Table - 01: Summary of Aquatic Habitats Assessed in Project Area, 2011-2012

Location ID	UTM (NAD83, 14U)		Dates of Investigation	Water Physiochemistry			Morphology			Substrate	Cover (%)						
	Northing	Easting		Water Temp. (°C)	pH	Cond. (µS/cm)	Channel Width (m)	Wetted Width (m)	Water Depth (m)		SWD	LWD	OHV	UCB	IV	Bo	Co
LR01*	6080710	427784	04-Jun-11	6.58	7.45	161	5.0	5.0	0.5	Or	10	0	0	10	0	0	0
LR02*	6080558	428726	04-Jun-11	4.44	6.83	293	0.5 - 1.75	0.5 - 1.75	0.32	Or	10	0	10	10	0	0	0
PL01	6079644	429637	3-Jun-11, 19-Oct-11	-	-	-	1.5	5.0	0.3	Or	5	0	5	0	10	0	0
LP01	6079593	429653	20-Jun-12	12	7.32	175	0.52	0.52	0.2	Or	10	0	20	0	0	0	
RB01	6078705	429230	3-Jun-11, 20-Jun-12	dry	dry	dry	dry	dry	-	Or	0	0	0	0	0	0	0
RB02*	6078695	429705	3-Jun-11, 20-Jun-12	13.8	7.45	98	7.0	5.0	1	Or	20	0	5	0	20	0	0
RB03*	6078839	430451	3-Jun-11, 19-Oct-11, 20-Jun-12	12.7	7.14	60	3.0 - 5.0	3.0 - 5.0	1.5	Or	20	0	10	5	0	0	0
RB04	6078774	430660	3-Jun-11, 19-Oct-11, 20-Jun-12	8	7.47	215	2.5	2.5	1	Or	10	0	20	0	0	0	0
RB05	6078575	431295	3-Jun-11, 19-Oct-11, 20-Jun-12	10	7.28	108	0.2 - 0.25	0.2 - 0.25	0.2	Or	20	0	50	0	0	0	0
RB06	6078345	431746	3-Jun-11, 19-Oct-11, 20-Jun-12	13.3	7.12	36	2.0 - 2.5	2.0 - 2.5	1	Or	50	0	20	0	0	0	0
RB07*	6078280	432437	3-Jun-11, 19-Oct-11, 20-Jun-12	6.7	7.14	222	0.5 - 1.75	0.5 - 1.75	0.32	Or	0	5	30	0	0	0	0
RB08	6078152	432753	19-Oct-11, 20-Jun-12	dry	dry	dry	dry	dry	-	Or	0	0	0	0	0	0	0
RB09	6078054	433070	3-Jun-11, 19-Oct-11, 20-Jun-12	8.1	6.72	56	1.0 - 1.5	1.0 - 1.5	0.29	Or	20	0	30	0	0	0	0
RB10	6078044	433334	3-Jun-11, 19-Oct-11, 20-Jun-12	6.9	6.58	35	0.2 - 0.8	0.2 - 0.8	0.15	Or	20	0	0	0	0	0	0
RB11	6078018	433502	3-Jun-11, 19-Oct-11, 20-Jun-12	dry	dry	dry	dry	dry	-	Or	-	-	-	-	-	0	0
RB12	6077999	434227	3-Jun-11, 19-Oct-11, 20-Jun-12	11.3	6.81	46	2.4	2.4	0.7	Or	15	5	10	0	5	0	0
RB13	6078089	434336	3-Jun-11, 19-Oct-11, 20-Jun-12	8.2	6.86	96	0.4 - 1.3	0.4 - 1.3	0.25	Or	30	10	20	0	0	0	0
RB14	6078142	434414	3-Jun-11, 19-Oct-11, 20-Jun-12	7.7	7.28	101	1.5	1.5	0.25	Or	30	5	10	0	0	0	0
RB15*	6078916	435053	3-Jun-11, 19-Oct-11, 20-Jun-12	9	7.53	339	3	0.5 - 1.5	0.25	Or	30	0	30	0	0	0	0
RB16*	6079369	435448	3-Jun-11, 19-Oct-11	16.1	7.82	136	1.0 - 5.0	1.0 - 5.0	1	Or	10	30	5	0	20	0	0
RB17	6078616	434842	3-Jun-11, 19-Oct-11	frozen	frozen	frozen	0.5	0.5	0.25	Or	40	5	20	0	0	0	0
AD02*	6079726	437077	20-Jun-12	6.7	7.75	306	5	0.25 - 2.00	0.02 - 0.5	Si, Sa, Or	5	5	0	10	0	0	0
AD03*	6080094	439068	20-Jun-12	15.6	7.46	223	5	5	0.26	Or	5	5	5	0	5	0	0
Existing pumphouse	6079923	434156	02-Jun-11	11.6	8.3	126	n/a	n/a	n/a	Bd, Bo, blast rock	0	0	0	0	0	5	0
Alternate pumphouse	6082487	429346	02-Jun-11	13.3	8.4	105	n/a	n/a	n/a	Bd, Bo	0	10	20	0	0	5	0
HWYAN*	6077613	439109	04-Jun-11	11.96	7.55	543	1.5	1.5	0.34 - 1.5	Or	5	0	10	5	5	0	0

Notes:
** Site card created*
Measurements collected at first date of investigation, except for RB17.
Water Temp. (°C) = water temperature in degrees Celsius; Cond. (µS/cm) = specific conductance in microSiemens per centimetre; m = metre; Or = organic; SWD = small woody debris; LWD = large woody debris; OHV = overhanging vegetation; UCB = undercut banks; IV = instream vegetation; Bo = boulder; - = not applicable; buried = culvert overgrown or covered with rocks, detritus or vegetation, preventing access.

Table - 01: Summary of Aquatic Habitats Assessed in Project Area, 2011-2012

Location ID	Culvert							Comments
	Number	Diameter (m)	Downstream Water Depth (m)	Upstream Water Depth (m)	Embedded?	Perched?	Overgrown?	
LR01*	2	0.9	0.06	0.11	No	Yes	No	
LR02*	1	0.6	0.04	0.05	No	Yes	No	
PL01	-	-	-	-	-	-	-	Ghost Creek crossing under the powerlines.
LP01	-	-	-	-	-	-	-	Located in the wooded area to the west of the powerline clearing.
RB01	1	0.77	dry	dry	No	Yes	No	
RB02*	2	1.63	0.24	0.25	No	Yes	No	
RB03*	2	1.95	1.56	1.5	-	Yes	No	
RB04	1	Buried	-	-	Yes	-	Yes	
RB05	1	0.8	0.06	0.2	No	Yes	No	
RB06	1	0.7	1	1	Yes	-	No	Water over the culverts; no flow.
RB07*	1	0.86	0.2	Buried	Yes	No	Yes	
RB08	1	0.75	dry	dry	Yes	No	Yes	
RB09	1	0.56	0.14	Buried	Yes	No	Yes	
RB10	1	0.6	0.33	0.24	Yes	No	Yes	
RB11	1	0.62	dry	dry	-	-	No	
RB12	1	0.8	0.5	0.38	Yes	Yes	Yes	
RB13	1	0.6	0.12	0.06	Yes	No	No	
RB14	1	0.55	0.38	0.3	Yes	-	Yes	
RB15*	-	-	-	-	-	-	No	Beaver impoundment.
RB16*	1	0.95	-	-	-	-	Yes	Beaver impoundment on north side of road. Culvert observed in October on south side of road, buried or underwater on the north side of the road.
RB17	1	0.7	frozen	frozen	Yes	-	Yes	No defined channel.
AD02*	1	0.9	0.02 - 0.5	0.02 - 0.5	Yes	No	No	Larger culvert ~150m upstream. Anderson TIA ~25m downstream of lower set of culverts.
	2	0.60, 0.40	0.02 - 0.5	0.02 - 0.5	Yes	No	Yes	
AD03*	-	-	-	-	-	-	-	
Existing pumphouse	0	-	-	-	-	-	-	Adjacent shoreline cover is composed of large woody debris, boulder, overhanging vegetation; at pumphouse location cover is composed of boulder, large woody debris. Steep shore.
Alternate pumphouse	0	-	-	-	-	-	-	Steep shore. Tern Creek inflow nearby.
HWYAN*	1	1.2	0.8	0.65	Yes	No	No	

Notes:
** Site card created*
Measurements collected at first date of investigation, except for RB17.
Water Temp. (°C) = water temperature in degrees Celsius; Cond. (µS/cm) = specific conductance in microSiemens per centimetre; m = metre; Or = organic; SWD = small woody debris; LWD = large woody debris; OHV = overhanging vegetation; UCB = undercut banks; IV = instream vegetation; Bo = boulder; - = not applicable; buried = culvert overgrown or covered with rocks, detritus or vegetation, preventing access.

Stream Assessment - Site Card # LR01

Assessment Date: June 4, 2011

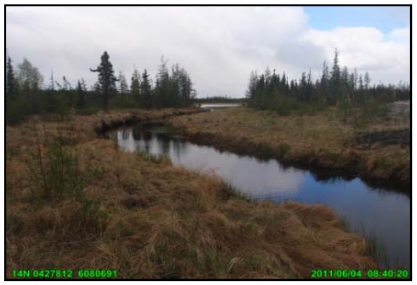

Photo 1: Stream crossing LR01, looking south with Tern Ditch in the background

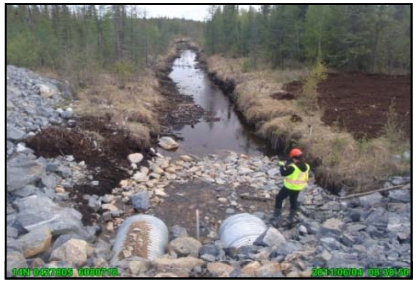

Photo 2: Stream crossing LR01, looking north

Photo 3: Stream crossing LR01, looking south

Location

Crossing # LR01
Watercourse Name Tern Ditch
UTM 14U 6080710 N 427784 E

Site Description

Upstream Waterbody: Tern Ditch Pond

Downstream Waterbody: Snow Lake

Channel Width: 5 m

Wetted Width: 5 m

Water Depth: 0.5 m

Pattern: Straight

Characterization: Perennial

Crown Cover: 0%

Substrate Type and Composition:

Organic	100%

Cover Type and Composition:

SWD	10%
UCB	10%

Morphology: Flat 100%

Culvert	Downstream	Upstream
Diameter (m):	0.9	0.9
Water Depth (m):	0.06	0.11
Embedded:	No	No
Perched (m):	0.16	0.2

Number: 2

Water Quality:

Temp. (˚C)	6.58
pH	7.45
Cond (µS/cm)	161
Turbidity	Clear

Surrounding Vegetation:
Upland vegetation includes grasses and mixed forest interspersed with wetland areas.

Unique Features:
The channel has 1 m vertical banks and therefore no riparian habitat.

Summary:
On the south side of the road, the channel opens into waterbody known to support forage fish. The channel itself was found to support forage fish but with little habitat or cover it is unlikely to support anything larger.

Fishing Effort: Minnow traps, Backpack electrofishing
Species: Brook Stickleback

Assessment

Fish Use

Spawning: Poor due to lack of suitable substrate for large-bodied fish but may provide limited habitat for forage species.

Migration: Marginal due good connectivity to upstream habitat but low water levels may impeded passage.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to bottom.

Aquatic Habitat Sensitivity

Low

This stream is moderately susceptible to erosion and downstream sedimentation due to the soft substrate and erodible banks. However, the entire stream substrate is composed of fines, therefore, moderate downstream sedimentation would have little effect on fish habitat.

Aquatic Habitat Value

Marginal

The cover and water depth may provide habitat for small-bodied species. Fish utilization of the creek is limited by low water levels and fish passage through a perched culvert.

Note: N/A = Not Applicable

Stream Assessment - Site Card # LR02

Assessment Date: June 4, 2011

Location

Crossing # LR02 **Watercourse Name** N/A
UTM 14U 6080558 N 428726 E

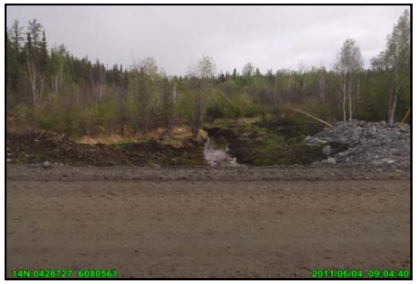

Photo 1: Stream crossing LR02, looking north

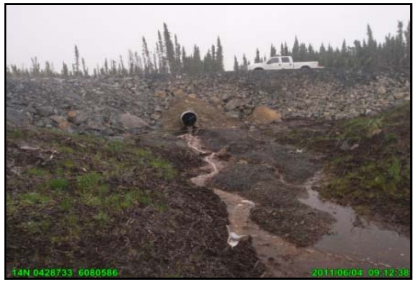

Photo 2: Stream crossing LR02, looking south.

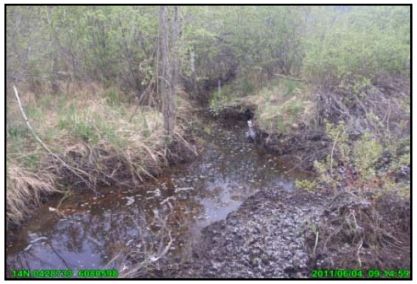

Photo 3: Stream crossing LR02, looking north

Site Description

Upstream Waterbody: None

Downstream Waterbody: None

Channel Width: 0.5 - 1.75 m

Wetted Width: 0.5 - 1.75 m

Water Depth: 0.32 m

Pattern: Meandering

Characterization: Perennial

Crown Cover: 30%

Substrate Type and Composition:

Organic	100%

Cover Type and Composition:

OHV	10%
SWD	10%
UCB	10%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	0.60	0.60
Water Depth (m):	0.04	0.05
Embedded:	No	No
Perched (m):	0.40	0.20

Number: 1

Water Quality:

Temp. (˚C)	4.44
pH	6.83
Cond (µS/cm)	293
Turbidity	Clear

Surrounding Vegetation:
Upland vegetation was a mix of deciduous trees, shrubs and grasses on the downstream (north) side. The upstream upland was more mature and consisted of deciduous and coniferous trees.

Unique Features:
A white gelatinous material coated the bottom of the stream that ran over gravel near the culvert. It is suspected this material is flocculant used to remove suspended particles from suspension. There is a quarry approximately 300 m from the wetland area on the downstream (north) channel.

Summary:
It appears that the culvert installation has provided a channel for wetland or saturated lowlands to drain. There is little flow throught the culvert from standing water. The downstream channel meanders, becomes braided and disipates into wetland area.

Fishing Effort: None

Species: N/A

Assessment

Fish Use

Spawning: Poor due to lack of suitable substrate.

Migration: Poor due to lack of connectivity.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

Substrate is susceptible to supension however low velocities and water levels would minimize the downstream transport of sediments.

Aquatic Habitat Value

No Fish Habitat

There is poor connectivity to fish bearing water ways; shallow water that would freeze to the bottom in winter and potential passages (such as beaver dams) would impeded fish passage.

Note: N/A = Not Applicable; OHV = overhanging vegetation; SWD = small woody debris; UCB = undercut bank.

Stream Assessment - Site Card # RB02

Assessment Date: June 3, 2011

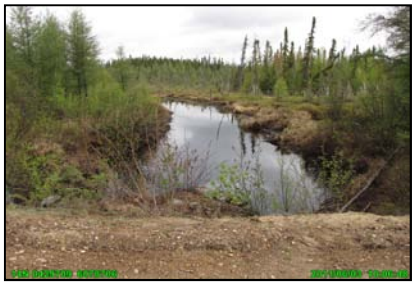

Photo 1: Stream crossing RB02, looking north

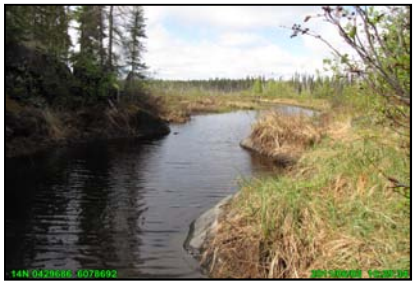

Photo 2: Stream crossing RB02, looking south.

Photo 3: Stream crossing RB02, looking south

Location

Crossing # RB02
UTM 14U 6078695 N 429705 E
Watercourse Name Ghost Creek

Site Description

Upstream Waterbody: Ghost Lake

Downstream Waterbody: Tern Lake

Channel Width: 7 m

Wetted Width: 5 m

Water Depth: ~ 1 m

Pattern: Sinuous

Characterization: Perennial

Crown Cover: 0%

Substrate Type and Composition:

Organic	

Cover Type and Composition:

SWD	20%
OHV	5%
IV	20%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	1.63	1.63
Water Depth (m):	0.24	0.24
Embedded:	No	No
Perched (m):	~ 0.05	~ 0.05

Number: 2

Water Quality:

Temp. (˚C)	13.8
pH	7.45
Cond (µS/cm)	98
Turbidity	Tea coloured

Surrounding Vegetation:
Grass and shrubs in the riparian zone with mixed forest of aspen, spruce and moss on the banks.

Unique Features:
This is an engineered channel.

Summary:
Water was stagnant in and around the culverts. The current channel appears to be a diversion from the main channel to faciliate development of the rail bed. The channel provides ubiquitous, uniform habitat.

Fishing Effort: Minnow traps

Species: Brook Stickleback

Assessment

Fish Use

Spawning: Poor due to lack of suitable substrate.

Migration: Moderate due to good connectivity to upstream habitat but shallow water at times

Rearing: Poor due to lack of cover and suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish

Aquatic Habitat Sensitivity

Low

Substrate is susceptible to suspension however, low velocities would minimize the downstream transport of sediments. The entire stream substrate is composed of fines, therefore, moderate downstream sedimention would have little effect on fish habitat.

Aquatic Habitat Value

Marginal

The limited cover and water depth may provide habitat for small-bodied species but it is unlikely that large bodied species utilize this waterway.

Note: SWD = small woody debris; OHV = overhanging vegetation; IV = instream vegetation.

Stream Assessment - Site Card # RB03

Assessment Date: June 3, 2011

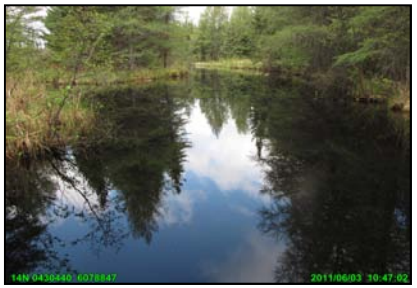

Figure 1: Stream crossing LR02, looking north

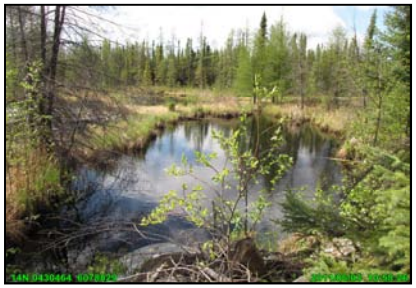

Figure 2: Stream crossing LR02, looking south.

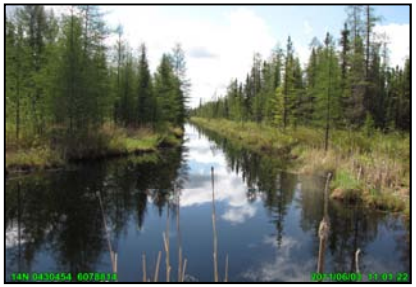

Figure 3: Stream crossing LR02, looking south.

Location

Crossing # RB03
UTM 14U 6078839 N 430451 E
Watercourse Name Threehouse Creek

Site Description

Upstream Waterbody: Threehouse Lake

Downstream Waterbody: Arm Lake

Channel Width: 3-5 m

Wetted Width: 3-5 m

Water Depth: 1.5 m

Pattern: Straight

Characterization: Perennial

Crown Cover: 10%

Substrate Type and Composition:

Organic	100%

Cover Type and Composition:

SWD	20%
OHV	10%
UCB	5%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	1.95	1.95
Water Depth (m):	1.56	1.5
Embedded:	No	No
Perched (m):	0.05	0.05

Number: 2

Water Quality*:

Temp. (˚C)	12.7
pH	7.14
Cond (µS/cm)	60
Turbidity	Tea-coloured

*Taken June 3, ice covered Oct 19

Surrounding Vegetation:
Riparian vegetation consists of grasses and shrubs. There are some wetland areas. Upland vegetation is mature coniferous forest with some deciduous trees but little undergrowth.

Unique Features:
There is a parking or turnaround area on the south side of the road next to the creek. On the south side there is a pool 5 m by 5 m that is seperated from the channel leading to Threehouse Creek by a grown over beaver dam. There are two runs that may provide passage for fish and water during high water periods. This is an engineered channel

Summary:
The creek is a uniform channel with organic substrate and little cover on either side of the roadway. The channel leading to Threehouse Lake is a straight channel 3 m wide and 2 m deep.

Fishing Effort: Minnow traps

Species: Brook Stickleback

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate.

Migration: Good due to connectivity to upstream habitat.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

This stream is moderately susceptible to erosion and downstream sedimentation due to the soft substrate and erodible banks. However, the entire stream substrate is composed of organic fines, therefore, moderate downstream sedimentation would have little effect on fish habitat.

Aquatic Habitat Value

Marginal

The limited cover and water depth may provide habitat for small-bodied species but it is unlikely that large-bodied species utlize this waterway.

Note: N/A = Not Applicable, SWD = small woody debris, OHV = overhanging vegetation, UCB = undercut bank

Stream Assessment - Site Card # RB07

Assessment Date: June 3, 2011

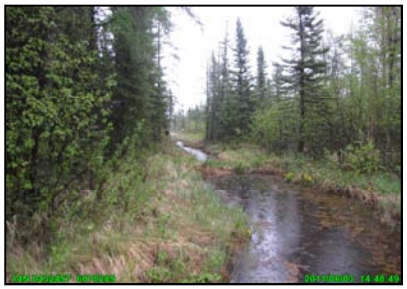

Figure 1: Stream crossing RB07, looking north

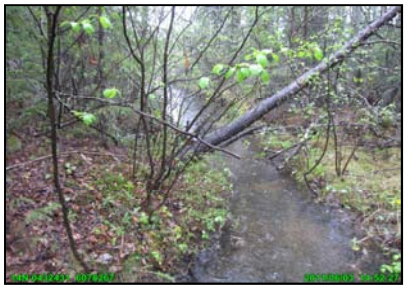

Figure 2: Stream crossing RB07, looking east, the channel follows the road until dispersing into wetland.

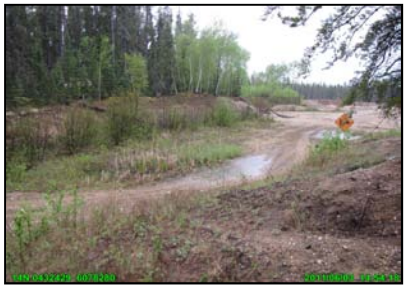

Figure 3: Stream crossing RB07 looking southwest with some water bypassing the partially blocked culvert and crossing the road.

Location

Crossing # RB07
UTM 14U 6078280 N 432437 E
Watercourse Name Gaspard Creek

Site Description

Upstream Waterbody: None

Downstream Waterbody: Gaspard Lake

Channel Width: 0.5 - 1.75 m

Wetted Width: 0.5 - 1.75 m

Water Depth: 0.32 m

Pattern: Straight

Characterization: Perennial

Crown Cover: 10%

Substrate Type and Composition:

Organic	100%

Cover Type and Composition:

LWD	5%
OHV	30%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	0.86	0.86
Water Depth (m):	0.2	N/A
Embedded:	Yes	Yes
Perched (m):	No	No

Number: 1

Water Quality*:

Temp. (˚C)	6.7
pH	7.14
Cond (µS/cm)	222
Turbidity	Clear

*Taken June 3, ice covered Oct 19

Surrounding Vegetation:
Riparian vegetation is dominated by grasses and deciduous shrubs. Upland vegetation is coniferous forest on the north side and a gradual transition into wetland on the south.

Unique Features:
The channel is just west of a sand pit area. The road elevation increases about 2.5-3 m with the culvert at the edge of this transition. As such, some water bypasses the culvert and flows across the low lying area of the road. The channel is used as a snowmobile trail in winter. The culvert on the south side of the road is no longer connected to the channel due to earth build up infront of the opening.

Summary:
The channel to Gaspard Lake is very uniform in cover and substrate. On the south side of the road the channel follows the road until dispersing into wetland.

Fishing Effort: None

Species: N/A

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate.

Migration: Good due to connectivity to upstream wetland.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

This stream is moderately susceptible to erosion and downstream sedimentation due to the soft substrate and erodible banks. However, the entire stream substrate is composed of organic fines, therefore, moderate downstream sedimentation would have little effect on fish habitat.

Aquatic Habitat Value

No Fish Habitat

The limited cover and water depth and lack of connection to Gaspard Lake prevent fish from utlizing this waterway.

Note: N/A = Not Applicable, LWD = large woody debris, OHV = overhanging vegetation

Stream Assessment - Site Card # RB15

Assessment Date: June 3, 2011

Location

Crossing # RB15 **Watercourse Name** Unnamed Creek 1

UTM 14U 6078916 N 435053 E

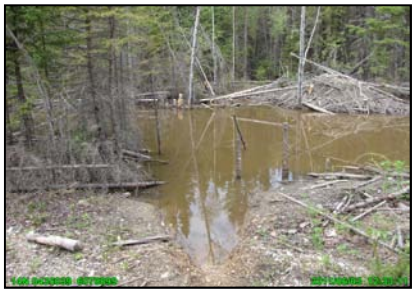

Figure 1: Stream crossing RB15 looking north into beaver impoundment.

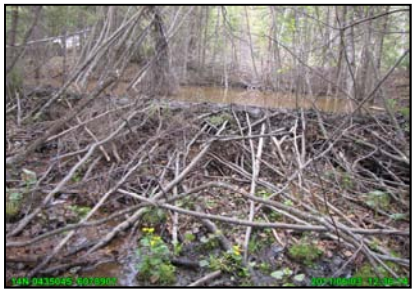

Figure 2: Stream crossing RB15, looking north with road in the background.

Figure 3: Stream crossing RB15 looking south.

Site Description

Upstream Waterbody: None

Downstream Waterbody: None

Channel Width: 0.5 - 1.5 m

Wetted Width: 0.5 - 1.5 m

Water Depth: 0.25 m

Pattern: Sinuous

Characterization: Intermittent

Crown Cover: 90%

Substrate Type and Composition:

Organic*	100%

*Mostly leaf litter

Cover Type and Composition:

SWD	30%
OHV	30%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	-	-
Water Depth (m):	-	-
Embedded:	-	-
Perched (m):	-	-

Number: -

Water Quality*:

Temp. (˚C)	9
pH	7.53
Cond (µS/cm)	339
Turbidity	Clear

*Taken June 3, ice covered Oct 19

Surrounding Vegetation:
The creek is surrounded almost entirely by deciduous forest.

Unique Features:
A beaver has created a dam along the north side of the road creating a beaver impoundment that stretches for several hundred meters. On the south side of the road there is a smaller 5 m by 5 m impoundment which then feeds a small creek. No culvert was found but it is likely under water or blocked by the beaver.

Summary:
Water in the beaver impoundments was very turbid and unlikely to provide fish habitat. The creek had little flow but consisted of mostly leaf matter which does not provide suitable substrate or habitat for fish.

Fishing Effort: Minnow traps

Species: None

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate.

Migration: Poor due to lack of connectivity.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

The substrate of the channel is dominated by fallen leaves which are decomposing. Downstream appears to be similar substrate and therefore disturbance would not affect any potential fish habitat.

Aquatic Habitat Value

No Fish Habitat

The limited cover and very low water depth does not provide suitable habitat for fish.

Note: N/A = Not Applicable, SWD = small woody debris, OHV = overhanging vegetation

Stream Assessment - Site Card # RB16

Assessment Date: June 3, 2011

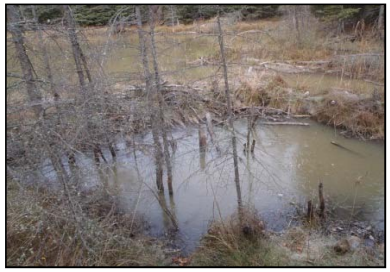

Figure 1: Stream crossing RB16 looking north into beaver impoundment.

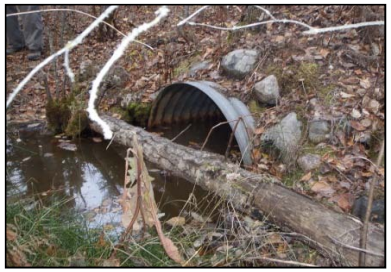

Figure 2: Stream crossing RB16, culvert on the south side of the road

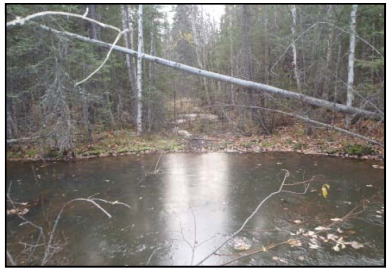

Figure 3: Stream crossing RB16 looking south.

Location

Crossing # RB16
Watercourse Name N/A
UTM 14U 6079369 N 435447 E

Site Description

Upstream Waterbody: None

Downstream Waterbody: None

Channel Width: 1.0 - 5.0 m

Wetted Width: 1.0 - 5.0 m

Water Depth: 1.0 m

Pattern: Straight

Characterization: Intermittent

Crown Cover: 90%

Substrate Type and Composition:

Organic*	100%

*Mostly leaf litter

Cover Type and Composition:

SWD	10%
OHV	5%
LWD	30%
IV	20%

Morphology:

Flat	100%

Culvert	Upstream	Downstream
Diameter (m):	-	0.95
Water Depth (m):	Frozen	Frozen
Embedded:	-	-
Perched (m):	-	-

Number: 1

Water Quality*:

Temp. (˚C)	16.1
pH	7.82
Cond (µS/cm)	136
Turbidity	Clear

*Taken June 3, ice covered Oct 19

Surrounding Vegetation:
The creek is surrounded by coniferous and mixed forest.

Unique Features:
A beaver has created a dam along the north side of the road creating a beaver impoundment that stretches for several hundred meters. On the south side of the road there is a smaller 5 m by 5 m impoundment which then feeds a small creek. No culvert was found on June 3 but the south side of the culvert was found on October 19. The north side of the culvert was buried or underwater and not observed.

Summary:
Water in the beaver impoundments was very turbid and unlikely to provide fish habitat. The creek had little flow but consisted of mostly leaf matter which does not provide suitable substrate or habitat for fish.

Fishing Effort: N/A

Species: N/A

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate.

Migration: Poor due to lack of connectivity.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

The substrate of the channel is dominated by fallen leaves which are decomposing. Downstream appears to be similar substrate and therefore disturbance would not affect any potential fish habitat.

Aquatic Habitat Value

No Fish Habitat

The limited cover and very low water depth does not provide suitable habitat for fish.

Note: N/A = Not Applicable, SWD = small woody debris, OHV = overhanging vegetation, LWD = large woody debris, IV = instream vegetation

Stream Assessment - Site Card # AD02

Assessment Date: June 20, 2012

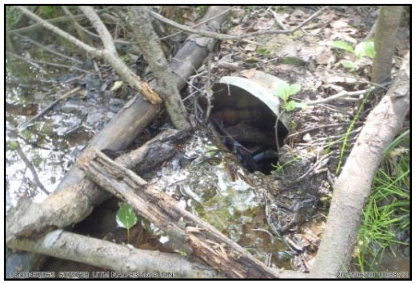

Figure 1: Stream crossing AD02, overgrown culvert.

Figure 2: Stream crossing AD02, discharging into Anderson TIA

Figure 3: Stream crossing AD02 eroding channel

Location

Crossing # AD02
UTM 14 U 437077 6079726
Watercourse Name N/A

Site Description

Upstream Waterbody: N/A

Downstream Waterbody: Anderson TIA

Channel Width: 5 m

Wetted Width: 0.25 - 2.0 m

Water Depth: 0.02 - 0.5 m

Pattern: Sinuous

Characterization: Perennial

Crown Cover: 100%

Substrate Type and Composition:

Silt	40%
Sand	20%
Organic	40%

Cover Type and Composition:

SWD	5%
LWD	5%
UCB	10%

Morphology:

Pool	20%
Riffle	40%
Run	30%
Flat	10%

Culvert	Anderson Mine	Railbed
Diameter (m):	0.4 and 0.6	0.9
Water Depth (m):	0.02 - 0.5	0.02 - 0.5
Embedded:	Yes	No
Perched (m):	No	No
Number:	2	1

Water Quality:

Temp. (˚C)	6.7
pH	7.75
Cond (µS/cm)	306
Turbidity	Clear

Surrounding Vegetation:
The creek is surrounded by coniferous and mixed forest.

Unique Features:
There are two culverts (0.6 m and 0.4 m diameter) crossing the road to Anderson Mine. An additional culvert (0.9 m) was found ~150 m upstream crossing the former rail bed. Further investigation found that upstream is an engineered drainage channel which feeds into this creek. There does not appear to be a waterbody upstream.

Summary:
The creek cuts through the soft silty, sandy substrate in the covered forest. There is limited cover and unsuitable substrate for fish in this area.

Fishing Effort: N/A

Species: N/A

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate and connectivity.

Migration: Poor due to lack of connectivity.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

High

Habitat sensitivity is high due to the highly mobile nature of the substrate. However, given that the surrounding banks and downstream substrate is similar in composition the aquatic habitat in this area is not limiting.

Aquatic Habitat Value

No Fish Habitat

While the water is flowing to a waterbody likely to harbour fish, this creek is unlikely to provide fish habitat to large bodied fish due to poor connectivity and potential for the water to freeze to the bottom in winter.

Note: TIA = Tailings Impoundment Area, N/A = Not Applicable, SWD = small woody debris, LWD = large woody debris, UCB = undercut bank

Stream Assessment - Site Card # AD03

Assessment Date: June 20, 2012

Figure 1: Stream crossing AD03 looking south west.

Figure 2: Stream crossing AD03 looking south, fine organic substrate visible.

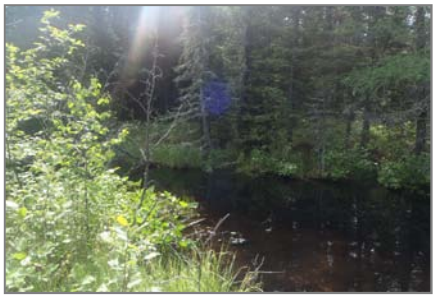

Figure 3: Stream crossing AND03 looking north east

Location

Crossing # AD03
UTM 14 U 437068 608094
Watercourse Name N/A

Site Description

Upstream Waterbody: N/A

Downstream Waterbody: Anderson TIA

Channel Width: 5 m

Wetted Width: 5 m

Water Depth: 0.26 m (at left downstream bank)

Pattern: Straight

Characterization: Perennial

Crown Cover: 5%

Substrate Type and Composition:

Fines	100%

Cover Type and Composition:

SWD	5%
LWD	5%
IV	5%
OHV	5%

Morphology:

Flat	100%

Culvert	Downstream	Upstream
Diameter (m):	-	-
Water Depth (m):	-	-
Embedded:	-	-
Perched (m):	-	-
Number:	-	-

Water Quality*:

Temp. (˚C)	15.6
pH	7.46
Cond (µS/cm)	223
Turbidity	Clear (darkly stained)

Surrounding Vegetation:
The south bank is dominated by mature coniferous forest while the north bank shows evidence of an old burn with regrowth as a wetland with grasses and mixed forest.

Unique Features:
This appears to be an engineered drainage channel with uniform width and depth. Similar channels are common in the area. Exporation upstream finds that there is no upstream draining waterbody. Downstream water flows through culverts at two locations (SCA-AD02) before entering Anderson TIA.

Summary:
The creek cuts through the soft silty, sandy substrate in the covered forest. There is limited cover and unsuitable substrate for fish in this area.

Fishing Effort: None

Species: N/A

Assessment

Fish Use

Spawning: Poor for large bodied fish due to lack of suitable substrate and connectivity.

Migration: Poor due to lack of connectivity.

Rearing: Poor due to lack of suitable substrate.

Over-wintering: Poor as this stream will likely freeze to the bottom and not have sufficient DO to sustain fish.

Aquatic Habitat Sensitivity

Low

This stream is moderately susceptible to erosion and downstream sedimentation due to the soft substrate and erodible banks. However, the entire stream substrate is composed of organic fines, therefore, moderate downstream sedimentation would have little effect on fish habitat.

Aquatic Habitat Value

Marginal

The limited cover and water depth may provide habitat for small-bodied species but it is unlikely that large-bodied species utlize this waterway.

Note: TIA = Tailings Impoundment Area, N/A = Not Applicable, SWD = small woody debris, LWD = large woody debris, IV = instream vegetation, OHV = overhanging vegetation

Stream Assessment - Site Card # HWYAN

Assessment Date: June 4, 2011

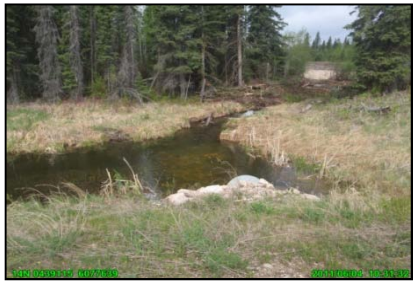

Photo 1: Stream crossing HWYAN, looking west.

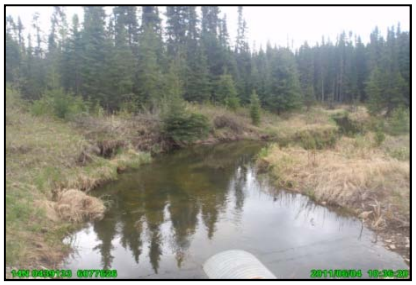

Photo 2: Stream crossing HWYAN, looking east (downstream).

Photo 3: Stream crossing HWYAN, looking downstream.

Location

Crossing # HWYAN
UTM 14U 6077613 N 439109 E
Watercourse Name Anderson Creek

Site Description

Upstream Waterbody: Anderson Tailing Impoundment Area

Downstream Waterbody: Anderson Bay, Wekusko Lake

Channel Width: 1.5 m

Wetted Width: 1.5 m

Water Depth: 0.55 - 1.50 m

Pattern: Meandering

Characterization: Perennial

Crown Cover: 0%

Substrate Type and Composition:

Organic	100%

Cover Type and Composition:

SWD	5%
Bo	5%
OHV	10%
IV	5%

Morphology:

Run	100%

Culvert	Downstream	Upstream
Diameter (m):	1.2	1.2
Water Depth (m):	0.65	0.8
Embedded:	Yes	Yes
Perched (m):	No	No

Number: 1

Water Quality:

Temp. (˚C)	11.96
pH	7.55
Cond (µS/cm)	543
Turbidity	Clear

Surrounding Vegetation:
Riparian habitat is dominated by grasses. Bank and upland habitat is almost entirely old growth coniferous forest with thick moss covering the forest floor everywhere.

Unique Features:
The stream is regulated through a weir from the Anderson Tailings Impoundment Area. A

Summary:
Water flow in Anderson Creek is stronger than any of the other streams studied in the area, and as such it may provide unique habitat. Approximately 300 m downstream there is a significant set of rapids with large boulders that may impede fish passage.

Fishing Effort: Minnow traps, Backpack electrofishing

Species: Pearl Dace, Brook Stickleback, Fathead Minnow, Iowa Darter

Assessment

Fish Use

Spawning: Moderate due to instream vegetation but lacks a floodplain.

Migration: Poor due to lack of any upstream habitat.

Rearing: Good due to slow moving backwater habitats and abundant cover.

Over-wintering: Moderate due to continuous discharge from the TIA water is not likely to freeze to the bottom.

Aquatic Habitat Sensitivity

Low

This stream is moderately susceptible to erosion and downstream sedimentation due to the soft substrate and erodible banks. However, the majority of the stream substrate is composed of fines, therefore, moderate downstream sedimentation would have little effect on fish habitat.

Aquatic Habitat Value

Marginal

The abundant instream vegetaton provides cover for small-bodied species for spawning and foraging, when adequate water levels exist. The creek is connected to Wekusko Lake and large bodied fish may migrate upstream in spring. However the weir impedes fish passage into the Anderson Tailings Impoundment Area.

Note: SWB = small woody debris; Bo = boulder; OHV = overhanging vegetation; IV = instream vegetation.