	1	-	-	-	8.76	6.08	6.55	-	-	-	7.13	~1000m downstream of Gold Brook Lake
1	11A	8	3.1	16	17	19	17	0.17	0.9	1	-	-	-	2.88	3.47	3.53	-	-	-	3.29	~1100m downstream of Gold Brook Lake
1	11B	8	4.3	19	22	18	20	0.20	0.9	1	-	-	-	3.08	3.01	3.14	-	-	-	3.08	~1100m downstream of Gold Brook Lake
1	11C	8	2.9	20	23	25	23	0.23	0.9	1	-	-	-	4.72	6.01	6.1	-	-	-	5.61	~1100m downstream of Gold Brook Lake
1	12A	8	5.5	33	34	29	32	0.32	0.9	1	-	-	-	3.01	3.33	3.27	-	-	-	3.20	~1200m downstream of Gold Brook Lake
1	12B	8	28	26	34	22	27	0.27	0.9	1	-	-	-	5.04	4.52	4.31	-	-	-	4.62	~1200m downstream of Gold Brook Lake
1	12C	8	3.6	31	27	30	29	0.29	0.9	1	-	-	-	4.06	3.74	4.26	-	-	-	4.02	~1200m downstream of Gold Brook Lake

FORMULA (CMS) = W (m) x D (m) x A x L (m) / T (sec)

WHERE: W =width, D = depth, L = length, A is coefficient for the stream bottom

Appendix F

ACCDC Information

DATA REPORT 5762: Goldboro, NS

Prepared 3 February 2017
by J. Churchill, Data Manager

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Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LIST

Included datasets:

Filename	Contents
GoldboroNS_5762ob.xls	All Rare and legally protected *Flora and Fauna* within 5 km of your study area
GoldboroNS_5762ob100km.xls	A list of Rare and legally protected *Flora and Fauna* within 100 km of your study area
GoldboroNS_5762ma.xls	All *Managed Areas* in your study area
GoldboroNS_5762ff.xls	Rare and common *Freshwater Fish* in your study area (DFO database)

1.2 RESTRICTIONS

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

1.3 ADDITIONAL INFORMATION

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries
Sean Blaney, Senior Scientist, Executive Director
Tel: (506) 364-2658
sblaney@mta.ca

Animals (Fauna)
John Klymko, Zoologist
Tel: (506) 364-2660
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Data Management, GIS
James Churchill, Data Manager
Tel: (902) 679-6146
jlchurchill@mta.ca

Billing
Jean Breau
Tel: (506) 364-2657
jrbreau@mta.ca

Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

Western: Duncan Bayne
(902) 648-3536
Duncan.Bayne@novascotia.ca

Western: Donald Sam
(902) 634-7525
Donald.Sam@novascotia.ca

Central: Shavonne Meyer
(902) 893-6353
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Central: Kimberly George
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Kimberly.George@novascotia.ca

Eastern: Mark Pulsifer
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Mark.Pulsifer@novascotia.ca

Eastern: Donald Anderson
(902) 295-3949
Donald.Anderson@novascotia.ca

Eastern: Terry Power
(902) 563-3370
Terrance.Power@novascotia.ca

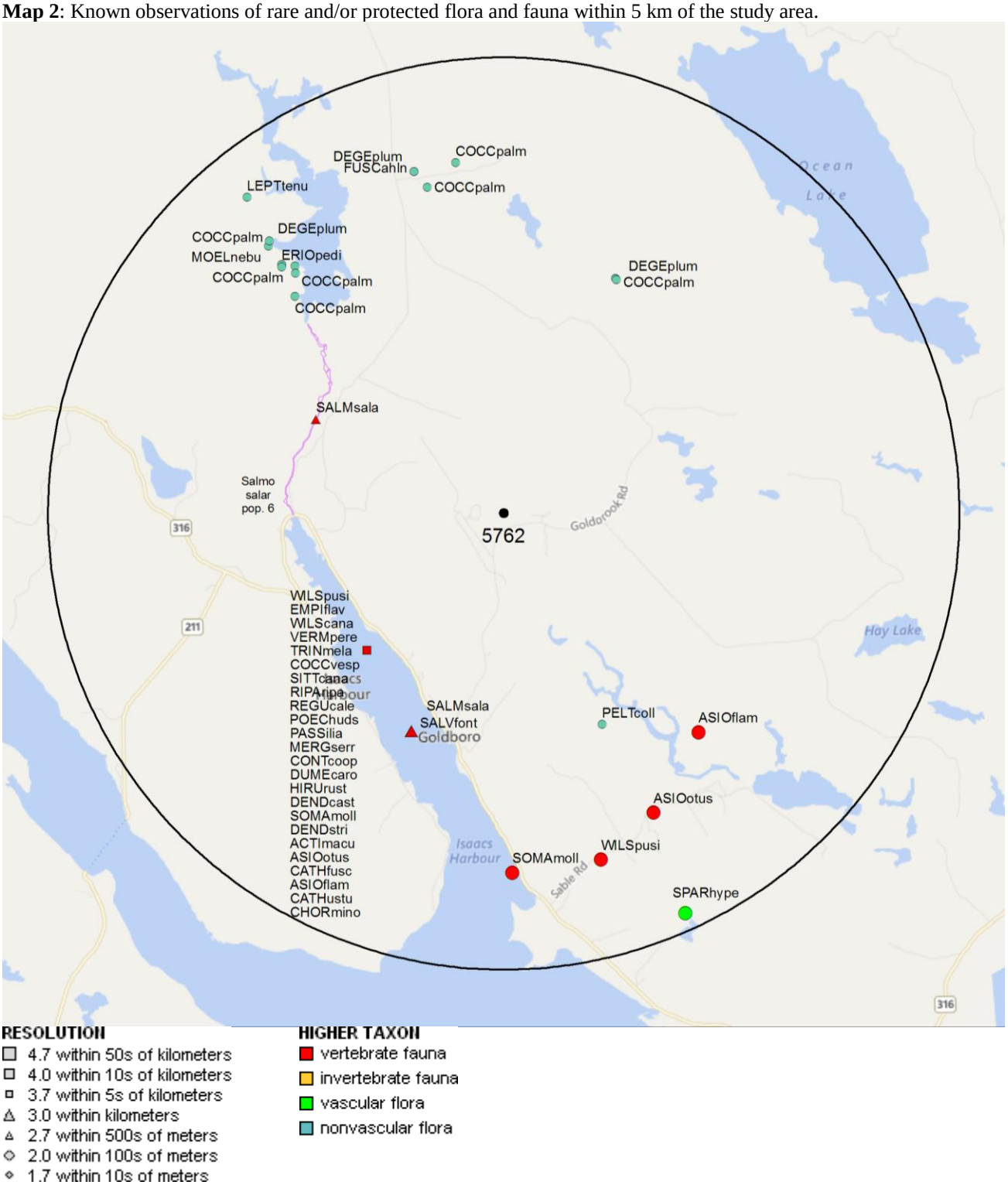
For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

2.1 FLORA
A 5 km buffer around the study area contains 1 record of 1 vascular, 21 records of 7 nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA
A 5 km buffer around the study area contains 37 records of 26 vertebrate, no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within 5 km of the study area.



3.0 SPECIAL AREAS

3.1 MANAGED AREAS
The GIS scan identified 2 managed areas in the vicinity of the study area (Map 3 and attached file: *ma*.xls)

3.2 SIGNIFICANT AREAS
The GIS scan identified no biologically significant sites in the vicinity of the study area (Map 3)

Map 3: Boundaries and/or locations of known Managed and Significant Areas within 5 km of the study area.

4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding “location-sensitive” species, section 4.3) within the 5 km-buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
N	*Erioderma pedicellatum (Atlantic pop.)*	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	3	3.6 ± 0.0
N	*Degelia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	3	2.9 ± 0.0
N	*Peltigera collina*	Tree Pelt Lichen				S2?	3 Sensitive	1	2.6 ± 0.0
N	*Leptogium tenuissimum*	Birdnest Jellyskin Lichen				S2S3	6 Not Assessed	1	4.5 ± 0.0
N	*Fuscopannaria ahlneri*	Corrugated Shingles Lichen				S3	4 Secure	1	3.9 ± 0.0
N	*Moelleropsis nebulosa*	Blue-gray Moss Shingle Lichen				S3	4 Secure	1	3.7 ± 0.0
N	*Coccocarpia palmicola*	Salted Shell Lichen				S3S4	4 Secure	11	2.8 ± 0.0
P	*Sparganium hyperboreum*	Northern Burreed				S1S2	3 Sensitive	1	4.8 ± 0.0

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	*Chordeiles minor*	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	1	2.1 ± 7.0
A	*Riparia riparia*	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	1	2.1 ± 7.0
A	*Hirundo rustica*	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	1	2.1 ± 7.0
A	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	1	2.1 ± 7.0
A	*Wilsonia canadensis*	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	1	2.1 ± 7.0
A	*Asio flammeus*	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	2	2.1 ± 7.0
A	*Salmo salar*	Atlantic Salmon				S1	2 May Be At Risk	2	2.3 ± 0.0
A	*Asio otus*	Long-eared Owl				S2S3	2 May Be At Risk	2	2.1 ± 7.0
A	*Poecile hudsonica*	Boreal Chickadee				S3	3 Sensitive	2	2.1 ± 7.0
A	*Sitta canadensis*	Red-breasted Nuthatch				S3	4 Secure	1	2.1 ± 7.0
A	*Salvelinus fontinalis*	Brook Trout				S3	3 Sensitive	1	2.6 ± 1.0
A	*Dumetella carolinensis*	Gray Catbird				S3B	2 May Be At Risk	1	2.1 ± 7.0
A	*Wilsonia pusilla*	Wilson's Warbler				S3B	3 Sensitive	2	2.1 ± 7.0
A	*Tringa melanoleuca*	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	1	2.1 ± 7.0
A	*Somateria mollissima*	Common Eider				S3S4	4 Secure	3	2.1 ± 7.0
A	*Actitis macularius*	Spotted Sandpiper				S3S4B	3 Sensitive	2	2.1 ± 7.0
A	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	1	2.1 ± 7.0
A	*Regulus calendula*	Ruby-crowned Kinglet				S3S4B	3 Sensitive	2	2.1 ± 7.0
A	*Catharus fuscescens*	Veery				S3S4B	4 Secure	1	2.1 ± 7.0
A	*Catharus ustulatus*	Swainson's Thrush				S3S4B	4 Secure	2	2.1 ± 7.0
A	*Vermivora peregrina*	Tennessee Warbler				S3S4B	3 Sensitive	1	2.1 ± 7.0
A	*Dendroica castanea*	Bay-breasted Warbler				S3S4B	3 Sensitive	2	2.1 ± 7.0
A	*Dendroica striata*	Blackpoll Warbler				S3S4B	3 Sensitive	1	2.1 ± 7.0
A	*Passerella iliaca*	Fox Sparrow				S3S4B	4 Secure	1	2.1 ± 7.0
A	*Coccothraustes vespertinus*	Evening Grosbeak				S3S4B,S3N	4 Secure	1	2.1 ± 7.0
A	*Mergus serrator*	Red-breasted Merganser				S3S4B,S5N	4 Secure	1	2.1 ± 7.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species "location sensitive". Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting a 5 km buffer of your study area are indicated below with "YES".

Nova Scotia

Scientific *Name*	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
Fraxinus nigra	Black Ash		Threatened	No
Emydoidea blandingii	*Blanding's Turtle - Nova Scotia pop.*	Endangered	Vulnerable	No
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
Bat Hibernaculum		[Endangered][1]	[Endangered][1]	No

1 *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NS Endangered Species Act.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
34	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
14	Cameron, R.P. 2011. Lichen observations, 2011. Nova Scotia Environment & Labour, 731 recs.
4	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
4	Neily, T.H. & Pepper, C.; Toms, B. 2013. Nova Scotia lichen location database. Mersey Tobeatic Research Institute, 1301 records.
2	Staff, DNR 2007. Restricted & Limited Use Land Database (RLUL).
1	Cameron, R.P. 2009. Erioderma pedicellatum database, 1979-2008. Dept Environment & Labour, 103 recs.
1	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
1	Neily, T.H. 2010. Erioderma Pedicellatum records 2005-09. Mersey Tobiatic Research Institute, 67 recs.
1	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 13059 records of 121 vertebrate and 363 records of 37 invertebrate fauna; 2792 records of 222 vascular, 607 records of 29 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	21	27.3 ± 0.0	NS
A	*Salmo salar pop. 1*	Atlantic Salmon - Inner Bay of Fundy pop.	Endangered	Endangered		S1	2 May Be At Risk	1	95.3 ± 0.0	NS
A	*Charadrius melodus melodus*	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	517	18.6 ± 7.0	NS
A	*Sterna dougallii*	Roseate Tern	Endangered	Endangered	Endangered	S1B	1 At Risk	61	10.8 ± 0.0	NS
A	*Calidris canutus rufa*	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	11	48.4 ± 0.0	NS
A	*Caprimulgus vociferus*	Whip-Poor-Will	Threatened	Threatened	Threatened	S1?B	1 At Risk	2	57.8 ± 7.0	NS
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	1	76.0 ± 7.0	NS
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	124	21.6 ± 10.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Anguilla rostrata*	American Eel	Threatened			S2	4 Secure	1	91.7 ± 0.0	NS
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	80	20.4 ± 7.0	NS
A	*Chordeiles minor*	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	173	2.1 ± 7.0	NS
A	*Riparia riparia*	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	156	2.1 ± 7.0	NS
A	*Hirundo rustica*	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	404	2.1 ± 7.0	NS
A	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	559	2.1 ± 7.0	NS
A	*Wilsonia canadensis*	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	318	2.1 ± 7.0	NS
A	*Dolichonyx oryzivorus*	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	188	16.3 ± 7.0	NS
A	*Sturnella magna*	Eastern Meadowlark	Threatened			SHB	3 Sensitive	2	24.8 ± 0.0	NS
A	*Hylocichla mustelina*	Wood Thrush	Threatened			SUB	5 Undetermined	8	12.0 ± 7.0	NS
A	*Passerculus sandwichensis princeps*	Savannah Sparrow princeps ssp	Special Concern	Special Concern		S1B	3 Sensitive	2	16.3 ± 7.0	NS
A	*Falco peregrinus pop. 1*	Peregrine Falcon - anatum/tundrius	Special Concern	Special Concern	Vulnerable	S1B,SNAM	3 Sensitive	2	51.9 ± 7.0	NS
A	*Bucephala islandica (Eastern pop.)*	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	1	94.8 ± 0.0	NS
A	*Asio flammeus*	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	4	2.1 ± 7.0	NS
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	165	17.8 ± 0.0	NS
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	33	36.0 ± 2.0	NS
A	*Morone saxatilis pop. 1*	Striped Bass- Southern Gulf of St Lawrence pop.	Special Concern			S2S3N	2 May Be At Risk	1	52.5 ± 1.0	NS
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Vulnerable	S3	3 Sensitive	12	33.7 ± 1.0	NS
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	215	11.6 ± 7.0	NS
A	*Tryngites subruficollis*	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	1	85.4 ± 0.0	NS
A	*Lynx canadensis*	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	6	68.1 ± 1.0	NS
A	*Accipiter cooperii*	Cooper's Hawk	Not At Risk			S1?B	5 Undetermined	2	97.5 ± 0.0	NS
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S2?B	5 Undetermined	5	30.7 ± 7.0	NS
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S3	4 Secure	11	14.5 ± 0.0	NS
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B	3 Sensitive	323	8.6 ± 7.0	NS
A	*Sialia sialis*	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	15	11.6 ± 7.0	NS
A	*Buteo lagopus*	Rough-legged Hawk	Not At Risk			S3N	4 Secure	2	25.7 ± 6.0	NS
A	*Accipiter gentilis*	Northern Goshawk	Not At Risk			S3S4	4 Secure	48	18.6 ± 7.0	NS
A	*Circus cyaneus*	Northern Harrier	Not At Risk			S3S4B	4 Secure	181	14.3 ± 7.0	NS
A	*Ammodramus nelsoni*	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	70	8.6 ± 7.0	NS
A	*Alces americanus*	Moose			Endangered	S1	1 At Risk	23	44.5 ± 1.0	NS
A	*Salmo salar*	Atlantic Salmon				S1	2 May Be At Risk	68	2.3 ± 0.0	NS
A	*Picoides dorsalis*	American Three-toed Woodpecker				S1?	5 Undetermined	4	21.8 ± 7.0	NS
A	*Passerina cyanea*	Indigo Bunting				S1?B	5 Undetermined	4	37.9 ± 0.0	NS
A	*Nycticorax nycticorax*	Black-crowned Night-heron				S1B	2 May Be At Risk	1	62.3 ± 7.0	NS
A	*Anas acuta*	Northern Pintail				S1B	2 May Be At Risk	2	38.1 ± 7.0	NS
A	*Oxyura jamaicensis*	Ruddy Duck				S1B	4 Secure	2	49.7 ± 7.0	NS
A	*Haematopus palliatus*	American Oystercatcher				S1B	5 Undetermined	7	51.9 ± 7.0	NS
A	*Myiarchus crinitus*	Great Crested Flycatcher				S1B	2 May Be At Risk	1	99.3 ± 7.0	NS
A	*Mimus polyglottos*	Northern Mockingbird				S1B	4 Secure	15	16.3 ± 7.0	NS
A	*Toxostoma rufum*	Brown Thrasher				S1B	5 Undetermined	4	47.7 ± 0.0	NS
A	*Vireo gilvus*	Warbling Vireo				S1B	5 Undetermined	5	53.1 ± 7.0	NS
A	*Dendroica pinus*	Pine Warbler				S1B	5 Undetermined	2	99.3 ± 7.0	NS
A	*Calidris minutilla*	Least Sandpiper				S1B,S3M	4 Secure	50	40.9 ± 0.0	NS
A	*Charadrius semipalmatus*	Semipalmated Plover				S1B,S3S4M	4 Secure	100	30.9 ± 0.0	NS
A	*Pluvialis dominica*	American Golden-Plover				S1S2M	3 Sensitive	10	53.9 ± 0.0	NS
A	*Limosa haemastica*	Hudsonian Godwit				S1S2M	3 Sensitive	4	53.9 ± 0.0	NS
A	*Vireo philadelphicus*	Philadelphia Vireo				S2?B	5 Undetermined	14	57.8 ± 7.0	NS
A	*Anas strepera*	Gadwall				S2B	2 May Be At Risk	2	48.7 ± 0.0	NS
A	*Empidonax traillii*	Willow Flycatcher				S2B	3 Sensitive	4	38.1 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Dendroica tigrina*	Cape May Warbler				S2B	3 Sensitive	67	11.6 ± 7.0	NS
A	*Piranga olivacea*	Scarlet Tanager				S2B	5 Undetermined	5	50.3 ± 7.0	NS
A	*Pooecetes gramineus*	Vesper Sparrow				S2B	2 May Be At Risk	6	21.8 ± 7.0	NS
A	*Molothrus ater*	Brown-headed Cowbird				S2B	4 Secure	28	20.4 ± 7.0	NS
A	*Bucephala clangula*	Common Goldeneye				S2B,S5N	4 Secure	103	7.1 ± 12.0	NS
A	*Branta bernicla*	Brant				S2M	3 Sensitive	1	36.3 ± 16.0	NS
A	*Phalacrocorax carbo*	Great Cormorant				S2S3	3 Sensitive	84	44.5 ± 7.0	NS
A	*Asio otus*	Long-eared Owl				S2S3	2 May Be At Risk	23	2.1 ± 7.0	NS
A	*Carduelis pinus*	Pine Siskin				S2S3	3 Sensitive	201	8.6 ± 7.0	NS
A	*Rallus limicola*	Virginia Rail				S2S3B	5 Undetermined	7	38.5 ± 7.0	NS
A	*Tringa semipalmata*	Willet				S2S3B	2 May Be At Risk	352	8.6 ± 7.0	NS
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	2 May Be At Risk	89	16.3 ± 7.0	NS
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S2S3B	3 Sensitive	158	8.6 ± 7.0	NS
A	*Icterus galbula*	Baltimore Oriole				S2S3B	2 May Be At Risk	20	36.5 ± 7.0	NS
A	*Pinicola enucleator*	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	71	12.0 ± 7.0	NS
A	*Numenius phaeopus hudsonicus*	Hudsonian Whimbrel				S2S3M	3 Sensitive	24	53.9 ± 0.0	NS
A	*Calidris melanotos*	Pectoral Sandpiper				S2S3M	4 Secure	12	58.6 ± 0.0	NS
A	*Perisoreus canadensis*	Gray Jay				S3	3 Sensitive	277	8.6 ± 7.0	NS
A	*Poecile hudsonica*	Boreal Chickadee				S3	3 Sensitive	494	2.1 ± 7.0	NS
A	*Sitta canadensis*	Red-breasted Nuthatch				S3	4 Secure	396	2.1 ± 7.0	NS
A	*Alosa pseudoharengus*	Alewife				S3	3 Sensitive	19	18.9 ± 1.0	NS
A	*Salvelinus fontinalis*	Brook Trout				S3	3 Sensitive	31	2.6 ± 1.0	NS
A	*Salvelinus namaycush*	Lake Trout				S3	3 Sensitive	1	80.4 ± 0.0	NS
A	*Calidris maritima*	Purple Sandpiper				S3?N	3 Sensitive	25	16.5 ± 13.0	NS
A	*Calcarius lapponicus*	Lapland Longspur				S3?N	4 Secure	1	79.9 ± 0.0	NS
A	*Falco sparverius*	American Kestrel				S3B	4 Secure	211	11.6 ± 7.0	NS
A	*Charadrius vociferus*	Killdeer				S3B	3 Sensitive	141	16.3 ± 7.0	NS
A	*Gallinago delicata*	Wilson's Snipe				S3B	3 Sensitive	224	8.6 ± 7.0	NS
A	*Sterna paradisaea*	Arctic Tern				S3B	2 May Be At Risk	84	8.6 ± 7.0	NS
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	2 May Be At Risk	43	21.8 ± 7.0	NS
A	*Tyrannus tyrannus*	Eastern Kingbird				S3B	3 Sensitive	70	16.3 ± 7.0	NS
A	*Dumetella carolinensis*	Gray Catbird				S3B	2 May Be At Risk	159	2.1 ± 7.0	NS
A	*Wilsonia pusilla*	Wilson's Warbler				S3B	3 Sensitive	58	2.1 ± 7.0	NS
A	*Tringa melanoleuca*	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	173	2.1 ± 7.0	NS
A	*Oceanodroma leucorhoa*	Leach's Storm-Petrel				S3B,S5M	4 Secure	58	13.9 ± 0.0	NS
A	*Fratercula arctica*	Atlantic Puffin				S3B,S5N	3 Sensitive	2	60.4 ± 7.0	NS
A	*Pluvialis squatarola*	Black-bellied Plover				S3M	4 Secure	76	38.0 ± 0.0	NS
A	*Tringa flavipes*	Lesser Yellowlegs				S3M	4 Secure	99	44.4 ± 0.0	NS
A	*Arenaria interpres*	Ruddy Turnstone				S3M	4 Secure	44	30.9 ± 0.0	NS
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	3 Sensitive	80	48.4 ± 0.0	NS
A	*Calidris fuscicollis*	White-rumped Sandpiper				S3M	4 Secure	17	58.6 ± 0.0	NS
A	*Limnodromus griseus*	Short-billed Dowitcher				S3M	4 Secure	27	58.6 ± 0.0	NS
A	*Calidris alba*	Sanderling				S3M,S2N	4 Secure	31	52.3 ± 0.0	NS
A	*Somateria mollissima*	Common Eider				S3S4	4 Secure	504	2.1 ± 7.0	NS
A	*Picoides arcticus*	Black-backed Woodpecker				S3S4	3 Sensitive	71	8.6 ± 7.0	NS
A	*Loxia curvirostra*	Red Crossbill				S3S4	4 Secure	51	18.6 ± 7.0	NS
A	*Botaurus lentiginosus*	American Bittern				S3S4B	3 Sensitive	139	20.2 ± 0.0	NS
A	*Anas discors*	Blue-winged Teal				S3S4B	2 May Be At Risk	61	18.6 ± 7.0	NS
A	*Actitis macularius*	Spotted Sandpiper				S3S4B	3 Sensitive	401	2.1 ± 7.0	NS
A	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	481	2.1 ± 7.0	NS
A	*Regulus calendula*	Ruby-crowned Kinglet				S3S4B	3 Sensitive	1140	2.1 ± 7.0	NS
A	*Catharus fuscescens*	Veery				S3S4B	4 Secure	203	2.1 ± 7.0	NS

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A	*Catharus ustulatus*	Swainson's Thrush				S3S4B	4 Secure	887	2.1 ± 7.0	NS
A	*Vermivora peregrina*	Tennessee Warbler				S3S4B	3 Sensitive	155	2.1 ± 7.0	NS
A	*Dendroica castanea*	Bay-breasted Warbler				S3S4B	3 Sensitive	279	2.1 ± 7.0	NS
A	*Dendroica striata*	Blackpoll Warbler				S3S4B	3 Sensitive	85	2.1 ± 7.0	NS
A	*Passerella iliaca*	Fox Sparrow				S3S4B	4 Secure	84	2.1 ± 7.0	NS
A	*Coccothraustes vespertinus*	Evening Grosbeak				S3S4B,S3N	4 Secure	227	2.1 ± 7.0	NS
A	*Mergus serrator*	Red-breasted Merganser				S3S4B,S5N	4 Secure	103	2.1 ± 7.0	NS
A	*Bucephala albeola*	Bufflehead				S3S4N	4 Secure	30	7.1 ± 12.0	NS
A	*Progne subis*	Purple Martin				SHB	2 May Be At Risk	3	33.6 ± 0.0	NS
A	*Eremophila alpestris*	Horned Lark				SHB,S4S5N	4 Secure	1	82.7 ± 7.0	NS
A	*Morus bassanus*	Northern Gannet				SHB,S5M	4 Secure	14	56.2 ± 16.0	NS
I	*Alasmidonta varicosa*	Brook Floater	Special Concern		Threatened	S1S2	3 Sensitive	8	20.8 ± 0.0	NS
I	*Danaus plexippus*	Monarch	Special Concern	Special Concern		S2B	3 Sensitive	19	13.4 ± 0.0	NS
I	*Satyrium acadica*	Acadian Hairstreak				S1	5 Undetermined	5	99.4 ± 1.0	NS
I	*Neurocordulia michaeli*	Broadtailed Shadowdragon				S1		26	26.6 ± 0.0	NS
I	*Lycaena dorcas*	Dorcas Copper				S1?	6 Not Assessed	7	82.7 ± 0.0	NS
I	*Strymon melinus*	Grey Hairstreak				S1S2	4 Secure	1	71.4 ± 0.0	NS
I	*Nymphalis l-album*	Compton Tortoiseshell				S1S2	4 Secure	1	86.0 ± 1.0	NS
I	*Haematopota rara*	Shy Cleg				S1S3	5 Undetermined	1	85.6 ± 0.0	NS
I	*Lycaena dospassosi*	Salt Marsh Copper				S2	1 At Risk	1	96.8 ± 0.0	NS
I	*Margaritifera margaritifera*	Eastern Pearlshell				S2	3 Sensitive	61	19.5 ± 0.0	NS
I	*Pantala hymenaea*	Spot-Winged Glider				S2?B	3 Sensitive	1	35.5 ± 1.0	NS
I	*Thorybes pylades*	Northern Cloudywing				S2S3	3 Sensitive	13	35.5 ± 0.0	NS
I	*Amblyscirtes hegon*	Pepper and Salt Skipper				S2S3	4 Secure	1	49.3 ± 0.0	NS
I	*Euphydryas phaeton*	Baltimore Checkerspot				S2S3	4 Secure	8	35.4 ± 0.0	NS
I	*Gomphus descriptus*	Harpoon Clubtail				S2S3	3 Sensitive	16	68.8 ± 0.0	NS
I	*Ophiogomphus aspersus*	Brook Snaketail				S2S3	2 May Be At Risk	5	68.8 ± 0.0	NS
I	*Ophiogomphus mainensis*	Maine Snaketail				S2S3	2 May Be At Risk	14	53.4 ± 0.0	NS
I	*Ophiogomphus rupinsulensis*	Rusty Snaketail				S2S3	2 May Be At Risk	37	26.6 ± 0.0	NS
I	*Alasmidonta undulata*	Triangle Floater				S2S3	4 Secure	7	33.2 ± 0.0	NS
I	*Callophrys henrici*	Henry's Elfin				S3	4 Secure	1	39.0 ± 0.0	NS
I	*Speyeria aphrodite*	Aphrodite Fritillary				S3	4 Secure	3	44.0 ± 100.0	NS
I	*Polygonia faunus*	Green Comma				S3	4 Secure	8	35.4 ± 0.0	NS
I	*Oeneis jutta*	Jutta Arctic				S3	2 May Be At Risk	3	39.0 ± 0.0	NS
I	*Aeshna clepsydra*	Mottled Darner				S3	4 Secure	3	45.8 ± 1.0	NS
I	*Aeshna constricta*	Lance-Tipped Darner				S3	4 Secure	1	98.8 ± 1.0	NS
I	*Boyeria grafiana*	Ocellated Darner				S3	3 Sensitive	7	26.8 ± 0.0	NS
I	*Gomphaeschna furcillata*	Harlequin Darner				S3	3 Sensitive	3	56.4 ± 0.0	NS
I	*Nannothemis bella*	Elfin Skimmer				S3	4 Secure	3	56.4 ± 0.0	NS
I	*Sympetrum danae*	Black Meadowhawk				S3	3 Sensitive	8	7.6 ± 0.0	NS
I	*Enallagma vernale*	Vernal Bluet				S3	5 Undetermined	4	63.8 ± 0.0	NS
I	*Amphiagrion saucium*	Eastern Red Damsel				S3	4 Secure	4	85.1 ± 0.0	NS
I	*Polygonia interrogationis*	Question Mark				S3B	4 Secure	21	30.2 ± 0.0	NS
I	*Erynnis juvenalis*	Juvenal's Duskywing				S3S4	4 Secure	1	50.4 ± 1.0	NS
I	*Amblyscirtes vialis*	Common Roadside-Skipper				S3S4	4 Secure	4	80.4 ± 2.0	NS
I	*Polygonia progne*	Grey Comma				S3S4	4 Secure	11	33.4 ± 0.0	NS
I	*Lanthus parvulus*	Northern Pygmy Clubtail				S3S4	4 Secure	30	26.6 ± 0.0	NS
I	*Lampsilis radiata*	Eastern Lampmussel				S3S4	3 Sensitive	16	27.7 ± 0.0	NS
N	*Erioderma pedicellatum (Atlantic*	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	S1	1 At Risk	335	3.6 ± 0.0	NS

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	pop.)									
N	*Erioderma mollissimum*	Graceful Felt Lichen	Endangered		Endangered	S1S2	2 May Be At Risk	1	97.2 ± 0.0	NS
N	*Peltigera hydrothyria*	Eastern Waterfan	Threatened			S1	2 May Be At Risk	1	50.1 ± 1.0	NS
N	*Sclerophora peronella (Nova Scotia pop.)*	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		5	47.2 ± 0.0	NS
N	*Degelia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	29	2.9 ± 0.0	NS
N	*Conardia compacta*	Coast Creeping Moss				S1?	3 Sensitive	1	99.5 ± 2.0	NS
N	*Lichina confinis*	Marine Seaweed Lichen				S1?	6 Not Assessed	1	88.9 ± 2.0	NS
N	*Cyrto-hypnum minutulum*	Tiny Cedar Moss				S1S2	3 Sensitive	1	76.5 ± 0.0	NS
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S2?	3 Sensitive	1	54.2 ± 3.0	NS
N	*Platydictya jungermannioides*	False Willow Moss				S2?	3 Sensitive	1	87.9 ± 0.0	NS
N	*Scorpidium scorpioides*	Hooked Scorpion Moss				S2?	3 Sensitive	1	83.6 ± 0.0	NS
N	*Leptogium teretiusculum*	Beaded Jellyskin Lichen				S2?	3 Sensitive	1	81.6 ± 0.0	NS
N	*Peltigera collina*	Tree Pelt Lichen				S2?	3 Sensitive	3	2.6 ± 0.0	NS
N	*Fuscopannaria leucosticta*	Rimmed Shingles Lichen				S2S3	2 May Be At Risk	3	67.1 ± 0.0	NS
N	*Leptogium tenuissimum*	Birdnest Jellyskin Lichen				S2S3	6 Not Assessed	1	4.5 ± 0.0	NS
N	*Usnea mutabilis*	Bloody Beard Lichen				S2S3	3 Sensitive	1	82.6 ± 0.0	NS
N	*Sticta fuliginosa*	Peppered Moon Lichen				S3	3 Sensitive	5	66.5 ± 0.0	NS
N	*Leptogium subtile*	Appressed Jellyskin Lichen				S3	3 Sensitive	1	65.0 ± 0.0	NS
N	*Fuscopannaria ahlneri*	Corrugated Shingles Lichen				S3	4 Secure	16	3.9 ± 0.0	NS
N	*Heterodermia speciosa*	Powdered Fringe Lichen				S3	4 Secure	2	30.3 ± 0.0	NS
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S3	3 Sensitive	7	45.4 ± 0.0	NS
N	*Nephroma bellum*	Naked Kidney Lichen				S3	3 Sensitive	1	98.9 ± 0.0	NS
N	*Moelleropsis nebulosa*	Blue-gray Moss Shingle Lichen				S3	4 Secure	18	3.7 ± 0.0	NS
N	*Dicranella varia*	a Moss				S3S4	5 Undetermined	1	98.6 ± 0.0	NS
N	*Encalypta procera*	Slender Extinguisher Moss				S3S4	4 Secure	2	55.6 ± 0.0	NS
N	*Schistidium agassizii*	Elf Bloom Moss				S3S4	4 Secure	1	26.8 ± 3.0	NS
N	*Leptogium saturninum*	Bearded Jellyskin Lichen				S3S4	5 Undetermined	1	81.6 ± 0.0	NS
N	*Coccocarpia palmicola*	Salted Shell Lichen				S3S4	4 Secure	161	2.8 ± 0.0	NS
N	*Heterodermia neglecta*	Fringe Lichen				S3S4	4 Secure	5	17.8 ± 0.0	NS
P	*Bartonia paniculata ssp. paniculata*	Branched Bartonia	Threatened	Threatened		SNA		1	91.5 ± 10.0	NS
P	*Juncus caesariensis*	New Jersey Rush	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	70	83.6 ± 0.0	NS
P	*Floerkea proserpinacoides*	False Mermaidweed	Not At Risk			S2	3 Sensitive	9	43.4 ± 1.0	NS
P	*Thuja occidentalis*	Eastern White Cedar			Vulnerable	S1	1 At Risk	2	13.7 ± 0.0	NS
P	*Sanicula odorata*	Clustered Sanicle				S1	2 May Be At Risk	2	94.6 ± 0.0	NS
P	*Zizia aurea*	Golden Alexanders				S1	2 May Be At Risk	19	31.6 ± 0.0	NS
P	*Arnica lonchophylla*	Northern Arnica				S1	2 May Be At Risk	1	68.6 ± 7.0	NS
P	*Bidens hyperborea*	Estuary Beggarticks				S1	2 May Be At Risk	1	53.9 ± 1.0	NS
P	*Ageratina altissima*	White Snakeroot				S1	2 May Be At Risk	2	53.1 ± 7.0	NS
P	*Barbarea orthoceras*	American Yellow Rocket				S1	2 May Be At Risk	12	54.0 ± 0.0	NS
P	*Cardamine pratensis var. angustifolia*	Cuckoo Flower				S1	2 May Be At Risk	1	80.7 ± 0.0	NS
P	*Cochlearia tridactylites*	Limestone Scurvy-grass				S1	2 May Be At Risk	12	28.9 ± 0.0	NS
P	*Stellaria crassifolia*	Fleshy Stitchwort				S1	2 May Be At Risk	1	88.6 ± 2.0	NS
P	*Suaeda maritima ssp. richii*	White Sea-blite				S1	5 Undetermined	4	27.6 ± 2.0	NS
P	*Hudsonia tomentosa*	Woolly Beach-heath				S1	2 May Be At Risk	6	50.9 ± 1.0	NS
P	*Desmodium canadense*	Canada Tick-trefoil				S1	2 May Be At Risk	10	87.5 ± 0.0	NS
P	*Polygonum viviparum*	Alpine Bistort				S1	2 May Be At Risk	1	77.4 ± 1.0	NS

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P	*Montia fontana*	Water Blinks				S1	2 May Be At Risk	2	50.9 ± 3.0	NS
P	*Agalinis paupercula var. borealis*	Small-flowered Agalinis				S1		1	94.8 ± 0.0	NS
P	*Scrophularia lanceolata*	Lance-leaved Figwort				S1	5 Undetermined	1	27.6 ± 1.0	NS
P	*Pilea pumila*	Dwarf Clearweed				S1	2 May Be At Risk	1	73.9 ± 6.0	NS
P	*Carex alopecoidea*	Foxtail Sedge				S1	2 May Be At Risk	2	49.3 ± 0.0	NS
P	*Carex granularis*	Limestone Meadow Sedge				S1	2 May Be At Risk	13	98.1 ± 0.0	NS
P	*Carex gynocrates*	Northern Bog Sedge				S1	2 May Be At Risk	9	85.2 ± 0.0	NS
P	*Carex haydenii*	Hayden's Sedge				S1	2 May Be At Risk	2	61.4 ± 5.0	NS
P	*Carex pellita*	Woolly Sedge				S1	2 May Be At Risk	7	87.6 ± 0.0	NS
P	*Carex plantaginea*	Plantain-Leaved Sedge				S1	2 May Be At Risk	1	96.4 ± 0.0	NS
P	*Carex tenuiflora*	Sparse-Flowered Sedge				S1	2 May Be At Risk	3	21.4 ± 1.0	NS
P	*Carex tincta*	Tinged Sedge				S1	2 May Be At Risk	1	49.3 ± 1.0	NS
P	*Carex viridula var. saxilittoralis*	Greenish Sedge				S1	2 May Be At Risk	4	90.6 ± 0.0	NS
P	*Carex viridula var. elatior*	Greenish Sedge				S1	2 May Be At Risk	8	85.1 ± 0.0	NS
P	*Carex grisea*	Inflated Narrow-leaved Sedge				S1	2 May Be At Risk	6	48.8 ± 0.0	NS
P	*Cyperus lupulinus ssp. macilentus*	Hop Flatsedge				S1	2 May Be At Risk	10	50.9 ± 1.0	NS
P	*Eleocharis erythropoda*	Red-stemmed Spikerush				S1	2 May Be At Risk	2	92.3 ± 0.0	NS
P	*Iris prismatica*	Slender Blue Flag				S1	2 May Be At Risk	2	32.6 ± 7.0	NS
P	*Malaxis brachypoda*	White Adder's-Mouth				S1	2 May Be At Risk	1	39.4 ± 7.0	NS
P	*Bromus latiglumis*	Broad-Glumed Brome				S1	2 May Be At Risk	15	61.1 ± 0.0	NS
P	*Elymus wiegandii*	Wiegand's Wild Rye				S1	2 May Be At Risk	7	64.1 ± 0.0	NS
P	*Elymus hystrix var. bigeloviana*	Spreading Wild Rye				S1	2 May Be At Risk	1	78.0 ± 1.0	NS
P	*Potamogeton nodosus*	Long-leaved Pondweed				S1	2 May Be At Risk	1	36.0 ± 5.0	NS
P	*Equisetum palustre*	Marsh Horsetail				S1	2 May Be At Risk	8	94.3 ± 0.0	NS
P	*Solidago hispida*	Hairy Goldenrod				S1?	2 May Be At Risk	1	71.5 ± 7.0	NS
P	*Crataegus robinsonii*	Robinson's Hawthorn				S1?	5 Undetermined	2	86.4 ± 50.0	NS
P	*Dichanthelium acuminatum var. lindheimeri*	Woolly Panic Grass				S1?	5 Undetermined	1	85.8 ± 0.0	NS
P	*Fraxinus nigra*	Black Ash			Threatened	S1S2	1 At Risk	47	40.3 ± 0.0	NS
P	*Rudbeckia laciniata*	Cut-Leaved Coneflower				S1S2	2 May Be At Risk	2	36.3 ± 0.0	NS
P	*Cornus suecica*	Swedish Bunchberry				S1S2	3 Sensitive	1	54.6 ± 6.0	NS
P	*Anemone virginiana var. alba*	Virginia Anemone				S1S2	3 Sensitive	6	95.4 ± 0.0	NS
P	*Parnassia palustris var. parviflora*	Marsh Grass-of-Parnassus				S1S2	2 May Be At Risk	9	74.1 ± 1.0	NS
P	*Carex livida var. radicaulis*	Livid Sedge				S1S2	2 May Be At Risk	22	78.0 ± 5.0	NS
P	*Juncus greenei*	Greene's Rush				S1S2	2 May Be At Risk	1	51.0 ± 1.0	NS
P	*Juncus alpinoarticulatus ssp. nodulosus*	Richardson's Rush				S1S2	2 May Be At Risk	8	52.0 ± 5.0	NS
P	*Platanthera huronensis*	Fragrant Green Orchid				S1S2	5 Undetermined	2	56.6 ± 10.0	NS
P	*Cinna arundinacea*	Sweet Wood Reed Grass				S1S2	2 May Be At Risk	24	61.1 ± 0.0	NS
P	*Sparganium hyperboreum*	Northern Burreed				S1S2	3 Sensitive	3	4.8 ± 0.0	NS
P	*Cryptogramma stelleri*	Steller's Rockbrake				S1S2	2 May Be At Risk	17	96.9 ± 0.0	NS
P	*Selaginella selaginoides*	Low Spikemoss				S1S2	2 May Be At Risk	2	81.7 ± 0.0	NS
P	*Carex vacillans*	Estuarine Sedge				S1S3	5 Undetermined	2	49.3 ± 0.0	NS
P	*Osmorhiza longistylis*	Smooth Sweet Cicely				S2	2 May Be At Risk	16	40.3 ± 0.0	NS

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P	*Erigeron philadelphicus*	Philadelphia Fleabane				S2	3 Sensitive	4	57.8 ± 7.0	NS
P	*Symphyotrichum ciliolatum*	Fringed Blue Aster				S2	3 Sensitive	2	36.5 ± 7.0	NS
P	*Impatiens pallida*	Pale Jewelweed				S2	3 Sensitive	7	28.4 ± 7.0	NS
P	*Caulophyllum thalictroides*	Blue Cohosh				S2	2 May Be At Risk	35	40.2 ± 0.0	NS
P	*Cardamine parviflora var. arenicola*	Small-flowered Bittercress				S2	3 Sensitive	2	94.6 ± 0.0	NS
P	*Draba arabisans*	Rock Whitlow-Grass				S2	3 Sensitive	3	97.6 ± 1.0	NS
P	*Lobelia kalmii*	Brook Lobelia				S2	2 May Be At Risk	48	77.0 ± 0.0	NS
P	*Stellaria humifusa*	Saltmarsh Starwort				S2	3 Sensitive	4	35.7 ± 0.0	NS
P	*Stellaria longifolia*	Long-leaved Starwort				S2	3 Sensitive	1	64.4 ± 0.0	NS
P	*Chenopodium rubrum*	Red Pigweed				S2	2 May Be At Risk	5	62.3 ± 7.0	NS
P	*Crassula aquatica*	Water Pygmyweed				S2	3 Sensitive	2	76.0 ± 7.0	NS
P	*Myriophyllum farwellii*	Farwell's Water Milfoil				S2	3 Sensitive	4	22.9 ± 0.0	NS
P	*Utricularia resupinata*	Inverted Bladderwort				S2	3 Sensitive	1	99.6 ± 0.0	NS
P	*Rumex salicifolius var. mexicanus*	Triangular-valve Dock				S2	3 Sensitive	4	60.8 ± 6.0	NS
P	*Anemone canadensis*	Canada Anemone				S2	2 May Be At Risk	2	53.5 ± 3.0	NS
P	*Anemone quinquefolia*	Wood Anemone				S2	3 Sensitive	3	26.9 ± 0.0	NS
P	*Anemone virginiana*	Virginia Anemone				S2	3 Sensitive	24	49.7 ± 0.0	NS
P	*Caltha palustris*	Yellow Marsh Marigold				S2	3 Sensitive	2	81.0 ± 0.0	NS
P	*Galium labradoricum*	Labrador Bedstraw				S2	3 Sensitive	25	80.8 ± 0.0	NS
P	*Salix pedicellaris*	Bog Willow				S2	3 Sensitive	6	82.1 ± 0.0	NS
P	*Comandra umbellata*	Bastard's Toadflax				S2	2 May Be At Risk	10	50.1 ± 0.0	NS
P	*Saxifraga paniculata ssp. neogaea*	White Mountain Saxifrage				S2	3 Sensitive	1	93.0 ± 7.0	NS
P	*Tiarella cordifolia*	Heart-leaved Foamflower				S2	3 Sensitive	1	83.6 ± 7.0	NS
P	*Viola nephrophylla*	Northern Bog Violet				S2	3 Sensitive	6	65.7 ± 0.0	NS
P	*Carex atratiformis*	Scabrous Black Sedge				S2	3 Sensitive	2	96.5 ± 7.0	NS
P	*Carex bebbii*	Bebb's Sedge				S2	3 Sensitive	9	44.1 ± 10.0	NS
P	*Carex castanea*	Chestnut Sedge				S2	2 May Be At Risk	15	80.8 ± 0.0	NS
P	*Carex hystericina*	Porcupine Sedge				S2	2 May Be At Risk	29	49.7 ± 0.0	NS
P	*Carex tenera*	Tender Sedge				S2	3 Sensitive	3	50.0 ± 1.0	NS
P	*Eleocharis quinqueflora*	Few-flowered Spikerush				S2	3 Sensitive	10	84.7 ± 0.0	NS
P	*Juncus stygius ssp. americanus*	Moor Rush				S2	3 Sensitive	26	81.6 ± 1.0	NS
P	*Allium schoenoprasum var. sibiricum*	Wild Chives				S2	2 May Be At Risk	1	61.9 ± 7.0	NS
P	*Lilium canadense*	Canada Lily				S2	2 May Be At Risk	45	26.6 ± 1.0	NS
P	*Cypripedium parviflorum var. pubescens*	Yellow Lady's-slipper				S2	3 Sensitive	5	50.5 ± 0.0	NS
P	*Cypripedium parviflorum var. makasin*	Small Yellow Lady's-Slipper				S2	3 Sensitive	1	99.1 ± 0.0	NS
P	*Cypripedium reginae*	Showy Lady's-Slipper				S2	2 May Be At Risk	101	52.9 ± 0.0	NS
P	*Spiranthes lucida*	Shining Ladies'-Tresses				S2	2 May Be At Risk	30	87.0 ± 0.0	NS
P	*Dichanthelium linearifolium*	Narrow-leaved Panic Grass				S2	3 Sensitive	1	90.1 ± 7.0	NS
P	*Potamogeton friesii*	Fries' Pondweed				S2	2 May Be At Risk	5	65.1 ± 0.0	NS
P	*Potamogeton richardsonii*	Richardson's Pondweed				S2	2 May Be At Risk	6	33.1 ± 0.0	NS
P	*Cystopteris laurentiana*	Laurentian Bladder Fern				S2	2 May Be At Risk	5	96.5 ± 10.0	NS
P	*Dryopteris fragrans*	Fragrant Wood Fern				S2	3 Sensitive	1	42.7 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
	var. remotiuscula									
P	*Polystichum lonchitis*	Northern Holly Fern				S2	3 Sensitive	5	78.6 ± 5.0	NS
P	*Woodsia glabella*	Smooth Cliff Fern				S2	3 Sensitive	2	96.5 ± 7.0	NS
P	*Symphyotrichum boreale*	Boreal Aster				S2?	3 Sensitive	35	83.9 ± 0.0	NS
P	*Cuscuta cephalanthi*	Buttonbush Dodder				S2?	5 Undetermined	5	49.8 ± 7.0	NS
P	*Epilobium coloratum*	Purple-veined Willowherb				S2?	3 Sensitive	3	55.8 ± 0.0	NS
P	*Crataegus submollis*	Quebec Hawthorn				S2?	5 Undetermined	2	63.8 ± 7.0	NS
P	*Eleocharis ovata*	Ovate Spikerush				S2?	3 Sensitive	1	16.7 ± 0.0	NS
P	*Scirpus pedicellatus*	Stalked Bulrush				S2?	3 Sensitive	4	55.1 ± 0.0	NS
P	*Senecio pseudoarnica*	Seabeach Ragwort				S2S3	3 Sensitive	17	14.1 ± 0.0	NS
P	*Betula michauxii*	Michaux's Dwarf Birch				S2S3	3 Sensitive	12	8.6 ± 0.0	NS
P	*Sagina nodosa*	Knotted Pearlwort				S2S3	4 Secure	7	36.0 ± 1.0	NS
P	*Sagina nodosa ssp. borealis*	Knotted Pearlwort				S2S3	4 Secure	2	89.3 ± 0.0	NS
P	*Hypericum dissimulatum*	Disguised St John's-wort				S2S3	3 Sensitive	1	20.2 ± 1.0	NS
P	*Triosteum aurantiacum*	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	109	40.2 ± 0.0	NS
P	*Shepherdia canadensis*	Soapberry				S2S3	3 Sensitive	6	94.0 ± 0.0	NS
P	*Empetrum eamesii ssp. atropurpureum*	Pink Crowberry				S2S3	3 Sensitive	1	52.9 ± 3.0	NS
P	*Chamaesyce polygonifolia*	Seaside Spurge				S2S3	3 Sensitive	9	52.9 ± 0.0	NS
P	*Halenia deflexa*	Spurred Gentian				S2S3	3 Sensitive	23	28.7 ± 1.0	NS
P	*Hedeoma pulegioides*	American False Pennyroyal				S2S3	3 Sensitive	2	72.9 ± 5.0	NS
P	*Polygonum buxiforme*	Small's Knotweed				S2S3	5 Undetermined	1	89.9 ± 0.0	NS
P	*Polygonum raii*	Sharp-fruited Knotweed				S2S3	5 Undetermined	4	22.1 ± 1.0	NS
P	*Amelanchier fernaldii*	Fernald's Serviceberry				S2S3	5 Undetermined	1	21.9 ± 1.0	NS
P	*Potentilla canadensis*	Canada Cinquefoil				S2S3	3 Sensitive	1	52.3 ± 2.0	NS
P	*Galium aparine*	Common Bedstraw				S2S3	3 Sensitive	15	49.5 ± 0.0	NS
P	*Salix pellita*	Satiny Willow				S2S3	3 Sensitive	1	47.1 ± 1.0	NS
P	*Veronica serpyllifolia ssp. humifusa*	Thyme-Leaved Speedwell				S2S3	3 Sensitive	1	55.0 ± 0.0	NS
P	*Carex adusta*	Lesser Brown Sedge				S2S3	3 Sensitive	1	41.2 ± 5.0	NS
P	*Carex hirtifolia*	Pubescent Sedge				S2S3	3 Sensitive	20	40.3 ± 0.0	NS
P	*Eleocharis olivacea*	Yellow Spikerush				S2S3	3 Sensitive	3	44.3 ± 0.0	NS
P	*Eriophorum gracile*	Slender Cottongrass				S2S3	3 Sensitive	8	7.4 ± 1.0	NS
P	*Cypripedium parviflorum*	Yellow Lady's-slipper				S2S3	3 Sensitive	44	49.7 ± 0.0	NS
P	*Poa glauca*	Glaucous Blue Grass				S2S3	3 Sensitive	8	96.9 ± 0.0	NS
P	*Stuckenia filiformis*	Thread-leaved Pondweed				S2S3	3 Sensitive	1	98.6 ± 0.0	NS
P	*Stuckenia filiformis ssp. alpina*	Thread-leaved Pondweed				S2S3	3 Sensitive	7	60.8 ± 0.0	NS
P	*Botrychium lanceolatum var. angustisegmentum*	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	4	79.1 ± 0.0	NS
P	*Botrychium simplex*	Least Moonwort				S2S3	3 Sensitive	3	75.1 ± 1.0	NS
P	*Angelica atropurpurea*	Purple-stemmed Angelica				S3	4 Secure	12	60.2 ± 0.0	NS
P	*Erigeron hyssopifolius*	Hyssop-leaved Fleabane				S3	3 Sensitive	9	49.7 ± 0.0	NS
P	*Megalodonta beckii*	Water Beggarticks				S3	4 Secure	5	43.5 ± 0.0	NS
P	*Packera paupercula*	Balsam Groundsel				S3	4 Secure	47	49.7 ± 0.0	NS
P	*Campanula aparinoides*	Marsh Bellflower				S3	3 Sensitive	9	34.4 ± 0.0	NS
P	*Vaccinium boreale*	Northern Blueberry				S3	3 Sensitive	5	21.9 ± 2.0	NS
P	*Vaccinium caespitosum*	Dwarf Bilberry				S3	4 Secure	45	26.5 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	*Bartonia virginica*	Yellow Bartonia				S3	4 Secure	1	78.8 ± 0.0	NS
P	*Proserpinaca palustris*	Marsh Mermaidweed				S3	4 Secure	15	61.1 ± 0.0	NS
P	*Proserpinaca palustris var. crebra*	Marsh Mermaidweed				S3	4 Secure	9	61.1 ± 0.0	NS
P	*Proserpinaca pectinata*	Comb-leaved Mermaidweed				S3	4 Secure	2	87.2 ± 1.0	NS
P	*Teucrium canadense*	Canada Germander				S3	3 Sensitive	33	46.7 ± 0.0	NS
P	*Decodon verticillatus*	Swamp Loosestrife				S3	4 Secure	1	82.7 ± 7.0	NS
P	*Epilobium strictum*	Downy Willowherb				S3	3 Sensitive	5	36.3 ± 0.0	NS
P	*Polygala sanguinea*	Blood Milkwort				S3	3 Sensitive	2	89.6 ± 1.0	NS
P	*Polygonum pensylvanicum*	Pennsylvania Smartweed				S3	4 Secure	14	48.9 ± 0.0	NS
P	*Polygonum scandens*	Climbing False Buckwheat				S3	3 Sensitive	26	28.6 ± 0.0	NS
P	*Plantago rugelii*	Rugel's Plantain				S3	4 Secure	1	94.7 ± 0.0	NS
P	*Samolus valerandi ssp. parviflorus*	Seaside Brookweed				S3	3 Sensitive	7	49.0 ± 0.0	NS
P	*Pyrola asarifolia*	Pink Pyrola				S3	4 Secure	3	83.9 ± 0.0	NS
P	*Pyrola minor*	Lesser Pyrola				S3	3 Sensitive	1	97.1 ± 2.0	NS
P	*Ranunculus gmelinii*	Gmelin's Water Buttercup				S3	4 Secure	36	32.4 ± 2.0	NS
P	*Rhamnus alnifolia*	Alder-leaved Buckthorn				S3	4 Secure	221	61.3 ± 0.0	NS
P	*Agrimonia gryposepala*	Hooked Agrimony				S3	4 Secure	154	40.2 ± 0.0	NS
P	*Amelanchier stolonifera*	Running Serviceberry				S3	4 Secure	2	41.6 ± 5.0	NS
P	*Galium kamtschaticum*	Northern Wild Licorice				S3	4 Secure	1	99.5 ± 1.0	NS
P	*Geocaulon lividum*	Northern Comandra				S3	4 Secure	4	47.6 ± 2.0	NS
P	*Limosella australis*	Southern Mudwort				S3	4 Secure	3	82.2 ± 5.0	NS
P	*Lindernia dubia*	Yellow-seeded False Pimperel				S3	4 Secure	9	63.9 ± 0.0	NS
P	*Laportea canadensis*	Canada Wood Nettle				S3	3 Sensitive	15	40.1 ± 3.0	NS
P	*Verbena hastata*	Blue Vervain				S3	4 Secure	35	40.2 ± 0.0	NS
P	*Carex cryptolepis*	Hidden-scaled Sedge				S3	4 Secure	7	45.5 ± 1.0	NS
P	*Carex eburnea*	Bristle-leaved Sedge				S3	3 Sensitive	23	54.1 ± 5.0	NS
P	*Carex lupulina*	Hop Sedge				S3	4 Secure	9	49.1 ± 6.0	NS
P	*Carex rosea*	Rosy Sedge				S3	4 Secure	4	34.5 ± 4.0	NS
P	*Carex tribuloides*	Blunt Broom Sedge				S3	4 Secure	6	31.9 ± 5.0	NS
P	*Carex wiegandii*	Wiegand's Sedge				S3	3 Sensitive	1	80.5 ± 0.0	NS
P	*Carex foenea*	Fernald's Hay Sedge				S3	4 Secure	1	68.7 ± 0.0	NS
P	*Juncus subcaudatus var. planisepalus*	Woods-Rush				S3	3 Sensitive	3	70.6 ± 5.0	NS
P	*Juncus dudleyi*	Dudley's Rush				S3	4 Secure	80	30.7 ± 0.0	NS
P	*Goodyera repens*	Lesser Rattlesnake-plantain				S3	3 Sensitive	7	65.7 ± 0.0	NS
P	*Listera australis*	Southern Twayblade				S3	4 Secure	36	10.5 ± 0.0	NS
P	*Platanthera grandiflora*	Large Purple Fringed Orchid				S3	4 Secure	31	18.6 ± 10.0	NS
P	*Platanthera hookeri*	Hooker's Orchid				S3	4 Secure	3	46.5 ± 0.0	NS
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3	4 Secure	1	82.7 ± 5.0	NS
P	*Alopecurus aequalis*	Short-awned Foxtail				S3	4 Secure	5	55.5 ± 1.0	NS
P	*Dichanthelium clandestinum*	Deer-tongue Panic Grass				S3	4 Secure	79	26.7 ± 0.0	NS
P	*Potamogeton obtusifolius*	Blunt-leaved Pondweed				S3	4 Secure	10	44.4 ± 1.0	NS
P	*Potamogeton praelongus*	White-stemmed Pondweed				S3	3 Sensitive	9	28.4 ± 10.0	NS
P	*Potamogeton zosteriformis*	Flat-stemmed Pondweed				S3	3 Sensitive	1	96.8 ± 7.0	NS
P	*Sparganium natans*	Small Burreed				S3	4 Secure	5	25.3 ± 0.0	NS
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S3	4 Secure	3	46.5 ± 0.0	NS
P	*Asplenium trichomanes-ramosum*	Green Spleenwort				S3	3 Sensitive	19	62.1 ± 0.0	NS
P	*Equisetum pratense*	Meadow Horsetail				S3	3 Sensitive	7	79.1 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	*Equisetum variegatum*	Variegated Horsetail				S3	4 Secure	37	58.2 ± 0.0	NS
P	*Isoetes acadiensis*	Acadian Quillwort				S3	3 Sensitive	1	37.6 ± 1.0	NS
P	*Lycopodium sitchense*	Sitka Clubmoss				S3	4 Secure	3	34.6 ± 1.0	NS
P	*Huperzia appalachiana*	Appalachian Fir-Clubmoss				S3	3 Sensitive	1	92.6 ± 1.0	NS
P	*Botrychium dissectum*	Cut-leaved Moonwort				S3	4 Secure	3	48.5 ± 1.0	NS
P	*Polypodium appalachianum*	Appalachian Polypody				S3	5 Undetermined	1	91.0 ± 0.0	NS
P	*Asclepias incarnata ssp. pulchra*	Swamp Milkweed				S3?	5 Undetermined	8	81.3 ± 0.0	NS
P	*Lycopodium sabinifolium*	Ground-Fir				S3?	4 Secure	3	57.3 ± 5.0	NS
P	*Suaeda calceoliformis*	Horned Sea-blite				S3S4	4 Secure	4	89.1 ± 0.0	NS
P	*Myriophyllum sibiricum*	Siberian Water Milfoil				S3S4	4 Secure	2	53.4 ± 0.0	NS
P	*Nuphar lutea ssp. pumila*	Small Yellow Pond-lily				S3S4	4 Secure	1	95.2 ± 2.0	NS
P	*Sanguinaria canadensis*	Bloodroot				S3S4	4 Secure	105	39.3 ± 5.0	NS
P	*Polygonum fowleri*	Fowler's Knotweed				S3S4	4 Secure	3	53.6 ± 0.0	NS
P	*Rumex maritimus*	Sea-Side Dock				S3S4		4	88.7 ± 0.0	NS
P	*Rumex maritimus var. fueginus*	Tierra del Fuego Dock				S3S4	4 Secure	5	88.0 ± 0.0	NS
P	*Fragaria vesca ssp. americana*	Woodland Strawberry				S3S4	4 Secure	18	55.6 ± 0.0	NS
P	*Salix petiolaris*	Meadow Willow				S3S4	4 Secure	4	82.1 ± 0.0	NS
P	*Eriophorum russeolum*	Russet Cottongrass				S3S4	4 Secure	7	46.5 ± 5.0	NS
P	*Triglochin gaspensis*	Gasp├─ Arrowgrass				S3S4	5 Undetermined	23	54.2 ± 0.0	NS
P	*Juncus acuminatus*	Sharp-Fruit Rush				S3S4	4 Secure	2	94.6 ± 0.0	NS
P	*Luzula parviflora*	Small-flowered Woodrush				S3S4	4 Secure	2	45.5 ± 0.0	NS
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	4 Secure	7	60.0 ± 1.0	NS
P	*Panicum tuckermanii*	Tuckerman's Panic Grass				S3S4	4 Secure	1	77.2 ± 0.0	NS
P	*Trisetum spicatum*	Narrow False Oats				S3S4	4 Secure	1	87.6 ± 0.0	NS
P	*Cystopteris bulbifera*	Bulblet Bladder Fern				S3S4	4 Secure	106	46.6 ± 1.0	NS
P	*Equisetum hyemale var. affine*	Common Scouring-rush				S3S4	4 Secure	11	50.4 ± 0.0	NS
P	*Equisetum scirpoides*	Dwarf Scouring-Rush				S3S4	4 Secure	39	79.5 ± 0.0	NS
P	*Lycopodium complanatum*	Northern Clubmoss				S3S4	4 Secure	3	82.7 ± 5.0	NS
P	*Schizaea pusilla*	Little Curlygrass Fern				S3S4	4 Secure	8	8.3 ± 0.0	NS
P	*Solidago simplex var. randii*	Sticky Goldenrod				SH	0.1 Extirpated	2	23.5 ± 5.0	NS
P	*Viola canadensis*	Canada Violet				SH	0.1 Extirpated	1	97.3 ± 0.0	NS

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The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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TABLE F1: SPECIES RANKING

Common Name	Scientific Name	Global Rarity Rank (IUCN)	Global Rarity Rank (CDC / Nature Serve) (GRANK)	National (COSEWIC) (NPROT)	National (SARA) (NPROTSAR)	Nova Scotia (SPROT)	Sub-national Rarity Rating (SRANK)	Sub-national Sub-group Rarity Rating (SGSRANK)	Survey Site
Flora									
Northern Burreed	*Sparganium hyperboreum*	-	G5	-	-	-	S1S2	3 Sensitive	Crane Lake
Boreal Felt Lichen - Atlantic pop.	*Erioderma pedicellatum (Atlantic pop.)*	CR A2c+4c	G1G2Q	Endangered	Endangered	Endangered	S1	1 At Risk	Meadow Lake
Salted Shell Lichen	*Coccocarpia palmicola*	-	G5	-	-	-	S3S4	4 Secure	Meadow Lake
Blue Felt Lichen	*Degelia plumbea*	-	GNR	Special Concern	Special Concern	Vulnerable	S3	4 Secure	Meadow Lake
Corrugated Shingles Lichen	*Fuscopannaria ahlneri*	-	G4G5	-	-	-	S3	4 Secure	Meadow Lake
Birdnest Jellyskin Lichen	*Leptogium tenuissimum*	-	GNR	-	-	-	S2S3	6 Not Assessed	Meadow Lake
Blue-gray Moss Shingle Lichen	*Moelleropsis nebulosa*	-		-	-	-	S3	4 Secure	Meadow Lake
Tree Pelt Lichen	*Peltigera collina*	-	G3G4	-	-	-	S2?	3 Sensitive	Goldboro
Fauna									
Altantic Salmon - Nova Scotia Southern Upland pop.	*Salmo salar pop. 6*	-	G5TNR	Endangered	-	-	S2	-	Isaacs Harbour River
Atlantic Salmon	*Salmo salar*	Least Concern	G5	-	-	-	S1	2 May Be At Risk	Isaacs Harbour & Isaacs Harbour River
Brook Trout	*Salvelinus fontinalis*	-	G5	-	-	-	S3	3 Sensitive	Isaacs Harbour
Spotted Sandpiper	*Actitis macularius*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Swainson's Thrush	*Catharus ustulatus*	Least Concern	G5	-	-	-	S3S4B	4 Secure	Isaac's Harbour MBBA square
Common Eider	*Somateria mollissima*	Least Concern	G5	-	-	-	S3S4	4 Secure	Isaac's Harbour MBBA square
Red-breasted Merganser	*Mergus serrator*	Least Concern	G5	-	-	-	S3S4B,S5N	4 Secure	Isaac's Harbour MBBA square

TABLE F1: SPECIES RANKING

Common Name	Scientific Name	Global Rarity Rank (IUCN)	Global Rarity Rank (CDC / Nature Serve) (GRANK)	National (COSEWIC) (NPROT)	National (SARA) (NPROTSAR)	Nova Scotia (SPROT)	Sub-national Rarity Rating (SRANK)	Sub-national Sub-group Rarity Rating (SGSRANK)	Survey Site
Bay-breasted Warbler	*Dendroica castanea*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Ruby-crowned Kinglet	*Regulus calendula*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Greater Yellowlegs	*Tringa melanoleuca*	Least Concern	G5	-	-	-	S3B,S3S4M	3 Sensitive	Isaac's Harbour MBBA square
Boreal Chickadee	*Poecile hudsonica*	Least Concern	G5	-	-	-	S3	3 Sensitive	Isaac's Harbour MBBA square
Tennessee Warbler	*Vermivora peregrina*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Bank Swallow	*Riparia riparia*	Least Concern	G5	Threatened	-	-	S2S3B	2 May Be At Risk	Isaac's Harbour MBBA square
Barn Swallow	*Hirundo rustica*	Least Concern	G5	Threatened	-	Endangered	S3B	1 At Risk	Isaac's Harbour MBBA square
Short-eared Owl	*Asio flammeus*	Least Concern	G5	Special Concern	Special Concern	-	S1S2B	2 May Be At Risk	Isaac's Harbour MBBA square
Evening Grosbeak	*Coccothraustes vespertinus*	Least Concern	G5	-	-	-	S3S4B,S3N	4 Secure	Isaac's Harbour MBBA square
Red-breasted Nuthatch	*Sitta canadensis*	Least Concern	G5	-	-	-	S3	4 Secure	Isaac's Harbour MBBA square
Blackpoll Warbler	*Dendroica striata*	Least Concern	G5	-	-	-	S3S4B	3 Sensitive	Isaac's Harbour MBBA square
Common Nighthawk	*Chordeiles minor*	Least Concern	G5	Threatened	Threatened	Threatened	S2S3B	1 At Risk	Isaac's Harbour MBBA square
Veery	*Catharus fuscescens*	Least Concern	G5	-	-	-	S3S4B	4 Secure	Isaac's Harbour MBBA square
Wilson's Warbler	*Wilsonia pusilla*	Least Concern	G5	-	-	-	S3B	3 Sensitive	Isaac's Harbour MBBA square
Olive-sided Flycatcher	*Contopus cooperi*	Near Threatened	G4	Threatened	Threatened	Threatened	S3B	1 At Risk	Isaac's Harbour MBBA square
Canada Warbler	*Wilsonia canadensis*	Least Concern	G5	Threatened	Threatened	Endangered	S3S4B	1 At Risk	Isaac's Harbour MBBA square
Fox Sparrow	*Passerella iliaca*	Least Concern	G5	-	-	-	S3S4B	4 Secure	Isaac's Harbour MBBA square

TABLE F1: SPECIES RANKING

Common Name	Scientific Name	Global Rarity Rank (IUCN)	Global Rarity Rank (CDC / Nature Serve) (GRANK)	National (COSEWIC) (NPROT)	National (SARA) (NPROTSAR)	Nova Scotia (SPROT)	Sub-national Rarity Rating (SRANK)	Sub-national Sub-group Rarity Rating (SGSRANK)	Survey Site
Long-eared Owl	*Asio otus*	Least Concern	G5	-	-	-	S2S3	2 May Be At Risk	Isaac's Harbour MBBA square
Gray Catbird	*Dumetella carolinensis*	Least Concern	G5	-	-	-	S3B	2 May Be At Risk	Isaac's Harbour MBBA square

TABLE F2: SPECIES HABITAT COMPARISON

Common Name	Scientific Name	Preferred Habitat and Distribution/Population
Flora		
Northern Burreed	*Sparganium hyperboreum*	The bur-reed family is found in north temperate regions of the world, as well as in Australia and New Zealand. These plants are perennial, aquatic herbs that grow completely under water or with some parts rising out of the water, growing as an emergent shallow-water aquatic at sedge-marshy streamlet borders. (2)
Boreal Felt Lichen - Atlantic pop.	*Erioderma pedicellatum (Atlantic pop.)*	Typical habitat for the Boreal Felt Lichen is northerly exposed forested slopes where cool and moist conditions prevail throughout most of the year. These mature forest sites are also rich in moisture-loving species such as sphagnum mosses and Cinnamon Fern (*Osmundastrum cinnamoneum*). In well-lit forests, the Boreal Felt Lichen is found predominantly on tree trunks' whereas in more shaded habitats it is found mostly on branches. The Boreal Felt Lichen is a globally rare species. It has been documented in Atlantic Canada, Sweden, and Norway, but it is currently believed to exist only in Canada. There are two distinct populations: the boreal population (the island of Newfoundland) and the Atlantic population (Nova Scotia and New Brunswick). Most of the Atlantic population of the Boreal Felt Lichen has disappeared. Having experienced a dramatic decline of over 90% over the past 20 years, the Atlantic population is in imminent danger of disappearing from the Maritimes. (1)
Salted Shell Lichen	*Coccocarpia palmicola*	Salted Shell Lichen occurs on rocks and soil among mosses in moist habitats, but also on tree trunks. (4)
Blue Felt Lichen	*Degelia plumbea*	Blue Felt Lichen thrives in the Atlantic coastal forests of Nova Scotia, where the locations are generally in mixed forests containing Red Maple (*Acer rubrum*) that are in wet depressions or adjacent to streams, rivers or lakes referred to as red maple swales (Golet et al. 1993). Red maple can make up 50% of the tree species composition while Balsam Fir (*Abies balsamea*) is also a common component, up to 30%. The age of Red Maples, in sites where Blue Felt Lichen is frequent, can exceed 90-100 years, though the stem size may be as small as 10cm dbh (diameter at breast height). Despite the relatively young age of these trees, the woodlands may be very ancient due to wave / gap replacement occurring on a local and movable patch scale in the landscape (Mosseler et al. 2003). The poorly drained, moist depressions where these maples grow can occur in very narrow strips (100-150 m) along stream edges, between ridges which scarcely register on topographic maps. The ridges provide protection from drying winds. Moss cover in the moist depressions is generally abundant and often includes a carpet of *Sphagnum*. The herb layer is usually dominated by Cinnamon Fern, but may include Bunchberry (*Cornus canadensis*), Sarsaparilla (*Aralia nudicaulis*), sedges (*Carex* spp.), gold thread (*Coptis* spp.) and False Lily of the Valley (*Maianthemum*). Outside of these Red Maple swales, Blue Felt Lichen is found on the Atlantic coast near rivers and streams or adjacent to wetlands. It also occurs less frequently in deciduous forests on rich soil on hillside slopes such as Cape Breton Highlands, on the North Mountain on the Fundy coast, and in the Cobequid Hills. These forests are dominated by Sugar Maple (*Acer saccharum),* Yellow Birch *(Betula alleghaniensis)* and Beech (*Fagus grandifolia)*. Blue Felt Lichen is most often found in humid micro-climates near seeps, vernal ponds or steep gullies. (1)
Corrugated Shingles Lichen	*Fuscopannaria ahlneri*	Corrugated Shingles Lichen habitat is most often spruce forest in small brook ravines or in north-facing slopes close to rivers on marine sediments. (3)
Birdnest Jellyskin Lichen	*Leptogium tenuissimum*	Birdnest Jellyskin Lichen habitat is among mosses on calcareous soil. (4)
Blue-gray Moss Shingle Lichen	*Moelleropsis nebulosa*	Blue-gray Moss Shingle Lichen habitat is sandy, well-drained soil; frequently a short-lived pioneer species on disturbed soil. (4)
Tree Pelt Lichen	*Peltigera collina*	Tree Pelt Lichen habitat is among mosses over bark (and occasionally rocks) in moist habitats at relatively intermediate to high elevations. (4)

TABLE F2: SPECIES HABITAT COMPARISON

Common Name	Scientific Name	Preferred Habitat and Distribution/Population
Fauna		
Altantic Salmon - Nova Scotia Southern Upland pop.	*Salmo salar pop. 6*	Of the the 65 Atlantic Salmon rivers on the Nova Scotia Southern Upland, 22% are 'acidified' and are known to have lost their salmon populations (8). Atlantic Salmon rivers are generally clear, cool and well oxygenated, with low to moderate gradient, and possessing bottom substrates of gravel, cobble and boulder (9). Spawning beds are often gravel areas with moderate current and depth (Fleming 1996), but habitats used by juvenile and adult salmon range across freshwater fluvial, lacustrine and estuarine environments. Chemical conditions also play a role in defining salmon habitat. Atlantic Salmon populations can experience reduced production or even extirpation in conditions of high alkalinity (8). Tolerance is life-stage dependent with fry and smolt being the most sensitive. Generally rivers that have pH's between 4.7 and 5.0 are considered moderately impacted and those below 4.7 are considered acidified (8), and are unlikey to be able to support salmon populations. As juvenile smolts or post-spawning 'kelts', Atlantic Salmon move from fresh water to brackish estuaries and then to the open ocean. (1)
Atlantic Salmon	*Salmo salar*	Atlantic Salmon rivers are generally clear, cool and well oxygenated, with low to moderate gradient, and possessing bottom substrates of gravel, cobble and boulder (9). Spawning beds are often gravel areas with moderate current and depth (Fleming 1996), but habitats used by juvenile and adult salmon range across freshwater fluvial, lacustrine and estuarine environments. Chemical conditions also play a role in defining salmon habitat. Atlantic Salmon populations can experience reduced production or even extirpation in conditions of high alkalinity (8). Tolerance is life-stage dependent with fry and smolt being the most sensitive. Generally rivers that have pH's between 4.7 and 5.0 are considered moderately impacted and those below 4.7 are considered acidified (8), and are unlikey to be able to support salmon populations. As juvenile smolts or post-spawning 'kelts', Atlantic Salmon move from fresh water to brackish estuaries and then to the open ocean. (1)
Brook Trout	*Salvelinus fontinalis*	Brook trout can inhabit a wide range of waters, but they require cold, clean water, and they are sensitive to poor oxygenation and acidity. Brook trout can inhabit a wide range of waters—from large lakes to tiny mountain streams—but they require cold, clean water, and they are sensitive to poor oxygenation and acidity. Migratory Brook Trout of the Northeast are anadromous, living in salt water and running up rivers to reproduce. (7)
Spotted Sandpiper	*Actitis macularius*	Pebbly lake shores, ponds, streamsides; in winter, also seashores. Breeds near the edge of fresh water in a wide variety of settings, including lakes, ponds, rivers, streams, in either open or wooded country. In migration and winter also found along coast on mudflats, beaches, breakwaters; also on such inland habitats as sewage ponds, irrigation ditches. (5)
Swainson's Thrush	*Catharus ustulatus*	Spruce forests and dense streamside woods; in migration, other woods. Breeds in coniferous forest with extensive leafy undergrowth. Occurs in many kinds of woodlands in migration. (5)
Common Eider	*Somateria mollissima*	Rocky coasts, shoals, islands. Very close to coastlines at all seasons. For nesting favors islands or coasts with rocky shorelines, either barren or forested. At other seasons on shallow oceanic waters, usually not far from shore. Rarely on fresh water. (5)
Red-breasted Merganser	*Mergus serrator*	Lakes, open water; in winter, coastal bays. During nesting season around lakes and rivers, within the northern forest. In winter mostly on coastal waters, including bays, estuaries, and open ocean; a few winter on ice-free reservoirs and large rivers. (5)

TABLE F2: SPECIES HABITAT COMPARISON

Common Name	Scientific Name	Preferred Habitat and Distribution/Population
Bay-breasted Warbler	*Dendroica castanea*	Woodlands, conifers in summer. Usually breeds in northern coniferous forest, in thick stands of spruce and fir. Where spruce is not found, will nest in deciduous or mixed second-growth woods of birches, maples, firs, and pines. (5)
Ruby-crowned Kinglet	*Regulus calendula*	Conifers in summer; other trees and brush in winter. Breeds in coniferous forest, including those of spruce, fir, Douglas-fir, and some pine woods. Winters in a wide variety of habitats, mainly in open deciduous woods, also in coniferous and mixed woods, mesquite brush, streamside thickets. (5)
Greater Yellowlegs	*Tringa melanoleuca*	Open marshes, mudflats, streams, ponds; in summer, wooded muskeg, spruce bogs. During migration and winter, found in wide variety of settings, including tidal flats, estuaries, open beaches, salt and fresh marshes, shores of lakes and ponds, riverbanks. Breeds in boggy and marshes places within northern coniferous forest. (5)
Boreal Chickadee	*Poecile hudsonica*	Mainly in forests of conifers, especially spruces, but also in some mixed forest. Occurs in low stunted spruces as far north as treeline. At southern edge of range (barely south of Canadian border), found in spruce bogs in east. (5)
Tennessee Warbler	*Vermivora peregrina*	Deciduous and mixed forests; in migration, groves, brush. Breeds in bogs, swamps, and forests. Prefers openings in second growth balsam-tamarack bogs, or aspen and pine woods, or edges of dense spruce forest. Nests near slight depressions of boggy ground. During spring migration, mostly high in trees. During fall migration, often lower in saplings, brush, weedy fields. (5)
Yellow-bellied Flycatcher	*Empidonax flaviventris*	Woods; in summer, boreal forests, muskegs, bogs. Breeds in wet northern forest, especially in Spruce (*Picea*) bogs with ground cover of *Sphagnum* moss, also in tamarack-white cedar swamps, and in willow-alder thickets along streams in dense coniferous forest. (5)
Bank Swallow	*Riparia riparia*	The Bank Swallow breeds in a wide variety of natural and artificial sites with vertical banks, including riverbanks, lake and ocean bluffs, aggregate pits, road cuts, and stock piles of soil. Sand-silt substrates are preferred for excavating nest burrows. Breeding sites tend to be somewhat ephemeral due to the dynamic nature of bank erosion. Breeding sites are often situated near open terrestrial habitat used for aerial foraging (*e.g.,* grasslands, meadows, pastures, and agricultural cropland). Large wetlands are used as communal nocturnal roost sites during post-breeding, migration, and wintering periods. (1)
Barn Swallow	*Hirundo rustica*	Before European colonization, Barn Swallows nested mostly in caves, holes, crevices and ledges in cliff faces. Following European settlement, they shifted largely to nesting in and on artificial structures, including barns and other outbuildings, garages, houses, bridges, and road culverts. Barn Swallows prefer various types of open habitats for foraging, including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared rights-of-way, cottage areas and farmyards, islands, wetlands, and subarctic tundra. (1)
Short-eared Owl	*Asio flammeus*	The Short-eared Owl makes use of a wide variety of open habitats, including arctic tundra, grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. It also occasionally breeds in agricultural fields. Preferred nesting sites are dense grasslands, as well as tundra with areas of small willows. While the Short-eared Owl has a marked preference for open spaces, the main factor influencing the choice of its local habitat is believed to be the abundance of food, in both summer and winter. Suitable breeding, migration and wintering habitat has declined significantly throughout the 20th century, resulting in a reduction in the number of owls. (1)
Evening Grosbeak	*Coccothraustes vespertinus*	Conifer forests; in winter, box elders and other maples, also fruiting shrubs. Breeds in coniferous and mixed forests; often associated with spruce and fir in northern forest, with pines in western mountains. In migration and winter, may be equally common in deciduous groves in woodlands and semi-open country. (5)

TABLE F2: SPECIES HABITAT COMPARISON

Common Name	Scientific Name	Preferred Habitat and Distribution/Population
Red-breasted Nuthatch	*Sitta canadensis*	Conifer forests; in winter, also other trees. Nesting habitat almost always has many conifers, such as spruce, fir, hemlock, either in pure stands or mixed with deciduous trees. Mature forest preferred, perhaps because old decaying wood needed for nest sites. In migration and winter may appear in any wooded habitat, but conifers always chosen if available. (5)
Blackpoll Warbler	*Dendroica striata*	Conifers; broadleaf trees in migration. Breeds in low northern spruce forest. (5)
Common Nighthawk	*Chordeiles minor*	The Common Nighthawk nests in a wide range of open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. (1)
Veery	*Catharus fuscescens*	Damp deciduous woods. For breeding, favours dense understory and leafy low growth near water. Surrounding habitat usually deciduous woods, sometimes mixed or coniferous woods. In mature forest, avoids areas with little understory, concentrating along streams or other openings. During migration, found mainly in deciduous woods. (5)
Wilson's Warbler	*Wilsonia pusilla*	Thickets along wooded streams, moist tangles, low shrubs, willows, alders. Breeds as far north as timberline, in thickets, second-growth, bogs, or in alder and willow groves near streams and ponds. In migration and winter, occurs from hot lowland thickets up to cool mountain woods; always in scrubby overgrown clearings and thin woods, not in the interior of dense forest. (5)
Olive-sided Flycatcher	*Contopus cooperi*	The Olive-sided Flycatcher is most often associated with open areas containing tall live trees or snags for perching. These vantage points are required for foraging. This species generally forages from a high, prominent perch from which it sallies forth to intercept flying insects and then returns to the same perch. Open areas may be forest clearings, forest edges located near natural openings (such as rivers or swamps) or human-made openings (such as logged areas), burned forest or openings within old-growth forest stands; these forests are characterized by mature trees and large numbers of dead trees. Generally, forest habitat is either coniferous or mixed wood. In the boreal forest, suitable habitat is more likely to be in or near wetland areas. (1)
Canada Warbler	*Wilsonia canadensis*	The Canada Warbler is found in a variety of forest types, but it is most abundant in wet, mixed deciduous-coniferous forest with a well-developed shrub layer. It is also found in riparian shrub forests on slopes and in ravines and in old-growth forests with canopy openings and a high density of shrubs, as well as in stands regenerating after natural disturbances, such as forest fires, or anthropogenic disturbances, such as logging. (1)
Fox Sparrow	*Passerella iliaca*	Wooded areas, undergrowth, brush. Breeds in brushy areas including woodland edges and clearings, streamside thickets, scrubby second growth, stunted coastal forest. Winters in similar habitats, also in brushy fields, chaparral, well-vegetated suburbs and parks. (5) The Fox Sparrow species is strongly associated with sapling or stunted coniferous forests, and it is almost entirely restricted in the Maritimes to high elevations and Nova Scotia's Atlantic Coast. In NS, the Fox Sparrow inhabits krummholz shrublands, black spruce bogs, and coastal marshes. It is most abundant in the region's taiga, highland, and upland areas and occurs in lower densities along the narrow strip of the coast influenced by wind and ocean spray. (6)
Long-eared Owl	*Asio otus*	Woodlands, conifer groves. Favored habitat includes dense trees for nesting and roosting, open country for hunting. Inhabits a wide variety of such settings, including forest with extensive meadows, groves of conifers or deciduous trees in prairie country, streamside groves in desert. Generally avoids unbroken forest. (5)
Gray Catbird	*Dumetella carolinensis*	Undergrowth, brush, thorn scrub, suburban gardens. At all seasons, favors dense low growth. Most common in leafy thickets along the edges of woods and streams, shrubby swamps, overgrown brushy fields, and hedges in gardens. Avoids unbroken forest and coniferous woods. (5)

TABLE F2: SPECIES HABITAT COMPARISON

Common Name	Scientific Name	Preferred Habitat and Distribution/Population

(1) Species at Risk Public Registry (SARA, 2017)
(2) Sask Virtual Herbarium (Sask, 2017)
(3) Lichen Herbarium (http://nhm2.uio.no/botanisk/bot-mus/lav/factshts/)
(4) Encyclopedia of Life (http://www.eol.org/)
(5) Audubon Society (http://www.audubon.org/bird-guide)
(6) Maritimes Breeding Bird Atlas
(7) http://www.orvis.com/news/fly-fishing/fish-facts-brook-trout-salvelinus-fontinalis/
(8) DFO 2014
(9) COESWIC 2013

Appendix G

Plant Inventory

Scientific Name	Common Name	S-Rank	SGS Rank
Abies balsamea	Balsam Fir	S5	Secure
Acer rubrum	Red Maple	S5	Secure
Alnus incana	Speckled Alder	S5	Secure
Alnus viridis	Green Alder	S5	Secure
Anaphalis margaritacea	Pearly Everlasting	S5	Secure
Andromeda polifolia var. glaucophylla	Bog Rosemary	S5	Secure
Anthoxanthum odoratum	Large Sweet Vernal Grass	SNA	Exotic
Aralia hispida	Spikenard	S5	Secure
Aralia nudicaulis	Wild Sarsaparilla	S5	Secure
Arethusa bulbosa	Dragon's Mouth	S4	Secure
Betula papyrifera var. cordifolia	Mountain Paper Birch	S5	Secure
Betula populifolia	Gray Birch	S5	Secure
Bromus ciliatus	Fringed Brome	S5	Secure
Calamagrostis canadensis	Bluejoint Reedgrass	S5	Secure
Calamagrostis pickeringii	Pickering's Reed Grass	S4S5	Secure
Calopogon tuberosus	Tuberous Grass Pink	S4	Secure
Carex arctata	Black Sedge	S5	Secure
Carex atlantica	Atlantic Sedge	S4	Secure
Carex brunnescens	Brownish Sedge	S5	Secure
Carex canescens	Silvery Sedge	S5	Secure
Carex crinita	Fringed Sedge	S5	Secure
Carex debilis	White-edged Sedge	S5	Secure
Carex echinata	Star Sedge	S5	Secure
Carex exilis	Coastal Sedge	S4	Secure
Carex folliculata	Northern Long Sedge	S5	Secure
Carex gynandra	Nodding Sedge	S5	Secure
Carex leptonervia	Finely-Nerved Sedge	S5	Secure
Carex lurida	Sallow Sedge	S5	Secure
Carex magellanica	Boreal Bog Sedge	S5	Secure
Carex nigra	Smooth Black Sedge	S5	Secure
Carex pallescens	Pale Sedge	S5	Secure
Carex pauciflora	Few-Flowered Sedge	S4S5	Secure
Carex stricta	Tussock Sedge	S5	Secure
Carex trisperma	Three-seeded Sedge	S5	Secure
Centaurea nigra	Black Knapweed	SNA	Exotic
Chamaedaphne calyculata	Leatherleaf	S5	Secure
Chelone glabra	Turtlehead	S5	Secure
Clintonia borealis	Yellow Bluebead Lily	S5	Secure
Coptis trifolia	Goldthead	S5	Secure
Cornus canadensis	Bunchbery	S5	Secure
Deschampsia flexuosa	Wavy Hair Grass	S5	Secure
Dichanthelium acuminatum	Woolly Panic Grass	S5	Secure
Dichanthelium boreale	Northern Panic Grass	S5	Secure
Diervilla lonicera	Northern Bush Honeysuckle	S5	Secure
Doellingeria umbellata	Hairy Flat-top White Aster	S5	Secure
Drosera intermedia	Spoon-Leaved Sundew	S5	Secure
Drosera rotundifolia	Round-leaved Sundew	S5	Secure
Dryopteris cristata	Crested Wood Fern	S5	Secure
Dulichium arundinaceum	Three-Way Sedge	S5	Secure

Scientific Name	Common Name	S-Rank	SGS Rank
Eleocharis acicularis	Needle Spikerush	S5	Secure
Eleocharis obtusa	Blunt Spikerush	S5	Secure
Eleocharis tenuis	Slender Spikerush	S5	Secure
Empetrum nigrum	Black Crowberry	S5	Secure
Epigaea repens	Trailing Arbutus	S5	Secure
Epilobium palustre	Marsh Willowherb	S5	Secure
Equisetum arvense	Field Horsetail	S5	Secure
Equisetum fluviatile	Water Horsetail	S5	Secure
Equisetum variegatum	**Variegated Horsetail**	**S3**	**Secure**
Eriophorum vaginatum	Tussock Cottongrass	S5	Secure
Eriophorum virginicum	Tawny Cottongrass	S5	Secure
Eupatorium perfoliatum	Common Boneset	S5	Secure
Eurybia radula	Low Rough Aster	S5	Secure
Fragaria virginiana	Wild Strawberry	S5	Secure
Galium palustre	Common Marsh Bedstraw	S5	Secure
Gaultheria hispidula	Creeping Snowberry	S5	Secure
Gaultheria procumbens	Eastern Teaberry	S5	Secure
Gaylussacia baccata	Black Huckleberry	S5	Secure
Glyceria canadensis	Canada Manna Grass	S5	Secure
Glyceria grandis	Common Tall Manna Grass	S4S5	Secure
Glyceria striata	Fowl Manna Grass	S5	Secure
Hieracium caespitosum	Field Hawkweed	SNA	Exotic
Hypericum boreale	Northern St John's-Wort	S5	Secure
Hypericum canadense	Canada St John's-wort	S5	Secure
Hypericum perforatum	Common St. John's-wort	SNA	Exotic
Ilex verticillata	Common Winterberry	S5	Secure
Iris versicolor	Harlequin Blue Flag	S5	Secure
Juncus brevicaudatus	Narrow-Panicled Rush	S5	Secure
Juncus canadensis	Canada Rush	S5	Secure
Juncus effusus	Soft Rush	S5	Secure
Juncus tenuis	Slender Rush	S5	Secure
Juniperus communis	Common Juniper	S5	Secure
Kalmia angustifolia	Lambkill	S5	Secure
Kalmia polifolia	Pale Bog Laurel	S5	Secure
Larix laricina	Eastern Larch	S5	Secure
Ledum groenlandicum	Labrador Tea	S5	Secure
Leucanthemum vulgare	Oxeye Daisy	SNA	Exotic
Linnaea borealis	Twin Flower	S5	Secure
Listera australis	**Southern Twayblade**	**S3**	**Secure**
Lonicera canadensis	Canada Fly Honeysuckle	S5	Secure
Lonicera villosa	Mountain Fly Honeysuckle	S5	Secure
Ludwigia palustris	Marsh Seedbox	S5	Secure
Lupinus polyphyllus	Large-Leaved Lupine	SNA	Exotic
Luzula multiflora	Common Woodrush	S5	Secure
Lycopus uniflorus	Northern Water Horehound	S5	Secure
Lysimachia terrestris	Swamp Yellow Loosestrife	S5	Secure
Maianthemum canadense	Wild Lily-of-The-Valley	S5	Secure
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5	Secure
Melampyrum lineare	American Cow Wheat	S5	Secure

Scientific Name	Common Name	S-Rank	SGS Rank
Menyanthes trifoliata	Bog Buckbean	S5	Secure
Mitchella repens	Partridgeberry	S5	Secure
Moneses uniflora	One-flowered Wintergreen	S5	Secure
Monotropa hypopithys	Pinesap	S4	Secure
Monotropa uniflora	Indian Pipe	S5	Secure
Morella pensylvanica	Northern Bayberry	S5	Secure
Myrica gale	Sweet Gale	S5	Secure
Nemopanthus mucronatus	Mountain Holly	S5	Secure
Nuphar lutea	Variegated Pond-lily	S5	Secure
Oclemena acuminata	Whorled Wood Aster	S5	Secure
Oclemena nemoralis	Bog Aster	S5	Secure
Oclemena x blakei	hybrid White Panicled American-Aster	S5	Secure
Onoclea sensibilis	Sensitive Fern	S5	Secure
Osmunda cinnamomea	Cinnamon Fern	S5	Secure
Osmunda claytoniana	Royal Fern	S5	Secure
Oxalis montana	Common Wood Sorrel	S5	Secure
Phegopteris connectilis	Long Beach Fern	S5	Secure
Photinia floribunda	Purple Chokeberry	S5	Secure
Picea glauca	White Spruce	S5	Secure
Picea mariana	Black Spruce	S5	Secure
Platanthera clavellata	Club Spur Orchid	S5	Secure
Platanthera blephariglottis	White Fringed Orchid	S4	Secure
Poa palustris	Fowl Blue Grass	S5	Secure
Potentilla simplex	Old Field Cinquefoil	S5	Secure
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5	Secure
Prunella vulgaris	Common Self-heal	S5	Secure
Prunus pensylvanica	Pin Cherry	S5	Secure
Pteridium aquilinum	Bracken Fern	S5	Secure
Ranunculus repens	Creeping Buttercup	SNA	Exotic
Rhododendron canadense	Rhodora	S5	Secure
Rosa nitida	Shining Rose	S4	Secure
Rubus allegheniensis	Alleghaney Blackberry	S5	Secure
Rubus canadensis	Smooth Blackberry	S5	Secure
Rubus chamaemorus	Cloudberry	S4	Secure
Rubus hispidus	Bristly Dewberry	S5	Secure
Rubus idaeus	Red Raspberry	S5	Secure
Rubus pubescens	Dwarf Raspberry	S5	Secure
Rumex acetosella	Sheep Sorrel	SNA	Exotic
Sarracenia purpurea	Pitcher Plant	S5	Secure
Scirpus atrocinctus	Black-girdled Bulrush	S5	Secure
Scirpus cyperinus	Common Woolly Bulrush	S5	Secure
Scirpus hattorianus	Mosquito Bulrush	S5	Secure
Scirpus microcarpus	Small-fruited Bulrush	S5	Secure
Sisyrinchium montanum	Mountain Blue-eyed-grass	S5	Secure
Solidago canadensis	Canada Goldenrod	S5	Secure
Solidago puberula	Downy Goldenrod	S5	Secure
Solidago rugosa	Rough-stemmed Goldenrod	S5	Secure
Solidago uliginosa	Northern Bog Goldenrod	S5	Secure
Sorbus americana	American Mountain Ash	S5	Secure

Scientific Name	Common Name	S-Rank	SGS Rank
Sparganium americanum	American Burreed	S5	Secure
Spiraea alba	White Meadowsweet	S5	Secure
Spiraea tomentosa	Steeplebush	S5	Secure
Spiranthes lacera	Slender Ladies'-tresses	S5	Secure
Symphyotrichum lanceolatum	Lance-leaved Aster	S4S5	Secure
Thalictrum pubescens	Tall Meadow Rue	S5	Secure
Thelypteris noveboracensis	New York Fern	S5	Secure
Thelypteris palustris	Eastern Marsh Fern	S5	Secure
Triadenum fraseri	Fraser's Marsh St John's-wort	S5	Secure
Trichophorum caespitosum	Tufted Clubrush	S5	Secure
Trientalis borealis	Northern Starflower	S5	Secure
Trifolium pratense	Red Clover	SNA	Exotic
Trifolium repens	Dwarf White Clover	SNA	Exotic
Typha latifolia	Broad-leaved Cattail	S5	Secure
Utricularia cornuta	Horned Bladderwort	S5	Secure
Vaccinium angustifolium	Late Lowbush Blueberry	S5	Secure
Vaccinium myrtilloides	Velvet-leafed Blueberry	S5	Secure
Vaccinium oxycoccos	Small Cranberry	S5	Secure
Vaccinium vitis-idaea	Mountain Cranberry	S5	Secure
Veronica officinalis	Common Speedwell	S5	Exotic
Viburnum nudum	Northern Wild Raisin	S5	Secure
Viola cucullata	Marsh Blue Violet	S5	Secure
Viola lanceolata	Lance-leaved Violet	S5	Secure
Viola macloskeyi	Small White Violet	S5	Secure

Rare flora are bolded and shaded.

Appendix H

Bird Inventory

Common Name	Scientific Name	S-Rank	SGS Rank	Highest Breeding Status	Number Recorded
Alder Flycatcher	*Empidonax alnorum*	S5B	Secure	PO	29
American Crow	*Corvus brachyrhynchos*	S5	Secure	OB	6
American Goldfinch	*Spinus tristis*	S5	Secure	PO	10
American Kestrel	*Falco sparverius*	S3	Secure	PR	1
American Redstart	*Setophaga ruticilla*	S4S5B	Secure	PO	17
American Robin	*Turdus migratorius*	S5B,S3N	Secure	PO	16
Bald Eagle	*Haliaeetus leucocephalus*	S5	Secure	OB	2
Belted Kingfisher	*Megaceryle alcyon*	S5B	Secure	OB	1
Black-and-white Warbler	*Mniotilta varia*	S5B	Secure	PO	18
Blackburnian Warbler	*Dendroica fusca*	S4B	Secure	PO	1
Black-capped Chickadee	*Poecile atricapillus*	S5	Secure	PO	6
Black-throated Green Warbler	*Setophaga virens*	S5B	Secure	PO	36
Blue Jay	*Cyanocitta cristata*	S5	Secure	PO	2
Blue-headed Vireo	*Vireo solitarius*	S5B	Secure	PO	20
Boreal Chickadee	*Poecile hudsonicus*	S3	Sensitive	CO	22
Broad-winged Hawk	*Buteo platypterus*	S5B	Secure	OB	2
Canada Goose	*Branta canadensis*	SNAB,S4N	Secure	OB	1
Canada Warbler	*Cardellina pusilla*	S3B	At Risk	PR	5
Cedar Waxwing	*Bombycilla cedrorum*	S5B	Secure	PO	5
Chestnut-sided Warbler	*Setophaga pensylvanica*	S5B	Secure	PO	4
Common Grackle	*Quiscalus quiscula*	S5B	Secure	PO	3
Common Loon	*Gavia immer*	S4B,S4N	May Be At Risk	OB	4
Common Yellowthroat	*Geothlypis trichas*	S5B	Secure	PO	43
Dark-eyed Junco	*Junco hyemalis*	S4S5	Secure	PO	16
Downy Woodpecker	*Picoides pubescens*	S5	Secure	PO	2
Fox Sparrow	*Passerella iliaca*	S3S4B	Secure	PO	1
Golden-crowned Kinglet	*Regulus satrapa*	S5	Sensitive	PO	12
Gray Catbird	*Dumetella carolinensis*	S3B	May Be At Risk	PO	2
Gray Jay	*Perisoreus canadensis*	S3	Sensitive	PR	2
Great Blue Heron	*Ardea herodias*	S4B,S4N	Secure	OB	1
Greater Yellowlegs	*Tringa melanoleuca*	S3B,S3S4M	Sensitive	PO	1

Breeding Status Codes:

OB = observed

PO = possible breeder

PR = probable breeder

CO = confirmed breeder

Common Name	Scientific Name	S-Rank	SGS Rank	Highest Breeding Status	Number Recorded
Spotted Sandpiper	*Actitis macularius*	S3S4B	Sensitive	PO	1
Spruce Grouse	*Falcipennis canadensis*	S4	Secure	CO	10
Swainson's Thrush	*Catharus ustulatus*	S3S4B	Secure	PO	12
Swamp Sparrow	*Melospiza georgiana*	S5B	Secure	PO	3
Tree Swallow	*Tachycineta bicolor*	S4B	Sensitive	PO	4
White-throated Sparrow	*Zonotrichia albicollis*	S5B	Secure	PR	57
Wilson's Warbler	*Cardellina pusilla*	S3B	Sensitive	PR	2
Winter Wren	*Troglodytes hiemalis*	S5B	Secure	PO	5
Yellow Warbler	*Setophaga petechia*	S5B	Secure	PO	1
Yellow-bellied Flycatcher	*Empidonax flaviventris*	S3S4B	Sensitive	PO	10
Yellow-bellied sapsucker	*Sphyrapicus varius*	S4S5B	Secure	PO	1
Yellow-rumped Warbler	*Setophaga coronata*	S5B	Secure	PO	25
Green-winged Teal	*Anas carolinensis*	S4S5B	Secure	PR	2
Hairy Woodpecker	*Picoides villosus*	S5	Secure	PO	2
Hermit Thrush	*Catharus guttatus*	S5B	Secure	CO	28
Least Flycatcher	*Empidonax minimus*	S4S5B	Secure	PO	12
Lincoln's Sparrow	*Melospiza lincolnii*	S4B	Secure	PR	8
Magnolia Warbler	*Setophaga magnolia*	S5B	Secure	PO	37
Nashville Warbler	*Oreothlypis ruficapilla*	S5B	Secure	PO	5
Northern Flicker	*Colaptes auratus*	S5B	Secure	CO	10
Northern Harrier	*Circus cyaneus*	S3S4B	Secure	PO	1
Northern Waterthrush	*Parkesia noveboracensis*	S4B	Secure	PO	1
Osprey	*Pandion haliaetus*	S4B	Secure	OB	4
Palm Warbler	*Setophaga palmarum*	S5B	Secure	PO	18
Purple Finch	*Haemorhous purpureus*	S4S5B,S3S4N	Secure	PO	5
Red-breasted Nuthatch	*Sitta canadensis*	S3	Secure	PO	12
Red-eyed Vireo	*Vireo olivaceus*	S5B	Secure	PO	7
Ruby-crowned Kinglet	*Regulus calendula*	S3S4B	Sensitive	PO	25
Ruby-throated Hummingbird	*Archilochus colubris*	S5B	Secure	PO	2
Song Sparrow	*Melospiza melodia*	S5B	Secure	PO	1
Total:					**602**

Breeding Status Codes:
OB = observed
PO = possible breeder
PR = probable breeder
CO = confirmed breeder

Appendix I

Water Quality Results

Table 1: Water Sample Locations

Sample ID	GPS Point	
	Latitude	Longitude
WS1	45.205142	-61.650432
WS2	45.204030	-61.645058
WS3	45.200898	-61.648194
WS4	45.199178	-61.638394
WS5	45.200846	-61.635811
WS6	45.201275	-61.641517
WS7	45.201364	-61.638269
WS8	45.202060	-61.636861
WS9	45.202539	-61.636737
WS10	45.206935	-61.634972
WS11	45.196201	-61.637666
WS12	45.203210	-61.642181
MS1	45.201184	-61.627129

Table 2 - Petroleum Hydrocarbons

Parameter	NSE Tier 1 EQS[3]	RDL[2]	Units	Sample Location						
				WS1	WS2	WS3	WS4	WS5	WS6	WS7
				11-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17
Benzene	2.1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	0.77	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	0.32	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylenes	0.33	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
VPH C6-C10 (Less BTEX)	-	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH >C10 - C16	-	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH >C16 - C21	-	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EPH >C21-C32	-	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH Tier 1	15, 0.1[4]	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Resemblance	NR[1]	NR	NR	NR	NR	NR	NR

Collection of samples by GEMTEC.

Analysis provided by AGAT Laboratories

Notes:

1. No Resemblance
2. Reported Detection Limit
3. NSE Tier 1 EQS = Nova Scotia
Environment Tier 1 Envionmental Quality Standards for Surface Water
4. Gas, Fuel / Lube

FD= Field Duplicate

Results that exceed the NSE Tier 1 EQS guidelines are shaded and bolded.

Table 2 - Petroleum Hydrocarbons

Parameter	NSE Tier 1 EQS[3]	RDL[2]	Units	Sample Location						
				WS8	WS9	WS10	WS11	WS12	MS1	WS3 FD (Duplicate)
				11-Jun-17	11-Jun-17	10-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17	11-Jun-17
Benzene	2.1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	0.77	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	0.008	<0.001
Ethylbenzene	0.32	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylenes	0.33	0.002	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
VPH C6-C10 (Less BTEX)	-	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
EPH >C10 - C16	-	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
EPH >C16 - C21	-	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
EPH >C21-C32	-	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH Tier 1	15, 0.1[4]	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Resemblance	NR	NR	NR	NR	NR	NR	NR

Collection of samples by GEMTEC.

Analysis provided by AGAT Laboratories

Notes:

1. No Resemblance
2. Reported Detection Limit
3. NSE Tier 1 EQS = Nova Scotia Environment Tier 1 Envionmental Quality Standards for Surfac
4. Gas, Fuel / Lube

FD= Field Duplicate

Results that exceed the NSE Tier 1 EQS guidelines are shaded and bolded.

Table 3 - General Chemistry

Sample Location:	Units	CCME FWAL[1]	RDL[2]	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
Date Sampled:				**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**
pH	-	6.5-9.0		**5**	**4.43**	**4.33**	**5.89**	**4.94**	7.35	**5.41**	**5**
Reactive Silica as SiO2	mg/L	–	0.5	3.20	3	2.5	0.8	2	3.9	5.4	2.20
Chloride	mg/L	120 [4]	1	4.0	4	3	5	4	5	8	5.0
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	–	2	<2	<2	<2	6	<2	2	11	<2
Alkalinity	mg/L	–	5	<5	<5	<5	<5	<5	34	<5	<5
True Color	TCU	-	5	251	249	259	83	120	58	22	120
Turbidity	NTU	–	0.1	2.1	2.4	1.6	3.4	2	2.2	2.2	1.1
Electrical Conductivity	umho/cm	–	1	32.0	33	30	42	26	93	81	26.0
Nitrate + Nitrite as N	mg/L	–	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.14
Nitrate as N	mg/L	13 [4]	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.14
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	varies[3]	0.03	<0.03	0.05	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
Ammonia as N Guideline	*mg/L*	*varies* [3]	-	*n/a*	*n/a*	*n/a*	*69.7*	*n/a*	*1.54*	*n/a*	*n/a*
Total Organic Carbon	mg/L	–	0.5	26.2	26.9	25.2	11.4	10	7.1	5.2	9.5
Ortho-Phosphate as P	mg/L	Fact Sheet	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.47	<0.01
Total Sodium	mg/L	–	0.1	2.7	2.8	2.3	3.5	2.5	4.4	6.7	3.2
Total Potassium	mg/L	–	0.1	0.2	0.2	<0.1	0.4	0.3	0.8	0.7	0.3
Total Calcium	mg/L	–	0.1	0.5	0.5	0.5	2.8	0.5	11.4	4.8	0.6
Total Magnesium	mg/L	–	0.1	0.4	0.4	0.3	0.6	0.3	1	1	0.4
Bicarb. Alkalinity (as CaCO3)	mg/L	–	5	<5	<5	<5	<5	<5	34	<5	<5
Carb. Alkalinity (as CaCO3)	mg/L	–	10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L	–	5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	-	1	9	9	8	19	8	46	34	12
Hardness	mg/L	–	–	2.9	2.9	2.5	9.5	2.5	32.6	16.1	3.1
Langelier Index (@20C)	-	–	–	-6.22	-6.68	-6.77	-4.49	-6.16	-1.61	-4.75	-6.05
Langelier Index (@ 4C)	-	–	–	-6.54	-7	-7.09	-4.81	-6.48	-1.93	-5.07	-6.37
Saturation pH (@ 20C)	-	–	–	11.10	11.1	11.1	10.4	11.1	8.96	10.2	11.00
Saturation pH (@ 4C)	-	–	–	11.40	11.4	11.4	10.7	11.4	9.28	10.5	11.40
Anion Sum	me/L	–	–	0.11	0.11	0.08	0.27	0.11	0.86	0.47	0.15
Cation sum	me/L	–	–	0.26	0.31	0.27	0.4	0.22	0.9	0.67	0.29
% Difference/ Ion Balance (NS	%	–	–	39.80	46	51.6	20.6	31.4	2.1	17.4	32.00
Kjeldahl Nitrogen	mg/L	–	0.4	0.6	0.6	0.5	0.6	<0.4	<0.4	<0.4	<0.4
Sulphide	mg/L	–	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Collection of samples conducted by GEMTEC.

Analysis provided by AGAT Laboratories.

Notes:

1. CCME FWAL = CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life Summary Table (CCME, 2015).
2. RDL = Reported Detection Limit.
3. Guideline is pH and temperature-dependent.
4. Long-Term Exposure.

"-" = None established / not measured.

Results that exceed the guideline are bold and shaded.

Table 3 - General Chemistry

Sample Location:	Units	CCME FWAL[1]	RDL[2]	WS9	WS10	WS11	WS12	MS1	WS3 FD (Duplicate)
Date Sampled:				**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**
pH	-	6.5-9.0		**4.78**	**4.87**	6.53	7.49	**5.54**	**4.37**
Reactive Silica as SiO2	mg/L	–	0.5	2.1	2.1	3.2	1.4	1.9	2.7
Chloride	mg/L	120 [4]	1	4	5	4	6	11	4
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	–	2	<2	<2	<2	3	<2	<2
Alkalinity	mg/L	–	5	<5	<5	6	23	<5	<5
True Color	TCU	-	5	101	119	178	12	159	257
Turbidity	NTU	–	0.1	1.9	3.6	2.4	2.1	2.5	2.6
Electrical Conductivity	umho/cm	–	1	26	25	35	74	56	30
Nitrate + Nitrite as N	mg/L	–	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L	13 [4]	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	varies[3]	0.03	0.04	0.07	<0.03	<0.03	<0.03	0.03
Ammonia as N Guideline	*mg/L*	*varies* [3]	-	*n/a*	*n/a*	*32.4*	*1.54*	*102*	*n/a*
Total Organic Carbon	mg/L	–	0.5	10.6	10.2	18.8	4.1	23.3	25.7
Ortho-Phosphate as P	mg/L	Fact Sheet	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L	–	0.1	3.2	2.9	3.6	5.5	7.6	2.8
Total Potassium	mg/L	–	0.1	0.3	0.3	0.3	1.3	2	<0.1
Total Calcium	mg/L	–	0.1	0.5	0.4	3.4	7	0.8	0.5
Total Magnesium	mg/L	–	0.1	0.4	0.3	0.7	1.1	0.8	0.3
Bicarb. Alkalinity (as CaCO3)	mg/L	–	5	<5	<5	6	23	<5	<5
Carb. Alkalinity (as CaCO3)	mg/L	–	10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L	–	5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	-	1	9	10	17	38	24	9
Hardness	mg/L	–	–	2.9	2.2	11.4	22.0	5.3	2.5
Langelier Index (@20C)	-	–	–	-6.33	-6.33	-3.67	-1.85	-5.39	-6.74
Langelier Index (@ 4C)	-	–	–	-6.64	-6.65	-3.99	-2.17	-5.71	-7.06
Saturation pH (@ 20C)	-	–	–	11.1	11.2	10.2	9.34	10.9	11.1
Saturation pH (@ 4C)	-	–	–	11.4	11.5	10.5	9.66	11.3	11.4
Anion Sum	me/L	–	–	0.11	0.14	0.23	0.69	0.31	0.11
Cation sum	me/L	–	–	0.27	0.24	0.46	0.73	0.58	0.29
% Difference/ Ion Balance (NS	%	–	–	40.5	25.4	32.6	2.7	29.9	43.8
Kjeldahl Nitrogen	mg/L	–	0.4	<0.4	<0.4	0.5	0.4	0.6	0.5
Sulphide	mg/L	–	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Collection of samples conducted by GEMTEC.

Analysis provided by AGAT Laboratories.

Notes:

1. CCME FWAL = CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life Summary Table (CCME, 2015).
2. RDL = Reported Detection Limit.
3. Guideline is pH and temperature-dependent.
4. Long-Term Exposure.

"-" = None established / not measured.

Results that exceed the guideline are bold and shaded.

Table 4 - Total Metals

Sample Location:	Units	NSE Tier 1 EQS[1]	RDL[2]	WS1	WS2	WS3	WS4	WS5	WS6
Date Sampled:				**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**11-Jun-17**
Aluminium	µg/L	5	5	**409**	**462**	**230**	**120**	**209**	**87**
Antimony	µg/L	20	2	<2	<2	<2	<2	<2	<2
Arsenic	µg/L	5.0	2	<2	5	**13**	**128**	**33**	**85**
Barium	µg/L	1000	5	<5	<5	<5	<5	<5	<5
Beryllium	µg/L	5.3	2	<2	<2	<2	<2	<2	<2
Bismuth	µg/L	-	2	<2	<2	<2	<2	<2	<2
Boron	µg/L	1200	5	5	6	<5	7	5	12
Cadmium[3]	µg/L	0.01	0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Chromium	µg/L	-	1	<1	<1	<1	<1	<1	<1
Cobalt	µg/L	10	1	<1	<1	<1	<1	<1	<1
Copper	µg/L	2	1	<1	<1	<1	<1	<1	<1
Total Cyanide	mg/L	5	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	µg/L	300	50	**593**	**765**	**1160**	**916**	**411**	**574**
Lead	µg/L	1	1	**1.2**	1	**1.2**	<0.5	<0.5	<0.5
Manganese	µg/L	820	2	51	27	19	73	19	153
Mercury	µg/L	0.026	0.026	<0.026	<0.026	**0.029**	<0.026	<0.026	<0.026
Molybdenum	µg/L	73	2	<2	<2	<2	<2	<2	<2
Nickel	µg/L	25	2	<2	<2	<2	<2	<2	<2
Phosphorus	mg/L	-	0.02	0.03	0.03	0.03	0.04	0.03	0.03
Selenium	µg/L	1.0	1	<1	<1	<1	<1	<1	<1
Silver	µg/L	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	21000	5	6	6	<5	19	5	87
Thallium	µg/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	-	2	<2	<2	<2	<2	<2	<2
Titanium	µg/L	-	2	5	6	3	<2	3	<2
Uranium	µg/L	300	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	µg/L	6	2	<2	<2	<2	<2	<2	<2
Zinc	µg/L	30	5	<5	<5	30	5	<5	<5

Collection of samples by GEMTEC.
Analysis provided by AGAT Laboratories.
Notes:
1. NSE Tier 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface
2. RDL = Reported Detection Limit.
3. The laboratory detection limit is greater than the NSE Tier 1 EQS guideline.

Results that exceed the NSE Tier 1 EQS guidelines are bolded and shaded.

Table 4 - Total Metals

Sample Location:	Units	NSE Tier 1 EQS[1]	RDL[2]	WS7	WS8	WS9	WS10	WS11	WS12
Date Sampled:				**11-Jun-17**	**11-Jun-17**	**11-Jun-17**	**10-Jun-17**	**11-Jun-17**	**11-Jun-17**
Aluminium	µg/L	5	5	**72**	**284**	**245**	**238**	**351**	**24**
Antimony	µg/L	20	2	<2	<2	<2	<2	<2	<2
Arsenic	µg/L	5.0	2	**1610**	**288**	**7**	3	**44**	**52**
Barium	µg/L	1000	5	5	<5	<5	<5	<5	<5
Beryllium	µg/L	5.3	2	<2	<2	<2	<2	<2	<2
Bismuth	µg/L	-	2	<2	<2	<2	<2	<2	<2
Boron	µg/L	1200	5	9	<5	<5	<5	6	11
Cadmium[3]	µg/L	0.01	0.017	**0.036**	<0.017	<0.017	<0.017	<0.017	<0.017
Chromium	µg/L	-	1	<1	<1	<1	<1	<1	<1
Cobalt	µg/L	10	1	2	<1	<1	<1	<1	<1
Copper	µg/L	2	1	2	<1	<1	<1	<1	<1
Total Cyanide	mg/L	5	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	µg/L	300	50	**591**	**1140**	**410**	**372**	**740**	**323**
Lead	µg/L	1	1	<0.5	1	<0.5	<0.5	0.5	<0.5
Manganese	µg/L	820	2	138	21	18	17	26	29
Mercury	µg/L	0.026	0.026	<0.026	**0.034**	<0.026	<0.026	<0.026	<0.026
Molybdenum	µg/L	73	2	<2	<2	<2	<2	<2	<2
Nickel	µg/L	25	2	4	<2	<2	<2	<2	<2
Phosphorus	mg/L	-	0.02	0.03	0.04	0.03	0.03	0.03	0.02
Selenium	µg/L	1.0	1	<1	<1	<1	<1	<1	<1
Silver	µg/L	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	21000	5	27	6.0	5	<5	25	74
Thallium	µg/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	-	2	<2	<2	<2	<2	<2	<2
Titanium	µg/L	-	2	<2	6.0	3	3	4	<2
Uranium	µg/L	300	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	µg/L	6	2	<2	<2	<2	<2	<2	<2
Zinc	µg/L	30	5	17	<5	<5	<5	<5	**53**

Collection of samples by GEMTEC.
Analysis provided by AGAT Laboratories.
Notes:
1. NSE Tier 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface
2. RDL = Reported Detection Limit.
3. The laboratory detection limit is greater than the NSE Tier 1 EQS guideline.

Results that exceed the NSE Tier 1 EQS guidelines are bolded and shaded.

Table 4 - Total Metals

Sample Location:	Units	NSE Tier 1 EQS[1]	RDL[2]	MS1	WS3 FD (Duplicate)
Date Sampled:				**11-Jun-17**	**11-Jun-17**
Aluminium	µg/L	5	5	**434**	**276**
Antimony	µg/L	20	2	<2	<2
Arsenic	µg/L	5.0	2	<2	**15**
Barium	µg/L	1000	5	<5	<5
Beryllium	µg/L	5.3	2	<2	<2
Bismuth	µg/L	-	2	<2	<2
Boron	µg/L	1200	5	13	<5
Cadmium[3]	µg/L	0.01	0.017	<0.017	<0.017
Chromium	µg/L	-	1	1	<1
Cobalt	µg/L	10	1	<1	<1
Copper	µg/L	2	1	<1	<1
Total Cyanide	mg/L	5	0.002	<0.002	<0.002
Iron	µg/L	300	50	**963**	**1160**
Lead	µg/L	1	1	<0.5	**1.1**
Manganese	µg/L	820	2	70	18
Mercury	µg/L	0.026	0.026	<0.026	<0.026
Molybdenum	µg/L	73	2	<2	<2
Nickel	µg/L	25	2	<2	<2
Phosphorus	mg/L	-	0.02	0.09	0.03
Selenium	µg/L	1.0	1	<1	<1
Silver	µg/L	0.1	0.1	<0.1	<0.1
Strontium	µg/L	21000	5	7	<5
Thallium	µg/L	0.8	0.1	<0.1	<0.1
Tin	µg/L	-	2	<2	<2
Titanium	µg/L	-	2	8	4
Uranium	µg/L	300	0.1	<0.1	<0.1
Vanadium	µg/L	6	2	<2	<2
Zinc	µg/L	30	5	7	<5

Collection of samples by GEMTEC.
Analysis provided by AGAT Laboratories.
Notes:
1. NSE Tier 1 EQS = Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface
2. RDL = Reported Detection Limit.
3. The laboratory detection limit is greater than the NSE Tier 1 EQS guideline.

Results that exceed the NSE Tier 1 EQS guidelines are bolded and shaded.

Table 5 - Field Parameters

Sample Location	Date	Temperature	Dissolved Oxygen	Conductivity	pH
		ºC	mg/L	µS/cm	-
Project Area Water Quality					
WS1	**11-Jun-17**	13.3	10.1	24.9	3.92
WS2	**11-Jun-17**	15.7	8.7	26.9	4.48
WS3	**11-Jun-17**	11.5	7.8	22.6	3.88
WS4	**11-Jun-17**	15.6	6.6	32.3	5.67
WS5	**11-Jun-17**	15.2	9.5	20.9	4.83
WS6	**11-Jun-17**	20.1	7.7	84.2	6.79
WS7	**11-Jun-17**	15.3	9.4	63.0	5.38
WS8	**11-Jun-17**	15.5	10.1	12.2	4.85
WS9	**11-Jun-17**	15.5	7.7	21.4	4.81
WS10	**10-Jun-17**	19.0	9.0	23.3	4.27
WS11	**11-Jun-17**	10.4	10.9	25.4	6.21
WS12	**11-Jun-17**	18.8	8.1	63.1	6.77
MS1	**11-Jun-17**	10.5	3.8	38.8	4.98
Gold Brook Water Quality					
Point 1	**7-Jun-17**	13.3	9.6	19.7	5.07
Point 2	**7-Jun-17**	13.4	10.4	19.5	4.93
Point 3	**7-Jun-17**	13.3	10.5	19.6	4.95
Point 4	**7-Jun-17**	14.0	10.3	19.7	4.96
Point 5	**7-Jun-17**	14.5	11.6	19.6	4.97
Point 6	**7-Jun-17**	15.2	10.2	19.8	4.98
Point 7A	**7-Jun-17**	15.6	10.4	10.3	5.03
Point 7B	**7-Jun-17**	17.0	11.0	21.1	4.81
Point 7C	**7-Jun-17**	17.1	10.2	21.2	4.87
Point 8A	**7-Jun-17**	20.7	8.9	23.0	5.04
Point 8B	**7-Jun-17**	18.3	10.3	21.7	4.96
Point 8C	**7-Jun-17**	18.3	10.4	21.7	4.95
Point 8D	**7-Jun-17**	18.3	9.8	21.7	4.97
Point 9	**7-Jun-17**	19.0	10.1	22.1	4.97
Point 10A	**7-Jun-17**	20.0	9.6	22.6	4.98
Point 10B	**7-Jun-17**	20.1	7.9	22.7	4.99
Point 11A	**7-Jun-17**	20.5	9.4	22.2	5.69
Point 11B	**7-Jun-17**	20.7	9.2	22.3	5.22
Point 11C	**7-Jun-17**	20.7	8.5	23.0	4.99
Point 12A	**7-Jun-17**	21.0	8.6	22.5	5.66
Point 12B	**7-Jun-17**	21.2	9.2	22.6	5.20
Point 12C	**7-Jun-17**	21.0	8.3	23.3	5.01

Parameters collected by GEMTEC.

Appendix J

Laboratory Analytical Sheets

11 Morris Drive, Unit 122
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TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: GEMTEC LIMITED
510 Topsail Rd #105
St. John's, NL A1E2C2
(709) 682-3770

ATTENTION TO: Darrol Rice

PROJECT: 80016.08

AGAT WORK ORDER: 17X225315

TRACE ORGANICS REVIEWED BY: Kelly Hogue, B.Sc, P.Chem, Operations Manager

WATER ANALYSIS REVIEWED BY: Laura Baker, Inorganics Data Reporter

DATE REPORTED: Jun 26, 2017

PAGES (INCLUDING COVER): 20

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-15

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
Benzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130		83	96	96	98	73	123	91	100
Isobutylbenzene - VPH	%	70-130		101	100	100	103	100	97	99	101
n-Dotriacontane - EPH	%	70-130		76	91	90	92	73	111	84	96

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-15

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
Benzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	0.008	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits							
Isobutylbenzene - EPH	%	70-130		94	98	92	96	93	97
Isobutylbenzene - VPH	%	70-130		104	100	98	96	102	100
n-Dotriacontane - EPH	%	70-130		88	92	88	89	89	92

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8463097-8463230 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By: Kelly Hogue

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Inorganic Chemistry (Water)

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-20

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
Total Cyanide	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
Total Cyanide	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulphide	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-13

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
Total Mercury	ug/L		0.026	<0.026	<0.026	0.029	<0.026	<0.026	<0.026	<0.026	0.034

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
Total Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-22

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
pH				4.88	4.43	4.33	5.89	4.94	7.35	5.41	4.98
Reactive Silica as SiO2	mg/L		0.5	3.2	3.0	2.5	0.8	2.0	3.9	5.4	2.2
Chloride	mg/L		1	4	4	3	5	4	5	8	5
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	<2	<2	<2	6	<2	2	11	<2
Alkalinity	mg/L		5	<5	<5	<5	<5	<5	34	<5	<5
True Color	TCU		5	251	249	259	83	120	58	22	120
Turbidity	NTU		0.1	2.1	2.4	1.6	3.4	2.0	2.2	2.2	1.1
Electrical Conductivity	umho/cm		1	32	33	30	42	26	93	81	26
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.14
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.14
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	0.05	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	26.2	26.9	25.2	11.4	10.0	7.1	5.2	9.5
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.47	<0.01
Total Sodium	mg/L		0.1	2.7	2.8	2.3	3.5	2.5	4.4	6.7	3.2
Total Potassium	mg/L		0.1	0.2	0.2	<0.1	0.4	0.3	0.8	0.7	0.3
Total Calcium	mg/L		0.1	0.5	0.5	0.5	2.8	0.5	11.4	4.8	0.6
Total Magnesium	mg/L		0.1	0.4	0.4	0.3	0.6	0.3	1.0	1.0	0.4
Bicarb. Alkalinity (as CaCO3)	mg/L		5	<5	<5	<5	<5	<5	34	<5	<5
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	9	9	8	19	8	46	34	12
Hardness	mg/L			2.9	2.9	2.5	9.5	2.5	32.6	16.1	3.1
Langelier Index (@20C)	NA			-6.22	-6.68	-6.77	-4.49	-6.16	-1.61	-4.75	-6.05
Langelier Index (@ 4C)	NA			-6.54	-7.00	-7.09	-4.81	-6.48	-1.93	-5.07	-6.37
Saturation pH (@ 20C)	NA			11.1	11.1	11.1	10.4	11.1	8.96	10.2	11.0
Saturation pH (@ 4C)	NA			11.4	11.4	11.4	10.7	11.4	9.28	10.5	11.4
Anion Sum	me/L			0.11	0.11	0.08	0.27	0.11	0.86	0.47	0.15
Cation sum	me/L			0.26	0.31	0.27	0.40	0.22	0.90	0.67	0.29

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-22

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
% Difference/ Ion Balance (NS)	%			39.8	46.0	51.6	20.6	31.4	2.1	17.4	32.0
Total Aluminum	ug/L		5	409	462	230	120	209	87	72	284
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L		2	<2	5	13	128	33	85	1610	288
Total Barium	ug/L		5	<5	<5	<5	<5	<5	<5	5	<5
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L		5	5	6	<5	7	5	12	9	<5
Total Cadmium	ug/L		0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.036	<0.017
Total Chromium	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1	2	<1
Total Copper	ug/L		1	<1	<1	<1	<1	<1	<1	2	<1
Total Iron	ug/L		50	593	765	1160	916	411	574	591	1140
Total Lead	ug/L		0.5	1.2	1.0	1.2	<0.5	<0.5	<0.5	<0.5	1.0
Total Manganese	ug/L		2	51	27	19	73	19	153	138	21
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	<2	4	<2
Total Phosphorous	mg/L		0.02	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.04
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	6	6	<5	19	5	87	27	6
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		2	5	6	3	<2	3	<2	<2	6
Total Uranium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Zinc	ug/L		5	<5	<5	30	5	<5	<5	17	<5

Certified By: Laura Baker

Results relate only to the items tested and to all the items tested

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FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-22

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
pH				4.78	4.87	6.53	7.49	5.54	4.37
Reactive Silica as SiO2	mg/L		0.5	2.1	2.1	3.2	1.4	1.9	2.7
Chloride	mg/L		1	4	5	4	6	11	4
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	<2	<2	<2	3	<2	<2
Alkalinity	mg/L		5	<5	<5	6	23	<5	<5
True Color	TCU		5	101	119	178	12	159	257
Turbidity	NTU		0.1	1.9	3.6	2.4	2.1	2.5	2.6
Electrical Conductivity	umho/cm		1	26	25	35	74	56	30
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.04	0.07	<0.03	<0.03	<0.03	0.03
Total Organic Carbon	mg/L		0.5	10.6	10.2	18.8	4.1	23.3	25.7
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	3.2	2.9	3.6	5.5	7.6	2.8
Total Potassium	mg/L		0.1	0.3	0.3	0.3	1.3	2.0	<0.1
Total Calcium	mg/L		0.1	0.5	0.4	3.4	7.0	0.8	0.5
Total Magnesium	mg/L		0.1	0.4	0.3	0.7	1.1	0.8	0.3
Bicarb. Alkalinity (as CaCO3)	mg/L		5	<5	<5	6	23	<5	<5
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	9	10	17	38	24	9
Hardness	mg/L			2.9	2.2	11.4	22.0	5.3	2.5
Langelier Index (@20C)	NA			-6.33	-6.33	-3.67	-1.85	-5.39	-6.74
Langelier Index (@ 4C)	NA			-6.64	-6.65	-3.99	-2.17	-5.71	-7.06
Saturation pH (@ 20C)	NA			11.1	11.2	10.2	9.34	10.9	11.1
Saturation pH (@ 4C)	NA			11.4	11.5	10.5	9.66	11.3	11.4
Anion Sum	me/L			0.11	0.14	0.23	0.69	0.31	0.11
Cation sum	me/L			0.27	0.24	0.46	0.73	0.58	0.29

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-22

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
% Difference/ Ion Balance (NS)	%			40.5	25.4	32.6	2.7	29.9	43.8
Total Aluminum	ug/L		5	245	238	351	24	434	276
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L		2	7	3	44	52	<2	15
Total Barium	ug/L		5	<5	<5	<5	<5	<5	<5
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L		5	<5	<5	6	11	13	<5
Total Cadmium	ug/L		0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
Total Chromium	ug/L		1	<1	<1	<1	<1	1	<1
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L		1	<1	<1	<1	<1	<1	<1
Total Iron	ug/L		50	410	372	740	323	963	1160
Total Lead	ug/L		0.5	<0.5	<0.5	0.5	<0.5	<0.5	1.1
Total Manganese	ug/L		2	18	17	26	29	70	18
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L		0.02	0.03	0.03	0.03	0.02	0.09	0.03
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	5	<5	25	74	7	<5
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		2	3	3	4	<2	8	4
Total Uranium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	<2
Total Zinc	ug/L		5	<5	<5	<5	53	7	<5

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8463097-8463128 The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

8463149-8463193 The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

8463220-8463230 The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

Certified By: Laura Baker

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Certificate of Analysis

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

CLIENT NAME: GEMTEC LIMITED

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

TKN

DATE RECEIVED: 2017-06-13

DATE REPORTED: 2017-06-14

		SAMPLE DESCRIPTION:		WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463097	8463098	8463108	8463118	8463128	8463139	8463149	8463159
Total Kjeldahl Nitrogen as N	mg/L		0.4	0.6	0.6	0.5	0.6	<0.4	<0.4	<0.4	<0.4

		SAMPLE DESCRIPTION:		WS9	WS10	WS11	WS12	MS1	Duplicate
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11	2017-06-11
Parameter	Unit	G / S	RDL	8463169	8463179	8463193	8463208	8463220	8463230
Total Kjeldahl Nitrogen as N	mg/L		0.4	<0.4	<0.4	0.5	0.4	0.6	0.5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Laura Baker

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Quality Assurance

CLIENT NAME: GEMTEC LIMITED

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	8461469	0.004	0.004	NA	< 0.001	92%	70%	130%	85%	70%	130%			
Toluene	1	8461469	< 0.001	< 0.001	NA	< 0.001	94%	70%	130%	88%	70%	130%			
Ethylbenzene	1	8461469	< 0.001	< 0.001	NA	< 0.001	95%	70%	130%	89%	70%	130%			
Xylene (Total)	1	8461469	< 0.002	< 0.002	NA	< 0.002	97%	70%	130%	93%	70%	130%			
C6-C10 (less BTEX)	1	8461469	0.03	0.03	NA	< 0.01	99%	70%	130%	102%	70%	130%	127%	70%	130%
>C10-C16 Hydrocarbons	1	8461469	< 0.05	< 0.05	NA	< 0.05	118%	70%	130%	104%	70%	130%	94%	70%	130%
>C16-C21 Hydrocarbons	1	8461469	< 0.10	< 0.10	NA	< 0.10	119%	70%	130%	104%	70%	130%	94%	70%	130%
>C21-C32 Hydrocarbons	1	8461469	< 0.1	< 0.1	NA	< 0.1	108%	70%	130%	104%	70%	130%	94%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By: Kelly Hogue

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Quality Assurance

CLIENT NAME: GEMTEC LIMITED
PROJECT: 80016.08
SAMPLING SITE:

AGAT WORK ORDER: 17X225315
ATTENTION TO: Darrol Rice
SAMPLED BY:

Water Analysis

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals															
pH	8462619		7.08	6.95	1.9%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	8460077	5.3	5.5	3.7%	< 0.5	92%	80%	120%		80%	120%	88%	80%	120%
Chloride	8483138		31	31	0.2%	< 1	98%	80%	120%	104%	80%	120%	NA	80%	120%
Alkalinity	8462619		<5	<5	NA	< 5	87%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	1	8462619	<5	<5	NA	< 5	90%	80%	120%		80%	120%		80%	120%
Turbidity	1	8463230	2.6	2.5	3.9%	< 0.1	104%	80%	120%		80%	120%		80%	120%
Electrical Conductivity	8462619		75	74	1.0%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Ammonia as N	1	8460077	0.04	0.04	NA	< 0.03	104%	80%	120%		80%	120%	94%	80%	120%
Total Organic Carbon	1	8463097	26.2	25.8	1.5%	< 0.5	109%	80%	120%		80%	120%	116%	80%	120%
Ortho-Phosphate as P	1	8460077	<0.01	<0.01	NA	< 0.01	89%	80%	120%		80%	120%	98%	80%	120%
Total Sodium	8463139	8463139	4.4	4.3	1.7%	< 0.1	101%	80%	120%	101%	80%	120%	NA	70%	130%
Total Potassium	8463139	8463139	0.8	0.8	3.5%	< 0.1	103%	80%	120%	102%	80%	120%	106%	70%	130%
Total Calcium	8463139	8463139	11.7	11.3	3.0%	< 0.1	100%	80%	120%	100%	80%	120%	NA	70%	130%
Total Magnesium	8463139	8463139	1.0	1.1	0.5%	< 0.1	100%	80%	120%	99%	80%	120%	NA	80%	120%
Bicarb. Alkalinity (as CaCO3)	8462619		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	8462619		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	8462619		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Total Aluminum	8463139	8463139	87	88	1.3%	< 5	99%	80%	120%	102%	80%	120%	105%	70%	130%
Total Antimony	8463139	8463139	<2	<2	NA	< 2	96%	80%	120%	88%	80%	120%	95%	70%	130%
Total Arsenic	8463139	8463139	85	87	2.5%	< 2	97%	80%	120%	92%	80%	120%	NA	70%	130%
Total Barium	8463139	8463139	<5	<5	NA	< 5	96%	80%	120%	102%	80%	120%	104%	70%	130%
Total Beryllium	8463139	8463139	<2	<2	NA	< 2	103%	80%	120%	105%	80%	120%	98%	70%	130%
Total Bismuth	8463139	8463139	<2	<2	NA	< 2	112%	80%	120%	118%	80%	120%	118%	70%	130%
Total Boron	8463139	8463139	12	11	NA	< 5	97%	80%	120%	98%	80%	120%	101%	70%	130%
Total Cadmium	8463139	8463139	<0.017	<0.017	NA	< 0.017	99%	80%	120%	97%	80%	120%	98%	70%	130%
Total Chromium	8463139	8463139	<1	<1	NA	< 1	96%	80%	120%	95%	80%	120%	111%	70%	130%
Total Cobalt	8463139	8463139	<1	<1	NA	< 1	106%	80%	120%	106%	80%	120%	122%	70%	130%
Total Copper	8463139	8463139	<1	<1	NA	< 1	106%	80%	120%	105%	80%	120%	119%	70%	130%
Total Iron	8463139	8463139	574	580	1.0%	< 50	98%	80%	120%	100%	80%	120%	NA	70%	130%
Total Lead	8463139	8463139	<0.5	<0.5	NA	< 0.5	118%	80%	120%	119%	80%	120%	124%	70%	130%
Total Manganese	8463139	8463139	153	148	3.1%	< 2	98%	80%	120%	98%	80%	120%	NA	70%	130%
Total Molybdenum	8463139	8463139	<2	<2	NA	< 2	99%	80%	120%	98%	80%	120%	114%	70%	130%
Total Nickel	8463139	8463139	<2	<2	NA	< 2	102%	80%	120%	104%	80%	120%	117%	70%	130%
Total Phosphorous	8463139	8463139	0.03	0.03	NA	< 0.02	88%	80%	120%	96%	80%	120%	107%	70%	130%
Total Selenium	8463139	8463139	<1	<1	NA	< 1	98%	80%	120%	96%	80%	120%	91%	70%	130%
Total Silver	8463139		< 0.1	< 0.1	0.0%	< 0.1	104%	80%	120%	101%	80%	120%	112%	70%	130%
Total Strontium	8463139	8463139	87	86	2.1%	< 5	98%	80%	120%	96%	80%	120%	NA	70%	130%
Total Thallium	8463139	8463139	<0.1	<0.1	NA	< 0.1	108%	80%	120%	112%	80%	120%	120%	70%	130%
Total Tin	8463139	8463139	<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	104%	70%	130%

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Quality Assurance

CLIENT NAME: GEMTEC LIMITED
AGAT WORK ORDER: 17X225315
PROJECT: 80016.08
ATTENTION TO: Darrol Rice
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Titanium	8463139	8463139	<2	<2	NA	< 2	100%	80%	120%	103%	80%	120%	111%	70%	130%
Total Uranium	8463139	8463139	<0.1	<0.1	NA	< 0.1	107%	80%	120%	107%	80%	120%	118%	70%	130%
Total Vanadium	8463139	8463139	<2	<2	NA	< 2	93%	80%	120%	92%	80%	120%	111%	70%	130%
Total Zinc	8463139	8463139	<5	<5	NA	< 5	108%	80%	120%	109%	80%	120%	110%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Total)															
Total Mercury	1	8463097	<0.026	<0.026	NA	< 0.026	96%	80%	120%		80%	120%	97%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
TKN															
Total Kjeldahl Nitrogen as N	1	8463097	0.6	0.5	NA	< 0.4	101%	80%	120%		80%	120%	108%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Total Metals															
Total Sodium	8463683		69.3	65.7	5.3%	< 0.1	105%	80%	120%	113%	80%	120%	NA	70%	130%
Total Potassium	8463683		<0.1	<0.1	NA	< 0.1	110%	80%	120%	113%	80%	120%	90%	70%	130%
Total Calcium	8463683		0.3	0.3	NA	< 0.1	111%	80%	120%	111%	80%	120%	92%	70%	130%
Total Magnesium	8463683		<0.1	<0.1	NA	< 0.1	105%	80%	120%	108%	80%	120%	89%	80%	120%
Total Aluminum	8463683		6	<5	NA	< 5	107%	80%	120%	107%	80%	120%	91%	70%	130%
Total Antimony	8463683		<2	<2	NA	< 2	106%	80%	120%	100%	80%	120%	95%	70%	130%
Total Arsenic	8463683		<2	<2	NA	< 2	100%	80%	120%	102%	80%	120%	129%	70%	130%
Total Barium	8463683		<5	<5	NA	< 5	100%	80%	120%	102%	80%	120%	102%	70%	130%
Total Beryllium	8463683		<2	<2	NA	< 2	102%	80%	120%	108%	80%	120%	102%	70%	130%
Total Bismuth	8463683		<2	<2	NA	< 2	106%	80%	120%	107%	80%	120%	101%	70%	130%
Total Boron	8463683		13	13	NA	< 5	105%	80%	120%	97%	80%	120%	102%	70%	130%
Total Cadmium	8463683		<0.017	<0.017	NA	< 0.017	97%	80%	120%	100%	80%	120%	124%	70%	130%
Total Chromium	8463683		<1	<1	NA	< 1	103%	80%	120%	102%	80%	120%	97%	70%	130%
Total Cobalt	8463683		<1	<1	NA	< 1	103%	80%	120%	102%	80%	120%	126%	70%	130%
Total Copper	8463683		17	16	5.8%	< 1	100%	80%	120%	100%	80%	120%	NA	70%	130%
Total Iron	8463683		57	54	NA	< 50	99%	80%	120%	98%	80%	120%	113%	70%	130%
Total Lead	8463683		1.9	1.8	NA	< 0.5	115%	80%	120%	116%	80%	120%	111%	70%	130%
Total Manganese	8463683		<2	<2	NA	< 2	100%	80%	120%	99%	80%	120%	123%	70%	130%
Total Molybdenum	8463683		<2	<2	NA	< 2	101%	80%	120%	101%	80%	120%	105%	70%	130%
Total Nickel	8463683		<2	<2	NA	< 2	104%	80%	120%	103%	80%	120%	128%	70%	130%
Total Phosphorous	8463683		0.05	0.04	NA	< 0.02	100%	80%	120%	110%	80%	120%	87%	70%	130%
Total Selenium	8463683		<1	<1	NA	< 1	101%	80%	120%	103%	80%	120%	94%	70%	130%
Total Silver	8463683		<0.1	<0.1	NA	< 0.1	98%	80%	120%	101%	80%	120%	120%	70%	130%
Total Strontium	8463683		<5	<5	NA	< 5	99%	80%	120%	99%	80%	120%	128%	70%	130%
Total Thallium	8463683		<0.1	<0.1	NA	< 0.1	107%	80%	120%	111%	80%	120%	108%	70%	130%

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GEMTEC LIMITED

AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

ATTENTION TO: Darrol Rice

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Tin	8463683		<2	<2	NA	< 2	102%	80%	120%	101%	80%	120%	111%	70%	130%
Total Titanium	8463683		<2	<2	NA	< 2	99%	80%	120%	106%	80%	120%	127%	70%	130%
Total Uranium	8463683		<0.1	<0.1	NA	< 0.1	102%	80%	120%	102%	80%	120%	108%	70%	130%
Total Vanadium	8463683		<2	<2	NA	< 2	97%	80%	120%	101%	80%	120%	122%	70%	130%
Total Zinc	8463683		13	12	NA	< 5	101%	80%	120%	97%	80%	120%	120%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Inorganic Chemistry (Water)															
Total Cyanide	8473499		<0.002	<0.002	NA	< 0.002	100%	80%	120%	101%	90%	110%	110%	70%	130%
Sulphide	8463097	8463097	<0.05	<0.05	NA	< 0.05	99%	80%	120%	100%	85%	115%	100%	70%	130%

Certified By:

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
>C10-C16 Hydrocarbons	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Resemblance Comment	ORG-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	VOL-120-5007	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID

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AGAT WORK ORDER: 17X225315

PROJECT: 80016.08

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Cyanide	INOR-93-6051	MOE 3015 & SM 4500 CN- A,B,C	TECHNICON AUTO ANALYZER
Sulphide	INOR-93-6054	SM 4500 S2- D	SPECTROPHOTOMETER
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC-TITRATE
Reactive Silica as SiO2	INORG-121-6028	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	IC
Fluoride	INORG-121-6005	SM 4110 B	IC
Sulphate	INORG-121-6005	SM 4110 B	IC
Alkalinity	INORG-121-6001	SM 2320 B	PC-TITRATE
True Color	INORG-121-6014	EPA 110.2	NEPHELOMETER
Turbidity	INORG-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC-TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	IC
Nitrite as N	INORG-121-6005	SM 4110 B	IC
Ammonia as N	INORG-121-6003	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INORG-121-6005	SM 4110 B	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Calcium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Magnesium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC-TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC-TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance (NS)	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Arsenic	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Barium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Beryllium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Bismuth	MET121-6104 & MET-121-6105	SM 3125	ICP/MS

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PROJECT: 80016.08

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SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Boron	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Cadmium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Chromium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Cobalt	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Copper	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Iron	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Lead	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Manganese	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Molybdenum	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Nickel	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Phosphorous	MET-121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Selenium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Silver	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Strontium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Thallium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Tin	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Titanium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Uranium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Vanadium	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Zinc	MET121-6104 & MET-121-6105	SM 3125	ICP/MS
Total Kjeldahl Nitrogen as N	INOR-121-6020	SM 4500 NORG D	COLORIMETER

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Chain of Custody Record

Laboratory Use Only

Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 4°
Hold Time:
AGAT Job Number: 17X 225315
Notes:

Report Information

Company: Gemtec Ltd.
Contact: Darrol Rice
Address: 191 Doak Rd., Fredericton, NB, E3C 2E6
Phone: 506-453-1025 Fax:
Client Project #: 80016.08
AGAT Quotation: 17-171452
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):

1. Name: Darrol Rice
   Email: darrol.rice@gemtec.ca
2. Name: Jennifer Hachey
   Email: jennifer.hachey@gemtec.ca

Report Format

☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included
☐ Export

Turnaround Time Required (TAT)

Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐

Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial
☐ Res/Park ☐ HRM 101
☐ Agricultural ☐ Storm Water
☐ FWAL ☐ Waste Water
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☑ No **Salt Water Sample** ☐ Yes ☑ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Sulfide	Other: Cyanide	Hazardous (Y/N)
WS1	June 11/17	Water			✓	✓	✓	✓				✓			✓											✓	✓	
WS2	↓	↓			✓	✓	✓	✓				✓			✓											✓	✓	
WS3					✓	✓	✓	✓				✓			✓											✓	✓	
WS4					✓	✓	✓	✓				✓			✓											✓	✓	
WS5					✓	✓	✓	✓				✓			✓											✓	✓	
WS6					✓	✓	✓	✓				✓			✓											✓	✓	
WS7					✓	✓	✓	✓				✓			✓											✓	✓	
WS8					✓	✓	✓	✓				✓			✓											✓	✓	
WS9					✓	✓	✓	✓				✓			✓											✓	✓	
WS10					✓	✓	✓	✓				✓			✓											✓	✓	
WS11					✓	✓	✓	✓				✓			✓											✓	✓	
WS12	June 11/17	Water			✓	✓	✓	✓				✓			✓											✓	✓	

Samples Relinquished By (Print Name):	Date/Time	Samples Received By (Print Name):	Date/Time
Jenna McCay	June 12/1:20	TMacDonald	08:40
Samples Relinquished By (Sign):	**Date/Time**	**Samples Received By (Sign):**	**Date/Time**
Jenna McCay	June 12/1:20		13-JUN

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

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N°: 57131