GEOLOGICAL AND GEOCHEMICAL
REPORT ON THE KUD, KUD-2, AND KUD-3

MINERAL CLAIMS

TATSHENSHINI RIVER AREA
ATLIN MINING DIVISION
BRITISH COLUMBIA

Lat. 59⁰52'

Long. 137⁰01'

N.T.S. 114 P/14, 15

OWNER/OPERATOR: NORANDA EXPLORATION COMPANY, LIMITED (NO PERSONAL LIABILITY)



M. Savell

February, 1984

12377

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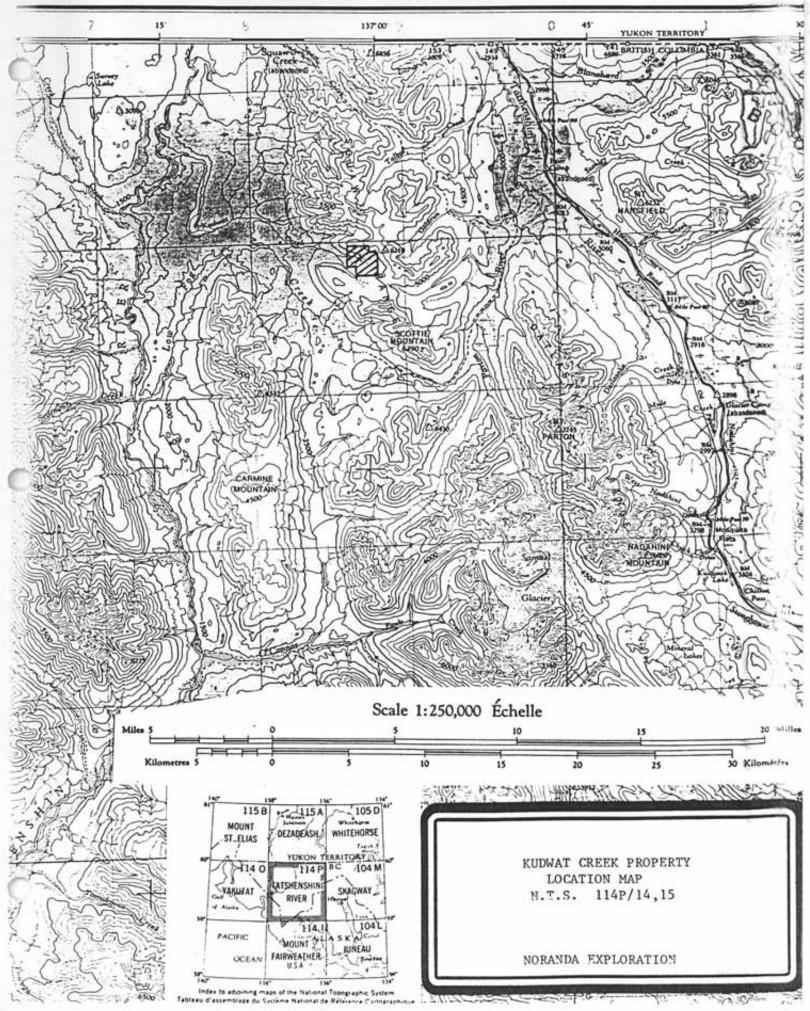
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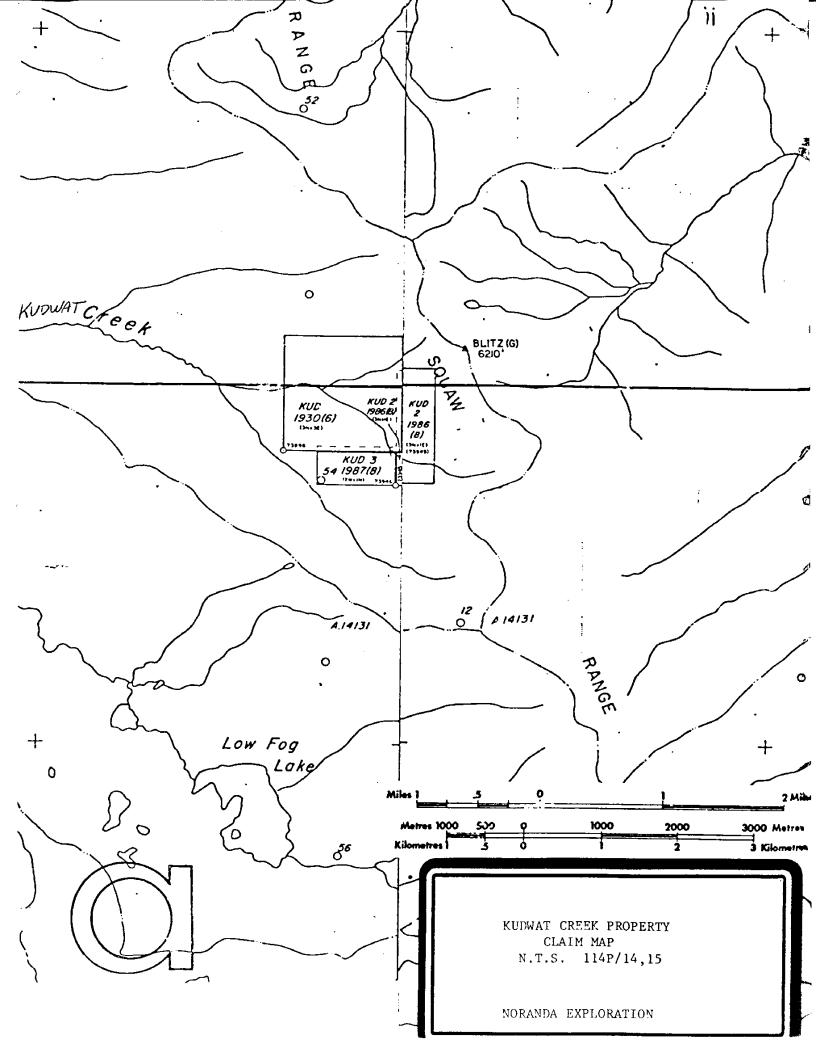
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CANADA





INTRODUCTION

This report describes the results of a geological and geochemical report carried out in June and August of 1984 on the Kud, Kud-2, and Kud-3 (Kudwat Creek Property), Atlin Mining Division, B.C.

These claims were staked to cover an occurrence of Cu-Ag-Au mineralization located during a regional exploration program in 1982.

Work completed to date includes geological mapping at a scale of 1:2,500, establishment of 9.7 km of gridlines, sampling and analyzing 388 soil samples, 25 rocks for geochemistry and 4 rocks for assay. The work was performed by employees of Noranda Exploration.

LOCATION AND ACCESS

The property is located in the Tatshenshini River map area at the headwaters of Kudwat Creek (N.T.S. 114P/14,15 Figure 1).

The "Haines cut-off Road" passes approximately 15 km to the east of the property.

Access to date has been by helicopter from Whitehorse, Atlin or the Noranda 1982 base camp at Mile 92 on the Haines Road. A rough 4-Wheel drive road and cat trail runs from the junction of the Parton and Tatshenshini Rivers to the Squaw Creek placer mining area, and passes approximately 5 km to the northeast of the property.

CLAIMS AND OWNERSHIP

The Kud claims were acquired by staking in 1983. The relevant details are listed below.

CLAIM NAME	UNITS	RECORD #	RECORD DATE	OWNER
Kud	9	1930	June 28, 1983	Noranda Exploration Compange, Limited (No personal Liability)
Kud-2	3	1986	August 11, 1983	Noranda Exploration Company, Limited (No personal Liability)
Kud-3	2	1987	August 11, 1983	Noranda Exploration Company, Limited (No personal Liability)

TOPOGRAPHY AND VEGETATION

The property lies on the eastern side of the Saint Elias Mountains just west of the Shakwak Trench. Topography in the area is rugged with ridges and peaks up to 1900 meters and glacial debris filled valleys at about 450 meters. However, on the property itself the topography is relatively subdued, with a gentle, west dipping slope that is easily walked.

The entire area of the claims is above treeline, the only vegetation being grasses, shrubs and mosses typical of an alpine tundra environment. Several kilometers to the west, the wide Tatshenshini River valley contains numerous stands of mature spruce and fir.

PREVIOUS EXPLORATION

There is no public record of any systematic exploration having been carried out on the property prior to staking by Noranda in 1983.

GRID PREPARATION

For control purposes, a grid was laid out. A compass and hip-chain controlled base line was run on a bearing of 130° for a length of 1 km and designated 100+00N. Grid lines were run at 100 meter spacings at right angles to the base lines for a total grid length of 9.7 km. One-half meter high wooden pickets on which the grid designation was marked were placed every 25 meters.

GEOLOGY

A. REGIONAL

The area was mapped by K. Dep Watson in 1943 on a scale of 1 inch to 2 miles, whose work was published as the B.C. Dept. of Mines Bulletin No. 25. More recent work has been done by the Geological Survey of Canada and has been released as open file map No. 926.

The area lies within the Alexander terrane in the Insular Belt of the Canadian Cordillera. In general these rocks consist of an upper Paleozoic sequence of complexly deformed, low grade metamorphosed sequence of basic volcanics, volcaniclastics, greywackes, shales and carbonates trending NW-SE. They are intruded by a number of granitic to basic stocks and sills.

B. PROPERTY

- 1) Lithology Rocks on the property are assumed to be Upper Paleozoic. Indications of younging directions, were absent and relative ages were determined by structural relations. From youngest to oldest the lithologies are:
- Unit 1: Massive to schistose greenstone sills, predominantly chlorite.

 May be metamorphosed equivalent of gabbroic or diabase sills,

 also basic flows. Consists of discontinuous lenses or boudins
 in unit 3. In the order of tens of meters thick.
- Unit 2: Very fine grained, grey, laminated, algal limestone. Shows a contorted, coarse, marbly texture at contacts with above unit.

 Approximately 30-49 meters thick.
- Unit 3: Schistose, calcareous greenstone to phyllite, consisting of chlorite-magnetite and chlorite-calcite-sericite-magnetite schists.

 Probably metamorphosed calcareous tuff or volcaniclastic. A few magnetic rich (up to ~70%) lenses possibly represent local

development iron formation. A few areas show extensive rusty weathering and bleaching. Narrow, discontinuous, pinching and swelling wisps or segregations of quartz and calcite are abundant. Irregular, narrow, quartz-carbonate veins occur throughout this unit, with dip and strikes similar to the local schistosity. In the order of 350-400 meters thick.

- Unit 4: Massive, cream coloured, sugary textured limestone. Approximately 35-45 meters thick.
- Unit 5: Black, fissile, faintly laminated, carbonaceous black shale and argillite. Approximately 35-45 meters thick. Possibly thin thrust slice derived from thicker unit to east.
- Unit 6: Massive, fine grey limestone. Extensive thicknesses.
- 2) Structure In general the rocks on the property strike from about 120° to 140° and dip 30° to 50° to the southwest. In the few places where bedding was discernable it was observed to parallel the schistosity.

The rocks are cut by a number of transverse faults of small displacement striking approximately northeast-southwest.

3) Mineralization - The occurrence consists of medium-grained tetrahedrite and associated malachite filling small, narrow, irregular clots and fissures in milky white, contorted, discontinuous quartz veins or lenses. They are believed to be of metamorphic origin rather than epithermal. The vein material makes up approximately 30% of the 1 meter thick mineralized area, and are exposed over a strike length of about 2 meters. The veins strike and dip essentially the same as the host rock, which is a chlorite-calcite-sericite phyllite of unit 3. The following table gives the results and descriptions for four channel samples collected across a true thickness of 3 meters at the showing.

TABLE 1: ASSAY DATA

Sample #	Description	Width	oz/t Au	oz/t Ag	8 Cta
03529	Footwall - chlorite-sericite-calcite phyllitic schist, with minor thin, qtz-carb wisps, very minor Cu stain (unit 3).	lm	0.001	0.08	0.02
03530	Schist as above but bleached, talcose with about 30% quartz vein material containing up to about 5% tetrahedrite Heavy Cu stain.	lm ∍.	0.016	4.90	3.80
03531	Similar to above, but with slightly less vein material. Taken approximately 2 meters along strike on same series of veins.	1m	0.022	2.62	3.55
03522	Hanging wall - similar to 03529, but more massive and chloritic (unit 1).	lm	0.002	0.06	0.02

GEOCHEMISTRY

A. SOILS

1) Sampling Method - A total fo 388 soil samples were collected on the grid previously described. The "B" soil horizon was sampled by digging a small hole with a grub hoe. Samples were placed in "Hi West Strength Kraft $3\frac{1}{2}$ " X 6 1/8" Open End" paper envelopes on which the grid designation was marked.

The samples were later analyzed for Cu, Zn, Pb, Mo, As, Ag and Au in the geochem lab of Noranda Exploration, Co, Ltd. at 1050 Davie St., Vancouver, B.C.

2) Analytical Method - The samples are first dried in a drying cabinet for a period of 24-48 hours. They are then screened and sifted to obtain a -80 mesh fraction.

To determine the amount of total extractable As, Ag, Cu, Zn, Pb, and Mo in each sample, the following procedure is employed:

A small amount of the -80 mesh material, 0.200 grams, is digested in 2ml of $HClO_5$ and 0.5ml HNO_3 for approximately four hours. Following digestion, each sample is diluted to 5ml with demineralized H_2O . A Varian Techtron Model AA-5 atomic absorption spectrophotometer is used to ascertain the content, in parts per million, of each element.

To determine the amount of total extractable Au in each sample, the following procedure is employed:

Ten grams of the -80 mesh material (or less if 10 grams not available) is roasted at 580° C for 1.5 hours and then digested with aqua regia. Au is ascertained by diluting this solution to 200 ml with demineralized $\rm H_2O$ and extracting the Au with 10 ml of MIBK. An aliquot of this solution is then read on a Varian Techtron Model AA-5 atomic absorption spectrophotometer and a value in ppb is obtained.

3) Results and Discussion - The results of the above analyses are shown on figures 4 to 7 (in pocket). The table below is a summary of the statistical parameters.

TABLE 2: Geochem Data - Summary Statistics

	Cu	Zn	Pb	Мо	As	Ag	Au
# of analyses	388	388	388	388	388	388	388
Lowest value	12	52	2	1	1	.2	10
Highest value	270	650	14	26	38	4.0	140
Mean (log)	52.0	143.9	2.3	2.2	1.4	.22	10.1
Stand. dev.(log)	.199	.140	.140	.346	.321	.136	.064
Mean (arith)	58.5	151.8	2.5	. 24	2.2	.24	10.4
Stand. dev.(arith)	34.08	53.95	1.26	.215	3.45	.215	6.67

(all values in ppm, except Au in ppb)

In general, results were somewhat dissappointing, as a strong, well defined amonalous target was not located. Samples taken in the immediate vicinity of the showing did not respond geochemically. It is possible that soil creep or slumping and mass movements may have displaced and homogenized soil horizons from areas upslope thus masking a geochemical response from underlying mineralized bedrock. Evidence for slumping was noted immediately to the north of the grid.

General observations made on the data were:

- Cu Four separate, moderately anomalous zones were located.
 - 1. 103+00 E, 99+25N to 104+00 E, 99+75 N; values from 130-260 ppm
 - 2. 105+75 E, 99+25 N to 105+75E, 100+25 N; values from 110-190 ppm
 - 3. 109+00 E, 99+50N to 112+00E, 99+00N; values from 100-270 ppm
 - 4. 107+00E, 96+00N to 112+00E, 96+00N; values from 96-230 ppm

The first three areas were found to have a thin, rocky soil ("C" horizon) and be close to outcrops of chloritic greenstones (units 1 and 3). Thus it is assumed that the greater portion of fine rock fragments in these samples and the higher Cu background in the greenstones resulted in a higher Cu response. The fourth area, although mapped as limestone, is covered by a talus apron of greenstone derived from outcrops upslope, and the soil samples collected were actually made up predominantly of talus fines of the greenstones.

Zn Generally insignificant results. The higher values (200-350 ppm) tend to be on the north half of the grid, and probably are derived from higher background values in the shales and limestones of units 4, 5, and 6. The erratic distribution may be the result of soil movements.

Pb Results insignificant.

Mo Results insignificant.

Ag Results insignificant, except for erratic result of 4.0 ppm at 103+ooE, 101+75N, source unknown.

As Results insignificant.

Au Only two responses.

- 1. 110+00E, 100+00N 30 ppb Au, questionable
- 2. 105+00E, 99+75 140 ppb Au, may reflect some ineralization. follow-up is low priority.

B. ROCKS

A total of 25 rock chip samples were collected and analyzed, primarily as a check for precious metal values. They were generally samples of "suspicious" rocks and usually totalled about ½ kg. Analytical treatment is the same as for soils, except that the rocks are initially crushed and pulverized to at least -150 mesh. Locations are shown on figure 3 (in pocket), and analytical results and descriptions are listed in the following table.

TABLE 3: Rock sample descriptions and results (in ppm except Au in ppb)

Sample #	Description	Width	Cu	Zn	Pb	Мо	As	Ag	Au
20551	barren white quartz lensor "sweat" in chl-qtz-car		52	18	2	۷ 2	< 2	0.4	10
20552	as above, with minor Cu- staining	10cm	1600	180	2	< 2	< 2	14	10
20553	dark grey sugary quartz vein with minor Cu- staining	15cm	800	24	2	< 2	< 2	0.8	10
20554	as for 20551, with minor Cu-staining in surround- ing schist	15cm	180	56	4	0.4	< 2	< 2	10
20555	as for 20554, with abundant calcite	15 cm	n 380	70	6	10	< 2	1.4	10
20556	chl-qtz-calc schist with minor disseminated pyrite	grab	1200	90	4	< 2	< 2	8.4	10
20557	as for 20555	15cm	1800	180	6	2	< 2	9.2	10
20558	qtz-carb lense or "sweat"	40cm	30	50	2	< 2	< 2	0.2	10
20559	chl-qtz phyllitic schist with thin wisps of qtz-carb	grab	120	120	2	< 2	< 2	0.4	10
20560	as for 20559	grab	36	76	2	< 2	< 2	0.4	10
20561	irregular, branching qtz vein	lm	22	70	2	< 2	∢ 2	0.2	10
20562	irregular, branching qtz-carb veins, lenses	50cm	260	56	4	∢ 2	< 2	1.2	10
20563	as in 20562	2.5m	20	58	2	« 2	< 2	0.2	10
20564	chl-sericite schist with abundant thin qtz-carb wisps	grab	18	46	2	< 2	< 2	0.2	10
20565	Cu-stained, talcy, phy- llitic greenschist	grab	5200	220	2	< 2	< 2	10	10

20566	qtz-carb boulder with minor tetrahedrite and Cu-staining	float4	1000	32	2	< 2	< 2	24	10
24451	rusty quartz veins or sweats with minor pyrite, in bleached greenstone	50cm	24	52	2	< 2	< 2	0.2	10
24452	bleached sericite-talc schist(hanginig wall to above)	lm	6	8	2	< 2	< 2	0.2	10
24453	as for 24451	3m	16	110	2	< 2	< 2	0.2	10
24454	as for 24451	2m	6	14	2	< 2	< 2	0.2	10
24455	mag-chl-ser schist, up to ∽70% magnetite	2m	14	40	2	5	< 2	0.4	10
24456	as for 24452	1m	8	28	2	2	< 2	0.2	10
24457	rusty mag-pyr rich quartz vein	float	6	24	2	2	< 2	0.2	10
24458	rusty, bleached zone with ~20% quartz vein material	3m	28	62	2	4	< 2	0.4	10
27183	as for 24451	1m	32	72	2	2	< 2	0.2	10

None of the rocks contained important base or precious metal values. Above average Ag values (up to 24 ppm or 0.85 oz/t) are associated with above average Cu values (up to 5200 ppm or 0.52%).

CONCLUSIONS AND RECOMMENDATIONS

The Kud Cu-Ag-Au showing has been found to be too narrow and to have too low precious metal values to warrant further testing. Geochemistry has failed to trace the mineralization along strike. The nature of the mineralization suggests geophysical methods may not be suitable. Trenching is probably the best method of testing for mineralization along strike at surface, however, the nature of the showing rates this as low priority.

Appendix A Statement of Qualifications

Statement of Qualifications

- I, Michael Savell, of the City of Vancouver, in the Province of British Columbia, do certify that:
- 1. I have been an employee of Noranda Exploration Company, Limited since May, 1980.
- I am a graduate of Dalhousie University with a Bachelor of Science (honours) degree in geology.
- 3. I am a member in good standing of the Canadian Institute of Mining and Metallurgy, the Prospectors and Developers Association, and the Geological Association of Canada.

Michael Savell Project Geologist

Noranda Exploration Co., Ltd.

APPENDIX B

Statement of Costs

NORANDA EXPLORATION COMPANY, LIMITED

STATEMENT OF COST

DATE	FEBRUARY	1984
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\$1,308.64

PROJECT - KUDWAT CREEK TYPE OF REPORT Geology and Geochem

•	1	Ungoe	٠
а	,	Wages	•

No. of Days - 16 mandays

Rate per Day - \$81.79

Dates From - June 1, 1983 - July 31, 1983

Total Wages 16 X \$81.79

b) Food and Accommodation:

No. of Days - 16

Rate per Day - \$25.00

Dates From - June 1, 1983 - July 31, 1983

Total Cost - 16 X \$25.00 \$ 400.00

c) Transportation:

No. of Days - 16

Rate per Day - \$195.78

Dates From - June 1, 1983 - July 31, 1983

Total cost 16 X \$195.78 \$3,132.50

d) Analysis \$4,154.80

e) Cost of Preparation of Report

Author	\$ 163.58
Drafting	\$ 163.58
Typing	\$ 81.79

f) Other:

Total Cost \$9,404.89

UNIT COSTS

Unit Costs for Geology

No. of Days - 5 No. of Units - 5

Unit Costs - 160.82 / Day Total cost 5 X 160.82

\$ 804.12

Unit Costs for Geochem

No. of Days - 11

No. of Units - 413 Samples Unit Costs - 20.82 / Sample Total Cost - 413 X 20.82

\$8,600.77

Total Cost

\$9,404.89

NORANDA EXPLORATION COMPANY, LIMITED

DETAILS OF ANALYSES COSTS

Project: Kudwat Creek

Element	No. of Determinations	Cost per Determination	<u>Total</u>
Cu	413	1.60	660.80
Zn	413	.60	247.80
Рb	413	.60	247.80
Мо	413	.60	247.80
Ag	413	.60	247.80
Au	413	4.00	1,652.00
As	413	2.00	826.00
Cu	4	1.60	6.40
Au	4	4.00	16.00
Ag	4	.60	2.40

Total \$4,154.80

APPENDIX C

Certificate of Analysis

Rossbacher Laboratory Ltd.

GEOCHEMICAL ANALYSTS & ASSAYERS

2225 S. SPRINGER AVE., BURNABY, B. C.

TELEPHONE: 299-6910

AREA CODE: 604

CERTIFICATE OF ANALYSIS

CERTIFICATE NO. 83360

TO: NORANDA EXPLORATION CO LTD.

INVOICE NO.

1050 Davie St Vancouver, B.C.

DATE RECEIVED

DATE ANALYSED Sept 1,1983

ATTN: 1012	# 8-33	KUD CL	April 5	DATE ANALYSE	_D Sept	1,1983
SAMPLE NO.:	oz/T Au	oz/T Ag	Ç Cu			
3929	0.001	0.08	0.02			
3930	0.016	4.90	3.80			
3931	0.022	2.62	3.55			
3932	0.002	0.06	0.02			
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