FINAL REPORT - STOKES LAKE PROGRAM

HESS PROJECT

ATLAS EXPLORATION LIMITED
By:

M. E. Coates

November 1969

105 K

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FINAL REPORT

STOKES LAKE PROGRAM

HESS PROJECT

N.T.S. 105-K

Yukon Territory

By

M. E. (TIM) COATES, P. ENG.

ATLAS EXPLORATIONS LIMITED

November, 1969

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Photo 4 Stream section west of Gossan #16 on Tay River illustrates intricate folding and faulting in Devonian argillites and cherts.

Photo 5 Folded rocks near Villa showing 105-K-13.

Photo 6 White River Ash layer (white) overlying "B" horizon above Gossan #15 105-K-13.

INTRODUCTION

This report includes descriptions of geological, geochemical and prospecting work done in the "Stokes Lake Belt", N.T.S. Area 105-K, Yukon Territory. The work was carried out in the period from August 24, 1969 to September 21, 1969 by a party of men varying in numbers from 10 to 14. The field party was supported by helicopter and fixed-wing aircraft and was under the direct supervision of the writer.

The technique employed in the Stokes Lake Program entailed geochemical sampling in the vicinity of Magnetic Anomalies (MA) and in zones of rusty alteration or "Gossans" (G). Prospecting and geological follow-up work was done in areas of bedrock outcroppings.

SUMMARY

Survey work in the Stokes Lake belt was completed September 21, 1969. In all, 14 Gossans and 30 Magnetic Anomalies were examined. Prospecting has been done in the Villa Area, the Buzz Grid area and in the vicinity of Magnetic Anomalies #9 and #14.

The work done was successful in pin-pointing three areas for further work and resulted in the staking of the OWL Group in October, 1969.

CONCLUSIONS AND RECOMMENDATIONS

The Stokes Lake Program succeeded in finding two geochemically anomalous areas which appear to be of merit (See Figures 2, 4 and 11). Recommendations for further work are given below. Budget estimates and suggested scheduling are shown in Appendix I.

1. Owl Group - Buzz Grid Area (Fig. 4 and Fig. 11)

   The area is one which has been found to carry high Cu, Pb, and Zn geochemical values in soil samples.

   (a) More exhaustive sampling should be done in the vicinity of the Owl Group anomaly to determine its areal extent. The area is largely obscured by overburden but should be prospected thoroughly for float, etc.

   It is recommended that a grid be cut with a 4800 ft. baseline trending at 130° - parallel to the regional strike - and passing through the most highly anomalous zone. Cross-lines, 4000 ft. in length, should be cut at 400 ft. intervals.

   A magnetometer survey of the grid should be done and correlated with the results of the geochemical soil sampling.

   Contingent airborne work will depend on the results of the grid work and geological studies.

   (b) The Buzz Grid area has been prospected in part. The existing grid should be extended to the east for another 1000 ft. and fill-in soil sample lines run in at 400 ft. intervals to detail the anomaly. Several days prospecting work should be done in the

grid area to ascertain the cause of the anomaly. Reconnaissance silt and soil sample lines should be done in the area between the Buzz Grid and the Owl Group to test for other anomalous zones within or adjacent to Magnetic Anomaly No. 9.

2. Villa Area

The geochemical sampling at Gossan #1 and Magnetic Anomaly No. 2 yielded Pb geochemical values up to 850 ppm (See Fig. 2). It is recommended that a geologist, a prospector and soil samplers spend 5 days in the area to sample and prospect the area thoroughly and map the area geologically.

REPORT ON THE STOKES LAKE PROGRAM

LOCATION AND ACCESS

The Stokes Lake belt is a northwest-southeast trending tract about 12 miles in width which extends from Stokes Lake in the northwest along the Tay River Valley to Tay Lake in the southeast. The belt encompasses parts of N.T.S. areas 105-K-7, 8, 9, 10, 11, 12 and 13 (See Fig. 1).

Access to the Stokes Lake Area is by helicopter or float equipped aircraft from Ross River, a village at the junction of the Ross and Pelly Rivers, about 35 miles south of the area.

HISTORY

Initial explorations in the Stokes Lake Belt area were done in the fall of 1965 by Dynasty Explorations. This work was confined to the south-central flank of the area and was limited to soil sampling follow-up of rust seepages and alteration zones discovered by helicopter recce (See Photos 1, 2 and 3).

The present work was undertaken to follow-up two types of exploration targets.

(1) Isolated (non-regional) Magnetic Anomalies appearing on recce governmental aeromagnetic maps of the area.

(2) Alteration zones and gossans discovered during the fixed-wing recce of Coates and Godwin, June, 1969.

The following general guidelines were suggested by participants in conference at Big Kalzas Lake, August, 22, 1969.

Offre

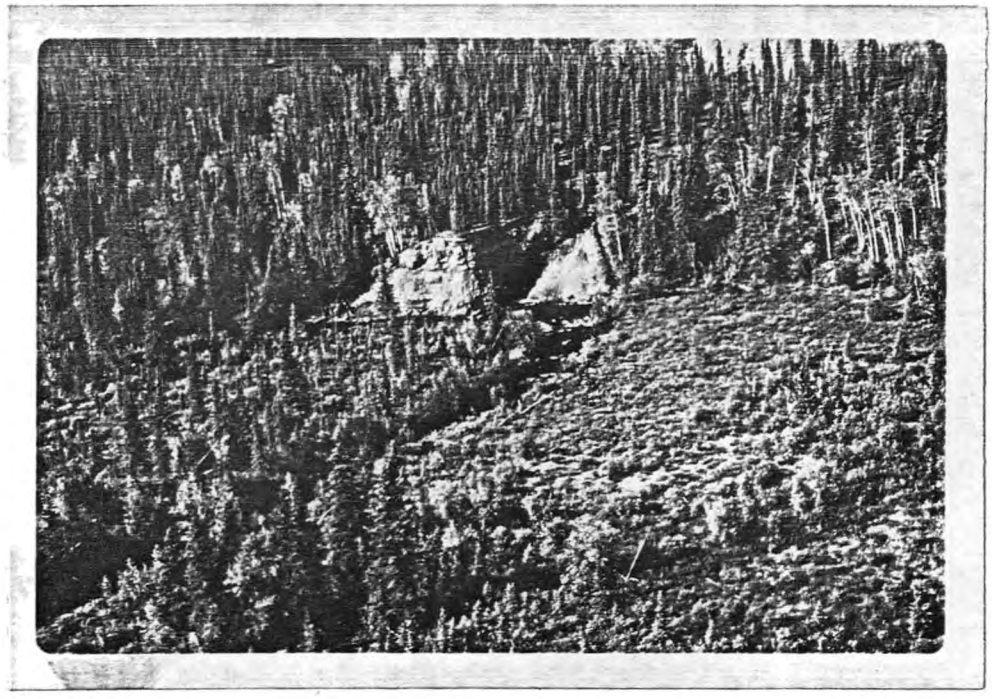


Photo 1

Aerial view of Gossan #1.
Yellow layer above the creek bed is
rust-cemented conglomerate (105-K-13)

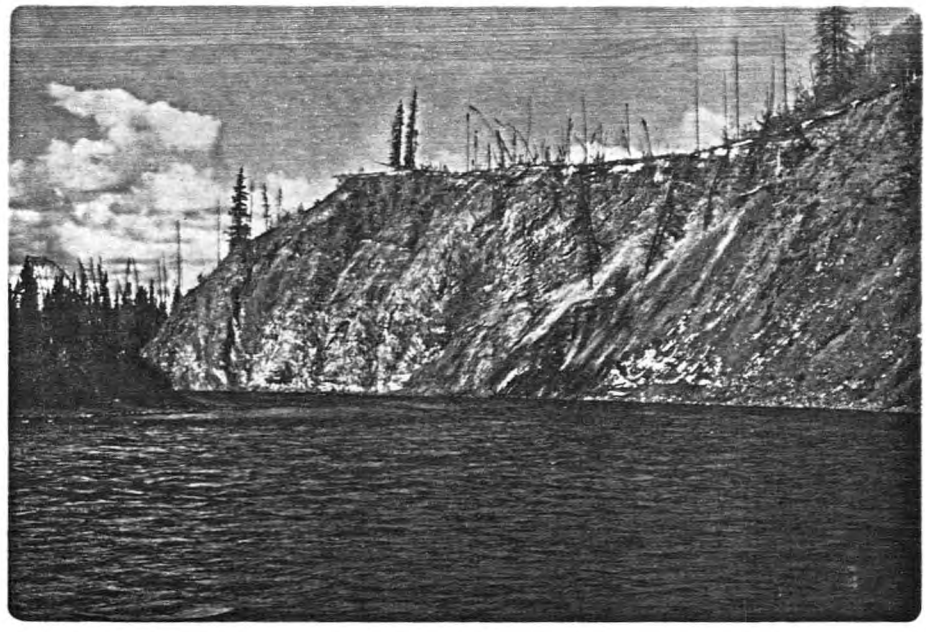


Photo 2

Gossan #15.
On the north bank of Tay River 105-K-13
White material in the right-central
part of the photograph is sulphide
alteration product (Fe SO_4).

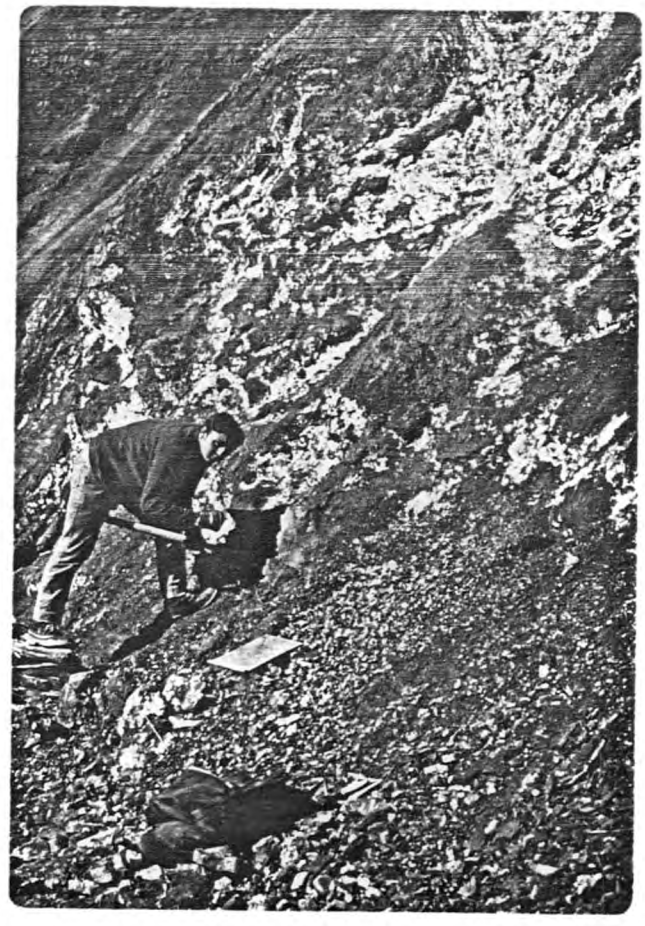


Photo 3

Gossan #15.
Fe SO_4 alteration products
occurring over pyritic argillite
(105-K-13).

Dr. Aaro Aho, John S. Brock, Richard Strong and Alan Temple were present at that time.

(1) Helicopter recce (3 or 4 days) to pin-point gossan areas to do follow-up prospecting on. Assign priorities and sample gossans by the 'Star Method' (two orthogonal soil sample lines, 2000 ft. in length - samples collected at 100 ft. intervals).*

(2) Aeromagnetic anomalies with coincident alteration zones to be prospected by Etzel or Brodell to determine the presence or absence of economic minerals.

(3) Magnetic anomalies to be tested from the helicopter using the MF-1 magnetometer and flying at an altitude of approximately 100 ft. A.G. to determine the focus of the anomalies. Those highs on the northern flank of the belt to receive priority.**

(4) Suggested follow-up technique in the vicinity of the anomalies was to run three soil sample lines across the strike of the anomaly, 1000 ft. apart and with a soil sample interval of 200 ft.

(5) Geological check-work or examination of rock chips collected by samplers in the course of examining gossan or anomaly zones

It was hoped that 20 to 25 areas could be examined in the above manner in the period August 25 to September 15.

* Recce for gossans in the latter part of August proved to be difficult due to the masking effects of the colourful autumn vegetation. Most of the alteration zones detected in the Fall recce were along the banks of streams where rock outcroppings form steep cliffs.

** Magnetometer traverses using the helicopter proved to be impractical as the instrumental variations due to the magnetic field of the helicopter dwarfed all other fluctuations.

GENERAL GEOLOGY

The Stokes Lake area is underlain by a group of sedimentary rocks, largely cherty grey-green argillites with minor limy sections. Chert pebble conglomerate is less abundant and only occasionally are narrow bands of fossiliferous limestone encountered. These rocks were mapped by J. A. Roddick of the Geological Survey of Canada and are grouped as unit 5 on the geological map of the Tay River Area (105-K, Map 13-1961). The following is a description after Roddick:

> "Unit 5 underlies much of the region between the Anvil and South Fork Ranges. It contains practically no type of rock that does not exist also in the Ordovician-Silurian strata (3), from which it appears to have been derived. Quartzite and limestone are, however, much more abundant in unit 5. The assigned age of the unit is based on Upper Devonian brachiopods from thin beds of silty limestone and chert (5c) between Stokes Lake and Tay River, and on Mississippian brachiopods from a silty sandstone (5c) near the centre of the map-area. The dark cherts of unit 5b are at least 1,500 ft. thick on Twopete Mountain and northwest of the head of Blind Creek.
>
> "Massive chert-pebble conglomerate beds (5a) form conspicuous outcrops in the vicinity of Stokes Lake. At least two beds are presented in the unit. Most of the fragments are of dark grey chert and shale, but significant numbers of fragments in the beds north of Earn River consist of light grey quartzite. The conglomerate beds are not as prominent to the east, and may thin in that direction.
>
> "Mississippian brachiopods were found in a massive grey limestone bed (6) northeast of Twopete Mountain. The limestone is involved in the complex folding and faulting of unit 5."

In the vicinity of Magnetic Anomalies #20 and #21 a window of Proterozoic red slates and minor gritty quartzite penetrates the Paleozoic cover. Elsewhere in the belt, eroded remnants of Tertiary (?) porphyritic extrusive rocks disconformably overlie Paleozoic rocks. These volcanic

remnants give positive aeromagnetic responses and are the source of many of the Magnetic Anomalies in the northern flank of the Stokes Lake Belt.

Additional occurrences of fetid fossiliferous limestone were mapped near the Tay River in the course of anomaly follow-up work; none of these exceeded 200 ft. in thickness

STRUCTURAL GEOLOGY

Regionally, the rocks between Macmillan and Tintina vallies can be considered as a major fault block with hinge-type displacement about a northwest trending maximum axis, depression being in the southwest.

Locally domed in proximity to the Anvil Range intrusives, Paleozoic rocks in the Stokes Lake Belt describe a synform, troughing in the Tay River Valley, with the northern limb rising toward Macmillan River and the coincident axis of uplifted Proterozoic rocks.

Low-angle faulting and superficial (?) folding are common in the trough area (See Photo 4). Shallow dips and flat lying fold axes of northwest trend are common in the Stokes Lake belt.

ECONOMIC GEOLOGY

Mineral occurrences discovered in the Stokes Lake Program area are of fracture-filling and replacement type.

A. Fracture Filling

(1) Owl Claims area ($133^{o}20'$ - $62^{o}38'$)N.T.S. 105-K-11)

The only mineralization discovered to date has been a narrow quartz, arsenopyrite, stibnite vein. It does not seem likely that this type of mineralization could account for the Cu-Pb-Zn geochemical

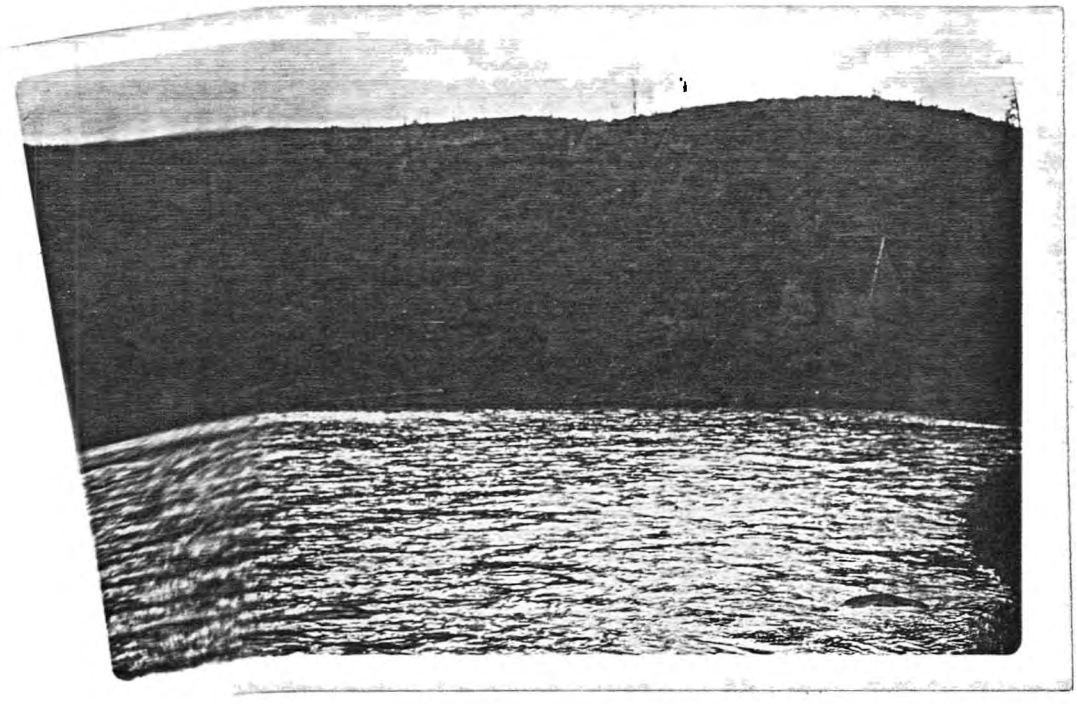


Photo 4

Stream section west of Gossan #16 on Tay River illustrates intricate folding and faulting in Devonian argillites and cherts.

anomaly found in the central parts of the claim group.

(2) Buzz Grid area (105-K-12)

Small pieces of sulphide bearing float were found in talus in proximity to the granitic plug. The float samples contain vein-type mineralization, mainly arsenopyrite with lesser amounts of galena and chalcopyrite in quartz gangue. An assay of the specimen of the float gave the following values:

	Au oz/T	Ag oz/T	Lead	Zn	Cu
No. 4028	.005	1.68			1.7%
No. 4030	Tr.	15.8	7.5	.40	0.14%

Subsequent geochemical results obtained from a 2000 ft. grid over the area reveal the presence of a Cu-Pb-Zn anomaly in the soils.

(3) Magnetic Anomaly #28 ($62^{o}23'N - 132^{o}34'W$)

Several boulders of compact grey-green limy argillite were found by George Johnny. Small amounts of chalcopyrite, galena and sphalerite are localized along hairline fractures in the float. Assay of a representative specimen gave the following values

	Au.oz/T	Ag oz/T	Pb	Zn	Cu
No. 4031	Tr.	.24	.59	.27	.10

No in situ mineralization was found. Soil samples taken below the occurrence gave the following values:

	Cu	Pb	Zn
TC-69-90	62	65	95
-91	85	102	142
-92	98	76	110
-93	51	111	98

Bedrock in the immediate area of the discovery is of tuffaceous volcanic origin.

B. Replacement Type Occurrences

(1) Villa Showing (105-K-13)

The mineralization of the Villa Showing was discovered by Matt Waldner in the course of doing a geological traverse along the creek bed. Float picked up contained 30% sphalerite, 2% chalcopyrite and 15% pyrrhotite in a foliated, granular quartzose matrix. Two sulphide occurrences were subsequently found:

(a) The upper showing is a foot long by 6 inches thick replacement in a limy layer interbedded with green cherts. Bedding in the cherts is 2 inches to 5 inches in interval and chert layers are separated by laminae of grey green slate. The sulphide pod is found on the northern limb of a local anticlinal structure which plunges at 10^{o} to the southeast (See Photo 5). In the margins of the pod considerable amounts of matted fiberous tremolite have developed.

Analyses of several samples from this occurrence gave the following values:

	Au oz/T	Ag oz/T	Cu	Pb	Zn
No. 4025	Tr	0.28	0.58	Tr	15.0%

Rock chips from pieces of float found below the showing yielded the following values:

	Cu	Pb	Zn
Tc-81	3180	50	46
-82	2600	325	102,000

(b) The lower showing occurs on the southern flank of the same anticlinal structure, in the creek bed but approximately 600 ft. farther down the creek. This showing contains a higher percentage of coarse-grained pyrrhotite with only minor amounts of sphalerite.

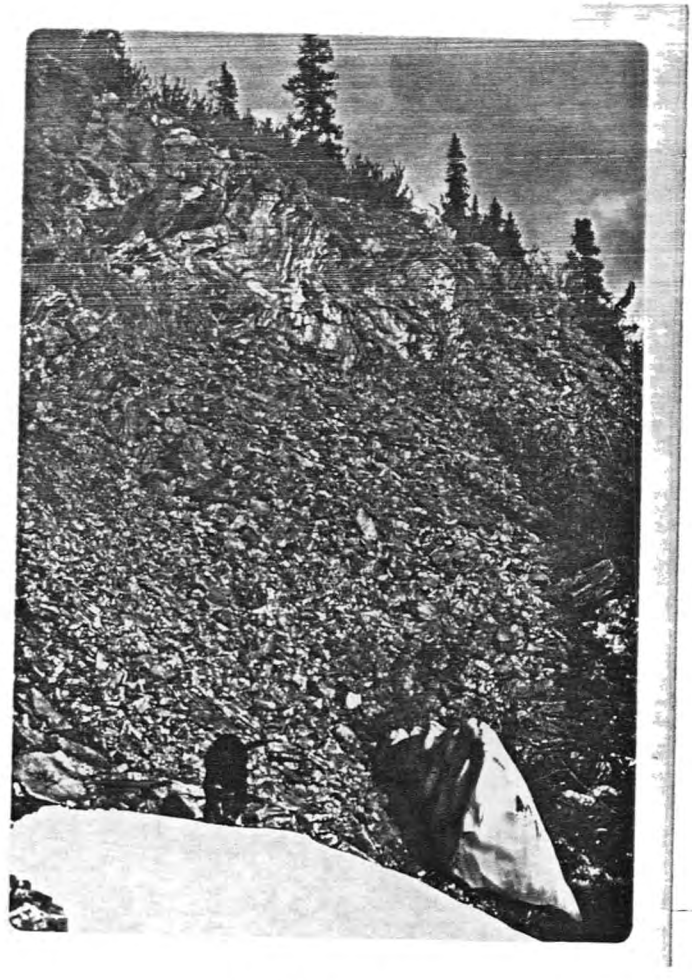


Photo 5

Folded rocks near Villa Showing 105-K-13.

GEOCHEMISTRY

Soil samples collected during the Stokes Lake Program were analyzed by Atomic Absorption methods using a total digestion (hot Aqua Regia).

Results have been interpreted visually but in general results exceeding following standards have been regarded as definitely anomalous:

Cu	Pb	Zn
100 ppm	100 ppm	400 ppm

Three areas have been selected for further work on the basis of encouraging geochemical results, coincident Magnetic Anomalies and the presence of small showings in their environs. They are, in order of priority, as follows:

(a) The Owl Group Area
(b) The Buzz Grid - MA #8 Area
(c) The Gossan #1 Area.

In several areas soil samples and samples of the White River Ash have been collected and analyzed for Cu, Pb and Zn content (See Photo 6). Profiles of the respective values have been shown on the map-face of respective areas. It was hoped that sampling of the almost omnipresent ash horizon would provide a reliable substitute sample at sites where 'B' horizon material is not present or difficult to sample. The erratic results obtained from the limited test group examined seem to indicate that the Ash horizon is not suitable for sampling.

Respectfully submitted,

M.E. (Tim) Coates

November 25, 1969

Photo 6

White River Ash layer (white) overlying "B" horizon above Gossan #15 105-K-13.

PROPOSED BUDGET
STOKES LAKE PROGRAM AREA
1970 SEASON

Owl Group - Buzz Grid Area - June (1-15)

(02)	Prospecting		
	Salary & Wages (Brodell)	$ 350.00	
	Assays	50.00	
	Camp Operation	150.00	
	Freight & Transportation		
	Helicopter (5 hrs.@$120/hr.)	600.00	
	Fixed Wing	150.00	
	Total Prospecting		$ 1,300.00
(03)	Staking (Contingent)		
	Assume staking cost of $75/claim for an additional 20 claims	$1,600.00	
	Total Staking (Contingent)		$ 1,600.00
(05)	Linecutting		
	Salaries & Wages	$	
	12 miles; approx.30 man-days @ $20/day	600.00	
	Camp Operation ($10 man/day)	300.00	
	Contingent linecutting (6 miles)	450.00	
	Total Linecutting		$ 1,350.00
(06)	Geology		
	Salaries & Wages	$ 450.00	
	Field Expenses	100.00	
	Assays	100.00	
	Camp Operation	150.00	
	Freight & Transportation		
	Helicopter (2 hr.@$120/hr.)	240.00	
	Fixed Wing	200.00	
	Total Geology		$ 1,240.00
(07)	Geophysics		
	Salary & Wages (Magnetometer survey)	$ 100.00	
	Camp Operation	50.00	
	Freight & Transportation	50.00	
	Contingent Airborne EM & Mag.		
	200 line miles @ $75/mile	15,000.00	
	Total Geophysics		$15,200.00

(08)	Geochemistry		
	Salaries & Wages		
	30 man-days @$20/day	$ 600.00	
	Camp Operation (@$10/man-day)	300.00	
	Freight & Transportation	200.00	
	Assays (1000 samples @$2.00)	2,000.00	
	Total Geochemistry		$ 3,100.00
	TOTAL		$23,790.00
	Villa Area (Gossan #1)		$ 2,000.00
	Buzz Grid Area		$ 2,000.00
	GRAND TOTAL		$31,790.00

Figure 1 LOCATION MAP, Stokes Lake Program Area
105 K 1" = 4 miles

Figure 2 GEOCHEMICAL VALUES MAP
Villa Area (G-#1, 3, & 9 and MA #2,3)
105 K-13 1" = ¼ mile

Figure 3 GEOCHEMICAL VALUES MAP
Gossan # 2
105 K-13 1"=½ mile

Figure 4 GEOCHEMICAL VALUES MAP
Buzz Grid Area (Includes gossan #4 & MA #8 & 9) 105 K-12 1" = ½ mi

Figure 5 GEOCHEMICAL VALUES MAP
Gossans # 7 & 8
105 K-12 1" = 1000'

Figure 6 GEOCHEMICAL VALUES MAP
Gossans #10 & 11
105 K 1" = ½ mile

Figure 7 GEOCHEMICAL VALUES MAP
Gossans # 15 & 16
105 K-13 1" = 1000'

Figure 8 GEOCHEMICAL VALUES MAP
GOSSAN #17
105 K-13, L-16 1" = ½ mile

Figure 9 GEOCHEMICAL VALUES MAP
Gossan #18
105 K-12 1" = 1000'

Figure 10 AEROMAGNETIC MAP
Tay River
105 K 1" = 4 miles

Figure 11 GEOCHEMICAL VALUES MAP
MA #9
105 K-11 1' = 1000'

Figure 12 GEOCHEMICAL VALUES MAP
MA #14
105 K-12 1" = ¼ mile

Figure 13 GEOCHEMICAL VALUES MAP
MA #20 & MA #21
105 K-10 1" = 1000'

Figure 14 GEOCHEMICAL VALUES MAP
MA #22
105 K-10 1" = 1000'

Figure 15 GEOCHEMICAL VALUES MAP
MA #23A & 23B
105 K-10 1" = 1000'

Figure 16 GEOCHEMICAL VALUES MAP
MA #24
105 K-10 1" = 1000'

Figure 17 GEOCHEMICAL VALUES MAP
MA #25A
105K-8 1" = 1000'

Figure 18 GEOCHEMICAL VALUES MAP
MA #25B
105 K-8 1" = 1000'

Figure 19 GEOCHEMICAL VALUES MAP
MA #25C & G #19
105 K-7, 8, 10 1" = 1000'

Figure 20 GEOCHEMICAL VALUES MAP
MA #26A & MA#26B
105 K-9 1" = 1000'

Figure 21 GEOCHEMCIAL VALUES MAP
MA #26C
105 K-9, 8, 10 1" = 1000'

Figure 22 GEOCHEMICAL VALUES MAP
MA #27
105 K-7 1" = 1000'

Figure 23 GEOCHEMICAL VALUES MAP
MA #28A & MA #28B
105 K-7 1" = 1000'

Figure 24 GEOCHEMICAL VALUES MAP
MA # 30
105 K-8 1" = 1000'

Figure 25 GEOCHEMICAL VALUES MAP
MA #31 & MA #32
105 K-8 1" = 1000'

Figure 26 GEOCHEMICAL VALUES MAP
MA #33
105 K-8 1" = 1000'

Figure 27 GEOCHEMICAL VALUES MAP
MA #34
105 K-8 1" = 1000'

Figure 28 GEOCHEMICAL VALUES MAP
MA #36
105 K-8 1" = 1000'

Figure 29 GEOCHEMICAL VALUES MAP
MA #37
105 K-7 1" = 1000'

Figure 30 GEOCHEMICAL VALUES MAP
MA # 38
105 K-7 1" = 1000'

Figure 31 GEOCHEMICAL VALUES MAP
MA #39
105 K-7 1" = 1000'

Figure 32 GEOLOGICAL MAP
Tay River Area
105 K 1" = 4 miles

Figure 33 TOPOGRAPHIC MAP
Tay River Area
105 K 1" = 4 miles

63° 00' N.

62° 30' N.

133° 30' W.

133° 00' W.

132° 30' W.

CAMP SITE

STOKES LAKE

MOUNT SELOUS

SOUTH MACMILLAN RIVER

MOUNT MENZIE

TWOPETE MTN.

TAY

Teddy Creek

LoFORCE LAKE

TEDDY LAKE

SUGGESTED AREA BOUNDARY

OWL CLAIM GROUP

TED CLAIM GROUP

BARK CLAIM GROUP

TARA CLAIM GROUP

HAL CLAIM GROUP

MARK CLAIM GROUP

TER CLAIM GROUP

DANE CLAIM GROUP

RIVER

STEAK LAKE

PROPOSED CAMP SITE

JIM COOK LAKE

POISON LAKE

BLIND LAKES

Anvil Creek

PELLY RIVER

Rose Creek

ROSE MTN.

MOUNT MYE

BOUNDARY OF ATLAS ANVIL AGREEMENT

G-1 G-2 G-3 G-4 G-5 G-7 G-8 G-9 G-10 G-11 G-12 G-13 G-14 G-15 G-16 G-18 G-19

MA-1 MA-2 MA-3 MA-4 MA-5 MA-6 MA-7 MA-8 MA-9 MA-10 MA-11 MA-12 MA-13 MA-14 MA-15 MA-16 MA-17 MA-18 MA-19 MA-20 MA-21 MA-22 MA-23 MA-24 MA-25 MA-26A MA-26B MA-26C MA-27 MA-28A MA-28B MA-29 MA-30 MA-31 MA-32 MA-33 MA-34 MA-35 MA-36 MA-37

MA 23A MA 23B MA 25A MA 25B MA 25C

A.M. A.A. J.F. J.B. T.R. M.L.

LEGEND

MAGNETIC ANOMALIES; "STAR SAMPLED", PROFILED.

GOSSAN or ZONES of ALTERATION; "STAR SAMPLED", PROFILED.

GROUND TRAVERSES 1965.

inches 0 1 2

centimetres 0 1 2 3 4 5

YUKON GEOLOGICAL SURVEY

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

ATLAS EXPLORATIONS LTD.

HESS PROJECT, YUKON

STOKES LAKE PROGRAM

LOCATION MAP

SHOWING

MAGNETIC ANOMALIES GOSSANS

N.T.S. AREA 105·K/5-16

SCALE: 1" = 4 miles

NOVEMBER, 1969.

FIGURE 1

MAGNETIC DECLINATION 34° E

STOKES LAKE

VILLA SHOWING

Cu-Zn

ROCK CHIPS
Cu - 2600 PPM.
Pb - 325 "
Zn - 102,000 PPM.

VILLA LAKE

SMALL GRANITE OUTCROP

MA.-2

58,300 Y

MA. 2
FOR GEOCHEMICAL RESULTS
SEE INSET MA. 2

MA.-3

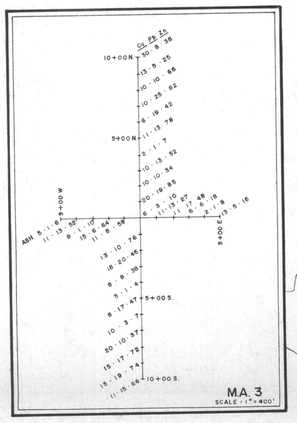
58,300 Y

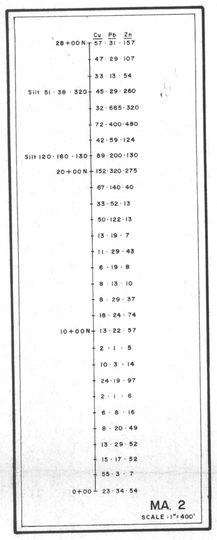
MA. 3 FOR GEOCHEMICAL RESULTS SEE INSET MA. 3

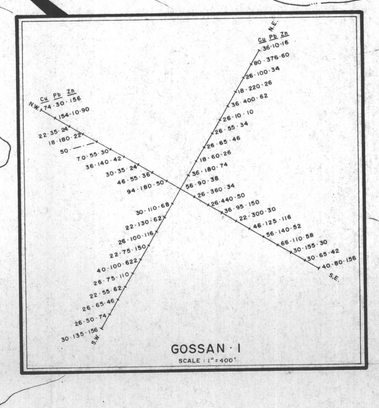
GOSSAN

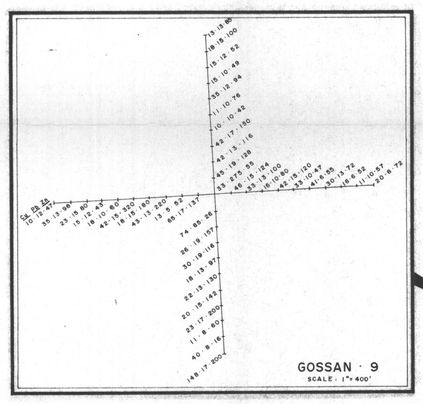
GOSSAN 3

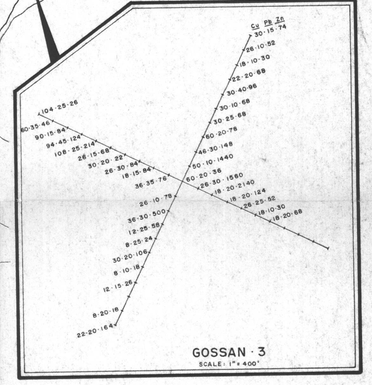
GOSSAN 9



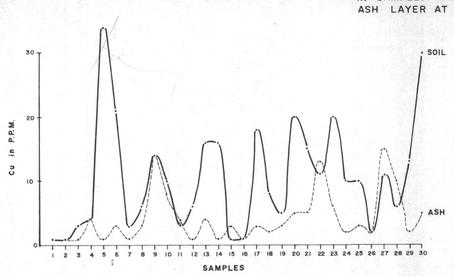


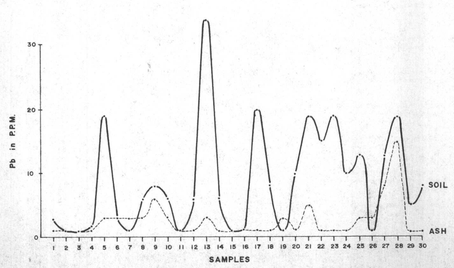


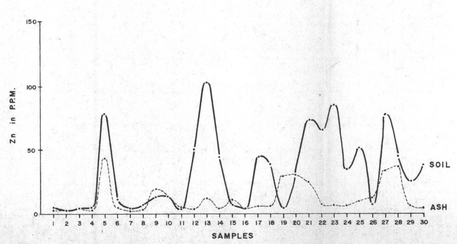




PROFILES SHOWING BASE-METAL CONCENTRATIONS IN SAMPLES TAKEN FROM 'B'-HORIZON & WHITE RIVER ASH LAYER AT SELECTED LOCALITIES.







LEGEND

- ● ..... SOIL SAMPLE LOCATION
- ●20-5-41-2 ..... VALUES ARE PROGRESSIVELY Cu, Pb, Zn, Mo. IN P.P.M.
- ⊗ ..... GOSSANS, RUST SEEPS
- ANOMALOUS SITES.

inches / centimetres

This reference scale bar has been added to the original image. It will remain accurate only as long as the image remains and can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

ATLAS EXPLORATIONS LTD.
HESS PROJECT, YUKON
STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

GOSSANS 1, 3 & 9
MAGNETIC ANOMALIES 2 & 3
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS
N.T.S. AREA 105-K/13
SCALE 1" = 1/4 mile
NOVEMBER, 1969.

FIGURE 2

EARN

RIVER

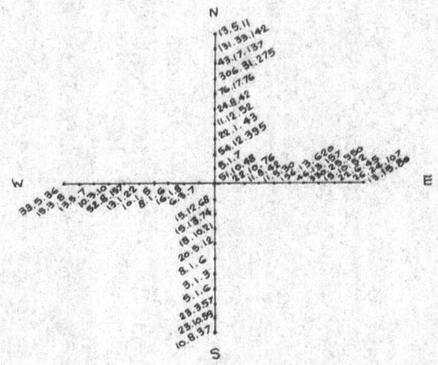
GOSSAN # 2
(SEE INDEX MAP)

▲ 5418

5000

4500

GOSSAN # 2



SCALE 1" = 1000'

inches
0 1
0 1 2
centimetres

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YUKON GEOLOGICAL SURVEY

ATLAS EXPLORATIONS LTD.

HESS PROJECT Y.T.

HESS OEX

N.T.S. 105-K-14

GEOCHEMICAL SURVEY OF GOSSAN # 2

SCALE 1" = 1/2 MI

OCTOBER 1969

FIGURE 3

ATLAS EXPLORATIONS LIMITED
HESS PROJECT, Y.T.
HESS 0EX.
N.T.S. 105-K-12

GEOCHEMICAL SURVEY
GOSSAN 4

DATE OF SURVEY:
DATE DRAFTED: OCT. 1969

FIG. No. 4
TO ACCOMPANY REPORT:

SCALE 1" = 1/4 MI

133° 30'

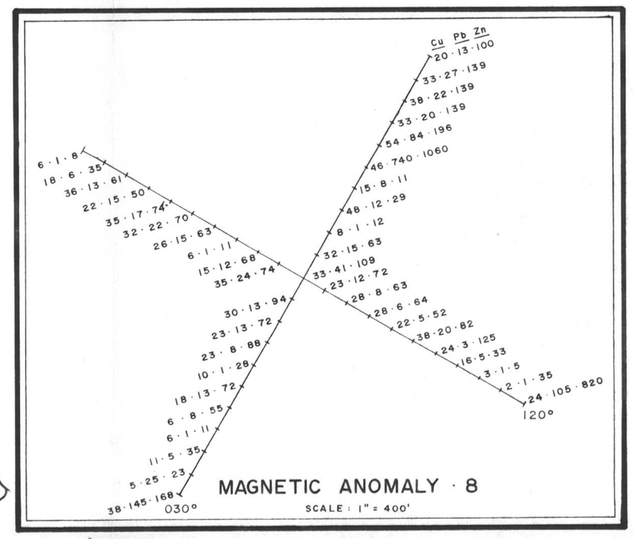
62° 40'

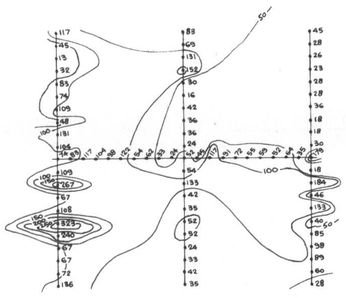
4000
4500
5000
5000
5000
5500
5000

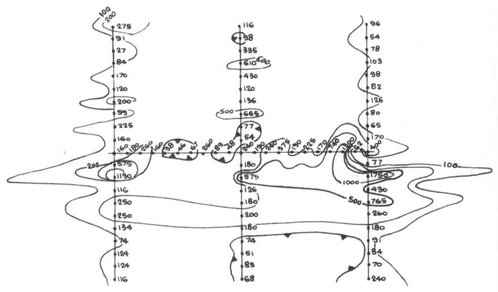
M.A. 8

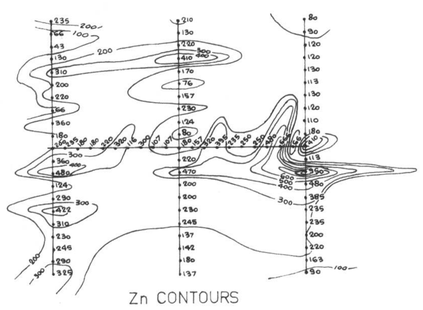
58,400 γ

BUZZ GRID




Cu CONTOURS


Pb CONTOURS


Zn CONTOURS

COPPER-LEAD-ZINC
VALUES AND CONTOURS FOR BUZZ-GRID
SCALE 1" = 800'

inches
centimetres

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YUKON GEOLOGICAL SURVEY

133° 30'

62° 45' N.

MAGNETIC DECLINATION 37°

5500

5000

4500

4000

3500

3000

TREE LINE

GOSSAN 8

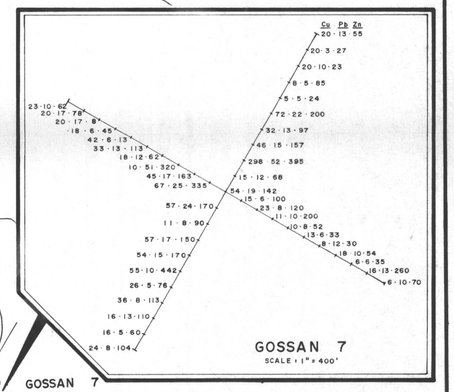
△5852
MOUNT MENZIES

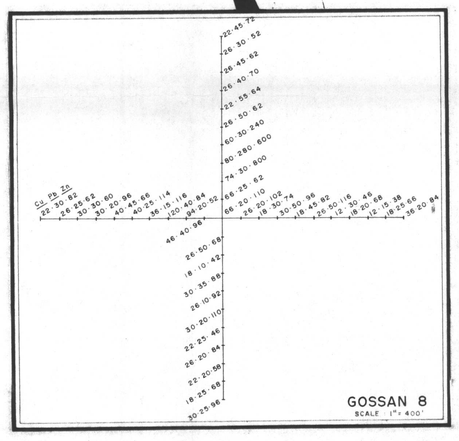
GOSSAN 7

2500

TO JAY RIVER 1 MILE

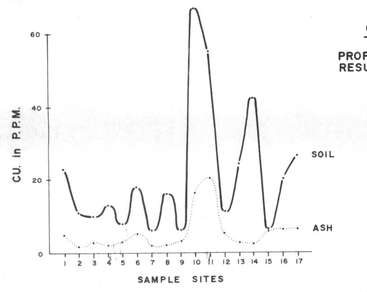
133° 25' W.

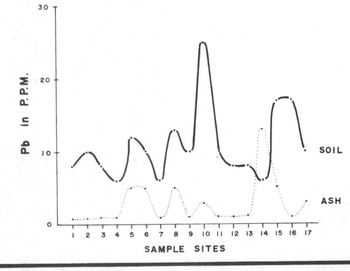


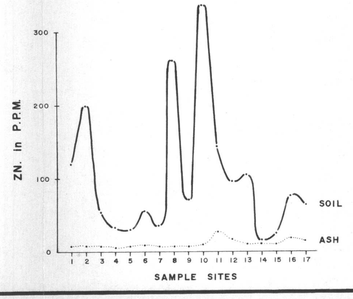


GOSSAN 7

PROFILED GEOCHEMICAL RESULTS FROM 17 SAMPLE SITES.

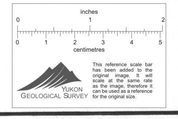






LEGEND

- ● ..... SOIL SAMPLE LOCATION
- ● 20-30-96-2 ..... VALUES ARE PROGRESSIVELY Cu, Pb, Zn, Mo. in P.P.M.
- ⊗ ..... GOSSANS, RUST SEEPS
- ANOMALOUS SITES.



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HESS PROJECT, YUKON

STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

GOSSANS 7 & 8

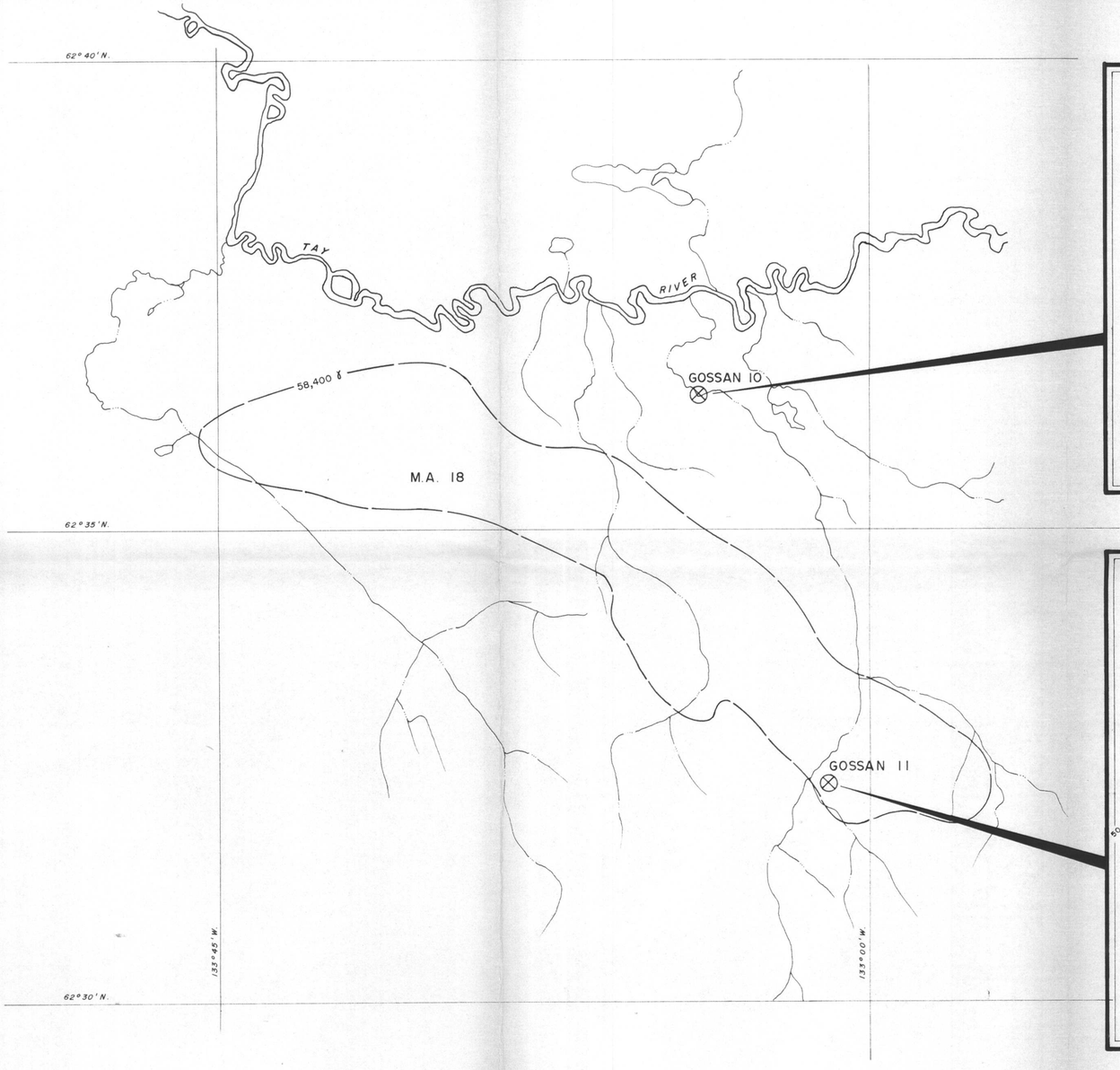
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

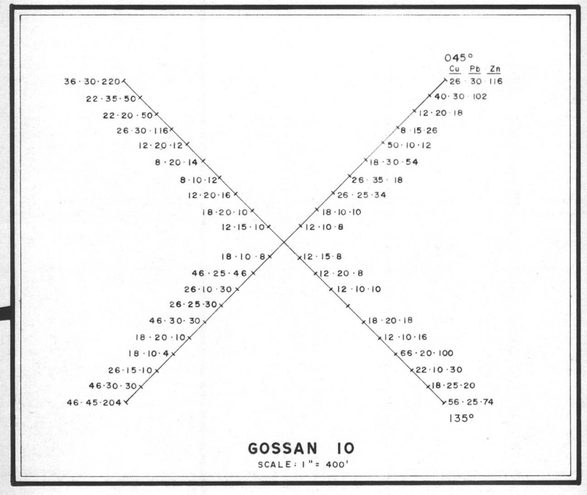
N.T.S. AREA 105·K/12

SCALE: 1" = 1000'

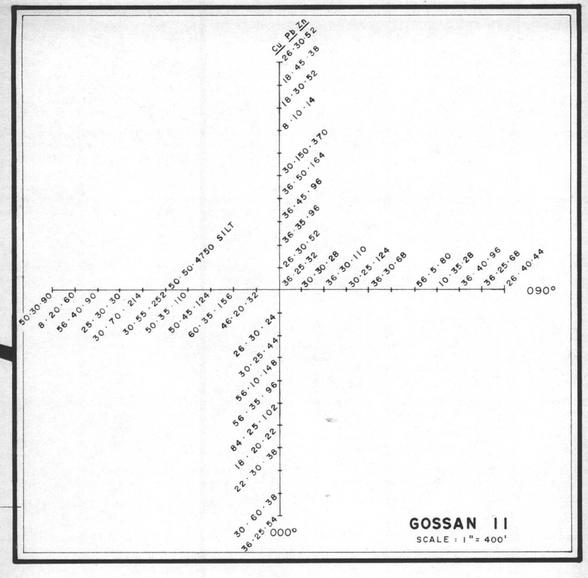
NOVEMBER, 1969.

FIGURE 5

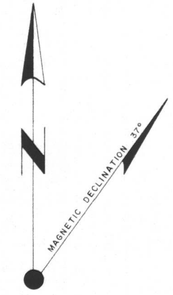




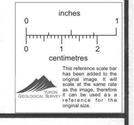
GOSSAN 10
SCALE: 1"= 400'



GOSSAN 11
SCALE: 1"= 400'



GEOCHEMICAL VALUES: Cu, Pb, Zn, in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 100'



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STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

GOSSANS 10 & 11

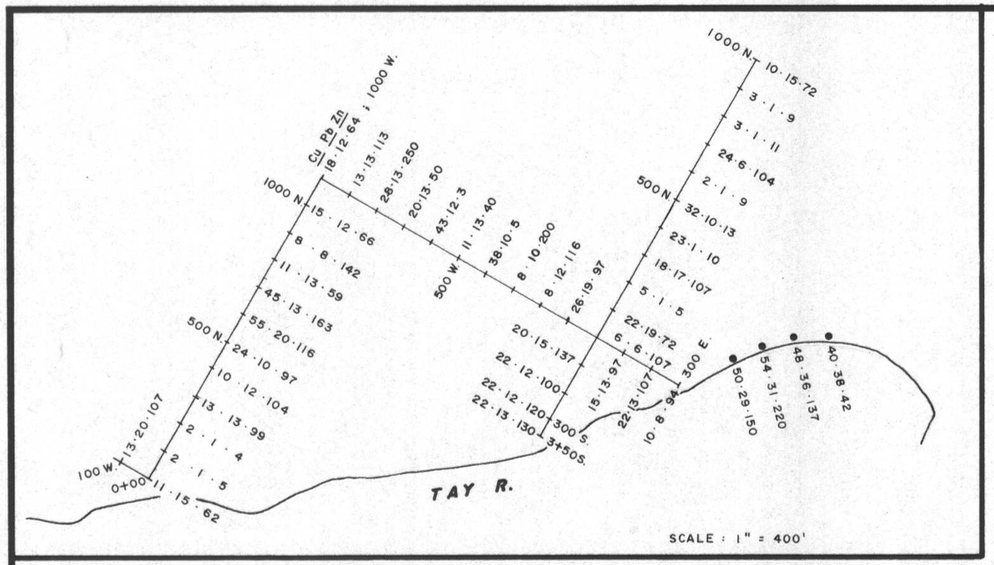
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

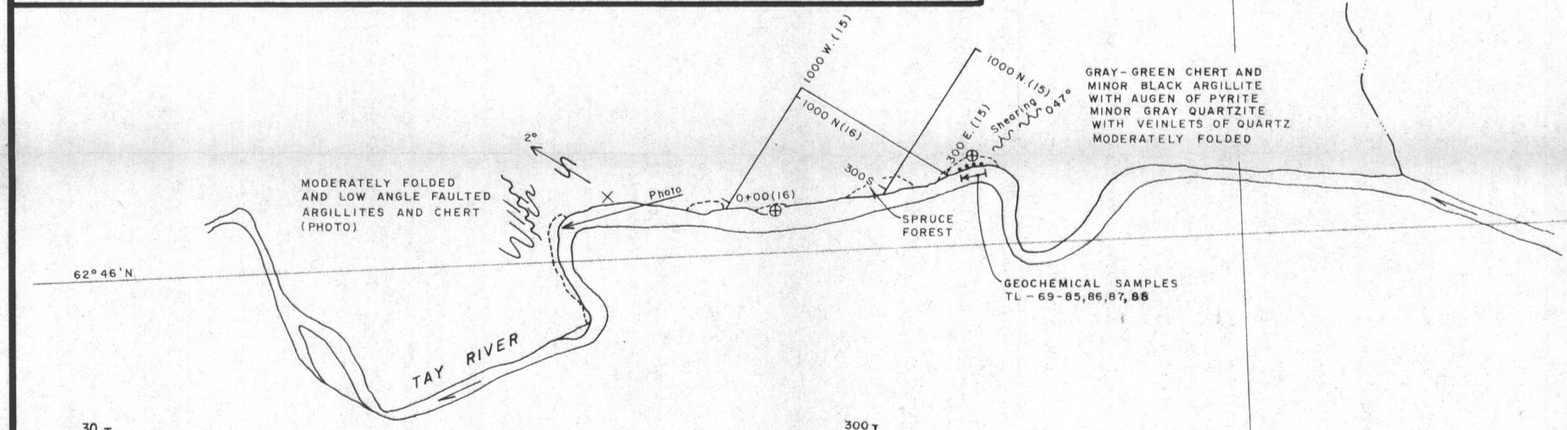
N.T.S. AREA 105-K/11, 12

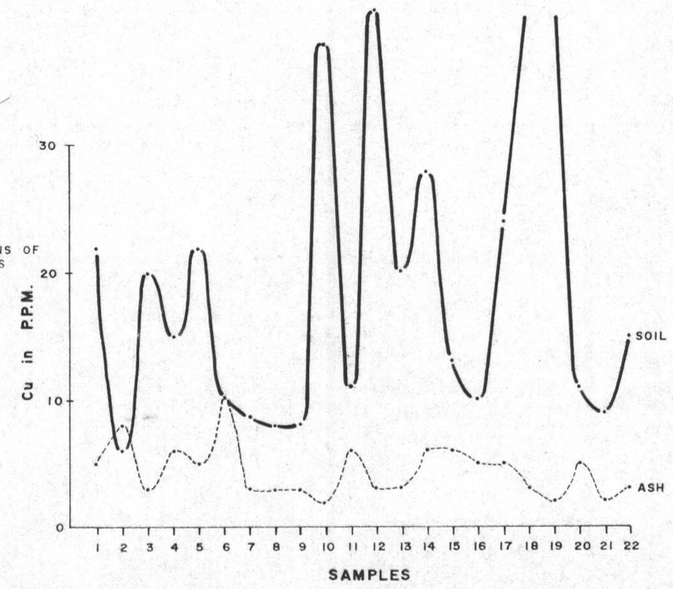
SCALE: 1"= 1 mile

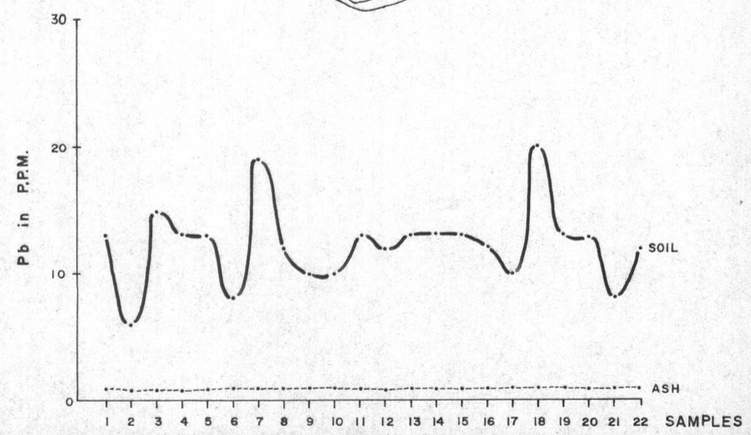
NOVEMBER, 1969.

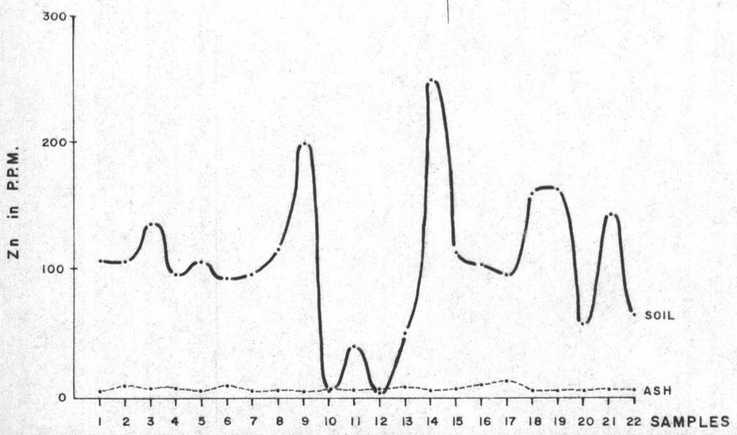
FIGURE 6



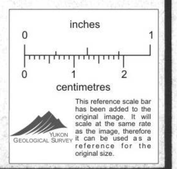








⊕ ···· GOSSAN or ALTERATION ZONE



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GEOCHEMICAL VALUES MAP

GOSSAN 15 & 16

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/13

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 7

inches
0 1
0 1 2
centimetres

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YUKON GEOLOGICAL SURVEY

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HESS OEX

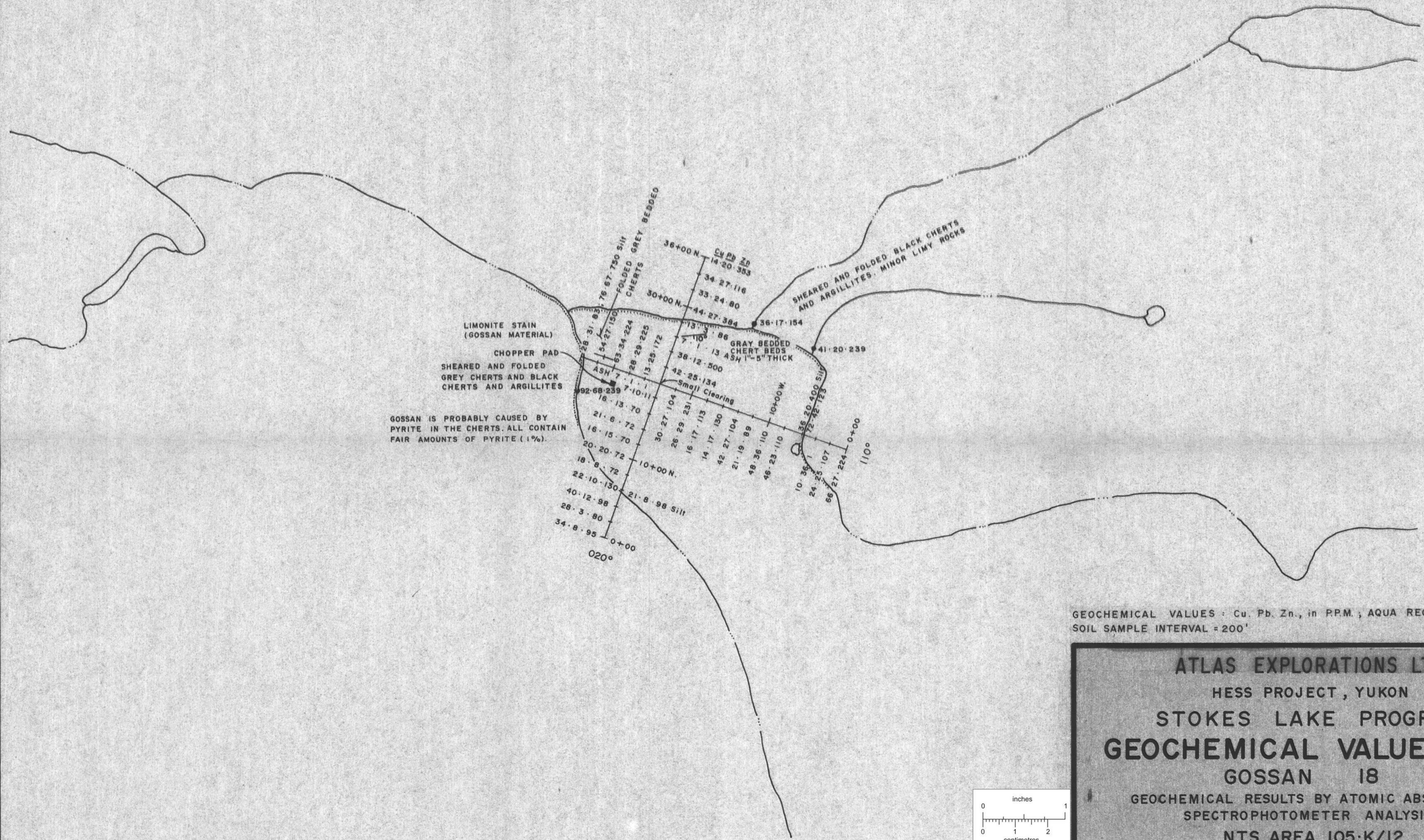
N.T.S. 105-L-16

GEOCHEMICAL SURVEY OF GOSSAN #17

SCALE 1"=1/2 MI

OCTOBER 1969

FIGURE 8



GEOCHEMICAL VALUES : Cu. Pb. Zn., in P.P.M. ; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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YUKON GEOLOGICAL SURVEY

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GEOCHEMICAL VALUES MAP

GOSSAN 18

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION
SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/12

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 9

GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

AEROMAGNETIC SERIES

SHEET 105 K

134° 00′ 63° 00′ | 30′ | Joins Map 7853G "Lansing" | 30′ | 132° 00′ 63° 00′

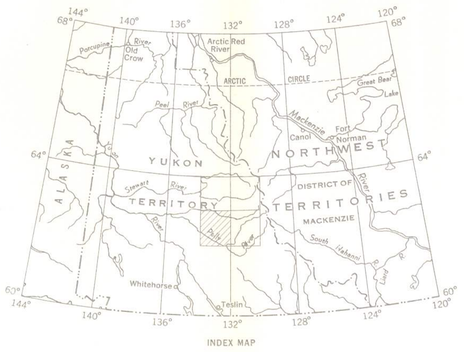
45′

Joins Map 7209G "Glenlyon"

15′

Joins Map 7838G "Sheldon Lake"

62° 00′ 134° 00′ | 30′ | Joins Map 7005G "Quiet Lake" | 30′ | 132° 00′ 62° 00′



INDEX MAP

Flight altitude: nominally 1000 feet above ground level where terrain permitted.

MAP 7839 G

TAY RIVER

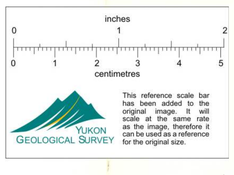
YUKON TERRITORY

Scale One Inch to Four Miles = $\frac{1}{253{,}440}$

Miles

4 2 0 4 8 12

COPIES OF THIS MAP MAY BE OBTAINED FROM THE DIRECTOR, GEOLOGICAL SURVEY OF CANADA OTTAWA



Airborne Magnetic Survey, April 1966 to June 1968, by Aero Photo Inc., Québec, four-mile map compiled from one inch to one mile geophysical maps published by the Department of Energy, Mines and Resources.

No correction has been made for regional variation.

GEOPHYSICS PAPER 7839G
TAY RIVER
YUKON TERRITORY
SHEET 105 K

FIGURE 10

OWL GROUP

1-8	H. BRODELL,	OCT. 19, 1969.
9-16	R. ETZEL,	" " "
17-24	S. McLEOD,	" " "
25-32	L. TURNER,	" " "
33-40	T. ADAMSON,	OCT. 18, 1969.

GEOCHEMICAL VALUES : Cu · Pb I Zn · Mo ; in P.P.M.
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

ATLAS EXPLORATIONS LTD.

HESS PROJECT, YUKON

STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 9

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/11

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 11

EMMAY LAKE

MA

68400

14

3500

4000

MA

68400

MA

68400

68400

MA

3500

inches
0 1 2
0 1 2 3 4 5
centimetres

YUKON GEOLOGICAL SURVEY

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ATLAS EXPLORATIONS LIMITED

HESS PROJECT Y.T.

HESS-0EX.

NTS 105-K-11

GEOCHEMICAL SURVEY

MAGNETIC ANOMALY 14

DATE OF SURVEY:

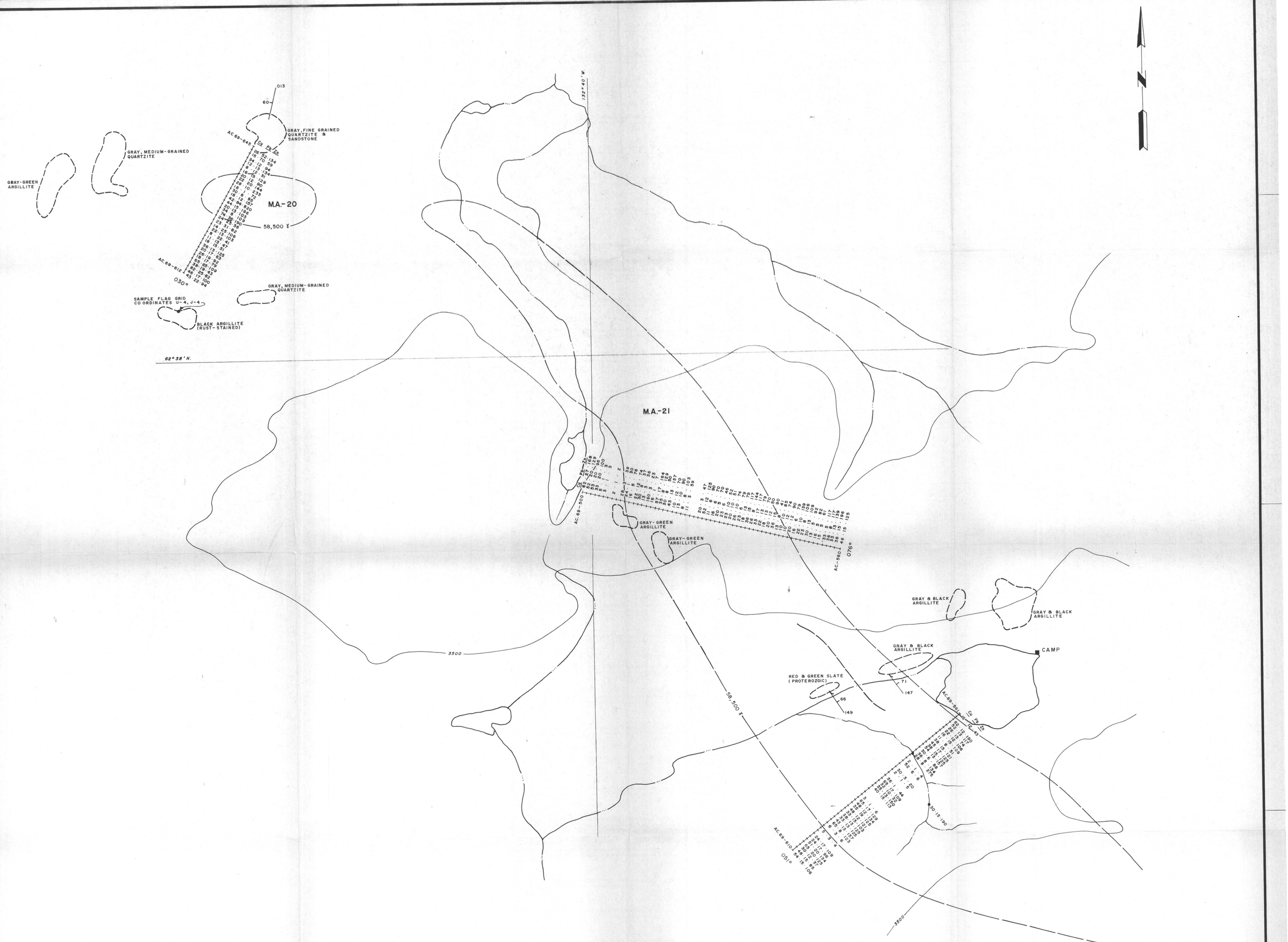
DATE DRAWN: OCT. 28-1969

FIG.№ 12

TO ACCOMPANY REPORT:

.....

SCALE 1" = 1/4 MI.



GEOCHEMICAL VALUES : Cu, Pb, Zn, in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 100'

ATLAS EXPLORATIONS LTD.

HESS PROJECT, YUKON

STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALIES 20 & 21

GEOCHEMICAL RESULTS BY ATOMIC ABSORPT SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/10

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 13

inches 0 1 2
centimetres 0 1 2 3 4 5

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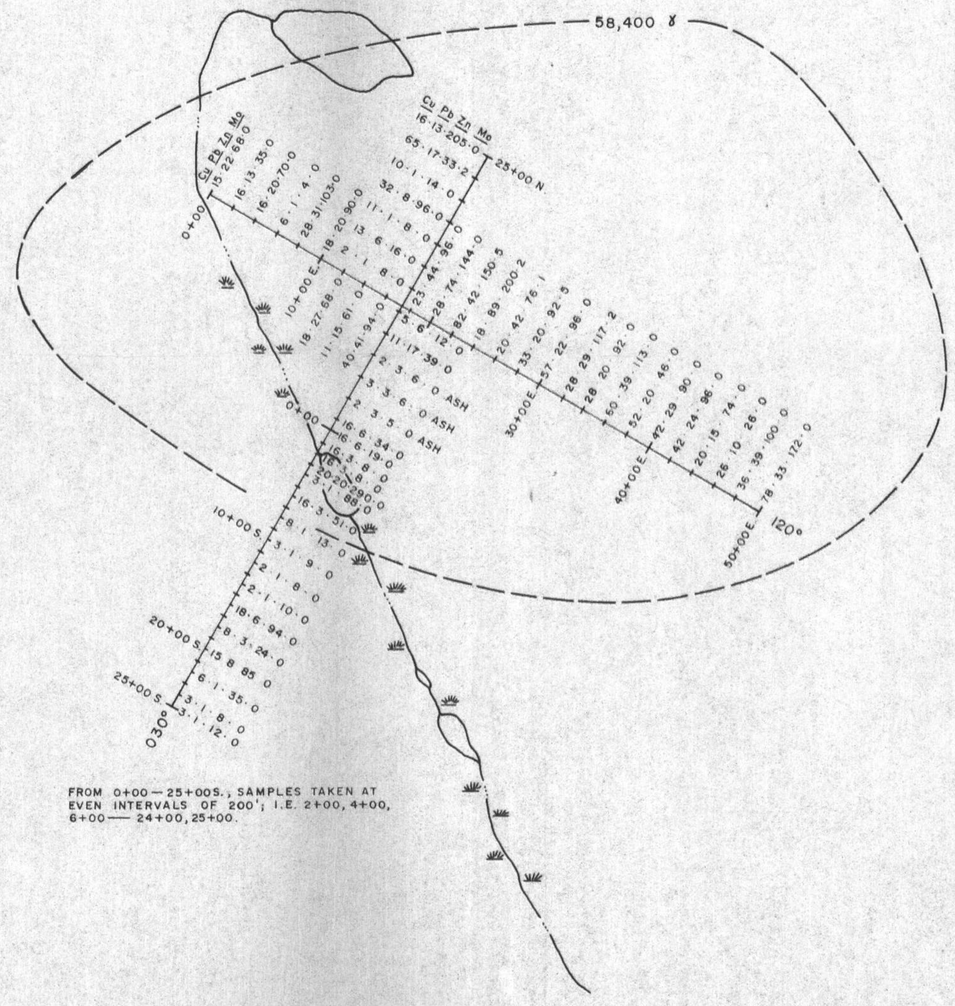
YUKON GEOLOGICAL SURVEY



FROM 0+00 — 25+00S., SAMPLES TAKEN AT EVEN INTERVALS OF 200'; I.E. 2+00, 4+00, 6+00 — 24+00, 25+00.

GEOCHEMICAL VALUES : Cu. Pb. Zn. Mo., in P.P.M., AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

YUKON GEOLOGICAL SURVEY

ATLAS EXPLORATIONS LTD.

HESS PROJECT, YUKON

STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 22

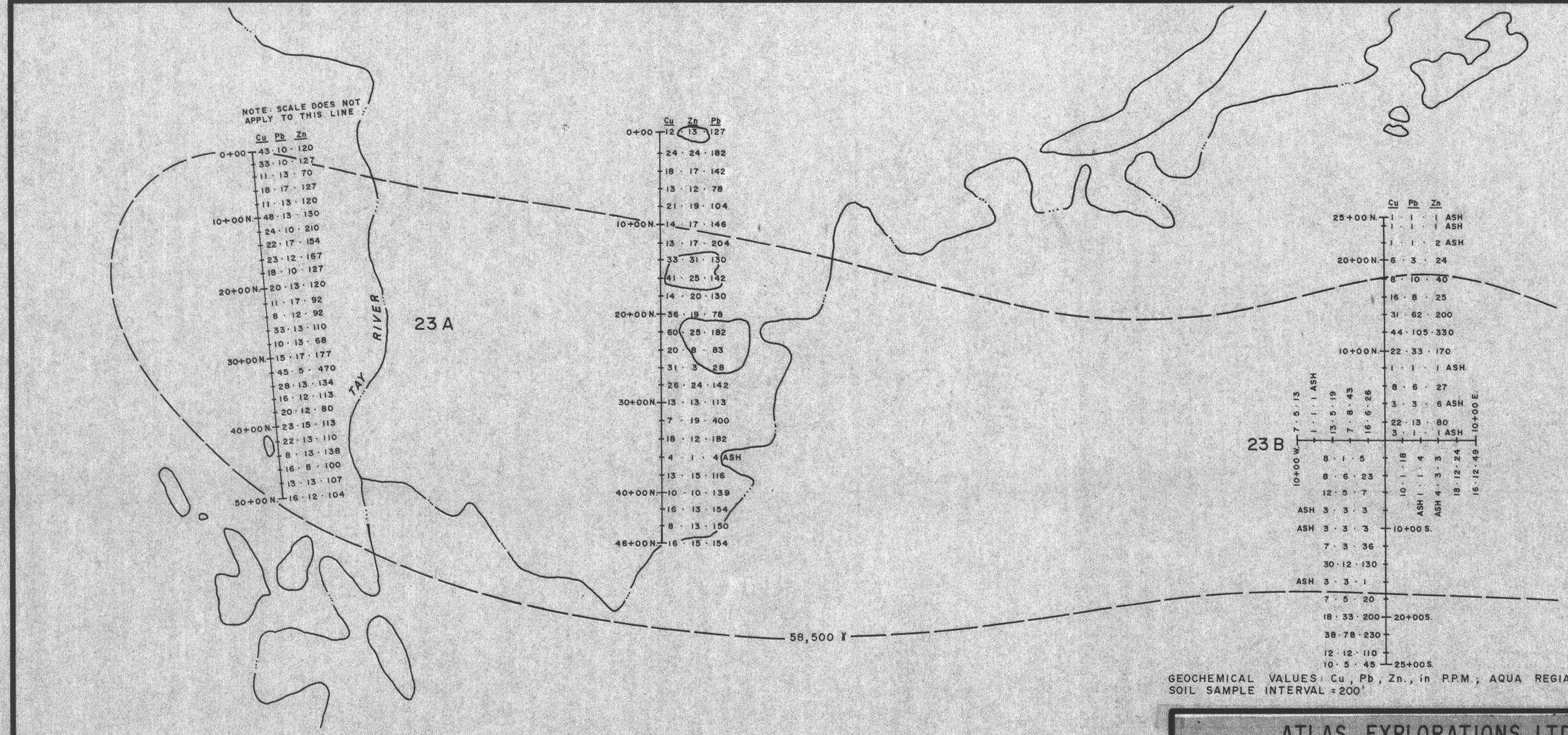
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/10

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 14



GEOCHEMICAL VALUES: Cu, Pb, Zn., in P.P.M.; AQUA REGIA.
SOIL SAMPLE INTERVAL = 200'

inches
0 1
centimetres
0 1 2

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HESS PROJECT, YUKON

STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALIES 23-A & 23-B

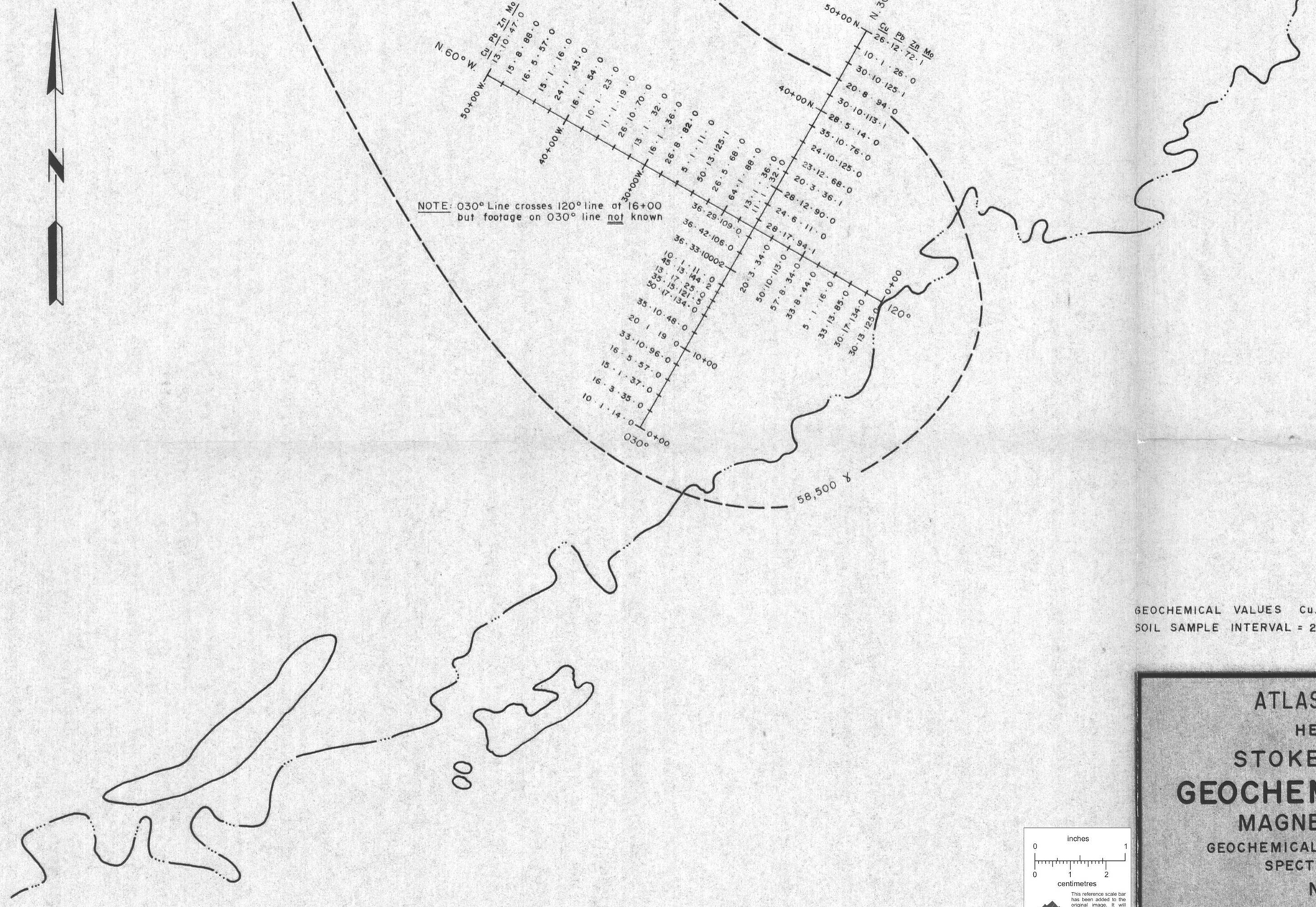
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/10

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 15



GEOCHEMICAL VALUES Cu. Pb. Zn. Mo., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200 ft.

inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 24

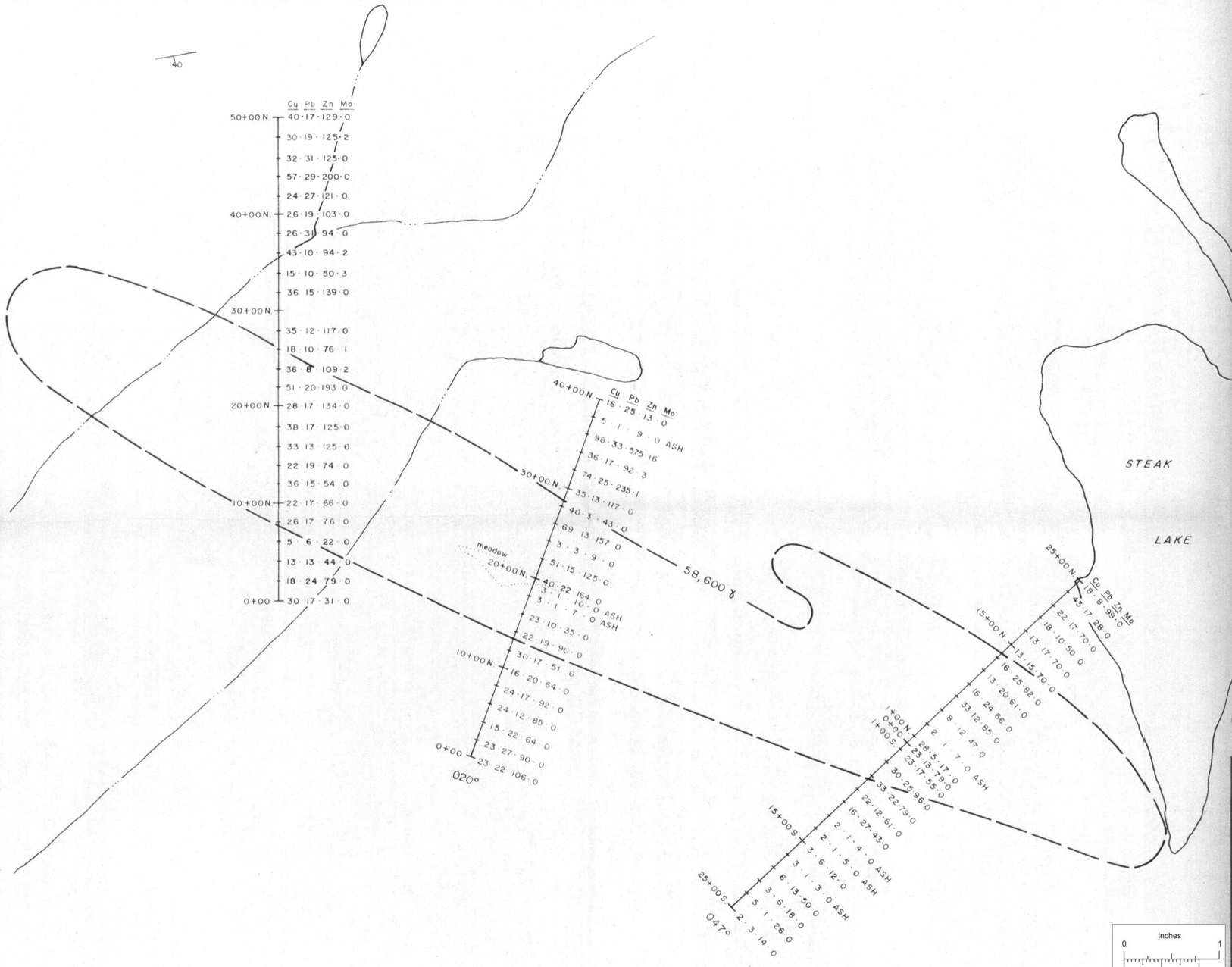
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/10

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 16



GEOCHEMICAL VALUES Cu Pb Zn Mo, in P.P.M., AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 25-A

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/7

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 17

SMALL OUTCROP OF SILTY BLACK ARGILLITE WITH WHITE LAMINATIONS

58,600 γ

62°28'N.

132°27'W

Lineament

Meadow

Creek

0+00S
10+00S
20+00S
30+00S
40+00S
50+00S

25+00N
15+00N
9+00N
1+00N
1+00S
9+00S
15+00S
25+00S

Cu	Pb	Zn	Mo
35	33	172	2
28	10	125	7
6	1	23	0
10	12	57	0
11	12	41	0
23	24	92	0
11	19	47	0
24	34	54	0
65	400	320	0
28	20	100	0
24	12	41	0
3	1	7	0 Ash
59	36	117	0
36	24	52	0
55	105	285	0
52	29	70	0
23	41	105	0
28	80	121	0
3	1	4	0
24	36	92	0
50	33	105	0
22	24	59	0
10	13	41	0
15	13	44	0
6	1	5	0 Ash
8	1	8	0 Ash
8	1	8	0 Ash

Cu	Pb	Zn	Mo
28	17	117	0
5	3	50	0
28	19	103	0
22	19	96	0
30	20	128	0 Silt
30	20	157	0 Soil
42	15	117	0
30	10	52	0
15	15	82	0
18	12	57	0
5	1	8	0
30	20	94	0
23	13	92	0
10	22	7	0 Ash
22	25	94	0
3	1	6	0
8	8	18	0
48	22	90	0
43	59	129	0
5	8	12	0
5	6	7	0
46	24	27	2
26	29	27	2
20	3	37	0
30	6	260	0
42	12	275	0
45	12	79	0
18	1	66	0

GEOCHEMICAL VALUES, Cu.- Pb. I Zn.- Mo.
HOT AQUA REGIA DIGESTION
SOIL SAMPLE INTERVAL = 200 ft.

inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 25-B

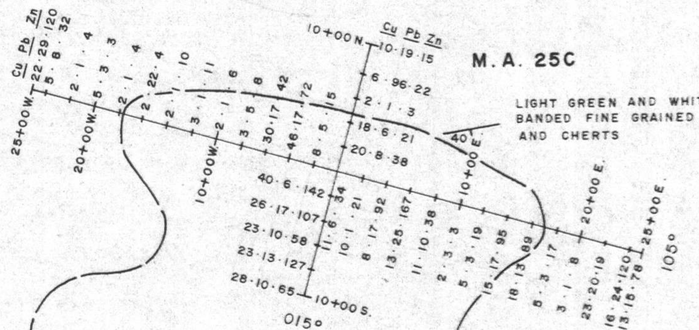
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/8

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 18

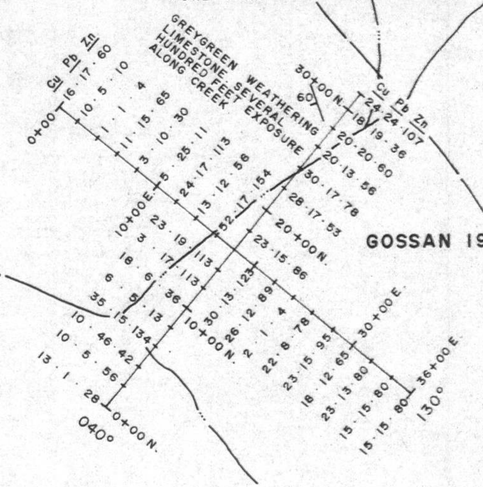


M.A. 25C

LIGHT GREEN AND WHITE WEATHERING BANDED FINE GRAINED QUARTZITE AND CHERTS

BUFF AND REDDISH GREEN WEATHERING CLASTIC LIMESTONE. CLASTIC PARTICLES WEATHER MORE THAN MATRIX.

10



GREY GREEN LIMESTONE SEVERAL HUNDRED FEET ALONG CREEK

WEATHERING SEVERAL EXPOSURE

GOSSAN 19

GOSSAN NOT FOUND. POSITION APPROXIMATED

M.A. 25A

M.A. 25A

58,500 ft

58,600 ft

58,500 ft

GEOCHEMICAL VALUES : Cu, Pb, Zn, in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 25-C

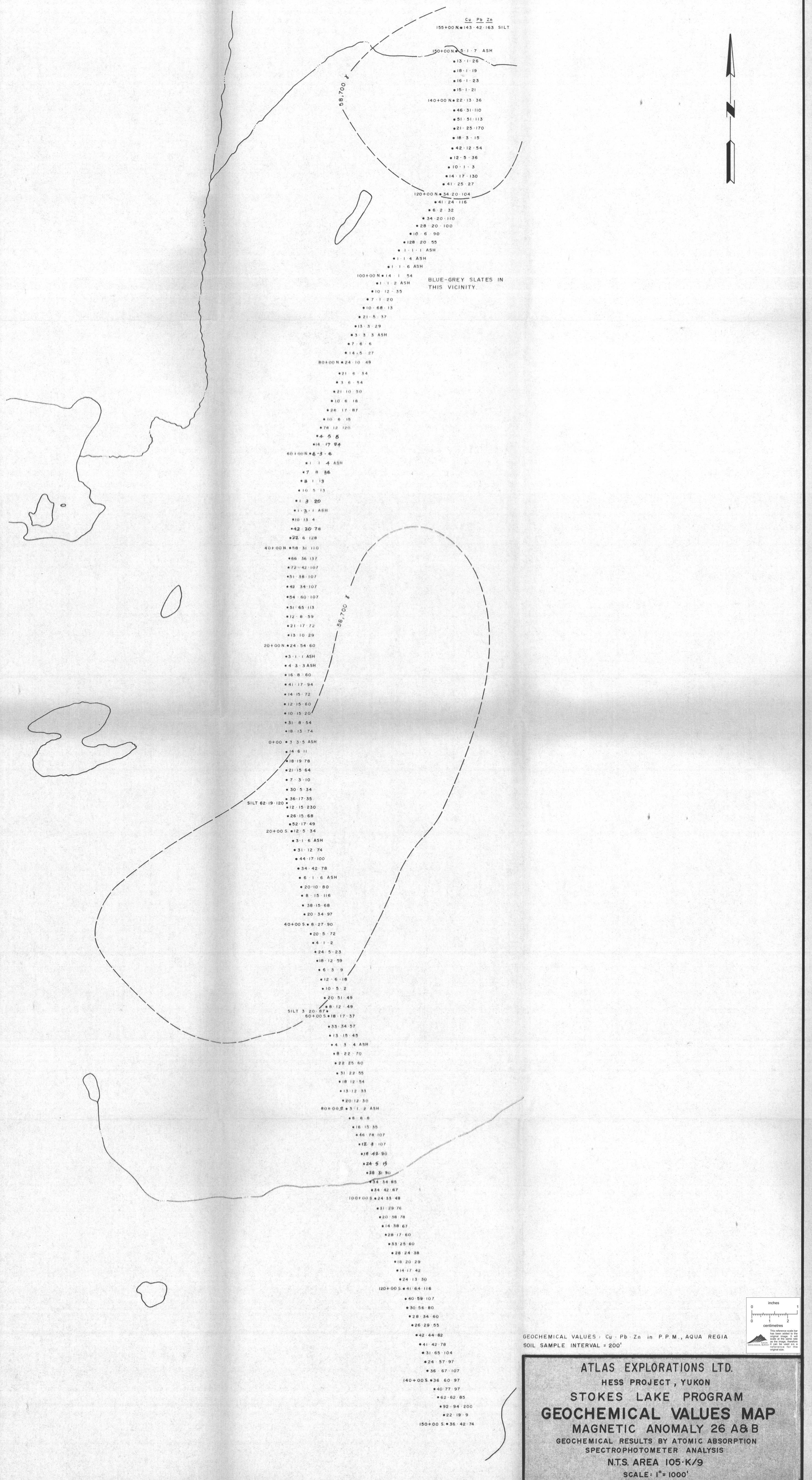
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/7 & K/10

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 19



GEOCHEMICAL VALUES : Cu · Pb · Zn in P.P.M., AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 26 A & B

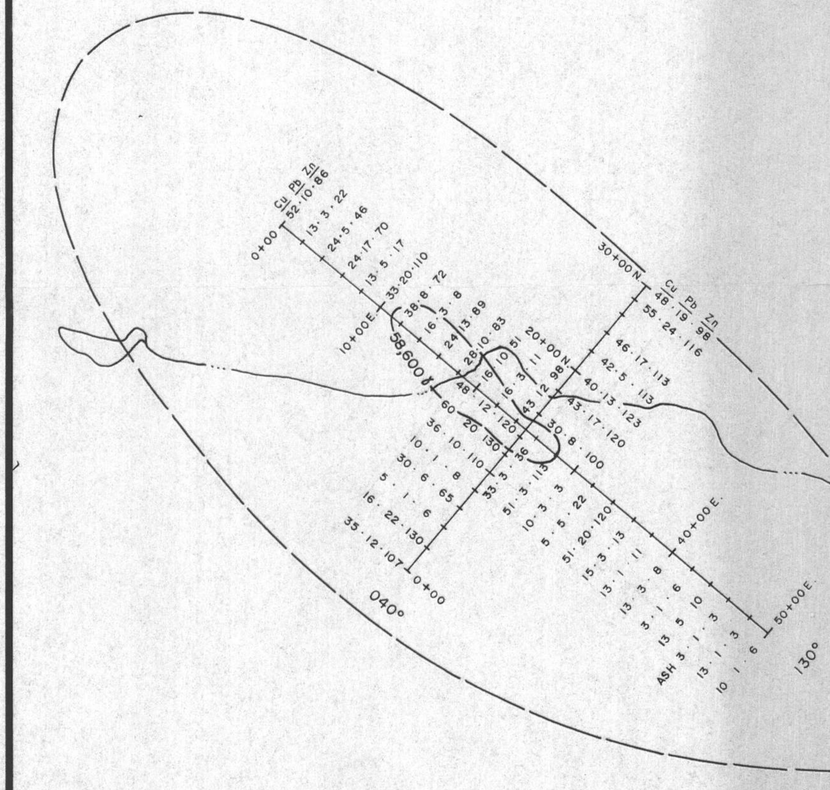
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/9

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 20



GEOCHEMICAL VALUES, Cu. Pb. Zn., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
centimetres
0 1 2

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 26-C

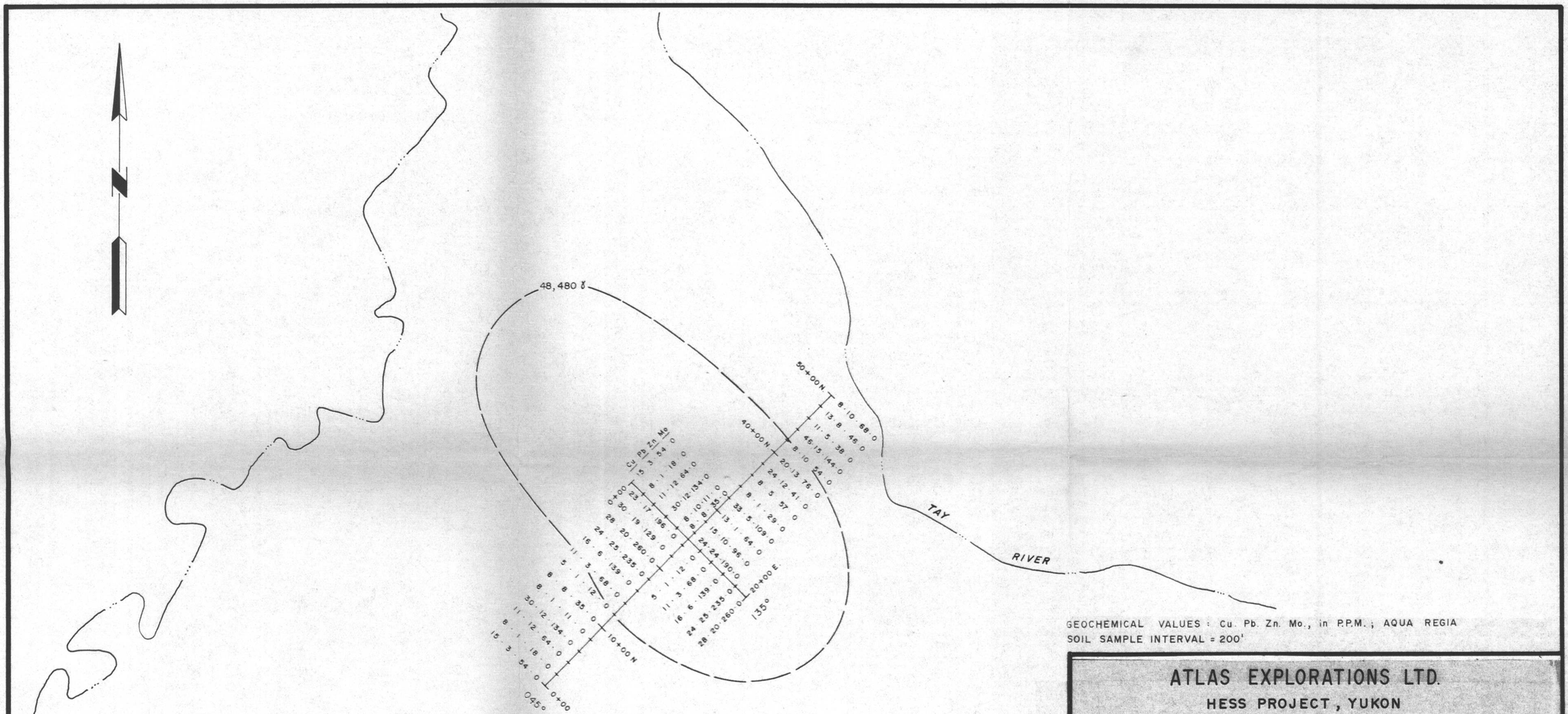
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/9 & K/10

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 21



GEOCHEMICAL VALUES : Cu. Pb. Zn. Mo., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 27

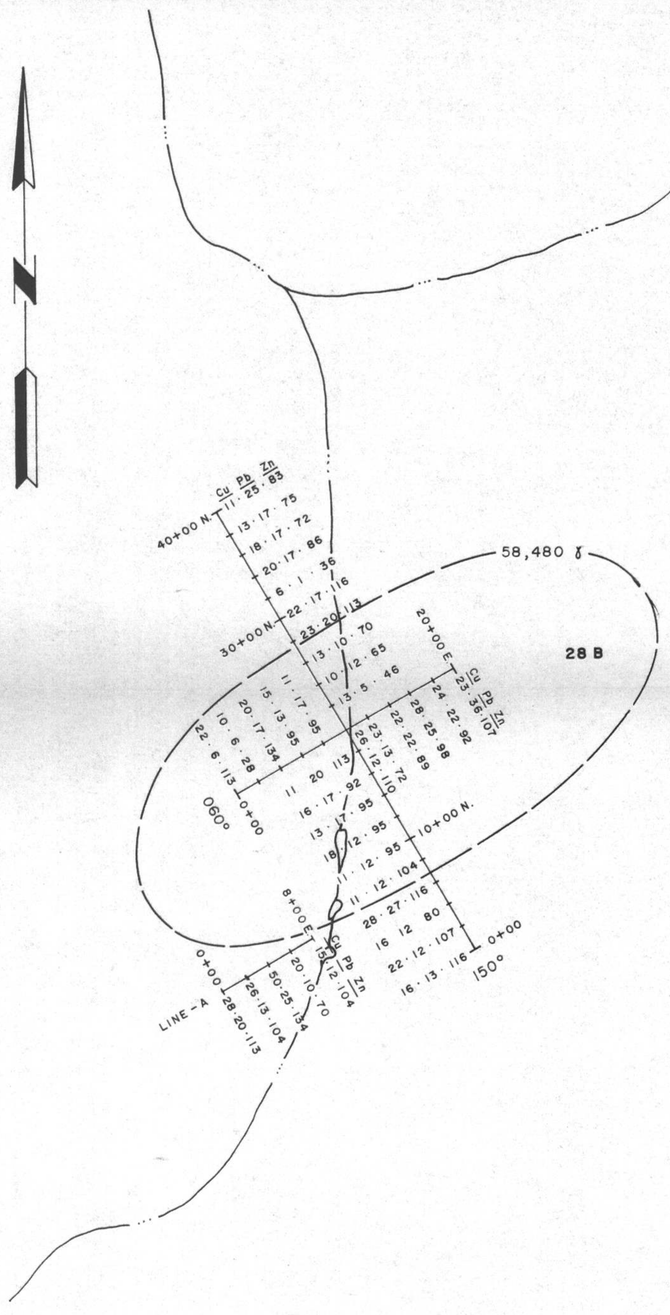
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105-K/7

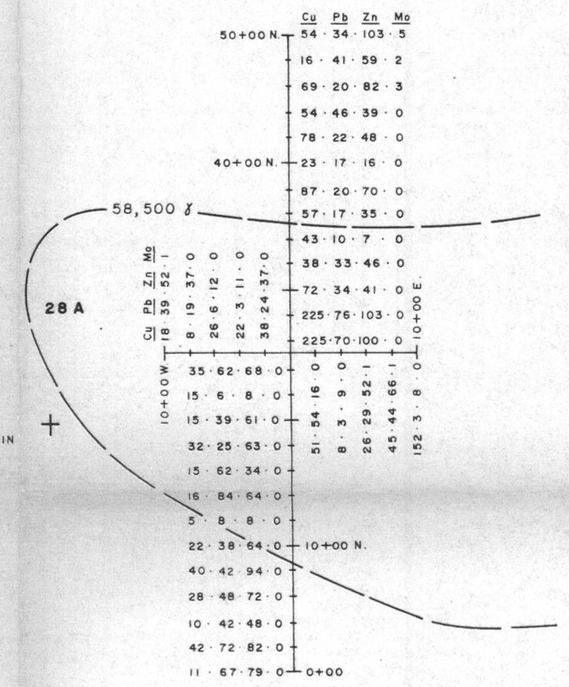
SCALE: 1"= 1000'

NOVEMBER, 1969.

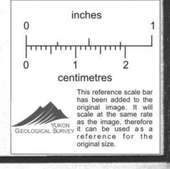
FIGURE 22



MINOR GALENA ALONG HAIRLINE FRACTURES IN DARK GREEN DACITE.



GEOCHEMICAL VALUES: Cu. Pb. Zn. Mo., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'



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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALIES 28-A & 28-B

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105-K/7

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 23

TAY RIVER

ALTERATION ZONE CONSISTING OF FOLDED GRAY AND GREEN BEDDED CHERTS. VERY MUCH PYRITE, UP TO 5% IN SOME ROCKS. MINOR CHERT PEBBLE CONGLOMERATE AND QUARTZITE TO THE NORTH.

58,500 Y

58,600 Y

58,500 Y

0+00									20+00 W
	13 · 13 · 86	12 · 12 · 65	24 · 12 · 116	24 · 12 · 104	28 · 12 · 107	33 · 17 · 146			
0+00	30 · 22 · 127	26 · 13 · 130	26 · 17 · 177	24 · 17 · 134	18 · 10 · 104	24 · 12 · 116	26 · 13 · 113	7 · 25 · 51	40+00 S.
	31 · 12 · 130	24 · 12 · 98	44 · 19 · 167	12 · 5 · 78	28 · 17 · 146				50+00 S.

10+00 S.									
	26 · 17 · 123	6 · 1 · 8	7 · 10 · 42	20 · 17 · 95	28 · 12 · 98	22 · 6 · 60	25 · 10 · 100	16 · 13 · 89	16 · 15 · 95
	13 · 10 · 72	26 · 13 · 100	18 · 13 · 98	18 · 13 · 95	80 · 78 · 142	21 · 10 · 10 · 78	10 · 10 · 78	26 · 15 · 142	12 · 12 · 110

GEOCHEMICAL VALUES Cu. Pb. Zn., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 30

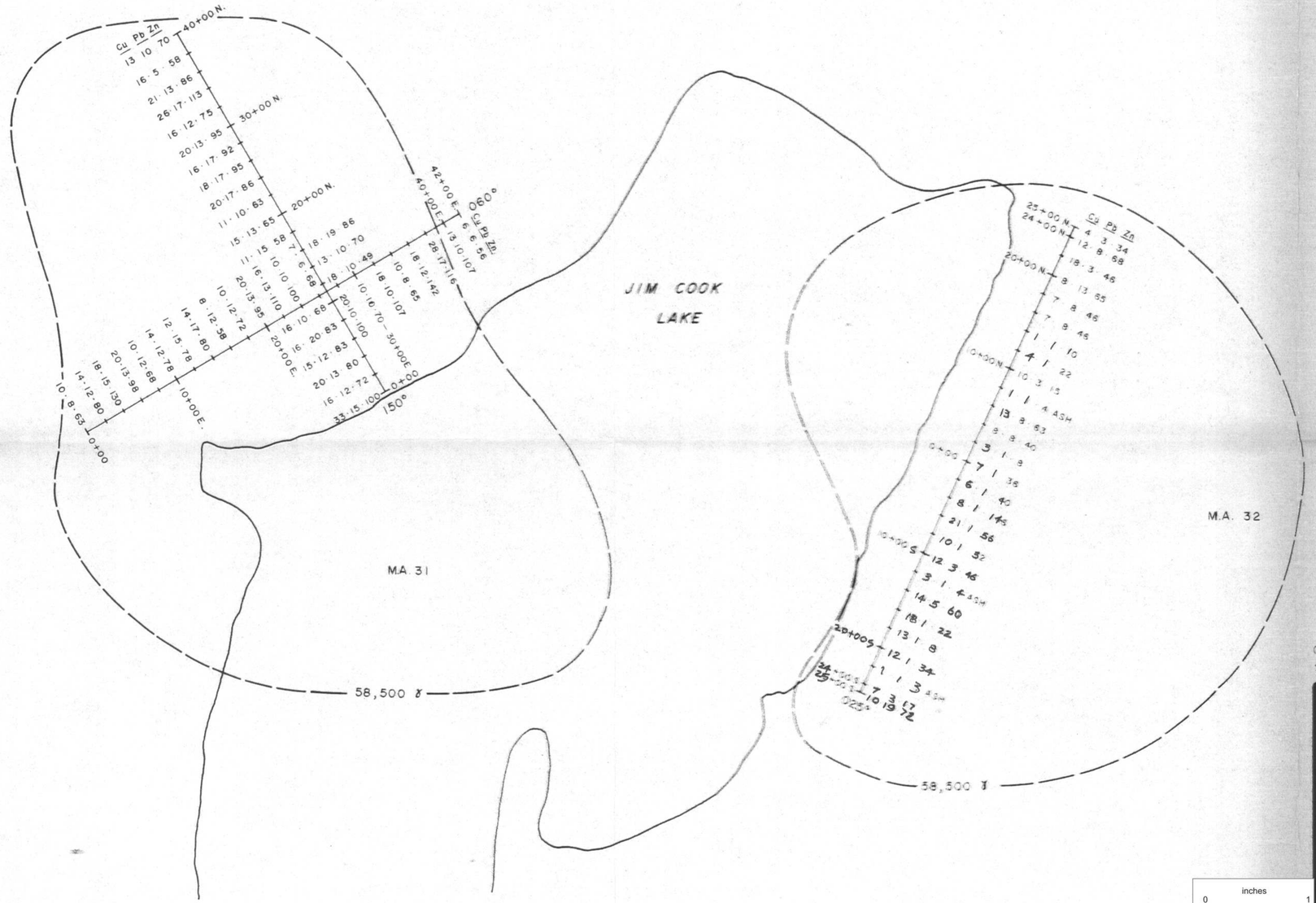
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/8

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 24



GEOCHEMICAL VALUES Cu., Pb., Zn., in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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STOKES LAKE PROGRAM

GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALIES 31 & 32

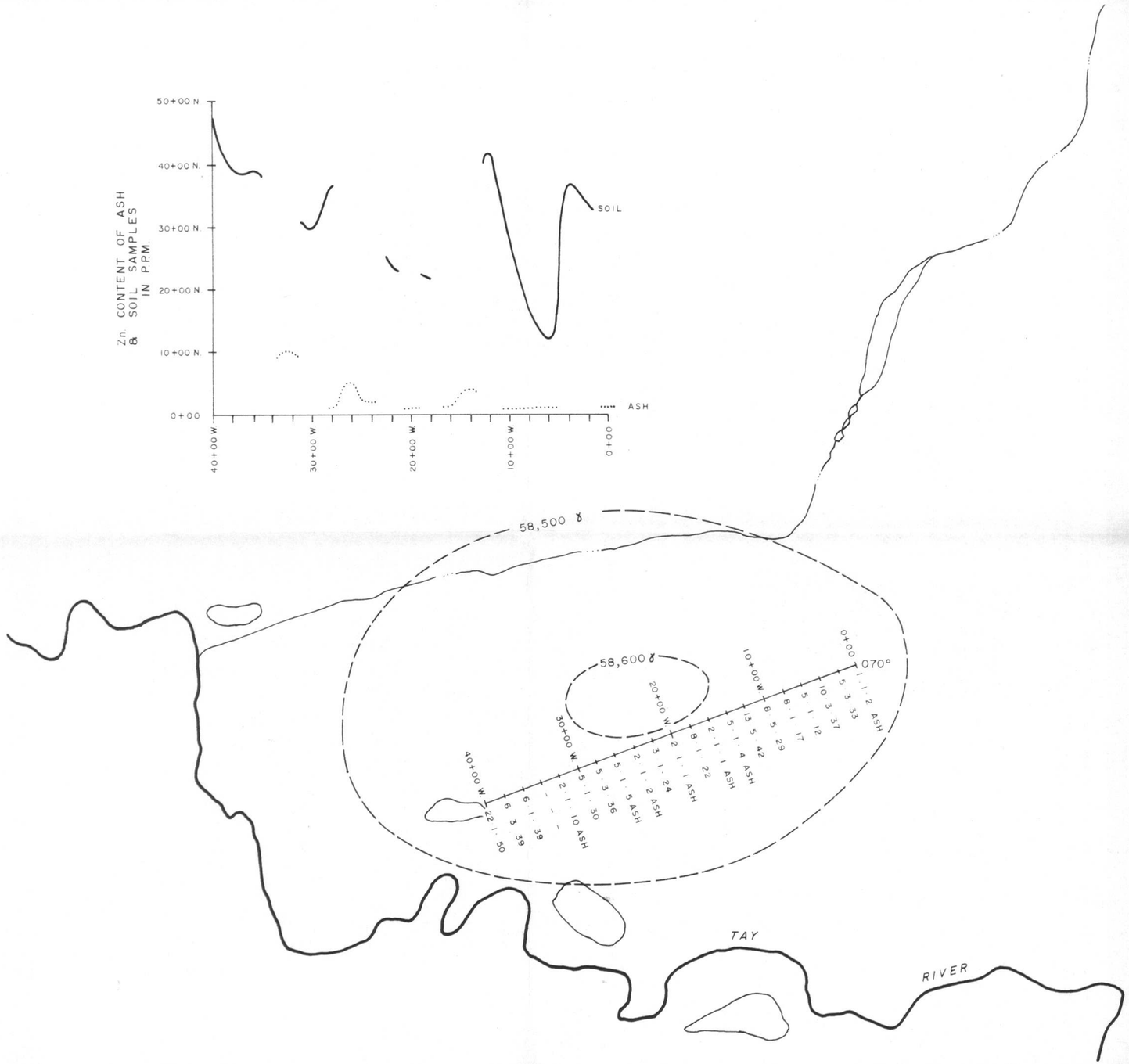
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

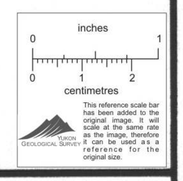
N.T.S. AREA 105·K/8

SCALE: 1" = 1000'

NOVEMBER, 1969.

FIGURE 25





GEOCHEMICAL VALUES : Cu · Pb I Zn · Mo , in P.P.M.
SOIL SAMPLE INTERVAL = 200'

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 33

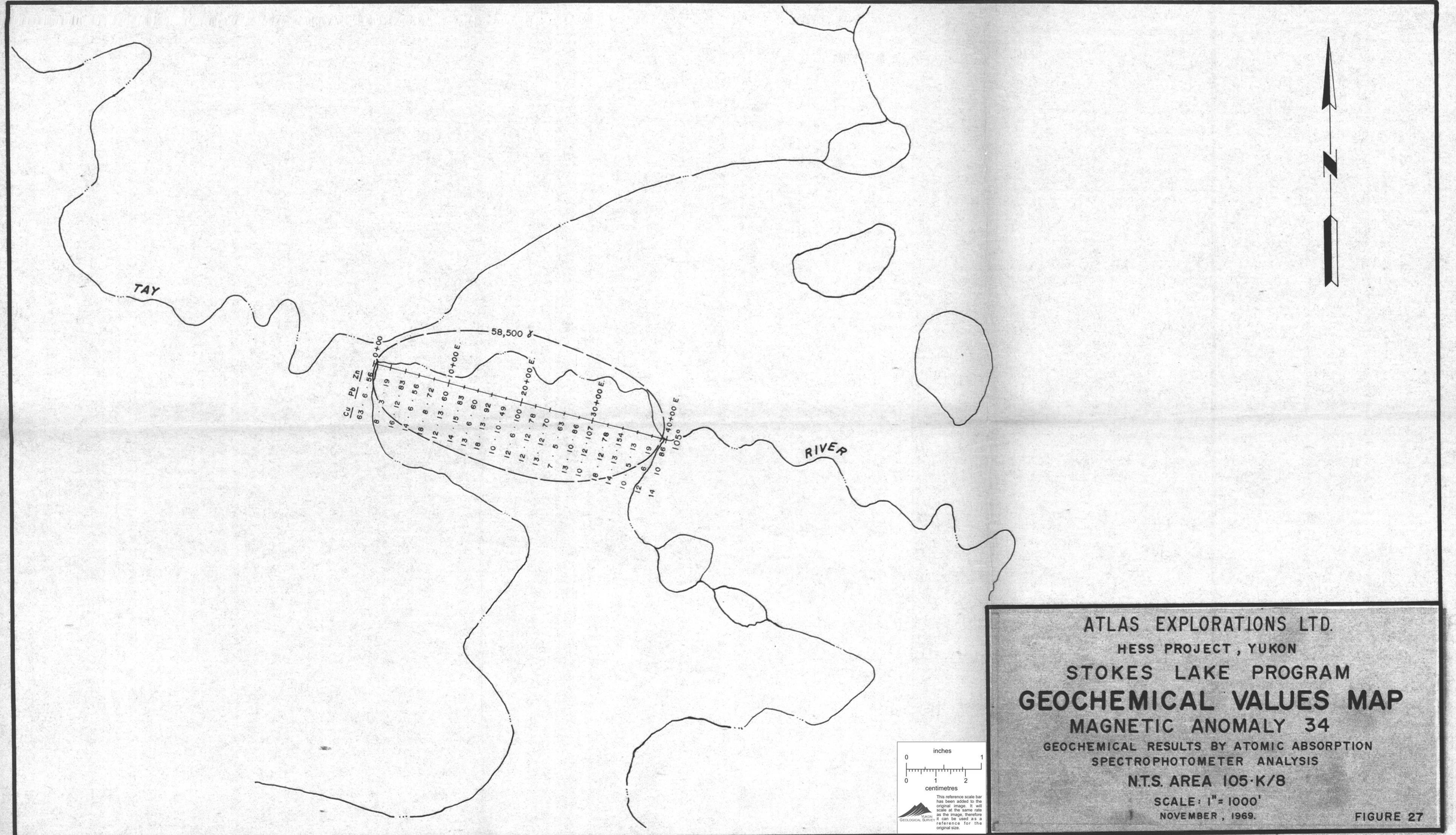
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/8

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 26



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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 34

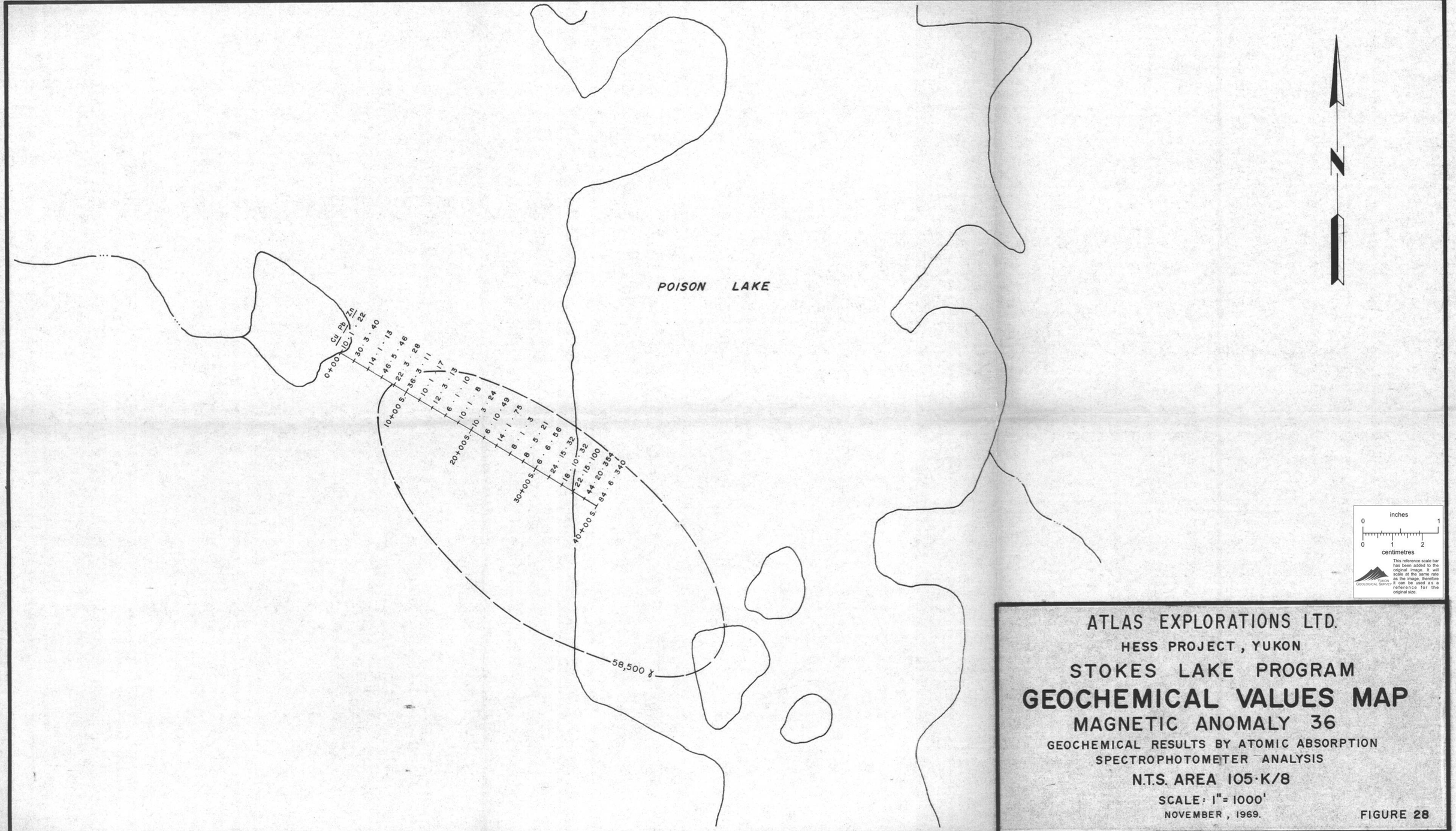
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/8

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 27



inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 36

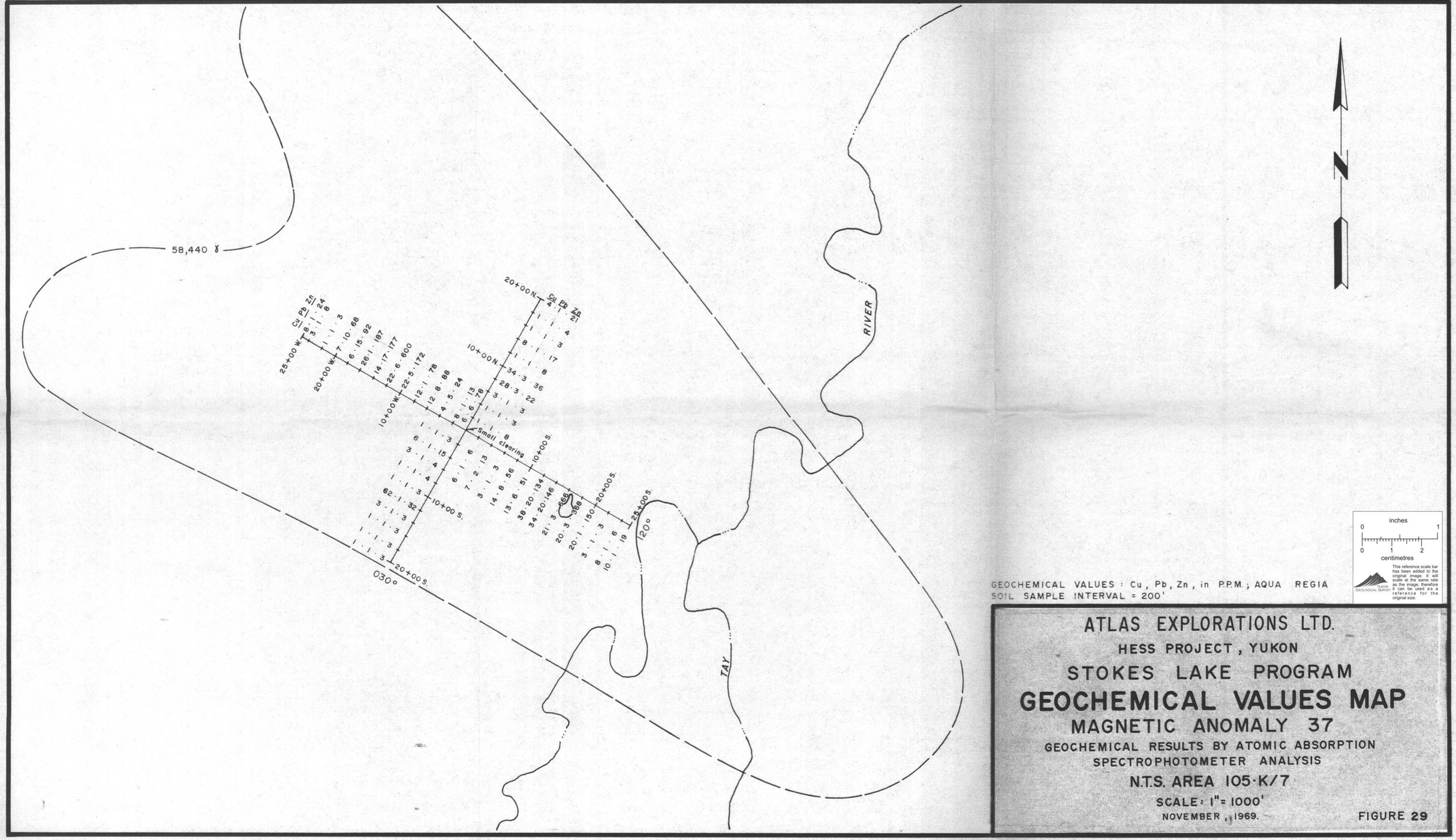
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/8

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 28



GEOCHEMICAL VALUES : Cu , Pb, Zn , in P.P.M. ; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 37

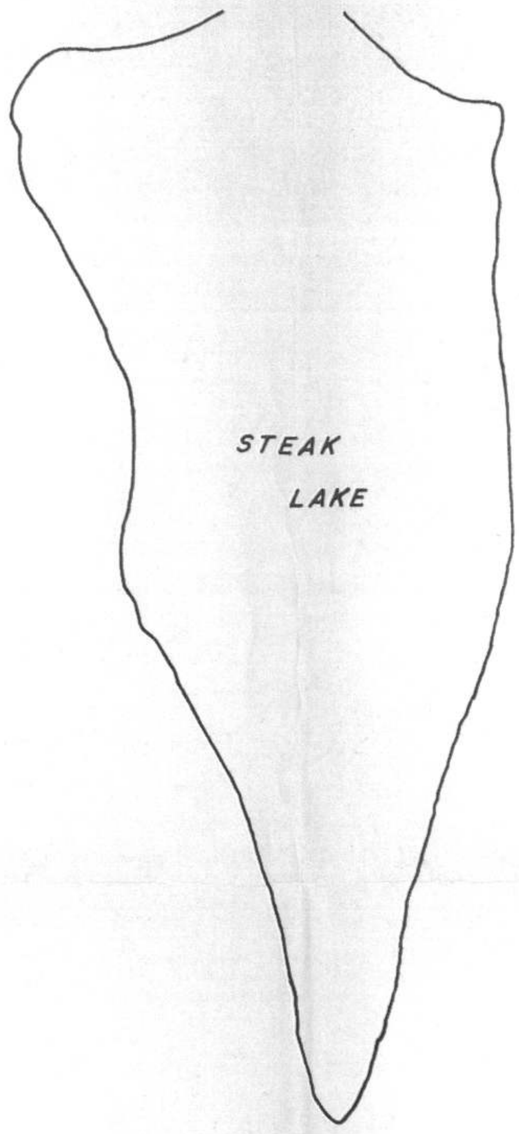
GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

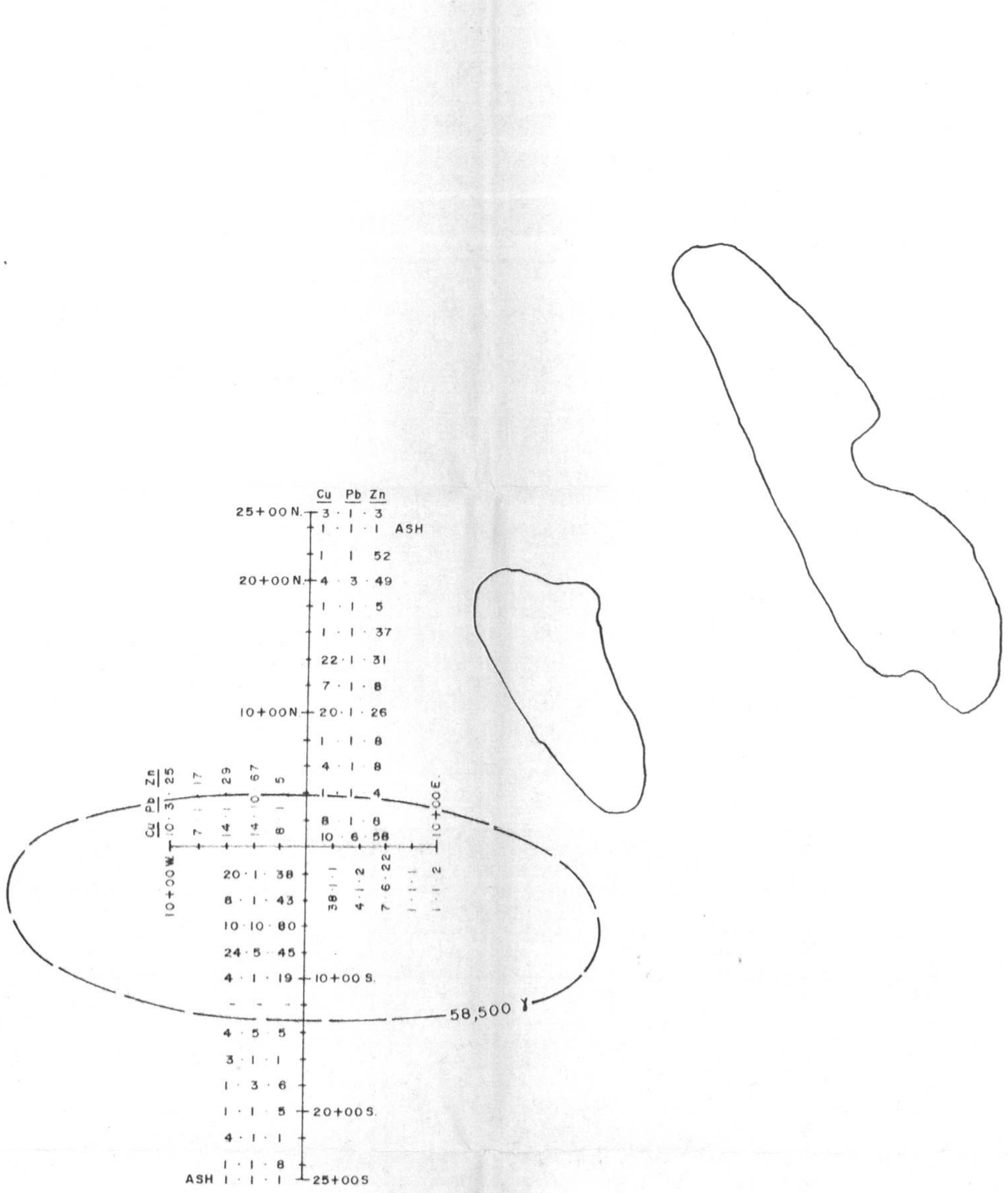
N.T.S. AREA 105-K/7

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 29





GEOCHEMICAL VALUES : Cu , Pb , Zn , in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 38

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/7

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 30

inches
0 1
0 1 2
centimetres
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YUKON GEOLOGICAL SURVEY

LITTLE OUTCROP SEEN. HOWEVER, NORTH OF LINEAR FEATURE SHOWS A DARK GREEN DACITE WITH QUARTZ PHENOCRYSTS, SOUTH IS GREY CHERTS. MAGNETIC ANOMALY COINCIDES WITH VOLCANIC ROCKS.

GEOCHEMICAL VALUES : Cu, Pb, Zn, in P.P.M.; AQUA REGIA
SOIL SAMPLE INTERVAL = 200'

inches
0 1
0 1 2
centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

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GEOCHEMICAL VALUES MAP

MAGNETIC ANOMALY 39

GEOCHEMICAL RESULTS BY ATOMIC ABSORPTION SPECTROPHOTOMETER ANALYSIS

N.T.S. AREA 105·K/7

SCALE: 1"= 1000'

NOVEMBER, 1969.

FIGURE 31

GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 105 K

LEGEND

CENOZOIC

QUATERNARY
15 — 15a, modern unconsolidated alluvial deposits; 15b, unconsolidated glacial and alluvial deposits

TERTIARY
14 — Grey and dark grey andesite, dacite, and basalt, commonly massive and porphyritic; minor pyroclastic material

13 — Granodioritic quartz and feldspar porphyry, probably plutonic equivalent of 14

PALEOGENE
12 — Brown-weathering, brown, impure sandstone with plant remains, grey and brown conglomerate, and brown shale; 12a, rusty weathering conglomerate; minor sandstone and shale, may be equivalent to 12 but age not established, locally interbedded with part of 14

MESOZOIC

CRETACEOUS (?)
11 — Medium-to coarse-grained quartz monzonite and granodiorite, commonly porphyritic; minor diorite and gneiss

TRIASSIC
10 — Interbedded, dark grey to black, friable, micaceous sandstone, and shale; minor conglomerate and concretionary shale

PALAEOZOIC

MISSISSIPPIAN (?) AND/OR LATER (?)
9 — 9a, greenish grey quartzite, commonly thin-bedded; micaceous and silvery graphitic schists; minor dark grey siliceous slate, silty limestone, and grey micaceous quartzite; 9b, conglomerate with pebbles of chert, andesite, quartzite, chlorite schist, and limestone

8 — Altered, dark green andesite and basalt flows and tuffs, commonly schistose, rarely porphyritic; minor phyllite, dark argillite, and light grey quartzite

7 — Banded quartzose granulite, green and purplish banded skarn, quartz-sericite schist, hornfels and phyllite; chlorite schist and thin altered andesite (8) common in upper part; minor crystalline limestone

MISSISSIPPIAN
6 — Dark grey massive limestone

DEVONIAN AND MISSISSIPPIAN
UPPER DEVONIAN AND LOWER (?) MISSISSIPPIAN
5 — 5a, chert-pebble conglomerate; 5b, black and grey chert, shale, quartzite; minor conglomerate and limestone, 5c, black slate, black and brown siliceous shales, sandstone, greywacke, phyllite; minor conglomerate

SILURIAN AND DEVONIAN
4 — Grey-and buff-weathering, thick-bedded dolomite, buff to reddish weathering, sandy and silty, dolomite and siltstone; buff, grey, and white quartzites

ORDOVICIAN AND SILURIAN
3 — Black and varicoloured cherts, black, grey, and greenish grey shales; minor chert-pebble conglomerate, quartzite, limestone, and phyllite; 3a, massive chert-pebble conglomerate

CAMBRIAN (?)
MIDDLE AND UPPER CAMBRIAN (?)
2 — Buff-and grey-weathering, grey, green, and black shales, slates, and phyllites; silty limestone and siltstone

PROTEROZOIC

1 — 1a, light grey and whitish quartzite, banded hornfels and granulite, grey quartzite, skarn; minor chert and crystalline limestone; 1b, crystalline limestone; 1c, green and maroon shale, slate, phyllite, quartzite; minor andesite; 1d, gritty massive, quartz-pebble quartzite, medium-grained, grey quartzite, and dark slate

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A — Quartz-biotite schist, micaceous quartzite, banded, altered, sedimentary and volcanic rocks, hornfels; minor gneiss and crystalline limestone

Geological boundary (defined, approximate, assumed)
Bedding (horizontal, inclined, vertical, tops unknown)
Foliation (inclined)
Fault (defined, approximate, assumed)
Anticline (arrow indicates direction of plunge)
Fossil locality
Mineral occurrence or prospect (lead, Pb; zinc, Zn) ×Zn

Geology by J.A. Roddick, 1958, 1960, and L.H. Green, 1960

Cartography by the Geological Survey of Canada, 1961

Air photographs covering this area may be obtained through the National Air Photographic Library, Topographical Survey, Ottawa

In response to public demand for earlier publication, Preliminary Series maps are issued in this simplified form and will be clearer to read if all or some of the map-units are hand-coloured

PUBLISHED, 1961
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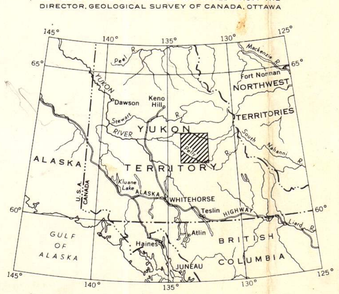
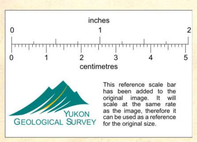


MAP 13-1961
GEOLOGY
TAY RIVER
YUKON TERRITORY

Scale: One Inch to Four Miles = 1/253,440
Miles
4 2 0 4 8 12



LEGEND

Road (dry weather)
Horizontal control point 5418
Intermittent stream
Marsh
Contours (interval 500 feet) 5000
Height in feet above mean sea-level 6627

Base-map prepared by the Army Survey Establishment, R.C.E., Dept. of National Defence, 1949-1951

Approximate magnetic declination, 34° 00' East

DESCRIPTIVE NOTES

During the summer the map-area is accessible by motor vehicle on the Canol Road as far as Pelly River. Pelly and South Macmillan Rivers can be used by small boats to reach the southern and northern parts, respectively. Numerous lakes, suitable for float-equipped aircraft, are scattered throughout the map-area.

Ice covered all of the area during the Pleistocene, except possibly the highest peaks. It moved west and northwest along the major valleys.

Unit 1 is a sequence of mainly quartzose, clastic rocks, best exposed east of Mount Selous. In Nahanni map-area these rocks are overlain, probably unconformably, by limestone of probable Cambrian age, and are, therefore, considered to be late Precambrian. At several places in Tay River and Sheldon Lake map-areas, Ordovician strata (3) lie on light-coloured siliceous rocks consisting mainly of light grey to whitish quartzite, grey and brownish quartzite, banded hornfels, and skarn (1a). These rocks (1a) appear to comprise the upper part of unit 1, but owing to complex structure, the stratigraphic sequence of units 1a to 1d has not been firmly established. Unit 1c consists mainly of shales, of which the most easily recognized are green and maroon. They are exceptionally persistent along strike, but outcrop best east of the map-area. The lower part of unit 1 is characterized by massive, gritty, quartz-pebble quartzite (1d) interbedded with dark shales. The thickness of unit 1 is not known as its base is not exposed and it is complexly folded and faulted; but it is thought to exceed 10,000 feet.

Unit 2 was recognized only south of Tintina Valley. Most of the rocks in this unit are sheared and more or less phyllitic. The cleavage is at various angles to the bedding. As similar rocks were found in Quiet Lake map-area, in places overlying Lower Cambrian strata and in others underlying Ordovician strata, a tentative Middle and Upper Cambrian age has been assigned to this unit.

In the northern part of Tay River map-area the Precambrian rocks (1) are overlain unconformably by mainly black chert and shale (3) containing Ordovician and Silurian graptolites. These beds are limited in the map-area to the vicinity of South Macmillan River, but are more widespread to the east. The cherts are commonly thin bedded, and more or less silty. The thickness of these strata is probably about 10,000 feet, but poor exposures and extremely complex structure combine to prevent a reliable estimate.

Unit 4 outcrops in a structurally complex belt south of Tintina Valley. It is best exposed south of the map-area in the vicinity of Fox Mountain, where the thickness is perhaps as much as 5,000 feet. There, Silurian fossils were found in dolomitic siltstones low in the section, and Middle Devonian fossils in massive grey dolomite near the top. The Siluro-Devonian carbonate rocks, although prominent south of Tintina Valley, do not appear north of it in Tay River map-area, where Devono-Mississippian strata (5) are believed to lie unconformably on the Ordovician-Silurian rocks (3), although the contact between the two units is not exposed.

Unit 5 underlies much of the region between the Anvil and South Fork Ranges. It contains practically no type of rock that does not exist also in the Ordovician-Silurian strata (3), from which it appears to have been derived. Quartzite and limestone are, however, much more abundant in unit 5. The assigned age of the unit is based on Upper Devonian brachiopods from thin beds of silty limestone and chert (5c) between Stokes Lake and Tay River, and on Mississippian brachiopods from a silty sandstone (5c) near the centre of the map-area. The dark cherts of unit 5b are at least 1,500 feet thick on Twopete Mountain and northwest of the head of Blind Creek.

Massive chert-pebble conglomerate beds (5a) form conspicuous outcrops in the vicinity of Stokes Lake. At least two beds are represented in the unit. Most of the fragments are of dark grey chert and shale, but significant numbers of fragments in the beds north of Earn River consist of light grey quartzite. The conglomerate beds are not as prominent to the east, and may thin in that direction.

Mississippian brachiopods were found in a massive grey limestone bed (6) northeast of Twopete Mountain. The limestone is involved in the complex folding and faulting of unit 5.

The granitic core of the Anvil Range is flanked by units 7, 8, and 9. Most of these rocks are metamorphosed to some extent and locally, as in the vicinity of Blind Creek, to grades as high as coarse-grained staurolite-garnet-mica schist. As no fossils were found in the three units, nothing is definitely known as to their age except that they are older than the probably Cretaceous granitic rocks that cut them. They have been tentatively considered Mississippian (?) and/or younger (?) because volcanic rocks of that age, similar to those of unit 8, have been found in other Yukon map-areas. A Precambrian age has also been considered because of their outcrop pattern with respect to the granitic rocks and their high degree of metamorphism compared to the nearby unmetamorphosed Devono-Mississippian rocks (5), but no rocks like them were recognized in unit 1.

Unit 7 is several thousand feet thick. Near the granitic rocks the unit locally contains sulphide minerals. Unit 7 grades upward into material that is increasingly volcanic. The main volcanic assemblage (8) is in a belt that follows the northeast side of the Tintina fault zone for about 250 miles. Chloritization and shearing are common in these rocks, but, except in the immediate vicinity of granitic bodies, the grade of metamorphism is low. The conglomerate (9b) contains abundant volcanic material, and appears to overlie unit 8.

Unit 10 is predominantly sandy and shaly, and was found only in isolated exposures in Tay River valley. It contains Triassic pelecypods.

Granitic rocks (11) comprise the core of the Anvil Range and Mount Selous, as well as smaller stocks elsewhere in the map-area. These rocks are clearly intrusive, with sharp, crosscutting contacts and very rare xenoliths. Also rare in the granitic rocks is foliation, even near the Tintina fault zone. If these rocks are the same age as similar rocks dated in the Itsi Mountains (about 96 m.y.), they are Middle Cretaceous.

Shale, sandstone, and conglomerate (12), containing granitic pebbles and Paleocene plant fragments, were found in some of the tributaries entering Pelly River from the south. Similar, but less conglomeratic rocks are present in the valley of South Macmillan River.

Rather peculiar looking quartz and feldspar porphyries, of granodioritic composition (13), are associated with the volcanic rocks of unit 14 from Blind Lakes to the Canol Road (just east of the map-area). In several places the flows (14) appear to overlie the porphyries, but the actual contacts are covered. Apparent similarities in composition and close areal association suggest that the porphyries may have been feeders to, or intrusive equivalents of the flow.

Flows of unit 14 underlie much of the area between Tay River and the South Macmillan - Riddell river-system, and form the South Fork Range. The aggregate thickness exceeds 5,000 feet. Individual flows are rarely well-defined, but appear to range in thickness from about 10 feet to perhaps 300 feet, with many about 50 feet. Pyroclastic rocks comprise only a very minor proportion of the assemblage. The upper part is characterized by dark dacites with phenocrysts of quartz and biotite. The lower part is mainly andesitic and basaltic, commonly containing feldspar phenocrysts. The volcanic rocks are gently deformed. Maximum dips of about 30° were noted. The volcanic sequence lies unconformably on intensely deformed Palaeozoic strata. The unconformity varies in elevation through about 2,000 feet. This may be accounted for by faulting and deformation, but the flows were probably extruded onto a surface of at least moderate relief. The gentle deformation and the porphyritic, massive character of these rocks distinguish them from the older volcanic unit (8), which is rarely porphyritic and commonly sheared.

The main mineral discovery in the map-area is a lead-zinc prospect located on Vangorda Creek between Mount Mye and Pelly River. Although inactive now, it was extensively drilled by its owner—Vangorda Mines Limited. The deposit consists mainly of disseminated pyrite, galena, sphalerite, and minor chalcopyrite in gently dipping sericitic schists (7) near their contact with the granitic rocks (11).

MAP 13-1961
TAY RIVER
YUKON TERRITORY
SHEET 105 K

63°00'

134°00'

4049

5487

EARN RIVER

STOKES LAKE

EARN R.

TAY RIVER

Overburden

CHERT PEBBLE CONGLOMERATE 40

MEDIUM GREY RUSTY QUARTZITE

DARK GREY QUARTZITE

BLACK CHERT

BLACK QUARTZITE

MEDIUM GREY RUSTY QUARTZITE

DARK GREY CHERT PEBBLE CONGLOMERATE

CHERT PEBBLE CONGLOMERATE

LIGHT GREY QUARTZITE

BLACK CHERT BRECCIA

LIGHT GREY QUARTZITE FLOAT

BLACK CHERT & LIGHT GREY QUARTZITE

LIGHT GREY BEDDED QUARTZITE

BIOTITE QUARTZ PEGMATITE

LIGHT GREY QUARTZITE

SPH. CPY. PY. PO

MEDIUM GREY QUARTZITE & MINOR CHERT BRECCIA FLOAT

VERY FINE GRAINED BLACK QUARTZITE

INTERBEDDED QUARTZITE, CHERT PEBBLE CONGLOMERATE & GRANITIC ARGILLITE

Black slates and argillites, sheared

Bedded, fossiliferous, grey weathering crystalline limestone

Sheared slates, overlaying by river gravels and 15' of limonite cemented gravels

Sheared black cherts and argillites

Buff weathering black crystalline fossiliferous bedded limestone

Black bedded cherts and argillites folded and sheared, some grey bedded cherts.

G-9 - Sheared and polished black cherts, also folded

10a

inches

centimetres

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

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