APPENDIX S WETLAND BASELINE STUDY 2013

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March 12th, 2014

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Attention : Mark Wheeler

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RE: Wetland Baseline Study (2013), Goliath Gold Project
OE-KN-018101

DST Consulting Engineers Inc. (DST) is pleased to present Treasury Metals Inc. (Treasury) with a final copy of the Wetland Baseline Study (2013) for the Goliath Gold Project. As requested in your letter dated February 26, 2014, DST has included the Recommendations for Treasury to strengthen the Wetland Baseline work in this separate letter.

Recommendations:

In 2012, wetland surveys were conducted according to the Ontario Wetland Evaluation System (OWES) for wetlands located within the Project area, with emphasis placed on those wetlands that are located in areas where there is proposed mining infrastructure development. In light of the conclusions of the report, DST recommends the following:

- Treasury staff to review the study areas from the data collected in 2012 to ensure that wetland baseline data collection efforts are adequate in terms of covering the potential areas of development, as currently understood;
- DST recommends that all wetland evaluations remain as open files as wetlands can change over time (due to natural succession, changes in hydrology, etc.);
- Wetlands with open water should have an additional visit to obtain data on the extent of the wetland and nature of submergent and floating vegetation as well as hydrological characteristics; and,

- Wetland records should be amended as new information becomes available. For example, changes to the status of species, confirmation of new species occurrences, wetland boundary modifications, and changes to the social values of the wetland would be recorded.

We appreciate the opportunity to work with Treasury, and to submit this Baseline study report for the Goliath Gold Project. Should you have any questions or require further information, please do not hesitate to contact the undersigned, at your convenience. We look forward to working with you in the future

Sincerely,

For **DST CONSULTING ENGINEERS INC.**

Krista Prosser, B.A
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Wetland Baseline Study (2013), Goliath Gold Project

Prepared For:
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March 2014

DST File No.: OE-KN-018101

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EXECUTIVE SUMMARY

Treasury Metals Inc. has continued its environmental baseline evaluation efforts at the Goliath Gold project in northwestern Ontario since 2010. Treasury Metals Inc. current exploration and drilling program has been principally focused on targets located in the northeast and east of the Goliath Gold deposit, within its >49 km^2 property block. Baseline studies are completed to gain an understanding of the current natural environment of the site, support mine development decisions and management plans, and to provide support to rigorous on-going monitoring and mine closure plans.

The project is expected to require the completion of federal and provincial environmental assessments and permits prior to development. To support ongoing drilling activities and project permitting Treasury Metals Inc. retained DST Consulting Engineers Inc. (DST) in 2012 to gather environmental baseline data and submit environmental reports. These reports will provide valuable information to support physical, biological, and socio-economic decisions.

During the summer of 2012 DST Consulting conducted wetland surveys. The purpose of the surveys was to gain baseline knowledge of the wetlands located within the Project area, with emphasis placed on those wetlands that are located in areas where there is proposed mining infrastructure development. A qualified individual used the Ontario Wetland Evaluation System (OWES) to assess and score wetlands. It was determined that none of the wetlands surveyed were considered provincially significant. Marsh wetland types were the most commonly encountered and swamp wetland types covered the largest area within the study area. No threatened, endangered, or provincially significant species of vegetation were encountered during the field surveys, however, five provincially significant avian species were identified in five of the wetlands assessed

Table of Contents

EXECUTIVE SUMMARY ..... **i**
TABLE OF CONTENTS ..... **ii**

1. INTRODUCTION 4
1.1 STUDY AREA 5
2. Methods 8
2.1 NATURAL HERITAGE INFORMATION CENTRE (NHIC) 8
2.2 WETLAND EVALUATIONS 8
2.3 WETLAND SCORING 11
2.3.1 *Plant Survey* *11*
2.3.2 *Soil/Substrate Type* *12*
2.3.3 *Wetland Boundaries* *12*
2.3.4 *Delineating Wetland Types* *13*
2.3.5 *Delineating Vegetation Communities* *13*
2.3.6 *Special features, wildlife, furbearers, wild rice etc.* *14*
2.3.7 *Fish Habitat Information* *14*
3. Results 15
3.1 NATURAL HERITAGE INFORMATION CENTRE (NHIC) 15
3.2 WETLAND FIELD DATA 15
3.3 WETLAND EVALUATIONS 17
4. Closure 20
4.1 SUMMARY 20
4.2 CONCLUSIONS 20
5. Reference List 21

FIGURES

1.1 Wetland Areas within Goliath Gold Project Study Area
2.1 Studied Wetlands assessed within Goliath Gold Project Study area

TABLES

Table 3.1: Provincially Rare Plant Species Listed in NHIC for the Project Area 15
Table 3.2 Dominant plant species in all assessed wetlands 16
Table 3.3: Proportional distribution of wetland types and dominant vegetation for evaluated wetlands in the Goliath Gold Project study area (2012) 16
Table 3.4: Provincially significant species identified in 2012 wetland evaluations 17
Table 3.5: Summary of OWES scores for each wetland evaluated 19

APPENDICES

Appendix A Species Encountered During Ontario Wetland Evaluation Field Surveys

Appendix B Ontario Wetland Evaluation Data and Scoring Record

Appendix C Request for Information Letter

Appendix D Limitations of Report

1. INTRODUCTION

Treasury Metals (TML) is a Canadian gold exploration and development company focused on its 100% owned high-grade Goliath Gold Project (the Project), situated in the Kenora/Dryden Mining District of northwestern Ontario. The Project is located adjacent to the village of Wabigoon, Ontario, approximately 20 km east of the city center of Dryden or 330 km west of the city of Thunder Bay (refer to Figure 1.1).

The Project Area consists largely of two historic properties, the “Thunder Lake Property”, previously owned by Teck-Corona and the “Laramide Property”, located partially within both the Hartman and Zealand townships. The properties have a total area of approximately 4,881 hectares, comprised of 4,064 hectares of 137 unpatented land claims and 19 patented land claims for the remainder. Treasury holds the entire project subject to specific royalties on 13 of the patented land parcels. The site can be readily accessed year round from Highway 17 and multiple public secondary roads that extend north from the highway, including Anderson Road, Maggrah Road and Tree Nursery Road.

The Project is expected to require the completion of federal and provincial environmental assessments and permits prior to development. To support ongoing drilling activities and project permitting, TML retained DST Consulting Engineers Inc. (DST) to gather baseline data and to submit environmental reports summarizing data collection efforts that occurred in 2012 and 2013.

The Baseline Assessment Studies include the following components:

- Surface Water;
- Sediment Quality;
- Benthic Invertebrates Community;
- Fisheries;
- Wildlife;
- Birds;
- Wetlands and vegetation; and,
- Hydrology.

The following report presents the results of the wetland component of the 2012 terrestrial baseline data collection efforts.

Wetlands are defined by the Ontario Wetland Evaluation System (OWES) as "lands that are seasonally or permanently flooded by shallow water as well as lands where the water table is close to the surface; in either case the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water tolerant plants". For the OWES there are four wetland types that are recognized; bog, fen, swamp and marsh (which includes open water marsh). Any wetland may be comprised of one or more wetland types.

Wetlands areas are unique ecosystems protected indirectly through the Fish and Wildlife Conservation Act, Municipal Act, Endangered Species Act, Lakes and Rivers Improvement Act, Environmental Assessment Act, and the Ontario Water Resources Act. Wetlands are specifically recognized in the Provincial Policy Statement (2005), under Section 3 of the Planning Act, and the Conservation Authorities Act. At the federal government level, the Canada Wildlife Act, Fisheries Act, Migratory Birds Convention Act, Species at Risk Act, and Canadian Environmental Assessment Act provide some protection to wetlands through species and habitat conservation measures.

The purpose of completing the wetland evaluations within the Project area was to acquire baseline data on all wetlands, peatlands, and riparian plant communities, as well as to map and describe wetlands following the OWES. The specific objectives were as follows:

- Characterize all riparian/wetland vegetation communities according to the appropriate classification guides (OWES);
- Describe individual wetland vegetation community distribution, structure, and diversity; and, Identify any provincially significant wetlands as scored according to the OWES.

The following report presents the results of the 2012 wetlands data collection for the Project area.

1.1 *Study Area*

The Project area lies within the Dryden Forest Management Unit (FMU) and the Wabigoon FMU in northwestern Ontario. The majority of the Project area is within the Dryden FMU. Both FMUs fall within the boundaries of the Wabigoon Ecoregion and are located on the Precambrian Shield. The bedrock in the area is primarily granite and greenstone comprised of metavolcanic and metasedimentary rocks, with granitoid intrusions.

The landscape of the Wabigoon Ecoregion is a gently sloping plain of shallow tills over bedrock in conjunction with moraine of varying depths. Sediments consist of sandy-silt, sand and gravel deposits overlain by lacustrine sand, silt and varved clays. Localized pockets of clay and silt are scattered in low-lying areas.

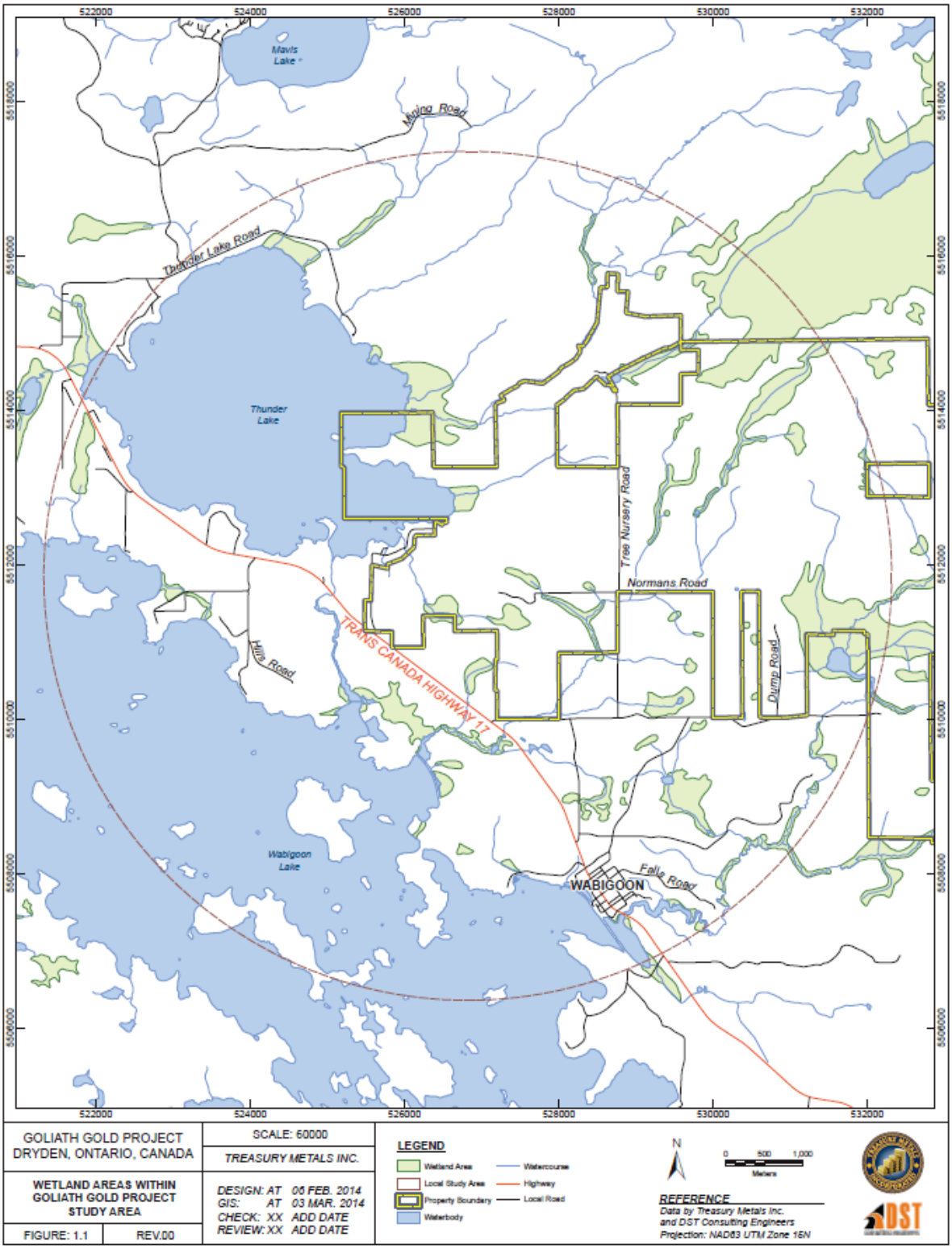
The characteristic forest canopy of the Dryden FMU is dominated by coniferous species including jack pine (*Pinus banksiana* Lamb.) and black spruce (*Picea mariana*) with a mix of trembling aspen (*Populus tremuloides* Michx) and white birch (*Betula papyrifera* var. *papyrifera* Marsh.) Eastern white cedar (*Thuja occidentalis*), tamarack (*Larix laricina*), and bur oak (*Quercus macrocarpa*) occur to a limited extent. Pockets of red pine (*Pinus resinosa*) and white pine (*Pinus strobus*) are scattered throughout the landscape. The Dryden Forest is a conifer-dominated forest (53%) with a lesser amount of mixedwood (42%) and only a small portion of the forest being classified as pure hardwood (5%).

Fire is responsible for the greatest degree of natural disturbance in the Dryden FMU. Fires have a significant impact on the age class structure of forests and result in uneven aged canopies. Fire has established nearly all the mature forests in the region. Upland coniferous fires cycles occur onaverage every 60 years and tend to be stand replacing. Mixed stand fire cycles tend to occur between 60 and 80 years with variable intensities, and red and white pine stands burn approximately every 150 years.

The Dryden FMU is 307,117 ha in size and is largely encompassed by the Wabigoon FMU. The Kenora FMU and Whiskey Jack FMU border small northern sections, and the English River FMU borders a small portion of the eastern border FMU to the east. Forest management planning activities are co-ordinated through the Ontario Ministry of Natural Resources (OMNR) Dryden District office. Administrative support is received from theOMNR northwest region office in Thunder Bay. The OMNR is responsible for the approval of land and resource use decisions pertaining to forest management.

For the purposes of this assessment, a Local Study Area (LSA) was developed. The LSA was delineated to included TMI's patented land and the areas immediately adjacent to these locations that could be physically impacted by development. The boundaries of the LSA include Thunder Lake to the east, Hughes Creek, Black Water Creek, Thunder Creek and Wabigoon Lake to the south. A total of nine wetlands which were identified as being potentially impacted by future development and were assessed using the OWES.

1.1 Wetland Areas within Goliath Gold Project Study Area



2. METHODS

2.1 *Natural Heritage Information Centre (NHIC)*

Rare species are considered to be important and worthy of protection. In the OWES, four levels of significance are recognized – (1) endangered/threatened, (2) provincially significant, (3) regionally significant and (4) locally significant. The Natural Heritage Information Centre (NHIC) compiles, maintains and distributes information on natural species, plant communities and areas of conservation concern in Ontario. Global and provincial ranks are used to prioritize conservation and protection efforts focused on globally and provincially rare species. Records were compiled from the NHIC to supplement the field plot data. The NHIC provides a provincial designation prioritizing protection efforts for each species, known as the S-Rank. These ranks have been assigned by the NHIC based on current scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy. Ranks are determined by the estimated number of occurrences, community extent, and community range within the province. The provincial ranks are as follows (NHIC 2009):

- SH - Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could receive the SH designation without a 20-40 year delay if the only known occurrences in a province were destroyed or if an extensive search was unsuccessful. The SH rank is reserved for species or communities for which some effort has been made to relocate occurrences;
- S1 Critically Imperiled – Critically imperiled in the province due to extreme rarity, or steep declines;
- S2 Imperiled – Imperiled in the province due to very restricted range, very few populations (≤ 20), or steep declines;
- S3 Vulnerable – Vulnerable in the province due to restricted range, relatively few populations (≤ 80), or steep declines; and,
- S4 Apparently Secure – Uncommon but not rare; may be cause for long-term concern due to declines or other factors.

2.2 *Wetland Evaluations*

A total of nine wetlands within the LSA were assessed (Figure 2.1). Prior to field work, Forest Resource Inventory (FRI) data and 1:6,500 Google Earth satellite images of each wetland were examined. A first estimate of wetland boundaries and vegetation community boundaries were interpreted and marked onto each image. Site visits, which included ground-truthing all accessible portions of each wetland, occurred throughout the early fall of 2012. All vegetation communities were visited in the field to confirm vegetation community boundaries and to identify vegetation forms and species. The satellite images were corrected as required in the field. Each wetland

evaluation included an in depth information gathering phase which involved contact with the following organizations, agencies, and resources:

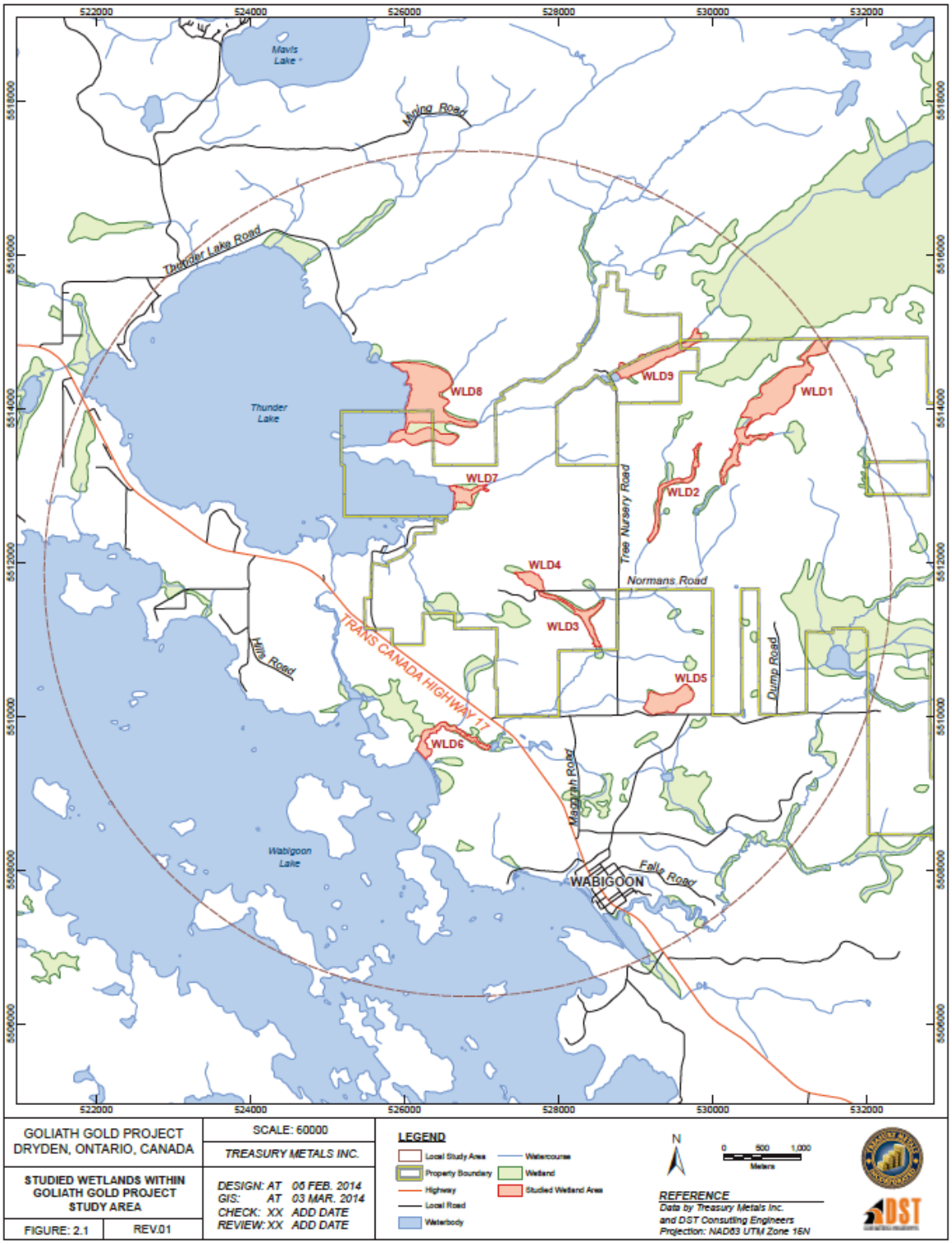
- Forest Resource Inventory (FRI) maps;
- LIDAR digital imagery aerial photography;
- Watershed maps, created by DST;
- Dryden District OMNR;
- Natural Resources Values Information System (NRVIS), Land Information Ontario (LIO),Crown Land Use Policy Atlas (CLUPA);
- Wabigoon Lake Ojibway Nation, Eagle Lake First Nation, Lac Seul First Nation, Whitefish Bay First Nation, Wabaskang First Nation, Aboriginal Peoples of Wabigoon, Metis Nation of Ontario, and Grassy Narrows First Nation
- Natural Heritage Information Centre (NHIC);
- Review of topographic and soil maps; and,
- Previous studies including fish habitat, waterfowl surveys, breeding bird surveys, and vegetation surveys.

Wetlands with an area greater than 0.5 ha, as identified through FRI maps, were considered for evaluation. Data collected during field observations included:

- plant surveys (vegetation forms, common species and identification of rare plants);
- soil/substrate types;
- wetland boundaries;
- delineating wetland types;
- delineating vegetation communities;
- identifying presence of special features, wildlife, furbearers, wild rice etc.; and,
- recording fish habitat information.

Wetlands were selected for evaluation based on the potential for adjacent developments.

2.1 Studied Wetlands assessed within Goliath Gold Project Study area



2.3 *Wetland Scoring*

The OWES evaluation procedure involved assigning points to the different features of a wetland, based on four components: social, hydrological, biological and special features. As the score for each component is capped at 250 points, a wetland can score a maximum of 1000 points. Wetlands which achieve a total score of 600 or more points, or score 200 or more points in either the biological or special features components are considered to be provincially significant.

The social component of the OWES considers human uses and the amenities that wetlands provide.

The hydrological component of the OWES had six subcomponents including the ability of the wetland to affect: flood attenuation, groundwater recharge, downstream water quality improvement, carbon sequestration, shoreline erosion control, and groundwater discharge.

The biological component of the OWES focusses on productivity and biodiversity of the wetland. The majority of these scores are calculated through the mapping and delineation of the wetland. The number of vegetation forms and variation within a wetland determine the score for this component.

The special features component of the OWES included the rarity of species within the wetland as well as significant features and habitats.

2.3.1 *Plant Survey*

Per cent cover of vegetation forms within each portion of the wetland were estimated and dominant species were identified. The vegetation forms used in the OWES included;

- Tall shrubs (TS) – woody vegetation 1 to 6 m in height;
- Low shrubs (LS) – woody vegetation less that 1 m in height, with dense foliage and several to many stems;
- Narrow leaved emergents (NE) – erect, rooted, herbaceous monocots which may be temporarily or permanently flooded at the base but are exposed at the upper portion;
- Broad-leaved emergent (BE) – broad-leaved plants <1 m tall;
- Robust emergent (RE) – erect emergent from 1.5 to 3 m in height;
- Floating plants (F) – rooted, vascular hydrophytes with leaves floating horizontally on the water surface;
- Free-floating plants (FF) – non-rooted, vascular hydrophytes floating on the water surface;
- Herbs, ground cover (GC) – non-woody herbaceous plants;

- Unvegetated (U) – open water <2 m deep with no vegetation;
- Submergent Vegetation (SU) – rooted hydrophytes with leaves entirely under the water surface; and,
- Dead Conifers, Dead Hardwoods, Dead Shrubs (DC, DH, DS) – dead standing trees or shrubs.

Plant identification was determined on site using identification field guides including: *Wetland Plants of Ontario*; and, *Ecosites of Ontario (Operational Draft April 20, 2009: Swamp Indicators* (OMNR). Plants that could not be identified in the field were noted, sketched, photographed or sampled and later identified.

The plant survey data was used to determine wetland types and wetland boundaries through the use of indicator species. The number and type of different plant species identified was used to map the wetland boundaries and to calculate each OWES score.

2.3.2 *Soil/Substrate Type*

For each wetland type that was evaluated, a soil sample was collected through the use of a soil auger (to a maximum depth of 1.2m), to determine:

- organic surface thickness;
- humus form;
- thickness of total organic layers;
- depth to mottles, gleying, and water table; and,
- soil type.

The results of the soil sampling were used in the scoring of the wetland, based on OWES criteria.

2.3.3 *Wetland Boundaries*

The wetland boundaries were identified and mapped using LIDAR digital imagery. Many wetland boundaries are distinct and evident from visual inspection while others are difficult to delineate due to unclear transition zones. A consistent set of criteria was required to identify the boundaries of wetland areas. This study used upland forest borders, lake borders, beaver-flooded areas, and wetland complexes to delineate the wetland boundaries.

Upland Forest Borders

The outer wetland boundary was determined according to the OWES ’50% wetland vegetation rule’, where 50 % of the plant community consists of upland species. Upland indicator species were used to help make wetland boundary decisions at the time of the site visit. Areas were mapped as wetland if they contained 50% wetland vegetation species or greater. Where applicable a well-defined tree line was used to indicate a wetland boundary. The principal criterion

of the wetland boundary being the species composition of the plant community.

Lake Borders

According to OWES lakes are defined as "*Areas of open water that are greater than 8 ha in size and at some location are greater than 2 m in depth from the normal low water mark"* . The deep water boundary of wetlands that border lakes, rivers, ponds, or streams was identified at 2 m of depth.

Beaver Flooded Areas

Beaver-flooded areas can be considered wetlands and were therefore evaluated when encountered. The outer wetland boundary was determined using the '50% wetland vegetation rule'.

2.3.4 *Delineating Wetland Types*

A wetland can be comprised of multiple types of ecosystems including: bogs, fens, swamps, and marshes. The OWES refers to these classifications as wetland types. Wetland types differ in their appearance and species composition and therefore have different rates of productivity. Wetland types are determined based on major plant associations, substrate and hydrological information obtained in the wetland. A wetland may be comprised of one or more wetland types. Productivity of a wetland is assessed by determining the fractional area that a wetland type occupies within the wetland. The minimum size of a wetland type for mapping purposes is typically 0.5 ha, exceptions include: mapping at a finer scale of 1:5,000 or 1:2,000, or when highlighting a specialized community.

2.3.5 *Delineating Vegetation Communities*

Vegetation communities and wetland boundaries were determined through a combination of aerial imagery and field data collection. Wetland boundaries were mapped on aerial digital imagery photos prior to the field visit to:

- Determine wetland boundaries;
- Delimit boundaries between wetland types;
- Delimit vegetation communities;
- Ascertain directions and period of drainage;
- Check soil/substrate types; and
- Search for seeps and marl deposits.

A site visit was then conducted to verify the aerial imagery analysis. During the site visit, the entire wetland was ground-truthed. The outer boundary of a wetland determined its size. Internal boundaries were those between the four wetland types and between vegetation communities. Identification and delineation of outer wetland boundaries was based on the presence and relative abundance of wetland plant species. The assessment of the relative abundances of wetland versus terrestrial plant species is known as the "50% wetland vegetation rule". This rule uses relative cover, and assesses the relative abundance of wetland plant species to upland plant species cover. Other wetland criteria such as substrates was used to assist in boundary identification.

2.3.6 *Special features, wildlife, furbearers, wild rice etc.*

The following features were noted in the field observations:

- beaver lodges/dams;
- evidence of furbearer trap lines;
- plant species observations (e.g., wild rice, cranberries); and,
- wildlife observations (e.g., furbearers, waterfowl, baitfish, amphibians).

These attributes are wetland dependant and some are considered to be economically valuable products which contribute to the overall scoring of the wetland.

Observations of rare animals were recorded and scored based on the level of significance as dictated in the 'special features' component of the OWES. The OMNR Species at Risk in Ontario (SARO) list and species identified as endangered by the national Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list are the only approved lists to be used when scoring threatened and endangered species. Species that are listed as 'Special Concern' in the SARO are considered to be provincially significant in the OWES scoring record. Species ranks are based upon data and recommendations from sources including: the Ontario Rare Breeding Bird Program Database; the Ontario Herpetofaunal Summary Database; the Atlas of the Rare Vascular Plants of Ontario Database; OMNR's Fish Distribution Database; Lepidoptera/Odonata Databases; COSEWIC status reports; and the Committee on the Status of Species at Risk in Ontario (COSSARO). A species is considered to be provincially significant if it is ranked as S1, S2, S3, SH or if it is tracked by the NHIC. In order to be scored as an endangered or threatened species a species must be recorded as using the wetland in at least two different years within a 10 year period. Special habitat features such as mineral licks were also noted.

2.3.7 *Fish Habitat Information*

The OMNR has information on the level of significance (locally, provincially, or regionally) of the spawning and nursery habitat within the wetlands evaluated, which was accessed through Natural Resources Values Information Systems (NRVIS). A qualitative and quantitative assessment of the fish habitat based on field observations was completed. Any additional information provided by the OMNR or DST fisheries studies regarding the significance of spawning and nursery habitat and locally significant areas present within an evaluated wetland was used to score the wetland appropriately.

Fish habitat was classified into three categories: low marsh, high marsh, and swamp. Low marshes contain permanent water and, therefore, provides year-round fish habitat. Such habitats are typically open water marshes containing submergent and/or emergent vegetation. High marshes are seasonally dry and dominated by emergent vegetation, which may be used as spring spawning or nursery habitat. Swamp communities containing fish habitat may be either seasonally flooded or permanently flooded. The presence of fish habitat, rather than actual use,

was recorded for all evaluated wetlands if no previously collected data was available.

3. RESULTS

3.1 *Natural Heritage Information Centre (NHIC)*

A search of the NHIC database indicated a number of vascular plants that were tracked as provincially rare and have been identified within the Dryden District. The habitat of these plants includes ditches, shorelines, rocky outcrops, disturbed areas, damp thickets, meadows, seasonally flooded swales, and other wet ground and wetland type areas. All species are listed below in Table 3.1. These species were not encountered during any of the wetland field evaluations in 2012.

Table 3.1: Provincially Rare Plant Species Listed in NHIC for the Project Area

Scientific Name	Common Name	Provincial Rank	S Rank Review Date
Carex parryana	Parry's Sedge	S1	2013
Carex praticola	Northern Meadow Sedge	S2	2009
Crassula aquatica	Water pygmyweed	S2	2009
Hudsonia tormentosa	Beach-Heather/Sand-Heather	S3	2009
Juncus vaseyi	Vasey's Rush	S3	2009
Leucophysalis grandiflora	Large-flowered Ground Cherry	S3	2009
Limosell aquatica	Northern Mudwort	S2	2009
Moehringia macrophylla	Large-leaved Sandwort	S2	2009
Opuntia fragilis	Brittle Prickly Pear Cactus	S3	2009
Pascopyrum smithii	Western Wheatgrass	S2	2009
Polystichum braunii	Braun's Holly Fern	S3	2009
Potentilla rivalis	Brook Cinquefoil	SH	2009
Schoenoplectus heterochaetus	Slender Bulrush	S3	2009
Subularia aquatica	Water Awlwort	S3	2009
Symphyotrichum ericoides var. pansum	Prairie White Heath Aster	S2	2009
Symphyotrichum sericeum	Western Silvery Aster	S1	2009
Zizia aptera	Heart-leaved Alexander	S1	2009

3.2 *Wetland Field Data*

Wetlands types were classified by indicator species identified during field investigations. Data collected from the wetland sites identified 153 species of vegetation within the nine wetlands surveyed (Appendix A). The dominant species of each vegetation form and the percent occurrence across all wetland types encountered is presented in Table 3.2 No rare or non-native plant species were identified during the field assessments.

Table 3.2 Dominant plant species in all assessed wetlands

Dominant Species		% Occurrence	Vegetation Form
Common Name	**Scientific Name**		
Canada bluejoint	*Calamagrostis canadensis*	65.2	Narrow-leaved Emergents (NE)
Sphagnum spp.	*Sphagnum spp.*	39.1	Mosses and Lichens (M)
Speckled alder	*Alnus incana*	60.1	Tall Shrubs (TS)
Labrador Tea	*Rhododendron groenlandicum*	26.1	Low Shrubs (LS)
Lance-leaved Aster	*Aster lanceolatus*	34.8	
Dwarf Raspberry	*Rubus pubescens*	34.8	Herbs and Graminoides (GC)
Viola Species	*Viola spp.*	34.8	
Tape grass	*Vallisneria amaericana*	13.0	Submerged Plants (SU)
Common cattail	*Typha latifolia*	43.5	Robust Emergents (RE)
Buckbean	*Menyanthes trifoliata*	13.0	Broad-leaved Emergents (BE)
Floating-Leaved pondweed	*Potamogeton natans*	13.0	Floating Plants (F)
Eastern White Cedar	*Thuja occidentalis*	17.4	Conifer (C)
White Birch	*Betula papyrifera*	4.3	Hardwood (H)
Balsam Poplar	*Populus balsamifera*	4.3	
Duckweed	*Lemna minor*	4.3	Free Floating Plants (FF)

The area (ha) of each evaluated wetland within the Project study area was determined. In polygons with more than one wetland type, the fractional area of each wetland type and dominant vegetation form was calculated. The Swamp wetland type occupies the largest area in hectares of all the wetlands evaluated followed by Fen, and Marsh, see Table 3.3.

Table 3.3: Proportional distribution of wetland types and dominant vegetation for evaluated wetlands in the Goliath Gold Project study area (2012)

Wetland type	Total % of area of wetlands surveyed	*% Dominant Vegetative forms*										
		Conifer (C)	Tall Shrubs (TS)	Low Shrubs (LS)	Narrow Emergents (NE)	Robust Emergents (RE)	Broad-leaved Emergents (BE)	Floating Plants (F)	Subemergents (SU)	Mosses and Lichens (M)	Herbs and Ground Cover (GC)	Unvegetated (U)
Fen	34	0	22.0	7.0	3.5	0	0	0	0	1.5	0	0
Marsh	16.3	0	0	0	7.2	6.1	0	1	2.3	0	0	
Swamp	49.7	22.88	26.9	0	0	0	0	0	0	0	0	0

The mapping components required to calculate an OWES score for a wetland include: delineation of the wetland boundary, identification of wetland vegetation communities, and the determination of the drainage basin associated with the wetland. Individual wetland maps, wetland species lists and wetland scoring records can be found in Appendix B.

Wetlands exist in different site types including: palustrine (inland with no flow or intermittent inflow and either permanent or intermittent outlfow), lacustrine (associated with a lake), and isolated

(ombrotrophic e.g. bogs). During the 2012 wetland evaluations, 23.1% of the wetlands assessed were lacustrine sites located on Thunder Lake and Wabigoon Lake, 73.9% palustrine, and 0% were isolated. No Isolated ombrotrophic bogs were identified during this monitoring program.

Lacustrine sites are often associated with marshes. Marshes, in the boreal forest, are often found as a transition between open water and shorelines and contain dominant species such as robust emergents and submerged plant species. Meadow marshes, which are dominated by emergent vegetation and up to 25% tall shrubs, are semi-permanently or seasonally flooded and occur in floodplains of small streams, beaver meadows, ditches and occasionally isolated basins. The marsh wetland type was the most encountered of all wetland types evaluated; the majority consisted of semi-permanently flooded open water areas dominated by emergent vegetation and shrubs. Marshes provide habitat for many kinds of invertebrates, fish, amphibians, waterfowl and aquatic mammals and therefore are important in supporting fisheries.

3.3 *Wetland Evaluations*

As per the description in the methodology there are four major components within the data scoring record: social, hydrological, biological and special features. No wetlands evaluated exceeded the maximum score for any component, and none of the wetlands were deemed to be provincially significant.

Wabigoon Lake Ojibway Nation, Eagle Lake First Nation, Lac Seul First Nation, Whitefish Bay First Nation, Wabaskang First Nation, Aboriginal Peoples of Wabigoon, Metis Nation of Ontario, and Grassy Narrows First Nation were consulted to obtain information required for this component. See Appendix C for the request for information letter that was sent to each community, no responses were received.

There were no occurrences of endangered species within the wetlands assessed, however there were five wetlands in which provincially significant animal species were identified and observed. The wetland identification number and the species are listed in Table 3.4.

Table 3.4: Provincially significant species identified in 2012 wetland evaluations

Wetland ID	Scientific Name	Common Name
WLD9	*Contopus cooperi*	Olive Sided Flycatcher
WLD4, WLD7, WLD6, WLD 8	*Haliaeetus leucocephalus*	Bald Eagle
WLD 8	*Wilsonia canadensis*	Canada Warbler

The OWES scores that were calculated for the 2012 baseline wetland evaluations did not identify any of the wetlands as provincially significant due to the fact that the total scores for each individual wetland were below 600 points. All scores by components and subsections are summarized in Table 3.5. The average score of all the wetlands evaluated was 359, the maximum score was 448, and the minimum score calculated was 277.

Table 3.5: Summary of OWES scores for each wetland evaluated

Wetland ID:		WLD1	WLD2	WLD3	WLD4	WLD5	WLD6	WLD7	WLD8	WLD9
BIOLOGICAL COMPONENT										
Productivity	Growing Degree-Day/soils (max 30)	8	7	10	9	8	8	13	9	8
	Wetland Type (max 15)	7	8	9	13	7	15	11	8	9
	Site Type (max 5)	2	2	2	2	2	5	2	2	2
Biodiversity	Number of Wetland types (max 30)	20	13	13	13	13	9	13	20	20
	Vegetation Communities (max 45)	5	5	3	5	5	3	5	5	7
	Diversity of Surrounding Habitat (max 7)	6	7	6	7	7	7	7	7	6
	Proximity to other wetlands (max 8)	8	8	8	8	8	8	8	8	8
	Interspersion (max 30)	9	6	9	12	12	15	12	18	6
	Open water type (max 30)	8	0	14	20	8	30	30	14	14
	Size (max 50)	10	7	9	17	8	25	25	21	9
Total Biological Component (not to exceed 250)		83	63	83	106	78	125	126	112	89
SOCIAL COMPONENT										
Economically Valuable Products	Wood products (max 14)	0	0	0	0	0	0	0	6	4
	Low Bush Cranberry (max 2)	2	2	0	0	2	0	0	0	2
	Wild rice (max 10)	0	0	0	0	0	10	0	0	0
	Commercial fish (max 12)	0	12	12	12	0	12	12	12	12
	Furbearers (max 12)	3	0	3	3	0	3	6	0	3
Recreational Activities	Hunting/Fishing/Nature (max 80)	0	0	0	0	0	8	0	0	0
	Landscape Distinctness (max 3)	3	3	3	3	3	3	3	3	3
	Absense of human disturbance (max 7)	7	4	4	4	7	4	7	7	4
	Educational Uses (max 20)	0	0	0	0	0	0	0	0	0
	Facilities and Programs (8)	0	0	0	0	0	0	0	0	0
	Research and Studies (max 12)	8	5	5	5	0	5	5	5	5
	Proximity to human settlement (max 40)	10	10	10	10	10	10	10	10	10
	Ownership (max 10)	8	5	4	8	4	4	8	8	4
	Size (max 20)	7	2	2	2	3	5	5	11	7
	Aboriginal and cultural (max 30)	0	0	0	0	0		0	0	0
Total for Social Component (not to exceed 250)		48	43	43	47	29	64	56	62	54
HYDROLOGICAL COMPONENT										
	Flood attenuation (max 100)	59	35	10	14	34	0	0	0	30
Ground Water Recharge	Site type (20)	20	20	20	20	20	0	0	0	20
	Hydrological Soils (max 10)	7	7	4	4	4	0	0	0	7
Downstream Water Quality	Watershed Improvement (max 30)	30	30	30	30	21	30	30	30	30
Improvement	Adjacent Watershed Land Use (max 60)	4	4	4	4	14	29	14	29	4
	Vegetation form (max 10)	8	8	8	10	8	10	10	8	8
	Carbon Sink (max 15)	15	9	9	9	0	9	9	9	9
	Shoreline erosion control (max 15)	0	0	0	0	0	8	15	8	0
	Groundwater Discharge (max 30)	22	21	18	17	12	22	17	17	21
Total for Hydrological Component (not to exceed 250)		165	134	103	108	113	108	95	101	129
SPECIAL FEATURES										
Rarity	Wetlands (max 70)	50	30	30	30	40	20	30	50	50
	Endangered/Threatened spp. breeding habitat (no max)	0	0	0	0	0	0	0	0	0
	Traditional use by endanger/threatend spp. (no max)	0	0	0	0	0	0	0	0	0
	Provincially significant animals (no max)	0	0	0	50	0	50	50	80	50
	Provincially significant plants (no max)	0	0	0	0	0	0	0	0	0
	Regionally significant spp. (no max)	0	0	0	0	0	0	0	0	0
	Locally significant spp. (no max)	0	0	0	0	0	0	0	0	0
	Species of Special Status (Black Duck) (max 25)	0	0	0	10	0	10	10	10	0
Significant Features and Habitat	Colonial Waterbirds (max 50)	0	0	0	0	0	0	0	0	0
	Winter Cover for Wildlife (max 100)	0	0	0	0	0	0	0	0	0
	Waterfowl Staging/Moutling (max 150)	0	0	0	0	0	0	0	0	0
	Waterfowl Breeding (max 100)	0	0	10	10	0	10	10	10	0
	Migratory Passerine, Shorebird or Raptor stopover (max 100)	0	0	0	0	0	0	0	0	0
	Ungulate Habitat (max 100)	0	0	0	0	0	0	0	0	0
	Fish Nursery Habitat (max 100)	2	1	4	1	1	7	3	1	1
	Fish Staging/Migration Habitat Present (max 25)	5	0	0	1	0	25	5	5	5
	Ecosystem Age (max 25)	16	6	30	1	18	0	1	17	6
	Great Lake Coastal Wetlands (max 75)	0	0	0	0	0	0	0	0	0
Total for Special features (not to exceed 250)		73	37	74	103	59	122	109	173	112
TOTAL		**369**	**277**	**303**	**364**	**279**	**419**	**386**	**448**	**384**

4. CLOSURE

4.1 *Summary*

- None of the provincially significant species listed in the NHIC database were encountered during the field surveys;
- The swamp wetland type occupied 49.7% of the wetland areas assessed. The dominant vegetation form was tall shrubs;
- Small areas of marsh dominated by emergent vegetation and shrubs are prominent throughout the study area;
- Provincially significant species were identified in five of the wetlands assessed; and
- No Provincially significant wetlands were identified within the study area under the OWES

4.2 *Conclusions*

No wetlands were identified as being provincially significant by OWES standards and procedures. Wetland files can be amended as new information becomes available. For example, changes to the status of species, confirmation of new species occurrences, wetland boundary modifications, and changes to the social values of the wetland can be updated on any OWES wetland scorecard.

We appreciate this opportunity to provide environmental services to you. If you have any questions or comments, please contact the undersigned.

For DST CONSULTING ENGINEERS INC.

Krista Prosser, B.A
Environmental Scientist, Kenora

Terry Honsberger, M.Sc.
Junior Associate, Thunder Bay

Milan Makusa, Ing., P. Geo.
Sr Technical Advisor, Ottawa

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Appendix A

Species Encountered During Ontario Wetland Evaluation Field Surveys

Vegetation Form	Scientific Name	Common Name
Conifer	*Abies balsamea*	Balsam Fir
	Larix laricina	Tamarack
	Picea mariana	Black Spruce
	Thuja occidentalis	Eastern White Cedar
Hardwood	*Betual papyrifera*	White Birch
	Populus balsamifera	Balsam Poplar
Tall Shrubs (TS)	*Alnus incana*	Speckled Alder
	Betula glandulosa	Dwarf Birch
	Cornus stolonifera	Red-Osier Dogwood
	Cornus stolonifera	Round-leaved Dogwood
	Salix spp.	Willow
	Sorbus americana	Mountain Ash
	Viburnim opulus	Highbush Cranberry
Low Shrubs (LS)	*Andromeda glaucophylla*	Bog rosemary
	Chamaedaphne calyculata	Leather Leaf
	Kalmia polifolia	Bog laurel
	Larix laricina	Tamarack
	Myrica gale	Sweet Gale
	Rhododendron groenlandicum	Labrador Tea
	Ribes spp.	Currant
	Rosa acicularis	Prickly Wild Rose
	Rubus idaeus	Red Raspberry
	Salix spp.	Willow
	Vaccinium spp.	Blueberry
Narrow-Leaved Emergents (NE)	*Agrostis scabra*	Tickle Grass
	Calamagrostis canadensis	Canada bluejoint
	Carex aquatilis	Wire Sedge
	Carex bebbii	Bebb's Sedge
	Carex brunnescens	Brownish Sedge
	Carex disperma	Soft leaved Sedge
	carex exilis	Starved Sedge
	Carex intumescens	Bladder Sedge
	Carex lacustris	Lakebank Sedge
	Carex lasiocarpa	Wire Sedge
	carex magellanica	Poor Sedge
	Carex oligosperma	Few-Seeded Sedge
	Carex pauciflora	Few Flowered Sedge
	Carex spp.	Sedges
	Carex trisperma	3-fruited Sedge
	Carex uticulata	Beaked Sedge
	carex viridula	Green Sedge
	Cinna latifolia	Drooping Woodreed
	Equisetum palustre	Marsh Horsetail
	Equisetum pratense	Meadow Horsetail
	Equisetum sylvaticum	Wood Horsetail
	Eriophorum viridi-carniatum	Green Cottongrass
	Eriphorum vaginatum	Dense Cottongrass

Vegetation Form	Scientific Name	Common Name
Narrow-Leaved Emergents (NE)	*Agrostis scabra*	Tickle Grass
	Glyceria canadensis	Rattlesnake Manna Grass
	Glyceria grandis	Tall Manna Grass
	Juncus tenuis	Canada Rush
	Juncus tenuis	Path Rush
	Phalaris arundinacea	Reed Canary Grass
	Phragmites australis	Common Reed
	Poa palustris	Fowl Blue Grass
	Scirpus cyperinus	Woolgrass
	Scirpus validus	Softstem Bullrush
	Scrirpus cespitosus	Tufted Clubrush
	Sparganium eurycarpum	Large-Fruited Burreed
Broad-Leaved Emergents (BE)	*Alisma plantago-aquatica*	Water Plantain
	Calla palustris	Water arum
	Caltha palustris	Marsh Marigold
	Menyanthes trifoliata	Buckbean
	Sagittaria rigida	Broad-Leaved Arrowhead
	Sagittaria rigida	Stiff Arrowhead
Robust Emergents (RE)	*Acorus calamus*	Sweetflag
	Phragmites australis	Common Reed
	Scirpus acutus	Hardstem Bulrush
	Sium suave	Water Parsnip
	Sparganium emersum	Common Burreed
	Sparganium eurycarpum	Large-Fruited Burreed
	Typha latifolia	Common Cattail
	Zizania palustris	Wild rice
Herbs and Graminoids (GC)	*Ascelpias incarnata*	Swamp Milkweed
	Aster borealis	Rush Aster
	Aster lanceolatus	Lance-leaved Aster
	Aster lanceolatus	Lance-leaved Aster
	Aster nemoralis	Bog Aster
	Aster puniceus	Purple Stemmed Aster
	Aster spp.	Aster
	Athryium filix-femina	Lady Fern
	Biden cernua	Nodding Bur-Marigold
	Bidens frondosa	Devil's Beggar-ticks
	Caltha palustris	Marsh Marigold
	Campanula aparinoides	Marsh Bellflower
	Cirsium multicum	Swamp Thistle
	Coptis trifolia	Goldthread
	Cornus canadensis	Bunch Berry
	Dryopteris carthusiana	Spinulose Wood Fern
	Eupatorium maculatum	Spotted Joe-Pye Weed
	Fragaria virginiana	Common Strawberry
	Galium trifidum	Small Bedstraw
	Galium triflorum	Fragrant Bedstraw
	Gaultheria hispidula	Creeping Snowberry
	Gymnocarpium dryopteris	Oak Fern
	Hypericum majus	Canada St. John's Wort

Vegetation Form	Scientific Name	Common Name
Herbs and Graminoids (GC)	*Impatiens capensis*	Jewelweed
	Iris versicolor	Northern Blue Flag
	Linnaea borealis	Twinflower
	Lonicera oblongifolia	Swamp Honeysuckle
	Lycopus uniflorus	Northern Bugleweed
	Maianthemum trifolium	Three-Leaved Solomon's Seal
	Mitella nuda	Naked Mitrewort
	Petasites frigidus	Northern Sweet Coltsfoot
	Polygonum periscaria	Lady's Thumb
	Potentilla palustris	Marsh Cinquefoil
	Pyrola asarifolia	Pink Pyrola
	Ribes spp.	Currant
	Rubus pubescens	Dwarf Raspberry
	Rumex orbiculatus	Great Water Dock
	Sarracenia purpurea	Pitcher-Plant
	Solidago uliginosa	Northern Bog Goldenrod
	Thalictrum pubescens	Tall Meadow Rue
	Triadenum fraseri	Marsh St. John's Wort
	Trientalis borealis	Starflower
	Vaccinium macrocarpon	Large Cranberry
	Vaccinium oxycoccos	Small Cranberry
	Viola spp.	Viola
Floating (F)	*Brasenia schreberi*	Water Shield
	Nuphar pumila	Small Yellow Pond Lily
	Potamogeton natans	Floating-Leaved pondweed
	Potamogeton pusillus	Slender Pondweed
	Sagittaria cuneata	Floating Arrowhead
	Sparganium fluctuans	Floating-Leaved Burreed
Free-Floating (FF)	*lemna spp.*	Duckweed
Subermergent (SE)	*Callitriche hermaphroditica*	Submerged Water Starwort
	Megalodonta beckii	Water Marigold
	Myriophyllum sibiricum	Northern Water Milfoil
	Najas flexilis	Water Nymph
	Potamogeton pusilllus	Slender Pondweed
	Potamogeton richardsonii	Richardson's Pondweed
	Potamogeton robbinsii	Fern Pondweed
	Ranunculus longirostris	Curly White Water Crowfoot
	Utricularia vulgaris	Common Bladderwort
	Vallisneria amaericana	Tape Grass
Mosses and Lichens (M)	*Aulacomnium palustre*	Ribbed Bog Moss
	Cladina rangiferina	Reindeer Lichen
	Cladonia cristatella	British Soldiers
	Climacium dendroides	Tree Moss
	Dicranum undulatum	Wavy Moss
	Drepanolcladus spp.	Sickle Moss
	Lycopodiella inundata	Northern Bog Clubmoss
	Lycopodium annotinum	Clubmoss
	Lycopodium annotinum	Stiff clubMoss
	Mnium spp.	Mniums

Vegetation Form	Scientific Name	Common Name
Mosses and Lichens (M)	*Polytricium spp.*	Haircap Mosses
	Rhytidiadelphus triquetrus	Electrified Cat's Tail Moss
	Scorpidium scorpiodes	Scorpion's Tail
	Sphagnum girgensohnii	Common Green Peat Moss
	Sphagnum russowii	Wide-Tongued Peat Moss
	Sphagnum spp.	Common Peat Mosses
	Thuidium delicatulum	Common Fern Moss
	Tomenthypnum nitens	Fuzzy Brown Moss
Dead Conifers, Hardwoods, and Shrubs	No individual species	Included as a vegetation form

Appendix B

Ontario Wetland Evaluation Data and Scoring Records

Appendix C

Request for Information Letter and First Nations' Response

Treasury METALS INC.

Goliath Gold Project P.O. Box 783 Dryden, Ontario, P8N 2Z4, Canada
Tel: (807) 938-6961 Fax: (807) 938-6499
www.treasurymetals.com

January 28, 2014

SUBJECT: **Wetland Evaluations and Aboriginal Values**

Chief Gardner,

Treasury Metals Inc., through its consultant DST Consulting Engineers, is currently undertaking a baseline wetlands assessment using the OWES (Ontario Wetland Evaluation System) protocol from the Ontario Ministry of Natural Resources. We would like to inform you of this study and to request some information from you about the specific area in which wetlands are being evaluated.

What are wetlands?

Wetlands are areas where water-saturated soils favour the type of plants which are adapted to grow there. Marshes, bogs, swamps, and fens are all types of wetlands. Wetlands provide unique and specialized habitat for a great variety of species.

What is the wetlands evaluation program all about?

The purpose of the wetlands evaluation program is to describe the wetlands and identify their ecological and cultural significance. This is done by applying a standard procedure for collecting information to each wetland that we wish to evaluate.

There are many types of information collected on each wetland which enables us to determine its significance in terms of its biological productivity, the diversity of habitat it supports, the human uses which it may have (like hunting or wild rice harvest), its ability to attenuate floods and recharge ground water, and the rare or endangered plant and animal species it may support.

What does it all mean?

What this means is that once the information is collected, each wetland can then be ranked according to provincial guidelines, which determines its level of provincial significance.

Why do we need your help?

One of the attributes in the wetland evaluation system is "Aboriginal Values". In this, we seek to include and acknowledge any cultural heritage or aboriginal values that are identified. For example, a wetland may be used for wild rice harvesting or trapping, or it may have special cultural or spiritual values.

Treasury Metals Inc. has contracted biologists from DST Consulting Engineers Inc. to evaluate several wetlands within the area of interest. We have provided a map of this area and are requesting that you identify wetland areas in which there are any special values that your community may have attached to the wetland. All applicable information will be incorporated into the evaluation.

Please respond in writing prior to February 21, 2014 or by directly contacting the consultant biologist, Krista Prosser (DST Consulting Engineers) at (807) 548-2383 ext. 221. Krista can provide you with any other information about wetland evaluations you may require. We look forward to hearing from you.

Yours truly,

Murray Ferguson
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Appendix D

Limitations of Report

LIMITATIONS OF REPORT

NATURAL SCIENCE INVESTIGATIONS

The information, conclusions and recommendations given herein are specifically for this project and this Client only, and for the scope of work described herein. It may not be sufficient for other uses. DST does not accept responsibility for use by third parties.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the Client. Note, however, that no scope of work, no matter how exhaustive, can identify all ecological and/or environmental conditions. This report therefore cannot warranty that all conditions on or off the site are represented by those identified at specific locations.

Any recommendations and conclusions provided that are based on conditions or assumptions reported herein will inherently include any uncertainty associated with those conditions or assumptions. In fact many aspects involving professional judgement contain a degree of uncertainty which cannot be eliminated. This uncertainty should be managed by periodic review and refinement as additional information becomes available.

Note also that standards, guidelines, methodologies and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any topographic benchmarks and elevations documented in this report are primarily to establish relative elevation differences between study locations and should not be used for other purposes such as grading, excavation, planning, development, etc.

Any comments given in this report on potential environmental conditions/site ecology are intended only for the guidance of the Client. The scope of work may not be sufficient to determine all of the environmental factors at each site. Contractors bidding on this project should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work.

Any results from an analytical laboratory, federal or provincial government agencies, other subcontractor, or any other third party, reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the Client.