PROPOSED EXPLORATION PROGRAM
SOUTHEASTERN YUKON TERRITORY AND
ADJACENT NORTHWEST TERRITORY
With Special Reference to Tungsten Exploration

February 22, 1960

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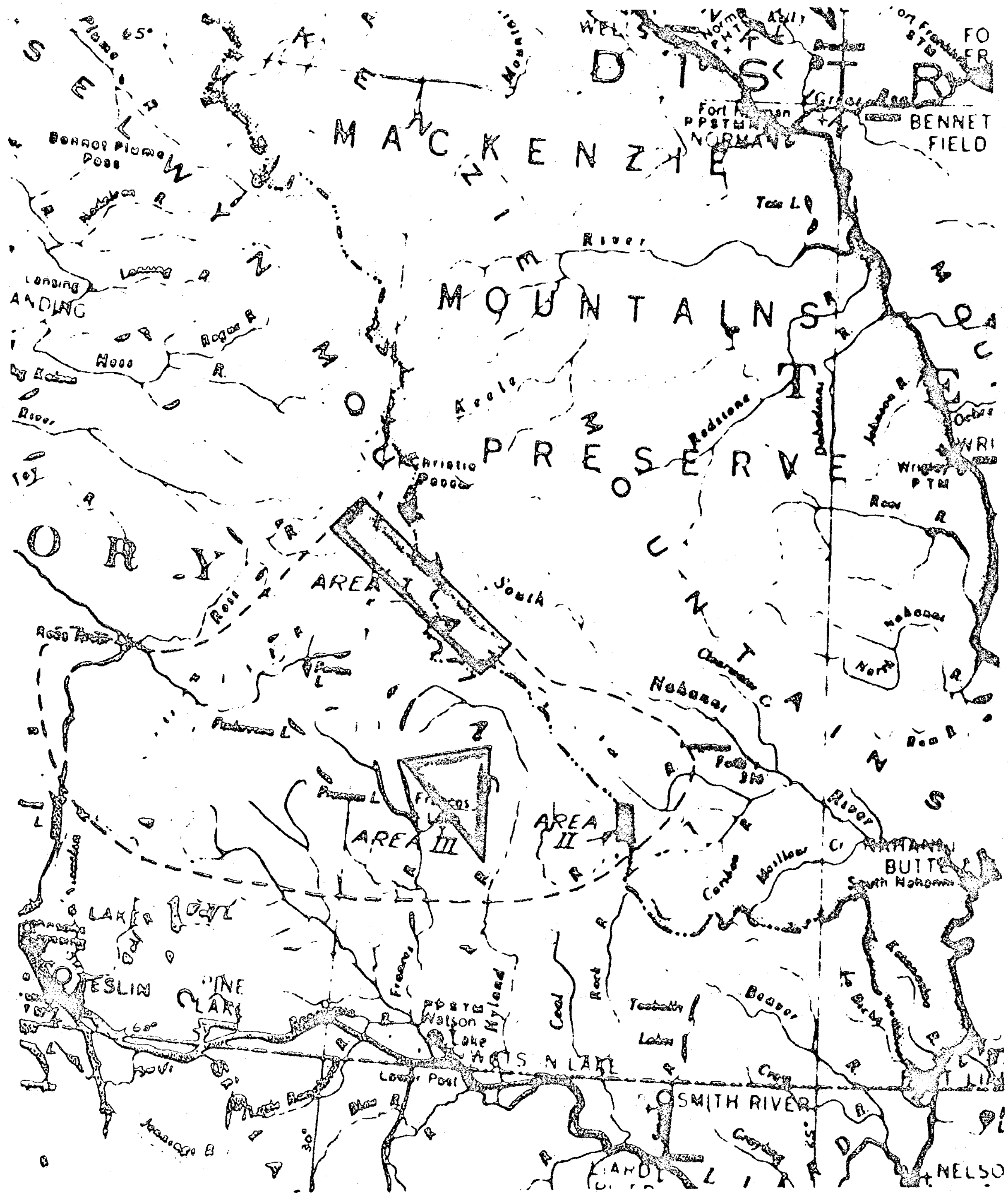


AREA INVESTIGATED - Outlined in Red
PROSPECTING AREAS - Outlined in Green

Fig. 1

CAMEX AERIAL EXPLORATION LIMITED	SCALE	APPROVED	DATE
	1" = 50 Mi		
INDEX MAP OF AREA INVESTIGATED	DRAWN L.A.	FILE NUMBER	
	TRACED		
	CHECKED		

ABSTRACT

An area in the southeastern Yukon and adjacent Northwest Territory has been investigated for potential mineral bearing zones, with particular reference to tungsten mineralization. The known geology and structure of the area is presented and, from the assembled data, three areas considered to be favourable for prospecting are submitted. One of these areas is selected for investigation this summer, the other two held as alternates. Helicopter exploration is considered to be the only feasible method of prospecting, for competitive reasons. Preliminary estimate of funds required to carry out the project is $100,000.

INTRODUCTION

The discovery of a high grade scheelite deposit in the Northwest Territories approximately 130 miles north of Watson Lake was disclosed to the public in the November 26, 1959 issue of the Northern Miner. This deposit, upon which plans for production are being formulated, was found by a helicopter team of engineers and prospectors financed by Karl Springer and associates. The McKenzie Syndicate, as the exploration group is called, has had two engineers, and eight prospectors searching for two seasons in the Flat River area and are believed to have covered this belt of geologically favourable ground for a length of fifty miles.

Another occurrence of tungsten mineralization is reported at the Canol Metals property on Stormy Mountain, 8 miles east of the Canol road and 90 miles east of Whitehorse. This prospect was explored for molybdenum during the early part of 1959 and it was not until fall that scheelite was known to be present. The information available indicates narrow widths, up to 3 feet, of fairly high grade scheelite, reportedly assaying up to 7% WO_3.

Based on the 1958 figures for tungsten consumed in the United States, i.e. 6.6 million lbs., the present reserve quoted by the Canada Tungsten Mining Corp. (McKenzie Syndicate discovery) of 1.2 million tons of 2.2% WO_3, is capable of supplying the U.S. requirements for 6 years, assuming a constant rate of consumption. These figures are used only to illustrate that the Flat River area is already established as a major tungsten province which ranks in importance with any known in North America today.

The Flat River area lies at the south end of the Selwyn Mountain range, 130 miles north of the only existing transportation route, the Alaska Highway. For isolated areas like this, tungsten exploration is only made feasible because of the comparatively high dollar value of tungsten concentrates per unit of weight. In this sense it can be placed in a category with gold and silver, where transportation costs in remote areas do not consume the major portion or all of the dollar value contained in the concentrates of the metal. With tungsten quoted at $12.00 per short ton unit, for example, it can be calculated that concentrates averaging 70% WO_3, have a contained value of 42¢ per lb. This can be compared, as a rough example, with chalcopyrite concentrates, averaging 30% Cu having a net smelter value of less than 7¢ per lb. at the smelter (i.e. after smelting costs are deducted but not freight). Transportation costs from Flat Lake to Vancouver and northwestern U.S. ports have been estimated at 4.2¢ per lb., as follows:-

	¢ per lb.
(a) Flat Lake - Watson Lake by air 150 miles @ 20¢ per ton mile	1.5¢
(b) Trucking Watson Lake - Whitehorse 260 miles @ 6¢ per ton mile, plus handling	0.9¢
(c) Whitehorse to Vancouver - White Pass quote by rail and ship $1.80 per cwt.	1.8¢
Total	4.2¢

Thus, completing the comparison, the cost of shipping chalcopyrite concentrates from the Flat Lake area by the above method would be 60 percent of the contained net copper value, whereas only 10 percent of the value of scheelite concentrates is consumed by transportation.

The added cost of freighting supplies and equipment into isolated areas and the increased cost of maintaining a mining camp in the north substantially raises the grade necessary for profitable operation. Even under the most ideal geological setting where mining is relatively simple a minimum grade of around 1.5% WO_3 would be required (at $12.00 units) for profitable operation.

Of possible great importance to the mineral industry of the Yukon is a proposed road from Watson Lake to Ross River. It is understood that considerable survey work has been done and that construction work will start this summer. The road undoubtedly will stimulate prospecting activity in the Frances Lake and adjoining areas since geological conditions appear favourable for finding mineral deposits here.

Base metal deposits, especially those containing precious metal values, will be included in the minerals sought along the proposed road, whereas precious metals, tungsten and similar metals will remain the target for prospecting in those areas in which access, road construction and trucking costs are not sufficiently reduced to eliminate the use of air freight.

The aim of this report is to outline the known geology, and summarize the prospecting possibilities in the areas influenced by the above described new discoveries and developments. These areas include the portion of the Pelly Mountains lying east of the Canol Road, the North end of the Liard Plain, Hyland Plateau, and south end of the Selwyn Mountain range.

PHYSIOGRAPHY

The Pelly Mountains are a fairly rugged range lying north of the Liard River drainage and south of the Pelly and

Finlayson Rivers. The highest peaks, some over 7,000 feet, have been carved by glaciation into rugged, steep mountains which rise above a former rolling erosion level. Glacial cirques are common on the north slopes of the mountains.

The Selwyn Mountain range extends southward to the lower country east of Frances River. The southeast part of the range, which includes the headwaters of Flat and South Nahanni Rivers, is called the Rogan Mountains. The highest peaks are close to 9,000 ft., and alpine glaciers are prevalent in the higher areas.

The Liard Plain and Hyland Plateau lie south of the Pelly and Logan Mountains and extends into British Columbia to the south. The Hyland River, in its lower reaches, is a mature stream with characteristic meanders and ox-bows.

GEOLOGY

The known geology of the area described is shown on the 20 mile map of the Yukon and adjacent portion of the Northwest Territories, published by the Geological Survey of Canada. A large portion of the area has been mapped by the G.S.C. but as yet much of the information has not been published. In 1958 a preliminary reconnaissance survey by the G.S.C., using a Piper Super Cub, obtained basic geological information which was used to plan "Operation Pelly", a helicopter supported geological reconnaissance survey begun last year. A preliminary map covering the season's work may be published this spring, but is not anticipated before August.

The following is a brief description of the rock formations classified according to age groups:-

Precambrian

Apart from a small belt of known Precambrian rocks at Ross River the distribution of rocks belonging to this age group is uncertain. The core of the Logan Mountains, which lie between the Hyland River and Frances Lake, for example, is a mixture of granitic, granitoid, and metamorphic rocks the age of which can only be identified as pre-Mississippian, although much of the coarse schist, paragneiss, and quartzite making up this mountain range resembles the Yukon group, which is at present assigned to a Precambrian and Paleozoic age. On the southwest side of the Pelly range, between Quiet and Seagull Lakes, near the Canol Road, a group of metamorphosed sedimentary and volcanic rocks appear similar to rocks of the Yukon group but can only be classed as pre-Mississippian at present.

Lower Paleozoic

The early cambrian sediments are a mixed assemblage

of quartzite, limestone and argillite, or more highly metamorphosed equivalents, in those areas where its age can be established on fossil evidence. A narrow belt of Lower Cambrian sediments from the Wolf Lake area is believed to extend northwest at least as far as the Canol Metals property.

A belt of sediments thought to be Lower Cambrian runs in a narrow belt along the Flat River valley for at least 60 miles. The main tungsten deposit of the Canada Tungsten Mining Corp. lies in the lowest limestone band of this group. The detailed stratigraphy of this area is considered to be as follows:-

Age	Unit	Thickness
Cambrian	Limestone, pink and buff weathering.	800' approx.
	Argillite, minor chert limestone.	200' approx.
	Limestone	150'
	Chert with minor limestone argillite	110'
	Phyllitic Argillite	200'

In the Logan Mountains a limestone mass lying northeast of Frances Lake is regarded as Cambrian but its extent has not been traced.

On the Upper Pelly and Ross Rivers, near the Canol Road, the top of the Cambrian is a thick sequence of grits, and red and green slates.

The Ordovician appears to be conformable with the Cambrian, although it is not elsewhere in other areas in the Yukon. North of Ross River the Ordovician comprises, from bottom to top, black slate associated with a thick section of varicolored cherts, and ferruginous chert conglomerate that carries some thin limonite beds. A similar assemblage is known in the Logan Mountains.

Near the headwaters of the South Nahanni River the Ordovician consists of a thick assemblage of black and green slates overlain by about 1500 feet of limestone.

In the southwestern McKenzie Mountains, on the upper South Nahanni River, the Silurian is represented by 500 to 750 feet of black cherty and shaly limestone. A quartzite member, recognized by a diagnostic black lichen growing on it, occurs 2 miles southwest of the main Flat Lake tungsten deposit. In the Ketza River area a thick series of Silurian dolomite has been thrust over the Cambrian as an isolated fault block. To the south of the area, not far from Tootsie Lake, about 500 feet of siltstone, quartzite, and dolomite of Silurian age are known.

In the southwestern McKenzie Mountains a section of

1150 feet of black nodular limestone overlain by 1,000 feet of black shale and thinly bedded limestone has been identified as Middle and Upper Devonian. Grey and black dolomite, dolomitic limestone, and quartzite of Devonian age are known east of Wolf Lake. East of Seagull Creek in the Quiet Lake Map-Area an isolated thrust block of dark slate and quartzite contains Middle-Devonian fossils, and Devonian quartzites and argillites are found in the vicinity of the silver-lead showings in the Ketza River area. Middle Devonian dolomite occurs east of Seagull Lakes in a thrust fault block.

Upper Paleozoic

In the southern McKenzie Mountains, near the mouth of the South Nahanni, Mississippian strata consist of 450 to 1100 feet of dark grey shale with overlying limestone. These beds are succeeded by 1,000 feet of Middle Carboniferous sandstone and dark grey shale overlain by chert and conglomerate. These strata thin out considerably to the south and west, and volcanic rocks of Mississippian age predominate along a belt extending from northeast of Wolf Lake through the southwest corner of the Finlayson Map-area into the Ketza River Area. The crustal disturbance which brought about the period of vulcanism in the Mississippian is related to a period of uplift in the late Paleozoic suggested by the absence of Permian and Pennsylvanian strata throughout the area.

Three or four small granitic stocks in the Seagull Lakes area have been assigned to the Mississippian because of the degree of metamorphism they exhibit.

Most of the area has been intruded by large granitic masses which are generally regarded as Late Cretaceous or early Tertiary. Granite and Quartz Monzonite are the most abundant types, but more alkaline varieties occur mostly around the margins of the larger intrusive masses. Portions of the intrusives contain quartz-tourmaline concentrations and fluorite druses; this condition is found in the granite near Hole-in-the-wall Lake, Flat River area.

STRUCTURE

Within the area being considered all ages of the sedimentary rocks are strongly folded along northwest trending axes, and major thrust faulting associated with the folding has produced some remarkably straight lineaments. The Tintina fault is the most persistent within the area, since its topographic expression is a valley 400 miles long. It can be traced in the area under study from Ross River Post southeast to the head of the Black River, in the southeast corner of the Finlayson Map-area. It is not in alignment with the Rocky Mountain trench, the northern extremity of which appears to lie about 10 miles southwest.

At least three other major fault structures associated

with the Tintina fault have been identified. These lie southwest of the main fault, strike subparallel to it, and have been identified for as much as 20 miles southwest of the major structure. One of the faults joins into the Tintina near the head of the Black River.

On the west side of the Canol Road, southwest of Pleasant Lake (Lat. 61°37' Long. 133°25'W) the sediments have been thrust in the opposite direction, i.e. to the southwest onto Cretaceous granite. Along the Tintina and related faults Cambrian to Devonian sediments have been thrust over younger sediments in a complex manner which, with subsequent erosion, has left numerous isolated blocks of older sediments resting unconformably on younger strata.

The structural picture in the Flat River area is not too well known. The oldest rocks are traceable along the valley for over 50 miles but whether the structure is anticlinal or monoclinal is not known at present. The structure, whichever it is, follows the valley persistently, and at the main Cantung deposit the fold plunges gently north.

The Logan Mountains are complexly folded and are probably faulted along the upper Hyland River valley. Structural detail, however, is lacking in this area.

PREVIOUS EXPLORATION

Exploration for lode deposits in the Flat River Area is believed to have begun in 1954, following a reconnaissance geological mapping program carried out in 1953 by E. F. Roots of the Geological Survey of Canada. Lead, zinc and copper mineralization was noted during this preliminary survey and, as a result, Northwestern Explorations carried out a prospecting program in 1954. This consisted of a 2 man prospecting team which was supported by a packer and 6 horses. Four contact metamorphic deposits were discovered during the season, in which the prospectors are reported to have covered 600 square miles. In 1955 and 1956 Northwestern carried out a more detailed program of prospecting, geological mapping, and diamond drilling in the vicinity of the four discoveries. The parties were serviced by a helicopter on this work.

Hudson Bay Mining and Smelting Co. carried out a more regional type of exploration work in 1954 and 1955. This helicopter prospecting program began at their McMillan Pass property near the Canol Road and is believed to have covered the central and western portions of the area this report deals with. Hudson Bay are known to have had camps on Frances, Finlayson, and Wolf Lakes; some drilling was done in the Wolf Lake and Crescent Lake areas as a result of their prospecting.

In 1958 McKenzie Syndicate began exploring the Flat

River area north and northwest of Lucky Lake. This program was continued in 1959 as a result of the important scheelite discovery made in late 1958, as already described. In addition, a copper prospect 20 miles southeast of Lucky Lake was staked by the Syndicate.

Prospectors Airways have done some prospecting in the vicinity of the above copper property of McKenzie Syndicate and, many years ago, the Consolidated Mining and Smelting Company prospected for placer gold on Bennet Creek, 12 miles east of this area.

Newmont Explorations prospected around Grass Lakes, McNeil Lake, Wasson Lake and Wolf Lake in 1956 and 1957, which resulted in their drilling a copper prospect in the Wasson Lake Area in 1957. American Smelting and Refining purchased their McMillan Property 40 miles north of Watson Lake; this company is not known to have carried out any major prospecting program.

Conwest Explorations were active in the Ketza River area in 1956 exploring a number of silver lead prospects and in 1958 did some drilling for assesmment work on an arsenical gold prospect in the same area. Conwest are not known to have prospected any other areas, their work being restricted, for the most part, to property examination.

Almost every company working in the Yukon has at one time or another looked at properties or carried out prospecting along the Canol road. Little attention has been given to tungsten prospecting until last fall, however, when the Canol Metals property was found to contain scheelite.

PROPOSED EXPLORATION

1. Favourable Areas

From the information assembled, a number of areas are indicated to be favourable for prospecting. The most obvious one is the extension of the Flat River structure to the northwest; this monoclinal or anticlinal fold, which brings Cambrian sediments to the surface along the Flat River Valley for 50 miles or more, is known to extend northwest for some distance. It and similar associated structures are considered to extend northwest at least as far as the Itsi Mountains beyond Ross River, over 80 miles northwest of the main Flat Lake scheelite deposit. The extent and distribution of granite masses adjacent to this area is not accurately known. The core of the Itsi Mountains is granite, however, and fairly large masses of granite occur on all sides of this unmapped area; it is therefore likely that numerous granitic masses occur along the fold structure. Favourable conditions for typical pyrrhotite scheelite skarn mineralization should exist where granitic bodies intrude the Cambrian limestone formations along this belt.

The second favourable area lies along the east slope

of a mountain range about 20 miles long which lies south of Flat River and west of Seaplane Lake. The favourable belt runs from the copper prospect staked by McKenzie Syndicate last year and runs for at least 12 miles north. Cambrian limestone strikes north and dips 45° west at the copper prospect; granite is known to occupy the centre and west flank of the range so that, if westerly dips prevail, an ideal structural condition for scheelite mineralization should occur along the length of the contact zone for 12 miles. This belt lies outside of the area explored to date by McKenzie Syndicate.

The third favourable area is known only by the reported existence of a number of gossans on the mountains immediately south of Anderson Lake and Anderson Creek. This creek flows westerly into the east arm of Frances Lake. Two miles east of the mouth of Anderson Creek a large zone of pyrite pyrrhotite mineralization is reported in an area of granitic and metamorphic rocks, with a known limestone mass not too distant from, and trending toward, this zone. Nine miles up Anderson Creek from its mouth, a 200 lb. block of solid galena is known to have been found. On the ridge south of Anderson Lake another pyrrhotite - pyrite mass is believed to occur within a roof pendant. Seven miles southeast, along the structural trend, quartz veins carrying galena are reported.

A few interesting occurrences of mineralization are mentioned in case they can be fitted into a broad-scale program or some different type of investigation than outlined herein. A rusty zone believed to occur in granite is reported on Hill 7288, Frances Lake Map-Area, 11 miles northeast of Mount Billings. A widespread area of metamorphosed limestone is reported to the south of Hill 7393, Finlayson Map-Area, just north of the bend of the Liard River. Lastly, a prospector, who was formerly in the company's employ, reported seeing a pyrrhotite zone near Twin Mountain, Quiet Lake Map-area, which he believes is similar in appearance to the Flat River tungsten property.

2. Development of Program

The competitive interest in the three areas described has been mounting since the news of the McKenzie Syndicate discovery was released to the press. At least three helicopter supported prospecting programs will be covering portions or all of the three main areas described this summer. McKenzie Syndicate will undoubtedly be exploring the Flat River structure beyond the area already covered by them; Phelps Dodge Corp. are planning a helicopter program which will probably take them into the above areas; and the Nahanni 60 Syndicate are planning a helicopter program which is to begin east of the Flat River area of interest but which may extend westward into this area as the season progresses.

Thus it is apparent that any prospecting program which

does not have helicopter support will be lacking the mobility required to maintain a program which can keep pace with others planned in the area. Also, of course, to maintain a competitive position, preliminary planning must be thorough, so that prospecting activities can be started as early in the season as weather permits and can be carried on effectively throughout the season without unnecessary loss of time.

The areas described herein as being favourable for prospecting cannot be listed in their order of importance from the data presented. Each area is rated to have the same chance for finding important mineralization. The northwest extension of the Flat Lake Belt is selected over the two other areas because it is, as near as can be ascertained, a large area which has received only minor prospecting to date. One pyrrhotite showing is rumoured to exist about 25 miles northwest of Flat Lake, but this is not based on reliable information.

The area west of Seaplane Lake was placed second because it is the only portion of the Flat River structural belt between Seaplane and Flat Lakes believed to have been left unexplored by McKenzie Syndicate. The structure and presence of favourable rock types makes this area attractive, however, the McKenzie Syndicate are not likely to overlook this area and should be planning to commence work here at the beginning of the field season.

The third area, east of Frances Lake, is the most accessible and is closest to transportation routes; it was placed third in order of importance partly for this reason. The reported occurrences of pyrrhotite have probably been examined by Hudson Bay Exploration, and may have been seen by numerous other individuals and groups as well. It is entirely possible that scheelite could have been missed, however. The proposed road past Frances Lake undoubtedly will stimulate re-examining the reported sulphide occurrences in this area.

3. <u>Preliminary Cost Estimate, Proposed Exploration Program.</u>

(i) Setting out Gas caches for Helicopter use
(this should be completed before the end of March)
Average distance 160 miles (1 hr. 25 mins.)
Cost per trip with Beaver 2 hrs. 50 mins. x $85.00 = $240
Average load 2½ bbls. 1125 lbs.
Cost per trip with Otter 2 hrs. 50 mins. x $125.00 = $355
Initial helicopter requirements 1 Month's supply (100 hrs.
@ 15 gals. gas/hr. = 1500 gals. gasoline
plus 30 gals. lube oil
Trips required using Otter $\frac{1530}{45x6} = 6$
Cost transporting helicopter fuel = 6 x $355 = $2130
Ferrying allowance 1400
Cost per gallon: transporting to area $2.32 $3500 apprx
Price at Watson Lake .53
Total $2.75

(ii) Fixed wing service aircraft during Summer (Co. Beaver @ $60.00)

(a) Helicopter Gas requirements
2 months' supply, 28 trips @ $170 — $4,800

(b) Gas required in caches for Fixed wing flying in area
(1) Moving base camps and personnel
(2) Reconnaissance work in area
Estimated 70 hrs. @ 17 gals/hr; 1200 gals @ $2.75/gal. — $3,300

(c) Transporting food supplies, etc.
estimated 10 trips @ $170 — $1,700

(d) Transporting personnel
12 trips @ $170 — $2,000

(iii) Helicopter Rental - Bell G-2
3 months @ 100 hrs. per month @ $108/hr. — $32,400

(iv) Labour costs, field supplies; head office expense 11 men. 2 engineers, 8 prospectors, 1 cook, 120 days @ $25.00 — $33,000

(v) Equipment costs; tents, hardware, radios, stoves, etc. estimated — $5,000

(vi) General Expense:

Plane fares return Vancouver-Watson Lake	$2,000
Head Office expense 5 months @ $200	1,000
Miscellaneous, assaying, recording etc.	4,000

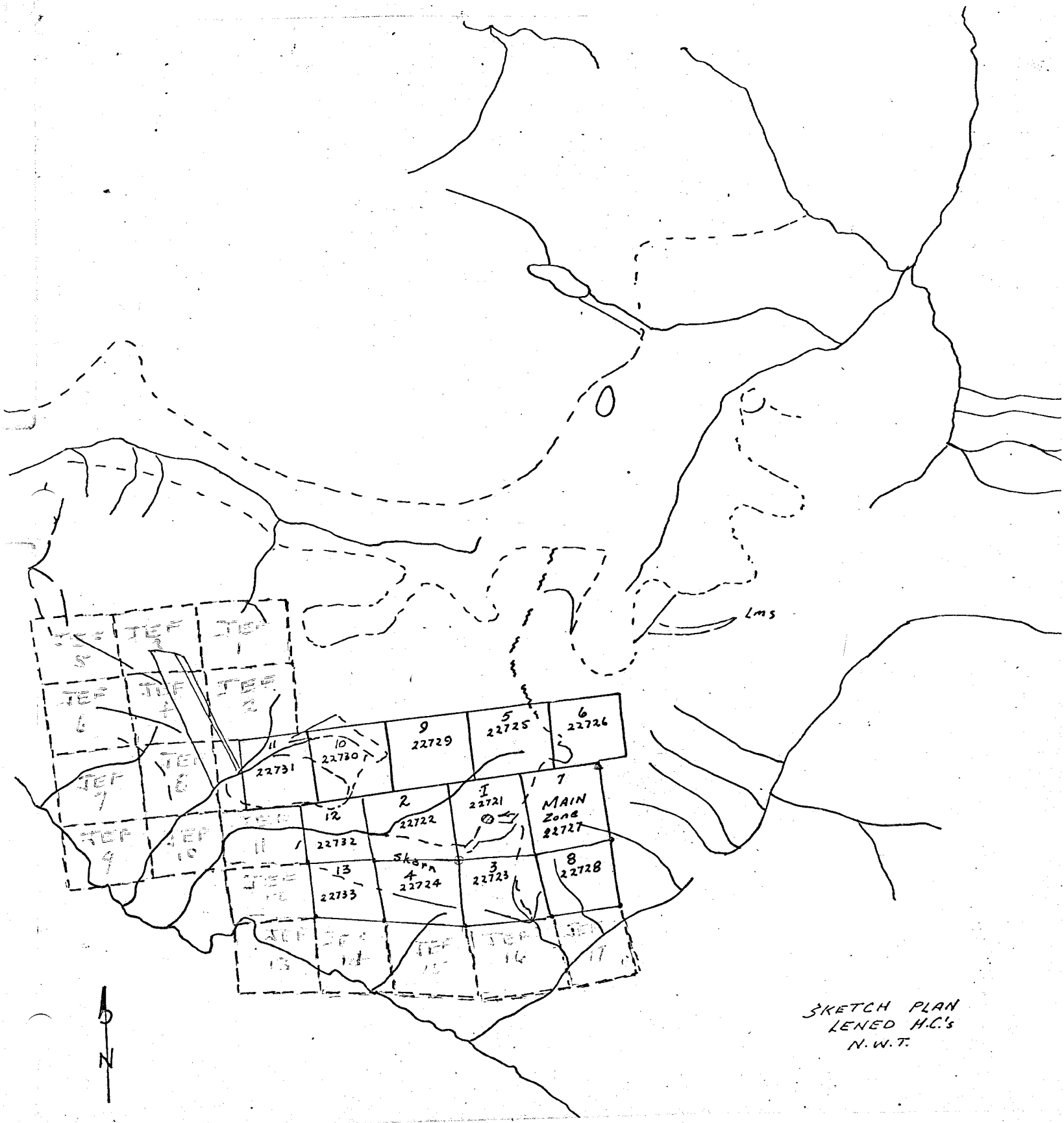
Total	$92,600
Contingencies, say	7,400
Funds required for program	$100,000

Submitted by:

L. Adie.

LA:mg
Vancouver, B.C.
22 February 1960.

cc: J. D. Little
J. A. Mitchell
L. Adie
File



SKETCH PLAN
LENED H.C.'s
N.W.T.

CANEX AERIAL EXPLORATION LTD.

BUDGET ESTIMATE AND PROPOSED WORK NAHANNI TUNGSTEN PROJECT (LENED) 1961

INTRODUCTION

The following report covers a proposed program of work on the Lened tungsten prospect, Nahanni District, N.W.T. As a result of work carried out during the 1960 field season a limited program of geological mapping and diamond drilling, outlined herein, is believed by the writer to be warranted, and is recommended for consideration by the participants in the Northern Venture.

Because of the property's isolated location a helicopter is considered necessary to carry supplies and equipment into the property and service the camp periodically during the program. Full time use of a helicopter is not necessary, however, and the project could very easily be integrated with a program of exploration by the Northern Venture syndicate or another group. Until more is known regarding the use of a helicopter for other exploration work a fifty percent usage factor is tentatively charged to the Lened program.

SUMMARY OF 1960 WORK.

The Lened prospect lies in an area which, prior to this year, had not been geologically mapped and, although a considerable amount of information was gathered in the field concerning the geology and structure, much more work is required to establish detailed stratigraphy and solve structural complications in the area. For our added information the results of a mapping program carried out by the G.S.C. are anticipated sometime during the winter.

The structural interpretation on the Lened is still regarded more or less as originally reported. Briefly, the showing appears to lie on the northeast side of a major northwesterly trending fold, the axis of which is inclined southwest. The plunge of the fold structure is gently northwest. A coalescing of calcareous bands running through the Lened area with other lime bands to the west is the basis for this structural interpretation.

On the west side of the discovery showing the limestone is considered to be overturned with dips on banding varying from 35° S.W. to vertical. On the east side of the property bedding in overlying quartzite beds dips to the northeast. Whether or not banding in the limestone is actually bedding has yet to be determined by detailed mapping; structural complications such as this and a lack of outcrops in the mineralized area make detailed mapping an essential part of an exploration program for the 1961 season.

As a result of the competitive nature of exploration undertaken during the 1960 field season, efforts were devoted chiefly to broad scale exploration, and work on the Lened was limited to determining the feasibility of carrying out additional work in the 1961 season. To this end a small trenching program was laid out; this work was only partially completed owing to the steepness of the hillside and depth of talus in the discovery area.

-/2.

Two trenches of three originally laid out were dug across strike in the interval between outcroppings of scheelite bearing skarn. This work disclosed two main zones of mineralization in each cut, as shown on the accompanying sketch. In the upper trench the original discovery of high grade, originally 5 feet across, was determined to be 8 feet wide. A sample taken on this mineralization ran as follows:-

Width 8.0 ft. 7.6% WO_3 Nil Cu

Fifty feet northwest of the above sample is an outcrop of what is believed to be a continuation of this zone. A sample cut across this zone ran :-

Width 8.8 ft. 2.15% WO_3 0.18% Cu

Approximately 25 feet northeast of the above described zone a second zone of mineralization was exposed in both cuts by digging along the hillside northeast from the two described outcrops through an average depth of 5 feet of slide rock. In the upper trench a solid mass of sulphides, chiefly pyrrhotite, which appears to be fairly fresh, was exposed. A sample of this ran:-

Width 7.0 ft. 2.2% WO_3 0.72% Cu

In the lower trench solid rock was not actually reached, but a 19 foot zone of decomposed bedrock, chiefly rusty clay, which is thought to be most decomposed greisenized granite, assayed as follows:-

Width 19.0 ft. 2.5% WO_3 0.09% Cu

A definite correlation between this scheelite zone and the heavy sulphide zone in the upper cut cannot be established without further work. Also, it should be pointed out that the above 19 foot sample may be salted as a result of residual weathering. This may also be true of other samples of decomposed bedrock (i.e. mostly greisenized granite), which, however, assay less than 1% WO_3.

PROPOSED WORK

The initial stage of proposed exploration is based on the premise that the exposed mineralization is part of two irregular but roughly tabular masses formed through a selective replacement of favourable limey strata and controlled by adjacent sill-like intrusions of greisenized granite. This favourable zone strikes northwest and dips 65°-70° S.W.; anticipated mineable grade of the zone considered worthy of testing is of the order of 2% WO_3 or better.

The first work proposed is to attempt to follow this zone by diamond drilling on 100 foot sections from the discovery area in both directions along strike. A rigid layout of drilling on each section has not been made since it proposed to follow the work closely in the field, where work can be planned accordingly as results are obtained and interpreted.

-/3.

Careful geological mapping and drill hole data should assist in obtaining detailed geological structures necessary for outlining the potential of the property as a whole. Preliminary mapping indicates the bedding to the east of the mineral showings is anticlinal or monoclinal and it is thought possible that a zone of mineralization may lie in calcareous beds within this structure near its contact with the intrusive.

To accommodate a crew to fulfill the above program it is proposed to setup a camp in the cirque below the showings for three drill crews, a cook, helicopter crew, and engineering staff of three to handle surveying, mapping, and core logging. Also a tent would be set up at the small lake northwest of the prospect for storing supplies brought in by float 'plane, pending their delivery to the camp by helicopter.

BUDGET ESTIMATE

The following is an estimate of funds required for the 1961 program as outlined. Helicopter rental is estimated at a rate of 50% minimum flying time charged to the project. Supervision has also been charged at approximately half time to this project pending information on other work which may be proposed or approved by the syndicate.

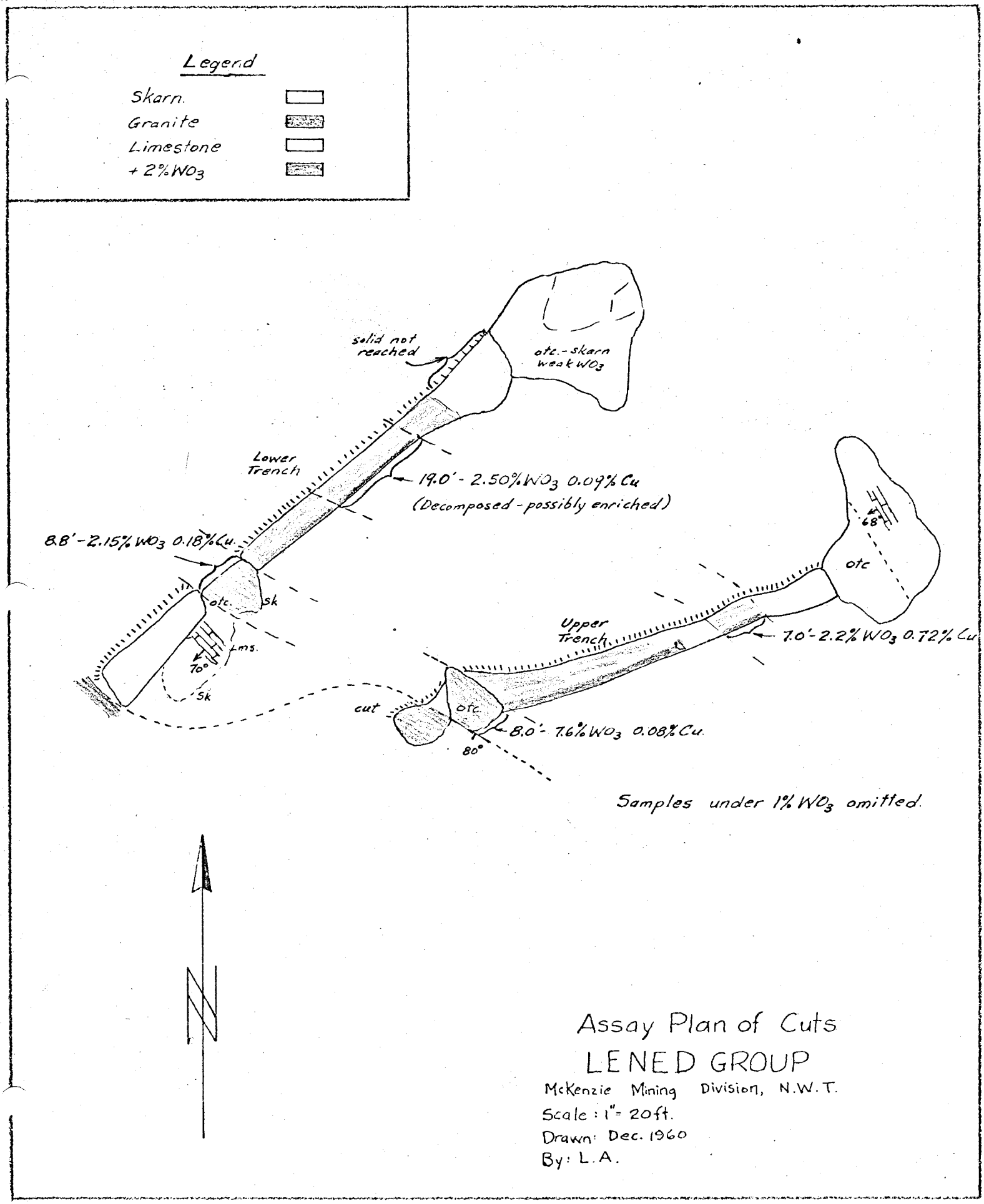
1.	Proposed Contract diamond drilling 3,000 ft. @ $6.50	$ 19,500
2.	Engineering, Geology, Supervision 3-1/2 months @ $1,800 2 geologists @ $525 1 surveyor @ $375 Supervision @ $375	6,300
3.	Helicopter Charter 40 hrs./month 3-1/2 months @ $ 120/hr	16,800
4.	Fixed wing (Beaver) 245 hrs. @ $60.00 Flying drill to Lake 17 trips @ 60 min. return Return drill to Watson Lake 16 trips @ 3 hrs. return Flying Helicopter fuel 12 trips @ 3 hrs. return Beaver gas cache 2 trips @ 3 hrs. return Diesel fuel for drilling and heating 20 trips @ 3 hrs. return Food and Supplies 17 trips @ 3 hrs return Personnel 8 trips @ 3 hrs. return Supervision 3 trips @ 3 hrs. return	14,700
5.	Equipment costs - lumber, hardware, tents, est.	1,500
6.	General Expenses - Assaying, Ground Transport, Insurance -	
	Head Office charges	5,000
	Sub-Total	63,800
	Contingencies	6,200
	Total	$ 70,000

Estimated cost per foot $\frac{70,000}{3,000}$ = $23.33/ft.

Respectfully submitted.

L. ADIE, P. Eng.

LA:mg
Vancouver, B.C.
29 November 1960



Assay Plan of Cuts
LENED GROUP

McKenzie Mining Division, N.W.T.
Scale: 1" = 20ft.
Drawn: Dec. 1960
By: L.A.

CANEX AERIAL EXPLORATION LTD.

DETAILED WORK PROGRAM AND BUDGET ESTIMATE

VENTURE #39 LENED
(Nahanni Tungsten Venture)

Prepared: February 10, 1961
By: L. Adie
A. Allan

Phase IA. MOVING DRILL AND EQUIPMENT TO SUPPLY LAKE - SCHEDULED TO COMMENCE FEBRUARY 15, 1961:-

A. Delivery of Materials and Equipment:		Hours	Rate	Total
February 15	Beaver - J.O.E. Vanc. - Watson Lake	9	$60	$540
16	Gathering supplies.			
17-21	Flying 4 men, misc. supplies and gas for ferrying drill from Cantung to Lened. Len White will advise watchman at Cantung of arrival of our aircraft. 2 day allowance for weather.	7	$60	$420
22-28	Ferrying drill from Cantung to Long Lake 14 trips @ 1 hr. ret. 2 day allowance for weather.	14	$60	$840
March 1	Return to Watson L. - Boyle's representative return to Vanc.	1½	$60	$ 90
2	Gathering supplies in Watson - stove, tents.			
3-8	Flying 450 gals. Diesel fuel Watson L. to Long L. 1 day allowance bad weather.	12	$60	$720
9-13	Flying 250 gals. Av. gas and heaters, tents, etc. 1 day allowance bad weather Watson L. to Long L.	9	$60	$540
13-16	Flying 2x4s & plywood strips. 1 day allowed for bad weather and assembling load.	9	$60	$540
17	Return to Vancouver.	9	$60	$540
		70½		$4,230

B. Estimated Cost of Equipment & Labour: $1920

1.	2 only 14x16x4 - 10 oz. wt. tents @ $85		$170
2.	2 only 18x20 Flies @ $40		80
3.	2 only Coleman Space Heaters @ $65		130
4.	Lumber and Hardware - to be ordered at Fort St. John		400
	(a) 2x4s 1000 Lineal ft. @ $.10	$100	
	(b) plywood 25 sheets ½" @ $4.00	100	
	(c) " 25 sheets ¼" @ $3.00	75	
	(d) drill decking 80 lineal ft. 2'x6" @ .25	20	
	(e) 50 " " 2"x10" @ .30	15	
	(f) Nails 100# @ .30	30	
	(g) Miscellaneous Hardware	40	
	(h) Laths 4 bundles	20	
5.	Labour:-		
	1 Boyle's Mechanic		
	- 15 days @ $25		$375
	- Return to Vancouver by CPA		90
	Labourer to assist in unloading @ Long Lake 15 days @ $15		225
6.	Food and Accommodations:-		450
	2 men, 30 days @ $5.00	$300	
	Hotel accommodations	150	

C. Cost of fuel transported:

1.	Aviation gas 250 gals. @ .60	$150
2.	Diesel fuel 450 gals. @ .38	170
3.	Barrel demurrage, motor oil	380

Total IA $6850.00

Phase IB. MOVING SUPPLIES AND EQUIPMENT FROM SUPPLY LAKE TO LENED CAMPSITE - SCHEDULE TO COMMENCE MARCH 7.
Assume Helicopter chartered to fly to Long Lake from Whitehorse, March 7.

		Hours	Rate	Total
March 7	- Ferry time Whitehorse to Long Lake	4	$120	$ 480
8-12-	Transporting Supplies and Drill to Property:-			
	(a) 14,000# drill equip., 20 trips @ .15 min. travel + 30 min. loading and unloading 1 day allowed for bad weather	5	120	600
12-16-	(b) Lumber and Camp Equipment, supplies, 4000# lumber 8 trips @ .15 min.	2	120	240
	(c) Diesel fuel - 4500# 6 trips @ .15 min.	1½	120	180
	(d) Moving Personnel. 4 trips @ .15 min.	1	120	120

	March 17 - Ferry Time Long Lake to Whitehorse 4 hrs. @ $120		$ 480
	Total		$2,100
B.	Estimated Labour and Supplies:		
	1. Labour (L. A. Welch) 1 month @ $400	$ 400	
	2. Supplies (Helicopter Pilot, Mech. Welch) 55 man dys. @ $5.50	300	
	3. Oil Heating - 10 gals./dy. 30 days = 300 gals. (already charged)		
Total IB			$2,800
Total Cost	Moving drill and Camp Equipment Feb. 15 - Mar. 17		$9,650
	Contingencies 10%		950
TOTAL			$10,600

Phase IIA. DIAMOND DRILL PROGRAM - SCHEDULED TO BEGIN MAY 25 OR AS SOON AS WATSON LAKE IS OPEN TO FLOAT AIRCRAFT. PROGRAM TIMING TO BE SCHEDULED.

A.	Cost of Additional Supplies for completing 3000' drilling:-		
	1. Diesel fuel - 4400 gals. @ $.38/gal.	$1670	
	Estimated loss on drums abandoned or damaged	300	
	2. Camp Gas - 3 drums. 135 gals. @ .50	70	
	3. Propane - 6 tanks @ $10.00	60	
	4. Helicopter gas, 1,000 gals. @ $.60	600	
	5. Food Supplies - 11 men/day 60 days @ $5.50	3600	
	6. Camp Equipment, additional beds, etc.	100	
			$ 6,400
B.	Cost of Diamond Drilling (Based on 3000' drilling):-		
	1. Drill rental @ $4.50 per runner hour - 24 hrs./day for 56 days	$6050	
	2. Drill Wages - 56 dys. 3 drillers, 3 helpers + time and ½ for Sundays - estim.	6000	
	3. Cost plus charges - labour only 30% on wages 15% compensation and V.I.	2700	
	4. Diamond loss and setting charges @ $.75/ft.	2250	
	5. Travel - Edmonton - Watson L. 6 @ $150 ret.	900	
	6. Freight on Equipment Watson L. - Vancouver	750	
	7. Core Boxes - 120 boxes @ $3.00	350	
	8. Misc. Equipment, spare parts, rod grease etc. air express on bits etc.	700	
			$19,700

C.	Engineering and Administration:-			
	1. Administration and head office charges		$ 800	
	2. Staff on Lened:		2300	
	1 Sr. Geologist 2 months	$1400		
	1 Jr. Geologist 2 months	900		
	3. Travel and Hotel Accommodation -		400	
	Airfares	300		
	Hotel	100		
	4. Engineering Equipment -			
	Drafting, Supplies, etc.	100		$ 3,600
D.	Camp Expense:			1,100
	1. Setting up - 2 men 1 week	200		
	2. Operating - Cook 2 months	900		
E.	Fixed Wing Transport Cost - 86 trips @ 3 hrs. @ $60.00			15,500
	Weights to be moved:-			
	Diesel - 4400 gals. @ 10#	44,000		
	Propane - 6 bottles @ 150#	1,000		
	Camp Gas 135 gals. @ 10#	1,400		
	Crew & gear - 12 @ 300# in and out	7,200		
	Food - estim. 7#/may/day	5,000		
	Helicopter gas - 1,000 gals. @ 10#	10,000		
	Camp Equipment - estim.	2,000		
	Diamond drill to Watson L.	14,000		
	Survey Equip. & Valuables to Watson L.	1,000		
		85,600		
F.	Helicopter Charges:			7,000
	1. Transporting above weight to property @ 856#/load 100 loads @ 15 min; 25 hrs. $120/hr.		$3000	
	2. Ferrying to or from Expl. site 24 hrs. @ 120		3000	
	3. Removal of drill at end of program 5 hrs. @ $120		600	
	4. Miscellaneous - valuable equipment, removal, transp. samples, etc. 3 1/3 hrs. @ 120		400	
Total, Operating phase				$ 53,300
Credit - board from Boyle's ($2.50 per man day) $ 2.50 x 6 x 60				900
Balance, Total Phase II				$ 52,400
Total Cost Phase I Feb. Mar./61				9,650
Cost Phase I and II June, July/61				$ 62,050
Contingencies 10%				6,200
Add Royalty payments to prospectors 3,000 ft. @ $.50				1,500
				$ 69,750
TOTAL			say	70,000

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CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

FIRST EDITION

CANADA, SHEET 105 I

130°00' 45' 30' 15' 129°00' 45' 30' 15' 128°00'
63°00' 45' 30' 15' 62°00'

O'Grady Lake 4260±

ROSS RIVER

YUKON TERRITORY
NORTHWEST TERRITORIES

MT WILSON 7746

SOUTH NAHANNI RIVER

MACKENZIE MOUNTAINS

PROSPECTOR RIVER

PELLY RIVER

Summit Lake

Gull Lake

WOODSIDE RIVER

MT PIKE 6580

Hyland River

NORTHWEST TERRITORIES
YUKON TERRITORY

CANEX BASE CAMP

LINATION OF THE COMPASS NEEDLE, 1954

Surveyed, compiled, drawn and printed by the ARMY SURVEY ESTABLISHMENT R.C.E., 1949-54
Aerial photography by the R.C.A.F. 1949
Universal Transverse Mercator Projection.

NAHANNI

Contour interval 500 Feet
All Elevations in Feet above Mean Sea Level.

NORTHWEST
Niddery Lake | Sekwi Mountain | Foran