NORTH AMERICAN TUNGSTEN CORPORATION LTD




North American Tungsten Corporation Ltd.

MACTUNG PROJECT

2007 ENVIRONMENTAL BASELINE STUDIES RARE PLANT SURVEY AND ECOSYSTEM LAND CLASSIFICATION UPDATE

W23101021.007

December 2007

CREATING AND DELIVERING BETTER SOLUTIONS

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North American Tungsten Corporation Ltd.

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RARE PLANT SURVEY AND ECOSYSTEM LAND CLASSIFICATION UPDATE

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EXECUTIVE SUMMARY

North American Tungsten Corporation Ltd. retained EBA Consulting Engineers and Scientists Ltd. (EBA) to update and supplement baseline vegetation information collected in 2006 at the Mactung Project Property (Mactung). EBA conducted a rare plant survey (RPS), trace element concentration sampling and an update of ecosystem land classification (ELC) from August 13 to August 15, 2007 as recommended in earlier work (EBA 2007). The surveys were conducted in the area of the current proposed footprint for the Mactung Project in Yukon as well as the adjacent Northwest Territories.

A three day RPS was conducted from August 13th to August 15th, 2007 in the proposed disturbance footprint for the Mactung Project. Two days of effort were conducted in Yukon-based proposed development area and one day of effort was conducted in the NWT. A total of 31 plants species were identified as having a potential to occur within the local study area (LSA), 13 of these in Yukon and 18 in the NWT. In 2007, no rare species were observed in areas proposed for development.

A baseline assessment of trace element concentrations (TEC) in plant tissue was also performed within the LSA. A total of 14 vegetation samples were collected, with two samples collected at each of seven sample locations. Literature on baseline concentrations or standards is currently not available in Yukon or the NWT for metal concentrations in plants. The analyses indicated that the vegetation samples collected in the NWT (MTEC00 and MTEC01) had relatively high values for most metals in horsetail, while MTEC01 had relatively high values for most metals in willow composite samples.

Fifteen distinct ecosystem units/ map units and 12 complex polygon associations were mapped based on sampling performed by EBA in 2006 and 2007. One new ecosystem unit, spruce-moss, was observed in 2007 at lower elevations (below 1200 m a.s.l.) in the Hess River basin. Three new complex associations were mapped including: birch-moss: heath-lichen, birch lichen: spruce-moss, and willow-sedge: wetland. Birch- lichen: fir-moss was replaced in 2007 with Birch-lichen: spruce-moss. The map units with the greatest percent cover within the LSA are: epilithic lichen (41.7%), heath-lichen (13.7%), birch-lichen (6.0%), fescue-willow (3.4%), fir-lichen: fir-moss (4.0%), and spruce-moss (3.1%).

To perform in-field quality assurance of the ELC map, EBA conducted 36 visual inspections to determine if mapping conducted by remote sensing techniques was comparable with the field data. Overall correlation between the sites inspected in 2007 and ELC mapping from 2006 was 61%. Correlation between field inspections and map units was 72 percent in the NWT and 50% in the Yukon. During the 2007 field program it was observed that in the Yukon portion of the LSA, white spruce replaced subalpine fir below approximately 1,200 m a.s.l. This accounted for five of the nine errors noted in the Yukon part of the mapping. The map of ecosystem units in the LSA has now been revised and updated to include all new observations. EBA is confident that the updated map accurately reflects the distribution of ecosystem units in the Mactung LSA.

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1.0 INTRODUCTION

North American Tungsten Corporation Ltd. (NATCL) is considering development of a world-class tungsten deposit located near Macmillan Pass, on the border between the Yukon and the Northwest Territories (Figure 1). The mine site is located in Yukon in the Selwyn Mountains at an elevation of 1,725-1,800 metres above sea level (m a.s.l.). The mine site is connected to the southern Yukon during summer months by the North Canol Road, and is 650 km (400 air km) northeast of Whitehorse. The mine site is linked to the North Canol Road just east of Macmillan pass by a 10 km-long access road.

NATCL retained EBA Engineering Consultants Ltd. (EBA) to update and supplement historic baseline vegetation information at the Mactung Project Property (Mactung), on both Yukon and Northwest Territories portions of the study area examined in 2006. The survey objective was to document terrestrial ecosystems and vegetation within the Local Study Area (LSA) for future regulatory submissions leading to Mactung Project approvals and implementation.

Based on the 2006 baseline studies, it was recommended that once the Mactung Project footprint had been determined, the following studies be undertaken:

- A site-specific rare plant survey in the area of the proposed Mactung Project infrastructure footprint;
- Collection of baseline information regarding trace element concentrations in vegetation for cumulative effects and impact assessment purposes for the Mactung Project; and
- In field quality assurance/ quality control (QA/QC) of the ecosystem land classification (ELC) mapping be performed.

2.0 OBJECTIVES

The objectives of this report were to satisfy recommendations made as a result of the 2006 Vegetation and Ecosystem Land Classification (EBA 2007) studies. These included:

- Determine if rare plants or rare plant associations are present within the proposed footprint for the Mactung Mine site;
- Collect data on baseline trace element concentrations (TEC) in vegetation in and around the proposed Mactung Project area; and
- Update and perform in field quality assurance (QA) of ELC mapping performed in 2006.

3.0 SUMMARY OF 2006 ENVIRONMENTAL BASELINE STUDIES-VEGETATION AND ECOSYSTEM LAND CLASSIFICATION (EBA 2007)

The following is a summary of the Vegetation and Ecosystem Land Classification conducted during the 2006 Environmental Baseline Studies for the Mactung Project (EBA 2007).

- The Mactung Project Local Study Area is located in Yukon in the Selwyn Mountain Range where the Canol Road crosses the Yukon/Northwest Territories boundary. Mapping of bioclimate zones for the LSA show that the Alpine represents 65.5%, the Shrub Taiga represents 13.6% and the Wooded Taiga represents 21.0% of the LSA.
- A total of 51 GIF plots and 26 visual plots were completed for a total of 77 sample plots. The 77 plots sampled within 324 polygons (including 24 no data polygons) represent a sampling intensity of 23.8%. Average polygon size was determined to be 69.3 hectares.
- Thirteen distinct vegetation units/map units and 10 complex polygon associations were mapped at a scale of 1:20,000 based on sampling performed by EBA in 2006. The map units with the greatest percent cover of the LSA are: epilithic lichen 41.7%, heath-lichen 13.7%, fir-lichen: fir-moss 6.7%, birch-lichen 5.8%, fescue-willow 3.4%, and fescue-sedge 3.3%.
- One hundred twenty three different plants were recorded within the 51 ground inspection plots. Twenty-nine of these recorded plants were identified only to genus and are assumed to be different than those identified to species.
- Initial reconnaissance indicates there is a potential for 26 rare plant species to occur in the LSA. Two rare species (*Rubus arcticus* and *Carex albo-nigra*) were recorded in the LSA, but not in areas that have been considered for the proposed footprint of the mine. A list of rare plant communities does not currently exist for the Mactung Project LSA. In general, wetlands and arctic/ alpine communities are considered sensitive communities.
- There are no national parks, territorial parks, habitat protection or wildlife management zones in the area of the Mactung Project LSA.
- Various wetlands and riparian areas have been identified in the LSA. Two areas that may be possibly be impacted by the proposed project footprint area of the mine include a small marsh and riparian area in the upper valley in Yukon and wetlands in the Upper Dale Valley, NWT.

4.0 METHODS

Mr. Jamie Slogan (M.Sc., R.P.Bio.) and Mr. Glen Rudman (M.Sc.) conducted a rare plant survey (RPS), trace element concentration sampling and ecosystem land classification (ELC) survey from August 13th to August 15th, 2007. The surveys were conducted in the area of the proposed footprint for the Mactung Project in both Yukon and the Northwest Territories. Vegetation sampling for trace element analysis (TEC) in plant tissue was conducted within and downgradient of the Mactung Project footprint from August 13 - 16.

4.1 RARE PLANT SURVEY

A rare plant survey (RPS) was completed over a two year period as part of on-going environmental baseline studies conducted by EBA for NATCL at Mactung. A three day RPS was conducted from August 13th to August 15th, 2007 in the proposed disturbance footprint for the Mactung Project. For this survey, two days of effort were conducted in Yukon and one day of effort was conducted in the NWT. A formal rare plant survey was not conducted during the 2006 field season due to uncertainty of the potential disturbance footprint. A rare plant reconnaissance was conducted and 14 vegetation plots were sampled within the area of the proposed footprint during the 2006 season. Data collected in July 2006 were used to supplement the 2007 RPS. The reconnaissance included approximately 15 minutes of effort at the end of sampling each plot to look specifically for listed plant species.

Prior to conducting the rare plant survey, several sources including McJannet *et al.* (1995); Douglas *et al.* (1981), and NatureServe Yukon were used to compile a list of rare plants species for Yukon and the NWT that could potentially be present in the Mactung LSA. The RPS included a two person team walking in a meandering fashion on foot through the area of interest. In 2007, six visual plots were established in Yukon and 9 visual plots in the NWT in areas previously proposed for physical works (AMAX 1983). These areas were sampled in order to map vegetation communities in the area and survey rare plants at a finer scale. Approximately 15 minutes of effort was taken at the end of sampling each plot to look specifically for listed plant species.

4.2 TRACE ELEMENT CONCENTRATIONS IN PLANT TISSUES

A baseline assessment of trace element concentrations (TEC) in plant tissue was performed within the LSA. A total of 14 vegetation samples were collected with two samples collected at each of seven sample locations. Four sample locations were established in the Yukon (MTEC 03, 04, 05, and 06) and three in the NWT (MTEC 00, 01, 02). The purpose of the assessment was to collect information on metal concentrations in plant tissue in areas potentially affected by future mining activity and in undisturbed areas down-gradient from the proposed mine. Sample locations were primarily established in riparian areas. Locations of samples are shown in Figure 2 with species and rationale for sample locations explained in Table 1.

TABLE 1. SUMMARY OF VEGETATION TRACE ELEMENT SAMPLING PROGRAM		
Sample Location	**Species Sampled**	**Rationale for Location**
MTEC 00	Horsetail Willow Composite	Downstream of Dale Valley and Cirque Lake Tributaries-NWT
MTEC 01	Horsetail Willow Composite	In upper portion of previously proposed tailings area-NWT
MTEC 02	Horsetail Willow Composite	Immediately downstream of previously proposed tailings area-NWT
MTEC 03	Horsetail Sedge Composite	In proposed borrow pit-Yukon
MTEC 04	Horsetail Sedge Composite	In current proposed tailing area-Yukon (Photo 1)
MTEC 05	Horsetail Willow Composite	Immediately downstream of current proposed tailings area-Yukon (Photo 2)
MTEC 06	Horsetail Willow Composite	Downstream of confluence of tributaries draining the Project area-Yukon

Plant species chosen for the TEC assessment include Sedge composite (*Carex* species) at two locations, willow composite (*Salix* species) at four locations, and horsetail (*Equisetum arvense*) at all locations. Sedges and willows are major components of the diet of ungulates including caribou and moose and horsetails are believed to accumulate metals. All TEC samples were collected at ELC sample locations so that a general plant species list and soil characteristics from each site were recorded. Current year's foliage was collected from above-ground tissues with a focus on newest growth. Some stem tissue was also included in willow samples. Vegetation samples were collected and placed in paper bags for drying, prior to shipment to Cantest Ltd. in Burnaby, BC for analysis. All metals, except mercury, were analysed using Inductively Coupled Argon Plasma Spectroscopy (ICP) or ICP Mass Spectroscopy (ICP-MS). Mercury was analyzed using Cold Vapour Atomic Absorption Spectrophotometry or Cold Vapour Atomic Fluorescence Spectrophotometry.

4.3 ELC FIELD SAMPLING

To assess reliability of the ELC mapping ten percent of polygons were to be revisited and sampled. Suggested sample size is a minimum of 30 polygons with an overall correlation of at least 65-75% (RIC 1998). Sampling of vegetation was completed using ground inspection forms (GIF's) -FS 212-2 (1) and visual inspections according to methodology outlined in the *Field Manual for Describing Terrestrial Ecosystems* (MoF 1998). Field data were collected using methods that were also consistent with the Yukon Environment Site Description Form. Mapping of vegetation adhered to the *Standard for Terrestrial Ecosystem Mapping in British Columbia* (RIC 1998). All plot positions were recorded using a Garmin 76 Global Positioning System with accuracy of between 6-8 m. Guidelines and nomenclature for ecosystem land classification are from EBA (2007), which was further based upon Kershaw and Kershaw (1983) and Zoladeski *et al.* (1996). Vegetation nomenclature followed Cody (1996).

4.4 ELC MAPPING

The imagery used for the ELC mapping was created from one high resolution satellite image and the LSA for vegetation is based on the size of the image. The LSA consists of a tasked, ortho-rectified Quickbird image acquired August 21, 2006. The Quickbird satellite collects panchromatic imagery at 60-70 cm resolution and multi-spectral imagery at 2.4-2.8 m resolution. The acquired imagery has been shown in natural color and enhanced with panchromatic high resolution band to increase visual interpretation.

Identification and delineation of terrain and vegetation polygons was completed on-screen using ArcGIS version 9.1. All polygons were determined and mapped by Mr. Jamie Slogan, to ensure consistency with the field sampling program, with the help of Mr. Barry Pierce, Remote Sensing/GIS Specialist M.Sc., ADP (GIS). ELC was mapped at a nominal scale of 1:20,000 for the LSA. Ecosystem units were mapped according to best professional judgement based on clearly defined vegetation units at a resolution of 1:20,000. A quality assurance/quality control (QA/QC) review of the mapping was performed by comparing all ground data locations with mapped polygons.

5.0 RESULTS

5.1 RARE PLANT SURVEY

A literature search and field reconnaissance for protected areas and rare, sensitive, and/or endangered plant communities was conducted for the LSA. There are no national parks, territorial parks, habitat protection or wildlife management zones in the area of the Mactung Project LSA. A list of rare plant communities does not currently exist for the Mactung LSA. In general, wetlands and arctic/alpine communities are considered sensitive communities. Wetlands and riparian areas have a higher potential for rare plants, high wildlife habitat value, are sensitive to potential contamination drainage, are very sensitive to disturbance and may take above average lengths of time to reclaim. Alpine plant communities also have a higher potential for rare plants, are very sensitive to disturbance and may take above average lengths of time to reclaim. Wetland and riparian areas in the Local Study Area should be considered as sensitive plant communities.

EBA consulted the *Species at Risk Act* (SARA) database, *The Rare and Vascular Plants of the Yukon* (Douglas *et al.* 1981), *Rare Vascular Plants in the Northwest Territories* (McJannet *et. al.* 1995) and NatureServe Yukon to determine potential rare vascular plants at Mactung. A list of potential rare plant species with species observed is presented in Table 2. A total of 31 plants species were identified as having a potential to occur within the LSA, 13 of these in Yukon and 18 in the NWT (Table 2).

TABLE 2: LIST OF POTENTIAL AND OBSERVED RARE PLANT SPECIES FOR THE MACTUNG LOCAL STUDY AREA

Yukon			
Species	**Habitat**	**Location 1**	**Observed**
Angelica lucida	sub-alpine meadow	YT	
Arnica parryi	alpine, steep ravines, ledges	YT	
Carex albo nigra	dry alpine tundra	YT	2006
Carex arcta	woodland bogs, marshes	YT	
Listera cordata	alpine meadows near timberline	YT	
Phylodoce glanduliflora	alpine/sub-alpine slopes-moist	YT	
Poa porsildii	alpine/sub-alpine slopes-moist	YT/NWT[2]	
Polystichum lonchitis	limestone cliffs, rocky/talus slopes	YT	
Rubus arcticus ssp. stellatus	alpine and sub-alpine meadows	YT	2006
Salix arctophila	wet/dry mossy tundra	YT	
Saxifraga aizoides	Moist calcareous. and gravel	YT	
Phegopteris connectilis	alpine cliff ledges/rocky slopes	YT/NWT[2]	
Woodsia ilvensis	dry cliffs/talus slopes	YT	
Northwest Territories			
Species	**Habitat**	**Location 2**	**Observed**
Antennaria friesiana ssp. Alaskana	Arctic-alpine	YT/NWT	
Arnica mollis	alpine meadows and slopes	YT/NWT	
Carex phaecoephala	alpine meadows and slopes	NWT	
Draba albertina	Moist alpine and subalpine slopes	NWT	
Draba ogilviensis	Montane/alpine meadows	YT/NWT	
Draba porsildii	Montane/alpine meadows/scree	YT/NWT	
Epilobium hornemannii	Wet alpine tundra	NWT	
Eritrichium slendons	arctic-alpine scree slopes ledges	YT/NWT	
Festuca lenensis (ovina ssp alaskana)	dry tundra	YT/NWT	
Koeleria astiatica	Shale scree/dry tundra	YT/NWT	
Minuartia macrocarpa	Arctic - alpine	NWT	
Minuartia yukonensis	arctic-alpine scree slopes ledges	YT/NWT	
Poa porsildii	alpine/sub-alpine slopes-moist	YT/NWT	
Podisteva macounii	ridgetops/rock	YT/NWT	
Ranunculus turneri	sub-alpine meadows	YT/NWT	
Rumex acetosa	Arctic-alpine moist meadows	YT/NWT	
Senecio sheldonensis	Subalpine meadows	YT/NWT	
Viola selkirkii	alpine tundra	YT/NWT	

Notes: [1] Douglas *et. al.* 1981; [2] McJannet *et. al.*1995.

A three day RPS was conducted from August 13 to August 15, 2007 in the proposed disturbance footprint for the Mactung Project with two days of effort conducted in Yukon and one day of effort conducted in the NWT. Figure 3 illustrates the route taken by the team in relation to the footprint. In 2006, two rare species (*Rubus arcticus* and *Carex albo-nigra*) were observed in the LSA in the NWT, but not in areas that have historically been considered for the proposed footprint of the mine.

In 2007, no rare species were observed in areas proposed for development. In the NWT, *Rubus arcticus* ssp. *acaulis* was observed on a steep slope below camp. This species is not considered rare. *Carex albo-nigra* was not observed within the study area in 2007. *Antennaria friesiana ssp friesiana* was observed in the NWT and not *Antennaria friesiana ssp. alaskana*, which is considered rare. There were numerous observations of the genus *Poa*, some of which could not be identified to species. There were no observations of *Poa porsildii*.

5.2 TRACE ELEMENT CONCENTRATIONS IN PLANT TISSUES

A baseline assessment of trace element concentrations (TEC) in plant tissue was performed within the LSA. A total 14 vegetation samples were collected with two samples collected at each of seven sample locations (Figure 2). Results from TEC sampling are presented in Appendix A. Data was collected to establish baseline values for TEC in plants in and around the Project area. Literature on baseline concentrations or standards is currently not available in Yukon or the NWT for metal concentrations in plants. Due to the small sample size, standard error of mean is presented for species with multiple sampling locations to give an estimate of the accuracy of the mean. The analyses indicated that the vegetation samples collected in the NWT (MTEC00 and MTEC01) had relatively high values for most metals in horsetail, while MTEC01 had relatively high values for most metals in willow composite samples.

5.3 ELC FIELD SAMPLING

A total of 36 visual plots were sampled during the 2007 field season. Twenty-two of these visual plots were sampled from the ground and 14 were sampled from a helicopter. Including the 2006 field data, 51 GIF plots and 62 visual plots were sampled for a total of 113 sample plots within the LSA. A total of 324 polygons were mapped in 2006. Incorporating the 2007 field data and updating the ELC map resulted in a total of 454 polygons being mapped within the LSA. The 113 plots sampled within 454 polygons (including 24 no data and 6 water polygons) represents a sampling intensity of 24.8%. Average polygon size was determined to be 49 hectares. This meets the requirements for terrestrial ecosystem mapping (TEM) Level 4 survey. The sampling ratio was adjusted in the field to acquire the greatest amount of vegetation information as possible. There were no full plots recorded because concurrent terrain and soils data were being collected by another team of scientists (see separate EBA report on Terrain Mapping and Soils). To maximize field time, sampling concentrated on increasing the ratio of GIFs and visuals.

5.4 ELC MAPPING

Ecosystem units are the most detailed level of classification according to the YCEMF (2003). A summary of the ecosystem classification with newly identified ecosystem units is presented in Table 3. A summary of the results obtained from mapping ecosystem units at a 1:20,000 scale are presented in Table 4 and Figure 4. Detailed analysis of ecosystem units (that include aspect and soil modifiers) are not discussed herein; however all plot data was classified to this level and results are presented in (EBA 2007-Appendix B).

Complex polygons were used when distinct ecosystem units were not mappable with confidence at a 1:20,000 level. Complex polygons are limited to two map units and are assumed to occur as 50% Map Unit 1: 50% Map Unit 2. Complex polygons are not described in Table 3 as they are formed as a result of small-scale changes in microtopography, aspect, soil conditions and slope which create a patchwork of the broader ecosystem units explained below.

Fifteen distinct ecosystem units/ map units and 12 complex polygon associations were mapped based on sampling performed by EBA in 2006 and 2007 (excluding water and no data polygons). One new ecosystem unit, spruce-moss (Photo 4) was observed in 2007 at lower elevations (below 1200 m a.s.l.) in the Hess River basin. Three new complex associations were mapped including: birch-moss: heath-lichen, birch lichen: spruce-moss, and willow-sedge: wetland. Birch- lichen: fir-moss was replaced in 2007 with birch-lichen: spruce-moss. The map units with the greatest percent cover within the LSA are: epilithic lichen (41.7%), heath-lichen (13.7%), birch-lichen (6.0%), fescue-willow (3.4%), fir-lichen: fir-moss (4.0%), and spruce-moss (3.1%).

TABLE 3: DESCRIPTION OF MAPPED VEGETATION UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.

Ecosystem Unit	Unit Code	Description
Alpine		
Epilithic Lichen	EL	The epilithic lichen ecosystem unit (Photo 5) represents 41.9% or 9,243 Ha of the LSA with an average polygon size of 358 Ha. These areas are mainly exposed bare rock, talus or boulderfields covered with crustose lichen communities that occur above 1,650 m a.s.l. At lower elevations, dwarf shrub species and graminoid species may be observed sporadically.
Fescue-Sedge	FC	The fescue-sedge ecosystem unit represents 5% or 1,131 Ha of the LSA with an average polygon size of 18 Ha. These areas are dry alpine meadows observed in the alpine between 1,870 m a.s.l. and 1,515 m a.s.l. in Yukon and at lower elevations in the NWT. The ecosystem unit is dominated by *Festuca altaica* and *Cladina* species, although, *Carex* and *Poa* species may occur in high abundance on moister soils. These sites are generally on exposed, well drained soils, convex micro-topography and/or warm aspects.
Fescue –Willow	FS	The Fescue-Salix ecosystem unit (Photo 6) represents 4.3% or 971 Ha of the LSA with an average polygon size of 18 Ha. These areas are moist alpine meadows observed in the alpine between 1,780 and 1,590 m a.s.l. in Yukon and 1,650-1,600 m a.s.l. in the NWT. The ecosystem unit is

TABLE 3: DESCRIPTION OF MAPPED VEGETATION UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.		
Ecosystem Unit	**Unit Code**	**Description**
		dominated by fescue (*Festuca altaica*) and moss species, although, sedge (*Carex*), hairgrass (*Deschampsia*), and rush (*Luzula*) species may occur in high abundance. These sites are characterized by the occurrence of dwarf shrub species such as *Salix arctica, Salix reticulata, and Salix barrattianna.* Fescue-Salix ecosystem units are generally less exposed than Fescue-Sedge and occur on well drained soils, concave micro-topography and cool aspects.
Heath-Lichen	CC	The Heath-Lichen ecosystem unit represents 14% or 3,218 Ha of the LSA with an average polygon size of 38 Ha. These areas are dwarf shrub communities observed in the alpine of the Yukon and the NWT between 1,760 m a.s.l. and 1405 m a.s.l.. The vegetation unit is dominated by dwarf shrub species mountain heather (*Cassiope tetragona, Phyllodoce* species), crowberry (*Empetrum nigrum*), Lingonberry (*Vaccinium vitis idea*), and lichen species. Few plants grow taller than 20 cm high. These sites are generally on exposed and well drained soils.
Shrub Taiga		
Birch-Lichen	BC	The Birch-Lichen ecosystem unit represents 7.8% or 1,739 Ha of the LSA with an average polygon size of 22 Ha. These areas were observed in the Shrub Taiga of the Yukon and the NWT between 1,530 m a.s.l. and 1,350 m a.s.l. and in the Wooded Taiga mainly on upland terraces in the Yukon between 1,406 and 1,175 m a.s.l.. The ecosystem unit is dominated by scrub birch (Betula nana) and lichen species (*Cladina, Cetraria, and Cladonia*). On upland terraces in the Yukon *Ledum decumbens* occurred with high abundance. These sites are generally on exposed well drained soils, convex micro-topography and/or warm aspects.
Birch-Moss	BM	The Birch-Moss ecosystem unit represents 3% or 686 Ha of the LSA with an average polygon size of 27 Ha. These areas were observed in the Shrub Taiga of the Yukon and the NWT between 1,420 m a.s.l. and 1,385 m a.s.l. The ecosystem unit is dominated by scrub birch (*Betula nana*) and a moss understory (*Hylocomnium splendens* and *Polytrichum commune*). Birch-Moss is generally favoured on sheltered, moist, well drained soils, concave micro-topography and/or cool aspects.
Sedge–Bluebell	CM	The Sedge-Bluebell ecosystem unit represents 0.9% or 203 Ha of the LSA with an average polygon size of 13 Ha. These areas were observed in the lower Alpine and Shrub Taiga of the Yukon and the NWT between 1,620 m a.s.l. and 1,370 m a.s.l. The ecosystem unit is dominated by *Carex podocarpa* and a diverse mix of forbs including *Mertensia paniculata, Senecio triangularis, Artemesia arctica, and Polemonium acutiflorum.* These sites are generally gentle sloping, with moderately drained submesic to mesic soils, in sheltered valleys. This unit is similar to Willow-Bluebell and may occur at higher elevations with submesic soils. These units are may indicate seepage areas.
Willow – Bluebell	SM	The Willow-Bluebell ecosystem unit represents 1.8% or 397 Ha of the LSA with an average polygon size of 15 Ha. The Willow-Bluebell unit occurs adjacent to streams and seepage areas. These areas were observed in the lower Alpine and Shrub Taiga of the Yukon and the NWT between

TABLE 3: DESCRIPTION OF MAPPED VEGETATION UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.		
Ecosystem Unit	**Unit Code**	**Description**
		1,525 m a.s.l. and 1,455 m a.s.l. and in the Wooded Taiga at 1,400 m a.s.l.. The dense canopy is dominated by medium to tall willow species *Salix planifolia, Salix glauca, Salix alaxensis, and Salix barrattianna*. The understory is a diverse mix of forbs including *Mertensia paniculata, Senecio triangularis, Artemesia arctica, and Polemonium acutiflorum*. These sites are generally gentle sloping, moderately drained, with moist to wet soils, in sheltered valleys.
Willow (med/tall)-Slope	WS	The Willow-Slope ecosystem unit represents 1.5% or 327 Ha of the LSA with an average polygon size of 9 Ha. These areas were observed on steep slopes such as avalanche chutes in the Wooded Taiga of the Yukon between 1,450 m a.s.l. and 1,250 m a.s.l. The dense canopy is dominated by medium to tall willow species *Salix planifolia, Salix alaxensis, and Salix glauca*. An understory alpine fir was observed in the NWT along the Canol Road in the southeast portion of the LSA. The herbaceous (c) layer is characterized by sedge species (*Carex aquatilis and C. podocarpa*), *Salix reticulata*, and/ or a mix of forbs. These sites are steep slopes, with well drained, with submesic to xeric soils.
Wooded Taiga		
Fir-Lichen	AC	The Fir-Lichen ecosystem unit represents 4.2% or 932 Ha of the LSA with an average polygon size of 52 Ha. These areas were observed in the Wooded Taiga of the Yukon and the NWT between 1,445 m a.s.l. and 1,200 m a.s.l. The ecosystem unit is dominated by alpine fir (*Abies lasiocarpa*) and lichen species. The canopy is usually open and may a have Scrub birch B2 layer. These sites are generally on exposed, well drained soils, convex micro-topography and/or warm aspects.
Fir-Moss	AM	The Fir-Moss ecosystem unit represents 3% or 677 Ha of the LSA with an average polygon size of 36 Ha. These areas were observed in the Wooded Taiga of the Yukon between 1,450 m a.s.l. and 1,200 m a.s.l. The ecosystem unit is dominated by alpine fir (*Abies lasiocarpa*) and a moss understory (*Hylocomnium splendens and Polytrichum commune*). Percent canopy cover is higher than in the Fir-Lichen vegetation unit. Fir-Moss is generally favoured on sheltered, moist, well drained soils, concave micro-topography and/or cool aspects. This community also occurs adjacent to seeps streams.
Spruce-Moss	PM	The Spruce-Moss ecosystem unit (Photo 7) represents 3.9% or 873 Ha of the LSA with an average polygon size of 114 Ha. These areas were observed in the Wooded Taiga of the Yukon between 1,450 m a.s.l. and 1,200 m a.s.l. The ecosystem unit is dominated by white spruce (*Picea glauca*) and a moss understory (*Hylocomnium splendens and Polytrichum commune*). Black spruce (*Picea mariana*) may also occur in valley bottoms and intermixed with white spruce on lower slopes spruce-moss is replaced by fir-moss/ fir-lichen at elevations above approximately 1,200 m a.s.l.
Wetland and Riparian		
Sedge – Cinquefoil	CP	The Sedge-Cinquefoil ecosystem unit represents 0.1% or 16.4 Ha of the LSA with an average polygon size of 16.4 Ha. This area was observed in the Shrub Taiga of the NWT at 1,482 m a.s.l. The ecosystem unit is

TABLE 3: DESCRIPTION OF MAPPED VEGETATION UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.		
Ecosystem Unit	**Unit Code**	**Description**
		dominated by *Carex aquatilis* with a minor component of *Carex podocarpa* and *Potentilla palustris*. These sites are generally depressional to flat areas with poorly drained, subhygric soils in valleys bottoms. The groundcover was mainly *Sphagnum* species.
Willow – Sedge	SC	The Willow-Sedge ecosystem unit (Photo 8) represents 1.5% or 3,241 Ha of the LSA with an average polygon size of 15 Ha. The Willow-Sedge unit occurs adjacent to streams and rivers in floodplains. These areas were observed in the Shrub Taiga of the NWT between 1,500 m a.s.l. and 1,450 m a.s.l. and the Wooded Taiga of the Yukon between 1,300 and 1,150 m a.s.l. The dense canopy is dominated by medium to tall willow *species Salix alaxensis, Salix planifolia, and Salix glauca.* The understory is characterized by sedge species (*Carex aquatilis and C. podocarpa*), *Equisetum* species, and moss species. These sites are generally flat, moderately to well drained, with submesic to mesic soils.
Wetland	WD	The Wetland ecosystem unit represents 0.8% or 180.9 Ha of the LSA with an average polygon size of 12.9 Ha. In the southeast LSA along the North Canol Road graminoid and shrubby fens were observed in the Wooded Taiga along the Macmillan River at elevations of 1,300 m a.s.l.. These fens were observed to be dominated by willow and Sphagnum species. Other wetland areas include low-lying depressions along the Hess River where poor drained soils support shrubby fens and intermixed with black spruce
Other		
Water	WR	At least six small lakes were identified throughout the LSA including Cirque Lake to the north of the mine site. Lakes accounted for 0.2% of the LSA or 44.8 Ha with an average size 7.5 Ha.
No Data	ND	No data includes 16 areas which were unmappable due to cloud cover and shadow effects. A total of 3.6% or 793.3 Ha of the LSA was classified as no data with an average polygon size of 0.2 Ha.

TABLE 4. SUMMARY OF MAPPED ECOSYSTEM UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.					
Ecosystem Unit	**Map Unit**	**Polygons**	**Area**	**Average Area**	**Percent Cover**
Alpine					
Epilithic Lichen	EL	26	9310.3	358.1	41.9
Heath-Lichen	CC	77	2943.9	38.2	13.2
Fescue –Willow (Dwarf)	FS	28	752.9	26.9	3.4
Fescue-Sedge	FC	42	750.4	17.9	3.4
Heath-Lichen: Fescue-Sedge	CC:FC	13	545.5	42.0	2.5
Fescue –Willow (Dwarf): Willow (med/tall)-Slope	FS:WS	4	297.9	74.5	1.3

TABLE 4. SUMMARY OF MAPPED ECOSYSTEM UNITS WITHIN THE MACTUNG LOCAL STUDY AREA.					
Ecosystem Unit	**Map Unit**	**Polygons**	**Area**	**Average Area**	**Percent Cover**
Fescue-Sedge: Fescue – Willow (Dwarf)	FC:FS	4	143.0	35.8	0.6
Birch-Lichen: Fescue-Sedge	BC:FC	2	76.4	38.2	0.3
Shrub Taiga					
Birch-Lichen	BC	59	1330.0	22.5	6.0
Birch-Moss	BM	18	487.9	27.1	2.2
Willow –Bluebell	SM	27	397.3	14.7	1.8
Fir-Lichen: Birch-Lichen	AC:BC	10	329.5	33.0	1.5
Birch-Lichen: Birch-Moss	BC:BM	10	234.8	23.5	1.1
Willow (med/tall)-Slope	WS	20	179.0	8.9	0.8
Sedge –Bluebell	CM	13	173.8	13.4	0.8
Birch-Lichen	BL	1	63.4	63.4	0.3
Birch-Moss: Sedge – Bluebell	BM:CM	2	61.1	30.5	0.3
Birch-Moss: Heath-Lichen	BM:CC	1	5.2	5.2	0.0
Wooded Taiga					
Fir-Lichen: Fir-Moss	AC:AM	4	922.1	230.5	4.1
Spruce Moss	PM	6	682.6	113.8	3.1
Fir-Lichen	AC	9	471.0	52.3	2.1
Birch-Lichen: Spruce Moss	BC:PM	2	382.4	191.2	1.7
Fir-Moss	AM	6	216.3	36.0	1.0
Fir-Moss: Birch-Moss	AM:BM	1	101.1	101.1	0.5
Wetland and Riparian					
Willow-Carex	SC	23	343.0	14.9	1.5
Wetland	WD	14	180.9	12.9	0.8
Sedge –Cinquefoil	CP	1	16.4	16.4	0.1
Willow-Carex: Wetland	SC:WD	1	3.6	3.6	0.0
Other					
Water	WR	6	44.8	7.5	0.2
No Data	ND	24	793.3	33.1	3.6
Total	**30**	**454**	**22239.7**	**49**	**100**

5.5 ELC QUALITY ASSURANCE (QA) PROGRAM

To perform in-field quality assurance of the ELC map, EBA conducted 36 visual inspections to determine if mapping conducted by remote sensing techniques were accurate with field data. A total of 11% of the polygons were revisited based upon the results of the 2006 data. The results are presented in Table 4.

TABLE 5. SUMMARY ELC QUALITY ASSURANCE QA) PROGRAM FOR THE MACTUNG LOCAL STUDY AREA.

Sample Plots	NWT		Yukon	
	Correct	Incorrect	Correct	Incorrect
MV 201-213	9	4	-	-
MV 214-222	-	-	4	5
MV223-226	4	0	-	-
MV227-229	-	-	2	1
MV230-235	-	-	3	3
MV 236	0	1	-	-
Total	**13**	**5**	**9**	**9**
Percent Correct	**72**		**50**	

The overall correlation between the sites inspected in 2007 and ELC mapping from 2006 was 61%. Correlation between field inspections and map units was 72 percent in the NWT and 50% in the Yukon. Suggested acceptable values are 65% or higher. During the 2007 field program it was observed that in Yukon, white spruce replaced subalpine fir below approximately 1,200 m a.s.l. This accounted for five of the nine errors in mapping in the Yukon. The map of ecosystem units in the LSA (Figure 4) has been revised and updated to include all new observations. EBA is confident that the updated map accurately reflects the distribution of ecosystem units in the Mactung LSA.

6.0 SUMMARY

EBA conducted a rare plant survey (RPS), trace element concentration sampling and further ecosystem land classification (ELC) during the period August 13 to August 15, 2007. The surveys were conducted in the area of the proposed footprint for the Mactung Project in both Yukon and the Northwest Territories. Vegetation samples for trace element concentrations analysis (TEC) in plant tissue were collected within and downgradient of the Mactung Project footprint from August 13 - 16. The following is a summary of the Rare Plant Survey and Ecosystem Land Classification Update conducted for the 2007 Environmental Baseline Studies for the Mactung Project.

There are no national parks, territorial parks, habitat protection or wildlife management zones in the area of the Mactung Project LSA. A list of rare plant communities does not currently exist for the Mactung LSA. In general, wetlands and arctic/alpine communities are considered sensitive communities.

A three day RPS was conducted from August 13 to August 15, 2007 in the proposed disturbance footprint for the Mactung Project. Two days of effort were conducted in the Yukon and one day of effort was conducted in the NWT. A total of 31 plants species were identified as having a potential to occur within the LSA, 13 of these in Yukon and 18 in the NWT. In 2007, no rare species were observed in areas proposed for development.

A baseline assessment of trace element concentrations (TEC) in plant tissue was performed within the LSA. A total 14 vegetation samples were collected with two samples collected at each of seven sample locations. Literature on baseline concentrations or standards is currently not available in the Yukon or NWT for metal concentrations in plants. The analyses indicated that the vegetation samples collected in the NWT (MTEC00 and MTEC01) had relatively high values for most metals in horsetail, while MTEC01 had relatively high values for most metals in willow composite samples.

Fifteen distinct ecosystem units/ map units and 12 complex polygon associations were mapped based on sampling performed by EBA in 2006 and 2007. One new ecosystem unit, spruce-moss, was observed in 2007 at lower elevations (below 1,200 m a.s.l.) in the Hess River basin. Three new complex associations were mapped including: birch-moss: heath-lichen, birch lichen: spruce-moss, and willow-sedge: wetland. Birch- lichen: fir-moss was replaced in 2007 with Birch-lichen: spruce-moss. The map units with the greatest percent cover within the LSA are: epilithic lichen (41.7%), heath-lichen (13.7%), birch-lichen (6.0%), fescue-willow (3.4%), fir-lichen: fir-moss (4.0%), and spruce-moss (3.1%).

To perform in-field quality assurance of the ELC map, EBA conducted 36 visual inspections to determine if mapping conducted by remote sensing techniques were accurate with field data. Overall correlation between the sites inspected in 2007 and ELC mapping from 2006 was 61%. Correlation between field inspections and map units was 72% in the NWT and 50% in Yukon. During the field program it was observed that in Yukon, white spruce replaced subalpine fir below approximately 1,200 m a.s.l. This accounted for five of the nine errors in mapping in the Yukon. The map of ecosystem units in the LSA has been revised and updated to include all new observations. EBA is confident that the updated map accurately reflects the distribution of ecosystem units in the Mactung LSA.

7.0 CLOSURE

EBA is pleased to present North American Tungsten Corporation Ltd. with this 2007 Rare Plant Survey and Ecosystem Land Classification Update Report for the Mactung Project. The survey objective was to identify the potential for rare plants and rare plant communities in the proposed mine footprint; establish baseline trace element concentrations in plant tissues in and around the proposed mine; and conduct a quality assurance and update of ecological land classification performed in 2006. We are confident the information presented here will support future regulatory submissions leading to project approvals and production.

Respectfully submitted,
EBA Engineering Consultants Ltd.

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Reviewed by:

Richard Hoos, M.Sc., R.P.Bio.
Principal Consultant

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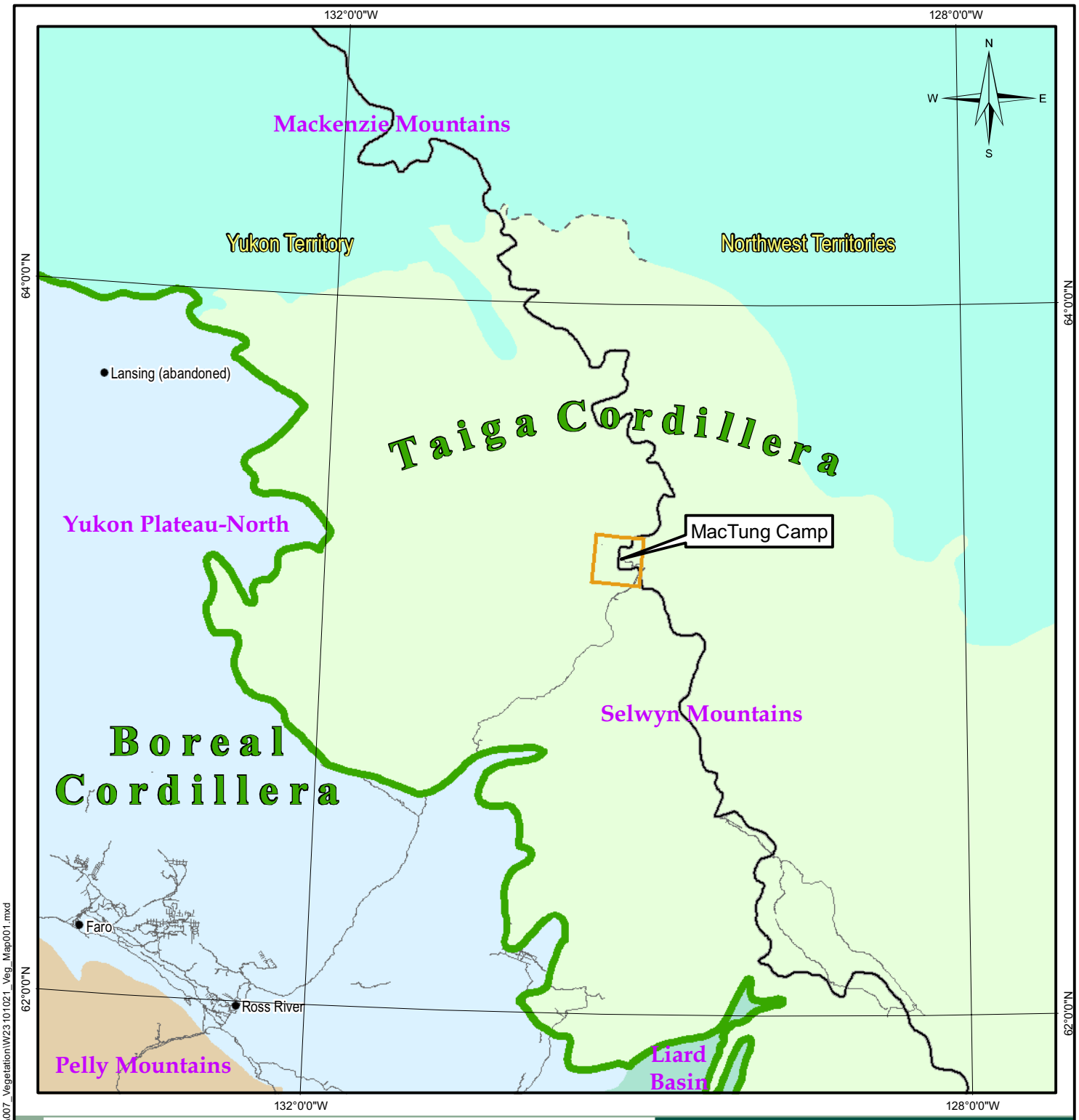
FIGURES



LEGEND

- Local Study Area
- NWT - Yukon Border
- Roads
- Place Names
- Ecozones
- Extrapolated Ecoregion Boundary

Ecoregions

- Selwyn Mountains
- Mackenzie Mountains
- Pelly Mountains
- Liard Basin
- Yukon Plateau-North

NOTES

Base data source:
Yukon, Northwest Territories Governments, NTS

MACTUNG PROJECT
2007 ENVIRONMENTAL BASELINE STUDIES
RARE PLANT SURVEY AND ECOSYSTEM LAND CLASSIFICATION UPDATE

Ecozones and Ecoregions

PROJECTION	DATUM
UTM Zone 9	NAD83

Scale: 1:1,725,000
20 10 0 20 40
Kilometres

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PROJECT NO.	DWN	CKD	REV
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DATE: November 26, 2007

EBA Engineering Consultants Ltd.

Figure 1

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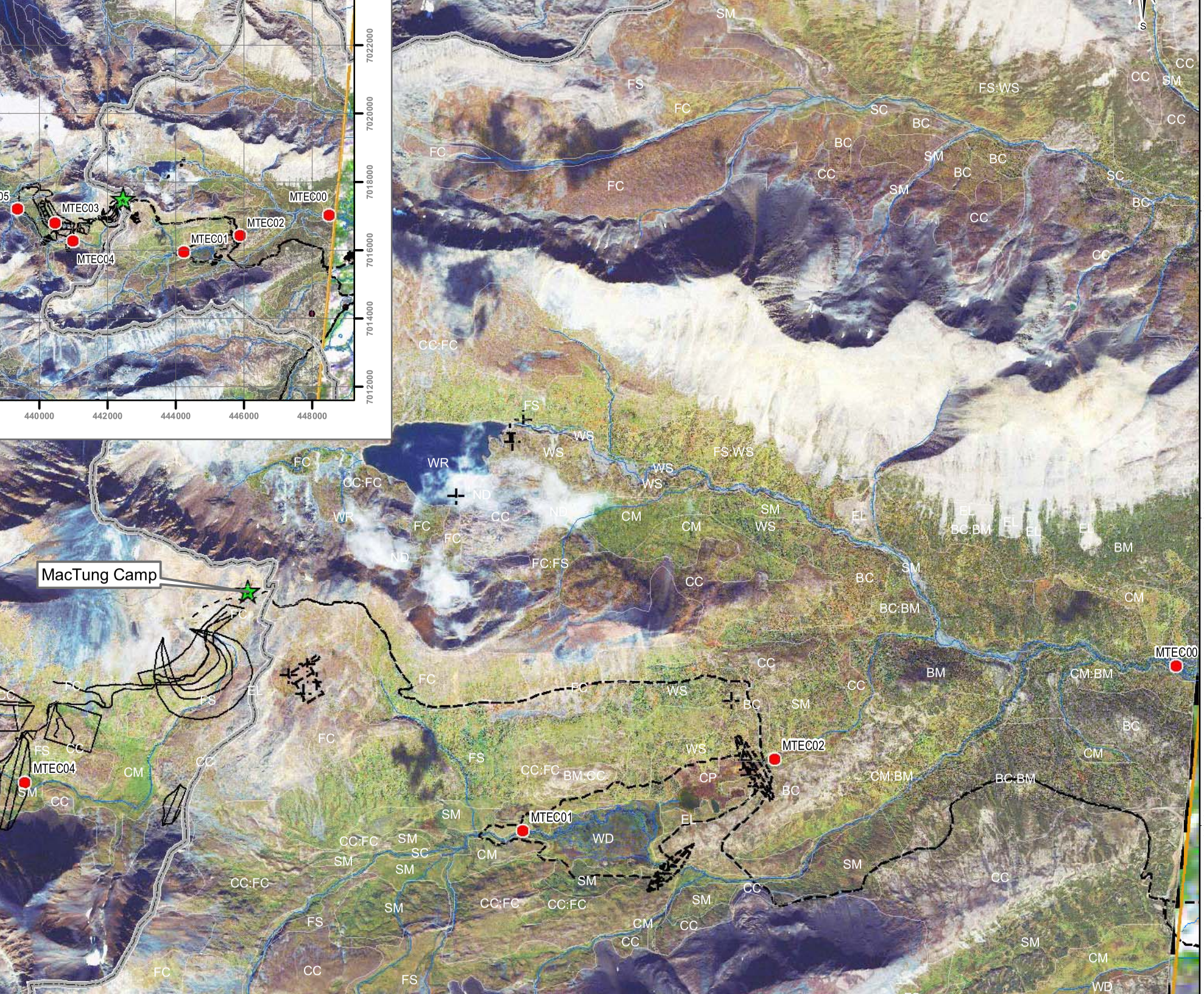
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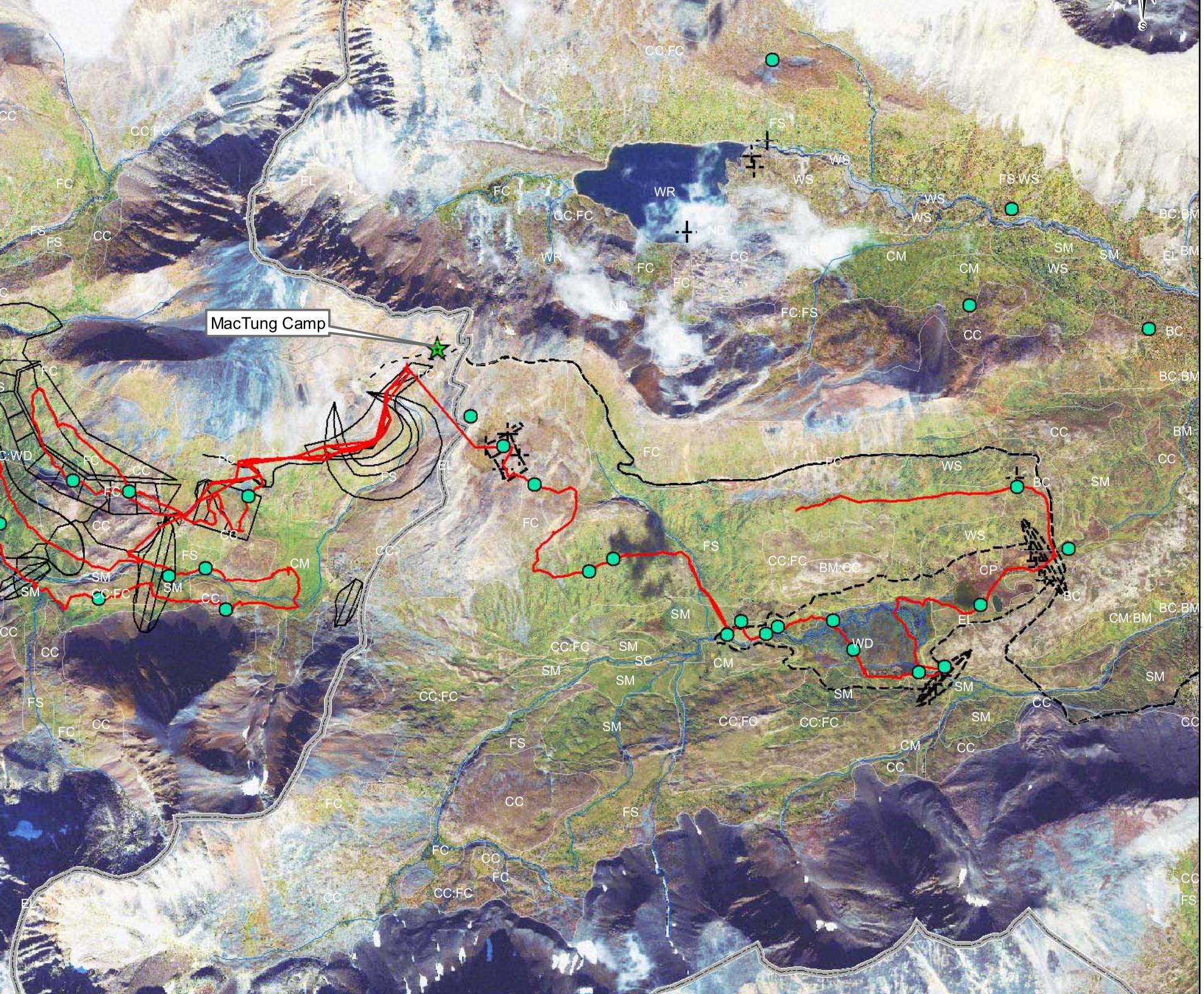

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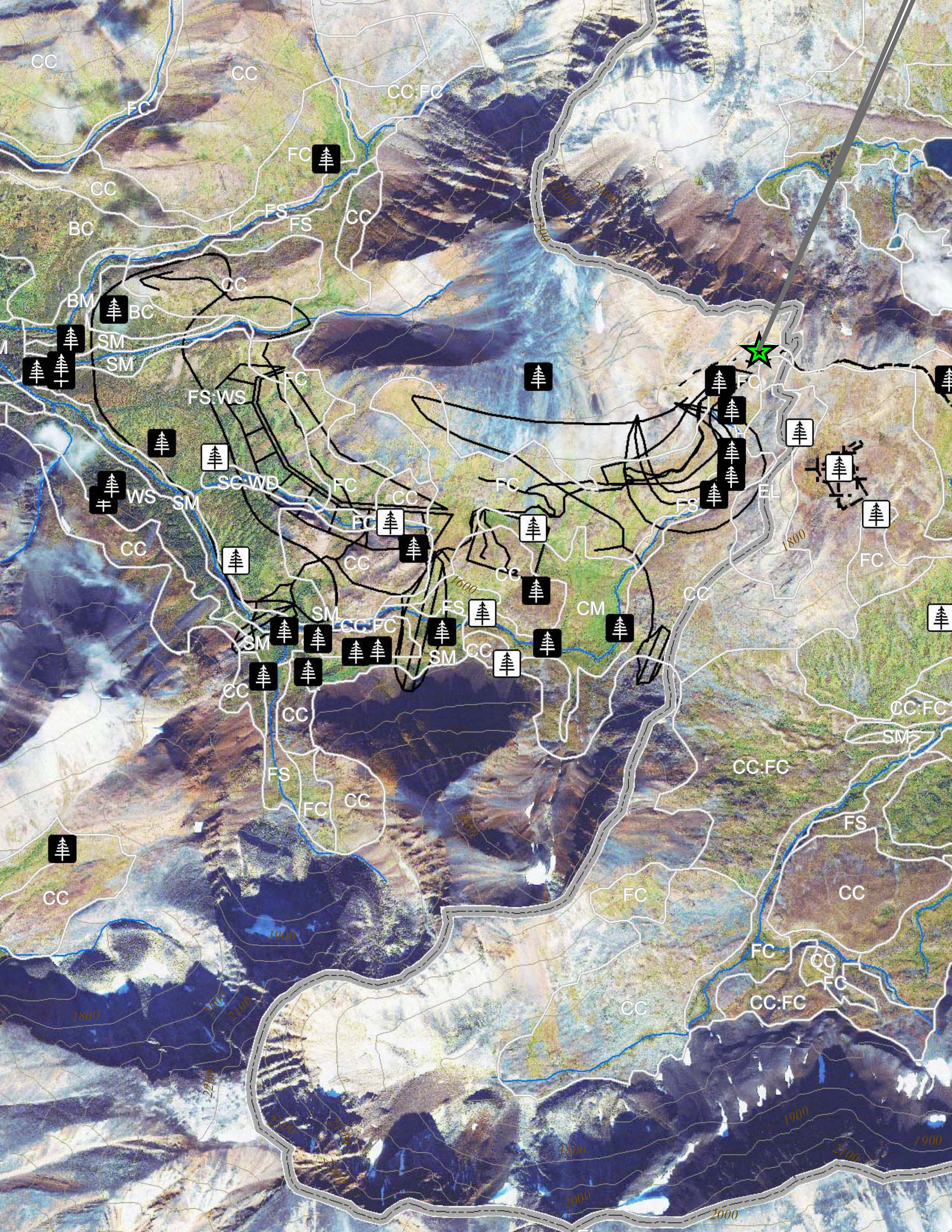
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PHOTOGRAPHS

Photo 1
Trace element sampling at Station MTEC 04 (proposed Yukon tailings storage area)

Photo 2
Trace element sampling at Station MTEC 05 (downstream of proposed Yukon tailings storage area)

Photo 3
Trace element sampling at Station MTEC 00 (downstream of Dale Valley, NWT)

Photo 4
Spruce-moss ecosystem unit at water quality Station 1

Photo 5
Epilithic lichen ecosystem unit below camp in the NWT

Photo 6
Fescue-willow ecosystem unit in the upper Dale Valley, NWT

Photo 7
Spruce-moss ecosystem unit in the Hess River Valley adjacent to water quality Station 2

Photo 8
Willow-sedge wetland ecosystem unit in the Dale Valley, NWT

APPENDIX

APPENDIX A RESULTS OF TRACE ELEMENT ANALYSIS OF PLANT TISSUE

MTES 00 8/16/2007	MTES 01 8/14/2007	MTES 02 8/16/2007	MTES 03 8/15/2007	MTES 04 8/16/2007	MTES 05 8/16/2007	MTES 06 8/16/2007	Mean	Standard Error	MTES 00 8/16/2007	MTES 01 8/14/2007	MTES 02 8/16/2007	MTES 03 8/16/2007	MTES 06 8/16/2007	Mean	Standard Error	MTES 8/15/20
6800	1070	44.8	36.2	348	1600	504	1486.14	911.08	71.4	27.1	13.1	16.6	23.2	30.28	10.57	186
0.5	0.4	0.1	0.2	0.2	0.2	0.1	0.24	0.06	0.05	0.2	0.05	0.1	0.05	0.09	0.03	0.1
19.5	6.8	0.9	0.1	0.8	4.9	1.2	4.89	2.61	0.3	0.2	0.05	0.05	0.2	0.16	0.05	0.2
195	77	54.7	26.1	37.7	44.1	65.3	71.41	21.58	33.8	66.4	39.5	19	53.1	42.36	8.13	17.2
0.4	0.17	0.1	0.1	0.06	0.15	0.07	0.15	0.04	0.1	0.1	0.1	0.1	0.1	0.10	0.00	0.02
13	26	14	12	20	34	42	23.00	4.37	18	8	5	25	31	17.40	4.93	5
3.33	3.76	0.25	1.04	1.21	2.07	2.33	2.00	0.48	9.33	19.7	1.25	13.6	7.08	10.19	3.10	0.51
19900	26000	25900	32000	30100	24400	35500	27685.71	1969.70	21300	20700	21600	17400	21000	20400.00	764.85	9210
17.1	5.1	0.4	0.2	1.3	6.7	1.7	4.64	2.27	0.2	0.05	0.05	0.05	0.05	0.08	0.03	1
7	3.6	0.4	0.2	1.4	1.8	1.4	2.26	0.90	1.8	2.6	0.4	0.5	0.9	1.24	0.42	0.2
29.9	17.5	4	6	7.6	17.7	13.8	13.79	3.39	5.9	5.7	4.5	6.4	5.8	5.66	0.31	5
9190	1270	384	146	707	2490	550	2105.29	1217.09	217	125	153	117	130	148.40	18.16	294
5.4	0.9	0.4	0.05	0.3	2.1	0.4	1.36	0.72	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.1
8210	5970	3060	4060	3630	4570	5870	5052.86	667.11	5540	3240	2380	3590	3490	3648.00	518.76	1180
396	68.4	108	13.8	113	53.9	41	113.44	48.95	205	326	312	147	75.2	213.04	47.95	58.1
0.017	0.019	0.005	0.005	0.005	0.005	0.005	0.01	0.00	0.013	0.005	0.005	0.005	0.005	0.01	0.00	0.005
3	2.4	1	0.2	0.9	1.5	2.2	1.60	0.37	0.5	1.4	0.5	1.2	1	0.92	0.18	0.4
26	23.6	0.6	1	5	13.1	15.6	12.13	3.92	7.4	25.2	0.6	8.3	16.8	11.66	4.25	2.9
2890	2360	2460	1500	2360	1800	2000	2195.71	174.90	3100	4000	2960	3490	2920	3294.00	203.21	906
43100	40300	46600	36800	40900	47000	54800	44214.29	2225.55	19500	18200	16300	26700	19600	20060.00	1763.69	1570
1	1.1	0.6	0.6	0.9	1.6	1.5	1.04	0.15	0.9	0.9	0.3	1.1	0.9	0.82	0.14	0.3
753	651	348	266	366	931	1120	633.57	122.27	102	93	105	112	125	107.40	5.35	332
0.11	0.06	0.02	0.03	0.03	0.06	0.03	0.05	0.01	0.005	0.02	0.005	0.005	0.02	0.01	0.00	0.01
179	81	92	31	65	85	111	92.00	17.29	12	9	9	7	15	10.40	1.40	17
44.3	71.7	58.2	51.6	61.7	60.8	92.7	63.00	5.91	44.9	57.2	42.3	35.8	48.8	45.80	3.55	15.9
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.05
0.16	0.18	0.03	0.03	0.05	0.05	0.11	0.09	0.02	0.03	0.04	0.1	0.1	0.04	0.06	0.02	0.02
0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.05
154	28.3	1.3	1.4	10.4	51	9.9	36.61	20.67	2.8	2.2	1.4	1.8	1.5	1.94	0.26	4.3
1.67	0.82	0.02	0.02	0.09	0.6	0.48	0.53	0.22	0.02	0.02	0.02	0.02	0.02	0.02	0.00	0.02
26.4	19.4	0.25	0.25	1.1	6.6	4.5	8.36	3.93	0.25	0.5	0.25	0.25	0.25	0.30	0.05	0.5
124	132	60.2	28.9	44.5	70.4	110	81.43	15.34	332	450	259	303	433	355.40	37.12	28.9
5	1.5	1.5	1.5	1.5	1.5	1.5	2.00	0.50	1.5	1.5	1.5	1.5	1.5	1.50	0.00	1.5

verted to the detection divided by 2 when calculating the mean.