MELIADINE WEST GOLD PROJECT:
FISHERIES BASELINE STUDIES 2008

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EXECUTIVE SUMMARY

Golder Associates Ltd. (Golder) was retained by Comaplex Minerals Corporation (Comaplex) to conduct baseline investigations of fish and fish habitat at the Meliadine West Gold Project (Project) in 2008. Most of the baseline information was collected during previous studies conducted by R.L.&L. Environmental Services Ltd. (RL&L) from 1997 to 2001 (RL&L 1998, 1999, 2000, 2001, 2002). Studies in 2008 were designed to fill gaps in available information on fish communities and habitat potential for fish use in the area that may be affected by the potential mine development and mining activities. This data report summarizes the results of studies conducted during the 2008 field season.

Fish and fish habitat assessments in 2008 were divided into three components:

- spring survey of 13 watercourses that potentially will be crossed by a proposed all-season road from Rankin Inlet;
- summer surveys of 37 small ponds that lie within or near proposed tailings areas; and
- summer assessments of fish populations and habitat in four lakes near the proposed zone of mine operations.

Of the sites surveyed, three road crossings and one lake (Chickenhead Lake) lie within the Discovery area of the Project; the remaining sites lie in the vicinity of the proposed Meliadine mine development or along the proposed road corridor linking Rankin Inlet to the proposed mine. Investigations were carried out between June 16 and August 6, 2008. Additionally, a mark-recapture study was performed at Lake B7 to estimate fish population size, focusing on Arctic grayling. A bathymetric survey was conducted in Chickenhead Lake to estimate lake volume and to map depth characteristics.

Watercourses investigated along the proposed road corridors were moderately diverse with respect to habitat potential for fish. Fish communities, where present, were dominated by small-bodied individuals, including Arctic grayling, ninespine stickleback, and slimy sculpin. Habitat quality was poor to moderate at most sites. Among the sites investigated, the Meliadine River crossing had the greatest potential to support multiple life stages of fish.

In general, the sampled ponds shared similar habitat characteristics that included shallow depth, warm water temperature, substrate dominated by fines, and low to moderate habitat potential for fish. Regardless of the habitat potential ratings, ponds in close proximity to fish-bearing waterbodies (e.g., Meliadine Lake) had a higher likelihood to support fish. This suggested that fish presence was more closely related to connectivity and proximity to fish-bearing waterbodies than to

the quality of habitat encountered. Where present, fish communities were dominated by ninespine stickleback; however, juvenile Arctic grayling were also captured in one pond.

Habitat quality in the sampled lakes was less variable than that observed in the sampled watercourses and ponds. All four lakes supported fish populations and three lakes (B6, B7, and Chickenhead) were rated as having excellent fish habitat. In contrast, Lake A52 had lower quality habitat and contained only ninespine stickleback. Lakes B6 and B7 supported both forage fish and sport fish species including Arctic grayling and cisco. Lake trout were captured only in Chickenhead Lake.

The results of a mark-recapture study of fish in Lake B7 estimated the size of the Arctic grayling population at 1,345 fish, with 95% confidence intervals ranging from 836 to 2,507 individuals. Population estimates could not be calculated for other fish species in the mark-recapture study, due to low sample size (i.e., only 19 cisco, four ninespine stickleback, and two burbot were captured). Bathymetric profiling in Lake B7 (RL&L 1999), in combination with habitat assessments from 2008, indicated the presence of a variety of habitats that were capable of supporting multiple life-stages of species known to inhabit the lake.

In summary, fish populations and fish habitats were highly variable within the Project study areas. Lakes B6, B7, Chickenhead Lake, and the Meliadine River were identified as important areas supporting sport fish species such as Arctic grayling. In total, 1,060 fish were captured during the 2008 study. Fish presence was confirmed (either by captures or observations) in all four sampled lakes, 9 of the 13 sampled streams, and 13 of the 37 sampled ponds.

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ACRONYMS

ATV	all-terrain vehicle
Comaplex	Comaplex Minerals Corporation
CPUE	Catch per Unit Effort
D	Discovery area (as prefix for site names)
EF	electrofishing
FL	Fork Length
FN	fyke net
Golder	Golder Associates Ltd.
GN	gill net
M	Meliadine West area (as prefix for site names)
MT	minnow trap
Project	Meliadine West Gold Project
RL&L	R.L.&L. Environmental Services Ltd.
UTM	Universal Transverse Mercator

UNITS

°C	degrees Celsius
h	hour
Hz	hertz
ha	hectares
km	kilometres
km^2	square kilometres
m	metres
mg/L	milligrams per Litre
mm	millimetres
ms	microsecond
m^2	square metres
m^3	cubic metres
m^3/s	cubic metres per second
n	number
s	seconds
µS/cm	microSiemens per centimetre
V	voltage
%	percent
<	less than
>	greater than

1 INTRODUCTION

1.1 BACKGROUND

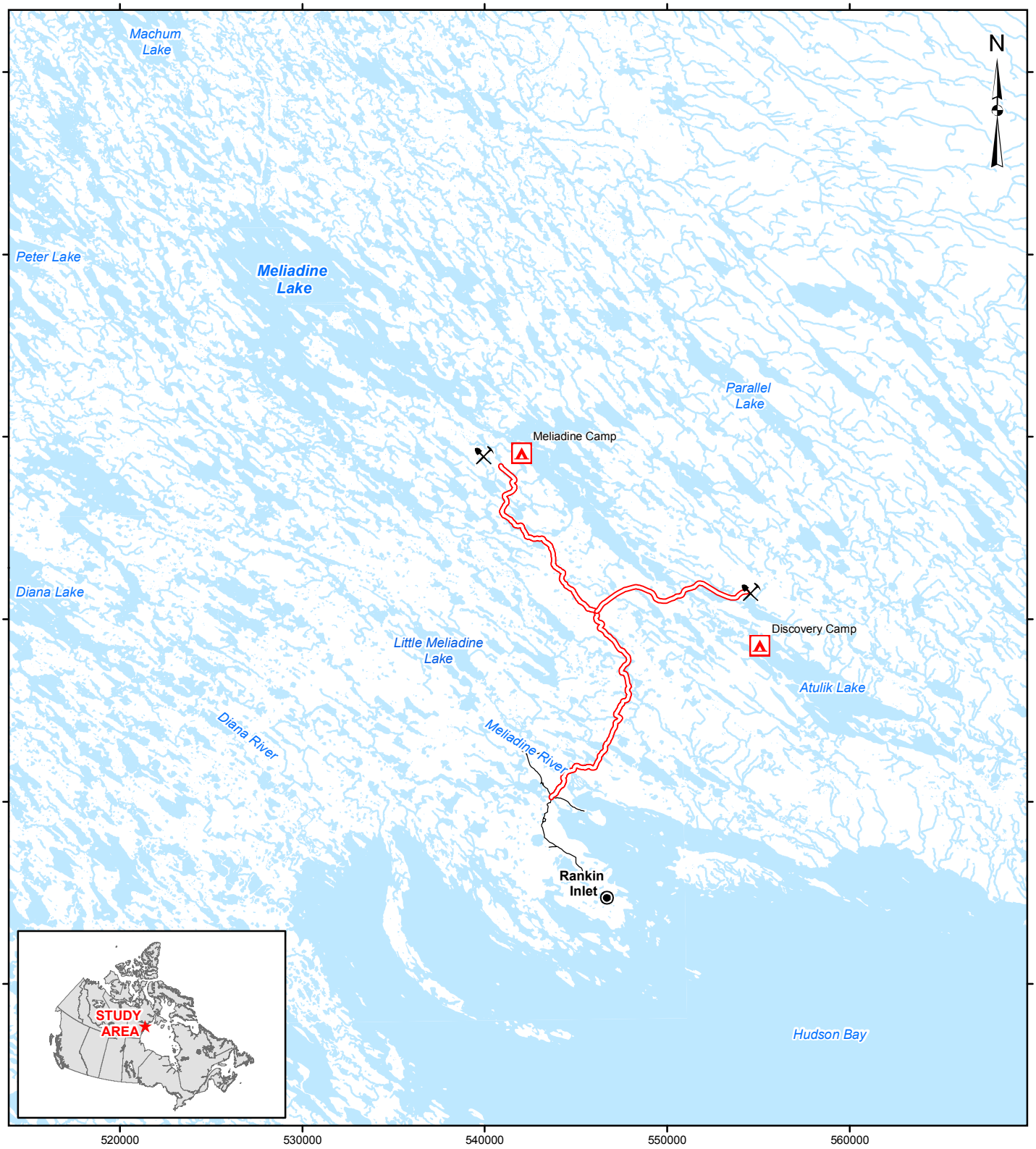
Comaplex Minerals Corporation (Comaplex) proposes to construct and operate a gold mine, known as the Meliadine West Gold Project (Project), located approximately 30 kilometres (km) northwest of Rankin Inlet, and 80 km south of Chesterfield Inlet in the Kivalliq Region of Nunavut (Figure 1). The proposed Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake on Inuit Owned Land.

The Project area is within the zone of continuous permafrost approximately 400 km north of the tree line with typical sub-arctic vegetation. The terrain is dominated by glacial landforms that include drumlins of glacial till, eskers consisting of gravels and sands, and numerous shallow lakes. The glacial deposits form low relief ridges oriented in a northwest-southeast direction. Regional drainage patterns are controlled by these ridges and the prevailing permafrost.

Meliadine Lake covers an area of 107 square kilometres (km^2) with a maximum length of 31 km (Environment Canada 1973). It features a highly convoluted shoreline (465 km in length) and over 200 islands. Most of the lake drains via the Meliadine River, which originates at the south end of the lake and flows through a series of waterbodies and short river segments into Hudson Bay (distance of 39 km). A second, smaller outflow from the west basin of Meliadine Lake drains into Peter Lake, which discharges into Hudson Bay through the Diana River system (distance of 70 km).

Several small watersheds drain into Meliadine Lake from a large peninsula between the south, east, and west basins of Meliadine Lake. These peninsula watersheds comprise networks of lakes, ponds, and interconnecting streams.

WMC International Ltd. undertook a multi-year gold exploration program in the Project area in 1995. That program included aquatic baseline studies from 1997 to 2001 (R.L. &L. Environmental Services Ltd. [RL&L] 1998, 1999, 2000, 2001, 2002). The main areas of emphasis within the Project study area included Meliadine Lake, Meliadine River, and several lakes and streams situated on a large peninsula at the southeast end of Meliadine Lake. Collected data included water quality and sediment quality, invertebrate communities, fish populations, and fish habitat. Stream crossings within a proposed road corridor between Rankin Inlet and the proposed Project were also sampled.



LEGEND

- CAMP
- PROPOSED MINE SITE
- ROAD - EXISTING
- ROAD - PROPOSED ALIGNMENT
- WATERCOURSE
- WATERBODY

10 0 10

SCALE 1:300,000 KILOMETRES

REFERENCE

Base data obtained from the Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

LOCATION OF THE MELIADINE WEST GOLD PROJECT

Golder Associates
Calgary, Alberta

PROJECT No. 07-1373-0055			SCALE AS SHOWN	REV. 1
DESIGN	KS	16 Sep. 2008	**FIGURE: 1**	
GIS	CP	20 Nov. 2008		
CHECK	DE	20 Nov. 2008		
REVIEW	LY	20 Nov. 2008		

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1.2 BASELINE STUDIES - 2008

Baseline investigations of fish and fish habitat conducted by Golder Associates Ltd. (Golder) in 2008 were divided into three components:

- spring survey of 13 watercourses that may be crossed by an all-season road from Rankin Inlet;
- summer surveys of 37 small ponds that lie within or near under consideration to receive tailings; and
- summer assessments of fish populations and habitat in four lakes near the proposed zone of mine operations.

Of the sites surveyed, three road crossings and one lake (Chickenhead Lake) lie within the Discovery area of the Project; the remaining sites lie within the vicinity of the proposed Meliadine West mine development and activity, or along the proposed road corridor linking Rankin Inlet to the mine. Results obtained from these two areas are presented separately within each study component.

Studies were designed to fill gaps in information available on fish communities and habitat potential for fish use in the area. Some of the study sites (e.g., Lakes B6 and B7) were surveyed previously during 1997 to 1999 and the present surveys were intended to update and expand the existing information. Other sites (mainly the road crossings and several small ponds) were investigated for the first time because of the need to examine potential alternatives for specific aspects of the Project configuration.

Field investigations in 2008 were conducted during three field visits: June 17 to 24, July 10 to 14, and July 31 to August 5. All streams along the proposed road corridor were sampled during the first visit, 16 ponds and 2 lakes were assessed during the second visit, and the remaining 21 ponds and 2 lakes were visited during the third visit. One lake (B7) was visited multiple times during the second and third field sessions to collect detailed fish information designed to generate a population estimate of the current number of fish in Lake B7.

Surveys focused on evaluating fish habitat (including baseline water quality parameters) and assessing fish community composition. Proposed stream crossing sites were assessed for habitat type, instream cover for fish, substrate composition, and channel morphology. Habitat information collected in ponds and lakes included maximum depth, basic water quality measurements, and qualitative assessments of instream cover and substrate composition. Fish were captured using a backpack electrofisher. Arctic grayling spawning use was assessed by egg sampling using kick nets. Fish communities in ponds and lakes

were assessed using minnow traps, backpack electrofisher, gill nets, fyke nets, and angling.

In addition to an assessment of the fish community, a mark-recapture study was conducted on Lake B7 to estimate the number of fish in the lake, with particular focus on the Arctic grayling population. Fish were caught and marked during the second field session and recaptured during the third, using gill nets and a fyke net.

To facilitate data recording and presentation of results, all species were assigned a four-letter code in accordance with Mackay et al. (1990). The common and scientific names of all fish species mentioned in this report, as well as their corresponding coded abbreviations, are presented in Table 1.

Table 1 Common and Scientific Names of Fish Species in the Meliadine Study Area, and their Coded Abbreviations

Family	Common Name	Scientific Name	Code
Salmonidae	lake trout	*Salvelinus namaycush* (Walbaum)	LKTR
Salmonidae	Arctic grayling	*Thymallus arcticus* (Pallas)	ARGR
Salmonidae	Arctic char	*Salvelinus alpinus* (Linnaeus)	ARCH
Salmonidae	cisco	*Coregonus artedi* (Lesueur)	CISC
Salmonidae	round whitefish	*Prosopium cylindraceum* (Pennant)	RNWH
Gadidae	burbot	*Lota lota* (Linnaeus)	BURB
Cottidae	slimy sculpin	*Cottus cognatus* Richardson	SLSC
Gasterosteidae	ninespine stickleback	*Pungitius pungitius* (Linnaeus)	NNST

2 ROAD CROSSING ASSESSMENTS

2.1 INTRODUCTION

Assessments of fish and fish habitat were conducted at 13 watercourse crossings along two proposed road corridors. Ten watercourse crossings were located along a primary corridor extending from Rankin Inlet to the proposed Project site (Figure 2). Three crossings were located along a secondary corridor that extends from the primary road to the Discovery Area, located approximately 16 km southeast of the Meliadine West camp (Figure 2). The stream crossings surveyed were assigned a unique designation that included a corridor prefix (M for Meliadine West area, D for Discovery area) followed by the distance (in kilometres) along the road alignment from south to north.

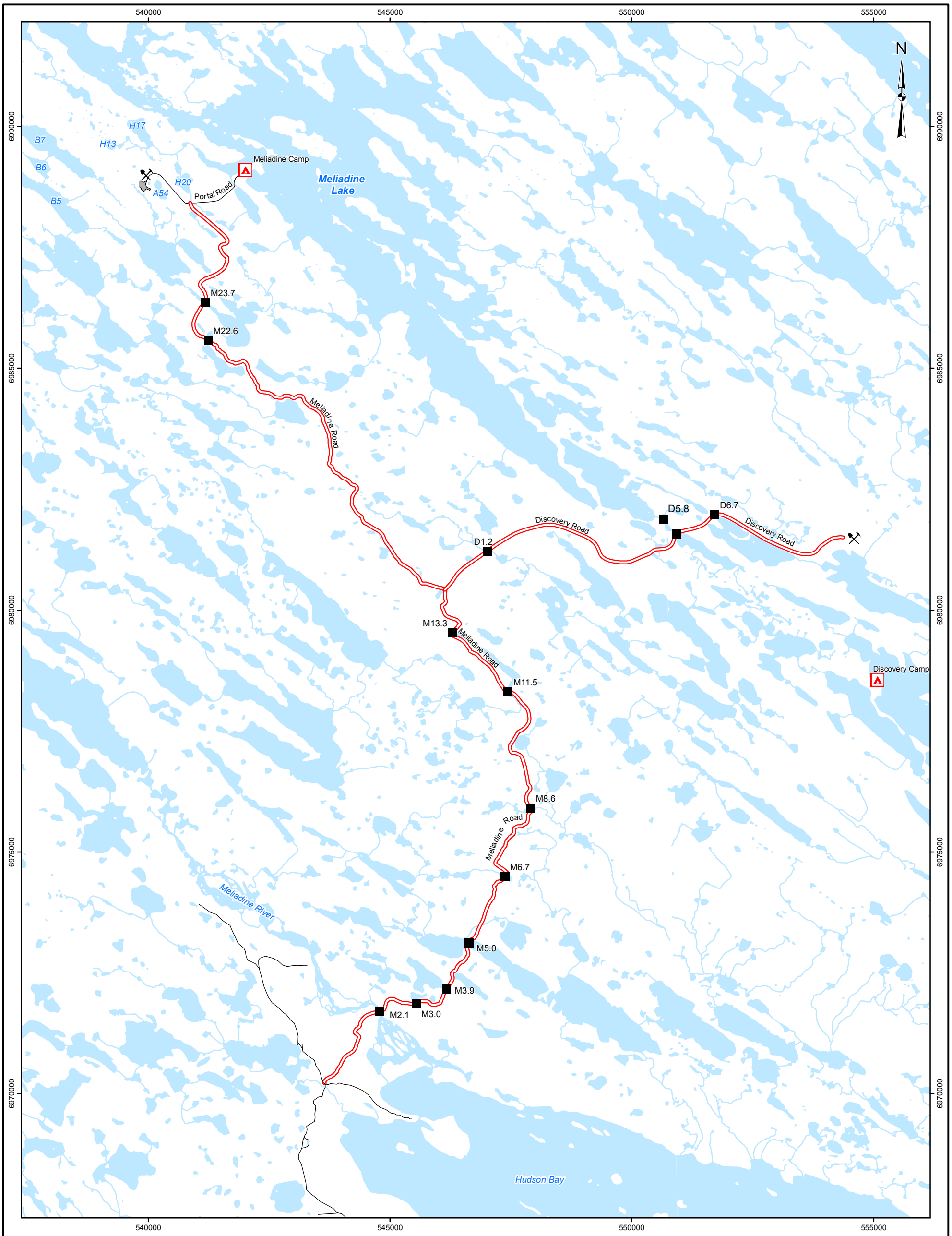
Crossing assessments were performed from June 16 to 25, 2008. The area was free of snow but ice was present along the margins of some of the watercourses investigated, especially the Meliadine River. Most meltwater had drained from the study area; however, standing water was observed along stream margins.

2.2 METHODS

2.2.1 Habitat Assessments

Habitat was surveyed at each of the proposed crossings to assess spawning, rearing, overwintering, and movement potential for fish. Parameters surveyed included channel and flooded width (metres [m]), depth (m), habitat type (e.g., riffles, pools), substrate, as well as general observations such as channel type (e.g., single, double, braided, and dispersed) and the presence of movement barriers. Channel width was defined as the edge of the watercourse with a defined bank. Flooded sections of watercourses were observed at widths greater than that of the defined channel; therefore, some study reaches had a wetted width greater than that of the channel. Flooded width was a measurement of wetted width beyond, and including, that of the defined channel. Substrates were assessed using a modified Wentworth scale as follows:

- Detritus (decomposed organic matter);
- Fines (<2 millimetres [mm] diameter);
- Gravel (2 to 64 mm);
- Cobble (65 to 256 mm); and
- Boulder (>256 mm).



LEGEND

- CAMP
- PROPOSED MINE SITE
- WATERCOURSE CROSSING
- ROAD - EXISTING
- ROAD - PROPOSED ALIGNMENT
- WATERCOURSE
- PORTAL WORK AREA
- WATERBODY

2,500 0 2,500

SCALE 1:75,000 METRES

NOTE

Water crossing sites investigated in June 2008.
Proposed road alignment as of September 2008.

REFERENCE

Project Infrastructure provided by Comaplex Minerals Inc. Base data obtained from the Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000). Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

WATERCOURSE CROSSINGS ALONG PROPOSED ROAD ALIGNMENT

Golder Associates
Edmonton, Alberta

PROJECT No. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 2**	
GIS	CP	26 Nov. 2008		
CHECK	JP	22 Oct. 2008		
REVIEW	LY	26 Nov. 2008		

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Water quality measurements, including temperature (ºC), pH, and conductivity (microSiemens per centimetre [µS/cm]) were taken in situ using calibrated hand-held water quality meters. Dissolved oxygen (milligrams per liter [mg/L]) was measured using a colorimetric kit (Chemetrics, Chemets dissolved oxygen kit).

As the watercourses investigated were often small and poorly defined, it was not practical to map individual habitat types as they were often less than 1 m in length. Instead, watercourses were divided into reaches of equal length (typically 50 m) with assessments of habitat parameters reflecting average conditions within each respective reach. Subsequently, means were calculated for each habitat parameter to describe average conditions for the stream as a whole. Cover types were described as proportions of available cover rather than proportions of stream area surveyed. Habitat conditions within inlets and outlets were also recorded; however, they were not included in habitat calculations. Digital photos were taken to supplement site descriptions.

2.2.2 Discharge

Velocity was recorded with a direct-readout meter (Swoffer Model 2100). Readings were taken while wading along a tag line positioned perpendicular to flow. Water depth and mean column velocities (at 60% depth) were measured at a representative number of vertical stations along the cross-section. Discharge was calculated according to methods outlined by Bovee and Cochnauer (1977). Most of the sites did not have sufficient flow and/or depth to measure discharge while the Meliadine River was flowing at a rate that precluded discharge from being measured safely.

2.2.3 Fish Data Collection and Analyses

Assessments of fish populations were conducted using a backpack electrofisher (Smith Root, POW Type 12B, settings: 100-300 V, 30-60 Hz, 4-6 ms). Field biologists waded upstream and sampled available habitats in equal proportions. A netter collected stunned fish and placed them in a holding container filled with water. Field biologists recorded sampling effort, electrofisher settings, and the number of fish captured and observed. Time constraints limited capture methods to backpack electrofishing; no other fish sampling method was used.

Life history information collected included fork length (FL, mm) weight in grams (g), and sexual maturity (if discernible through external examination). Relative abundance of fish was calculated in terms of catch-per-unit-effort (CPUE). CPUE was based on the number of fish captured per unit (100s) of sampling effort. Efforts were made to minimize mortalities and unnecessary harm to fish.

2.2.4 Egg Sampling

Egg sampling was conducted to assess spawning habitat potentially used by Arctic grayling. All suitable spawning substrates observed by the field biologists were sampled. The procedure involved positioning a fine mesh D-ring kick net on the stream bottom immediately downstream from a potential egg deposition site and disturbing the substrate with a foot for approximately 30 seconds (s) (approximate area of 0.4 square metres [m^2]). The contents of each kick net were examined in the field. Recorded data included the number of areas sampled, number of areas with eggs, total number of eggs encountered, and the maximum number of eggs per sampled area. Eggs were returned to the watercourse immediately.

2.3 RESULTS

With the exception of the Meliadine River, the majority of the watercourses to be crossed by the proposed roads were small, ephemeral streams, often characterized by poorly defined channels. The watercourses were comprised primarily of shallow-water habitats with occasional riffles and pools with moderate depth. Habitat potential for fish in the areas investigated was typically poor to moderate and use by fish appeared seasonal. However, habitat at some of the larger watercourses with perennial flow, such as the Meliadine River, had higher potential to support fish populations.

2.3.1 Habitat Assessments

The majority of the stream crossings were assessed for habitat and channel characteristics along their entire length (i.e., entire channel between two lakes or ponds). Detailed habitat data for individual sites are provided in Appendices A and B. Data summaries and photographs of each crossing are presented as a crossing atlas in Appendix C. The majority of watercourses had similar characteristics so data were grouped and summarized together in the text.

2.3.1.1 Meliadine West Road Corridor

Except for the Meliadine River crossing (discussed separately at the end of this section), surveyed stream sections ranged from 29 to 140 m in length. A variety of channel types were encountered including single, double, multiple, and braided, as well as areas of dispersed flow (i.e., without a well-defined stream channel). Generally, individual reaches consisted of more than one channel type. Multiple braids and dispersed channels were the main channel types observed (Appendix A).

Channel morphology was variable and attributable to the wide variety of habitat types observed at watercourses, even within single study reaches. Mean channel widths ranged from 3.7 to 8.9 m and mean depths were shallow ranging from 0.04 to 0.25 m; maximum depths did not exceed 0.6 m. Given the shallow conditions encountered, discharge could only be calculated for Sites M5.0 and M11.5 (0.03 and 2.60 m^3/s, respectively) (Figure 2). Instream cover for fish was available in a variety of forms and was abundant in each of the streams surveyed.

Given the semi-flooded conditions, aquatic and terrestrial plants provided the majority of cover ranging in proportion from 5 to 100% within individual reaches. Undercut banks were observed in small portions representing 2 to 30% of cover available for fish in four of the streams and were absent from the remaining six sites. Undercut banks were less common as low flow and relief in the area are not conducive to their formation. Cover provided by depth and/or turbulence was rarely observed, again, owing to shallow, low-gradient channels. Boulder gardens provided additional cover for fish, but considerably less than vegetation. Given the small size of the watercourses, instream cover mainly provided habitat for small-bodied fish, such as ninespine stickleback and juvenile Arctic grayling.

It is noteworthy that Site M6.7 (Figure 2) was dry at the time of visit. The watercourse had sections of moderately defined bed and bank and showed evidence of recent flow. Therefore, this seasonal watercourse may only provide fish habitat for short periods in the spring, and perhaps during large summer precipitation events. The channel showed damage resulting from all-terrain vehicle (ATV) activity (Appendix C, Figure C5, Photos 118, 121). Damage to tundra has accelerated erosion and subsequent deposition of sediment downstream of ATV crossings (Appendix C, Figure C5, Photo 122).

Another site of special note is Site M5.0 (Figure 2, Appendix C, Figure C3) where the crossing location is situated at a short, connecting watercourse between two large ponds. This site was short in length (29 m) but contained high quality fish habitat, especially for small-bodied forage fish. Although no game species were captured or observed, habitat potential for Arctic grayling rearing and spawning was good. Substrates were dominated by gravel, cobble, and boulders, and aquatic plants offered excellent cover for small fish. Hence, migration, rearing, and spawning potential were rated high; however, there was no overwintering potential because the watercourse will freeze to bottom during winter. Similar to what was observed at Site M6.7, ATV activity at Site M5.0 resulted in damage to portions of the stream bed and bank.

Habitat and channel characteristics at the Meliadine River (Site M2.1, Figure 2, Appendix C, Figure C1) were investigated over a length of 690 m. Along this section, the river was confined to a single channel with a few small rock-piles

scattered throughout. Wetted widths ranged widely from 34 to 134 m (*n*=4). The flooded width of the river ranged from 58 to over 200 m. At the time of visit, flows at the proposed crossing location precluded safe measurement of depth; however, depths were greater than 1.5 m along the periphery. Instream habitat consisted of run (72%), riffle (20%), and pool (8%) habitats. Substrate and instream habitat were difficult to gauge because the river was turbid; however, bank-side estimates suggested that substrates were dominated by boulder and cobble with gravel and fines present to lesser degrees. Aquatic plants were observed but uncommon.

2.3.1.2 Discovery Road Corridor

Within the Discovery road corridor, surveyed stream sections ranged in length from 140 to 530 m (Appendix B). Mean channel widths were less variable (2.2 to 4.9 m) than those at the Meliadine West road corridor. Mean flooded widths; however, ranged greatly from 21.5 to 63 m. Mean depths were low ranging from 0.03 to 0.18 m; maximum depths did not exceed 0.42 m. Multiple braids and dispersed channels were the main channel types observed along the Discovery road corridor. Given the shallow conditions encountered, discharge could not be calculated for any of the surveyed sites.

Instream habitats consisted primarily of shallow runs and pools. Water velocities were low as the majority of the watercourses were situated along shallow gradients. Hence, riffles were only observed occasionally and their overall contribution to the total habitat area was low. In contrast, shallow pools contributed substantially (>50%) to the total surveyed area of the streams. These pools existed in areas with terrestrial vegetation and poorly defined bed and bank, indicative of ephemeral flows.

In two of the streams surveyed (Sites D1.2 and D6.7) (Figure 2, Appendix C, Figures C11 and C13), substrate consisted primarily of detritus, mainly because of partial flooding along stream peripheries, which inflated the relative contribution of detritus. In sections of the watercourses bounded by defined bed and banks, cobble, boulders, and fines were more common and were present in relatively equal proportions. Small patches of gravel were observed but were less common and their contribution to total substrate area did not exceed 5 to 10% in a given stream. The third site, Site D5.8 (Figure 2, Appendix C, Figure C12) was dominated by coarse substrates, especially cobble.

Instream cover was available in a variety of forms. Aquatic and terrestrial plants provided the majority of cover, with boulders and undercut banks contributing to a lesser extent. Depth and/or turbulence provided little cover for fish owing to shallow, low-gradient channels. Given the small size of the watercourses, instream cover served mainly to provide habitat for small-bodied fish.

Of the three sites evaluated, Site D5.8 was rated the highest with respect to habitat quality for fish. Habitat features including coarse substrates, undercut banks, small pools, and aquatic plants contributed to this stream's high potential to support spawning and rearing fish. Overwintering was not deemed possible, given the shallow depths of the stream.

2.3.2 Fish Populations

2.3.2.1 Meliadine West Road Corridor

In total, 103 fish representing three species were captured from 5 of the 10 sites surveyed (Table 2 and Appendix D). Ninespine stickleback (*n*=98) was the most abundant species captured, accounting for 95% of the catch. Slimy sculpin (*n*=3) and Arctic grayling (*n*=2) were also captured. Site M5.0 was the most productive with respect to fish; 60 ninespine stickleback were captured and over 200 were observed. Overall, CPUE was moderate (3.4 fish/100s, including sites where no fish were captured) but highly variable between sites where fish were captured (0.2 to 20.5 fish/100s).

Table 2 Fish Captured or Observed in Watercourses along the Meliadine West Road Corridor, June 2008

Site	Effort (s)	Species	Number Captured [a]	Number Observed	Size Range (mm)	CPUE [b] (fish/100s)
M2.1	557	ARGR	1		48	0.2
		NNST		2		
M3.0	211	NNST		2		
M3.9	185	-				
M5.0	293	NNST	60	200	34 to 74[(a)]	20.5
M6.7	0	-				
M8.6	262	-				
M11.5	520	ARGR	1	5	89	0.2
		NNST	18	20	32 to 67	3.5
M13.3	222	NNST		10		
M22.6	398	NNST	2	25	28 to 68	0.5
M23.7	409	ARGR		1		
		SLSC	3		69 to 94	0.5
		NNST	18		38 to 67	4.4
TOTAL	**3,057**		**103**	**265**	**28 to 94**	**3.4**

a 20 of 60 captured fish were measured.

b Catch-per-Unit-Effort (CPUE) calculated for captured fish only

Note: mm= millimetres; s=seconds

Single Arctic grayling juveniles (48 and 89 mm FL) were captured at Sites M2.1 (Meliadine River) and M11.5, respectively. In addition, one Arctic grayling was observed at Site M23.7 (inflow to Peg Lake below Pump Lake). Based on age-length statistics for Arctic grayling captured in the Meliadine Study Area in the past (RL&L 1999), these fish were likely yearlings.

Sampling for Arctic grayling eggs was conducted at four streams (Sites M2.1, M8.6, M11.5, and M5.0); the remaining sites did not contain suitable spawning substrate. In total, 21 individual areas were sampled; however, eggs were not encountered.

2.3.2.2 Discovery Road Corridor

Within the Discovery road corridor, Site D5.8 was the only site where fish were captured (Table 3 and Appendix D). Seven Arctic grayling and 12 ninespine stickleback were captured and another four Arctic grayling and 20 ninespine stickleback were observed. The overall CPUE for captured fish was 5.9 fish/100s. This site was the most productive with respect to Arctic grayling in either of the two road corridors.

Table 3 Fish Captured or Observed in Watercourses along the Discovery Road Corridor, June 2008

Site	Effort (s)	Species	Number Captured	Number Observed	Size Range (mm)	CPUE [a] (fish/100s)
D1.2	265	NNST		2		
D5.8	322	ARGR	7	4	67 to 127	2.2
		NNST	12	20	36 to 71	3.7
D6.7	138	-				
TOTAL	**725**		**19**	**26**	**36 to 127**	**2.6**

a Catch-per-Unit-Effort (CPUE) calculated for captured fish only
Note: mm= millimetres; s=seconds

Egg sampling was conducted at Site D5.8; the remaining sites did not contain suitable spawning substrate. In total, nine Arctic grayling eggs were encountered in two of 10 areas sampled at Site D5.8 (Appendix C, Figure C12, Photo 853), indicating that the watercourse at Site D5.8 provides habitat for spawning and rearing Arctic grayling.

2.4 SUMMARY

The 13 proposed road crossings assessed during this investigation varied widely with regards to habitat potential for fish. Aquatic habitat at crossings along both road corridors was highly variable, with some streams supporting spawning and rearing, whereas others were dry or contained poor fish habitat. Based on data

collected during a hydrological assessment in July 2008 (Golder 2008), overwintering potential for fish at the proposed crossing of the Meliadine River was rated as nil as the river will freeze to bottom at this location.

Fish were captured at six sites (M2.1, M5.0, M11.5, M22.6, M23.7, and D5.8) and were observed but not captured at three others (M3.0, M13.3, and D1.2) for a total of nine confirmed fish-bearing streams. Arctic grayling were captured at three sites (M2.1, M11.5, and D5.8) and observed but not captured at Site M23.7. Ninespine stickleback was captured at five sites (M5.0, M11.5, M22.6, M23.7, and D5.8) and were observed but not captured at four sites (M2.1, M3.0, M13.3, and D1.2). Slimy sculpin were captured only at Site M23.7.

Within the Meliadine West road corridor, Site M2.1 (Meliadine River) was of particular importance. Because of high depths and velocities, this section was not fished and surveyed effectively; however, high fisheries potential was evident. One juvenile Arctic grayling was captured, indicating that rearing was occurring in the area. Furthermore, the presence of deep run and pool areas indicated high quality habitat for various life-stages of fish species known to inhabit the river.

Fish populations in the lower Meliadine River were studied intensively during the August-September periods of 1997, 1998, and 1999 using a fish fence that captured upstream migrants at a location approximately 2 km upstream from the proposed road crossing location (RL&L 1998, 1999, 2000). In total, 3761 fish were captured during the three-year study. Arctic char (3240 fish) predominated the catch, followed by Arctic grayling (263 fish), and round whitefish (227 fish). Lake trout and cisco were also captured at the fish fence site, but much less frequently (18 and 13 fish, respectively). These results confirmed the importance of the lower Meliadine River as a fish movement corridor, particularly for Arctic char adults that undergo feeding migrations to the sea in spring and return in fall to overwinter in the freshwater habitats of the Meliadine River drainage.

Other noteworthy watercourses within the Meliadine West road corridor include Site M23.7, where slimy sculpin were captured, and habitat quality for rearing and migration were rated as moderate to good. Sites M5.0, M11.5, and M22.6 also featured suitable rearing habitat for Arctic grayling. Although not confirmed by egg sampling, Sites M5.0 and M11.5 are likely used by Arctic grayling for spawning, based on the availability of suitable habitat and/or the presence of Arctic grayling juveniles in the catch. In contrast, Sites M3.0, M3.9, M6.7, M8.6, and M13.3 had relatively poor fish habitat potential, as evidenced by no fish captures and only 12 observed fish (ninespine stickleback) at Sites M3.0 and M13.3. Shallow depths, dry channels (e.g., Site M6.7), poor spawning substrates (detritus), and a lack of instream cover contributed to poor habitat ratings.

Within the Discovery road corridor, Site D5.8 (Figure 2) was most important for fish and fish habitat. Ninespine stickleback and Arctic grayling juveniles were captured and Arctic grayling eggs were collected. High quality spawning and rearing habitats were also present throughout the surveyed section. In contrast, Sites D1.2 and D6.7 featured poor quality fish habitat because of shallow depths and an absence of well defined channels.

Site M22.6 was the only previously studied (RL&L 1999) crossing location. Little has changed since the previous visit; watercourse dimensions were comparable, pools remained the dominant habitat type, substrates were dominated by detritus and fines, and vegetation was the dominant source of instream cover for fish. With respect to fish populations, electrofishing efforts in 2008 found only ninespine stickleback, as did sampling in 1999. Sampling for eggs did not occur during either survey because no suitable spawning habitat for Arctic grayling was observed.

3 POND ASSESSMENTS

3.1 INTRODUCTION

Assessments of fish and fish habitat were conducted at 37 ponds within Basins A, B, and H in the Project area (Figure 3). The purpose of the investigation was to assess fish presence and fish habitat potential in the waterbodies that are within or near the proposed mine development and mining activities. Assessments were performed from July 11 to 14 and August 1 to 5. The water levels were lower than those encountered during the investigations for the proposed road corridor and many of the ponds lacked stream flow to adjacent waterbodies.

3.2 METHODS

3.2.1 Habitat Assessments

Fish habitat was assessed qualitatively for potential for overwintering, movement, spawning, and rearing. Specifically, observations were made regarding habitat quality, substrate, and available cover. Water temperature (ºC), conductivity (µS/cm), and pH were measured using a calibrated water quality meter. Pond area and shoreline perimeter length were calculated using ArcGIS 9.2 software based on data (1:50,000) available from the National Topographic Database. Maximum depth was assessed by wading or from a boat. Digital photos were taken to supplement site descriptions.

3.2.2 Fish Data Collection and Analyses

Assessments of fish populations were conducted using the same procedures as those used during the road crossing investigation. However, in addition to a backpack electrofisher, baited Gee-type minnow traps were also used where sufficient depth allowed (Figure 3). Monofilament gill nets (25 mm mesh), each 15.2 m long and 1.8 m wide, were used to assess fish presence in large ponds. Relative abundance of fish was calculated in terms of CPUE based on the number of fish captured per unit of electrofishing effort (100 s) or per trap- or net-hour.

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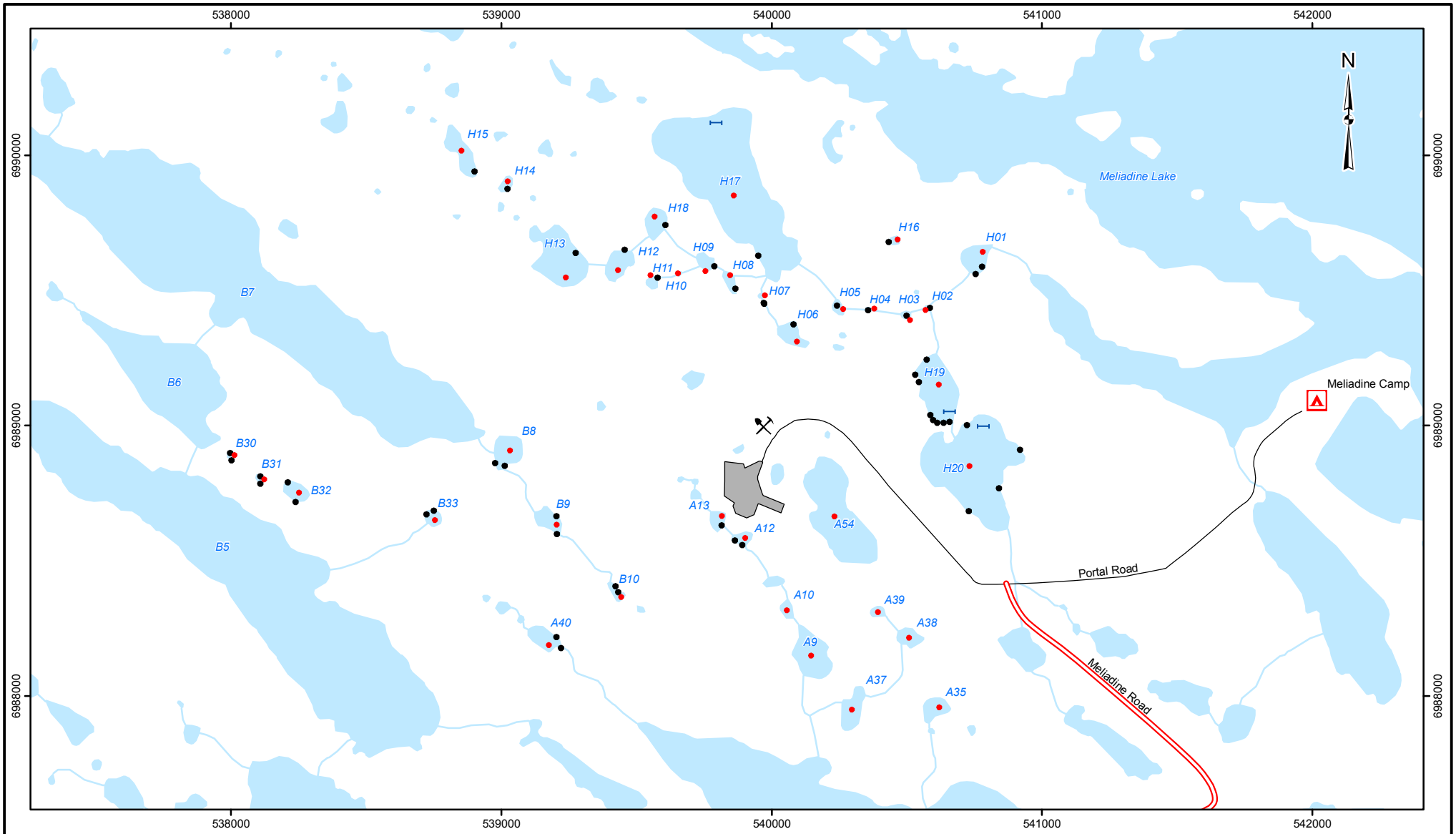

LEGEND

- CAMP
- PROPOSED MINE SITE
- ELECTROFISHING PERFORMED
- GILL NET
- MINNOW TRAP
- ROAD - EXISTING
- ROAD - PROPOSED ALIGNMENT
- WATERCOURSE
- PORTAL WORK AREA
- WATERBODY

500 0 500

SCALE 1:20,000 METRES

REFERENCE

Project Infrastructure provided by Comaplex Minerals Inc. Base data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

FISH SAMPLING LOCATIONS IN PONDS WITHIN THE MELIADINE WEST GOLD PROJECT AREA JUL - AUG 2008

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 3**	
GIS	CP	26 Nov. 2008		
CHECK	JP	20 Nov. 2008		
REVIEW	LY	26 Nov. 2008		

3.3 RESULTS

3.3.1 Habitat Assessments

The majority of the waterbodies investigated were small, shallow ponds with little potential to support fish for an extended period of time. The ponds ranged in size from approximately 0.04 ha (H10) to 15.8 ha (H17) with an average size of 1.4 ha (Appendix E). Pond size was considered in the evaluations of fish habitat because it provided insight towards assessments of overwintering and movement potential for fish. Habitat potential for fish was typically poor to moderate; however, habitat within the larger waterbodies was more favourable as evidenced by the capture of sportfish species. Waterbodies had similar dimensions and characteristics, and as such, descriptions are grouped and summarized below.

Sampled ponds were shallow (maximum depth range: 0.1 to 1.6 m), warm (temperature range: 15.0 to 22.1 ºC), and offered little potential to support fish on an annual basis. Good quality habitat within the majority of ponds was limited in abundance and suitable only for small fish. Substrates were dominated by fines but gravel and some cobble were observed along pond margins. Boulders, while present, did not contribute substantially to available fish habitat in general. Proportionally, vegetation offered the most potential to provide cover for fish.

Most ponds were capable of supporting important life stages of fish, including spawning and rearing for forage species, and if accessible, rearing areas for juvenile Arctic grayling. Spawning potential for Arctic grayling, however, was limited by the lack of suitable coarse substrates. Furthermore, overwintering potential was particularly poor because most ponds likely freeze to bottom during winter. Movement within ponds was unimpeded and movement between ponds appeared possible only during periods of increased flow (e.g., spring freshet and precipitation events). Given the propensity of the ponds to winterkill, this would be the mechanism by which ponds are populated.

Habitat quality varied somewhat between ponds. For example, Pond H20 is a large (9.5 ha), relatively deep (maximum depth of 1.6 m) pond with high quality habitat for both forage and sport fish. Pond H02 is significantly smaller (0.06 ha), shallower (maximum depth of 0.25 m) and contains poor fish habitat. The best habitat was found in Ponds H01, H15, H19, and H20. Maximum depth in these four sites ranged from 0.7 to 1.6 m, which was adequate to provide cover for small-bodied fish.

3.3.2 Fish Populations

In total, fish presence was confirmed in 13 of 37 ponds investigated (Figure 4). Two species, Arctic grayling (*n*=2, 49 to 55 mm in fork length) and ninespine stickleback (*n*=18, 48 to 72 mm in total length), comprised the catch from eight ponds (Table 4, Appendices D and E). In addition, 46 ninespine stickleback were observed but not captured; six fish were observed in two ponds (B30, 31) from which fish were captured and the other 40 stickleback were observed in five ponds (A10, A37, A54, H04, and H05) where fish were not captured (Appendix E).

Table 4 Fish Captured in Fish-Bearing Ponds within the Meliadine West Gold Project Area, Jul-Aug 2008

Pond	Method	Effort	Ninespine stickleback		Arctic Grayling	
			n	Length Range (mm)	n	Length Range (mm)
A12	Minnow traps	42 trap-h	5	53 to 68	0	-
A13	Minnow traps	42 trap-h	1	54	0	-
A40	Minnow traps	42.3 trap-h	4	55 to 59	0	-
B8	Minnow traps	43.5 trap-h	1	48	0	-
B30	Minnow traps	44.2 trap-h	4	51 to 72	0	-
B31	Minnow traps	44.2 trap-h	2	52 to 59	0	-
B32	Minnow traps	43.5 trap-h	1	53	0	-
H02	Minnow traps	21.5 trap-h	0	-	1	52
	Backpack electrofishing	120 s	0	-	1	49

Note: h= hours; s= seconds n= number captured; mm= millimeters

Minnow traps captured 18 ninespine stickleback and one Arctic grayling. Backpack electrofishing accounted for one Arctic grayling. Gill nets were used in Ponds H17, H19, and H20 (total effort of 61 h) and were unsuccessful in capturing any fish, indicating that it is unlikely that large fish inhabit these ponds. Despite substantial sampling effort exerted (Table 5), CPUE was low for each of the methods used during pond assessments, suggesting that densities of fish in the ponds were low.

Table 5 Fish Capture Methods, Total Effort and Total Catch in All Studied Ponds within the Meliadine West Gold Project Area, Jul-Aug 2008

Capture Method	Total Effort	Species Captured (n)	CPUE
Backpack electrofishing	7481 s	ARGR (1)	0.00013 fish/100 s
Minnow traps	1289 h	NNST (18)	0.013 fish/trap-h
		ARGR (1)	0.00078 fish/trap-h
Gill net	61 h	0	0 fish/net-h

Note: s= seconds; h= hours; n= number captured; CPUE= catch per unit effort

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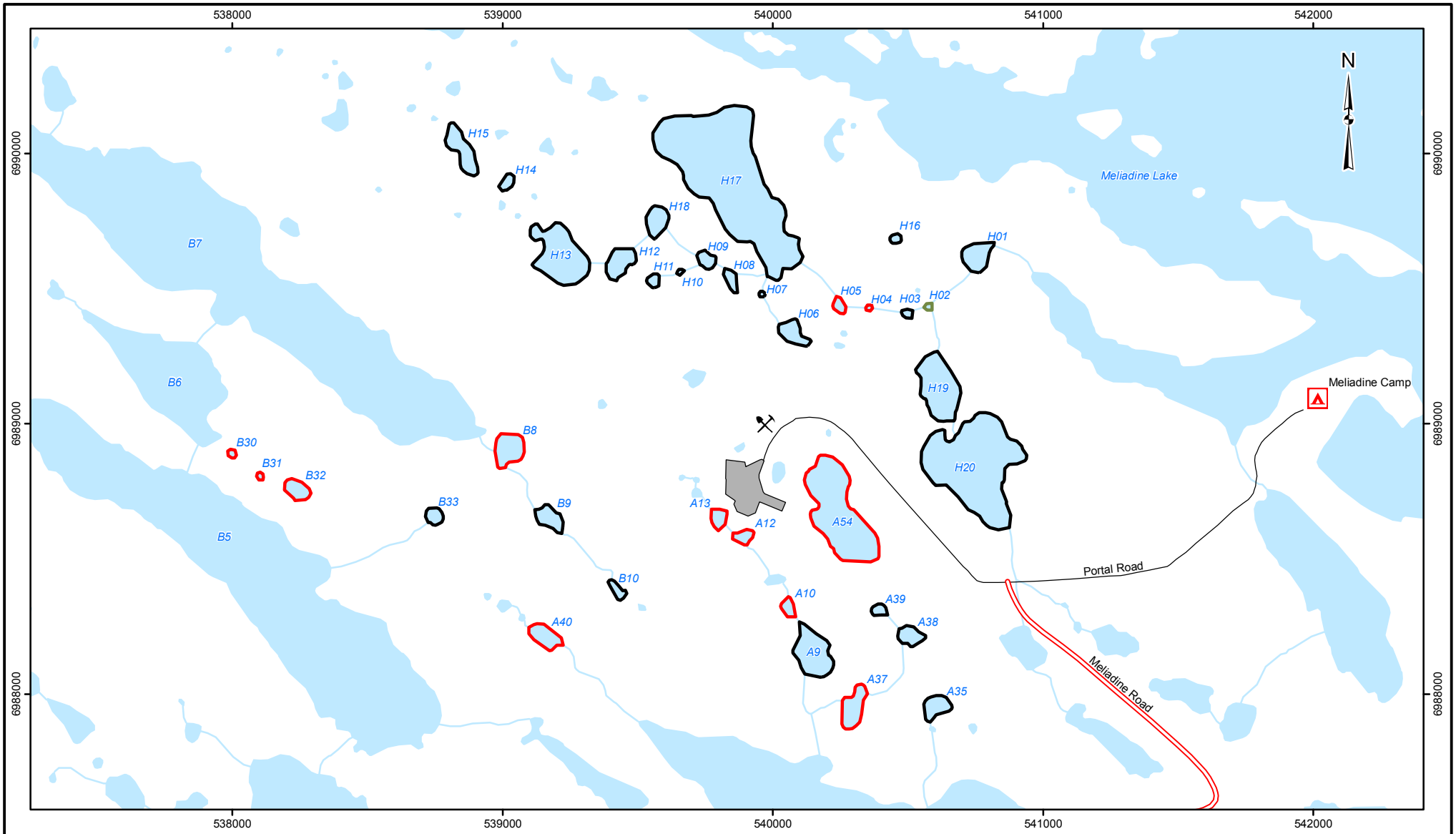

LEGEND

- CAMP
- PROPOSED MINE SITE
- ROAD - EXISTING
- ROAD - PROPOSED ALIGNMENT
- WATERCOURSE
- PORTAL WORK AREA
- WATERBODY
- NINESPINE STICKLEBACK CAPTURED OR OBSERVED
- ARCTIC GRAYLING CAPTURED
- FISH NOT CAPTURED OR OBSERVED

500 0 500
SCALE 1:20,000 METRES

REFERENCE

Project Infrastructure provided by Comaplex Minerals Inc. Base data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT
COMAPLEX MINERALS
MELIADINE WEST

TITLE
DISTRIBUTION OF FISH SPECIES IN PONDS SAMPLED WITHIN THE MEDIALINE WEST GOLD PROJECT AREA, JUL - AUG 2008

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 4**	
GIS	CP	26 Nov. 2008		
CHECK	JP	20 Nov. 2008		
REVIEW	LY	26 Nov. 2008		

3.4 SUMMARY

With the exception of the large ponds (H17, H19, and H20), variability between ponds was low with respect to size, shape, and their potential to support fish. Depth and water temperature were similar, as was substrate composition. Habitat quality and fish presence did not seem to be related in the studied ponds. All 13 ponds where fish were recorded (either captured or observed), displayed poor to moderate fish habitat for both sport and forage fish. For example, Pond H02, the only waterbody where Arctic grayling were captured, was shallow (maximum depth: 0.25 m), warm (15.9 ºC), had limited cover, and was rated as having a limited capacity to support fish. In contrast, among the 24 ponds where fish were not captured, 11 had moderate to high potential to support small-bodied fish. Ponds H01, H15, H17, and H20 were rated as having a good potential to support fish, yet no fish were captured or observed.

Given the locations of fish-bearing ponds and the relatively poor habitat observed, fish presence appeared to be more closely related to connectivity and proximity to fish-bearing waterbodies than to the quality of habitat. At the time of assessment, stream flow between ponds in the area was difficult to determine because potential channels connecting waterbodies were dry and poorly defined. However, evidence of recent flow was observed at a watercourse linking Pond H02 (the only site with Arctic grayling) to Pond H01, which in turn appears linked, at times, to Meliadine Lake. Therefore, seasonal variation in water levels likely dictates where and when fish can move to ponds and plays a prominent role in determining presence/absence of fish in different quality habitats. This was supported by the presence of fish in ponds that freeze to bottom during winter.

Similar observations were made during previous studies conducted on ponds B9, B10, and A54 (RL&L 1999). Field biologists documented poor fish habitat and considerable sampling (combined gill net effort of 91.7 net-h) in these three ponds did not yield any fish. The primary reason for the absence of larger fish in the ponds was reduced stream flow between the ponds and larger waterbodies in the area (RL&L 1999).

4 LAKE ASSESSMENTS

4.1 INTRODUCTION

Assessments of fish populations were conducted between July 10 to August 5, 2008 at three lakes in the Project area (lakes A52, B6, and B7) and at Chickenhead Lake in the Discovery area. The purpose was to assess fish populations with respect to community composition and habitat potential. Additionally, a mark-recapture study was performed at Lake B7 to estimate the size of the Arctic grayling population and a bathymetric survey was conducted in Chickenhead Lake to estimate lake volume and to map depth characteristics. Lakes B6 and B7, as well as the interconnecting stream B6-7, were studied previously in 1997 and 1998 (RL&L 1998, 1999). Relevant information from these studies is summarized to supplement 2008 data.

4.2 METHODS

4.2.1 Habitat Assessments

Habitat was assessed qualitatively with respect to movement, spawning, rearing, and overwintering potential for fish. Water temperature (ºC), conductivity (µS/cm), and pH were measured using a calibrated water quality meter and dissolved oxygen (mg/L) was measured using a colorimetric kit (Chemetrics, Chemets dissolved oxygen kit).

The bathymetric survey of Chickenhead Lake was conducted on August 4, 2008 using a Garmin 298 depth sounder. The sounder recorded geo-referenced depth readings every 1 s. Isobath and volume determinations were done using ArcGIS 9.2 software.

4.2.2 Fish Data Collection and Analyses

Fish populations were sampled using fyke nets, gill nets, backpack electrofisher, baited Gee-type minnow traps, and angling (Table 6, Figures 5, 6, and 7). Together, these five capture methods provided representative samples of fish size-classes inhabiting different habitats of the studied waterbodies.

All fish captured were held temporarily in tubs filled with water from their respective waterbody. Water was changed frequently to provide suitable holding conditions for captured fish. Collected information included fork length (mm), weight (g) and sexual maturity (if possible through external examination). Scales

from selected Arctic grayling, cisco and lake trout were collected for possible future reference; however, they were not aged for this report.

Table 6 Fish Capture Methods Used During Lake Investigations in the Meliadine West Gold Project Area, Jul-Aug 2008

Lake	Arctic Fyke Net	Small Fyke Net	Gill Nets	Backpack Electrofishing	Minnow Traps	Angling
A52		X	X	X	X	
B6		X				
B7	X		X			X
Chickenhead	X		X		X	X

In Lake B7, fish larger than 300 mm FL were marked with a uniquely numbered Floy™ tag and an adipose fin was clipped for all fish smaller than 300 mm FL. All marked fish were released several hundred metres from their capture location to avoid immediate recapture.

Relative abundance of fish was calculated using CPUE based on the number of fish captured per unit (100s) of electrofishing effort or per trap-, net-, or angling-h. Detailed descriptions of each capture method are provided below.

4.2.2.1 Fyke Nets

An Arctic fyke net was used to sample fish in near-shore habitats in Lake B7 (July 12 to 14 and July 31 to August 3, 2008) and in Chickenhead Lake (August 3 to 5, 2008). The Arctic fyke net consisted of one opening (4 m^2) comprised of nylon mesh tied into a metal frame. The mesh extended into a throat consisting of concentrically smaller compartments leading to a trap compartment. Two wings (each 15 m long) extended laterally from the trap, and one lead (30 m long) was attached to shore. The fyke net was installed in similar habitats in both Lake B7 and in Chickenhead Lake. Depth was 1.5 m, substrates at the sites consisted of boulders and large cobble with small patches of sand and gravel, and each had a slope of <5%.

A small fyke net (opening of 1 m^2), consisting of one trap, two 10-m wings, and a 20-m lead attached to shore, was installed in Lakes B6 (July 12 to 14, 2008) and A52 (August 3 to 4, 2008). In Lake B6, the trap was installed at a depth of approximately 1 m in an area dominated by cobble and boulders with a shallow (<5%) slope. In Lake A52, the trap was installed in 0.5 m of water in an area with a shallow (<5%) slope dominated by fines. Both the Arctic and small fyke net traps were checked for fish daily.

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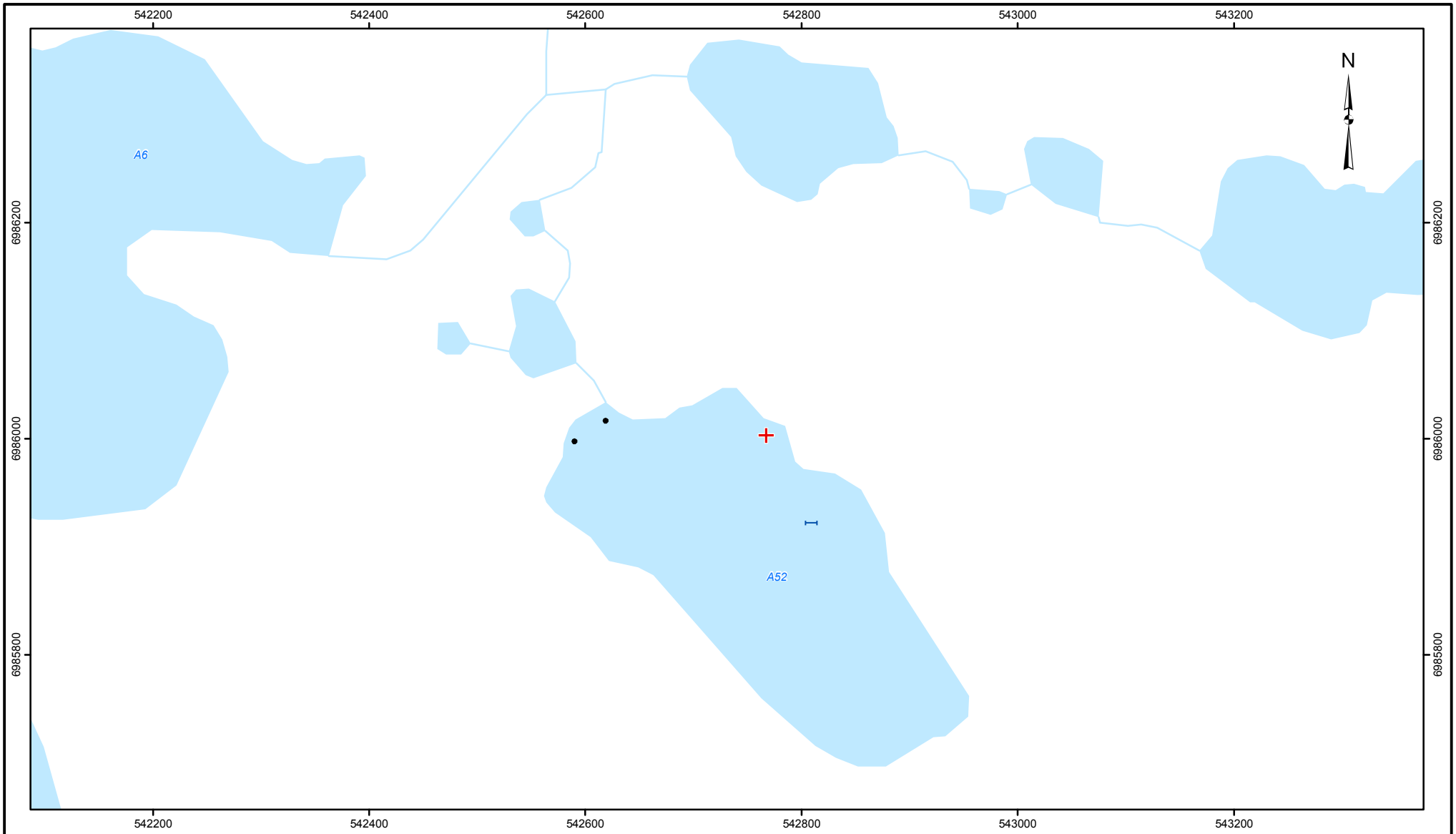

LEGEND

- FYKE NET
- GILL NET
- MINNOW TRAP
- WATERCOURSE
- WATERBODY

100 0 100
SCALE 1:5,000 METRES

REFERENCE

Data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

FISH SAMPLING LOCATIONS IN LAKE A52, AUGUST 2008

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 5**	
GIS	CP	20 Nov. 2008		
CHECK	JP	20 Nov. 2008		
REVIEW	LY	20 Nov. 2008		

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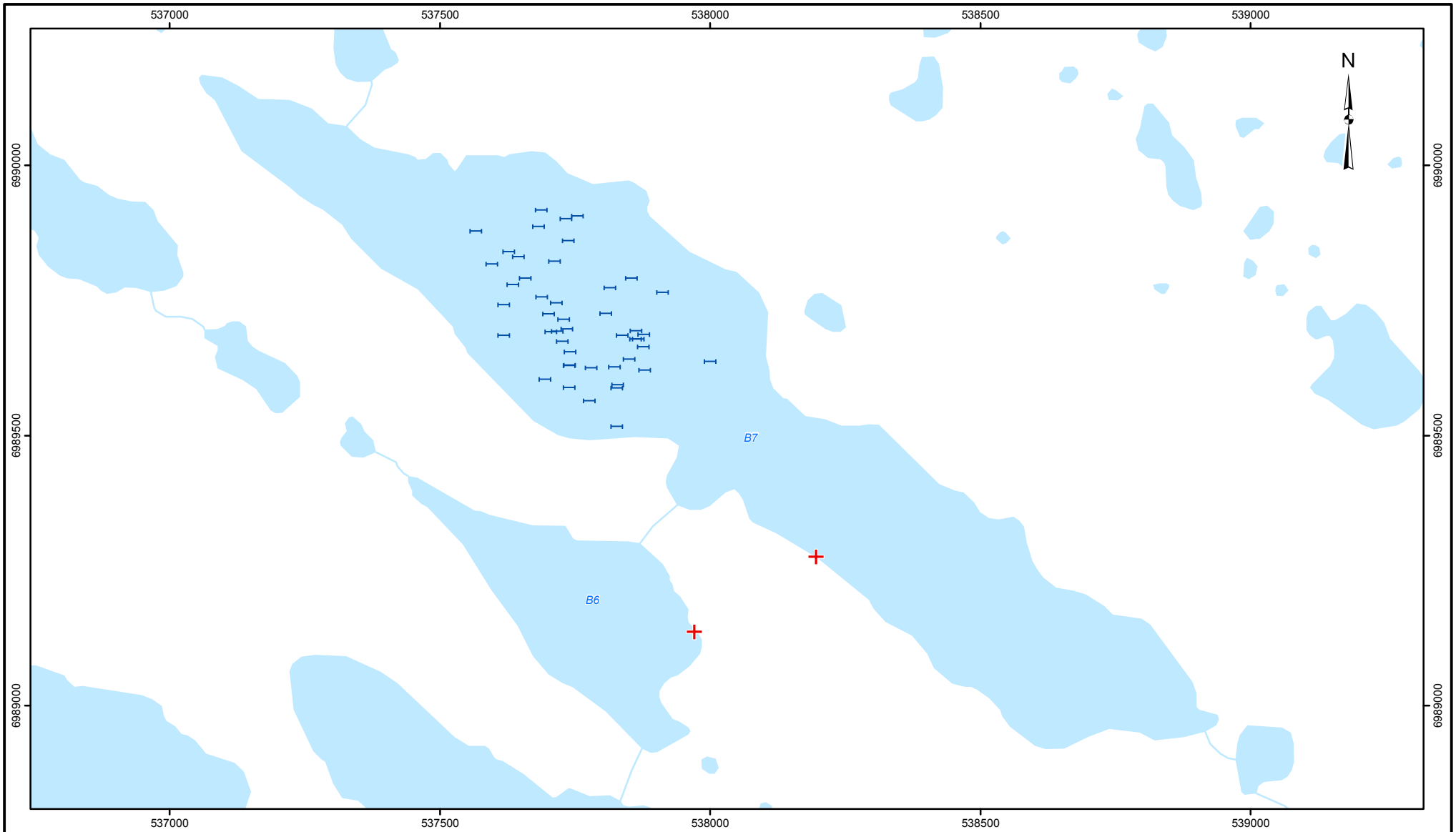

LEGEND

- FYKE NET
- GILL NET
- WATERCOURSE
- WATERBODY

250 0 250
SCALE 1:10,000 METRES

REFERENCE

Data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT
COMAPLEX MINERALS
MELIADINE WEST

TITLE
FISH SAMPLING LOCATIONS IN LAKES B6 AND B7, JUL - AUG 2008

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 6**	
GIS	CP	20 Nov. 2008		
CHECK	JP	20 Nov. 2008		
REVIEW	LY	20 Nov. 2008		

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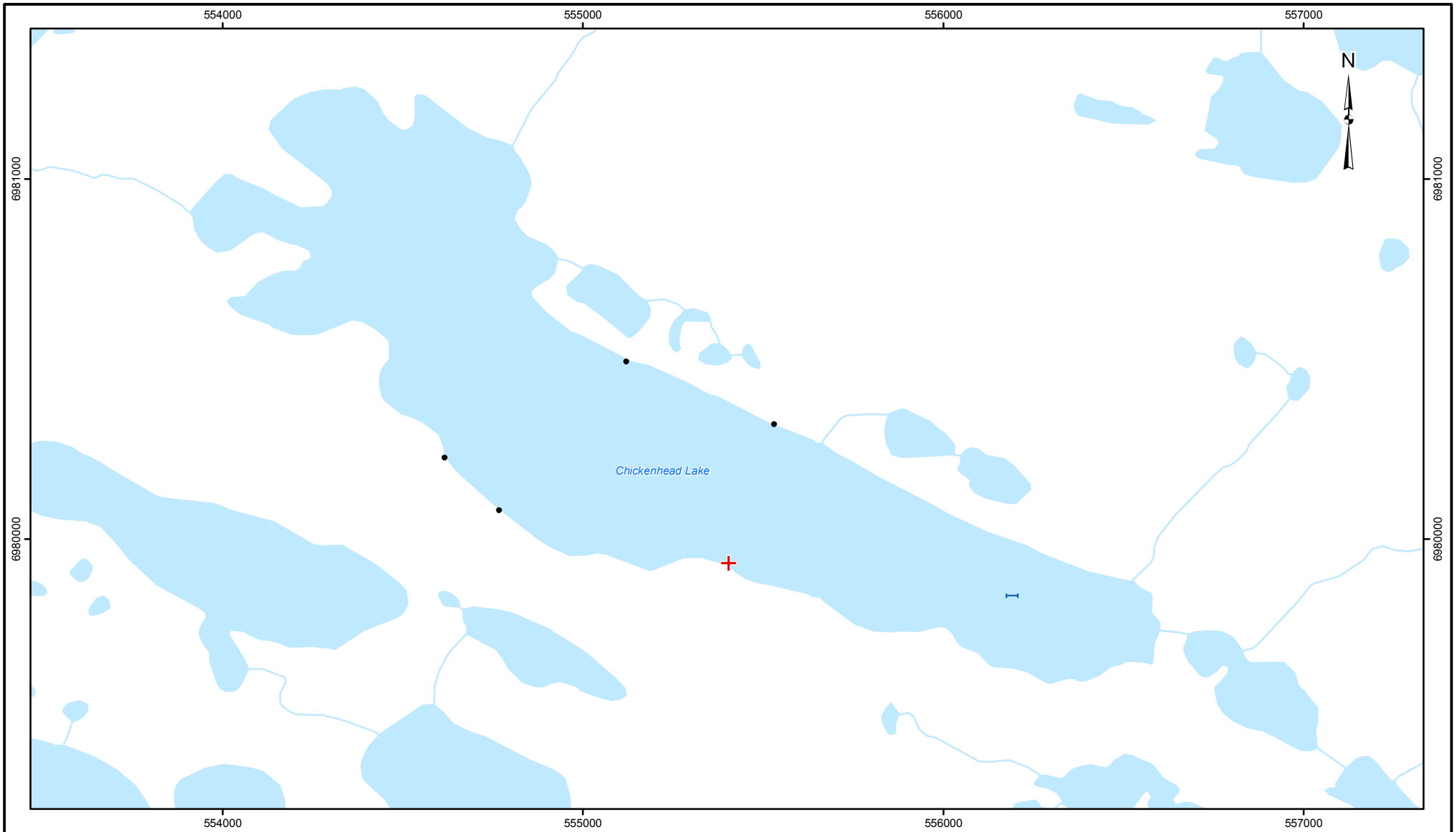

LEGEND

- FYKE NET
- GILL NET
- MINNOW TRAP
- WATERCOURSE
- WATERBODY

500 0 500

SCALE 1:15,000 METRES

REFERENCE

Data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

FISH SAMPLING LOCATIONS IN CHICKENHEAD LAKE, AUGUST 2008

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	RP	29 Sep. 2008	**FIGURE: 7**	
GIS	BR	24 Oct. 2008		
CHECK	RP	20 Nov. 2008		
REVIEW	LY	20 Nov. 2008		

4.2.2.2 Gill Nets

Three gill nets (25 mm monofilament mesh), each 15.2 m long and 1.8 m wide, were used individually and/or linked together to sample fish in pelagic areas of Lake A52, Lake B7, and Chickenhead Lake. Set durations ranged from 0.5 to 20.5 h (overnight) and set depths ranged from 1 to 4 m. Net locations and depths were adjusted between sets to optimize capture success. Information collected included Universal Transverse Mercator (UTM) coordinates, set and lift times, and the number of fish captured.

4.2.2.3 Backpack Electrofishing

A backpack electrofisher (Smith Root POW Type 12B, settings: 200-500 V, 30-60 Hz, 4-6 ms) was used to sample fish inhabiting littoral areas in Lake A52 on August 4, 2008. Sampling effort, electrofisher settings, and the number of fish captured and observed were recorded.

4.2.2.4 Minnow Traps

Gee-type minnow traps baited with cheese were used to sample small-bodied fish inhabiting littoral areas during both day and night. Traps were distributed to sample areas not assessed effectively by electrofishing. Set durations ranged from 24 to 46 h. Data collected included UTM coordinates, set duration, and the number of fish captured.

4.2.2.5 Angling

Angling was used occasionally to sample deep-water habitats and to assess fish distribution to guide gill net placement.

4.2.3 Population Estimate

The following equation (Bailey 1952) was used to estimate the size of fish populations in Lake B7:

$$N = M(C+1)/(R+1),$$

where M = number of individuals marked in the first sample,

C = total number of individuals captured in the second sample, and

R = number of individuals in second sample that are marked.

The equation is based on the Peterson method, generally considered the simplest method of estimating population size. Binomial confidence intervals (95%) were calculated graphically (Krebs 1999).

Population estimates were generated only for Arctic grayling because the number of individuals of other species captured and recaptured was insufficient for the calculation.

4.3 RESULTS

4.3.1 Lake A52

Lake A52 drains into a stream that connects lakes A5 and A6; however, the outflow does not have a well-defined channel and is likely ephemeral during most of the summer season (it was not flowing on August 3 when the survey was conducted). The lake was shallow (maximum depth of about 2 m) and featured an abundance of macrophytes distributed throughout the entire basin. Substrates along the lake margin were composed of cobble, gravel, and fines. Deeper areas of the lake were dominated by fines. On August 3, the water temperature was warm (13.2°C), and pH (9.0) and conductivity (491 µS/cm) were the highest among all ponds and lakes sampled in 2008.

Lake A52 contained suitable habitat for forage species (e.g., ninespine stickleback), mainly because of abundant cover provided by aquatic vegetation. Poor connectivity to other waterbodies and shallow depth limit the lake's habitat potential for use by sportfish such as Arctic grayling. Overwintering may be possible for species tolerant of low dissolved oxygen levels; however, it is likely that the lake freezes to bottom in most areas during winter.

Fish sampling was conducted using a small fyke net, backpack electrofishing, gill net and minnow traps (Table 7). The only species captured or observed in Lake A52 was ninespine stickleback. The fyke net captured over 500 fish of which 20 were randomly selected and measured (Appendix D). In addition, more than 100 individuals were captured or observed during backpack electrofishing. In contrast, fish were not captured in the minnow traps, despite considerable effort exerted (144 trap-h). Similarly, fish were not captured in the gill net, likely because the mesh size (25 mm) was too large to capture small-bodied fish such as ninespine stickleback.

Table 7 Fish Capture Methods, Effort, and Catch for Lake A52, August 2008

Method	Effort	Species	Number Captured	Size Range (mm)	CPUE
Small fyke net	46 trap-h	NNST	>500	55 to 82	>11 fish/trap-h
Gill net	48.5 net-h	-			0 fish/net-h
Backpack electrofishing	381 s	NNST	>100	-	>26 fish/100s
Minnow traps	144 trap-h	-			0 fish/trap-h

Note: h= hours; s=seconds; mm= millimetres; CPUE= catch per unit effort; > greater than

The absence of fish in the gill net catch suggested that Lake A52 did not provide suitable habitat for large-bodied fish such as Arctic grayling or cisco, even though these species have been previously documented in nearby Lake A6 (RL&L 1998, 1999).

4.3.2 Lake B6

Lake B6 is approximately 11.6 ha in area, has a maximum depth of 4.0 m, mean depth of 1.4 m, and contains approximately 166,100 cubic meters (m^3) of water (RL&L 1999). It features well-defined stream connections to Lake B7 upstream and Lake B5 downstream. Substrates along the lake shore are composed of boulder, cobble, and gravel; deeper areas of the lake are dominated by fines.

Fish sampling in Lake B6 was conducted using a small fyke net set on the northeast shore of the lake for 43.5 h (Figure 6, Table 8). The total catch of ten fish included one juvenile Arctic grayling, three juvenile cisco, and six ninespine stickleback.

Table 8 Fish Capture Methods, Effort, and Catch for Lake B6, July 2008

Method	Effort	Species	Number Captured	Size Range (mm)	CPUE
Small fyke net	43.5 trap-h	ARGR	1	134	0.02 fish/trap-h
		CISC	3	172 to 178	0.07 fish/trap-h
		NNST	6	43 to 61	0.14 fish/trap-h
TOTAL			**10**		**0.23 fish/trap-h**

Note: h= hours; mm= millimetres; CPUE= catch per unit effort

Lake B6 was sampled previously by angling in July 1997 when two Arctic grayling adults were captured (RL&L 1998). In addition, the inlet stream connecting Lake B7 to Lake B6 (Stream B6-7) was sampled by backpack electrofishing on seven occasions between June 1997 and August 1998 (RL&L 1998, 1999). The total catch of 98 fish included 54 Arctic grayling, 31 ninespine stickleback, 11 slimy sculpin, and two burbot. The presence of numerous (*n*=33) young-of-the-year Arctic grayling (between 20 and 31 mm FL) in mid-July of both 1997 and 1998 indicated that the stream was an important spawning area for this species.

The outlet of Lake B6 (Stream B5-6) was also sampled by backpack electrofishing six times between June 1997 and August 1998 (RL&L 1998, 1999), resulting in the total catch of 122 fish (33 Arctic grayling, 87 ninespine stickleback, and two slimy sculpin). Except for one Age-3 individual, all captured Arctic grayling were young-of-the-year fish.

Because of its adequate depth and well-defined gravel/cobble channels of both the inlet and outlet streams, Lake B6 can provide good quality spawning, rearing, and overwintering habitat to all fish species found in this system.

4.3.3 Lake B7

Lake B7 is approximately 57.8 ha in area, has a maximum depth of 5.1 m, mean depth of 1.5 m, and contains approximately 855,900 m^3 of water (RL&L 1999). It features a well-defined stream connection to Lake B6 downstream; however, its two small inlets (in the east and west parts of the lake) have poorly defined channels as B7 is a "height of land" waterbody. Substrates in littoral areas were dominated by boulder and cobble, with small patches of gravel and sand present. Substrates in the deeper areas of the lake were dominated by fines and boulders.

Fish sampling in Lake B7 was conducted using an Arctic fyke net set on the southeast shore and numerous short-duration gill nets sets in the northwest part of the lake (Figure 6, Table 9). The total catch of 318 fish included 293 Arctic grayling, 19 cisco, four ninespine stickleback, and two burbot.

Table 9 Fish Capture Methods, Effort, and Catch for Lake B7, Jul-Aug 2008.

Method	Effort	Species	Number Captured	Size Range (mm)	CPUE
Arctic fyke net	138.5 trap-h	ARGR	283	87 to 352	2.0 fish/trap-h
		BURB	2	273 to 307	0.01 fish/trap-h
		CISC	6	270 to 302	0.04 fish/trap-h
		NNST	4	49 to 78	0.03 fish/trap-h
Gill net	20.5 net-h	ARGR	10	149 to 329	0.5 fish/net-h
		CISC	13	152 to 297	0.6 fish/net-h
TOTAL			**318**		

Note: h= hours, mm= millimetres; CPUE= catch per unit effort

Although CPUE was low, the fyke net was effective in capturing a wide-range of life-stages representing four species (Table 9), during both the mark and recapture phases of the assessment. Arctic grayling (*n*=283) was the most prominent species captured, comprising 96% of the catch from the fyke net. Burbot, cisco, and ninespine stickleback comprised the remainder of the catch. Gill nets were used to sample a large proportion of deep-water habitat at Lake B7; fewer fish were captured and CPUE was lower compared to the fyke net. Size ranges of fish captured using both techniques was comparable.

Based on the modified Peterson method, the size of the Arctic grayling population in Lake B7 was estimated at 1,345 fish, with 95% confidence intervals ranging from 836 to 2,507 (M=188, C=92, and R=12). This estimate

includes both juvenile and adult fish. The variability of the estimate can be attributed to the fact that only 12 marked individuals were recaptured. The small number of recaptures may be related to the fact that Arctic grayling likely used the entire lake as a home range, thereby reducing the probability of recapture from the same spot as the original capture. It is also possible that marked fish became trap-averse resulting from the capture and mark procedures. The most probable explanation is that Arctic grayling distribute themselves throughout the entire lake. Habitat quality in the lake was relatively homogenous; therefore, Arctic grayling were no more likely to frequent the areas near the fyke net than the other areas of the lake. Further supporting this idea is the fact that only small fish (<220 mm), which typically move less than large fish, were recaptured.

Overall, Arctic grayling ranged from 87 to 352 mm in fork length (Figure 8). Based on the age-length relationship reported by RL&L (1999), these fish likely ranged from one to nine years in age. Arctic grayling between 160 to 179 mm in fork length were the dominant size-class captured in Lake B7 and were likely comprised of age-two or age-three fish. Larger fish (200 to 352 mm in fork length) were captured infrequently. This size distribution is indicative of a population with strong recruitment.

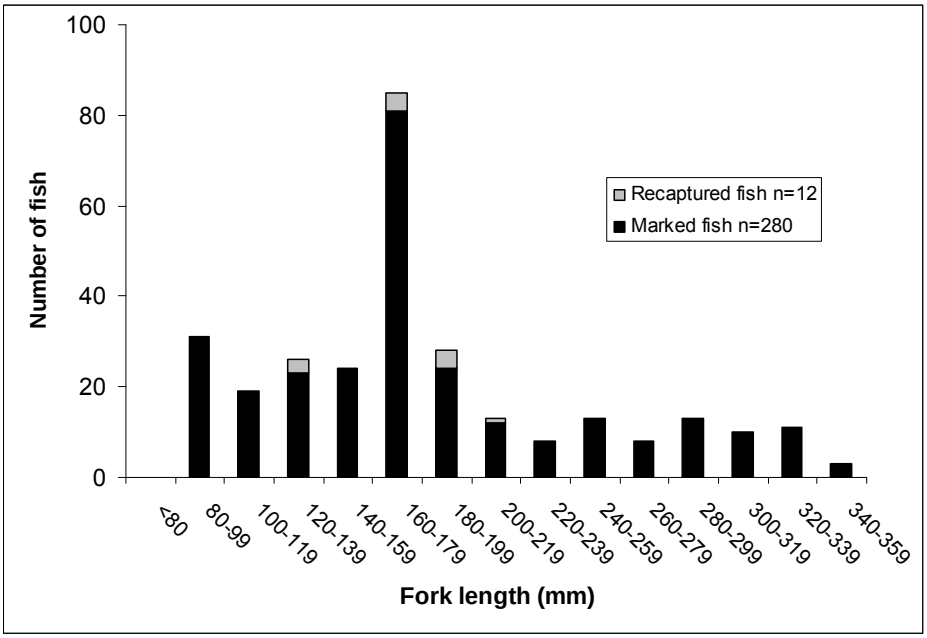

Figure 8 Length Frequency Distribution of Marked and Recaptured Arctic Grayling in Lake B7, Jul-Aug 2008

Lake B7 was previously sampled by angling and gill netting in 1997 and 1998 (RL&L 1998, 1999). The total catch of 29 fish included 14 Arctic grayling adults (275 to 410 mm in fork length, ages 7 to 10) and 15 cisco adults (274 to 367 mm, ages 5 to 10). In addition one adult burbot (600 mm, age 18) was found dead near the outlet in July 1998 (RL&L 1998).

4.3.4 Chickenhead Lake

Chickenhead Lake is located in the headwaters area of the Atulik River watershed, which flows into the Hudson Bay approximately 40 km east of the Meliadine River mouth. Chickenhead Lake is 135.5 ha in area, has a maximum surveyed depth of 8.9 m, a mean depth of 1.7 m, and contains approximately 2,340,820 m^3 of water. The bathymetric map of Chickenhead Lake shows a wide variety of potential habitats for fish (Figure 9). Shallow areas (<1 m) are prevalent along the lake's periphery, especially in the western portion, and areas of moderate depth (1 to 4 m) are scattered throughout the lake. There is one area of substantial depth (>8 m) located in the north-central area of the lake.

The lake contained good quality habitat for both forage and sportfish species. Similar to Lake B7, substrates in littoral areas were dominated by boulder, cobble with small patches of gravel and sand also present. In deeper areas, the bottom was dominated by fines; however, boulder substrates were also recorded. Habitat potential for spawning, rearing, movement, and overwintering was rated high.

The bathymetric profiling and habitat assessments indicated that the diverse habitats present in the lake are capable of supporting multiple life-stages of species occupying the system. Littoral areas featured habitat that provided good spawning and rearing potential. Off-shore, depth and variable substrate provided suitable cover for large fish. Overwintering potential for all species was also high because of adequate depth. These assessments were reflected in the species and size of fish captured during the fisheries assessment.

Arctic grayling, burbot, and lake trout were captured in both fyke and gill nets. Although CPUE for the fyke net was moderate (0.35 fish/trap-h), this method was effective in capturing wide size-ranges of Arctic grayling and lake trout (Table 10). Lake trout (n=17) was the most prominent species captured, comprising 57% of the catch. Arctic grayling (n=12) comprised 40% of the catch. Only one burbot (335 mm in total length) was captured. Ninespine stickleback and cisco were not captured and no fish were captured in minnow traps or by angling.

One notable specimen captured was a lake trout that was 942 mm in fork length. This fish was captured during a short (0.5 h) gill net set. The fish was too large

for the balance so its weight (9587 g) was estimated using a length-weight relationship developed for the Meliadine Lake area (RL&L 2001).

Table 10 Fish Capture Methods, Effort, and Catch for Chickenhead Lake, August 2008.

Method	Effort	Species	Number Captured	Size Range (mm)	CPUE
Arctic fyke net	42.3 trap-h	ARGR	10	235 to 402	0.24 fish/trap-h
		BURB	1	335	0.02 fish/trap-h
		LKTR	4	245 to 457	0.09 fish/trap-h
Gill net	54 net-h	ARGR	2	168 to 379	0.04 fish/net-h
		LKTR	13	172 to 942	0.24 fish/net-h

Note: h= hours; mm= millimetres; CPUE= catch per unit effort

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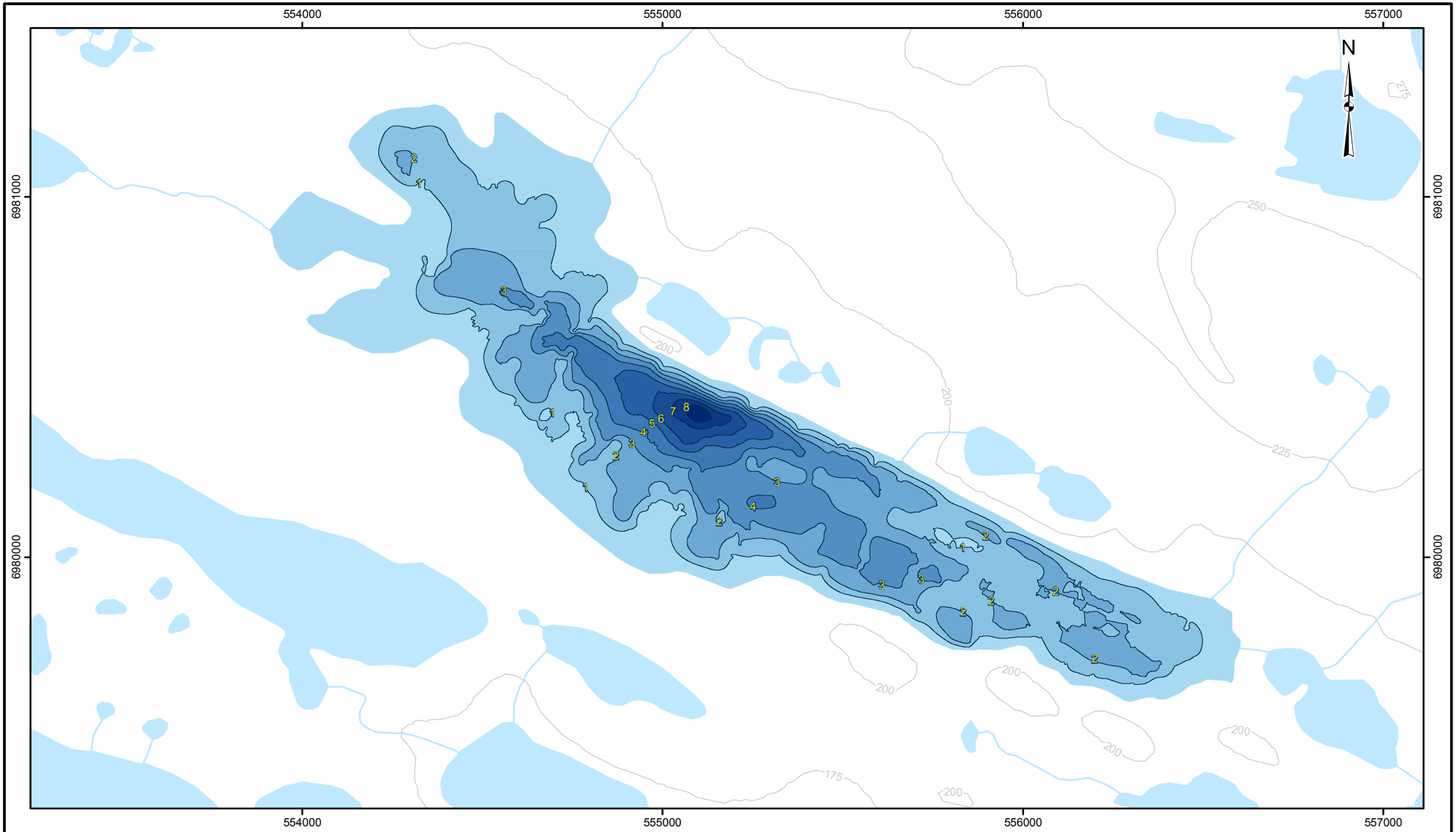

LEGEND

- CONTOUR (m)
- ISOBATH (m)
- WATERCOURSE
- WATERBODY

LAKE DEPTH (m)

0 1 2 3 4 5 6 7 8 9

400 0 400

SCALE 1:15000 METRES

NOTE

Bathymetric point data collected by Golder Associates Ltd, August, 2008.
Maximum Recorded Depth: 8.9 m

REFERENCE

Data obtained from Government of Canada, Natural Resources Canada, Centre for Topographic Information (1:50,000).
Projection: UTM Zone 15 Datum: NAD 83

PROJECT

COMAPLEX MINERALS
MELIADINE WEST

TITLE

CHICKENHEAD LAKE BATHYMETRY

Golder Associates
Edmonton, Alberta

PROJECT NO. 07-1373-0055			SCALE AS SHOWN	REV. 0
DESIGN	DC	21 Aug. 2008	FIGURE: 9	
GIS	CP	22 Oct. 2008		
CHECK	JP	20 Nov. 2008		
REVIEW	LY	20 Nov. 2008		

4.4 SUMMARY

Habitat quality within Lake B6, Lake B7, and Chickenhead Lake was favourable for supporting populations of sport and forage fish. Each of the lakes had sufficient size, depth, and cover to support all life-stages for the species known to inhabit the area. Therefore, habitat potential for movement, spawning, rearing, and overwintering was rated high for all three lakes. The habitat in Lake A52 was of lower quality. Although Lake A52 had the capacity to support populations of forage fish, it appeared unlikely that it could support sportfish species such as Arctic grayling.

Overall, ninespine stickleback was the most commonly captured species, followed by Arctic grayling, cisco, lake trout and burbot. Over 500 ninespine stickleback were captured in Lake A52, demonstrating its importance to forage fish in the area. Juvenile ninespine stickleback were observed, indicating that reproduction was occurring in the lake. The perimeter of the lake was investigated but no defined inflows or outflows were documented. Therefore, given the number and size range (juveniles observed) of fish captured and observed, it may be possible for Lake A52 to support ninespine stickleback through some years. Should the lake freeze to bottom, fish likely repopulate the lake during spring run-off when connectivity to nearby waterbodies is restored.

Lake B7 was inhabited by numerous Arctic grayling (population estimated at 1,345 fish) and may serve as an important source of dispersal for Arctic grayling in the surrounding area, depending on the water levels of connecting streams. A wide range of size-classes were captured, indicating good recruitment. In Lake B6 (downstream of Lake B7) only one Arctic grayling was captured, mainly due to lower sampling effort relative to Lake B7. Lake B6 is likely an important rearing area for Arctic grayling that were documented to spawn in the inflow and outflow streams (RL&L 1998, 1999).

Cisco were captured only in lakes B6 and B7. Lake B7 individuals (n=19) ranged from 152 to 302 mm in fork length, whereas B6 individuals (n=3) were 172 to 178 mm in length. The narrow size range recorded for cisco in Lake B6 is likely due to the schooling behavior of the juvenile fish of this species.

Lake trout were captured only in Chickenhead Lake. The wide size distribution (172 to 942 mm in fork length) was suggestive of a population ranging from juvenile to 30+ years in age. Because lake trout were not captured in any of the headwater lakes of Basins A and B in the Meliadine Lake watershed during the present or previous studies (RL&L 1998, 1999, 2000), the presence of this species in Chickenhead Lake was somewhat surprising and suggested that the upper Atulik River basin may have different characteristics than the upper Meliadine River drainage.

5 CONCLUSION

Aquatic investigations were carried out at 13 watercourses along the proposed road corridors, as well as in 37 ponds and four lakes located near the proposed mine areas. Three proposed road crossings and one lake were located within the Discovery area, whereas the remaining waterbodies fell within the Meliadine West area. Fish presence was confirmed (either by captures or observations) in all four lakes, 9 of the 13 streams, and 13 of the 37 ponds studied. Using a variety of methods, fish were captured in four lakes, six streams, and eight ponds. In total, 1060 fish were captured, of which 479 were measured (Table 11).

Table 11 Fish Captured at All Studied Sites within the Meliadine West Gold Project Area, Jun-Aug 2008

Method	Species	Number Captured	Size Range (mm)
EF, MT, FN	NNST	698 [a]	28 to 82
EF, MT, FN, GN	ARGR	317 [b]	48 to 402
GN, FN	CISC	22	152 to 302
GN, FN	LKTR	17	172 to 942
FN	BURB	3	273 to 335
EF	SLSC	3	69 to 94

a 118 NNST were measured.

b 316 ARGR were measured.

Note: EF= electrofishing; MT= minnow traps; FN= fyke net; GN= gill net; mm= millimetres

5.1 ROAD CROSSING ASSESSMENTS

The 13 watercourses investigated were somewhat diverse in depth, instream cover, habitat potential for fish, and fish presence. For example, flow and habitat quality ranged from non-existent (e.g., dry conditions at Site M6.7) to profuse, at sites such as M2.1 (Meliadine River). Fish populations were dominated by small-bodied individuals (ninespine stickleback, juvenile Arctic grayling, slimy sculpin), and habitat quality was poor to moderate at most sites. Moderate to high quality habitat was present at five locations (Sites M5.0, M2.1, D5.8, M23.7, and M11.5), which corresponded to the capture of forage fish and juvenile Arctic grayling. The Meliadine River (Site M2.1) had the greatest potential to support multiple life stages of fish of all sites investigated, but high flow conditions prevented the site from being sampled and investigated effectively.

5.2 POND ASSESSMENTS

The 37 studied ponds exhibited similar characteristics, including depth, temperature, substrate, and habitat potential for fish use. Ponds were

predominantly shallow, warm, had substrates dominated by fines, and contained poor to moderate fish habitat. Where fish were present, ninespine stickleback was the dominant species. Eleven of the ponds where fish were not found contained moderate to high habitat quality. In contrast, habitat quality was rated low to moderate in 13 of the 37 ponds where fish presence was confirmed. This discrepancy between fish presence and habitat quality can be resolved when connectivity and proximity to fish bearing waterbodies is taken into consideration. Ponds in close proximity to waterbodies known to be inhabited by fish (e.g., Meliadine Lake) have a higher probability of containing fish, regardless of habitat potential.

5.3 LAKE ASSESSMENTS

All four lakes investigated supported fish populations and three lakes (B6, B7, and Chickenhead) were rated as excellent with regards to fish habitat potential. In contrast, Lake A52 had lower quality habitat and was inhabited by ninespine stickleback only. Lake B7 contained a large number of Arctic grayling (estimated at 1,345 fish) and much smaller numbers of cisco, burbot and ninespine stickleback. Lake B6 also contained Arctic grayling, cisco, and ninespine stickleback. The presence of previously documented Arctic grayling spawning areas in the stream connecting lakes B6 and B7 suggested that both lakes are used for juvenile rearing and adult holding/feeding of this species. Chickenhead Lake supported sportfish species including Arctic grayling, lake trout and burbot; ninespine stickleback were not encountered.

6 CLOSURE

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

GOLDER ASSOCIATES LTD.

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APPENDIX A

HABITAT DATA FROM STREAM CROSSINGS IN THE MELIADINE WEST ROAD CORRIDOR

Appendix A. Habitat Data from Stream Crossing Investigations in the Meliadine West Road Corridor, June 2008.

Parameter	Site M2.1				Site M3.0						Site M3.9						Site M5.0		Site M6.7		
	R1	***R2***	***R3***	***R4***	***Out***	***R1***	***R2***	***R3***	***R4***	***In***	***Out***	***R1***	***R2***	***R3***	***R4***	***In***	***Out***	***In***	***R1***	***R2***	***R3***
Stream Size (m)																					
Length Surveyed	200	200	200	90		50	50	50	50			50	50	50	50	170			50	50	50
Mean Channel Width					0.8	0.2	1.5	1.9	5.0	11.2			2.5	4.1	1.2						
Min Channel Width					0.2	0.2	0.5	0.1	0.2	0.3	0.2		0.8	1.9	1.0	13.9					
Max Channel Width	122	34	48	134	1.4	0.9	2.5	3.6	10.0	22.0	0.8		4.2	6.4	3.3	55.0	28.0	11.9			
Flooded Width	>200	58	102	148	22	38	18	16	10	46	12	50	27	66	34	55			36	26	54
Mean Depth	0.5	1.0	1.0	0.75	0.15	0.08	0.08	0.04	0.08	0.15	0.12	0.1	0.07	0.04	0.08	0.12	0.15	0.35			
Maximum Depth	>1	>1	>1	>1	0.18	0.19	0.12	0.16	0.15	0.22	0.42	0.12	0.1	0.11	0.15	0.17	0.26	0.58			
Channel Type (% Length)																					
Single	100	100	100	100	30	30	30	10					95	80				100			
Double													5								
Multiple Braids					70	40	40	30	15					20	50		100			100	70
Dispersed							30					100			50				100		30
Flooded Banks						30		60	85												
Habitat Type (% Length)																					
Riffles	30	20	10	20			10										5				
Runs	70	70	70	80	70	45	60	10	15				100	100	40		75	100			
Pools		10	20		30	55	30	90	85			100			60		20				
Substrate (% Area)																					
Detritus						80	60	90	70	35	90	50	10	5	90	100		5	85		
Fines (<2 mm)	10	5	10	5			30	10	15	10		50	90	50	10		10	5		90	95
Gravel (2-64 mm)	20	5	20	5	10		10		5	5				20			20	10		10	5
Cobble (65-256 mm)	30	20	20	20	70	15			5	25				20			60	40	5		
Boulder (>256 mm)	40	70	50	70	20	5			5	25	10			5			10	40	10		
Instream Cover (%)																					
Undercut Bank				10						70	50										
Boulder Gardens	95	100	100	90	90	50	10			20	20						80	95			
Vegetation	5				10	50	90	100	100	10	30	100			100	100	20	5			

Notes: R1, R2, etc = individual stream sections; Out = outlet from lake/pond; In = inlet to lake/pond

Appendix A. Habitat Data from Stream Crossing Investigations in the Meliadine West Road Corridor, June 2008.

Parameter	Site M8.6						Site M11.5					Site M13.3					Site M22.6					Site M23.7			
	Out	***R1***	***R2***	***R3***	***R4***	***In***	***Out***	***R1***	***R2***	***R3***	***In***	***Out***	***R1***	***R2***	***R3***	***In***	***Out***	***R1***	***R2***	***R3***	***In***	***Out***	***R1***	***R2***	***In***
Stream Size (m)																									
Length Surveyed		30	30	30	30	170		100	100	100	80		100	100	100	40		50	50	50	50		50	50	40
Mean Channel Width	1.4	0.8	3.9	4.7	1.6	0.9	5.5	8.4	2.8	3.0	4.4	0.7	8.2	3.8	2.4	7.8	1.1	14.0	0.9	12.0	2.4	13.0	1.2	3.2	3.1
Min Channel Width	0.9	0.6	0.3	0.3	0.4	0.4	0.7	0.6	0.4	0.7	0.8	0.3	0.5	0.5	1.1	1.5	0.8	0.1	0.4	10.0	1.3	10.0	1.3	1.2	0.7
Max Channel Width	1.8	0.9	7.5	9.0	2.8	1.3	10.2	16.0	5.2	5.3	7.9	0.8	16.0	7.0	3.7	14.0	1.4	1.1	3.2	15.0	3.5	16.0	2.2	5.2	5.4
Flooded Width	20	9	12	12	22	16	46	16	16	48	28	0.82	3	9.5	18	44	12	60	15	25	5	42	42	44	48
Mean Depth	0.12	0.1	0.08	0.07	0.08	0.08	0.07	0.08	0.1	0.25	0.11	0.04	0.08	0.1	0.12	0.08	0.09	0.12	0.08	0.17	0.13	0.25	0.25	0.15	0.1
Maximum Depth	0.21	0.2	0.16	0.19	0.2	0.22	0.25	0.18	0.26	0.42	0.29	0.13	0.15	0.59	0.21	0.21	0.18	0.21	0.13	0.41	0.22	0.49	0.43	0.25	0.3
Channel Type (% Length)																									
Single				50					20	40			10	80	10				60						
Double									20																
Multiple Braids							80	90	40	30	80		45	20	30			70		50			100	100	100
Dispersed		100	100	50	100		20	10	20	30	20		45		60			20	40	50					
Flooded Banks																		10							
Habitat Type (% Length)																									
Riffles									40	70	20														
Runs				5	5		80	95	55	20	50			75	20			20	60	10			100	80	90
Pools		100	100	95	95		20	5	5	10	30		100	25	80			80	40	90				20	10
Substrate (% Area)																									
Detritus	95	95	95	95	90	80	80	70	85	5	20	80	70	80	70	70	20	60	10	45	10			10	5
Fines (<2 mm)						5	20	20	10	5	10		30	20	5	10		30	10	40	10	5	10	10	5
Gravel (2-64 mm)						5				30	20				5		10		20		10	5	10	10	10
Cobble (65-256 mm)								5		30	20				10	10	10	5	40	5	10	30	40	10	50
Boulder (>256 mm)	5	5	5	5	10	10		5	5	30	30	20			10	10	60	5	20	10	60	60	40	60	30
Instream Cover (%)																									
Undercut Bank										70	40	30		70		10	10	25	10	5	10	10	10	20	
Boulder Gardens	5	5		5	15	10			5	20	40	30			30	10	70	5	40	5	80	90	70	40	80
Vegetation	95	95	100	95	85	90		100	95	10	20	40	100	30	70	80	20	70	50	90	10		20	40	20

Notes: R1, R2, etc = individual stream sections; Out = outlet from lake/pond; In = inlet to lake/pond

APPENDIX B

HABITAT DATA FROM STREAM CROSSINGS IN THE DISCOVERY ROAD CORRIDOR

Appendix B. Habitat Data from Stream Crossing Investigations in the Discovery Road Corridor, June 2008.

Parameter	Site D1.2						Site D5.8				Site D6.7			
	Out	***R1***	***R2***	***R3***	***R4***	***In***	***Out***	***R1***	***R2***	***In***	***Out***	***R1***	***R2***	***R3***
Stream Size (m)														
Length Surveyed	100	100	100	100	100	100	50	50	50	60		30	30	30
Mean Channel Width	1.2	3.0	0.5	4.0	2.0	0.9	10.5	2.6	1.9	5.4	1.9	2.4	7.5	
Min Channel Width	0.6	0.9	0.4	0.7	0.5	1.8	1.4	1.4	1.2	1.5	1.1	0.9	1.2	
Max Channel Width	1.8	40	28	38	25	2.5	7.9	4.2	2.7	9.3	2.6	3.9	13.7	
Flooded Width	66	60	70	90	32	24	10.5	17.7	25.3	15.7	34	21	25	19
Mean Depth	0.10	0.15	0.20	0.20	0.15	0.10	0.15	0.10	0.10	0.10	0.15	0.05	0.01	
Maximim Depth	0.20	0.38	0.28	0.25	0.42	0.12	0.21	0.23	0.18	0.15	0.52	0.10	0.01	
Channel Type (% Length)														
Single	40	40	90	50	90			10	80	20				
Double	10			30						10				
Multiple Braids	40	30		5			95	80	10	50		100	100	
Dispersed	10	10	5	10	5		5	10	10	20				
Flooded Banks		20	5	5	5									
Habitat Type (% Length)														
Riffles								10	10	60				
Runs	80	20	70	10	90		90	70	80					
Pools	20	80	30	90	10		10	20	10	40		100	100	
Substrate (% Area)														
Detritus	60	70	90	90	95	90		5	5	50	10	90	10	
Fines (<2 mm)	10	20	5	10	5	10	10	10	5	10	10			
Gravel (2-64 mm)	5	5					20	20	10	20			10	
Cobble (65-256 mm)	15	5					30	60	80	10			20	
Boulder (>256 mm)	10		5				40	5		10	80	10	60	
Instream Cover (%)														
Undercut Bank								40	40					
Boulder Gardens	5				5		90	40	40	30	60		90	
Vegetation	95	100	100	100	95	100	10	20	20	70	40	100	10	

Notes: R1, R2, etc = individual stream sections; Out = outlet from lake/pond; In = inlet to lake/pond

APPENDIX C

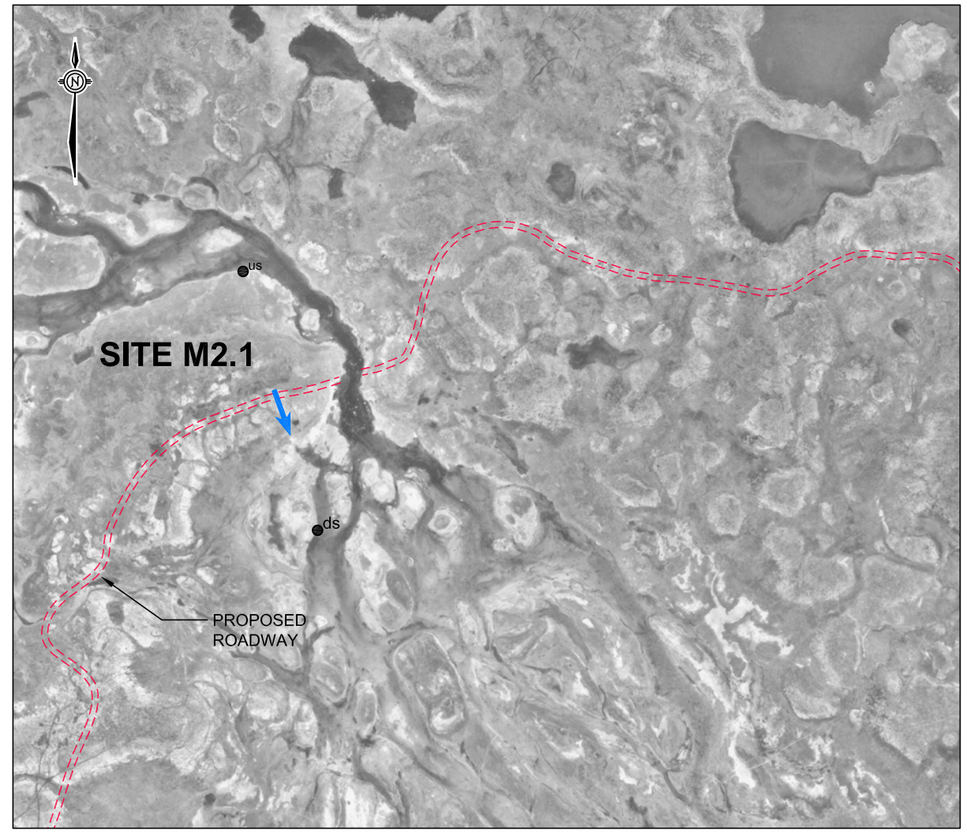
HABITAT SUMMARIES AND PHOTOS OF STREAM CROSSING SITES

Photo 459 - Juvenile Arctic grayling (FL: 48 mm).

Photo 462 - Upstream view 200 m upstream from proposed crossing location.

Photo 467 - Upstream view from 400 m upstream from proposed crossing location.

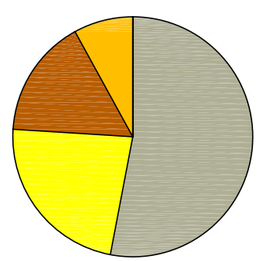
Photo 474 - Downstream view from 690 m upstream from proposed crossing location.



REFERENCE

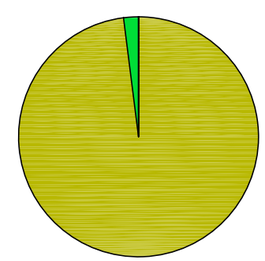
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



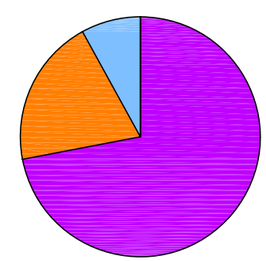
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M2.1
Date of Survey: June 20, 2008

Upstream UTM: 544595 E, 6971835 N
Downstream UTM: 544731, E 6971455 N

Water Quality:	
Time	08:30
Temperature	3.0 °C
Conductivity	N/A
pH	N/A
DO	10 to 12 mg/L

Channel:	
Stream length surveyed	690.0 m
Mean channel width	N/A
Mean flooded width	120.0 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	ARGR (1)	48	557 s
Observations	NNST (2)	<100	—
Egg sampling	—	—	4 kicks

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M2.1

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No. 1732934	
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C1	
REVIEW	JP	20/11/08		

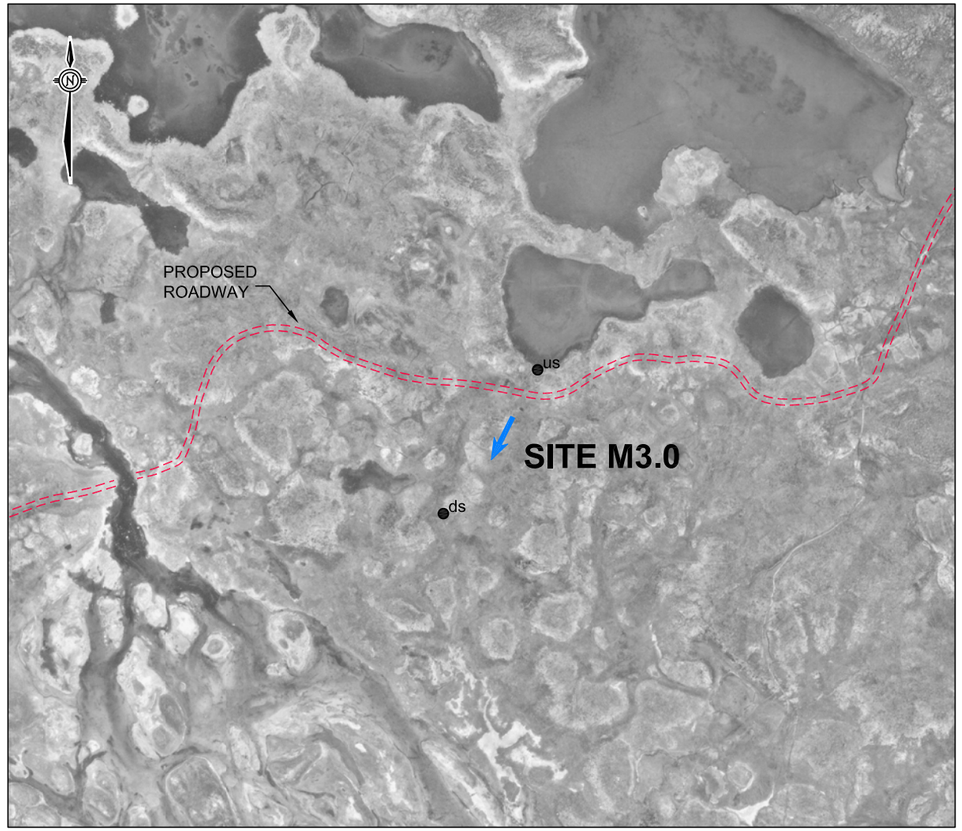
N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c01 – 1732934 site m2.1.dwg Nov 21, 2008 – 8:27am

Photo 497 - Downstream view from lake outlet.

Photo 485 - Downstream view from downstream end of study section.

Photo 489 - Downstream view from 100 m upstream from proposed crossing location.

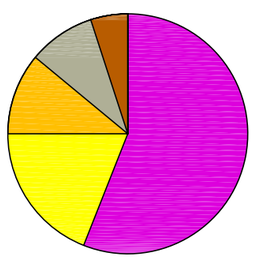
Photo 494 - Upstream view from proposed crossing location.



REFERENCE

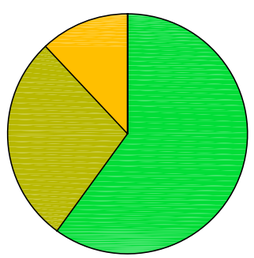
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



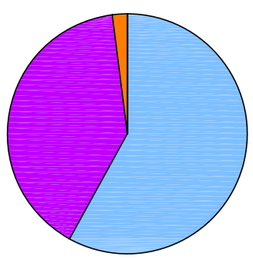
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M3.0
Date of Survey: June 20, 2008

Upstream UTM: 545477 E, 6971897 N
Downstream UTM: 545319 E, 6971656 N

Water Quality:	
Time	12:15
Temperature	11.5°C
Conductivity	N/A
pH	N/A
DO	8 to 10 mg/L

Channel:	
Stream length surveyed	400.0 m
Mean channel width	3.4 m
Mean flooded width	7.7 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	211 s
Observations	NNST (2)	60	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M3.0

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732935
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08		
REVIEW	JP	20/11/08		

FIGURE: C2

N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c02 – 1732935 site m3.0.dwg Nov 21, 2008 – 8:29am

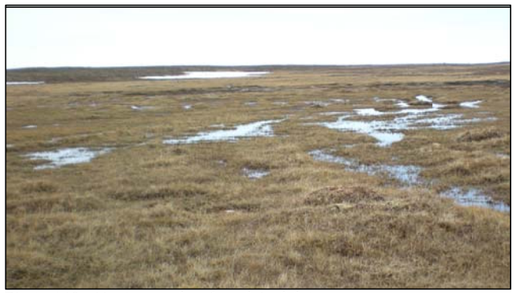
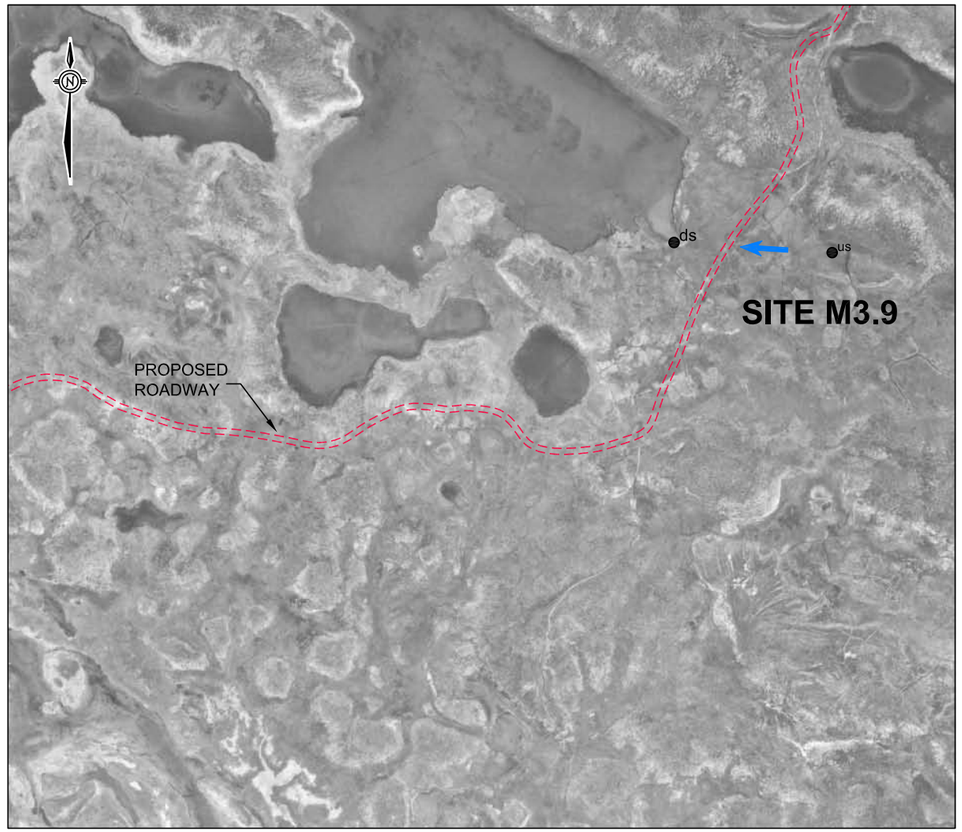


Photo 148 - Upstream view from lake inlet.

Photo 151 - Upstream view from 100 m upstream from the proposed crossing location.

Photo 154 - Downstream view of watercourse and ATV damage 150 m upstream from the proposed crossing location.

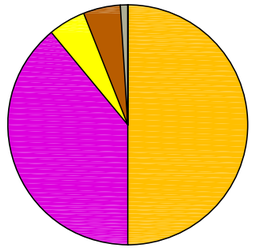
Photo 156 - Downstream view from 200 m upstream from proposed crossing location.



REFERENCE

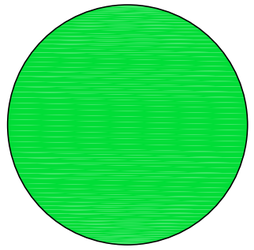
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



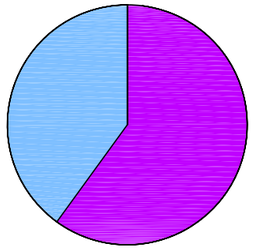
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M3.9
Date of Survey: June 18, 2008

Upstream UTM: 546349 E, 6972176 N
Downstream UTM: 546084 E, 6972193 N

Water Quality:	
Time	15:45
Temperature	9.0 °C
Conductivity	N/A
pH	N/A
DO	8-10 mg/L

Channel:	
Stream length surveyed	370.0 m
Mean channel width	1.8 m
Mean flooded width	44.3 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	185 s
Observations	—	—	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M3.9

Golder Associates
Edmonton, Alberta

PROJECT	07.1373.0055.4000		FILE No.	1732936
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08		
REVIEW	JP	20/11/08		

FIGURE: C3

N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c03 – 1732936 site m3.9.dwg Nov 21, 2008 – 8:31am

Photo 135 - Ninespine stickleback - note the variation in colouration.

Photo 138 - View of lake outlet and left bank approach.

Photo 140 - View of lake inlet.

Photo 141 - View of proposed crossing location.

REFERENCE

IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES

Site M5.0
Date of Survey: June 18, 2008

Upstream UTM: 546623 E, 6973136 N
Downstream UTM: 546644 E, 6973126 N

Water Quality:	
Time	12:30
Temperature	11.0°C
Conductivity	N/A
pH	N/A
DO	8 to 10 mg/L

Channel:	
Stream length surveyed	29.0 m
Mean channel width	N/A
Mean flooded width	N/A
Discharge	0.034 m^3/s

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	NNST (20)	34-74	293 s
Observations	NNST (>200)	30-40	—
Egg sampling	—	—	10 kicks

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M5.0

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732937
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C4	
REVIEW	JP	20/11/08		

N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c04 – 1732937 site m5.0.dwg Nov 21, 2008 – 8:33am

Photo 118 - Downstream view from 50 m downstream from proposed crossing location.

Photo 121 - Downstream view from left channel from 50 m downstream from proposed crossing location.

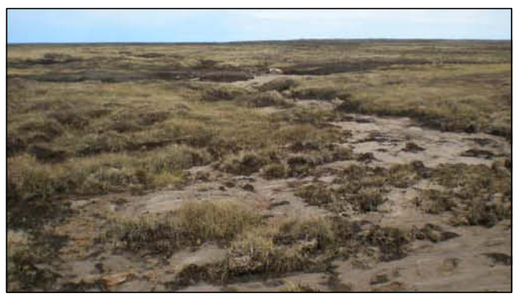
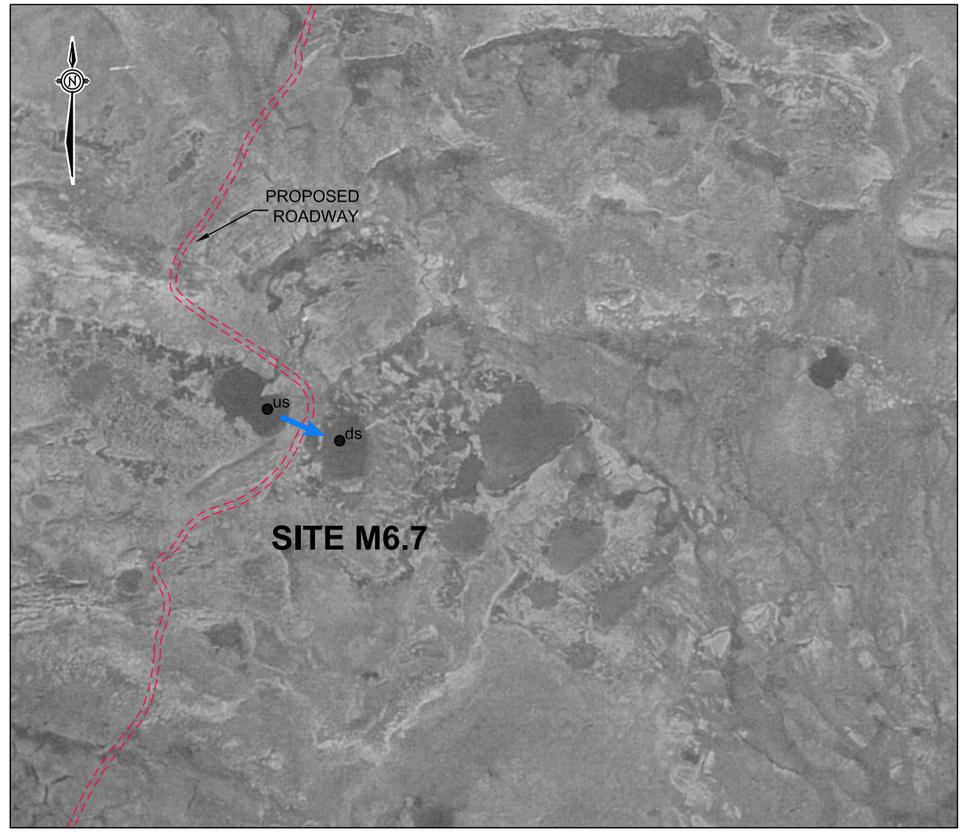


Photo 122 - Upstream view from 150 m downstream from proposed crossing location.

Photo 124 - Upstream view from inlet (200 m downstream from proposed crossing location).

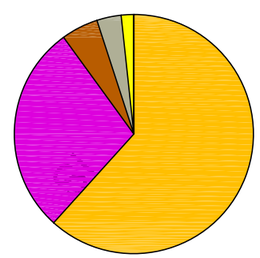


REFERENCE

IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200

SCALE METRES



SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER

Site M6.7
Date of Survey: June 20, 2008

Upstream UTM: 547336 E, 6974560 N

Downstream UTM: 547457 E, 6974507 N

Water Quality:	
Time	10:45
Temperature	DRY
Conductivity	DRY
pH	DRY
DO	DRY

Channel:	
Stream length surveyed	150.0 m
Mean channel width	DRY
Mean flooded width	38.7 m
Discharge	DRY

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	—
Observations	—	—	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M6.7

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732938
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08		
REVIEW	JP	20/11/08		

FIGURE: C5

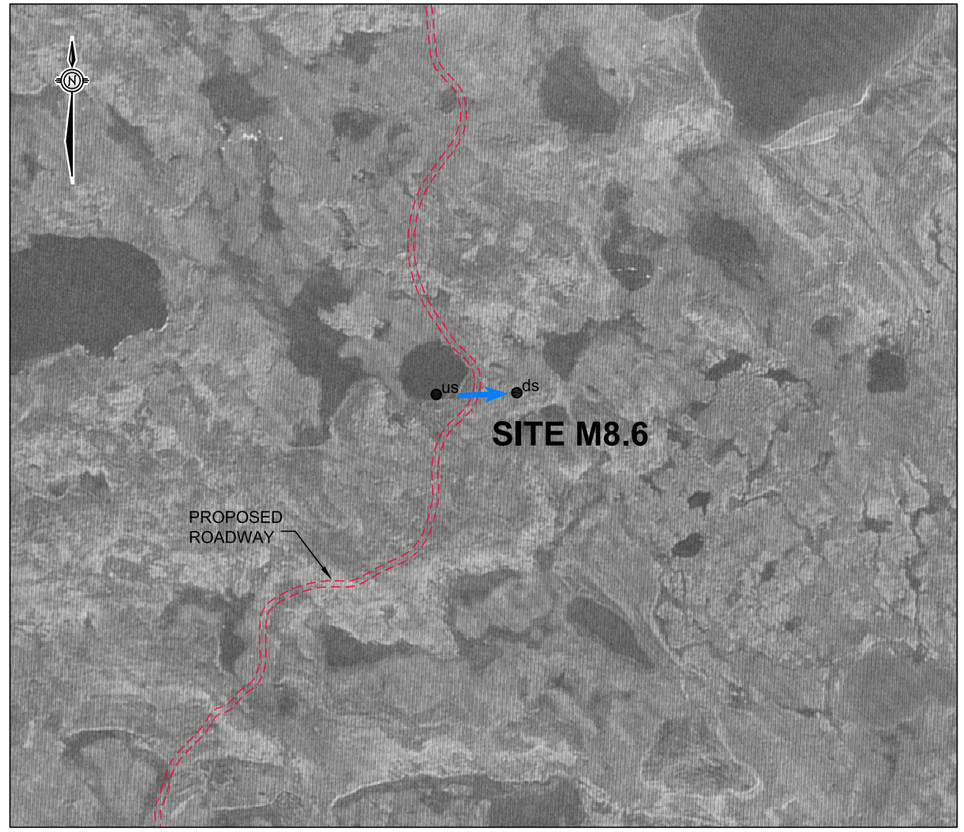
N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c05 – 1732938 site m6.7.dwg Nov 21, 2008 – 8:34am

Photo 095 - Upstream view 30 m upstream from outlet.

Photo 100 - Downstream view 90 m upstream from outlet.

Photo 102 - Downstream view 120 m upstream from outlet.

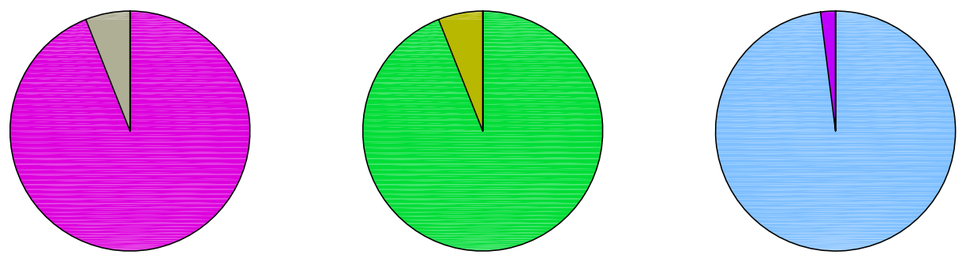
Photo 109 - Upstream view of watercourse inlet/lake outlet (secondary channel).



REFERENCE

IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



SUBSTRATE
- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER

INSTREAM COVER
- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS

HABITAT TYPE
- RIFFLES
- RUNS
- POOLS

Site M8.6
Date of Survey: June 18, 2008

Upstream UTM: 547855 E, 6975854 N
Downstream UTM: 547990 E, 6975857 N

Water Quality:

Time	07.30
Temperature	10.0°C
Conductivity	66.9 µS/cm
pH	7.8
DO	10 to 12 mg/L

Channel:

Stream length surveyed	310.0 m
Mean channel width	2.7 m
Mean flooded width	13.8 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	262 s
Observations	—	—	—
Egg sampling	—	—	1 kick

* N/A = Not Assessed

PROJECT
COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE
AQUATIC HABITAT SUMMARY FOR SITE M8.6

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732939
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C6	
REVIEW	JP	20/11/08		

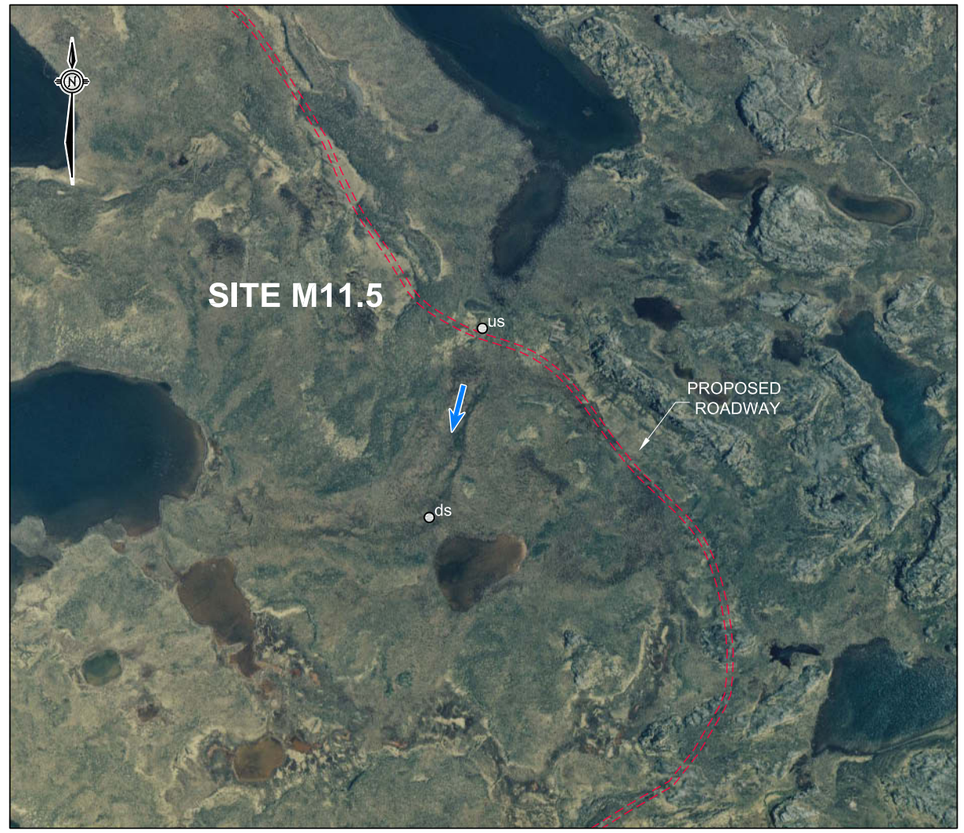
N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c06 – 1732939 site m8.6.dwg Nov 21, 2008 – 8:35am

Photo 221 - Juvenile Arctic grayling (FL: 89 mm).

Photo 230 - Upslope view from proposed crossing location.

Photo 233 - View of dispersed flow 100 m upstream from the proposed crossing location.

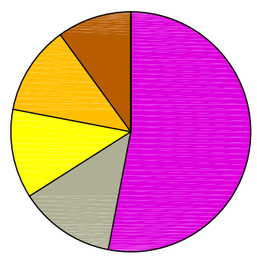
Photo 237 - Downstream view from 300 m upstream from the proposed crossing location.



REFERENCE

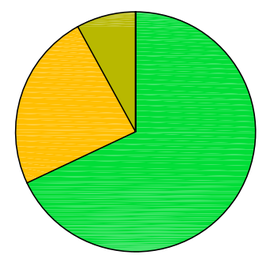
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



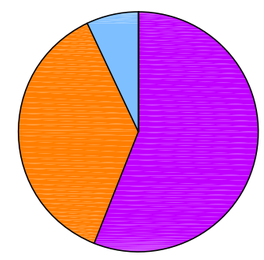
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M11.5
Date of Survey: June 19, 2008

Upstream UTM: 547466 E, 6978319 N
Downstream UTM: 547377 E, 6978002 N

Water Quality:

Time	16:15
Temperature	15.0°C
Conductivity	N/A
pH	N/A
DO	8 to 10 mg/L

Channel:

Stream length surveyed	380.0 m
Mean channel width	4.7 m
Mean flooded width	26.7 m
Discharge	2.56 m³/s

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	NNST (18) ARGR (1)	32-67 89	520 s
Observations	NNST (20) ARGR (5)	<200 10-60	—
Egg sampling	—	—	6 kicks

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M11.5

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732940
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08		
REVIEW	JP	20/11/08		

FIGURE: C7

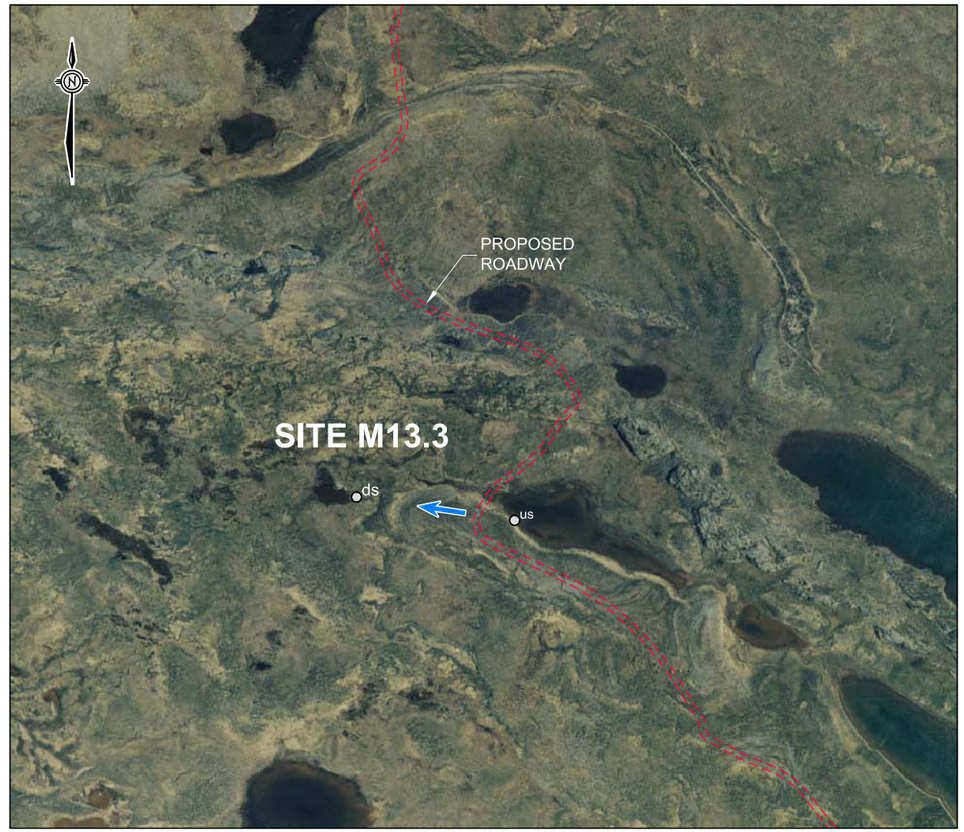
N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c07 – 1732940 site m11.5.dwg Nov 21, 2008 – 8:40am

Photo 201 - Downstream view from 100 m upstream from proposed crossing (ATV damage in foreground).

Photo 207 - Upstream view from 200 m upstream from proposed crossing location.

Photo 208 - Downstream view from 200 m downstream from proposed crossing location.

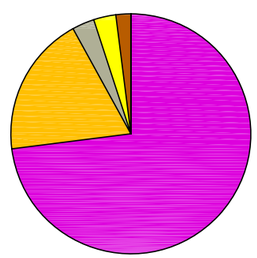
Photo 210 - Downstream view from 300 m upstream from proposed crossing location.



REFERENCE

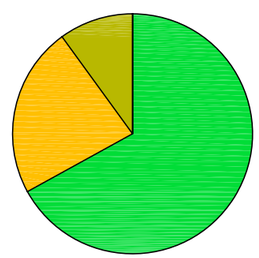
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



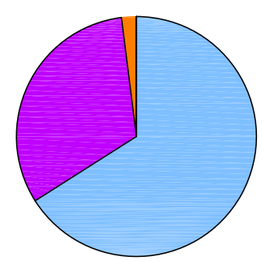
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- DEEPER THAN 5 m
- RUNS
- POOLS

Site M13.3
Date of Survey: June 19, 2008

Upstream UTM: 546338 E, 6979514 N
Downstream UTM: 546073 E, 6979553 N

Water Quality:

Time	13:30
Temperature	15.0°C
Conductivity	N/A
pH	N/A
DO	8 to 10 mg/L

Channel:

Stream length surveyed	340.0 m
Mean channel width	4.8 m
Mean flooded width	10.2 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range	Effort
E-fishing	—	—	222 s
Observations	NNST (10)	<100 mm	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M13.3

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732941
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08		
REVIEW	JP	20/11/08		

FIGURE: C8

N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c08 – 1732941 site m13.3.dwg Nov 21, 2008 – 8:47am

Photo 060 - Downstream view from 50 m upstream from watercourse outlet.

Photo 061 - Upstream view from 50 m upstream from watercourse outlet.

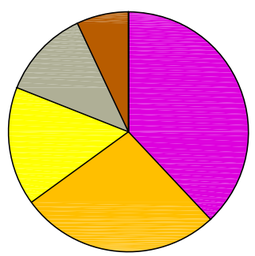
Photo 063 - Downstream view from 100 m upstream from watercourse outlet.

Photo 067 - View of ponded water and proposed left bank approach.

REFERENCE

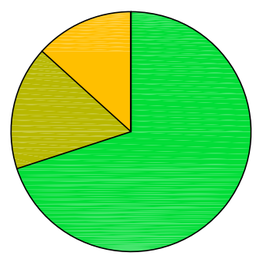
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

200 0 200
SCALE METRES



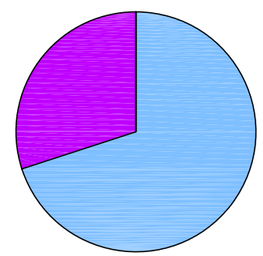
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M22.6
Date of Survey: June 17, 2008

Upstream UTM: 541223 E, 6985481 N

Downstream UTM: 541281, E 6985602 N

Water Quality:	
Time	09:30
Temperature	9.6°C
Conductivity	63.6 µS/cm
pH	7.5
DO	9-10 mg/L

Channel:	
Stream length surveyed	180.0 m
Mean channel width	9.0 m
Mean flooded width	33.3 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	NNST (2)	28-68	398 s
Observations	NNST (25)	<100	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M22.6

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No. 1732942	
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C9	
REVIEW	JP	20/11/08		

N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c09 – 1732942 site m22.6.dwg Nov 21, 2008 – 8:49am

Photo 034 - Slimy sculpin.

Photo 045 - Upstream view of single channel from 50 m upstream from proposed crossing.

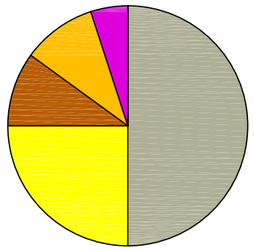
Photo 047 - Upstream view from 100 m upstream from proposed crossing location.

Photo 048 - Downstream view from 100 m upstream from proposed crossing location.

REFERENCE

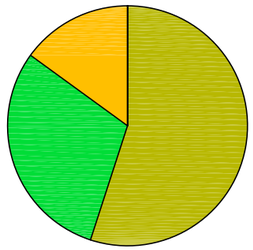
IMAGE OBTAINED FROM COMAPLEX MINERALS CORPORATION. PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 15

100 0 100
SCALE METRES



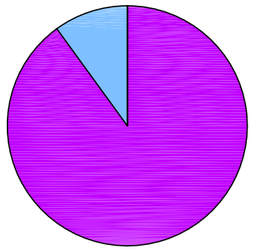
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site M23.7
Date of Survey: June 17, 2008

Upstream UTM: 541133 E, 6986401 N
Downstream UTM: 541192 E, 6986312 N

Water Quality:

Time	12:30
Temperature	12.4°C
Conductivity	119.9 µS/cm
pH	7.7
DO	10 - 12 mg/L

Channel:

Stream length surveyed	140.0 m
Mean channel width	2.2 m
Mean flooded width	43.0 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	NNST (18) SLSC(3)	38-67 69-94	409 s
Observations	ARGR (1)	250	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE M23.7

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732943
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C10	
REVIEW	JP	20/11/08		

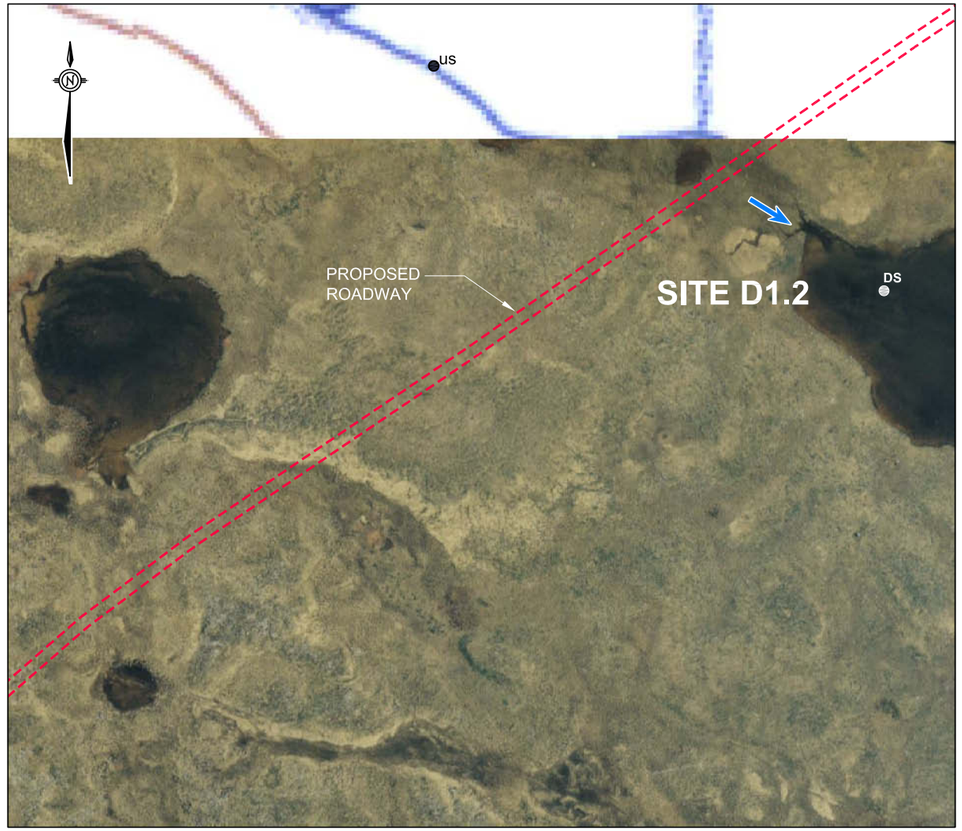
N:\CAD\2007\1373\0055 Meliadine West Gold Project\4000\c10 – 1732943 site m23.7.dwg Nov 21, 2008 – 8:56am

Photo 513 - Downstream view from 100 m upstream from proposed crossing location.

Photo 514 - Upstream view from 200 m upstream from proposed crossing location.

Photo 515 - Downstream view from 200 m upstream from proposed crossing location.

Photo 516 - Upstream view of ponded water 300 m upstream from proposed crossing location.



REFERENCE

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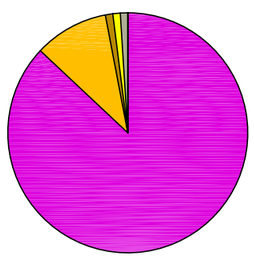
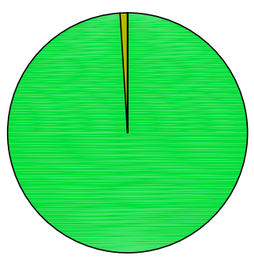
100 0 100
SCALE METRES



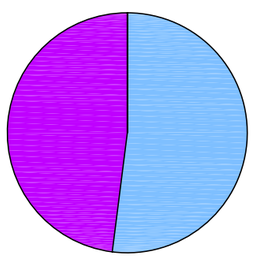
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site D1.2
Date of Survey: June 20, 2008

Upstream UTM: 546835 E, 6981369 N
Downstream UTM: 547190, E 6981152 N

Water Quality:	
Time	14:45
Temperature	20°C
Conductivity	N/A
pH	N/A
DO	6 to 8 mg/L

Channel:	
Stream length surveyed	530.0 m
Mean channel width	2.4 m
Mean flooded width	63.0 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	211 s
Observations	NNST (2)	60-80	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE D1.2

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732944
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	**FIGURE: C11**	
REVIEW	JP	20/11/08		

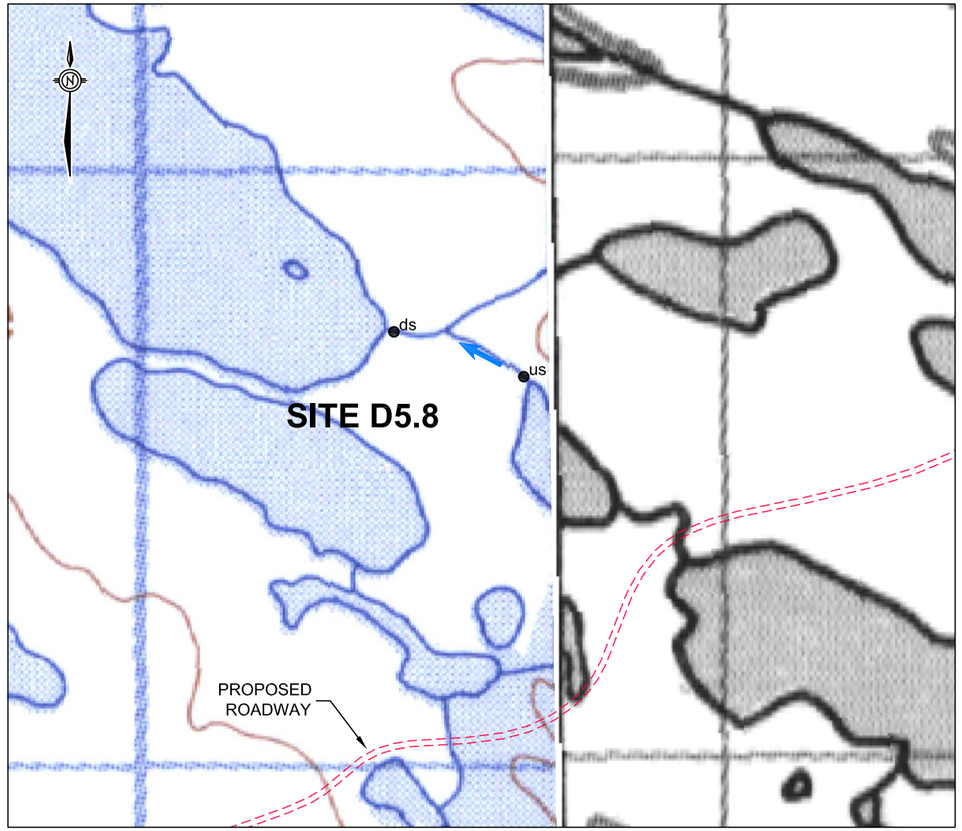
N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c11 – 1732944 site d1.2.dwg Nov 21, 2008 – 9:06am

Photo 839 - Juvenile Arctic grayling (FL: 127 mm).

Photo 843 - Upstream view from 50 m downstream from pond outlet..

Photo 848 - Downstream view from 150 m downstream from outlet.

Photo 853 - Arctic grayling egg.



REFERENCE

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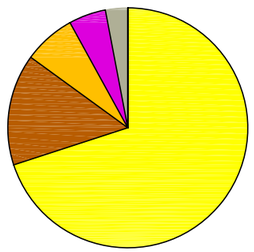
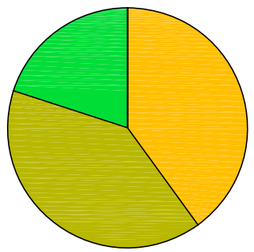
200 0 200
SCALE METRES



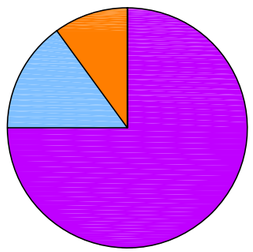
SUBSTRATE

- DETRITUS
- FINES
- GRAVEL
- COBBLE
- BOULDER



INSTREAM COVER

- VEGETATION
- BOULDER GARDENS
- UNDERCUT BANKS



HABITAT TYPE

- RIFFLES
- RUNS
- POOLS

Site D5.8
Date of Survey: June 21, 2008

Upstream UTM: 550681 E, 6981814 N
Downstream UTM: 550519 E, 6981899 N

Water Quality:	
Time	08:00
Temperature	16.0°C
Conductivity	N/A
pH	N/A
DO	8 to 10 mg/L

Channel:	
Stream length surveyed	270.0 m
Mean channel width	2.3 m
Mean flooded width	21.5 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	NNST (12) ARGR (7)	36-71 67-127	322 s
Observations	NNST (20) ARGR (4)	50-70 100	—
Egg sampling	ARGR (9)	—	10 kicks

* N/A = Not Assessed

NOTE

ROAD ALIGNMENT HAS CHANGED SINCE THE INVESTIGATION.

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE D5.8

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732945
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C12	
REVIEW	JP	20/11/08		

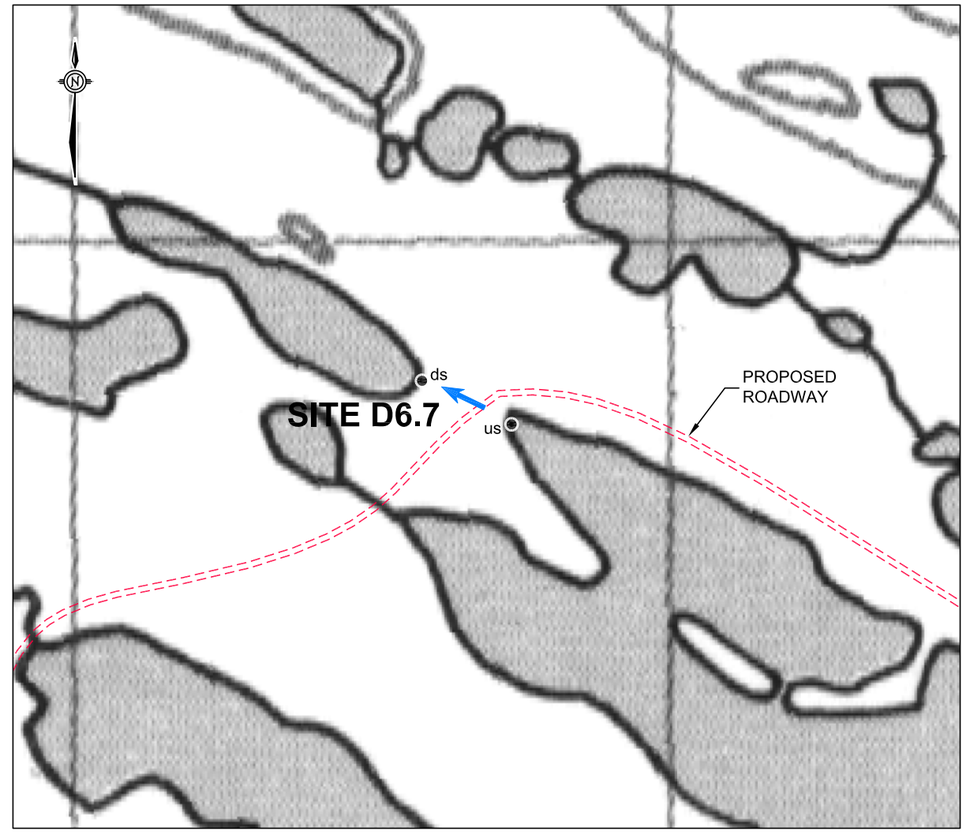
N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c12 – 1732945 site d5.8.dwg Nov 21, 2008 – 9:09am

Photo 024 - Downstream view from 30 m upstream from proposed crossing location.

Photo 025 - Upstream view of dispersed water from 30 m upstream from proposed crossing location.

Photo 026 - Upstream view from 60 m upstream from proposed crossing, near end of wetted section.

Photo 027 - Downstream view from 60 m upstream from proposed crossing, near end of wetted section.



REFERENCE

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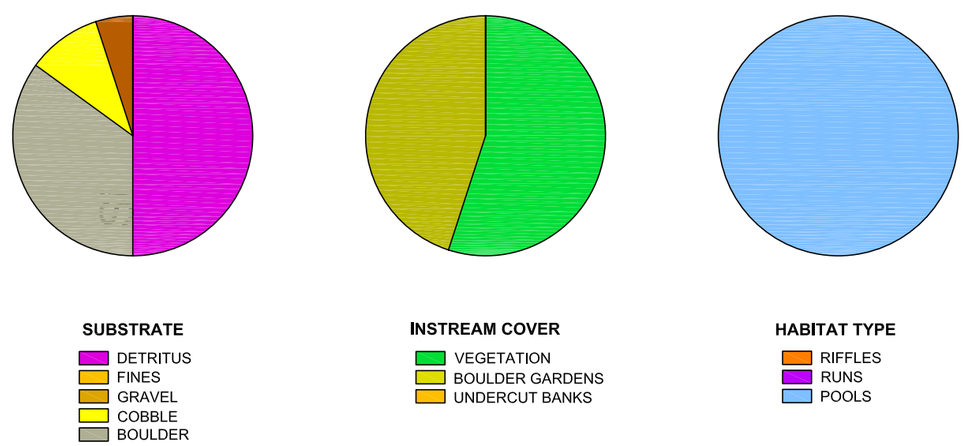
200 0 200
SCALE METRES



Site D6.7
Date of Survey: June 17, 2008

Upstream UTM: 551736 E, 6981927 N

Downstream UTM: 551586 E, 6982000 N

Water Quality:

Time	17:00
Temperature	16.2°C
Conductivity	66.8 µS/cm
pH	7.5
DO	10 to 12 mg/L

Channel:

Stream length surveyed	140.0 m
Mean channel width	4.9 m
Mean flooded width	21.7 m
Discharge	N/A

Fish Captured / Observed:

Method	Capture (n)	Size range (mm)	Effort
E-fishing	—	—	138 s
Observations	—	—	—
Egg sampling	—	—	—

* N/A = Not Assessed

PROJECT

COMAPLEX
MELIADINE WEST GOLD PROJECT

TITLE

AQUATIC HABITAT SUMMARY FOR SITE D6.7

Golder Associates
Edmonton, Alberta

PROJECT 07.1373.0055.4000			FILE No.	1732946
DESIGN	RP	30/09/08	SCALE AS SHOWN	REV. 0
CADD	FN	21/10/08		
CHECK	RP	20/11/08	FIGURE: C13	
REVIEW	JP	20/11/08		

N:\CAD\2007\1373\0055 Meliande West Gold Project\4000\c13 – 1732946 sited6.7.dwg Nov 21, 2008 – 9:11am

APPENDIX D

RAW DATA FROM INDIVIDUAL FISH CAPTURED IN THE PROJECT AREA

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Stream	M2.1	20-Jun-08	EF	ARGR	48	0.8	0.72				
Stream	M5.0	18-Jun-08	EF	NNST	74			F			
Stream	M5.0	18-Jun-08	EF	NNST	61			F			
Stream	M5.0	18-Jun-08	EF	NNST	71						
Stream	M5.0	18-Jun-08	EF	NNST	71						
Stream	M5.0	18-Jun-08	EF	NNST	69						
Stream	M5.0	18-Jun-08	EF	NNST	41						
Stream	M5.0	18-Jun-08	EF	NNST	41						
Stream	M5.0	18-Jun-08	EF	NNST	37						
Stream	M5.0	18-Jun-08	EF	NNST	43						
Stream	M5.0	18-Jun-08	EF	NNST	40						
Stream	M5.0	18-Jun-08	EF	NNST	36						
Stream	M5.0	18-Jun-08	EF	NNST	40						
Stream	M5.0	18-Jun-08	EF	NNST	45						
Stream	M5.0	18-Jun-08	EF	NNST	41						
Stream	M5.0	18-Jun-08	EF	NNST	37						
Stream	M5.0	18-Jun-08	EF	NNST	46						
Stream	M5.0	18-Jun-08	EF	NNST	53						
Stream	M5.0	18-Jun-08	EF	NNST	49						
Stream	M5.0	18-Jun-08	EF	NNST	36						
Stream	M5.0	18-Jun-08	EF	NNST	34						
Stream	M11.5	19-Jun-08	EF	ARGR	89	5.0	0.71				
Stream	M11.5	19-Jun-08	EF	NNST	46						
Stream	M11.5	19-Jun-08	EF	NNST	44						
Stream	M11.5	19-Jun-08	EF	NNST	61						
Stream	M11.5	19-Jun-08	EF	NNST	67						
Stream	M11.5	19-Jun-08	EF	NNST	57						
Stream	M11.5	19-Jun-08	EF	NNST	67						
Stream	M11.5	19-Jun-08	EF	NNST	61						
Stream	M11.5	19-Jun-08	EF	NNST	32						
Stream	M11.5	19-Jun-08	EF	NNST	38						
Stream	M11.5	19-Jun-08	EF	NNST	47						
Stream	M11.5	19-Jun-08	EF	NNST	41						
Stream	M11.5	19-Jun-08	EF	NNST	44						
Stream	M11.5	19-Jun-08	EF	NNST	47						
Stream	M11.5	19-Jun-08	EF	NNST	57						
Stream	M11.5	19-Jun-08	EF	NNST	57						
Stream	M11.5	19-Jun-08	EF	NNST	36						
Stream	M11.5	19-Jun-08	EF	NNST	36						
Stream	M11.5	19-Jun-08	EF	NNST	46						
Stream	M22.6	17-Jun-08	EF	NNST	68			F			
Stream	M22.6	17-Jun-08	EF	NNST	58			F			
Stream	M23.7	17-Jun-08	EF	NNST	54						
Stream	M23.7	17-Jun-08	EF	NNST	42						
Stream	M23.7	17-Jun-08	EF	NNST	67						
Stream	M23.7	17-Jun-08	EF	NNST	63						
Stream	M23.7	17-Jun-08	EF	NNST	42						
Stream	M23.7	17-Jun-08	EF	NNST	47						
Stream	M23.7	17-Jun-08	EF	NNST	65						
Stream	M23.7	17-Jun-08	EF	NNST	57						
Stream	M23.7	17-Jun-08	EF	NNST	62						
Stream	M23.7	17-Jun-08	EF	NNST	64						
Stream	M23.7	17-Jun-08	EF	NNST	57						
Stream	M23.7	17-Jun-08	EF	NNST	46						
Stream	M23.7	17-Jun-08	EF	NNST	47						
Stream	M23.7	17-Jun-08	EF	NNST	49						
Stream	M23.7	17-Jun-08	EF	NNST	38						
Stream	M23.7	17-Jun-08	EF	NNST	54						
Stream	M23.7	17-Jun-08	EF	NNST	57						
Stream	M23.7	17-Jun-08	EF	NNST	51						
Stream	M23.7	17-Jun-08	EF	SLSC	94	9.0	1.08				
Stream	M23.7	17-Jun-08	EF	SLSC	69	2.0	0.61				
Stream	M23.7	17-Jun-08	EF	SLSC	91	6.0	0.80				
Stream	D5.8	21-Jun-08	EF	ARGR	67	2.0	0.66				
Stream	D5.8	21-Jun-08	EF	ARGR	94	5.9	0.71				
Stream	D5.8	21-Jun-08	EF	ARGR	76	3.0	0.68				
Stream	D5.8	21-Jun-08	EF	ARGR	73	3.5	0.90				
Stream	D5.8	21-Jun-08	EF	ARGR	81	4.5	0.85				
Stream	D5.8	21-Jun-08	EF	ARGR	69	2.9	0.88				
Stream	D5.8	21-Jun-08	EF	ARGR	127	16	0.80				
Stream	D5.8	21-Jun-08	EF	NNST	71						
Stream	D5.8	21-Jun-08	EF	NNST	51						
Stream	D5.8	21-Jun-08	EF	NNST	41						
Stream	D5.8	21-Jun-08	EF	NNST	36						
Stream	D5.8	21-Jun-08	EF	NNST	49						
Stream	D5.8	21-Jun-08	EF	NNST	46						
Stream	D5.8	21-Jun-08	EF	NNST	36						
Stream	D5.8	21-Jun-08	EF	NNST	42						
Stream	D5.8	21-Jun-08	EF	NNST	39						
Stream	D5.8	21-Jun-08	EF	NNST	36						
Stream	D5.8	21-Jun-08	EF	NNST	43						
Stream	D5.8	21-Jun-08	EF	NNST	38						
Pond	A12	13-Jul-08	MT	NNST	55						

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Pond	A12	13-Jul-08	MT	NNST	60						
Pond	A12	13-Jul-08	MT	NNST	68						
Pond	A12	13-Jul-08	MT	NNST	64						
Pond	A12	13-Jul-08	MT	NNST	53						
Pond	A13	13-Jul-08	MT	NNST	54						
Pond	A40	13-Jul-08	MT	NNST	59						
Pond	A40	13-Jul-08	MT	NNST	56						
Pond	A40	13-Jul-08	MT	NNST	55						
Pond	A40	13-Jul-08	MT	NNST	57						
Pond	B8	14-Jul-08	MT	NNST	48						
Pond	B30	12-Jul-08	MT	NNST	60						
Pond	B30	12-Jul-08	MT	NNST	51						
Pond	B30	12-Jul-08	MT	NNST	53						
Pond	B30	12-Jul-08	MT	NNST	72						
Pond	B31	12-Jul-08	MT	NNST	52						
Pond	B31	12-Jul-08	MT	NNST	59						
Pond	B32	12-Jul-08	MT	NNST	53						
Pond	H02	02-Aug-08	EF	ARGR	49	1.1	0.93				
Pond	H02	02-Aug-08	MT	ARGR	52	1.0	0.71				
Lake	A52	04-Aug-08	FN	NNST	55						
Lake	A52	04-Aug-08	FN	NNST	56						
Lake	A52	04-Aug-08	FN	NNST	59						
Lake	A52	04-Aug-08	FN	NNST	61						
Lake	A52	04-Aug-08	FN	NNST	62						
Lake	A52	04-Aug-08	FN	NNST	65						
Lake	A52	04-Aug-08	FN	NNST	66						
Lake	A52	04-Aug-08	FN	NNST	66						
Lake	A52	04-Aug-08	FN	NNST	66						
Lake	A52	04-Aug-08	FN	NNST	67						
Lake	A52	04-Aug-08	FN	NNST	67						
Lake	A52	04-Aug-08	FN	NNST	67						
Lake	A52	04-Aug-08	FN	NNST	68						
Lake	A52	04-Aug-08	FN	NNST	71						
Lake	A52	04-Aug-08	FN	NNST	72						
Lake	A52	04-Aug-08	FN	NNST	72						
Lake	A52	04-Aug-08	FN	NNST	76						
Lake	A52	04-Aug-08	FN	NNST	76						
Lake	A52	04-Aug-08	FN	NNST	80						
Lake	A52	04-Aug-08	FN	NNST	82						
Lake	B6	14-Jul-08	FN	ARGR	134	26	1.08				
Lake	B6	14-Jul-08	FN	CISC	172	59	1.16				
Lake	B6	14-Jul-08	FN	CISC	177	56	1.01				
Lake	B6	14-Jul-08	FN	CISC	178	55	0.98				
Lake	B6	14-Jul-08	FN	NNST	60						
Lake	B6	14-Jul-08	FN	NNST	43						
Lake	B6	14-Jul-08	FN	NNST	56						
Lake	B6	14-Jul-08	FN	NNST	61						
Lake	B6	14-Jul-08	FN	NNST	47						
Lake	B6	14-Jul-08	FN	NNST	51						
Lake	B7	10-Jul-08	GN	ARGR	187					AD	
Lake	B7	10-Jul-08	GN	ARGR	248			M			Mortality
Lake	B7	10-Jul-08	GN	ARGR	295						Mortality
Lake	B7	10-Jul-08	GN	ARGR	305					AD	
Lake	B7	10-Jul-08	GN	ARGR	329				1602	AD	
Lake	B7	12-Jul-08	FN	ARGR	101	10	0.97			AD	
Lake	B7	12-Jul-08	FN	ARGR	107	11	0.90			AD	
Lake	B7	12-Jul-08	FN	ARGR	110	16	1.20			AD	
Lake	B7	12-Jul-08	FN	ARGR	112	13	0.93			AD	
Lake	B7	12-Jul-08	FN	ARGR	112	14	1.00			AD	
Lake	B7	12-Jul-08	FN	ARGR	116	18	1.15			AD	
Lake	B7	12-Jul-08	FN	ARGR	117	11	0.69			AD	
Lake	B7	12-Jul-08	FN	ARGR	118	18	1.10			AD	
Lake	B7	12-Jul-08	FN	ARGR	118	15	0.91			AD	
Lake	B7	12-Jul-08	FN	ARGR	119	18	1.07			AD	
Lake	B7	12-Jul-08	FN	ARGR	120	18	1.04			AD	
Lake	B7	12-Jul-08	FN	ARGR	120	18	1.04			AD	
Lake	B7	12-Jul-08	FN	ARGR	124	18	0.94			AD	
Lake	B7	12-Jul-08	FN	ARGR	128	23	1.10			AD	
Lake	B7	12-Jul-08	FN	ARGR	129	20	0.93			AD	
Lake	B7	12-Jul-08	FN	ARGR	138	25	0.95			AD	
Lake	B7	12-Jul-08	FN	ARGR	155	35	0.94			AD	
Lake	B7	12-Jul-08	FN	ARGR	157	45	1.16			AD	
Lake	B7	12-Jul-08	FN	ARGR	158	44	1.12			AD	
Lake	B7	12-Jul-08	FN	ARGR	159	41	1.02			AD	
Lake	B7	12-Jul-08	FN	ARGR	161	41	0.98			AD	
Lake	B7	12-Jul-08	FN	ARGR	162	43	1.01			AD	
Lake	B7	12-Jul-08	FN	ARGR	163	41	0.95			AD	
Lake	B7	12-Jul-08	FN	ARGR	164	45	1.02			AD	
Lake	B7	12-Jul-08	FN	ARGR	164	47	1.07			AD	
Lake	B7	12-Jul-08	FN	ARGR	165	42	0.93			AD	
Lake	B7	12-Jul-08	FN	ARGR	165	51	1.14			AD	
Lake	B7	12-Jul-08	FN	ARGR	167	46	0.99			AD	
Lake	B7	12-Jul-08	FN	ARGR	168	46	0.97			AD	

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Lake	B7	12-Jul-08	FN	ARGR	169	48	0.99			AD	
Lake	B7	12-Jul-08	FN	ARGR	169	46	0.95			AD	
Lake	B7	12-Jul-08	FN	ARGR	169	48	0.99			AD	
Lake	B7	12-Jul-08	FN	ARGR	169	51	1.06			AD	
Lake	B7	12-Jul-08	FN	ARGR	170	50	1.02			AD	
Lake	B7	12-Jul-08	FN	ARGR	170	48	0.98			AD	
Lake	B7	12-Jul-08	FN	ARGR	171	53	1.06			AD	
Lake	B7	12-Jul-08	FN	ARGR	172	51	1.00			AD	
Lake	B7	12-Jul-08	FN	ARGR	173	57	1.10			AD	
Lake	B7	12-Jul-08	FN	ARGR	173	49	0.95			AD	
Lake	B7	12-Jul-08	FN	ARGR	173	56	1.08			AD	
Lake	B7	12-Jul-08	FN	ARGR	175	61	1.14			AD	
Lake	B7	12-Jul-08	FN	ARGR	175	55	1.03			AD	
Lake	B7	12-Jul-08	FN	ARGR	178	53	0.94			AD	
Lake	B7	12-Jul-08	FN	ARGR	179	58	1.01			AD	
Lake	B7	12-Jul-08	FN	ARGR	179	57	0.99			AD	
Lake	B7	12-Jul-08	FN	ARGR	181	53	0.89			AD	
Lake	B7	12-Jul-08	FN	ARGR	181	65	1.10			AD	
Lake	B7	12-Jul-08	FN	ARGR	187	64	0.98			AD	
Lake	B7	12-Jul-08	FN	ARGR	189	80	1.18			AD	
Lake	B7	12-Jul-08	FN	ARGR	190	64	0.93			AD	
Lake	B7	12-Jul-08	FN	ARGR	204	82	0.97			AD	
Lake	B7	12-Jul-08	FN	ARGR	205	102	1.18			AD	
Lake	B7	12-Jul-08	FN	ARGR	208	99	1.10			AD	
Lake	B7	12-Jul-08	FN	ARGR	208	88	0.98			AD	
Lake	B7	12-Jul-08	FN	ARGR	215	101	1.02			AD	
Lake	B7	12-Jul-08	FN	ARGR	251	169	1.07			AD	
Lake	B7	12-Jul-08	FN	ARGR	311	299	0.99		1605	AD	
Lake	B7	12-Jul-08	FN	ARGR	327	364	1.04		1604	AD	
Lake	B7	12-Jul-08	FN	ARGR	349	409	0.96		1603	AD	
Lake	B7	13-Jul-08	FN	ARGR	101	7.0	0.68			AD	
Lake	B7	13-Jul-08	FN	ARGR	106	12	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	111	10	0.73			AD	
Lake	B7	13-Jul-08	FN	ARGR	112	12	0.85			AD	
Lake	B7	13-Jul-08	FN	ARGR	112	11	0.78			AD	
Lake	B7	13-Jul-08	FN	ARGR	112	16	1.14			AD	
Lake	B7	13-Jul-08	FN	ARGR	113	13	0.90			AD	
Lake	B7	13-Jul-08	FN	ARGR	114	16	1.08			AD	
Lake	B7	13-Jul-08	FN	ARGR	114	14	0.94			AD	
Lake	B7	13-Jul-08	FN	ARGR	115	12	0.79			AD	
Lake	B7	13-Jul-08	FN	ARGR	116	20	1.28			AD	
Lake	B7	13-Jul-08	FN	ARGR	117	17	1.06			AD	
Lake	B7	13-Jul-08	FN	ARGR	119	16	0.95			AD	
Lake	B7	13-Jul-08	FN	ARGR	119	16	0.95			AD	
Lake	B7	13-Jul-08	FN	ARGR	120	21	1.22			AD	
Lake	B7	13-Jul-08	FN	ARGR	121	18	1.02			AD	
Lake	B7	13-Jul-08	FN	ARGR	122	14	0.77			AD	
Lake	B7	13-Jul-08	FN	ARGR	123	17	0.91			AD	
Lake	B7	13-Jul-08	FN	ARGR	124	17	0.89			AD	
Lake	B7	13-Jul-08	FN	ARGR	125	16	0.82			AD	
Lake	B7	13-Jul-08	FN	ARGR	127	25	1.22			AD	
Lake	B7	13-Jul-08	FN	ARGR	127	19	0.93			AD	
Lake	B7	13-Jul-08	FN	ARGR	135	25	1.02			AD	
Lake	B7	13-Jul-08	FN	ARGR	142	32	1.12			AD	
Lake	B7	13-Jul-08	FN	ARGR	152	38	1.08			AD	
Lake	B7	13-Jul-08	FN	ARGR	153	35	0.98			AD	
Lake	B7	13-Jul-08	FN	ARGR	153	39	1.09			AD	
Lake	B7	13-Jul-08	FN	ARGR	154	41	1.12			AD	
Lake	B7	13-Jul-08	FN	ARGR	156	39	1.03			AD	
Lake	B7	13-Jul-08	FN	ARGR	157	40	1.03			AD	
Lake	B7	13-Jul-08	FN	ARGR	158	45	1.14			AD	
Lake	B7	13-Jul-08	FN	ARGR	159	34	0.85			AD	
Lake	B7	13-Jul-08	FN	ARGR	159	44	1.09			AD	
Lake	B7	13-Jul-08	FN	ARGR	160	45	1.10			AD	
Lake	B7	13-Jul-08	FN	ARGR	161	39	0.93			AD	
Lake	B7	13-Jul-08	FN	ARGR	161	37	0.89			AD	
Lake	B7	13-Jul-08	FN	ARGR	161	39	0.93			AD	
Lake	B7	13-Jul-08	FN	ARGR	162	44	1.03			AD	
Lake	B7	13-Jul-08	FN	ARGR	162	43	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	162	49	1.15			AD	
Lake	B7	13-Jul-08	FN	ARGR	163	51	1.18			AD	
Lake	B7	13-Jul-08	FN	ARGR	164	43	0.97			AD	
Lake	B7	13-Jul-08	FN	ARGR	166	46	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	166	47	1.03			AD	
Lake	B7	13-Jul-08	FN	ARGR	167	47	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	167	52	1.12			AD	
Lake	B7	13-Jul-08	FN	ARGR	169	50	1.04			AD	
Lake	B7	13-Jul-08	FN	ARGR	169	44	0.91			AD	
Lake	B7	13-Jul-08	FN	ARGR	171	51	1.02			AD	
Lake	B7	13-Jul-08	FN	ARGR	171	53	1.06			AD	
Lake	B7	13-Jul-08	FN	ARGR	171	47	0.94			AD	
Lake	B7	13-Jul-08	FN	ARGR	171					AD	
Lake	B7	13-Jul-08	FN	ARGR	172	55	1.08			AD	

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Lake	B7	13-Jul-08	FN	ARGR	173	51	0.98			AD	
Lake	B7	13-Jul-08	FN	ARGR	174	55	1.04			AD	
Lake	B7	13-Jul-08	FN	ARGR	175	57	1.06			AD	
Lake	B7	13-Jul-08	FN	ARGR	175	50	0.93			AD	
Lake	B7	13-Jul-08	FN	ARGR	177	52	0.94			AD	
Lake	B7	13-Jul-08	FN	ARGR	179	59	1.03			AD	
Lake	B7	13-Jul-08	FN	ARGR	181	50	0.84			AD	
Lake	B7	13-Jul-08	FN	ARGR	183	62	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	187	69	1.06			AD	
Lake	B7	13-Jul-08	FN	ARGR	192	76	1.07			AD	
Lake	B7	13-Jul-08	FN	ARGR	194	64	0.88			AD	
Lake	B7	13-Jul-08	FN	ARGR	205	86	1.00			AD	
Lake	B7	13-Jul-08	FN	ARGR	205	85	0.99			AD	
Lake	B7	13-Jul-08	FN	ARGR	207	83	0.94			AD	
Lake	B7	13-Jul-08	FN	ARGR	207	90	1.01			AD	
Lake	B7	13-Jul-08	FN	ARGR	207	96	1.08			AD	
Lake	B7	13-Jul-08	FN	ARGR	215	109	1.10			AD	
Lake	B7	13-Jul-08	FN	ARGR	234	148	1.16			AD	
Lake	B7	13-Jul-08	FN	ARGR	235	160	1.23			AD	
Lake	B7	13-Jul-08	FN	ARGR	235	155	1.19			AD	
Lake	B7	13-Jul-08	FN	ARGR	237	156	1.17			AD	
Lake	B7	13-Jul-08	FN	ARGR	238	153	1.13			AD	
Lake	B7	13-Jul-08	FN	ARGR	242	154	1.09			AD	
Lake	B7	13-Jul-08	FN	ARGR	243	155	1.08			AD	
Lake	B7	13-Jul-08	FN	ARGR	245	162	1.10			AD	
Lake	B7	13-Jul-08	FN	ARGR	252	183	1.14			AD	
Lake	B7	13-Jul-08	FN	ARGR	262	201	1.12			AD	
Lake	B7	13-Jul-08	FN	ARGR	278	223	1.04			AD	
Lake	B7	13-Jul-08	FN	ARGR	285	240	1.04			AD	
Lake	B7	13-Jul-08	FN	ARGR	291	258	1.05			AD	
Lake	B7	13-Jul-08	FN	ARGR	292	275	1.10			AD	
Lake	B7	13-Jul-08	FN	ARGR	305	274	0.97		1612	AD	
Lake	B7	13-Jul-08	FN	ARGR	315	327	1.05		1606	AD	
Lake	B7	13-Jul-08	FN	ARGR	321	360	1.09		1611	AD	
Lake	B7	13-Jul-08	FN	ARGR	325	339	0.99		1610	AD	
Lake	B7	13-Jul-08	FN	ARGR	338	408	1.06		1609	AD	
Lake	B7	13-Jul-08	FN	ARGR	339	422	1.08		1608	AD	
Lake	B7	13-Jul-08	FN	ARGR	347	460	1.10		1607	AD	
Lake	B7	13-Jul-08	FN	ARGR	352	452	1.04		1613	AD	
Lake	B7	14-Jul-08	FN	ARGR	111	9.0	0.66				Mortality
Lake	B7	14-Jul-08	FN	ARGR	112	19	1.35				Mortality
Lake	B7	14-Jul-08	FN	ARGR	115	16	1.05				Mortality
Lake	B7	14-Jul-08	FN	ARGR	116	13	0.83				Mortality
Lake	B7	14-Jul-08	FN	ARGR	120	18	1.04			AD	
Lake	B7	14-Jul-08	FN	ARGR	120	14	0.81				Mortality
Lake	B7	14-Jul-08	FN	ARGR	123	23	1.24			AD	
Lake	B7	14-Jul-08	FN	ARGR	124	16	0.84				Mortality
Lake	B7	14-Jul-08	FN	ARGR	147	33	1.04			AD	
Lake	B7	14-Jul-08	FN	ARGR	152	36	1.03			AD	
Lake	B7	14-Jul-08	FN	ARGR	159	39	0.97			R	Recap during mark phase
Lake	B7	14-Jul-08	FN	ARGR	162	39	0.92			AD	
Lake	B7	14-Jul-08	FN	ARGR	165	52	1.16			AD	
Lake	B7	14-Jul-08	FN	ARGR	166	52	1.14			AD	
Lake	B7	14-Jul-08	FN	ARGR	172	51	1.00			AD	
Lake	B7	14-Jul-08	FN	ARGR	179	56	0.98			AD	
Lake	B7	14-Jul-08	FN	ARGR	182	60	1.00			AD	
Lake	B7	14-Jul-08	FN	ARGR	185	75	1.18			AD	
Lake	B7	14-Jul-08	FN	ARGR	221	124	1.15			AD	
Lake	B7	14-Jul-08	FN	ARGR	237	132	0.99			AD	
Lake	B7	14-Jul-08	FN	ARGR	249	162	1.05			AD	
Lake	B7	14-Jul-08	FN	ARGR	250	168	1.08			AD	
Lake	B7	14-Jul-08	FN	ARGR	250	171	1.09			AD	
Lake	B7	14-Jul-08	FN	ARGR	251	168	1.06			AD	
Lake	B7	14-Jul-08	FN	ARGR	252	174	1.09			AD	
Lake	B7	14-Jul-08	FN	ARGR	262	175	0.97			AD	
Lake	B7	14-Jul-08	FN	ARGR	265	201	1.08			AD	
Lake	B7	14-Jul-08	FN	ARGR	274	233	1.13			AD	
Lake	B7	14-Jul-08	FN	ARGR	277	219	1.03			AD	
Lake	B7	14-Jul-08	FN	ARGR	281	237	1.07			AD	
Lake	B7	14-Jul-08	FN	ARGR	282	225	1.00			AD	
Lake	B7	14-Jul-08	FN	ARGR	286	271	1.16			R	Recap during mark phase
Lake	B7	14-Jul-08	FN	ARGR	287	249	1.05			AD	
Lake	B7	14-Jul-08	FN	ARGR	293	269	1.07			AD	
Lake	B7	14-Jul-08	FN	ARGR	294	286	1.13			AD	
Lake	B7	14-Jul-08	FN	ARGR	306	306	1.07		1616	AD	
Lake	B7	14-Jul-08	FN	ARGR	310	313	1.05		1615	AD	
Lake	B7	14-Jul-08	FN	ARGR	311	329	1.09		1614	AD	
Lake	B7	14-Jul-08	FN	ARGR	311	307	1.02		1619	AD	
Lake	B7	14-Jul-08	FN	ARGR	330	370	1.03		1617	AD	
Lake	B7	14-Jul-08	FN	ARGR	336	397	1.05		1620	AD	
Lake	B7	14-Jul-08	FN	ARGR	339	379	0.97		1618	AD	
Lake	B7	31-Jul-08	FN	ARGR	87	7.0	1.06			AD	
Lake	B7	31-Jul-08	FN	ARGR	89	5.0	0.71			AD	

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Lake	B7	31-Jul-08	FN	ARGR	126	25	1.25			AD	
Lake	B7	31-Jul-08	FN	ARGR	128	18	0.86			AD	
Lake	B7	31-Jul-08	FN	ARGR	128	20	0.95			AD	
Lake	B7	31-Jul-08	FN	ARGR	131	23	1.02			AD	
Lake	B7	31-Jul-08	FN	ARGR	131	23	1.02			AD	
Lake	B7	31-Jul-08	FN	ARGR	135	21	0.85			AD	
Lake	B7	31-Jul-08	FN	ARGR	135	25	1.02			AD	
Lake	B7	31-Jul-08	FN	ARGR	139	23	0.86			AD	
Lake	B7	31-Jul-08	FN	ARGR	140	31	1.13			AD	
Lake	B7	31-Jul-08	FN	ARGR	148	23	0.71			AD	
Lake	B7	31-Jul-08	GN	ARGR	149					AD	
Lake	B7	31-Jul-08	FN	ARGR	163	44	1.02			AD	
Lake	B7	31-Jul-08	FN	ARGR	168	54	1.14			AD	
Lake	B7	31-Jul-08	FN	ARGR	169	51	1.06			AD	
Lake	B7	31-Jul-08	FN	ARGR	178	53	0.94			AD	
Lake	B7	31-Jul-08	FN	ARGR	181	63	1.06			AD	
Lake	B7	31-Jul-08	FN	ARGR	181	58	0.98			AD	
Lake	B7	31-Jul-08	FN	ARGR	190	70	1.02			AD	
Lake	B7	31-Jul-08	FN	ARGR	198	71	0.91			AD	
Lake	B7	31-Jul-08	GN	ARGR	220			M			Mortality
Lake	B7	31-Jul-08	GN	ARGR	280					AD	
Lake	B7	31-Jul-08	GN	ARGR	325						Mortality
Lake	B7	31-Jul-08	GN	ARGR	196					AD	
Lake	B7	31-Jul-08	FN	ARGR	122	17	0.94			AD	Recaptured fish
Lake	B7	31-Jul-08	FN	ARGR	178	60	1.06			AD	Recaptured fish
Lake	B7	31-Jul-08	FN	ARGR	161	38	0.91			AD	Recaptured fish
Lake	B7	31-Jul-08	FN	ARGR	187	59	0.90			AD	Recaptured fish
Lake	B7	01-Aug-08	FN	ARGR	95	11	1.28			AD	
Lake	B7	01-Aug-08	FN	ARGR	122	22	1.21			AD	
Lake	B7	01-Aug-08	FN	ARGR	125	16	0.82			AD	
Lake	B7	01-Aug-08	FN	ARGR	125	16	0.82			AD	
Lake	B7	01-Aug-08	FN	ARGR	126	13	0.65			AD	
Lake	B7	01-Aug-08	FN	ARGR	126	21	1.05			AD	
Lake	B7	01-Aug-08	FN	ARGR	131	22	0.98			AD	
Lake	B7	01-Aug-08	FN	ARGR	133	17	0.72			AD	
Lake	B7	01-Aug-08	FN	ARGR	135	24	0.98			AD	
Lake	B7	01-Aug-08	FN	ARGR	136	24	0.95			AD	
Lake	B7	01-Aug-08	FN	ARGR	138	24	0.91			AD	
Lake	B7	01-Aug-08	FN	ARGR	140	22	0.80			AD	
Lake	B7	01-Aug-08	FN	ARGR	164	47	1.07			AD	
Lake	B7	01-Aug-08	FN	ARGR	165	46	1.02			AD	
Lake	B7	01-Aug-08	FN	ARGR	166	46	1.01			AD	
Lake	B7	01-Aug-08	FN	ARGR	166	51	1.11			AD	
Lake	B7	01-Aug-08	FN	ARGR	167	48	1.03			AD	
Lake	B7	01-Aug-08	FN	ARGR	167	43	0.92			AD	
Lake	B7	01-Aug-08	FN	ARGR	168	49	1.03			AD	
Lake	B7	01-Aug-08	FN	ARGR	169	45	0.93			AD	
Lake	B7	01-Aug-08	FN	ARGR	171	49	0.98			AD	
Lake	B7	01-Aug-08	FN	ARGR	171	44	0.88			AD	
Lake	B7	01-Aug-08	FN	ARGR	171	45	0.90			AD	
Lake	B7	01-Aug-08	FN	ARGR	173	56	1.08			AD	
Lake	B7	01-Aug-08	FN	ARGR	174	55	1.04			AD	
Lake	B7	01-Aug-08	FN	ARGR	175	54	1.01			AD	
Lake	B7	01-Aug-08	FN	ARGR	176	59	1.08			AD	
Lake	B7	01-Aug-08	FN	ARGR	178	58	1.03			AD	
Lake	B7	01-Aug-08	FN	ARGR	180	61	1.05			AD	
Lake	B7	01-Aug-08	FN	ARGR	183	60	0.98			AD	
Lake	B7	01-Aug-08	FN	ARGR	185	61	0.96			AD	
Lake	B7	01-Aug-08	FN	ARGR	187	72	1.10			AD	
Lake	B7	01-Aug-08	FN	ARGR	195	80	1.08			AD	
Lake	B7	01-Aug-08	FN	ARGR	198	78	1.00			AD	
Lake	B7	01-Aug-08	FN	ARGR	203	83	0.99			AD	
Lake	B7	01-Aug-08	FN	ARGR	261	203	1.14			AD	
Lake	B7	01-Aug-08	FN	ARGR	270	222	1.13			AD	
Lake	B7	01-Aug-08	FN	ARGR	284	172	0.75			AD	
Lake	B7	01-Aug-08	FN	ARGR	293	275	1.09			AD	
Lake	B7	1-Aug-08	FN	ARGR	130	17	0.77			AD	Recaptured fish
Lake	B7	1-Aug-08	FN	ARGR	187	73	1.12			AD	Recaptured fish
Lake	B7	1-Aug-08	FN	ARGR	129	25	1.16			AD	Recaptured fish
Lake	B7	1-Aug-08	FN	ARGR	213	107	1.11			AD	Recaptured fish
Lake	B7	1-Aug-08	FN	ARGR	192	70	0.99			AD	Recaptured fish
Lake	B7	02-Aug-08	FN	ARGR	122	19	1.05			AD	
Lake	B7	02-Aug-08	FN	ARGR	126	13	0.65			AD	
Lake	B7	02-Aug-08	FN	ARGR	128	22	1.05			AD	
Lake	B7	02-Aug-08	FN	ARGR	129	24	1.12			AD	
Lake	B7	02-Aug-08	FN	ARGR	131	23	1.02			AD	
Lake	B7	02-Aug-08	FN	ARGR	136	24	0.95			AD	
Lake	B7	02-Aug-08	FN	ARGR	138	24	0.91			AD	
Lake	B7	02-Aug-08	FN	ARGR	145	32	1.05			AD	
Lake	B7	02-Aug-08	FN	ARGR	145	28	0.92			AD	
Lake	B7	02-Aug-08	FN	ARGR	146	30	0.96			AD	
Lake	B7	02-Aug-08	FN	ARGR	160	43	1.05			AD	
Lake	B7	02-Aug-08	FN	ARGR	166	49	1.07			AD	

Appendix D. Raw Data for Individual Fish Captured in the Project Area, June-August 2008.

Waterbody Type	Site	Date	Capture Method	Species	Fork Length (mm)	Weight (g)	Condition Factor	Sex	Floy Tag Number	Fin Clip	Comment
Lake	B7	02-Aug-08	FN	ARGR	168	49	1.03			AD	
Lake	B7	02-Aug-08	FN	ARGR	169	49	1.02			AD	
Lake	B7	02-Aug-08	FN	ARGR	169	49	1.02			AD	
Lake	B7	02-Aug-08	FN	ARGR	175	55	1.03			AD	
Lake	B7	02-Aug-08	FN	ARGR	184	60	0.96			AD	
Lake	B7	02-Aug-08	FN	ARGR	184	64	1.03			AD	
Lake	B7	02-Aug-08	FN	ARGR	185	65	1.03			AD	
Lake	B7	02-Aug-08	FN	ARGR	198	84	1.08			AD	
Lake	B7	02-Aug-08	FN	ARGR	214	104	1.06			AD	
Lake	B7	14-Jul-08	FN	BURB	273	115	0.57			AD	
Lake	B7	01-Aug-08	FN	BURB	307	125	0.43			AD	
Lake	B7	10-Jul-08	GN	CISC	282			M		AD	
Lake	B7	10-Jul-08	GN	CISC	282					AD	
Lake	B7	10-Jul-08	GN	CISC	152					AD	
Lake	B7	10-Jul-08	GN	CISC	292					AD	
Lake	B7	10-Jul-08	GN	CISC	297					AD	
Lake	B7	10-Jul-08	GN	CISC	288			M		AD	
Lake	B7	10-Jul-08	GN	CISC	290			F		AD	
Lake	B7	10-Jul-08	GN	CISC	288					AD	
Lake	B7	10-Jul-08	GN	CISC	283					AD	
Lake	B7	10-Jul-08	GN	CISC	293					AD	
Lake	B7	10-Jul-08	GN	CISC	279					AD	
Lake	B7	31-Jul-08	GN	CISC	280					AD	
Lake	B7	31-Jul-08	GN	CISC	286					AD	
Lake	B7	01-Aug-08	FN	CISC	302	272	0.99			AD	
Lake	B7	01-Aug-08	FN	CISC	281	258	1.16			AD	
Lake	B7	01-Aug-08	FN	CISC	284	266	1.16			AD	
Lake	B7	02-Aug-08	FN	CISC	270	220	1.12			AD	
Lake	B7	02-Aug-08	FN	CISC	284	230	1.00			AD	
Lake	B7	03-Aug-08	FN	CISC	291	240	0.97			AD	
Lake	B7	12-Jul-08	FN	NNST	78						
Lake	B7	12-Jul-08	FN	NNST	77						
Lake	B7	12-Jul-08	FN	NNST	49						
Lake	B7	12-Jul-08	FN	NNST	62						
Lake	B7	02-Aug-08	FN	ARGR	249	161	1.04			AD	
Lake	B7	02-Aug-08	FN	ARGR	251	170	1.08			AD	
Lake	B7	02-Aug-08	FN	ARGR	319	352	1.08			AD	
Lake	B7	02-Aug-08	FN	ARGR	334	389	1.04			AD	
Lake	B7	2-Aug-08	FN	ARGR	172	51	1.00			AD	Recaptured fish
Lake	B7	2-Aug-08	FN	ARGR	184	63	1.01			AD	Recaptured fish
Lake	B7	2-Aug-08	FN	ARGR	167	44	0.94			AD	Recaptured fish
Lake	B7	03-Aug-08	FN	ARGR	135	25	1.02			AD	
Lake	B7	03-Aug-08	FN	ARGR	160	39	0.95			AD	
Lake	B7	03-Aug-08	FN	ARGR	176	56	1.03			AD	
Lake	B7	03-Aug-08	FN	ARGR	179	55	0.96			AD	
Lake	B7	03-Aug-08	FN	ARGR	318	335	1.04			AD	
Lake	Chickenhead	04-Aug-08	GN	ARGR	168	48	1.01	M			
Lake	Chickenhead	04-Aug-08	FN	ARGR	235	148	1.14				
Lake	Chickenhead	04-Aug-08	FN	ARGR	271	228	1.15				
Lake	Chickenhead	04-Aug-08	FN	ARGR	286	246	1.05				
Lake	Chickenhead	04-Aug-08	FN	ARGR	307	330	1.14				
Lake	Chickenhead	04-Aug-08	FN	ARGR	315	350	1.12				
Lake	Chickenhead	04-Aug-08	FN	ARGR	319	361	1.11				
Lake	Chickenhead	04-Aug-08	FN	ARGR	348	436	1.03				
Lake	Chickenhead	04-Aug-08	GN	ARGR	379	608	1.12	F			
Lake	Chickenhead	04-Aug-08	FN	ARGR	402	686	1.06				
Lake	Chickenhead	05-Aug-08	FN	ARGR	368	556	1.12				
Lake	Chickenhead	05-Aug-08	FN	ARGR	383	665	1.18				
Lake	Chickenhead	04-Aug-08	FN	BURB	335	234	0.62				
Lake	Chickenhead	04-Aug-08	GN	LKTR	172	52	1.02				
Lake	Chickenhead	04-Aug-08	GN	LKTR	177	59	1.06				
Lake	Chickenhead	04-Aug-08	GN	LKTR	177	58	1.05	M			
Lake	Chickenhead	04-Aug-08	GN	LKTR	196	88	1.17				
Lake	Chickenhead	04-Aug-08	GN	LKTR	196	74	0.98				
Lake	Chickenhead	04-Aug-08	GN	LKTR	212	103	1.08	M			
Lake	Chickenhead	04-Aug-08	GN	LKTR	214	103	1.05	M			
Lake	Chickenhead	04-Aug-08	GN	LKTR	232	128	1.03	M			
Lake	Chickenhead	04-Aug-08	FN	LKTR	245	164	1.12				
Lake	Chickenhead	04-Aug-08	GN	LKTR	257	159	0.94	M			
Lake	Chickenhead	04-Aug-08	GN	LKTR	265	177	0.95	M			
Lake	Chickenhead	04-Aug-08	FN	LKTR	283	231	1.02				
Lake	Chickenhead	04-Aug-08	GN	LKTR	373	536	1.03	M			
Lake	Chickenhead	04-Aug-08	GN	LKTR	397	669	1.07	M			
Lake	Chickenhead	04-Aug-08	FN	LKTR	457	1184	1.24				
Lake	Chickenhead	04-Aug-08	GN	LKTR	942						
Lake	Chickenhead	05-Aug-08	FN	LKTR	434	942	1.15				

Sampling Methods

EF	Backpack electrofishing
FN	Fyke net
GN	Gill net
MT	Minnow trap
SLSC	Slimy sculpin

Species

ARGR	Arctic grayling
BURB	Burbot
CISC	Cisco
LKTR	Lake trout
NNST	Ninespine stickleback

Condition Factor (CF)

CF = Weight [in g] x 10^5 / (FL [in mm])^3

Sex

F	Female
M	Male

Fin Clip

AD	Adipose fin
R	Recaptured during marking phase

APPENDIX E

HABITAT AND FISH CAPTURE DATA FOR PONDS IN THE PROJECT AREA

Appendix E. Habitat and Fish Capture Data for Sampled Ponds in the Project Area, July-August 2008.

Site	Date Sampled	Pond Area (m^2)	Pond Perimeter	Max. Depth (m)	Water Temperature (ºC)	pH	Conduc-tivity (µS/cm)	Fish Capture Method	Capture Effort	Species	Number Caught	Number Observed	Length (mm)	CPUE
A9	Jul 13-14	19114	570	0.47	18.0	n.d.	n.d.	EF	162 s	-	-	-	-	-
A10	Jul 13-14	2664	205	0.67	17.0	n.d.	n.d.	EF	119 s	NNST	-	1	-	-
A12	Jul 12-13	3024	220	0.87	18.0	n.d.	n.d.	MT EF	42.0 h 185 s	NNST -	5 -	- -	53-68 -	0.12 fish/trap-h -
A13	Jul 12-13	3598	230	0.31	19.0	n.d.	n.d.	MT EF	42.0 h 166 s	NNST -	1 -	- -	54 -	0.02 fish/trap-h -
A35	Jul 13-14	6604	322	0.43	18.0	n.d.	n.d.	EF	127 s	-	-	-	-	-
A37	Jul 13-14	9940	437	0.64	17.0	n.d.	n.d.	EF	126 s	NNST	-	1	-	-
A38	Jul 13-14	5197	282	0.54	17.0	n.d.	n.d.	EF	107 s	-	-	-	-	-
A39	Jul 13-14	2019	172	0.29	20.0	n.d.	n.d.	EF	144 s	-	-	-	-	-
A40	Jul 12-13	7502	351	0.82	17.0	n.d.	n.d.	MT EF	42.3 h 212 s	NNST -	4 -	- -	55-59 -	0.09 fish/trap-h -
A54	Jul 13-14	58993	1127	0.92		n.d.	n.d.	EF	411 s	NNST	-	1	-	-
B8	Jul 12-13	10724	401	0.61	17.0	n.d.	n.d.	MT EF	43.5 h 279 s	NNST -	1 -	- -	48 -	0.02 fish/trap-h -
B9	Jul 12-13	6644	337	0.74	17.0	n.d.	n.d.	MT EF	42.5 h 230 s	- -	- -	- -	- -	- -
B10	Jul 12-13	2392	218	n.d.	16.0	n.d.	n.d.	MT EF	42.5 h 223 s	- -	- -	- -	- -	- -
B30	Jul 11-12	767	103	n.d.	20.0	n.d.	n.d.	MT EF	44.2 h 156 s	NNST NNST	4	- 10	51-72	0.09 fish/trap-h
B31	Jul 11-12	577	90	n.d.	19.0	n.d.	n.d.	MT EF	44.2 h 125 s	NNST NNST	2 -	- 25	52-59 -	0.05 fish/trap-h -
B32	Jul 11-12	5406	279	n.d.	18.0	n.d.	n.d.	MT EF	43.5 h 294 s	NNST -	1 -	- -	53 -	0.02 fish/trap-h -
B33	Jul 11-12	3262	209	0.85	19.0	n.d.	n.d.	MT EF	43.5 h 285 s	- -	- -	- -	- -	- -
H01	Aug 2-3	9183	376	1.31	15.6	8.16	126	MT EF	42.0 h 396 s	- -	- -	- -	- -	- -
H02	Aug 2-3	615	97	0.25	15.9	8.08	169	MT EF	21.5 h 120 s	ARGR ARGR	1 1	- -	52 49	0.05 fish/trap-h 0.83 fish/100s
H03	Aug 2-3	1099	128	0.36	15.2	8.26	154	MT EF	18.3 h 169 s	- -	- -	- -	- -	- -
H04	Aug 2-3	409	76	0.55	15.0	8.09	115	MT EF	18.3 h 130 s	- NNST	- -	- 3	- -	- -

Appendix E. Habitat and Fish Capture Data for Sampled Ponds in the Project Area, July-August 2008.

Site	Date Sampled	Pond Area (m^2)	Pond Perimeter	Max. Depth (m)	Water Temperature (ºC)	pH	Conductivity (µS/cm)	Fish Capture Method	Capture Effort	Species	Number Caught	Number Observed	Length (mm)	CPUE
H05	Aug 2-3	2040	174	0.60	15.2	8.37	123	MT	17.3 h	-	-	-	-	-
								EF	142 s	NNST	-	5	-	-
H06	Aug 2-3	6725	353	0.46	18.9	8.55	182	MT	17.3 h	-	-	-	-	-
								EF	226 s	-	-	-	-	-
H07	Aug 1-2	392	73	0.67	20.9	8.58	97	MT	18.0 h	-	-	-	-	-
								EF	117 s	-	-	-	-	-
H08	Aug 1-2	2852	231	0.38	18.5	8.58	111	MT	18.3 h	-	-	-	-	-
								EF	149 s	-	-	-	-	-
H09	Aug 1-2	3305	219	0.42	18.7	8.27	173	MT	18.3 h	-	-	-	-	-
								EF	212 s	-	-	-	-	-
H10	Aug 1-2	375	77	0.11	22.1	8.50	193	EF	100 s	-	-	-	-	-
H11	Aug 1-2	1839	160	0.27	20.2	8.29	140	MT	19.8 h	-	-	-	-	-
								EF	147 s	-	-	-	-	-
H12	Aug 1-2	8861	376	0.54	18.9	8.42	120	MT	20.0 h	-	-	-	-	-
								EF	164 s	-	-	-	-	-
H13	Aug 1-2	32038	809	1.04	16.5	8.33	191	MT	20.8 h	-	-	-	-	-
								EF	221 s	-	-	-	-	-
H14	Aug 1-2	2263	185	0.61	17.1		236	MT	21.3 h	-	-	-	-	-
								EF	101 s	-	-	-	-	-
H15	Aug 1-2	11115	508	0.70	15.1	8.99	159	MT	22.0 h	-	-	-	-	-
								EF	287 s	-	-	-	-	-
H16	Aug 2-3	1171	125	0.36	16.1	7.91	48	MT	20.0 h	-	-	-	-	-
								EF	120 s	-	-	-	-	-
H17	Aug 1-2	158000	1968	1.40	18.4	8.28	89	MT	17.0 h	-	-	-	-	-
								EF	444 s	-	-	-	-	-
								GN	16.8 h	-	-	-	-	-
H18	Aug 1-2	7215	320	0.60	17.9	8.62	113	MT	19.0 h	-	-	-	-	-
								EF	221 s	-	-	-	-	-
H19	Aug 2-5	27946	677	1.40	15.6	8.06	177	MT	255 h	-	-	-	-	-
								EF	266 s	-	-	-	-	-
								GN	24.0 h	-	-	-	-	-
H20	Aug 2-5	94656	1421	1.60	15.1	8.10	158	MT	255 h	-	-	-	-	-
								EF	398 s	-	-	-	-	-
								GN	20.0 h	-	-	-	-	-

Notes: n.d. = not determined; EF = backpack electrofishing; MT = minnow traps; GN = gill net; CPUE = catch-per-unit-effort (excludes observed fish)