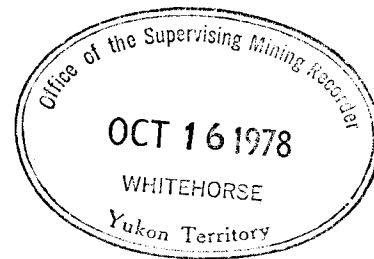
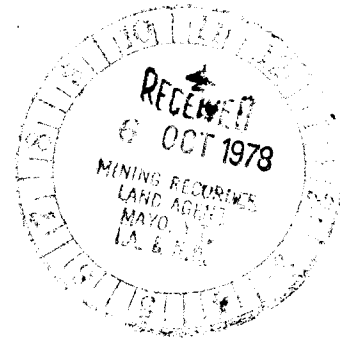


COMINCO LTD.

EXPLORATION
N.T.S. 105 0-7

WESTERN DISTRICT
13 SEPTEMBER 1978



GEOLOGICAL AND GEOCHEMICAL

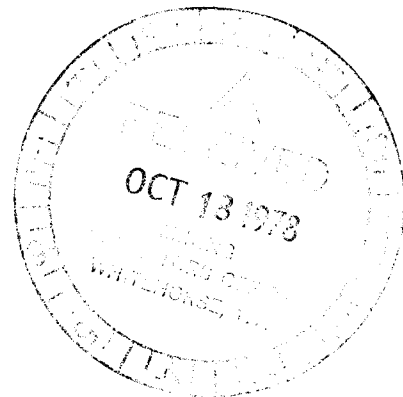
ASSESSMENT REPORT

ON THE

HESS 51 TO 56, 61 TO 64, 73 TO 86 CLAIMS

MAYO MINING DISTRICT, YUKON TERRITORY

LATITUDE: 63°17'N, LONGITUDE: 130°41'W



August 6, 1978 to August 22, 1978

G. Della Valle
Geologist

090380 .

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LIST OF ATTACHMENTS

~~AFFIDAVIT~~

~~EXHIBIT "A" STATEMENT OF EXPENDITURES~~

~~STATEMENT OF QUALIFICATIONS~~

PLATE 1: LOCATION MAP	SCALE 1" = 80 miles
PLATE 2: LOCATION MAP	SCALE 1" = 8 miles
PLATE 3: GEOLOGY MAP	SCALE 1:10,000
PLATE 4: COPPER GEOCHEMISTRY	SCALE 1:10,000
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PLATE 7: SILVER GEOCHEMISTRY	SCALE 1:10,000
PLATE 8: BARIUM GEOCHEMISTRY	SCALE 1:10,000
PLATE 9: CLAIM LOCATION	SCALE 1:10,000

COMINCO LTD.

EXPLORATION
N.T.S. 105 0-7

WESTERN DISTRICT
13 SEPTEMBER 1978

GEOLOGICAL AND GEOCHEMICAL

ASSESSMENT REPORT

ON THE

HESS 51 TO 56, 61 TO 64, 73 TO 86 CLAIMS

I LIST OF CLAIMS

<u>CLAIM NAME</u>	<u>TAG NUMBER</u>	<u>DATE RECORDED</u>
HESS 51	YA 15892	Aug. 5/77
HESS 52	YA 15893	Aug. 5/77
HESS 53	YA 15894	Aug. 5/77
HESS 54	YA 15895	Aug. 5/77
HESS 55	YA 15896	Aug. 5/77
HESS 56	YA 15897	Aug. 5/77
HESS 61	YA 15902	Aug. 5/77
HESS 62	YA 15903	Aug. 5/77
HESS 63	YA 15904	Aug. 5/77
HESS 64	YA 15905	Aug. 5/77
HESS 73	YA 16053	Sept. 6/77
HESS 74	YA 16054	Sept. 6/77
HESS 75	YA 16055	Sept. 6/77
HESS 76	YA 16056	Sept. 6/77
HESS 77	YA 16057	Sept. 6/77
HESS 78	YA 16058	Sept. 6/77
HESS 79	YA 16059	Sept. 6/77
HESS 80	YA 16060	Sept. 6/77
HESS 81	YA 16061	Sept. 6/77
HESS 82	YA 16062	Sept. 6/77
HESS 83	YA 16063	Sept. 6/77
HESS 84	YA 16064	Sept. 6/77
HESS 85	YA 16065	Sept. 6/77
HESS 86	YA 16066	Sept. 6/77

II PERSONNEL EMPLOYED

The basic camp consisted of a two-man party: G. Della Valle, geologist and I. Nicholson, field assistant, with the supervision of A.B. Mawer, senior geologist.

Personnel employed by Cominco Ltd. during the course of this study:

G. Della Valle	August 6 - September 15, 1978	409 Granville St.
I. Nicholson	August 6 - August 22, 1978	409 Granville St.
A.B. Mawer	August 6, 1978	409 Granville St.

III INTRODUCTION

The Hess claim group consisting of 86 mineral claims was staked over the period from September 1976 to August 1977 to cover a sequence of Cambrian to Devonian clastic rocks with lead and zinc mineralization in a massive barite horizon.

2.

The 1978 program was centered in the western part of the claim group and consisted of geological mapping and geochemistry over the claims Hess 73 to 86, which were staked at the end of the 1977 field season, to cover the western extension of favourable stratigraphy with mineralized baritic bed located on Hess 61.

Cash in lieu was paid for the claims Hess 49 to 72 as the assessment work for these claims was due on August 5, 1978. One day was spent on claims Hess 61 to 64 with detailed study and sampling of the "Hess 61 showing" and one day of soil sampling was spent on claims Hess 51 to 56.

IV LOCATION AND ACCESS

The Hess claim group is located in the Hess Mountains, Yukon Territory, some thirty kilometers west of MacMillan Pass airstrip. The property lies in the Mayo Mining District with coordinates: 63°17'N and 130°41'W on N.T.S. sheet 105/0-7 and has boundaries with the Lorraine, Fat City, Kam, Chas and Cathy claim groups. Access to the property is by helicopter from MacMillan Pass. During summer months, the Canol Road is open to Ross River, some 170 kilometers to the southwest, and schedule flights connect MacMillan Pass to Ross River and Whitehorse.

V GEOLOGY

A. Regional Geology

The MacMillan Pass area lies along the northeastern margin of the Selwyn Basin and is underlain by a sequence of Cambrian to Mississippian clastic rocks. This series was deposited in a shelf environment and grades to the east into carbonate rocks corresponding to a platform environment and the southwest into cherts of a deeper basin or distal environment.

Three transgressive cycles resulted in the deposition of three major formations: the Road River formation of Cambrian to lower Devonian age, the Canol formation of middle-upper Devonian age and the Imperial formation of Devonian to Mississippian age. These rocks are intruded by several granitic stocks of Cretaceous age, commonly surrounded by their metamorphic rocks aureole (rhyolitic dykes are also common). The Road River formation consists essentially of black carbonaceous shales and siltstone, with cherty and calcareous horizons. Intensive deformation resulted in tight isoclinal folding, particularly well marked in this formation. The Canol formation consists of a succession of turbidite rocks which range in grain size from a shale to a pebble conglomerate. Fine laminated rocks are also characteristic of turbidite deposition which occurred during crustal instability. The Imperial formation consists of greywacke, grey sandstone and quartzite. All three formations have been deformed in large open isoclinal folds of generally east-west trending directions.

B. Local Geology (Reference Plate 3)

The sequence of rocks, in the western portion of the Hess claim groups belong to Road River formation and Canol formation. From the oldest unit upward, the following series was mapped:

Road River Formation:

Unit 1: This unit is lower to middle Ordovician and is formed by an assemblage of different rock types. The main lithology is a black to dark grey siltstone and sandstone with thin carbonaceous and dolomitic laminations. Cross-bedding is common. A thick bedded grey limestone horizon is locally dolomitized and is marked by orange to tan weathering colour. Black carbonaceous shale containing graptolite fossils and brown cherty siltstone also occur in the assemblage.

3.

Unit 2: This unit is middle to upper Ordovician and is composed of dark grey finely bedded mudstone with light grey siltstone laminations. The upper part of this unit is a black finely bedded shale with abundant graptolites.

Unit 3: This unit is lower to middle Silurian and is composed of a brown weathering grey to bluish grey cherty siltstone and chert with fine disseminated pyrite. At the top of this unit, a brown weathering dark grey carbonaceous siltstone occurs.

Unit 4: This unit is middle to upper Silurian and consists of two sub-units with a grey weathering carbonaceous siltstone and shale at the base 4a and a very black graphitic mudstone on top 4b. A thick bedded barite witherite sequence occurs in the middle of the lower sub-unit with local lead-zinc mineralization and a thick barite bed also occurs in the upper sub-unit.

Canol Formation:

This formation is Devonian to Mississippian.

Unit 5: This unit appears to be missing in the limit of the working area but is defined in the property further east as a medium to thick bedded carbonaceous siltstone weathering rusty brown and grading upward into a brown banded siltstone and carbonaceous cross banded sandstone.

Unit 6: This unit is composed of a dark green locally hematitic rusty brown weathering chert pebble conglomerate, with subrounded cherty clasts and occasional angular siltstone clasts in a cherty matrix.

C. Structural Geology

The general structural style in the area consists of large scale east-west trending isoclinal folds of nearly vertical axial plane. Local drag folding is also visible in the Road River formation. In the Canol formation, represented by the Conglomerate unit, the competent character of this rock type results in large scale open folding.

East-west trending thrust faults and vertical faults with a relatively important displacement are indicated by discordant contacts such as between the Road River and the Canol formation where the lower Laminate unit is locally missing. Transversal northeast-southwest faults of smaller amplitude have also been observed.

VI MINERALIZATION

The Hess 61 showing consists of a folded barite bed located in the black siltstone of the upper Road River unit. The total outcropping length of the barite bed is over one hundred meters with the thickest part up to ten meters thick over thirty-five meters in length. This thick part contains disseminated mineralization and a central bed, 1.5 m to 6.5 m thick, of higher grade mineralization marked by a rusty brown weathering surface. Galena, sphalerite, pyrite and minor tetrahedrite form mineralized laminae conformable with the hosting barite. Rare veins intersecting the bedding contain massive tetrahedrite and galena and are thought to represent an epigenetic fracture filling period of mineralization, due to remobilization of the pre-existing sulphides.

Nine lines of chip sampling of five meter intervals over the mineralized horizon indicate an average grade of: 0.05% Cu, 1.6% Pb, 2.0% Zn, 2.67 oz/t Ag over an average thickness of three meters.

4.

On claims Hess 62 and 63, disseminated galena, sphalerite, pyrite and tetrahedrite were found in a one to two meters thick barite bed which appears to be in the same horizon as the Hess 61 showing, some five hundred meters along strike to the west, with the intermediate zone covered by talus. Chip sampling over two meters indicates a grade of: 0.05% Cu, 1.58% Pb, 1.54% Zn, 1.7 oz Ag. Twelve hundred meters further west along strike another outcropping zone in the upper Road River unit contains several one to two meter thick barite beds carrying zinc oxides. Rock assay values are: 0.028% Cu, 0.009% Pb, 0.16% Zn and 0.01 oz Ag.

VII GEOCHEMISTRY

A. Introduction

On claims Hess 73 to 86, 47 soil samples were taken on contour lines, to cover the overburden zone of the upper Road River unit mainly. The samples were taken at a hundred meter intervals. All the barite occurrences were also chip sampled and the Hess 61 showing was resampled.

On claims Hess 51 to 56, twenty-one soil samples were taken on a grid over a sequence of upper Road River unit with a thick barite bed, and lower Laminate unit. The grid was flagged with the base line running parallel to the creek. The samples were taken every hundred meters on transverse lines, two hundred meters apart.

The assays were analysed by Cominco laboratory for copper, lead, zinc, silver and barium. The soil samples were oven dried and sieved to minus 80 mesh before being digested in 20% hot nitric acid. Analysis for Cu, Pb, Zn and Ag was by atomic absorption, and lead and silver values were background corrected. Analysis for Ba was by Xray fluorescence. Analysis was supervised by F.C. Kiss, Senior Chemist for Cominco.

B. Interpretation

Threshold was determined using A.T. Sinclair method: "Application of probability graph in Mineral Exploration".

Anomalous and possibly anomalous values were determined as shown in the following diagram:

	<u>Possibly Anomalous</u>	<u>Anomalous</u>	
Cu		190 ppm	>
Pb	45 - 450	450 ppm	>
Zn	600 - 1200	1200 ppm	>
Ag	2.8 - 5.4	5.4 ppm	>
Ba	2.22 - 3.02	3.02 ppm	> ← % likely

Geochemistry: Hess 73 to 86

Copper:

Three anomalous values in copper define a one hundred by three hundred meter anomaly with values up to 310 ppm Cu. Two possibly anomalous values are isolated points.

Lead:

No lead anomalous values occur over the lines of geochemical sampling. Five possibly anomalous values are located in the eastern portion of the sampling lines.

Zinc:

A two hundred by two hundred meter anomaly is defined by two possibly anomalous values and two anomalous values, with the highest being 4100 ppm zinc. Other isolated anomalous and possibly anomalous values also occur.

5.

Silver:

Only one anomalous value in silver occurs over the sampling lines, and four values define a possibly anomalous zone extending over three hundred meters.

Barium:

Only one possibly anomalous value in barium occurs over the sampling lines.

The copper, zinc and silver anomalies are located in the same area over a four hundred by two hundred meter anomalous zone. However, this zone contains several spring discharge which appears to be at the origin of the enrichment in metallic elements, especially copper, zinc and silver.

This observation has been reported by Fletcher and Doyle in their publication "Factors Influencing Trace Element Distribution in the Eastern Yukon". These geochemical anomalies are not indicators of base metal deposits. Furthermore, the absence of barium anomalies suggest that the barite bed is not continuous over the area of the geochemical survey.

Geochemistry: Hess 51 to 56

Three barium anomalous values and two possibly anomalous values occur on the eastern portion of the grid area and are interpreted to be related to down slope dispersion of outcropping barite. Three possibly anomalous values in silver and one possibly anomalous value in zinc are isolated points and are interpreted to be related to erratic mineralization.

VIII CONCLUSIONS AND RECOMMENDATIONS

Geological mapping on the western portion of the Hess claim groups indicate that the stratigraphy of the Hess 61 showing extends westward over the claims Hess 73 to 86 where it contains disseminated mineralization in similar horizons.

In the overburden zone of the favourable stratigraphy coincident copper, zinc and silver geochemical anomalies are interpreted to be related to metallic enrichment in spring discharge area. The Hess 61 showing is a thirty-five by three meter barite hosted lead, zinc, silver and copper mineralized bed with average grade of 0.05% Cu, 1.6% Pb, 2.0% Zn and 2.67 oz/t. This grade is not of economic interest for a mineralized occurrence in this remote area. No further surface geology work is recommended on the claims Hess 73 to 86.

On claims Hess 51 to 56, a barium anomaly is related to down slope dispersion of outcropping barite. No further work is recommended on these claims.

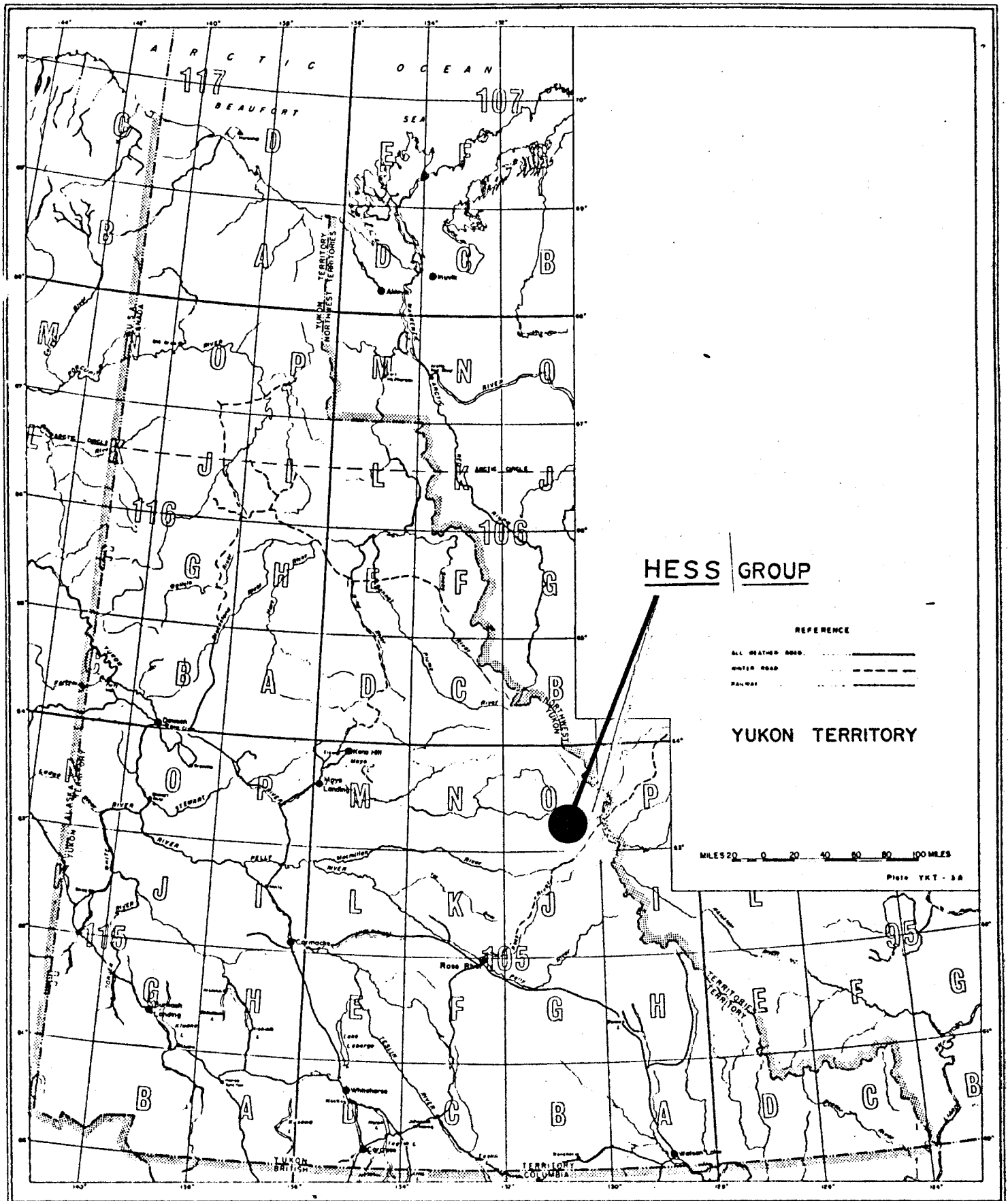
Report by: *G. Della Valle*
G. Della Valle
Geologist

Endorsed by: *A. B. Mawer*
A.B. Mawer,
Senior Geologist

Approved for
Release by: *G. Harden*
G. Harden,
Manager, Exploration
Western District

IX REFERENCES

- 1976: Blusson S.L.: Selwyn Basin; Yukon and District of MacKenzie. B.S.C. Paper 761A pp. 131-132
- 1976: John S. Brock: Selwyn-MacKenzie. Zinc-Lead Province Yukon and Northwest Territories. Western Miner March 1976. pp. 9-14.
- 1977: D.T. Templeman Kluit: Stratigraphy and Structural Relations between the Selwyn Basin, Pelly Cassiar Platform and Yukon Crystalline Terrane in the Pelly Mountains, Yukon. G.S.C. Paper 771A pp. 223-227.
- 1976: R.C. Carme: Geology of the Tom and Jason Zinc-Lead-Barite Deposit MacMillan Pass, Yukon Territory. Dept. of Indian and Northern Affairs 1976.
- 1976: A.T. Sinclair: "Application of Probability Graph in Mineral Exploration". Special volume No. 4 The Association of Exploration Geochemists.
- 1974: Doyle P., Fletcher K., Factors Influencing Trace Element Distribution in the Eastern Yukon. CIM Transactions: Vol. LXXVII. pp. 27-31.



Drawn by:	G DV			Traced by:	
Revised by:	Date:	Revised by:	Date:		

HESS GROUP

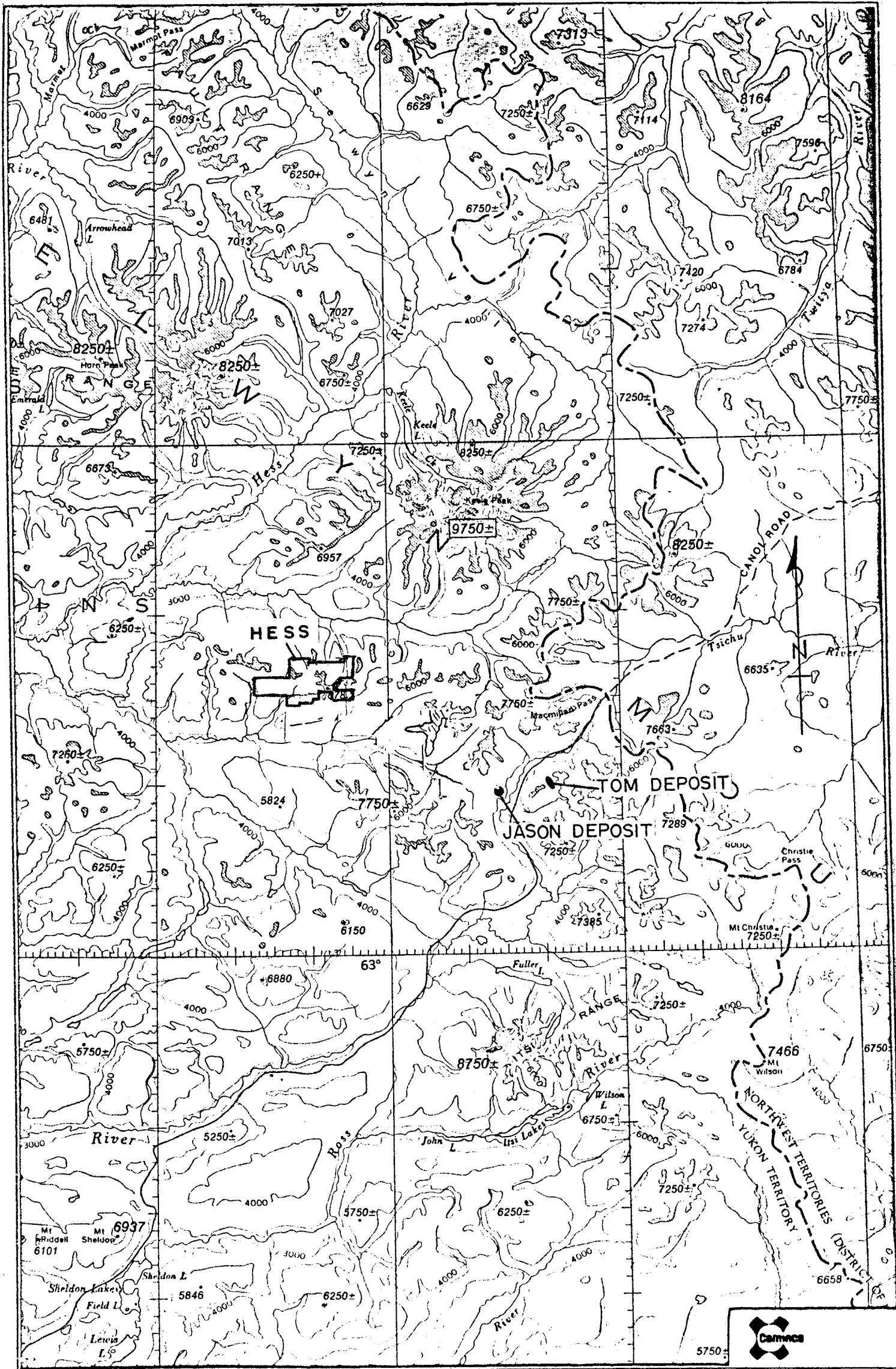
LOCATION MAP

Scale: 1" = 80 miles

Date: Sep 1978

Plate: 1





Drawn by: G. DV		Traced by:	
Revised by	Date	Revised by	Date

LOCATION MAP

HESS CLAIM GROUP (shows Tom & Jason deposits)

Scale: 1" = 8 miles Date: Sep 1978 Plate 2



LEGEND

CANOL FORMATION

- 6 CONGLOMERATE UNIT Chert pebble cong., gritstone
- 5 LOWER LAMINITE UNIT Carbonaceous siltstone

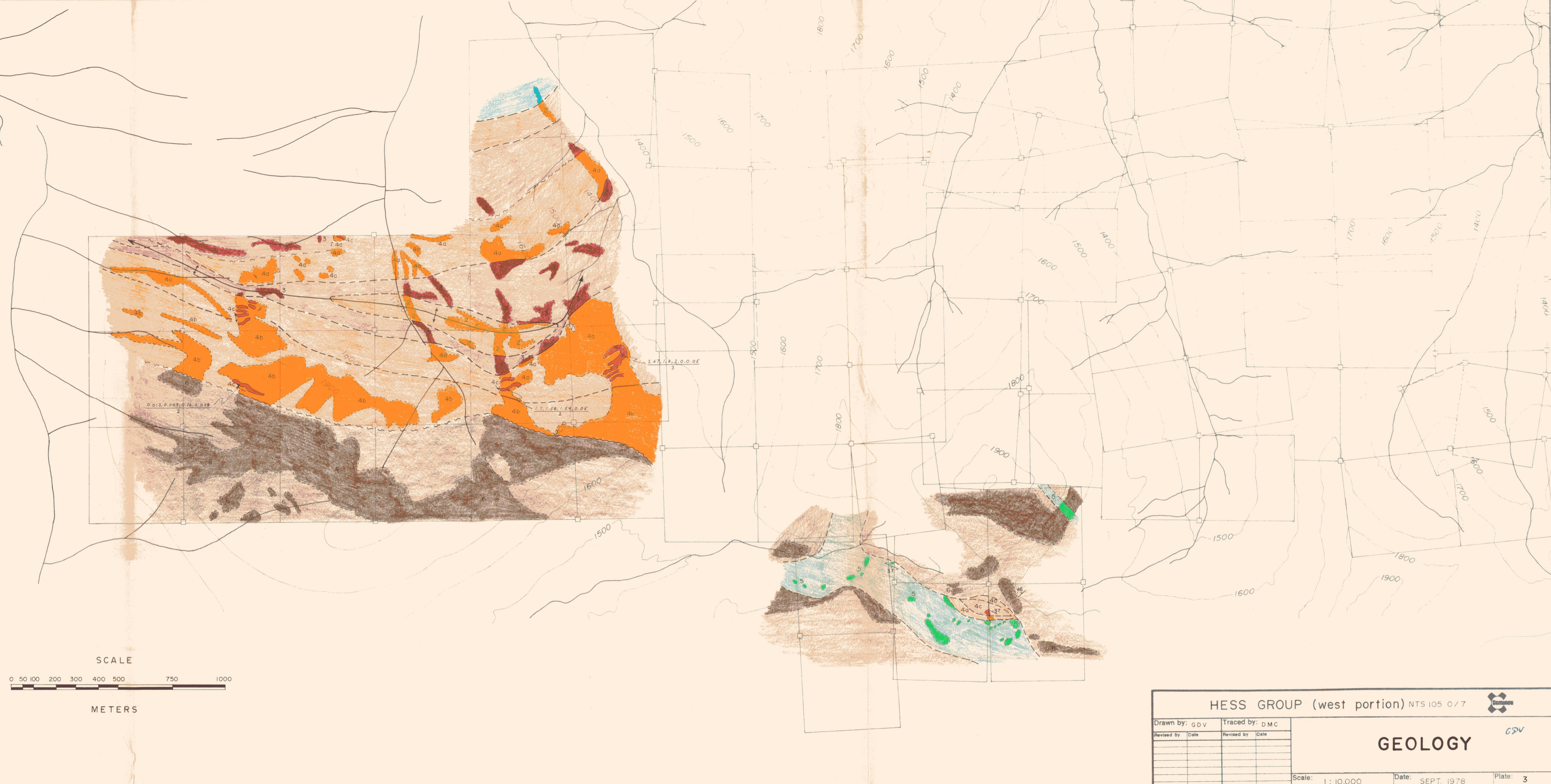
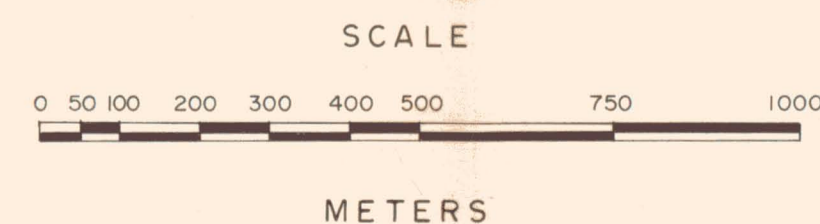
ROAD RIVER FORMATION

- 4 UPPER ROAD RIVER UNIT
 - 4a Carbonaceous siltstone, shale
 - 4b Black graphitic mudstone
 - 4c Barite, witherite
- 3 MARKER UNIT Cherty siltstone, chert
- 2 ACTIVE UNIT Black carbonaceous mudstone and siltstone
- 1 TRANSITION UNIT Siltstone, sandstone, limestone, shale

SYMBOLS

- * Pb,Zn,Cu. mineralization
- Geological contact
 - Definite
 - - - Assumed
- Fault
 - ~~~~~ Definite
 - ~~~~~ Assumed
- Strike and dip
- Outcrop
- Claim post location

$\frac{2.67, 1.6, 2.0, 0.05}{3}$ Assay result $\frac{\% Ag, \% Pb, \% Zn, \% Cu}{\text{length in meters}}$

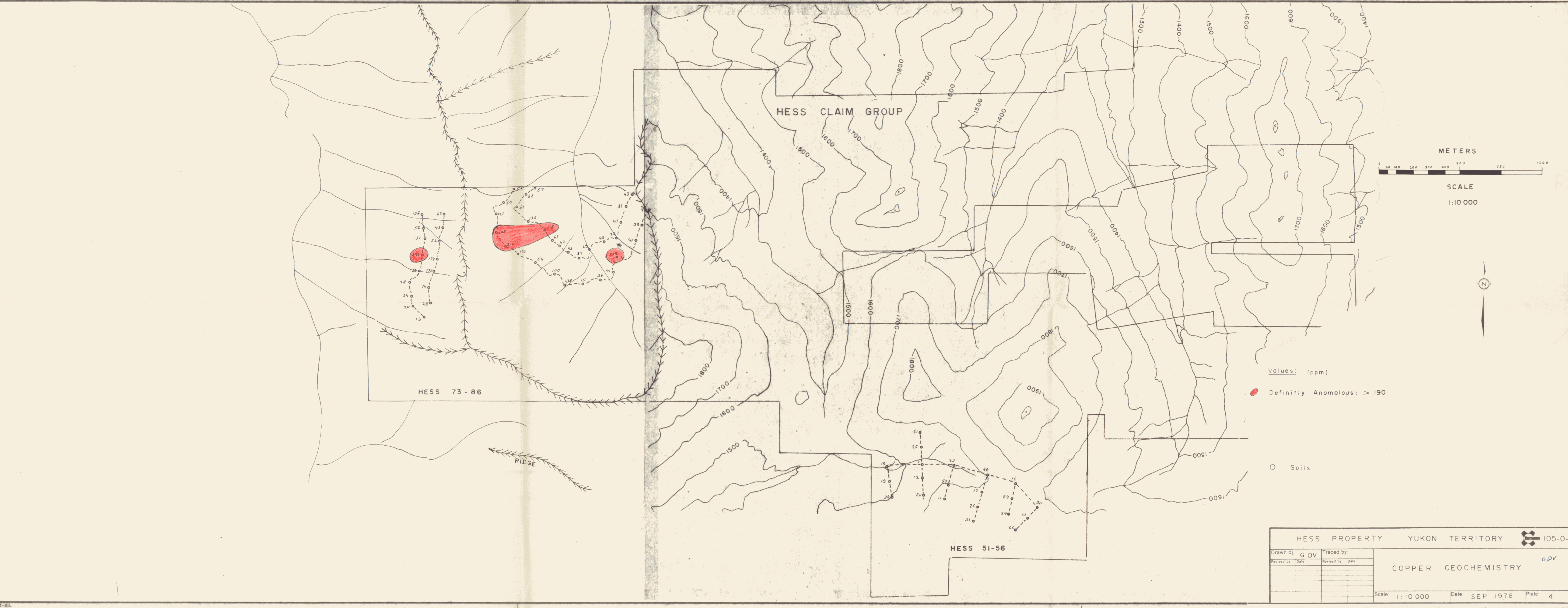


HESS GROUP (west portion) NTS 105 0/7

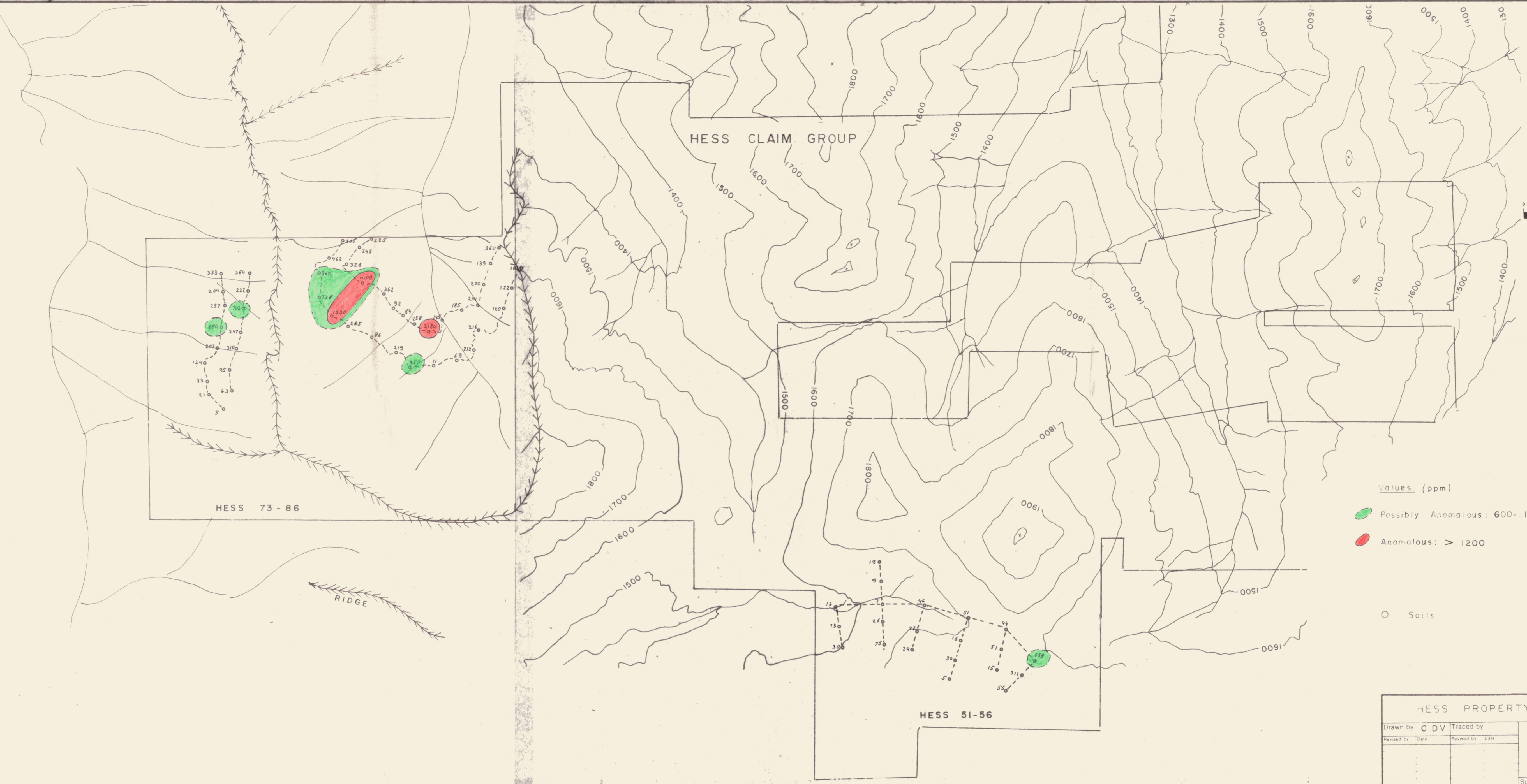
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Revised by: _____	Revised by: _____

GEOLOGY

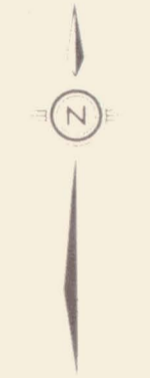
Scale: 1:10,000 Date: SEPT. 1978 Plate: 3



Hess Property Yukon Territory		105-0-7	
Drawn by	G DV	Traced by	G DV
Revised by		Revised by	
Date		Date	
COPPER GEOCHEMISTRY		Scale: 1:10 000	
		Date: SEP 1978	
		Plate: 4	



SCALE
1:10 000



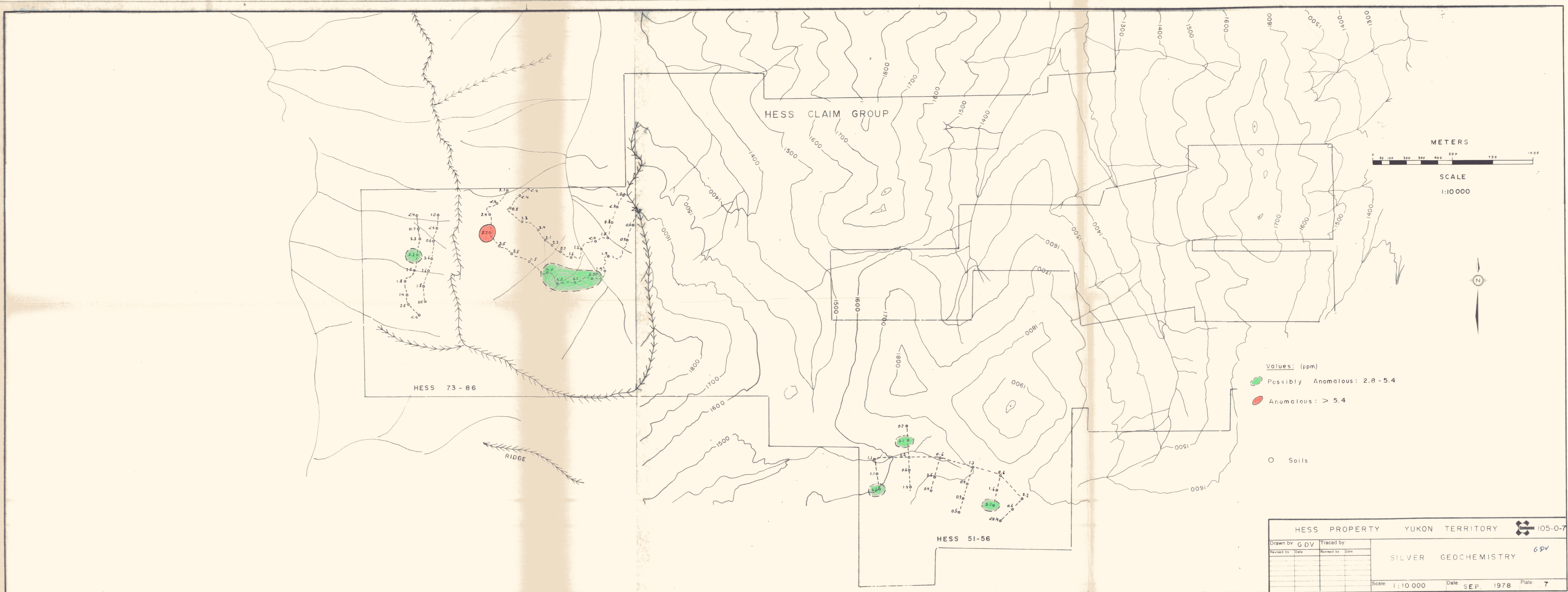
Values (ppm)

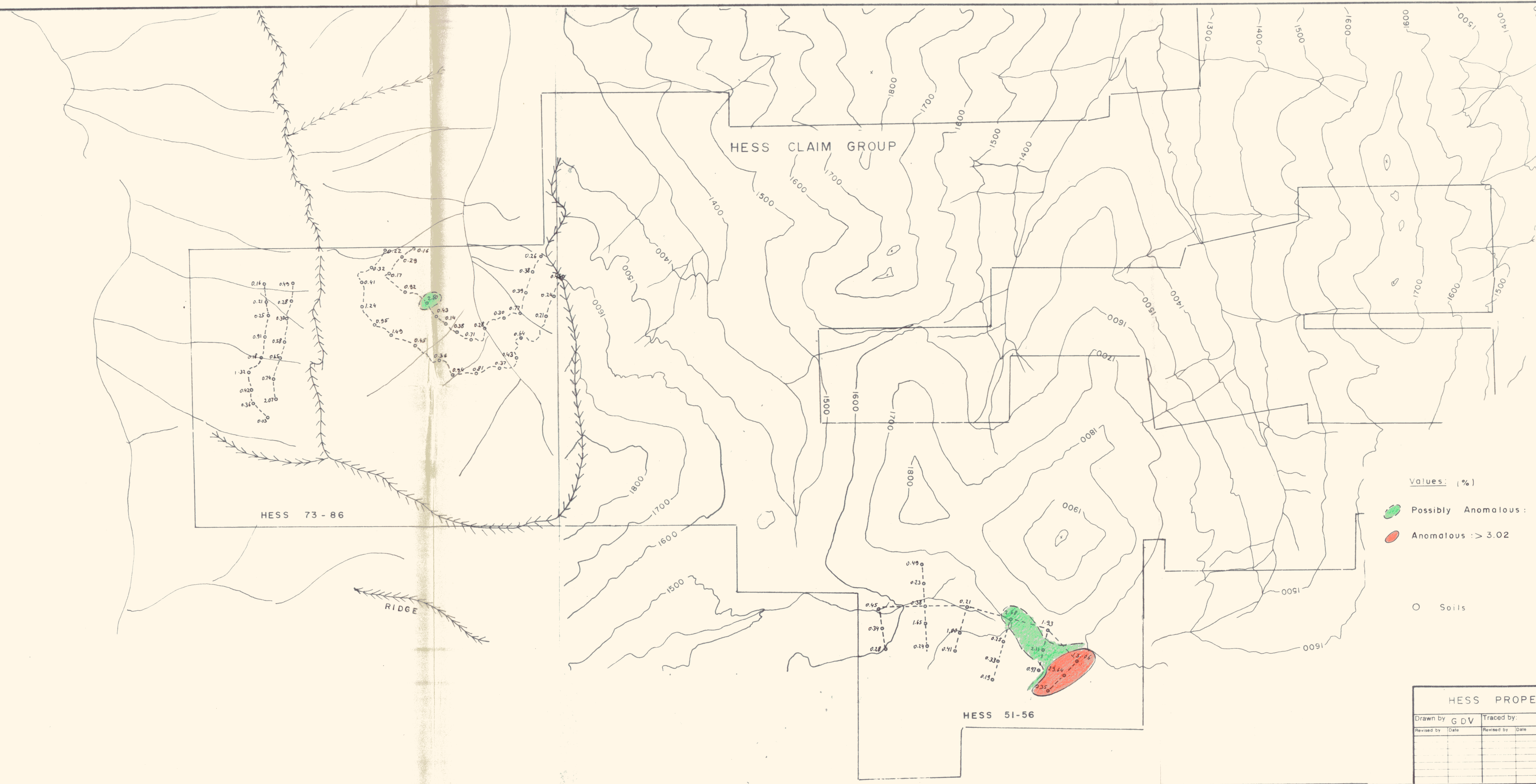
█ Possibly Anomalous: 600-1200

█ Anomalous: > 1200

○ Soils

HESS PROPERTY		YUKON TERRITORY		105-0-7	
Drawn by	G DV	Traced by			
Revised by		Revised by			
				ZINC GEOCHEMISTRY	
				G DV	
Scale 1:10 000		Date SEP 1978		Plate 6	





SCALE
1:10 000



Values: (%)

Possibly Anomalous: 2.22 - 3.02

Anomalous: > 3.02

Soils

HESS PROPERTY		YUKON TERRITORY		105-0-7	
Drawn by	G DV	Traced by:			
Revised by	Date	Revised by	Date		
BARIUM GEOCHEMISTRY				69V	
Scale: 1:10 000		Date: SEP. 1978		Plate: 8	

