GEOLOGICAL & GEOCHEMICAL

REPORT

on the

VU CLAIM GROUP

BY

ROBERT E. VAN TASSELL

Staking Sheet Nos. 105-M-14 & 105-M-15
Latitude - 63°57'N
Longitude - 135°00'W
Date Work Performed: July 2 - Aug. 6, 1965.

Table of Contents

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SUMMARY

The V (1-8) and the U (1-6) Mineral Claims were staked following the release of results of a G.S.C. geochemical survey on March 31, 1965. Lead and silver results were obtained from the G.S.C. over claims staked. From this information plus that obtained from reconnaissance prospecting an additional 25 claims were staked. These claims were called the VU's and the whole general area is referred to as the VU Claim Group on following maps.

The V claims and the U claims lie in adjacent valleys with the VU claims on the ridge in between. The whole area contains approximately 20% outcrop. It was felt that a preliminary soil sampling program would give an indication to possible vein zones in the area and would define areas for closer detailed follow-up work.

In addition to the geochemical survey, a preliminary geological reconnaissance was made to locate information which would aid in the interpretation of geochemical results.

PROPERTY

The V, U, and VU claim group was staked for and is held by United Keno Hill Mines Limited, Elsa, Yukon. The group is made up of the following claims:-

V - 1 to 8 incl.	Grant Nos.	84340 - 84347
U - 1 to 6 incl.	Grant Nos.	84334 - 84339
VU - 1 to 25 incl.	Grant Nos.	84540 - 84564

LOCATION

The V claims lie along Allen Creek and the U claims along the north tributary of McKim Creek. The VU claims fill in the area between these two groups and also extend both of them to the north. These claims lie approximately 12 miles southeast of Elsa and 7 miles north of Mayo Lake.

TOPOGRAPHY

The topography of the area is rugged with elevations varying from 4000 ft. to 6000 ft. The claim group for the most part lies above timberline although some buckbrush, crab spruce and willow grows in the valleys to the northeast.

The claims are bounded on the southeast and west sides by scarp faces which are between 400 and 1200 feet high. These scarp faces are near vertical and have large talus slopes.

GENERAL GEOLOGY

The general geology of the area has been described by Keck (1905), Bostock (1947) and Kindle (1952).

The consolidated rocks underlying the VU group area belong to the Yukon group and are PreCambrian and/or Palaeozoic in age. They consist of sericite, and graphite schists, thick and thin bedded quartzites and are cut by sills of meta diorite and meta-gabbeo (greenstone) of probable Mesozoic age.

The strata of the area lies on the limb of an anticline which has a south-easterly axis, striking from Keno Hill to Mayo Lake and dips from 10° to 30° to the southwest.

I GEOLOGICAL SURVEY

A. Detailed Geology

For the most part the area is drift covered and in many instances mapping is done by observing the slide rock or felsenmeer. There is approximately 20% outcrop in the area with the most of this being on the scarp faces. Fairly good geological sections can be obtained here.

The area is underlain by thick and thin bedded quartzites, graphite schist, sericite schist and numerous lenses of greenstone. The strike of the rocks in the area vary from N50E to N40W and dip from 49° at the north end of the group to 13° at the south. These differences are caused by local crenulations in the schists and indicate fairly complex folding.

(a) Thick and Thin Bedded Quartzites - These consist generally of quartz with minor sericite and graphite. Thick bedded quartzites are usually medium to dark grey and are highly jointed which is evident from frost heaved boulders. Thin bedded quartzites vary from an inch to a foot in thickness, are dark grey to black in colour and are generally interbedded with graphite schist.

(b) Graphite Schist - Black in colour, usually highly contorted and carrying pyrite. Usually contain many stringers of quartz which is in some cases crushed and limonite stained.

(c) Sericite Schist - Mainly a light grey green to olive green with some chlorite. These schists are usually highly contorted and carry stringers and bulbous masses of quartz.

(d) Greenstone - A grey green to dark green rock occurring usually as discontinuous sill like bodies or bases. The larger bodies show original texture whereas smaller thinner bodies have developed a foliation parallel to the sediments.

B. Structure

Rocks in the area have varying strikes and dips. This variation is due partly to local conditions (crenulations) where these lenses of greenstone have been interjected between layers of schist.

Aerial photos reveal a number of lineations through the area. Some of these (notably those striking from E to W and W60E) when checked on the ground represent vein structures. The N-S lineations represent possible cross faults. Both types of faults show breccia float.

C. Mineralization

The reconnaissance prospecting alone on the claim group found mineralization which indicates one definite vein zone. This zone cuts the bedding at a slight angle and is in the favourable quartzite formation. Vein material was of breccia with galena and siderite. Character assays returned values of (1) 25 oz. Ag/ton and 7.65% Pb, and (2) 13 oz. Ag/ton and 0.21% Pb. This gives favourable Ag-Pb ratios of 3.3 to 1 and 6.2 to 1.

The presence of aerial lineations and breccia plus anomalous lead results from soil sampling indicates the possibility for further vein structures.

II GEOCHEMICAL SURVEY

The claim baselines were used for setting up a grid for sampling purposes.

(a) A total of 3,074 soil samples were taken in 73 man days. Preliminary soil sampling was done on 300' line spacings with samples taken every 100 feet on the lines. Three of the baselines were also sampled at 100 ft. intervals.

Samples of approximately one cup size were taken using a mattock from holes 6 to 18 inches deep of "organic free" material. All Samples were tagged and placed in small plastic sample bags.

(b) Lab Procedure for Chemical Analysis of Soil Samples for Lead, Zinc and Copper.

(i) General - The initial laboratory techniques and methods of analysis were set up by Dr. R. E. Delavault of the University of British Columbia during a three week visit in early 1964. He felt that the procedures as set up were those best applicable to the particular conditions of the area.

(ii) Sampling

1. Place approximately 200 grams of the soil sample on a clean sheet of paper and allow to dry thoroughly.
2. When the soil has dried, mix thoroughly ;and crush.
3. With one gram scoop select a sample which possesses as little organic matter as possible and disregard any rock fragments larger than 1 mm. (a one mm. mesh seive may be used.)
4. Place the one gram soil sample in a small aluminum cup (made from aluminum foil) and tag.

(iii) Digestion

1. Place the one gram (well crushed) soil sample into a 22 x 175 mm. test tube, add one ml. of aqua regia and heat gently (about an hour) in the fume hood until the aqua regia has evaporated.
2. Allow the sample residue to cool for 10 or 15 minutes.
3. Add 1 ml. of dilute hydrochloric acid (1 HCl:10 H_2O) to the residue and gently heat (approx. 15 minutes) until the soil is just moist.
4. Dilute to 20 mls. with demineralized water and shake well.

(iv) Copper Test

1. Make a series of copper standards by diluting the 100γ/ml. stock solution to 1/ml., i.e. take 1 ml. of 100γ/ml. solution and dilute it to 100 mls. with demineralized water. The copper standards should be 0γ, 0.2γ, 0.5γ, 0.7γ, 1γ, 2γ, 3γ, 4γ, 6γ, 10γ. Therefore measure with a pipette respectively 0.2, 0.5, 0.7, 1.0, 2.0, mls., etc. of the 1γ solution into separate 18 x 150 mm. test tubes. Add the reagents for this test described below. These standards will keep for days, even weeks, if well stoppered.
2. To an aliquot of the sample solution in a 18 x 190 mm. test tube add 2 ml. of the ammonium citrate-sodium acetate-acetic acid buffer solution, enough demineralized water to make the total volume 6 to 8 mls., mix, and add 1 ml. of the biquinoline solution.
3. Put a plastic stopper on the test tube and shake about 20 seconds or 100 strokes.

(v) Lead Test

1. To an aliquot of the sample solution add 5-10 milligrams of ascorbic acid, wait a few minutes, then add ½ ml. of the potassium cyanide solution, and 1 ml. of ammonium-citrate buffer solution. Wait at least two minutes if much iron is present.
2. Add ½ or 1 ml. of dithizone working solution (dithizone dissolved in chloroform).

3. Shake and compare with the standards unless the color is the pink color of the pure complex. In such case, add more dithizone until a mixed color persists and match to the standards. The amount contained in a matching standard must, of course, be multiplied by the total number of ½ mls. of dithizone used.
4. Prepare a series of standards in the same manner as for copper and add the reagents as in "1" above. The standards should have the following range:
γ's lead 0, 0.2, 0.5, 0.8, 1, 1.5, 2, 3, 4, 5, 8 mls. of Dz. 1 ml. ½ ml, ½ ml, 1 ml, 1 ml, 2 ml, 2 ml, 3 ml, 3 ml, 4 ml. For higher amounts than 8γ per ml. add dithizone and shake until color for 8 is reached then there are 2γ per ml. used. These standards will keep for about 4 hours at normal room temperatures.

(vi) Zinc Test

1. Make a series of zinc standards by diluting the 100γ/ml. stock solution to 1γ/ml. solution in the same manner as for copper. The zinc standards should be 0γ, 0.2γ, 0.5γ, 0.6γ, 0.80γ, 1γ. Add the reagents for the test described below. These standards will keep for about 1½ hours at normal room temperatures.
2. To an aliquot of the unknown sample solution add 5-10 milligrams of ascorbic acid, wait a few minutes, and then add 2 mls. of the sodium-acetate buffer solution, and 2 mls. of the dithizone working solution (dithizone dissolved in toluene-10 milligrams/liter).
3. Shake from 30 to 40 seconds and compare to standards.

NOTES

1. Extreme care must be taken to prevent contamination from any source. This necessitates good cleaning of glassware with metal-free water. Acetone and/or ethyl ether can be used as a rinser. Extrememcare must be exercised with these latter organic solvents as they are extremely flammable.
2. Lead and zinc standards are very unstable (at normal room temperatures they keep from 1 to 4 hours), in presence of light and heat the metal dithizonate tends to break down. If standards wish to be preserved for a limited time, they should be put in a cold, dark place, e.g. a refrigerator. The author experimented with artificial standards by mixing suitable colored inks. These artificial standards were found to be unsatisfactory as the colors faded slightly in a short time and the accuracy desired was not possible.

(c) Interpretation of Results

All samples taken were analysed for lead, zinc and copper. From three years of previous work on Galena and Keno Hills, soil

sampling has proven to be an effective tool in locating vein zones in areas of relatively shallow overburden, i.e. 10 feet. Copper analysis of soil samples is no longer done on local work as values have proven to be very erratic and usually reflect areas of greenstone and sericite schist.

It was felt that a three metal determination (lead, zinc and copper) should be done on our outside property examinations to determine the cause of G.S.C. anomalies which were given as Total Heavy Metals.

In contouring results lead values are cut at 50 parts per million (P.P.M.) zinc at 100 P.P.M. and copper at 50 P.P.M. Lead has proven to be the best indicator, whereas zinc values occasionally reflect lead values but in some cases are erratic and widespread making zinc interpretations very difficult. Copper very seldom reflects vein zones but high values (anomalous) have been obtained over area of greenstone and sericite schist.

In the case of the VU group interpretation is based primarily on the lead plot although zinc weakly reflects the same anomalies. Zinc also reflects several small anomalies which do not appear on the lead plot.

Lead anomaly No. 1 is small but it lies on a vein strike direction. It is supported by zinc. Mineralization was picked up in this area assaying as high as 25 oz. Ag/ton.

Lead anomaly No. 2 is fairly large and is weakly supported by zinc.

This anomaly may be the surface expression of mineralization but only further work will determine this.

Minor zinc anomalies are evident along the creeks and may be due to downstream contamination although in only one case do they reflect lead mineralization.

Several copper anomalies are evident but they do no more than reflect the presence of greenstone and sericite schist.

CONCLUSIONS AND RECOMMENDATIONS

Prospecting located one vein zone in the claim group which was indicated by a geochemical anomaly. This could be a major discovery due to its close proximity to the T group. Mineralization has indicated silver in the order of 25 oz/ton and a silver-lead ratio of 3.3 to 1.

Hand trenching should be done on the vein found for structural information and for sampling.

Further detailed prospecting and soil sampling should be done on anomaly No. 2 to define possible vein zones and if results are favourable to further follow-up with trenching.

Stake, prospect and soil sample area immediately to the north-east of anomaly No. 2 on a fairly tight grid pattern to try and locate further vein zones.

SUMMARY OF WORK

1. Geological Mapping July 2nd - Aug. 6th

Two men prospected the 39 claim area and mapped on a scale of 1" = 400 feet for a total of 66 man days.

2. Geochemical Survey July 2nd - Aug. 6th

Five men collected 3,074 samples for a total of 73 man days. All samples were analyzed in the Geochemical Lab at Calumet.

Geological Mapping

1 Party Chief @ $450.00 per month by 30 days	$ 435.60
1 Party Chief @ $450.00 per month by 36 days	522.72
	$ 958.32

Geochemical Survey

5 Soil Samplers @ $375 per month by ;73 days	$ 883.30
3,074 soil samples @ $2.00 per sample for 3 analysis (Lead, Zinc and Copper)	6,148.00
	$ 7,031.30

Geological Mapping	$ 958.32
Geochemical Survey	7,031.30
Total	$ 7,989.62

AFFIDAVIT OF COSTS

I, ROBERT E. VAN TASSELL, of Calumet in the Yukon Territory make oath and say:

That the cost statement on page eight of the Geological and Geochemical Report on the VU claim group, to the best of my knowledge and belief, is the true amount of monies spent on the geological reconnaissance and geochemical survey of the said claims in 1965.

Sworn before me at ~~Calumet~~ MAYO in the Yukon Territory, this 7TH day of APRIL 1966.

Robert E Van Tassell

P M Cunningham
A Commissioner for Oaths
for Yukon Territory.

UNITED KENO HILL MINES LTD.

ELSA YUKON

EXPLORATION DEPARTMENT

VU CLAIM GROUP - ALLEN CREEK AREA

Latitude: 63°57' N Longitude: 135°00' W

Staking Sheet Nos. 105-M-14 and 15

4 2 0 4 8 12

Scale: 1 inch = 4 miles

628

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EXPLORATION DEPARTMENT

VU CLAIM GROUP

GENERAL GEOLOGY

Sediments

1 Limestone

2 Quartzite — 2a Quartzite with Graphite Schist — 2b Quartzite (broken or crushed)

3 Pale Siliceous Quartzite

4 Graphite Schist — 4a Graphite Schist with Quartzite

5 Sericite Schist

Intrusives

6 Greenstone — 6a Greenstone (altered or highly schistose)

7 Acid Dyke

8 Lamprophyre

Vein Material

○ Vein Material (breccia, siderite, limonite etc.)

○ Sulfides (galena, sphalerite etc.)

Geological Contact (observed) — Geological Contact (assumed)

Vein (observed) — Vein (projected or possible)

Fault (observed) — Fault (assumed)

Bedding — Lineations

Schistosity

Photo Center — Trail

Spot Height — Cut Line

Buildings — Roads

Bluff — Bulldozer Trench

Swamp — Hand Trench

Stream — Workings

Slide Rock or Frost Heave — Adit

400 200 0 400 800 1200 1600

SCALE: 1 inch = 400 feet

Drawn by T.H. and G.S. Nov 1965

Geology by M.J. Russell and J.K. Carrington August 1965

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EXPLORATION DEPARTMENT

VU CLAIM GROUP

SOIL SAMPLING
LEAD PLOT

CONTOUR INTERVALS IN PARTS PER MILLION (PPM)

	0	-	50
	50	-	100
	100	-	200
	200	-	400
	400	-	800
	800	-	1600
	1600	-	3200
	3200	-	6400
	6400	-	12,800
	over 12,800		

-3 -13 -13
-48 -7 -16 Lead plot in parts per million (ppm)

(5) Anomaly Reference Number

267	Photo Center		Trail
3770	Spot Height		Cut Line
	Buildings		Roads
	Bluff		Bulldozer Trench
	Swamp		Hand Trench
	Stream		Workings
	Slide Rock or Frost Heave		Adit

400 200 0 400 800 1200 1600

SCALE 1 inch = 400 feet

Baseline N 7° E

Baseline N 42° E

Baseline N 36° W

Baseline S 7° W

Drawn by T.H. and G.S. Dec. 1965

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EXPLORATION DEPARTMENT

VU CLAIM GROUP

SOIL SAMPLING
ZINC PLOT

CONTOUR INTERVALS IN PARTS PER MILLION (PPM)

	0	-	100
	100	-	200
	200	-	400
	400	-	800
	800	-	1600
	1600	-	3200
	3200	-	6400
	6400	-	12,800
	12,800	-	25,600
	over 25,600		

-64 -48 -81
-96 -40 -64 Zinc plot in parts per million (ppm)

+	Photo Center	- - -	Trail
	Spot Height	— —	Cut Line
□	Buildings		Roads
	Bluff		Bulldozer Trench
	Swamp	<::::>	Hand Trench
	Stream	□	Workings
	Slide Rock or Frost Heave	⊢	Adit

400 200 0 400 800 1200 1600

SCALE : 1 inch = 400 feet

Baseline N. 7° E.

Baseline N. 52° E.

Baseline N. 38° W.

Baseline S. 7° W.

Drawn by T.H. and G.S. Feb. 1966

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ELSA YUKON

EXPLORATION DEPARTMENT

VU CLAIM GROUP

SOIL SAMPLING
COPPER PLOT

CONTOUR INTERVALS IN PARTS PER MILLION (PPM)

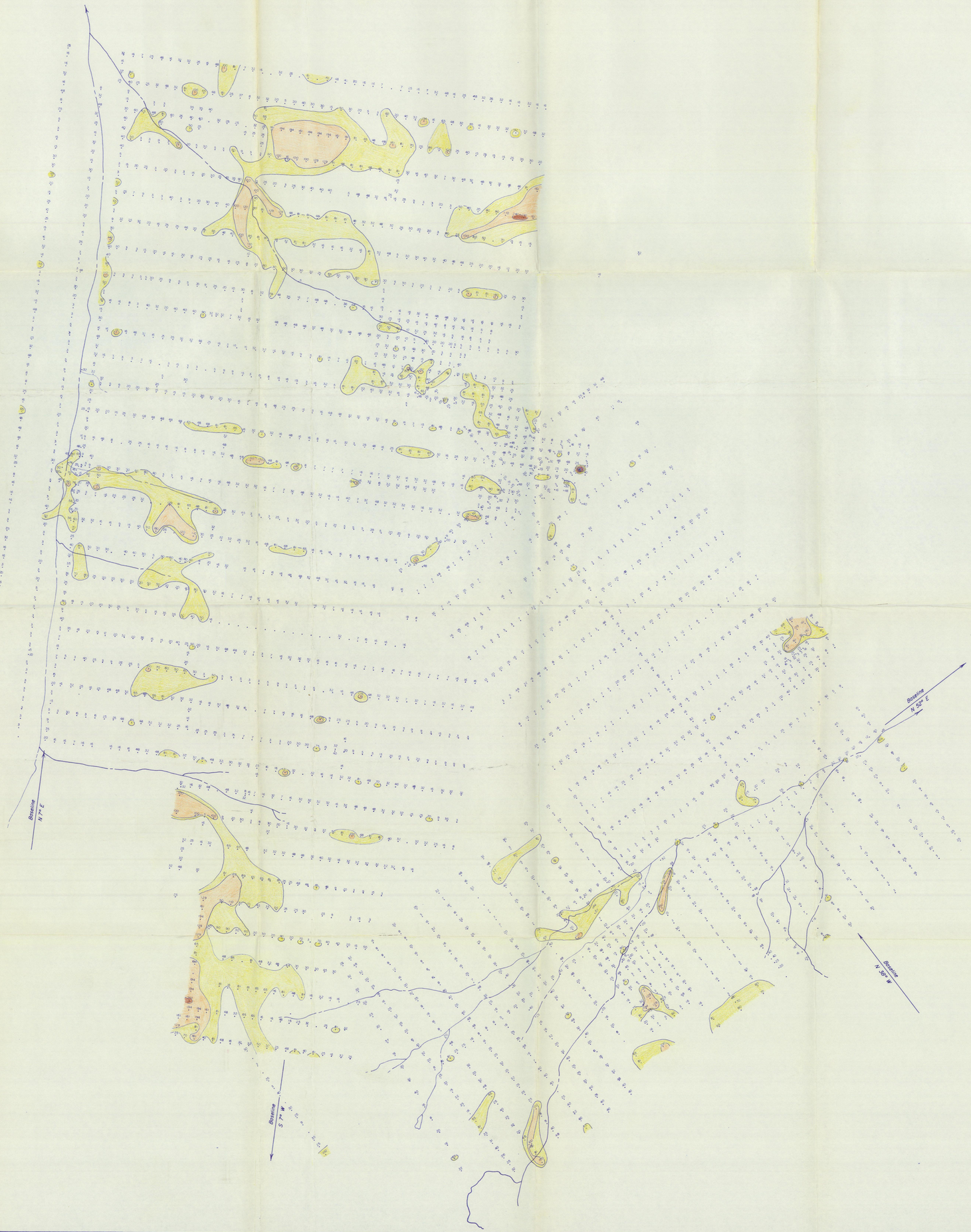
	0	-	50
	50	-	100
	100	-	200
	200	-	400
	400	-	800
	800	-	1600
	1600	-	3200
	3200	-	6400
	6400	-	12,800
	over 12,800		

16 40 32
40 16 48 Copper plot in parts per million (ppm)

+ 267	Photo Center		Trail
3770	Spot Height		Cut Line
	Buildings		Roads
	Bluff		Bulldozer Trench
	Swamp		Hand Trench
	Stream		Workings
	Slide Rock or Frost Heave		Adit

400 200 0 400 800 1200 1600

SCALE: 1 inch = 400 feet



Drawn by T.H. and G.S. Feb. 1965.