REPORT

Exotic and Rare Plant Field Survey

Tłı̨chǫ All-Season Road

Submitted to:

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Government of Northwest Territories
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1790290

January 2019

Distribution List

Government of Northwest Territories - 1 eCopy

Golder Associates Ltd. - 1eCopy

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1.0 INTRODUCTION

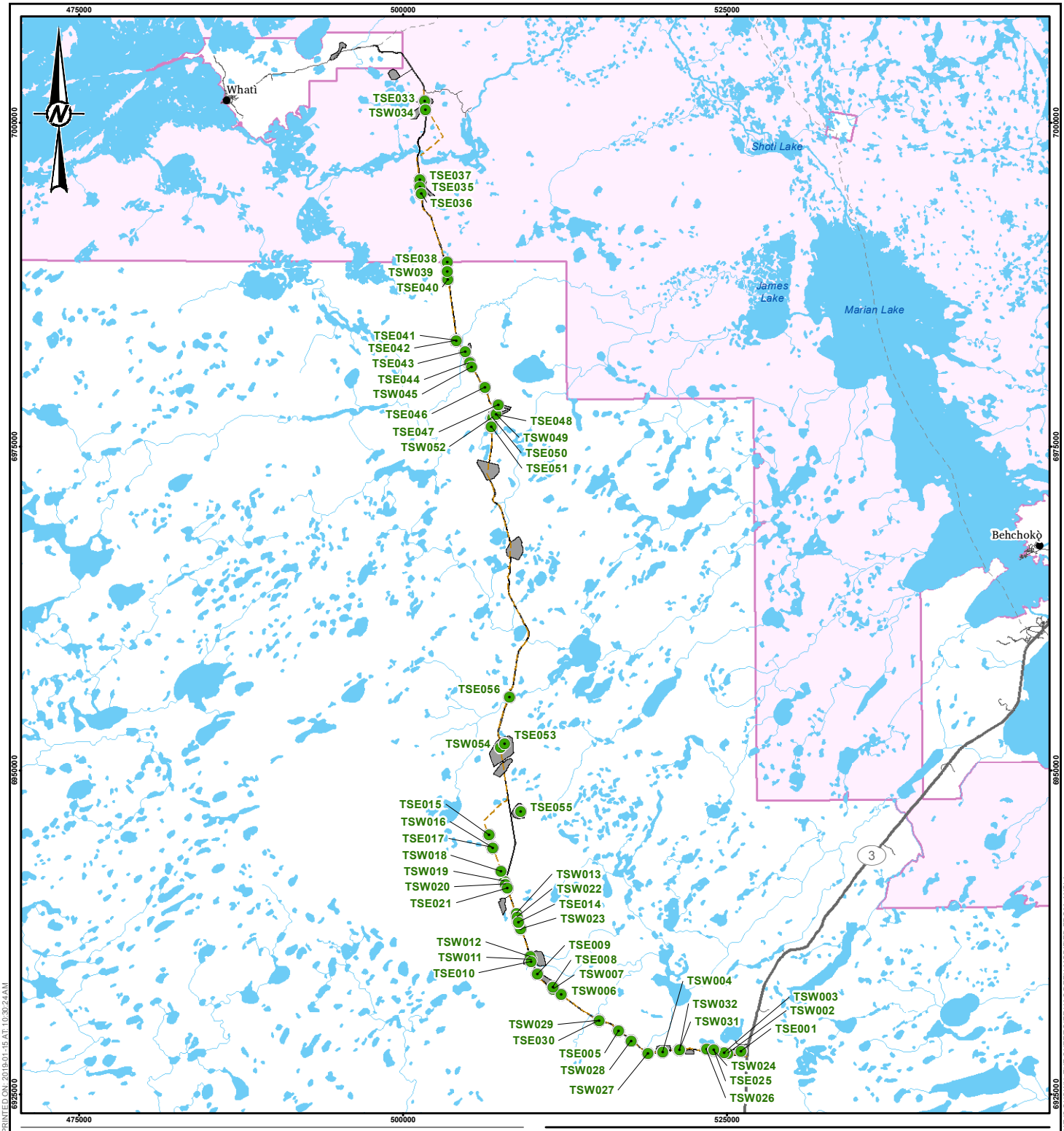
1.1 Background

Golder Associates Ltd. (Golder) was retained by the Government of the Northwest Territories Department of Infrastructure in 2018 to complete vegetation field surveys consisting of exotic and rare plant assessments along the proposed Tłı̨chǫ All-Season Road (Tłı̨chǫ ASR or the Project). This study was completed in response to a commitment made by the Department of Infrastructure during the environmental assessment of the Project. The commitment was as follows:

> *Herbaceous plant surveys of the Project footprint will be completed during the growing season by a qualified botanist in advance of construction, one year following construction and again after five years of operations. If rare plants and/or invasive species are found, ENR will be consulted to determine next steps.* (Cited from land use permit application W2016E0004 Updated Project Description Appendix F, Commitment Number 69)

2.0 STUDY AREA

The Project is defined as an all-season road approximately 97 kilometres (km) in length, within a 60 m wide right-of-way. It has a roadway approximately 8.5 metres (m) in width to accommodate a two-lane gravel road with culverts and two-lane bridges at water crossing locations. The road will have a design speed of 80 kilometres per hour (km/h) with a posted speed limit of 70 km/h. The Tłı̨chǫ ASR is entirely contained within the Wek'èezhìı area and begins approximately 45 km southwest of Behchokǫ̀ near KM 196 along Territorial Highway 3 (Figure 1). The Project is located within the Taiga Plains Level II Ecoregion, and includes the Great Slave Plain High Boreal and the Lac Grandin Plain Low Subarctic Level IV Ecoregions (ECG 2009). The objective of this report is to provide the results of the exotic and rare plant surveys completed during the summer of 2018 along the Tłı̨chǫ ASR and quarry locations.



LEGEND

- POPULATED PLACE
- ALL-SEASON ROAD
- LOCAL ROAD
- WINTER ROAD
- OLD AIRPORT ROAD
- WATERCOURSE
- TŁĮCHǪ LAND
- WATERBODY
- VEGETATION PLOT
- PROJECT FOOTPRINT

0 8 16
1:425,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 11 DATUM: NAD83

CLIENT
GOVERNMENT OF NORTHWEST TERRITORIES

PROJECT
TŁĮCHǪ ALL-SEASON ROAD

TITLE
PROJECT FOOTPRINT AND VEGETATION PLOT LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-01-15
DESIGNED	CS
PREPARED	LMS
REVIEWED	CS
APPROVED	CS

PROJECT NO.	REV.	FIGURE
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3.0 METHODS

3.1 Vegetation Field Surveys

Vegetation field surveys were completed by a qualified botanist (Golder) and community member (Whatì) from August 9 to 15, 2018 (Appendix A, Photo 1). Field surveys were completed in accordance with the Alberta Native Plant Council (ANPC) rare plant surveys guidelines (ANPC 2012), and targeted representative vegetation communities along the Tłı̨chǫ ASR footprint. The Project was accessed through combination of ATV and helicopter, and field surveys completed on foot. Surveys were focused at the southern end Tłı̨chǫ ASR footprint near Territorial Highway 3, due to ease of access and higher potential of exotic plant presence. Any exotic or rare plants encountered along all portions of the Project were documented. Surveys were limited to the proposed Tłı̨chǫ ASR alignment and proposed borrow source areas.

3.2 Exotic Plants

Exotic plant species observations were recorded within the Project for any exotic species designated as “alien” by the Working Group on General Status of NWT Species (2016). When exotic species were observed, the location, number of individuals location and phenology were recorded.

3.3 Rare Plants

Rare plants were defined as vascular plant species with ‘Endangered’, ‘Threatened’, and “Special Concern’ ranks (Government of Northwest Territories 2018). None of the rare plant species listed in the 2018 Species at Risk in the Northwest Territories (GNWT 2018), Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or *Species At Risk Act* (Government of Canada 2018) are expected to occur in the Tłı̨chǫ or Wek’èezhìi region.

Rare plant surveys followed a ‘reconnaissance search’ method and ‘meander search’ pattern, where the surveyor walked ‘randomly’ noting each new species until no more new species were observed (ANPC 2012).

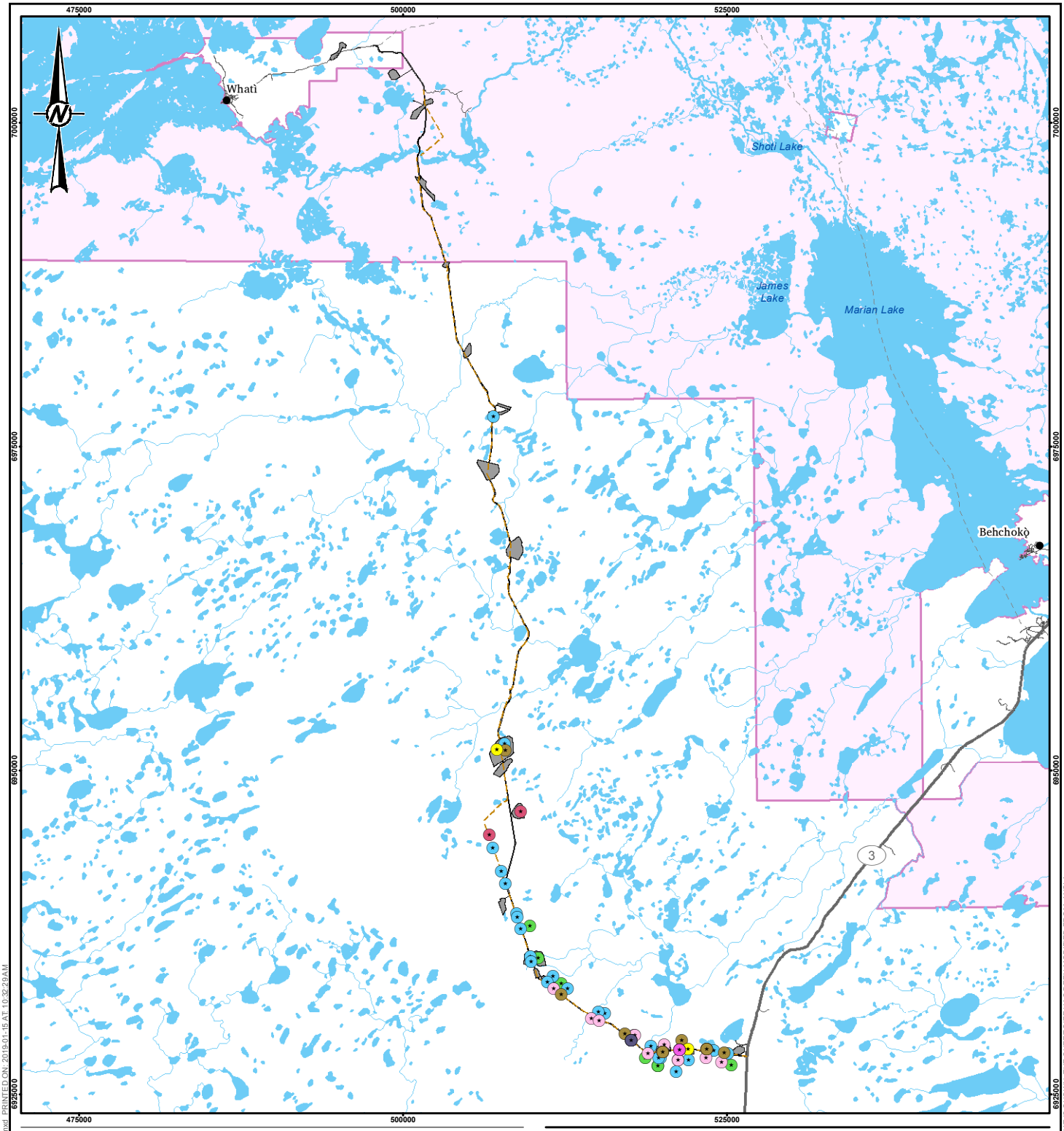
4.0 RESULTS

4.1 Vegetation

A total of 56 vegetation survey plots were completed (Figure 1). Location details of completed vegetation survey plots is presented in Appendix B. The 2018 vegetation survey identified 135 vascular plants, of which 130 were identified to species level and 5 could be identified only to genus. A total of 14 non-vascular plants (7 bryophytes and 7 lichens) were identified during the field surveys. Appendix C shows the full list of vascular and non-vascular species observed. The most common and widespread vascular species found were jack pine (*Pinus banksiana*), shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*), black spruce (*Picea mariana*) and bog cranberry (*Vaccinium vitis-idea*). The most common and widespread non-vascular species found were reindeer lichen (*Cladonia mitis*) and star-tipped reindeer lichen (*Cladonia stellaris*).

4.2 Exotic Plants

Eight exotic species were documented at 27 locations throughout the Project (Figure 2, Table 2). All eight species are considered ‘Alien’ by the Working Group on General Status of NWT Species (2016).



LEGEND

- POPULATED PLACE
- ALL-SEASON ROAD
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- OLD AIRPORT ROAD
- WATERCOURSE
- TŁĮCHǪ LAND
- WATERBODY
- PROJECT FOOTPRINT

EXOTIC SPECIES OBSERVATIONS*

- BROMUS INERMIS SSP. INERMIS
- CHENOPODIUM ALBUM
- CREPIS TECTORUM
- MATRICARIA MATRICARIOIDES
- PLANTAGO MAJOR
- POLYGONUM ARENASTRUM
- TARAXACUM OFFICINALE
- TRIFOLIUM HYBRIDUM

0 8 16

1:425,000 KILOMETRES

NOTE(S)

* THE SPECIES LOCATIONS HAVE BEEN SHIFTED WHERE NECESSARY FOR CARTOGRAPHIC PURPOSES.

REFERENCE(S)

1. BASE DATA OBTAINED FROM GEOGRATIS, © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.
PROJECTION: UTM ZONE 11 DATUM: NAD83

CLIENT
GOVERNMENT OF NORTHWEST TERRITORIES

PROJECT
TŁĮCHǪ ALL-SEASON ROAD

TITLE
PROJECT FOOTPRINT AND EXOTIC SPECIES OBSERVATIONS

CONSULTANT
GOLDER

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APPROVED	CS

PROJECT NO.	REV.	FIGURE
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Table 1: Exotic Plant Species Observations and Location in the Project

Species Name	Common Name	Rank[a]	Location[b]		Approximate Number of Individual Plants	Plot Number
			Easting	Northing		
Bromus inermis ssp. *inermis*	smooth brome	Alien	506629	6945024	100	TSE015
		Alien	509090	6946849	100	TSE055
Chenopodium album	lambs-quarters	Alien	525073	6928170	200	TSW002
		Alien	520029	6928314	100	TSW004
		Alien	511636	6933142	350	TSW007
		Alien	509928	6935399	150	TSW011
		Alien	509100	6937818	1	TSW023
		Alien	518908	6928177	100	TSW027
Crepis tectorum	annual hawks-beard	Alien	511566	6933309	10	TSE008
		Alien	509904	6935284	150	TSE010
		Alien	507858	6952111	1	TSE053
		Alien	525073	6928170	50	TSW002
		Alien	520029	6928314	10	TSW004
		Alien	512223	6932706	10	TSW006
		Alien	511636	6933142	100	TSW007
		Alien	509842	6935666	100	TSW012
		Alien	508738	6938992	150	TSW013
		Alien	506941	6944065	500	TSW016
		Alien	507575	6942250	250	TSW018
		Alien	507915	6941252	185	TSW020
		Alien	508791	6938729	275	TSW022
		Alien	509095	6937813	2	TSW023
		Alien	524011	6928442	75	TSW024
		Alien	518908	6928177	20	TSW027
		Alien	515135	6930719	20	TSW029
		Alien	521310	6928478	150	TSW032
		Alien	506989	6977301	40	TSW052

Table 1: Exotic Plant Species Observations and Location in the Project

Species Name	Common Name	Rank[a]	Location[b]		Approximate Number of Individual Plants	Plot Number
			Easting	Northing		
Matricaria discoidea	pineapple weed	Alien	524810	6928231	200	TSW003
		Alien	520029	6928314	100	TSW004
		Alien	520029	6928314	100	TSW004
		Alien	511636	6933142	100	TSW007
		Alien	523420	6928530	5	TSW026
		Alien	518908	6928177	75	TSW027
		Alien	517584	6929179	10	TSW028
		Alien	515135	6930719	25	TSW029
		Alien	515135	6930719	25	TSW029
		Alien	521310	6928478	100	TSW032
Plantago major	common plantain	Alien	524816	6928235	250	TSW003
		Alien	520029	6928314	25	TSW004
		Alien	512223	6932706	300	TSW006
		Alien	523420	6928530	170	TSW026
		Alien	517584	6929179	250	TSW028
		Alien	521307	6928475	150	TSW031
		Alien	507535	6951787	350	TSW054
Polygonum aviculare	common knotweed	Alien	517584	6929179	200	TSW028
Taraxacum officinale	common dandelion	Alien	521310	6928478	250	TSW032
		Alien	507535	6951787	150	TSW054
Trifolium hybridum	alsike clover	Alien	521310	6928478	10	TSW032

[a] Exotic rank according to the Working Group on General Status of NWT Species (2016)

[b] Locations based on 11V NAD83.

Representative photos of exotic species observed during the 2018 vegetation field surveys are provided in Appendix A.

4.3 Rare Plants

No rare plants were observed within the Project footprint during the 2018 field surveys. Although no rare plants were observed, it does not preclude their presence in the Project area.

5.0 CONCLUSIONS

No rare plants were observed within the Project footprint during the 2018 field surveys. Although no rare plants were observed, it does not preclude their presence in the Project area. Overall, the results of the 2018 field surveys show minimal exotic plant occurrences within the Project footprint, with most observations concentrated in the most southern section of the project with closer proximity to Territorial Highway 3, and largely confined to the existing Tłı̨chǫ ASR alignment. Previously documented exotic plants along Territorial Highway 3 (Oldham and Delisle-Oldham, 2017) are likely the pathway for the spread of exotic plants along the existing Tłı̨chǫ ASR alignment. Exotic plant populations along Territorial Highway 3 will likely continue to colonize the Tłı̨chǫ ASR alignment unless a weed management plan (for exotic plants) is implemented. The occurrence of these exotic plants will likely remain confined to disturbed areas and not affect surrounding undisturbed areas.

6.0 CLOSURE

We trust the information contained in this report is sufficient for your present needs. Should you have any questions regarding the project, please do not hesitate to contact the signatories below at (867) 873-6319.

Yours Truly,

Golder Associates Ltd.

Christopher Shapka
Terrestrial Biologist

Damian Panayi
Project Manager, Wildlife Biologist

CS/DP/crm

7.0 REFERENCES

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Working Group on General Status of NWT Species. 2016. NWT Species 2016-2020 – General Status Ranks of Wild Species in the Northwest Territories, Department of Environment and Natural Resources, Government of the Northwest Territories, Yellowknife, NT. 304 pp.

APPENDIX A

Photograph Log

Photo 1. **Whatì Community Member Lisa Zoe Assisting in Vegetation Survey in Project Area**

Photo 2. ***Chenopodium album*** **(lamb's quarters) – TSW007**

Photo 3. ***Chenopodium album*** **(lamb's quarters) – TSW011**

Photo 4. ***Crepis tectorum*** **(narrow-leaf hawksbeard) – TSW012**

Photo 5. ***Crepis tectorum*** **(narrow-leaf hawksbeard) – TSW019**

Photo 6. ***Matricaria discoidea*** **(pineapple weed) – TSW006**

Photo 7. ***Matricaria discoidea*** **(pineapple weed) – TSW029**

Photo 8. ***Matricaria discoidea*** **(pineapple weed) and** ***Plantago major*** **(common plantain) – TSW003**

Photo 9. ***Plantago major*** **(common plantain) – TSW031**

Photo 10. ***Polygonum aviculare*** **(common knotweed – TSW026**

Photo 11. ***Taraxacum officinale*** **– (common dandelion) – TSW054**

Photo 12. ***Taraxacum officinale*** **(common dandelion) – TSW055**

APPENDIX B

Plot Locations

Table B-1: Vegetation Plot Location

Plot ID	Date	Time	Location[a]	
			Easting	Northing
TSE001	09/08/2018	16:47	526071	6928343
TSW002	10/08/2018	8:47	525073	6928170
TSW003	10/08/2018	9:04	524815	6928230
TSW004	10/08/2018	9:39	520029	6928314
TSE005	10/08/2018	10:14	516658	6929903
TSW006	10/08/2018	11:06	512223	6932706
TSW007	10/08/2018	11:30	511636	6933142
TSE008	10/08/2018	11:51	511566	6933309
TSE009	10/08/2018	7:18	510362	6934305
TSE010	10/08/2018	13:47	509904	6935284
TSW011	10/08/2018	14:11	509928	6935399
TSW012	10/08/2018	14:34	509842	6935666
TSW013	10/08/2018	15:15	508738	6938992
TSE014	10/08/2018	15:25	508894	6938294
TSE015	11/08/2018	12:01	506629	6945024
TSW016	11/08/2018	12:39	506941	6944065
TSE017	11/08/2018	12:57	506941	6944065
TSW018	11/08/2018	13:38	507575	6942250
TSW019	11/08/2018	13:56	507847	6941451
TSW020	11/08/2018	14:19	507915	6941252
TSE021	11/08/2018	14:36	508033	6940913
TSW022	11/08/2018	15:25	508791	6938729
TSW023	11/08/2018	15:34	509100	6937818
TSW024	12/08/2018	8:48	523991	6928430
TSE025	12/08/2018	9:03	523974	6928433
TSW026	12/08/2018	9:30	523420	6928530
TSW027	12/08/2018	9:59	518908	6928177
TSW028	12/08/2018	10:21	517584	6929179
TSW029	12/08/2018	11:01	515135	6930719
TSE030	12/08/2018	11:33	515149	6930709
TSW031	12/08/2018	12:18	521307	6928475
TSW032	12/08/2018	9:03	521310	6928478
TSE033	13/08/2018	10:05	501692	7001662
TSW034	13/08/2018	10:53	501740	7001011
TSE035	13/08/2018	12:18	501324	6995014

Table B-1: Vegetation Plot Location

Plot ID	Date	Time	Location[a]	
			Easting	Northing
TSE036	13/08/2018	12:59	501418	6994551
TSE037	13/08/2018	13:49	501309	6995632
TSE038	13/08/2018	14:48	503423	6989252
TSW039	13/08/2018	15:31	503388	6988525
TSE040	13/08/2018	15:47	503463	6987928
TSE041	14/08/2018	10:05	504107	6983205
TSE042	14/08/2018	10:28	504102	6983208
TSE043	14/08/2018	7:54	504830	6982334
TSE044	14/08/2018	12:35	505115	6981466
TSW045	14/08/2018	12:58	505308	6981177
TSE046	14/08/2018	13:53	506306	6979608
TSE047	14/08/2018	15:15	507355	6978213
TSE048	15/08/2018	9:42	507203	6977499
TSW049	15/08/2018	10:10	507203	6977499
TSE050	15/08/2018	10:22	506900	6977200
TSE051	15/08/2018	10:55	506805	6976585
TSW052	15/08/2018	11:28	506989	6977301
TSE053	15/08/2018	12:32	507858	6952111
TSW054	15/08/2018	13:30	507535	6951787
TSE055	15/08/2018	14:16	509090	6946849
TSE056	15/08/2018	15:22	508234	6955668

[a] All Location coordinates in UTM Zone 11V

APPENDIX C

Vegetation Species List

Table C-1: Species Observed During 2018 Field Surveys

SCIENTIFIC NAME	COMMON NAME
TREE/SHRUB	
Betula papyrifera	white birch
Larix laricina	tamarack
Picea glauca	white spruce
Picea mariana	black spruce
Pinus banksiana	jack pine
Populus tremuloides	aspen
SHRUB	
Alnus viridis ssp. *crispa*	American green alder
Amelanchier alnifolia var. *alnifolia*	saskatoon
Andromeda polifolia	bog rosemary
Arctostaphylos rubra	alpine bearberry
Arctostaphylos uva-ursi	common bearberry
Betula pumila	dwarf birch
Chamaedaphne calyculata	leatherleaf
Dasiphora fruticosa ssp. *floribunda*	shrubby cinquefoil
Dryas drummondii	yellow mountain avens
Empetrum nigrum	crowberry
Juniperus communis	ground juniper
Juniperus horizontalis	creeping juniper
Linnaea borealis	twinflower
Lonicera dioica	twining honeysuckle
Myrica gale	sweet gale
Rhododendron groenlandicum	common Labrador tea
Ribes oxyacanthoides	northern gooseberry
Rosa acicularis	prickly rose
Rubus idaeus	wild red raspberry
Salix arbusculoides	shrubby willow
Salix candida	hoary willow
Salix glauca	smooth willow
Salix myrtillifolia	myrtle-leaved willow
Salix planifolia	flat-leaved willow
Salix serissima	autumn willow
Salix sp. 1	willow species
Shepherdia canadensis	Canada buffaloberry
Vaccinium oxycoccus	small bog cranberry
Vaccinium uliginosum	bog bilberry

Table C-1: Species Observed During 2018 Field Surveys

SCIENTIFIC NAME	COMMON NAME
Vaccinium vitis-idaea	bog cranberry
Viburnum edule	low-bush cranberry
FORB	
Achillea millefolium	common yarrow
Anemone multifida	cut-leaved anemone
Antennaria neglecta	broad-leaved everlasting
Antennaria rosea	rosy everlasting
Aquilegia brevistyla	blue columbine
Asplenium viride	green spleenwort
Aster sp.	aster species
Astragalus alpinus	alpine milkvetch
Boechera stricta	Drummonds rock cress
Campanula rotundifolia	harebell
Chamerion angustifolium	common fireweed
Chenopodium album	lambs-quarters
Comarum palustris	marsh cinquefoil
Coptidium lapponicum	Lapland buttercup
Cornus canadensis	bunchberry
Crepis tectorum	narrow-leaf hawksbeard
Cystopteris fragilis	fragile bladder fern
Dracocephalum parviflorum	American dragonhead
Drosera rotundifolia	round-leaved sundew
Equisetum arvense	common horsetail
Equisetum fluviatile	swamp horsetail
Equisetum scirpoides	dwarf scouring-rush
Erigeron compositus	cut-leaved fleabane
Erigeron sp.	fleabane species
Fragaria virginiana	wild strawberry
Galium boreale	northern bedstraw
Gentianella amarella ssp. *acuta*	felwort
Geocaulon lividum	northern bastard toadflax
Hedysarum alpinum	alpine hedysarum
Linum lewisii	wild blue flax
Maianthemum trifolium	three-leaved Solomons-seal
Matricaria discoidea	Pineapple weed
Minuartia dawsonensis	Dawson sandwort
Orthilia secunda	one-sided wintergreen

Table C-1: Species Observed During 2018 Field Surveys

SCIENTIFIC NAME	COMMON NAME
Oxytropis borealis	boreal locoweed
Parnassia palustris	northern grass-of-parnassus
Pedicularis flammea	flame-colored lousewort
Pedicularis labradorica	Labrador lousewort
Pedicularis lapponica	northern lousewort
Petasites frigidus var. *palmatus*	palmate-leaved coltsfoot
Petasites frigidus var. *sagittatus*	arrow-leaved coltsfoot
Pinguicula villosa	small butterwort
Plantago canescens	western ribgrass
Plantago major	common plantain
Platanthera huronensis	northern green bog orchid
Polygonum aviculare	common knotweed
Potentilla bimundorum	branched cinquefoil
Potentilla norvegica	rough cinquefoil
Pyrola asarifolia	common pink wintergreen
Pyrola chlorantha	greenish-flowered wintergreen
Pyrola minor	lesser wintergreen
Rhinanthus minor	yellow rattle
Rubus arcticus	dwarf raspberry
Rubus chamaemorus	cloudberry
Rubus pubescens	dewberry
Rumex maritimus	golden dock
Saxifraga tricuspidata	three-toothed saxifrage
Scheuchzeria palustris	scheuchzeria
Solidago multiradiata	alpine goldenrod
Solidago simplex ssp. *simplex*	sticky goldenrod
Symphyotrichum ciliatum	rayless aster
Symphyotrichum ciliolatum	Lindley's aster
Symphyotrichum laeve	smooth aster
Taraxacum officinale	common dandelion
Tofieldia pusilla	dwarf false asphodel
Trifolium hybridum	alsike clover
Triglochin maritima	seaside arrow-grass
Viola adunca	early blue violet
Zigadenus elegans	white camas

Table C-1: Species Observed During 2018 Field Surveys

SCIENTIFIC NAME	COMMON NAME
GRAMINOID	
Agrostis scabra	rough hair grass
Bromus inermis ssp. *inermis*	smooth brome
Calamagrostis canadensis	bluejoint
Calamagrostis purpurascens	purple reed grass
Calamagrostis stricta ssp. *inexpansa*	northern reed grass
Carex aquatilis var. *aquatilis*	water sedge
Carex canescens ssp. *canescens*	short sedge
Carex capillaris	hair-like sedge
Carex capitata	capitate sedge
Carex foenea	silvery-flowered sedge
Carex gynocrates	northern bog sedge
Carex limosa	mud sedge
Carex magellanica	bog sedge
Carex pellita	woolly sedge
Carex praegracilis	graceful sedge
Carex scirpoidea	rush-like sedge
Carex siccata	hay sedge
Carex sp. 1	sedge species
Carex vaginata	sheathed sedge
Carex viridula	green sedge
Elymus trachycaulus	slender wheatgrass
Elymus violaceus	high wildrye
Eriophorum vaginatum	sheathed cotton grass
Glyceria striata	fowl manna grass
graminoid species 1	graminoid species
Hordeum jubatum	foxtail barley
Juncus arcticus	arctic rush
Juncus stygius var. *americanus*	marsh rush
Leymus innovatus	hairy wild rye
BRYOPHYTE	
Aulacomnium palustre	tufted moss
Hylocomium splendens	stair-step moss
Pleurozium schreberi	Schrebers moss
Polytrichum strictum	slender hair-cap moss
Sphagnum fuscum	rusty peat moss
Sphagnum magellanicum	midway peat moss

Table C-1: Species Observed During 2018 Field Surveys

SCIENTIFIC NAME	COMMON NAME
Tomentypnum nitens	golden moss
LICHEN	
Cladonia borealis	boreal pixie-cup
Cladonia mitis	reindeer lichen
Cladonia rangiferina	reindeer lichen
Cladonia stellaris	star-tipped reindeer lichen
Cladonia stygia	reindeer lichen
Flavocetraria nivalis	crinkled snow lichen
Peltigera aphthosa	studded leather lichen

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