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APPLICATION

FOR

NORTHERN MINERAL EXPLORATION ASSISTANCE

ON THE

LOGAN PROJECT

YUKON TERRITORY

(LEE, THOR AND ZEUS CLAIM GROUPS)

by

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LOGAN PROJECTPARTICULARS OF PROPOSED PROGRAM  
OF EXPLORATORY WORK TO BE UNDERTAKEN  
BY SPARTAN EXPLORATIONS LTD., (N.P.L.)I INTRODUCTION

In accordance with requirements of Application for Northern Mineral Exploration Assistance, as noted in Section 4, Subsections (a), (b), (c) and (d) of the Regulations, Spartan Explorations Ltd. (N.P.L.) is herein submitting information required for formal application. Particulars of this application are described below in the order raised in Section 4 of the Regulations.

II DESCRIPTION OF AREA OF PROPOSED EXPLORATORY WORK, AND  
HOLDINGS TO WHICH THEY RELATE (4a)1) Introduction

During August and September, 1967, Spartan Explorations conducted a program of reconnaissance exploration in the Logan Project area (a region of about 500 square miles, located generally between Anderson Creek on the south, Hyland River on the east, latitude 62° 00'N. on the north, and a line between McPherson Lake and Anderson Creek on the west, in the east-central Yukon Territory).

Parts of the area were prospected and geologically mapped, and some geochemical and geophysical surveying was done. A total of 780 claims were staked in four groups to cover important discoveries of lead-zinc-silver, molybdenum-tungsten and tungsten.

The Logan Project area is underlain by northwesterly-striking Proterozoic (?) metasedimentary rocks intruded by a granodiorite batholith of Cretaceous age. The batholith appears to form the core of a northwesterly-plunging anticlinorium. Younger granitic stocks

are known to intrude older granodiorite. Spartan Explorations located lead-zinc-silver in skarnitized limestone beds in the metasediment sequence, molybdenum-tungsten associated with younger granitic stocks, and tungsten in numerous geologic environments in the project region.

## 2) List of Holdings

	<u>Claims</u>	<u>Recording Date</u>	<u>Tag Numbers</u>	<u>Total</u>	
<u>LEE GROUP - 232 Claims - Watson Lake Mining District - Map Sheet 105-H-14</u>					
LEE	1-192 incl.	Sept. 6th, 1967	Y19118-Y19309	192	
"	193-232 "	Oct. 6th, 1967	Y22187-Y22226	<u>40</u>	Total 232
<u>THOR(WEST) GROUP-140 Claims-Watson Lake Mining District-Map Sheet 105-H-14</u>					
THOR	1-28 incl.	Sept. 18th, 1967	Y19515-Y19542	28	
"	133-160 "	" "	" Y19543-Y19570	28	
"	265-292 "	" "	" Y19571-Y19598	28	
"	397-424 "	" "	" Y19599-Y19626	28	
"	529-556 "	" "	" Y19667-Y19694	<u>28</u>	140
<u>THOR(EAST) GROUP-320 Claims-Watson Lake Mining District-Map Sheet 105-H-14</u>					
THOR	457-496 incl.	Sept. 18th, 1967	Y19627-Y19666	40	
"	589-628 "	" "	" Y19695-Y19734	40	
"	721-760 "	" "	" Y19735-Y19774	40	
"	853-892 "	" "	" Y19775-Y19814	40	
"	985-1024 "	" "	" Y19815-Y19854	40	
"	1117-1156 "	" "	" Y19855-Y19894	40	
"	1249-1288 "	" "	" Y19895-Y19934	40	
"	1357-1396 "	" "	" Y19935-Y19974	<u>40</u>	320
<u>ZEUS GROUP-88 Claims-Watson Lake Mining District-Map Sheet 105-H-15</u>					
ZEUS	1-6 incl.	Sept. 18th, 1967	Y19395-Y19400	6	
"	7	" "	" Y22227	1	
"	8-88 "	" "	" Y19402-Y19482	<u>81</u>	88
GRAND TOTAL CLAIMS .....					780

3) Lee Group

The Lee group of 232 claims covers an area of lead-zinc-silver and tungsten occurrences near the southeastern end of McPherson Lake, approximately 40 miles east of Finlayson Lake on the Watson Lake-Ross River road, eastern Yukon Territory.

Initially, Spartan Explorations became interested in the claim area upon the discovery, along a creek bank, of an outcrop of massive sphalerite-galena-chalcopyrite accompanied by pyrrhotite as a strata-bound replacement of a limy argillite member in an anticlinally folded succession of metasediments plunging gently southwesterly. Particularly significant was the high silver content which, from several high grade samples, averaged 2 ounces of silver to each percent lead. Continued prospecting revealed large boulders of float with similar grade in an area approximately 600 feet on the 'down plunge' extension of the structure exposed in the creek.

Grid geochemical soil sampling and magnetometer survey coverage was begun in the area including the creek outcrop and the float discovery. Weak to moderately high values in both lead and zinc were indicated in an area approximately 600 feet wide and 800 feet long, 'open' up-slope. Magnetometer data revealed an anomalously high southwesterly trending feature 'open' up-slope.

Subsequently, interesting amounts of scheelite were discovered in an outcrop zone of massive pyrrhotite replacement which is covered by overburden in both directions along its strike projection. The outcrop zone extends for over 100 feet and, based on an extrapolation from one assay of a grab sample, is visually estimated to grade 0.5%  $WO_3$  over a 10-foot width.

Coincidentally, geochemical silt sampling of another creek in the claim area revealed anomalously high zinc concentrations. Follow-up reconnaissance silt and soil sampling located a hillside area where impressively high zinc values (800 - 5,000 p.p.m.) were obtained over approximately 2,000 feet. Silicified dolomite fragments with a few scattered grains of pyrite were found in the area of almost complete overburden cover. This area lies on the flank of an aeromagnetically high anomaly and is situated near the intersection of two sets of air photo lineaments interpreted as wrench-type faults.

The field crews were prematurely withdrawn from reconnaissance work on the Lee group late in the 1967 season in order to assist in prospecting and claim staking a new discovery in another area.

The Lee group offers a potential for the discovery of a strata-bound massive sulphide replacement of lead and zinc containing significantly high silver values. On the same claim group, tungsten and zinc indications are sufficiently impressive to warrant detailed prospecting and follow-up grid geochemical sampling together with magnetometer coverage.

#### 4) Thor Group

Molybdenum and tungsten values have been obtained from numerous outcrop samples taken over a broad area by Spartan Explorations on their Thor claims, totalling 460 claims in two groups, recently staked in the Tustles Lake area in the eastern Yukon Territory. Preliminary geological reconnaissance points strongly to the possibility of the discovery of a Climax-type porphyry molybdenum deposit.

Molybdenite, often accompanied by important amounts of scheelite, is found in a number of occurrences scattered throughout sub-elliptical zones within two potash-rich intrusives ranging in composition from quartz-monzonite to granite. Owing to poor exposure near the boundaries between the quartz-potash-rich area of molybdenum mineralization and the granodiorite of the main batholith, it is not certain whether these granitic rocks represent a younger intrusion or, instead, a large area of pervasive hydrothermal alteration. Distinctively, a wide range of rock textures occurs in the Thor(East) intrusive.

On the Thor(East) group the zone of potash feldspar rocks outcrop over an area more than 2 miles in diameter. Near the centre of this area, a pyritized quartz-eye granite porphyry plug outcrops for over 1,000 feet along a ridge near the headwall ridge of the main glacier.

On the Thor(West) group a similar intrusive of potash-rich rock, approximately  $1/2$  mile wide, extends in an east-west direction for over one mile. Air photo study reveals the presence of several prominent intersecting sets of faults and fracture systems on both Thor groups.

Molybdenite is found most commonly in zones of silica-rich rocks as hairline fracture fillings, as whisps and rosettes in clouded quartz stringers, and as disseminations bordering quartz-sericite zones.

In four areas on the Thor(East) and two areas on the Thor(West) claims, significant amounts of molybdenite have been found in talus slides beneath rusty cliff outcrops which, where accessible without benefit of mountaineering equipment, were observed to contain similar molybdenite-bearing material in place. The molybdenite-quartz mineralization in

these outcrops appears to be preferentially associated with a prominent steeply dipping, east-west fracture system. However, airborne geologic reconnaissance and preliminary study of air photos in the western half of the Thor(East) mineralized area suggests the presence of complex fracture systems which may at depth extend under the known outcrop areas of better molybdenite occurrences a few thousand feet to the east.

5) Zeus Group

The Zeus property is an 88 claim group located six miles north-east of Tustles Lake and 110 air-line miles east of Ross River. Access is by float-equipped aircraft from Ross River, landing on Tustles Lake, and thence by helicopter to the property; access may also be made by helicopter from the Cantung Road, 20 miles to the east. No evidence of previous work exists on the property, although several syndicates, companies and independent prospectors are known to have worked in the region.

Spartan Explorations Ltd. conducted a relatively systematic conventional prospecting program in the area in late August and mid-September, 1967. Due to the difficulty of recognizing scheelite except by detailed surveying with ultraviolet lamps, however, this work is considered very preliminary.

The Zeus property covers a hornfelsic contact zone in which a semi-concordant granodiorite body intrudes east-west striking, steeply dipping quartzites, limestone and phyllites. A northerly-striking



fracture set cuts the rocks and displacements up to 200 feet have been observed. Skarn zones of from 1 to 20 feet wide occur up to several hundred feet from the contact.

Most skarn zones contain scheelite (tungsten), and some skarns contain lead, zinc and minor copper as well as scheelite. Preliminary work has shown a large number of narrow mineralized zones; in one locality, selected high grade material was visually estimated at 5% scheelite. Scheelite is very difficult to recognize in daylight, and prospecting with ultraviolet is the only positive means of identification.

Evidence of valuable minerals on the Zeus property is widespread. Preliminary work has shown that a large number of mineralized zones exist in a geologic environment favourable for scheelite (tungsten).

### III DESCRIPTION OF PROPOSED PROGRAM AND ESTIMATES OF PROPOSED EXPENDITURES, BASIS OF ESTIMATES AND PURPOSE OF EXPENDITURES(4b)

#### 1) Introduction

Because only a portion of what is believed to be an area of high exploration potential was covered during the 1967 season, Spartan proposes to conduct preliminary prospecting, geologic mapping and geochemical sampling over the greater part of the Logan Project area.

The total crew required for the project will consist of 18 men as follows:

- 2 - Project managers (experienced geologists)
- 1 - Camp manager
- 3 - Geologists (graduate level)
- 3 - Junior geologists (2nd or 3rd-year level)
- 3 - Prospectors
- 3 - Geochemical samplers-line cutters (Ross River Indians)
- 1 - Cook
- 2 - Helicopter crew

18 men total

It is proposed that three teams consisting of geologist, junior geologist and geochemical sampler (one team would have a prospector in addition) work in areas requiring detailed surveys (claim groups) and that two prospectors and the project managers (working part time) cover as yet inadequately explored ground within the project area.

The program will be under the direction of two experienced geologists, Mr. J.S. Dodge, Vice-President, Explorations, and Dr. C.L. Smith, Exploration Manager & Chief Geologist, both of whom will be devoting nearly full time to the project.

Base camps will be established at McPherson Lake and Tustles Lake, and fly camps will be set out and moved by helicopter at intervals of about one week. The base camps will be supplied by fixed-wing aircraft from Ross River, where Spartan maintains a permanent exploration office.

## 2) Proposed Program on Lee Group

It is proposed by Spartan Explorations during the 1968 field season to conduct a program of detailed geological mapping, geochemical soil sampling and magnetometer and E.M. surveys on the Lee group and immediately surrounding areas. Incomplete data now available on the lead-zinc-silver prospect indicates the need to provide additional funds for preliminary drilling. The objectives of the 1968 program would be to carry out:

- 1) Detailed prospecting and geological mapping to resolve the stratigraphic succession and complex structural setting as a guide to the interpretation and extension of known mineralization.
- 2) Geochemical soil sampling not only on a close spaced

grid over the two known areas of lead-zinc-silver interest, but also on a reconnaissance grid over the entire claim area.

- 3) Magnetometer and electromagnetic ground surveys on close spaced grids over the several known areas of lead-zinc-silver and tungsten mineralization.
- 4) Preliminary exploratory diamond drilling on the original lead-zinc-silver area with an allowance for, say, 2,500 feet total. Drill sites would be selected following an evaluation of all geological, geochemical and geophysical data obtained during the 1968 field program.

### 3) Proposed Program on Thor Group

Two complimentary phases of exploration are recommended for the 1968 field season. The first phase would include reconnaissance geological mapping along with geochemical silt and overburden sampling within and in the vicinity of the two Thor groups of claims. This phase would be undertaken initially at the lower altitudes to take advantage of early snow melt in these areas. Subsequently, a program of detailed geological mapping and rock-chip geochemical sampling would be carried out within the broad areas of quartz-potash feldspar intrusives wherein important occurrences of molybdenum mineralization have been discovered.

### 4) Proposed Program on Zeus Group

Detailed prospecting, geological mapping, magnetic and E.M. surveys, trenching and shallow diamond drilling will be required to provide an evaluation of the potential for the discovery of economic deposits of scheelite on and in the vicinity of the Zeus claims.