

# **Prospecting Report**

On the

# **Spy Property**

Kluane Ranges, Whitehorse Mining District, Yukon, Canada

Located Within:

NTS Sheet 115 G02

### Centered at Approximately:

Latitude 61.08° North by Longitude 138.45° West

**Claims:** 

VM	1 - 32	YC66812 - YC66843
SPY	1 - 86	YE10801 - YE10886
SPY	87 - 126	YF47275 - YF47314
SPY	127 - 141	YE10911 - YE10925
V	1 - 28	YE69339 - YE69366

### Grouping Certificate: HWO7638

Field Work Conducted: August 24, 2017

### **Report Prepared for:**

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# 1 Introduction

The SPY Property consists of 201 contiguous claim units covering an area in the front ranges of the Kluane Mountains centered over the Nines and Congdon Creek drainages, approximately 13 km south of Destruction Bay, Yukon Territory in the Whitehorse Mining District.

The Spy project is located approximately 267 km northwest of Whitehorse, Yukon Territory. The project area is on NTS map sheet 115 G02 and centered at a latitude of 61°08'N and a longitude of 138°45'W. The Spy claims cover an area of approximately 4000 hectares in the Whitehorse Mining District.

The 2017 field program on the SPY claims consisted of 2 mandays (August 24, 2017) of preliminary geological mapping and rock sampling undertaken to provide targets for future exploration and to scout a potential drill hole location. This report was prepared as an assessment report for the Yukon Government. Claims worked on during the program were: SPY 45, 49, 51, and VM 12 and 16.

# 2 Summary of Previous Investigations

The region was first explored in the early 1900's by prospectors looking for the source of placer copper on the upper White River. One native copper deposit (Canyon City) was discovered in 1905. Limited development work uncovered several large tabular masses of native copper. In the 1930's placer miners were active on Nines, Quill, Burwash, Congdon Creeks.

The area surrounding the SPY property has been explored periodically since the early 1950's after the completion of the Alaska Highway in 1942-1945 provided access to the Nines and Congdon Creek drainages. The discovery of the Wellgreen mineral deposit on upper Quill Creek initiated an exploration boom through the Kluane Ranges focussed on rocks of the Kluane Ultramafic Belt, a 600km long trend in the southwest corner of the Yukon characterized by Cu-Ni mineralization in mafic to ultramafic Triassic aged sills and volcanic rocks.

The Kluane mafic-ultramafic suite hosts many magmatic nickel (Ni) - copper (Cu) - platinum group element (PGE) ±gold (Au) occurrences from Northern British Columbia through Yukon and into Alaska. The Kluane suite intrusions are sill-like bodies that preferentially intrude the country rock sequences at or near the contact between the Hasen Creek Formation sediments and Station Creek Formation volcanics. Many of the ultramafic sills have marginal gabbro phases at their bases and upper contacts that appear to be preferentially mineralized. The Kluane Belt Ni-Cu-PGE occurrences are particularly enriched in the rarer platinum group elements osmium, iridium, ruthenium and rhodium.

The best known deposit and the sole past producer in the belt is the Wellgreen Deposit (Minfile 15G024). The Wellgreen deposit, 7 km northwest of SPY property, was mined between 1972 and 1973, producing 171,652 tonnes with an average grade of 2.23% Ni, 1.39% Cu, 0.073% Co and 2.15 grams/tonne Pt and Pd, then shut down due to weak metal prices, excessive dilution and erratic distribution. The deposit, now 100% owned by Wellgreen Platinum Ltd Inferred Mineral Resource of 846 million tonnes at 1.57 g/t Pt Eq. or 0.41% Ni Eq, both at a 0.57 g/t Pt Eq or 0.15% Ni Eq cut off (Simpson, 2014).

Two MINFILE occurrences are located in the area of the SPY claims. The Congdon, (Minfile Number 115G 003) and Bock, (Minfile Number 115G 084), as documented by the Yukon Geological Survey *(Deklerk, 2009)*. A summary of previous work is listed in Table 2.1.

Year	Work	Results
1953	Conwest stake the RAM claims over	Several minor showings of copper-nickel and copper
	headwaters of Halfbreed and Lewis Creeks.	found.
	Program of detailed geological mapping and	
	prospecting.	
1953-54	Staked as Rawhide, Eagle, etc. in Apr-Oct/53 by	
	P. Versluce, H. Versluce and C. Gibbons, who	
	optioned the property in Apr/54 to R. Hide.	
1956	Restaked as Ram cl 1-6 (72751) in Aug/56 by	
	M. McCallion	
1961	Restaked as Eva cl 1-4 (77040) in Oct/61 by D.	
	Carnegie	

Table 2.1 Previous work on the SPY property (after James D., 2017).

Year	Work	Results
1967	Gypsum reported by GSC in 3 localities	Southernmost occurrence staked by AGIP in 1983
1972-73	Restaked as Spy cl 1-12 in Jul/72 by Nickel	Discovery of chalcopyrite and nickeliferous
	Syndicate (Canadian Superior Exploration Ltd,	pyrrhotite in gabbro at the base of the main (Spy)
	Aquitaine, Home Oil Ltd and Getty Mines Ltd).	peridotite sill (McLoughlin and Vincent, 1973).
	Geological mapping and geochemical	
	sampling.	
1986-87	Restaked in Aug/86 by Polestar Exploration Inc,	
	and as Tony cl (YB5915) in Jul/87 by Walhalla	
	Exploration Ltd, which carried out prospecting,	
4000.00	mapping and sampling in 1988.	
1988-89	Polestar conducted geochemical surveying on	Outlined four gold and four platinum and palladium
	the I claims in 1988 and optioned 50% of its	anomalies with values up to 920 ppb Au, 158 ppb Pt
	Interest to Hunter Gold Inc in Jan/89.	and 277 ppb Pd over the Spy ultramatic sill (Giroux
1002	RHW Tomple staked the Achley of (VR27000)	und Wontgomery, 1988)
1993	on Nines creek in Jun/93.	
1994-95	In Oct/94 Inco Ltd staked a block of 508 Klu	
	claims. The claim block covered Minfile	
	Occurrences #115G 003, 084, 098 and 099.	
	Inco staked a second block of 18 Klu claims	
	north of Congdon Creek in Aug/95.	
1994-97	Geological mapping, lithogeochemical, silt,	Delineated sulphide showings, with highly
	heavy mineral sampling and soil sampling in	anomalous PGE grades and significant Ni and Cu,
	1994 and 1995 ( <i>Bell, 1996</i> ), an airborne EM and	over a strike of 3.6 km along the base of the 6 km
	magnetics survey in 1996 (McGowan, 1996),	long Spy Sill. Maximum values from the gabbro at
	followed up by geological mapping, prospecting	the lower contact include 3.1% Ni, 2.8% Cu, 0.2%
	and ground geophysical surveying in 1997	Co, 3.1 g/t Pt, 1.4 g/t Pd and 1.0 g/t Au from grab
2000	(Hattle, 1997), by Inco Ltd.	samples.
2000	santoy Resources Ltd optioned the property	The program outlined massive and disseminated NI,
	chin sampling, prospecting, silt and soil	cu and PGE mineralization associated with a 950m
	camping, prospecting, sitt and son	strike length of the spy sill ( <i>fulk, 2001</i> ).
2005	Klu claims were acquired by Resolve Ventures	Recommends drilling on the Spy sill but more
2005	Re-processing of the 1996 airborne geophysics	information needed to target holes, and blast
	and a brief property visit sampling previously	trenching to uncover the basal contact. (Ligrd and
	identified geophysical features was completed.	Lavigne, 2006)
	The majority of the claim block lapsed in 2007.	
2008	Staked by Tom Morgan as VM claims, with V	Recommends deep auger sampling along contact
	claims added. Reconnaissance program in	areas and exposing fresh contact material by
	2008. Brief mapping and prospecting program	trenching (Morgan, 2009).
	in 2011.(Pautler, 2012)	
2013	Spy claims optioned by Ashburton Ventures	Geophysical review and petrophysical study.
2016	Prospecting, sampling, XRF analysis, 18.5	Recommends drone magnetic survey, blast
	mandays of work using helicopter access in	trenching, chip sampling, prospecting and sampling
2017	September, 2016.	tollowed by diamond drilling.
2017	Reprocessing of airborne magnetic data for	
	NIS 115G by Aurora Geosciences, Open File	
	2017-30	

Summarized form the assessment report by James D., 2017:

The oldest rocks exposed on the Spy project are Pennsylvanian to Lower Permian clastic sedimentary rocks of the Hasen Creek Formation and volcanic rocks of the Station Creek Formation. Both formations are intruded by the Upper Triassic Kluane mafic-ultramafic suite including the Spy sill, which has been the target for exploration since it was discovered in 1972. Maple Creek gabbros intrude the Station Creek and Hasen Creek formations and the Kluane intrusions. The Hasen Creek Formation is overlain to the southwest by the Triassic Nikolai Group volcanic rocks, Triassic to Cretaceous clastic rocks of the Tatamagouche succession, Tertiary Amphitheatre Group sedimentary rocks and Wrangell Lavas.

The Spy sill is located in the southern half of the project and extends for 6-8 kilometres along a northwest trend. The sill is 75 to 100 metres thick and dip varies from 30 to 450 to vertical. At the north end the sill intersects the Bock's Brook mafic-ultramafic intrusions. Ni-Cu-PGE mineralization on the property has historically been associated with the basal marginal gabbro phase of the Spy Sill. Intermittent sulphide showings have been found over a strike of 3.6 km along the base of the Spy sill, of which a 1.5km exposure on the Spy claims has received the most work. These sulphide showings have highly anomalous PGE grades along with significant Ni and Cu.

Recent work at the at the Wellgreen deposit have shifted attention from narrow, rich basal sulphides to bulk tonnage deposits contained in the entire sill and the adjacent country rock. Previous sampling programs at Spy did not include a large component of consistent chip samples across the sill and country rock. Most of the samples are grab samples with no length and work was focused on exploring and evaluating mineralization at the basal contact of the Spy sill and underlying footwall siltstone of the Hasen Creek formation.

The Spy sill is close to being ready for a drill program. The Ni-Cu-PGE values and the consistency of mineralization over the 1.5km exposure are sufficient, but the area needs more ground work to delineate drill targets. The bulk of work should take place on the Spy sill to delineate drill targets, and other work would include prospecting and investigation into prospective areas on the property.

A budget of \$181,100 including the following activities is proposed:

- Drone magnetic geophysics survey
- Chip sampling across the width of the sill and into the country rock.
- Trenching to uncover the sill in areas of low cover.
- Prospecting and mapping the other Kluane mafic-ultramafic intrusions and Skolai Group rocks from the north end of the Spy sill to the northwest end of the claim block.

# 3 Property Description and Location

# 3.1 Location

The SPY Property is located in the Kluane Ranges of the southwestern Yukon, 13km south of the hamlet of Destruction Bay and 250km northwest of Whitehorse (Figure 3.1). The project area is on NTS map sheet 115 G02 and centered at a latitude of 61°08'N and a longitude of 138°45'W. Whitehorse, population 25,000, is well equipped to support the mining industry with general service as well as an available skilled labour force, transportation (the Alaska Highway, Whitehorse airport) and abundant hydroelectric grid power. The property is located within the Kluane & White River First Nations territorial lands.

# 3.2 Mineral Titles

Group Ten Metals Inc. owns 100% of the Spy Property as of December 7, 2017 when the claims owned by Bill Harris were transferred to Group Ten (RW04568). Prior to this transfer, the claims were grouped under certificate HW07638. The SPY 127 – 141 claims were added during a day of staking on August 3, 2017. A mineral tenure summary for the Spy Property is given in Table 3.1 and a map is given in Figure 3.2.

Claims	Grant Number	No. of Claims	Registered owner	Recording Date	Expiry Date
VM 1-32	YC66812 – YC66843	32	Group Ten Metals Inc.	21/02/2008	21/02/2022
V 1-28	YE69339 – YE69366	28	Group Ten Metals Inc.	18/08/2011	21/02/2022
SPY 1-80	YE10801 – YE10880	80	Group Ten Metals Inc.	01/04/2015	01/04/2024
SPY 81-86	YE10881 – YE10886	6	Group Ten Metals Inc.	01/04/2015	01/04/2023
SPY 87-126	YF47275 – YF47314	40	Group Ten Metals Inc.	26/11/2015	26/11/2018
SPY 127-141	YE10911 - YE10925	15	Group Ten Metals Inc.	11/08/2017	11/08/2018
Total		201			

Table 3.1 Mineral tenure summary

# 3.3 Reliance on Other Experts

The author relied on information, maps, geochemical analysis results and interpretations produced by other experts in the fields of geology or geophysics during the preparation of this report.

# 3.4 Permit

A Mining Land Use (MLU) Permit is required to do exploration work on claims in Yukon except for low impact, grassroots activities that are classified as Class 1 activities as defined in the Quartz Mining Act. Group Ten applied for a Class 3 permit (LQ00441), which was granted in July 5, 2016 and is in effect until July 4, 2021. Group Ten have met with the Kluane First Nation Chief and council and staff and keep them apprised of exploration activities in their traditional territory.



Figure 3.1 Location map of the Spy property.



Figure 3.2 Claim map for the Spy property.

## 3.5 Property Legal Status

The Yukon Mining Recorder website (http://www.yukonminingrecorder.ca/) confirms that all claims of the Property as described in Table 3.1 Mineral tenure summary were in good standing at the date of this report and that no legal encumbrances were registered with the Yukon Mining Recorder against the titles at that date. The author makes no assertion with regard to the legal status of the property. The property has not been legally surveyed to date and no requirement to do so has existed. There are no other royalties, back-in rights, environmental liabilities, or other known risks to undertake exploration.

# 4 Accessibility, Infrastructure and Climate,

# 4.1 Accessibility

The SPY claims are located 13 km south of Mile 1110 on the Alaska Highway. The village of Destruction Bay is 13 km to the north and the Yukon capital Whitehorse lies 275 km southeast of the property. Gravel roads up Nines, Bocks and Congdon Creeks provide foot access to lower elevations on the claims while higher elevations require helicopter. Road distances from the property to communities are summarized in the following table:

Table 4.1 Driving distances to the Property.

Location	Description	<b>Road Distance</b>
Whitehorse (pop. 25,000)	Nearest city with services	257 km
Haines Junction	village	85 km
Destruction Bay	village	13 km

### 4.2 Climate

The Nines Creek area features a northern interior climate with long cold winters and low annual precipitation. The exploration season extends from early June until late September with occasional thunderstorms and a few intervals of warm dry conditions.

# 4.3 Local Resources

General and skilled labour is readily available in the City of Whitehorse (population 25,000). The city, 310km by road from the project area, offers year-round charter and schedule fixed wing service (to Vancouver, Edmonton & Calgary). Locally Destruction Bay has a nursing station, fuel, lodging, restaurants, and repair services. Cellular service covers higher elevation portions of the project area. The Kluane first nation is based in Burwash Landing.

### 4.4 Infrastructure

Charter helicopter and fixed wing service are available from Haines Junction or Whitehorse. Commercial accommodation, fuel and meals are available in Destruction Bay, and limited support services and casual labour pool is available from Burwash Landing.

# 4.5 **Topography and Vegetation**

The project area is in the front ranges of the Kluane Mountains southwest of the Shakwak Valley and Kluane Lake. The rocky ridges of the front ranges are deeply incised by the extensive drainages of Nines and Congdon Creeks. Upland areas can be fairly steep featuring talus and outcrop up to 2400m while the valley floor is at 1400m elevation featuring grassy slopes with sparse spruce forest, glacial moraines and fans of gravel and boulders along creek gullies (Figure 4.1). The vegetation on the property is light with spotty black spruce, white spruce on south facing exposures and alder willow with sub-alpine flora found at and above the timberline.



Figure 4.1 Photo showing the topography of the Spy property.

# 5 Geological Setting and Mineralization

# 5.1 Regional Geology

The SPY property is located in the Kluane Ranges, underlain by mafic volcanic rocks of island arc and ocean floor genesis (Wrangellia Terrane) with thick assemblages of overlying oceanic sedimentary rocks that range in age from 400 to 220 million years old (Figure 5.1).

The Wrangellian Terrane is characterized by widespread Triassic flood basalts and complementary mafic intrusive rocks which are believed to have originated by in a mantle plume which erupted onto the extinct Pennsylvanian and Permian Sicker-Skolai island arc (Carne, R. 2001). The Upper Triassic Nikolai Formation forms a discontinuous linear belt extending across southwest Yukon and is characterized by basal conglomerate and/or volcanic breccia, amygdaloidal basalt and andesitic flows and local tuff, breccia, shale and limestone. The Nikolai Formation was initially mapped in the area by Kindle (1976) as partly serpentinized peridotite, talc schist and green serpentine schist of Lower Cretaceous or later age (Figure 5.2).

The SPY property lies within the Kluane Ultramafic Belt, a 600km long belt of rocks in the southwest corner of the Yukon that are characterized by mineralized mafic to ultramafic Triassic aged sills known as the Kluane mafic-ultramafic suite. The Kluane Ultramafic Belt extends from northern BC into Alaska and hosts magmatic Ni-Cu-PGE (+/- Au) deposits and occurrences. It is the second largest Ni-Cu-PGE mafic-ultramafic belt in North America after the Circum-Superior Belt in central Canada (Hulbert, 1997).

Topographically, the Kluane Ultramafic Belt is in the Kluane Ranges which are foothills to the St. Elias Mountains that range along the Yukon-Alaska border. The ultramafic rocks are distinctively coloured (glossy black to dark brown or light green to pale grey when altered) and can be seen as distinctive linear features. The dominant structural direction, controlled by the major Duke River and Denali faults, ranges in orientation from 290° to 310°. Movement of Wrangellia northwards along the Denali Fault began in the Tertiary and continues today. The fault is steeply dipping and the order of displacement may be 100s of kilometres. The Duke River Fault is also near vertical and joins the Denali Fault southwest of Haines Junction. Between the major faults small scale faulting is common and faults increase in number to the southeast. Major fold axes are oriented in the same dominant northwest direction. The folds are tight and inclined to the southwest. A later folding episode has refolded the strata at right angles to the dominant direction along northeast axes (Carne, 2001).



Figure 5.1 Regional geological setting of the Spy Project.

The Kluane mafic-ultramafic sills are elongated cumulate bodies than are postulated to be the crystallized magma chambers that fed the overlying Triassic Nikolai basalts. The sills are layered, with a thin rim of gabbro around the margins grading into an ultramafic core of peridotite and dunite (Hulbert, 1997). The width of the sills ranges from less than 10 to 600m and they can cover up to 20 km in strike length. The sills intrude the older Pennsylvanian to Permian Skolai Group near the contact between the lower Station Creek Formation and the overlying Hasen Creek formation. Most of the sills are poorly exposed and some are deformed and altered by faults. Nickel and Copper values increase from east to west along the belt. Compared to other Ni-Cu-PGE deposits worldwide, the belt is known for having high concentrations of PGEs such as Osmium, Iridium, Ruthenium and Rhodium and high Platinum to Palladium ratio (James, 2016).

The Skolai Group contains the oldest rocks in the ultramafic belt, the Station Creek Formation a sequence of volcanic and volcaniclastics rocks with increasing sedimentary content in the upper half. In the upper 400m of the Station Creek formation, shale siltstone, limestone and argillite are interbedded with fine grained tuff layers that decrease in abundance upwards. The contact with the overlying Hasen Creek Formation is gradual and is placed at the top of the tuff layers. The Hasen Creek Formation is a subaqueous sequence consisting of shale, cherty argillite, chert and siltstone grading up into limestone, conglomerate, greywacke and sandstone.

Sill-like gabbroic bodies of the Maple Creek Gabbro intrude the Hasen Creek Formation. They are generally found higher in the sequence than the ultramafic sills and may be feeders to the Nikolai volcanics. Maple Creek gabbros can be distinguished from Kluane gabbros because they do not grade into peridotite or dunite, can be finer grained and may display columnar jointing. They also are not associated with Ni-Cu-PGE mineralization (James, 2016).

The upper Triassic Nikolai Group is widespread consisting of basalt flows and pillow lavas with local interbedded limestone, unconformably overlying the Hasen Creek formation. The likely sources of the Nikolai volcanics are magma chambers represented by the Kluane ultramafic sills and feeders represented by the Maple Creek Gabbro.



Figure 5.2 SW Yukon Exposure of Flood Basalt of the Triassic Nikolai Formation (from Greene, A.R., S. Coates, J.S., Weiss, D., and Israel, S., 2005.)

Q – Quaternary	Unconsolidated alluvium, colluvium and glacial deposits.
NW Miocene to	NW1 -Extensive volcanic unit, volumetrically significant but not associated with
Pliocene Wrangell	mineralization.
Lavas	Occur on the southwest side of Wrangellia overlapping onto the Alexander Terrane.
	Abundant west of the Donjek River and typically form piles 400-1000m thick.
	Mafic to felsic volcanic rock with
	NW2 – volcanic conglomerate.
MW Mid to late	Youngest intrusions in the area. Related to the Wrangell Lavas. Felsic to mafic
Miocene Wrangell	composition.
Suite	
OT Oligocene	Homogeneous granite with lesser granodiorite, diorite and gabbro. Subvolcanic
Tkope Suite	rhyolite, rhyodacite and dacite.
Kgd, Kd, Kg late	Found along the length of the ultramafic belt but are more prevalent in the north.
Early Cretaceous	Medium to coarse-grained, biotite-hornblende granodiorite, quartz diorite, quartz
Kluane Ranges	monzonite and hornblende diorite. Minor diorite and gabbro.
Suite	
uTrC upper Triassic	Conformably overlies the Nikolai Group, varying in thickness from zero to several
Chitistone	hundred metres.
	Argillaceous limestone and argillite; massive limestone, limestone breccia and well-
	bedded limestone, gypsum and anhydrite. (McCarthy, Chitistone and Nazina
	limestone)
uTrNv upper	uTrN3 – thinly bedded grey limestone and argillite.
Triassic Nikolai	uTrN2 – dark green to maroon amygdaloidal basalt and basaltic andesite flows,
formation	locally pyroxene and plagioclase phyric. (Nicolai Greenstone)
	uTrN1 – light to dark green volcanic breccia, pillow lava and basal conglomerate.
LTrK late Triassic	Preferentially intrudes at or near the Hasen Creek-Station Creek contact.
Kluane Ultramafic	LTrK1 - peridotite, dunite and clinopyroxenite, layered intrusions, locally with
Suite.	gabbroic chilled margins.(Kluane-type mafic-Ultramafics Gabbro-Diabase Sills)
	LTrK2 - Maple Creek gabbro. Fine to coarse grained diabase and gabbro sills and
	dykes. Intrudes the Skolai Group and locally the Kluane ultramatic suite.
PH lower Permian	PHp – fine-grained clastic rocks. Lower part contains volcaniclastics, rare basalts,
Skolai Group -	rare chert beds and chert-pebble conglomerate.
Hasen Creek Fm.	PHc – limestone, locally fossiliferous, massive to bedded.
PSv Mississippian	PSv-undifferentiated Skolai Gp; includes Hasen and Station Creek formations
to Pennsylvanian	PSvb - Dark green basalt flows, pillows, pillow breccia, local magnetite-rich jasper.
Skolai Group-	PSvt – bedded to massive chert, tuff
Station Creek Fm.	PSv – interbedded volcanic breccia, volcaniclastics; minor basalt flow.
	PSvt – laminated volcanic tuff and volcanoclastic siltstone.

Table 5.1 Table of formations (Units and descriptions modified from the Yukon Geological Survey digital geology map (Open File 2016-1).

### 5.2 **Regional Mineralization**

There are four main types of Ni-Cu-PGE mineralization in the Kluane Ultramafic Belt found in all the mineralized sills from southeast Alaska to northern B.C. (Hulbert, 1997):

- 1. Basal accumulations of massive sulphides
- 2. Disseminated sulphides at the gabbro-ultramafic contact in each intrusion
- 3. PGE and Au rich zones associated with hydrothermal quartz-carbonate alteration at the edges of the sills and extending into the country rock.

 Disseminated and lesser net textured or massive sulphides in the ultramafic core of each sill.

Two other types of mineralization have a limited range (Hulbert, 1997):

- 1. Skarn ores developed in Permian carbonates at Wellgreen.
- 2. Ni-rich ores within the footwall in the White River sill.

The most common sulphide minerals are pyrrhotite, pyrite, pentlandite and chalcopyrite; the common oxide minerals are magnetite and ilmenite. Figure 5.3 below illustrates a typical, simplified ultramafic sill. The best known deposit and the sole producer in the belt is Wellgreen Platinum's Wellgreen Deposit (Minfile 115G024). At Wellgreen the platinum group metals combine with As, Sb, Te, Bi, Ni, S, Co and Fe to form minerals and alloys. Sperrylite (PtAs<sub>2</sub>) and Sudburyite (PdSb) are two of the more abundant minerals (Hulbert, 1997).



Figure 5.3 Deposit model for the Kluane Belt (modified from Hulbert, 1997).

### 5.3 Property Geology

The property geology and structure has been summarized by James, D., 2017 from previous investigations, see Figure 5.4:

The oldest rocks exposed on the Spy property are clastic sedimentary rocks of the Hasen Creek Formation and Station Creek Formation, both Pennsylvanian to Lower Permian Skolai Group and exposed along the length of the claim block. The strata trend northwest and dip at an average of 40° southwest. The Hasen Creek Formation is intruded by Late Triassic mafic to ultramafic sills of the Kluane mafic-ultramafic suite, including the Spy sill. A significant band of limestone within the Hasen Creek Formation

is mapped below the Spy sill and additional similar limestone bands occur above the sill. Maple Creek gabbros intrude the Station Creek formation and ultramafic rocks.

The Hasen Creek Formation is overlain by the Triassic Nikolai Group volcanic rocks, Jurassic to Cretaceous clastic rocks of the Tatamagouche succession, Tertiary Amphitheatre Group sedimentary rocks and Wrangell Lavas. The Wrangell Lavas which dominate in the southwest of the property consist of rusty, red-brown basaltic andesite flows, interbedded with felsic tuff. On the northwestern edge of the project is the semi-circular Bock's Brook stock, a Wrangell Suite intrusion of diorite to gabbro composition.

The Spy sill is in the southern half of the claim block and intrudes Hasen Creek siltstone for 6-8 kilometres along a northwest trend, extending off the property at the south end. The sill is 75 to 100 metres thick. Dip is variable, interpretation of magnetic data suggest it ranges from 30 to 45° at the Spy Showing to vertical at the southeast and northwest ends (Bell, 1996). Contacts with the country rock are sharp and often sheared, accompanied by local hornfelsing, silicification and sulphide mineralization. At the north end the sill intersects the Bock's Brook mafic-ultramafic intrusions. The northern 4 km of sill are more diffuse than the southern portion and are dominated by gabbro.

The Spy sill is composed of peridotite, gabbro and anorthositic gabbro members, which form sub-parallel moderately dipping units. Peridotite forms the central phase of the sill and measures approximately 35 to 60 metres in thickness. It is generally unserpentinized, fine to medium grained, black, and feldspathic. Marginal gabbro, between 2 to 50 metres thick, occurs at the top and base of the peridotite unit and varies in composition between gabbro and melagabbro. The contact between the marginal gabbro and the peridotite is generally gradational over several metres. Both the marginal gabbro and peridotite units are intruded by an anorthosite to anorthositic gabbro which occurs locally as a 10 to 15 m thick, concordant to cross-cutting sill with gabbroic margins. The anorthositic gabbro is light grey, fine to medium grained and generally contains 2 to 4% finely disseminated pyrite and pyrrhotite. Thin anorthosite seams within peridotite have also been noted south of the Spy showing and highlight small scale block faulting.

Maple Creek gabbro sills intrude the Spy sill and occur stratigraphically above and below it. The most continuous Maple Creek gabbro sill occurs 230 metres down-section from the base of the peridotite and is up to 160 metres thick. This sill is intermittently exposed over a 10-kilometre strike. The northwestern end of the Spy sill is cut by a 200-metre thick section of Maple Creek gabbro. Elsewhere, smaller bodies of Maple Creek gabbro also cut and form lens shaped bodies within the peridotite. Maple Creek gabbros are typically barren of mineralization.

The Bock's Brook intrusions are in the northern half of the claim block and are only partly covered by Spy claims. The southernmost intrusion is the largest peridotite intrusion on the property, measuring 500m at its thickest extent. The thickness may be exaggerated

by repeated fault slices, but there appears to be at least one smaller sill below the main sill. The peridotite is serpentinized and fault bounded along the northern contact.

The Lewis intrusions are located at the northwest end of the claim block. There are three intrusions of relatively unserpentinized peridotite to pyroxenite composition intruding Hasen Creek Formation sediments. Only part of one intrusion is covered by the Spy claims. They are in an extremely rugged area which has made exploration difficult.

All the above units are locally overlain by Quaternary unconsolidated glacial, glaciofluvial and glaciolacustrine deposits and ice.

Quaternary material in the valley bottoms of Nines Creek, Bock's Brook and Lewis Creek obscures much of the structure, but it appears to consist of several fault bounded slices of folded Paleozoic and Mesozoic strata, overlain by gently dipping Tertiary rocks. Bounding faults trend northwest, parallel to the regional Denali Fault and appear to have a steep dip. Axial planes of folds are also northwest with a steep dip; axes are assumed to be near horizontal.



Figure 5.4 Property Geology Map & Legend (from James, D., 2017).

#### **Geology Legend**

### **Yukon Faults**

- --- strike slip, dextral, approximate MID TO LATE MIOCENE
- thrust, , approximate
- -- thrust, , covered
- unknown, , approximate
- -- unknown, , covered
- unknown, , defined
- -- unknown, , inferred
- Folds

### Yukon Bedrock Geology

MW: WRANGELL SUITE: fine to medium grained, hornblende biotite granodiorite and porphyritic (K-feldspar) hornblende granodiorite; medium grained, uniform biotite diorite and pyroxene gabbro; subvolcanic hornblende biotite rhyolite, rhyodacite, dacite, and trachyte (Wrangell Suite)

#### **MIOCENE TO PLIOCENE**

NW1: WRANGELL LAVAS: rusty red-brown, phyric and non-phyric basaltic andesite flows (minor pillow lava), interbedded with felsic tuff, volcanic sandstone and conglomerate; acid pyroclastics related to intra-Wrangell intrusions; thin basaltic andesite and andesite flows (Wrangell Lavas)

#### PALEOCENE TO OLIGOCENE

OA: AMPHITHEATRE: yellow-buff to grey-buff sandstone, pebbly sandstone, polymictic conglomerate, siltstone, mudstone; minor brown-grey carbonaceous shale and thin lignitic coal; mostly fluvial and lacustrine deposits, local debris-flow deposits; some shallow marine (Aphitheatre ; Kulthieth)

#### **CRETACEOUS AND (?) OLDER**

KK1: KK: KLUANE SCHIST: undivided

#### LATE TRIASSIC AND (?) OLDER

LTrK2: MAPLE CREEK: gabbro

LTrK1: KLUANE: mafic to ultramafic intrusions

#### UPPER TRIASSIC

uTrN2: NIKOLAI: basalt, andesite

uTrN1: NIKOLAI: basal conglomerate

uTrM: MC CARTHY

uTrKT: TATAMAGOUCHE

uTrC: CHITISTONE: thin interbedded light to dark grey argillaceous limestone and dark grey argillite; massive light grey limestone, limestone breccia and darker grey, well-bedded limestone; white to creamy-white gypsum and anhydrite (McCarthy, Chitistone and Nizina limestones)

#### **PENNSYLVANIAN TO (?) LOWER PERMIAN**

CPH2:SKOLAI/HASEN CREEK: carbonate

CPH1: SKOLAI/HASEN CREEK: siltstone, mudstone, sandstone

CPS5: SKOLAI/STATION CREEK: volcanic breccia

CPS1: SKOLAI: undivided Skolai Gp., Station Creek and Hasen Creek fms.

#### **DEVONIAN TO UPPER TRIASSIC AND (?) OLDER**

DTrI2: ICEFIELD: white to creamy-white gypsum and anhydrite; thin-bedded to massive, light grey to dark bluish-grey limestone or marble; minor dark grey calcareous argillite, calcareous siltstone-sandstone; local buff-grey crinoidal limestone

DTrI3: ICEFIELD: dark green (locally purple), porphyritic (augite) and non-porphyritic basaltic to andesitic flows and pillow lava; local volcaniclastic sediments, agglomerate, breccia, cherty tuff, grey limestone or marble, gypsum and basic intrusions

#### SILURIAN AND DEVONIAN

SDB1: BULLION: massive to well-bedded light grey limestone or marble, thin-bedded dark grey limestone or marble; minor dark blue-grey calcareous argillite or phyllite (Bullion Creek Limestone)

#### LOWER ORDOVICIAN TO DEVONIAN AND (?) OLDER

ODG2: GOATHERD: dull rusty-buff or green-grey greywacke siltstone-sandstone, and argillite or phyllite; minor grit; rarer limestone, pebble conglomerate, conglomerate; locally includes quartzite

#### **CAMBRIAN TO ORDOVICIAN AND (?) YOUNGER**

COD1: DONJEK: massive to well-bedded, coarse- to medium-grained greywacke; minor siltstonesandstone, argillite, phyllite or schist, and basic intrusions; conglomerate, basic flows (some pillowed), pyroclastics(?), and volcanic breccia; greenstone, amphibolite (N. Alsek Ranges Greywacke-Gabbro assem.; Donjek Range Greywacke-Greenstone assem.; Field Creek Volcanics)

### 5.4 Mineralization

Mineral occurrences on the SPY property have been summarized by James, D., 2017 as follows:

"The Spy property covers the Congdon/Spy 115G003 mineral occurrence and two of three locations for the Bock 115G084 minfile occurrence as documented by the Yukon Geological Survey. The Congdon/Spy occurrence is the Spy Sill and the Bock occurrences were originally gypsum showings, but have been reclassified as Ni-Cu-PGE (Au) showings.

Ni-Cu-PGE (Au) mineralization is associated with the basal marginal gabbro phase of the Spy Sill, a northwest trending sill which contains the original Spy Showing. Intermittent sulphide showings occur over a strike of 4 km along the base of the 6-8 km long sill. These sulphide showings have anomalous PGE grades along with significant Ni and Cu.

Most Ni-Cu-PGE mineralization is associated with the basal contact of the Spy Sill and the footwall Hasen Creek siltstone, but disseminated lower grade mineralization is also found throughout the entire sill and into the country rock on either side. Numerous mineral occurrences have established the presence of both narrow massive sulphide lenses and disseminated mineralization within the contact zone. Host rocks include gabbro and peridotite phases of the sill as well as footwall siltstone. Several showings of massive and disseminated mineralization occur intermittently over a strike length of 1.5km between the 99 and Sweet 16 showings. Between Nines Creek and Congdon Creek, the Solo and South Spy showings suggest that mineralization continues at the south end, but steep terrain makes access difficult and this area has not received much work. A description of the Spy sill showings follows, listed in order from northwest to southeast. See figure 6.5 for the locations of showings. No significant Ni-Cu-PGE showings on Group Ten claims have been found at intrusions other than the Spy Sill although only a limited amount of work has been done elsewhere."

Named mineral occurrences described by James, D., 2017 are listed below in Table 5.2 (see Figure 5.5 for showing locations):

Occurrence	Location UTM	Description
SPY	621100E 6780350N	The Spy showing consists of massive chalcopyrite-pyrrhotite lenses, up to 2.0 by 0.25 metres, occurring in sediments at the base of the Spy sill. The host siltstone is weakly altered, but highly fractured with chalcopyrite-pyrrhotite mineralization occurring along the fractures. Inco took a grab sample that returned spectacular values of 75.8 g/t Pt, 7.9 g/t Pd, 7.0 g/t Au, 10.4% Cu and 2.6% Ni, but this sample has not been replicated. Santoy's best sample returned 7.07 g/t Pt, 1.33 g/t Pd, 0.693 g/t Au, 0.45% Cu and 0.16% Ni over 1.0m, open in all directions, but there is a question as to whether Santoy relocated the Spy showing previously sampled by Inco.
	South of SPY	

Table 5.2 Spy mineral occurrences (after James, D., 2017).

Occurrence	Location UTM	Description
99 Showing	621500E 6779850N	The 99 Showing occurs in talus and subcrop of rusty peridotite with 10% net textured or fracture controlled and vug-filling sulphides (pyrrhotite>pentlandite>chalcopyrite) 10m above the basal gabbro contact. Downslope is another medium grained gabbro unit with 2-5% pyrrhotite/pentlandite, minor chalcopyrite and local malachite and azurite. The best samples from 2016 contained 0.587 g/t PGE+Au, 5122 ppm Cu, 469 ppm Ni, and 43 ppm Co and 0.302 g/t PGE+Au, 2047 ppm Cu, 1263 ppm Ni and 163 ppm Co. Fifty metres to the east the sill is buried under talus. Inco collected a grab sample approximately 120m upslope from this area which returned 4.750 g/t Pt, 1.910 g/t Pd, 2.610 g/t Au, 0.28% Cu and 2.91% Ni. Santoy were not able to locate the sample. Interestingly, the sample was taken at a gabbro-siltstone contact above the peridotite from an underexplored horizon.
Solo Showing	622400E 6779300N	The Solo Showing is on the east side of Nines Creek in a fault zone perpendicular to the contact between the Spy sill and Hasen Creek sediments. Mineralization is found in the peridotite, gabbro, sediments and contact hornfels. The ultramafic has been altered to a listwanite with carbonate veining, and trace Cu oxides. Gabbro lenses within the ultramafic are mineralized with blebs of pyrrhotite, pentlandite, and chalcopyrite with limonite staining. Sediments are rusty, altered and fractured with minor Cu oxides and disseminated sulphides. The best samples ran 1.542 g/t PGE+Au, 3130 ppm Cu, 7636 ppm Ni and 276 ppm Co and 2.182 g/t PGE+Au, 1694 ppm Ni, 1367 ppm Ni and 74 ppm Co.
SPY South- Central	622500E 6779200N	This is an area not a specific showing. It refers to the strike extension of the Spy sill south of the Spy Showing into the southern Nines Creek valley. The area is extremely rugged and difficult to access. The sill can be seen in outcrop trending across the cliff. Two new showings were prospected in this area in 2016, the 99 Showing and Solo Showing.
	North of SPY	
Bugs	621000E 6780500N	The Bugs showing is located approximately 200 metres northwest of the Spy showing and consists of two outcrops of silicified gossanous siltstone in contact with mineralized marginal gabbro. The siltstone is strongly malachite stained and hosts 10 cm wide massive chalcopyrite-pyrrhotite veins in several orientations. The best grab sample was 3.954 g/t Pt, 1.248 g/t Pd, 0.342 g/t Au, 3.66% Cu and 1.44% Ni over 0.9m. Santoy collected a continuous chip over 2.8m with a weighted average of 2.613 g/t PGE+Au, 1.60% Cu and 0.77% Ni.
Wylie	620900E 6780540N	At the Wylie showing mineralization occurs in sulphide net textured marginal gabbro, malachite-stained, footwall siltstone with disseminated chalcopyrite and pyrite, and massive sulphide veins in marginal gabbro. A 4.4m chip sample returned a weighted average of 1.01 g/t PGE+Au, 1.17% Cu and 0.23% Ni. Between the Wylie and Bug showings, mineralization is common but not continuous.
Taz	620700E 6780680N	The Taz showing consists of strongly malachite altered siltstone downsection of the gabbro contact. Thick scree in the area covers the gabbro contact. A hand trench over the siltstone was sampled for its entire 5.5 metre length with the most significant mineralization being a 1.5m chip that returned 1.324 g/t Pt, 0.701 g/t Pd, 0.489 g/t Au, 0.25% Cu and 0.38% Ni. The Taz was revisited in 2016.
21 Again	620350E 6780800N	The 21 Again showing is a semi-massive pyrrhotite skarn up to 3 m occurring at the contact of limestone, limey shales and gabbro, located between the Sweet 16 and Taz showings and approx. 230m up section in an overlying gabbro unit. It may be part of the same horizon as Claim Post. The mineralization was traced for over 50 metres and then into talus cover. A composite chip was taken by Santoy, but contained only 77 ppb Pt, 68 ppb Au and 604 ppm Cu.

Occurrence	Location UTM	Description
Sweet 16	620500E 6781050N	The Sweet 16 showing is located northwest of the Taz Showing and consists of one small outcrop and several small pits over a 100m area. Extensive talus cover extends between the Taz and Sweet 16 showings. Mineralization is disseminated net-mesh textured pyrrhotite>pyrite>chalcopyrite in a marginal gabbro at or above the siltstone contact. The best result was a 1.2m chip containing 1.850 g/t Pt, 1.554 g/t Pd, 1.071 g/t Au, 0.12 % Cu and 0.03% Ni. Several grab and chip samples collected by Santoy and Inco in the area contain values ranging from 0.5-2.1 g/t combined PGE+Au, but a lack of outcrop has limited understanding of the extent of mineralization. This showing was revisited in 2016.
Claim Post	620250E 6781200N	The Claim Post showing is one of several pyrrhotite-magnetite horizons found above the Spy Sill. At Claim Post a 4m thick pyrrhotite horizon is hosted by silicified siltstone and capped by magnetite and gabbro. Minor magnetite and chalcopyrite occur within the pyrrhotite. Copper values from historic samples were in the 0.1 to 0.3% range, cobalt values were 33-640 ppm. Nickel values reached a maximum of 520ppm and PGE values were low (Bell, 1996).
	North of main Spy sill	
Spy North	619700E 6781900N	Spy North covers the sill from the Claim Post showing northwest to its intersection with the Bock's Brook intrusions. The sill kinks north in this section and heads down into the Nines Creek valley where it can be traced through scattered outcrops. Part of this area was prospected and sampled in 2015 and 2016. There is some evidence that a parallel gabbro sill continues directly northwest from where the sill kinks. A subtle discontinuous trend of moderate conductivity parallel to the sill suggests the presence of gabbro that continues northwest parallel to the strong linear magnetic high that defines the sill. In 2015, a prospecting traverse along a ridge that intersected this trend passed through Nikolai basalts and andesite dykes.
Bock's Brook	615442E 6785036N	Previous work needs to be researched and compiled for this area, but the amount of work and number of samples is limited. The ruggedness of the terrain and the higher results from the Spy sill have diverted attention away from this area. INCO collected samples from three intrusions and country rock in this area. The southernmost intrusion extends onto the Spy claims and contained the best overall sample of the three intrusions at 674 ppm Ni, 289 ppm Cu, 65 ppm Co, 15 ppb Pt, 26 ppb Pd and tr Au. Santoy spent one day in the area and collected no anomalous PGE samples, but did find one sample of float with 20% pyrite and chalcopyrite that assayed 0.85% Cu. No bedrock source was located.
Lewis	610180E 6790000N	The Lewis Intrusions at the northwest end of the claim have also not received much work. INCO collected 12 samples from two intrusions in this area. All samples were collected outside the current spy claim area. The best sample assayed 1585 ppm Ni, 4360 ppm Cu, 105 ppm Co, 580 ppb Pt, 296 ppb Pd and Au from the westernmost intrusion. Limited sampling on the eastern intrusion which extends onto the SPY claims returned Ni in the 59-361 ppm range, Cu in the 59-361 ppm range, Co in the 35-99 ppm range and trace PGE values.
Bock Minfile	613193E 6790170N	The original Bock minfile occurrences were originally recorded as gypsum showings from 1967. The deposit type was later updated to Gabbroid Ni-Cu once the focus of investigation changed. Bell, 1995 records fault slices containing gypsum along the tributary creek below on the Bock's Brook ultramafic intrusions and 2m by 3m by 1m rafts of gypsum in Nikolai basalt north of the ultramafic intrusion. This area corresponds roughly with the recorded location of 115G084C.



Figure 5.5 Named mineral occurrences, Spy central & south area.

# 6 Work Program: Geological Survey

Recent expenditures on the SPY property are summarized as follows:

2017 Exploration Program, Aug. 24, 2017: prospecting, geological mapping, rock sampling: \$8,245.14.

A Longford Field Crew mobilized to the SPY claims on Aug. 24, 2017 utilizing a Trans North helicopter for access. Field personnel included: project manager James Rogers and geologist Ryan Versloot. Local supplies, services and fuel were obtained from Destruction Bay and Burwash Landing.

## 6.1 Geological Survey, Rock Sampling

Four rock samples were collected on the traverses, summarized in Table 6.1 and locations are shown in Figure 6.1. Samples were sent to Bureau Veritas in Whitehorse to undergo fire assay fusion and aqua regia digestion ICP-ES analysis.

Sample No.	Easting	Northing	Sample Source	Au_PPB	Cu_PPM	Ni_ PPM
K896670	619777	6781365	grab	82	3	15
K896671	619781	6781428	grab	3	59	150
K896672	620589	6781033	grab	8	219	1411
K896673	620567	6780938	grab	11	133	1985

Table 6.1 Sample summary of 2017 prospecting.



Figure 6.1 2017 Geosites and samples.

# 6.2 Geophysical Interpretation

In July 2017, Aurora Geosciences Ltd. released reprocessed geophysical imagery for map sheet 115G02 (Figure 6.2). Magnetic highs in the southeast of the project area correspond strongly with the mapped ultramafic sill which has been the subject of most of the work on the property so far. The magnetic high in the north west of the property has been less explored and may help direct future prospecting mapping and prospecting.



Figure 6.2 2017 aeromagnetic reprocessing: reduced to pole tilt derivative.

# 7 Interpretation and Conclusions

Previous exploration on the Spy property has outlined numerous showings with sulphide mineralization in ultramafic sills, gabbro and surrounding sedimentary rocks. The Spy sill remains the primary target for exploration to delineate drill targets (James, D., 2017).

Other work recommended by James, D. (2017) include "prospecting and investigation into prospective areas on the property. Activities include:

- Drone magnetic geophysics survey
- Chip sampling across the width of the sill and into the country rock.
- Trenching to uncover the sill in areas of low cover.
- Prospecting and mapping the other Kluane mafic-ultramafic intrusions and Skolai Group rocks from the north end of the Spy sill to the northwest end of the claim block.

The Spy project can be broken into three areas that require similar work. Area 1 covers the 5.5 km section of the Spy sill from the Claim Post showing southeast to Congdon Creek. It contains the 1.5km exposed section between the Sweet 16 and 99 Showings and is the area of the property closest to being a drill target. This area will receive the most intensive work.

Area 2 continues from the end of Area 1 northwest for approx. 6km, stopping north of Nines Creek. In the southern half of Area 2 the Spy sill kinks north but ultramafic rocks have been mapped by Polestar and Pautler (2011) continuing straight northwest. Polestar also report anomalous rock samples from grid sampling over this area. The 1996 airborne geophysics clearly traces the sill as a linear magnetic high that turns north at 619500E, but subtle, secondary conductive features associated with patchy magnetic highs parallels the Spy sill to the northwest.

Area 3 covers the northwest end of the claim block. It covers a large area of territory, approx. 1000 hectares that has received very little work. INCO mapped the area, but sampling was limited and there do not appear to be any chip samples. Kluane suite mafic-ultramafic intrusions occur within this area – the Bock's Brook and Lewis intrusions, including the thick (up to 500m) southern Bock's Brook sill that is thickened by fault repetition. There is a large area of prospective Skolai Group mapped in Area 3, although Quaternary cover obscures much of the area."



Figure 7.1 Areas recommended for follow up on the Spy property.

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# 8 Recommendations

Table 8.1 Recommended work program for the Spy property from James, D. (2017).

### Spy project budget

### First Phase - geochemical database, drone magnetic survey

			unit	
	amount	time	cost	total
geologist	1	3	500	\$1,500
GIS technician	1	8	350	\$2,800
Drone magnetic survey				\$10,000
helicopter	1	4	1,600	\$6,400
total				\$20,700

### Area 1 - Spy sill chip sampling and trenching - 12 days

	rock samples	300		45	\$13,500
Geochemistry	soil samples	100		35	\$3,500
	rare PGEs assay	10		150	\$1,500
	senior geologist	1	12	500	\$6,000
Labour	jr geologist	1	12	400	\$4,800
	field technician	2	12	350	\$8,400
	blaster	1	6	400	\$2,400
	blaster's assistant	1	6	275	\$1,650
	camp costs	1	60	150	\$9,000
Camp, travel,	fuel		12	200	\$2,400
logistics	truck	2	12	50	\$1,200
	helicopter	1	10	1600	\$16,000
Supplies	blasting - powder, b-line, amex,				
Supplies	caps				\$3,000
total cost area 1	L				\$73,350

### Area 2 - North end of Spy sill exposure to Bock's Brook intrusion - 5 days

Coochomistry	rock samples	50		45	\$2,250
Geochemistry	soil samples	50		35	\$1,750
	senior geologist	1	5	500	\$2,500
Labour	junior geologist	1	5	400	\$2,000
	field technician	2	5	350	\$3,500
	camp costs	1	20	150	\$3,000
Camp, travel,	fuel	1	5	200	\$1,000
logistics	truck	1	5	50	\$250
	helicopter	1	10	1600	\$16,000
total cost area	2				\$32,250

# Area 3 - North end of claim block - 3 days

	rock samples	75		45	\$3,375
Geochemistry	soil samples	50		35	\$1,750
	senior geologist	1	3	500	\$1,500
Labour	prospector	1	3	350	\$1,050
	jr geologist	1	3	400	\$1,200
	camp costs	1	12	100	\$1,200
Camp, travel,	fuel		3	200	\$600
logistics	truck	1	3	50	\$150
	helicopter	1	10	1600	\$16,000
total cost area	3				\$26,825
Subtotal - field contingency 15	% Field Total				<b>\$153,125</b> \$22,969 \$176,094
	Report Writing and GIS				\$5,000
Entire program	1				\$181,094

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# 10 Statement of Qualifications

i, Graham Davidson, with business address at 53 Grandin Woods, St. Albert, Alberta T8N 2Y4 hereby certify that:

- I am a practising Geologist, resident in St. Albert, Alberta;
- I am a member in good standing with Association of Professional Engineers, Geologists and Geophysicists of Alberta (# 42308);
- I hold a Bachelor of Science (Honours) degree in Geology (1982) from the University of Western Ontario;
- I have practiced my profession as a geologist since graduation;
- I have no direct or indirect interest in the SPY property, which is the subject of this report.
- I have based this report on:
  - Field work conducted by exploration contractors under my direct supervision
  - Historical research into past operations on and adjacent to the subject claims
- I consent to the use of this report for any Filing Statement, Statement of Material Facts, or support document.

Graham Davidson P.Geol.



Member Signature

Jay Nagendran, P.Eng. Registrar & CEO

	Sample				Sample	Sample						Grain	
Site No.	No.	Easting	Northing	Date	Туре	Source	Lithology	Colour	Alteration	Alt Int	Magnetism	Size	Description
SPY1	K896670	619777	6781365	8-24-2017	grab	outcrop	Gabbro	Dk grey			strong	vfg	litho above sill, heavy, mostly magnetite minor diss sulph, weakly
SPY2	K896671	619781	6781428	8-24-2017	grab	outcrop	Gabbro	Dk grey	serpentinized	weak	none	mg-cg	serpentinized, no magnetism hasen creek tuff contact with
SPY3		619853	6781915	8-24-2017			Tuff						gabbro, good measurement
SPY4		619494	6782143	8-24-2017			Seds	Rusty					finely laminated seds contact between gabbro and
SPY5		619457	6782155	8-24-2017			Contact						hasen creek sweet 16 area, black and strongly serpentinized, no obv
SPY6	K896672	620589	6781033	8-24-2017	grab	float	Ultramafic	black	serpentinized	strong	mod	vfg	sulph
SPY7	K896673	620567	6780938	8-24-2017	grab	outcrop	Ultramafic	black	serpentinized	strong	mod	vfg	like previous but from outcrop

2018-05-01

# APPENDIX B:

Statement of Costs

DATE:

April 26, 2018



SEND TO:

Group Ten Metals Inc. #904-409 Granville Street Vancouver, 8C Canada VSC 172 604-357-4790 Longford Exploration Services Ltd. #460-688 West Hastings Street Vancouver, BC Canada V68 1P1 778-809-7009

#### SPY Recon 2017 Cost Summary

Personnel		Durys	Ra	te	1	Line Total
Project Manager - Rogers	August 24	1	S	800.00	\$	800.00
Geologist-Versipot	August 24	1	\$	500.00	S	500.00
					\$	-
					5	
				Cat Tabal	¢	1 300.00
Front and the define		Linite		Rate		line Total
Fond and Longing		UNIS.	1	407 85	6	407.85
Rooms, Food and Groceries		-	1	Cat Total	¢.	402.85
Tracconstation		Units/Days	100	Unit Price		Line Total
	1 kee with cafety and recovery rear	1	C	140.00	<	140.00
Truck	1 ton who salety and recovery gea	1	1	50.00	6	50.00
Trailer	18 YOODD COVERED FIRME	500	te	0.55	é	275.00
Puel	per kni für truck		1	1 450 000	0	1,650,00
Long Kanger	Transivoren	100	12	1,030,00	e	120.00
Jet Foel		100	13	Cat. Total	C I	2,245.00
Faulant ant Pantals		Ifnits		Unit Price		Line Total
Electronics Vit	Radios Satishones GPS per maniday	2	5	20.00	s	40.00
Dettable VSE with Stand	Der Dau	1	3	177.42	5	177.42
The Comp	d percentration per man day	0	1	20.05	¢	
Thy Camp	re person setup, per mar day	-	-	Cat Total	5	217.42
Consumable		Units		Unit Price	1	Line Total
Sample Baits		2	S	5.00	5	10.00
Flagging Tape		2	5	5.00	5	10.00
Office Consumables		2	5	3.00	5	6.00
				Cat. Total	5	26.00
Analytical		Units		Unit Price		Line Total
Analysis - Rock	prp70-250, FA330, AQ300	4	5	34.25	s	137.00
				Cat. Total	S	137.00
Post Field		Units		Unit Price		Line Total
Assessment Report prep and work filing		1	5	2,500.00	S	2,500.00
				Cat. Total	5	2,500.00
< 1	1	Est	tim	ated Sub Total	s	6,828.27
	- 1	3	Mar	sagement 15%	s	1,024.24
				SUB TOTAL	s	7,852.51
19.10				GST 5 %	5	392.63
				Total	Ś	8,245,14

# APPENDIX C: 2017 Assay Certificates



MINERAL LABORATORIES Canada

www.bureauveritas.com/um

Bureau Veritas Commodities Canada Ltd.

9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada PHONE (604) 253-3158

# CERTIFICATE OF ANALYSIS

### **CLIENT JOB INFORMATION**

Procedure

PRP70-250

Code

FA330

EN002

AQ300

SHP01

September 25, 2017 Page: 1 of 2

SAMPLE PREPARATION AND ANALYTICAL PROCEDURES

**Code Description** 

Number of

Samples

4

4

4

4

4

**ADDITIONAL COMMENTS** 

Client:

#### Longford Exploration Services Ltd. 6970 Napier Street Burnaby British Columbia V5B 2C4 Canada

Submitted By: James Rogers Receiving Lab: Canada-Whitehorse Received: August 28, 2017 Report Date:

Crush, split and pulverize 250 g rock to 200 mesh

Environmental disposal charge-Fire assay lead waste

Per sample shipping charges for branch shipments

Fire assay fusion Au Pt Pd by ICP-ES

1:1:1 Aqua Regia digestion ICP-ES analysis

# WHI17000706.1

Test

30

0.5

Wgt (g)

Report

Status

Completed

Completed

Lab

WHI

VAN

VAN

VAN

VAN

### Project: Spy Shipment ID: P.O. Number Number of Samples: 4

### SAMPLE DISPOSAL

PICKUP-PLP	Client to Pickup Pulps
PICKUP-RJT	Client to Pickup Rejects

Bureau Veritas does not accept responsibility for samples left at the laboratory after 90 days without prior written instructions for sample storage or return.

### Longford Exploration Services Ltd. Invoice To: 6970 Napier Street Burnaby British Columbia V5B 2C4 Canada

# MARCUS LAU oduction Manag

CC:

This report supersedes all previous preliminary and final reports with this file number dated prior to the date on this certificate. Signature indicates final approval; preliminary reports are unsigned and should be used for reference only. "\*" asterisk indicates that an analytical result could not be provided due to unusually high levels of interference from other elements.

											Clie	nt:	<b>Loi</b> 6970 Burn	<b>Longford Exploration Services Ltd.</b> 6970 Napier Street Burnaby British Columbia V5B 2C4 Canada								
B U R E A U VERITAS	MINERAL LABO Canada	RATOR	IES		www	.burea	uverita	s.com/ı	um				Proje	Project: Spy								
Bureau Verita	ureau Veritas Commodities Canada Ltd.												Repo	rt Date:	Sept	ember 25	5, 2017					
9050 Shaughr	nessy St Vancouve	bia V6F	9 6E5 C	Canada																		
PHONE (604)	253-3158												Page:		2 of 2	2				Pa	art: 1	of 2
CERTI	FICATE O	F AN	IALY	SIS													W	HI17	7000	706	.1	
		Method	WGHT	FA330	FA330	FA330	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300
		Analyte	Wgt	Au	Pt	Pd	Мо	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Th	Sr	Cd	Sb	Bi	v
		Unit	kg	ppb	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		MDL	0.01	2	3	2	1	1	3	1	0.3	1	1	2	0.01	2	2	1	0.5	3	3	1
K896670	Rock		2.32	82	<3	2	<1	3	7	404	<0.3	15	96	4304	>40	<2	<2	21	2.1	<3	<3	31

K896671

K896672

K896673

Rock

Rock

Rock

1.80

1.67

2.06

3

8

11

16

29

28

12

36

46

<1

<1

<1

59

219

133

<3

4

<3

34

62

50

<0.3

0.3

<0.3

150

1411

1985

32

114

121

401

1035

979

3.22

7.44

7.63

<2

<2

<2

<2

<2

<2

51

7

4

<0.5

<0.5

<0.5

<3

<3

<3

<3

<3 <3 34

48 39

			Client:	Longford Explorat 6970 Napier Street Burnaby British Columbia V5	ion Services Ltd B 2C4 Canada	l.
B U R E A U VERITAS	A U MINERAL LABORATORIES www.bureauveritas.com/um eritas Commodities Canada Ltd.		Project:	Spy		
Bureau Veritas	s Commodities Canada Ltd.		Report Date:	September 25, 2017		
9050 Shaughn	essy St Vancouver British Colu	umbia V6P 6E5 Canada				
PHONE (604)	253-3158		Page:	2 of 2	Part:	2 of 2
CERTIF	FICATE OF ANAL	YSIS		WHI	17000706.1	

		Method	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300	AQ300
		Analyte	Ca	Р	La	Cr	Mg	Ва	Ti	В	AI	Na	κ	w	S	Hg	ті	Ga	Sc
		Unit	%	%	ppm	ppm	%	ppm	%	ppm	%	%	%	ppm	%	ppm	ppm	ppm	ppm
		MDL	0.01	0.001	1	1	0.01	1	0.001	20	0.01	0.01	0.01	2	0.05	1	5	5	5
K896670	Rock		2.53	<0.001	5	20	0.48	77	0.025	30	0.33	<0.01	<0.01	<2	1.47	2	7	17	<5
K896671	Rock		1.28	0.017	1	214	3.10	55	0.048	<20	2.95	0.20	0.08	<2	<0.05	<1	<5	6	<5
K896672	Rock		0.45	0.021	3	549	15.73	87	0.071	151	1.77	<0.01	0.14	<2	0.12	<1	<5	5	6
K896673	Rock		0.25	0.016	3	569	18.13	61	0.061	126	1.53	<0.01	0.11	<2	0.09	<1	<5	6	7

Client: Longford Exploration Services Ltd. 6970 Napier Street Burnaby British Columbia V5B 2C4 Canada MINERAL LABORATORIES BUREAU www.bureauveritas.com/um Project: VERITAS Canada Spy Report Date: September 25, 2017 Bureau Veritas Commodities Canada Ltd. 9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada PHONE (604) 253-3158 1 of 1 Part: 1 of 2 Page: QUALITY CONTROL REPORT WHI17000706.1 Method WGHT FA330 FA330 FA330 AQ300 Analyte Мо Cu Pb Mn Wgt Au Pt Pd Zn Ag Ni Co Fe As Th Sr Cd Sb Bi Unit kg ppb ppb ppb ppm ppm ppm ppm ppm ppm ppm ppm % ppm ppm ppm ppm ppm ppm ppm 2 2 3 MDL 0.01 3 2 1 1 3 1 0.3 1 1 2 0.01 2 1 0.5 3 Pulp Duplicates Rock K896672 1.67 8 29 36 <1 219 4 62 0.3 1411 114 1035 7.44 <2 <2 7 <0.5 <3 <3 48 QC REP K896672 <1 230 3 64 0.3 1474 118 1066 7.69 <2 <2 7 <0.5 <3 <3 50 **Reference Materials** STD CDN-PGMS-19 Standard 243 123 517 457 2213 STD CDN-PGMS-23 Standard 500 STD CDN-PGMS-19 Standard 200 100 456 STD CDN-PGMS-23 Standard 477 431 1986 STD DS11 Standard 12 150 136 350 1.5 76 13 1030 3.06 42 6 65 2.3 5 11 48 7 STD OREAS45EA Standard 1 670 19 31 < 0.3 356 49 389 19.93 4 3 1.0 <3 <3 288 STD CDN-PGMS-19 Expected 230 108 476 STD CDN-PGMS-23 Expected 496 456 2032 STD OREAS45EA Expected 1.6 709 14.3 31.4 0.26 381 52 400 23.51 10 10.7 3.5 303 STD DS11 Expected 13.9 156 138 345 1.71 81.9 14.2 1055 3.2082 42.8 7.65 67.3 2.37 7.2 12.2 50 BLK <2 <3 Blank <2 BLK Blank 2 <3 <2 BLK Blank 5 <3 4 BLK Blank <2 <3 <2 BLK Blank <1 <1 <3 <1 < 0.3 <1 <1 <2 < 0.01 <2 <2 <1 <0.5 <3 <3 <1 Prep Wash ROCK-WHI <2 33 <2 < 0.5 21 Prep Blank <3 <2 <1 16 <3 < 0.3 <1 3 579 1.95 4 18 <3 <3

Client: Longford Exploration Services Ltd. 6970 Napier Street Burnaby British Columbia V5B 2C4 Canada MINERAL LABORATORIES BUREAU www.bureauveritas.com/um Project: VERITAS Canada Spy Report Date: September 25, 2017 Bureau Veritas Commodities Canada Ltd. 9050 Shaughnessy St Vancouver British Columbia V6P 6E5 Canada PHONE (604) 253-3158 1 of 1 Part: 2 of 2 Page: QUALITY CONTROL REPORT WHI17000706.1 Method AQ300 Analyte w Sc Са Ρ La Cr Mg Ва Ti в AI Na κ s Hg ТΙ Ga Unit % % % % % % ppm ppm % ppm % ppm ppm ppm ppm ppm ppm MDL 0.01 0.001 1 1 0.01 1 0.001 20 0.01 0.01 0.01 2 0.05 1 5 5 Pulp Duplicates K896672 Rock 0.45 0.021 3 549 15.73 87 0.071 151 1.77 < 0.01 0.14 <2 0.12 <5 5 <1 QC REP K896672 0.47 0.021 3 570 16.72 90 0.073 148 1.82 < 0.01 0.15 <2 0.13 <1 <5 6 **Reference Materials** STD CDN-PGMS-19 Standard Standard STD CDN-PGMS-23 STD CDN-PGMS-19 Standard STD CDN-PGMS-23 Standard STD DS11 Standard 1.03 0.071 16 57 0.85 435 0.088 <20 1.10 0.07 0.40 3 0.28 <1 6 <5 <5 7 78 STD OREAS45EA Standard 0.04 0.029 829 0.09 142 0.096 <20 3.05 0.01 0.06 <2 < 0.05 <1 <5 31 STD CDN-PGMS-19 Expected STD CDN-PGMS-23 Expected STD OREAS45EA Expected 0.036 0.029 7.06 849 0.095 148 0.0984 3.13 0.02 0.053 0.036 12.4 78 STD DS11 Expected 1.063 0.0701 18.6 61.5 0.85 417 0.0976 6 1.129 0.0694 0.4 2.9 0.2835 0.3 4.9 4.7 3.1 BLK Blank BLK Blank BLK Blank BLK Blank BLK Blank < 0.01 < 0.001 <1 <1 < 0.01 <1 <0.001 <20 < 0.01 < 0.01 < 0.01 <2 < 0.05 <1 <5 <5 <5 Prep Wash ROCK-WHI Prep Blank 0.58 0.039 0.072 < 0.05 <5 5 2 0.47 52 <20 0.80 0.07 0.09 <2 <1 <5 <5