

R E P O R T

ON THE

G E O P H Y S I C A L S U R V E Y

W H I T E Y A N D H G R O U P M I N E R A L C L A I M S

K E E N C R E E K A R E A , B . C .

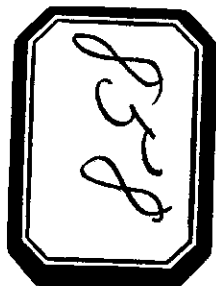
49° 117° N.E

S L O C A N M I N I N G D I V I S I O N

82F/14E

Author: Harvey H. Cohen

A N D E X M I N E S L T D .
V A N C O U V E R , B . C .



858

Andex Mines Ltd.,
315 - 543 Granville Street,
Vancouver, B.C.

RE: Geophysical Survey
H 1-23 and Whitey 1-5 & 7 M.C.'s
Keen Creek Area, B.C.
Slocan Mining Division

DETAILS OF EXPENDITURES:

Surveying of base line
Surveying of claim boundaries
Surveying of grid lines
Setting stations and flagging
400' x 100' grid

T. Rolston	\$50/ day	16	June 3-21, 1966	
A. Rolston	30	15		
K. Doduk	30	15		
H. Cohen	100	3		\$2000.00

Geophysical Survey
Instrumentation & recording
Plotting of Results
Mapping of worksheets

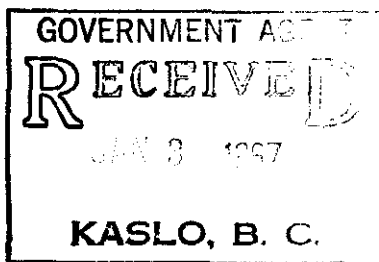
T. Rolston	\$50/ day	16	June 22-July 5, 1966	
A. Rolston	30	15		
K. Doduk	30	15		
H. Cohen	100	8		\$2500.00

Analysis of Results
Preparation of maps
Reports

H. Cohen	100	8		
S. Holder	30	10		
S. Houghton	30	10		\$1400.00

Inst rentals				900.00
Truck rental				200.00

Total cost of survey \$7000.00



[Handwritten signature]

HARVEY H. COHEN ENGINEERING LTD.
CONSULTING ENGINEERS

TELEPHONE: BUS. 684-6711
RES. 266-8169

1264 WEST PENDER STREET
VANCOUVER 1, B. C.

July 8th, 1966

Andex Mines Ltd.,
314 - 543 Granville Street,
Vancouver 2, B.C.

Subject:
Geophysical Survey
Whitey and H Group Mineral Claims
Keen Creek Area, B.C.
File: 66-144

Dear Sirs;

Pursuant to your instructions, the writer has conducted a geophysical survey on the above mentioned 29 claim group in the Slocan Mining Division, B.C. during the period June 3 to present, The following report is based on the results of that survey.

Respectfully submitted,



Harvey H. Cohen, P.Eng.

HHC/sh



R E P O R T
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G E O P H Y S I C A L S U R V E Y
W H I T E Y A N D H G R O U P M I N E R A L C L A I M S
K E E N C R E E K A R E A , B . C .
S L O C A N M I N I N G D I V I S I O N

A N D E X M I N E S L T D .
V A N C O U V E R , B . C .

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MAP : Geophysical Survey Whitey and H Group
Mineral Claims, Keen Creek Area, B.C.

2

GEOPHYSICAL SURVEY

WHITEY 1, 2, 3, 4, 5, 7 and H 1 - 23 M.C.'s

KEEN CREEK AREA, B.C.

SLOCAN MINING DIVISION

INTRODUCTION

The Whitey and H Group mineral claims, 29 in number, are owned by Andex Mines Ltd. (NPL) of Vancouver, B.C.

The property is situated along Keen Creek in the Kaslo area of the Selkirk Mountains and lies in close proximity to the former silver-lead producers such as the Cork Province, Gibson, Silver Bear, Silver Bell, Bismark. The property is connected to Kaslo by good road $14\frac{1}{2}$ miles in length, and Kaslo is situated on the Nelson-Beaton highway, approximately 22 miles north of Nelson, and an additional 40 miles from the Consolidated Mining & Smelting Co. smelter at Trail, B.C.

The geographical location may best be described as:

Longitude: $117^{\circ} 10' W$ Latitude : $49^{\circ} 50' N$

CERTIFICATE

I, Harvey H. Cohen, of 8438 Wiltshire Street, Vancouver 14, B.C. hereby certify that;

1. I am a graduate of the University of British Columbia B Ap Sc in Mining Engineering.
2. I am a registered Professional Engineer in the Province of British Columbia since 1954 and have been practising my profession for 17 years.
3. I have no direct or indirect interest in the Whitey or H Group of Mineral Claims nor in any securities of Andex Mines Ltd. NPL the company actively engaged in exploring this property in the Keen Creek Area, B.C.
4. I have no expectation of receiving or obtaining any interest in securities of Andex Mines Ltd. NPL
5. Information contained in the accompanying report is based on the results obtained during the recent geophysical survey conducted on the property under the writer's direction.

Harvey H. Cohen

Harvey H. Cohen, P.ENG.

To accompany Report on the Geophysical Survey, Whitey and H Group Mineral Claims, Keen Creek Area, B.C., Slocan Mining Division dated July 8th, 1966 for Andex Mines Ltd.

PHYSIOGRAPHY

Drainage of the property by Keen Creek (South Fork) is northerly and easterly into Kootenay Lake. The slopes are wooded and cut by creeks entering Keen Creek from the east and west. The main flow is fed from the Kokanee glacier (elev. 9400'). Generally, the area shows moderate relief to the north of the property, and steep slopes and talus at the south extremities. The main timber growth consists of fir, balsam, hemlock, cedar, alder.

RESULTS OF GEOPHYSICAL INVESTIGATIONS

The purpose of the geophysical survey was to measure the total magnetic field to an accuracy of better than one part in 100,000 to detect and measure any magnetic or non-magnetic anomalies on the property, their size, intensity, and possible cause. An anomaly would result from the presence or absence of magnetic minerals in rocks being investigated. Locally the main rock mass in the area is a granitic carrying the accessory mineral magnetite as a constituent. A band of sedimentary rocks cuts through the Andex property in a southwesterly direction, and the resulting contact area provides a favorable geologic environment for mineral deposition.

Silver-lead-zinc mineralization, closely associated with the magnetic mineral pyrrhotite does exist on adjoining known deposits, and this is subject to detection and measurement.

Other factors which produce variations in the magnetic field are:

1. A concentration of magnetic minerals (possibly associated with valuable minerals).
2. A variation in amount of accessory magnetite in granite or sedimentary bedrock.
3. A variation in amount of magnetite distributed through or connected with the overburden.
4. A variation in depth of non-magnetic overburden on caprock over bedrock having a constant vertical magnetic intensity.
5. Variations in amount of magnetic minerals in adjacent bands of volcanic and/or sedimentary rocks. These variations are not expected to be great, and produce elongated highs and lows parallel to the formation strike.

6. Any combination between variations in magnetic minerals in the rock and variations in the thickness of the overlying magnetic or non-magnetic overburden or caprock.

INSTRUMENTATION

The geophysical survey employed an "ELSEC" Proton magnetometer type 592/3, designed to measure the total magnetic field to a tolerance of 1 part in 100,000 over the range of field strengths normally found on the earth's surface. The measurement recorded is the total magnetic vector - in gamma. The instrument is powered by an accumulator pack or external batteries, and is fully transistorized.

OPERATION

The purpose of the magnetometer is to measure "magnetic intensity" - which may best be described as the force (torque) which tends to turn a magnetized needle at that point into line with the magnetic direction. A conventional magnetometer consists of just such a needle and with a delicately constructed instrument the accuracy can be achieved.

The Proton magnetometer employed during this survey is designed to function as follows:

The Proton is an elementary particle with the nucleus of the hydrogen atom. The behaviour in the proton magnetometer can be understood by regarding it as a tiny bar magnet spinning rapidly about its longitudinal axis; it therefore has the properties of both a magnetised needle and a gyroscope. Because of the former it tries to point along the lines of force, but its gyroscopic property prevents this temporarily and it performs gyrations while in the gradual process of achieving this direction. These gyrations are similar to those of a spinning top under the influence of gravity. The important thing is that the speed of gyration (or frequency of precession) is exactly proportional to the magnetic intensity. This frequency is about 2000 gyrations per second for an intensity of 48,000 gamma.

Since hydrogen is a constituent part of water and organic liquids a large number of protons (about 10^{25}) are conveniently obtained in a quarter-pint bottle and this forms the detecting element. The gyrating protons induce

an electro-motive-force of about a microvolt in a coil wound around the bottle and this e.m.f. is passed to the instrument for amplification and frequency measurement. The gyrating protons will only induce an e.m.f. if there is a preferred phase and this is obtained by preceding each measurement by a polarizing period (automatically sequenced after pressing a start button). During this period a current of an amp is passed through the measuring coil thereby creating a magnetic field of several hundred gauss along its axis, and this produces a net proton magnetic moment in that direction; when the polarizing current is cut off the gyration of these protons en masse induce the detectable e.m.f. already mentioned. The axis of the coil is roughly East-West.

The proton magnetic moment builds up to saturation in five seconds of polarisation. During the subsequent gyrations the protons gradually get out of phase and the induced e.m.f. decays away in about five seconds.

Strong magnetic gradients (100 gamma per foot and upwards) cut down this decay time seriously, thus the frequency measurement is made within the first second of gyration.

After selective amplification, the signal is squared and then frequency divided by 1024 (10 binary stages). The resultant square wave is used to open and close a gate, which once closed remains locked until the "start" button is pressed. When the gate is open the output of a 100 KC/S crystal-controlled oscillator is allowed through the decade chain and the final states of the five decade units, shown on the respective meters, indicate the number of oscillator cycles occurring during the 1024 gyrations.

In operation, the polarizing period is automatically sequenced and after about five seconds the meters indicate a five figure number which is a measure of the magnetic intensity wherever the water-bottle is placed. The magnetic intensity equals $\frac{24051.1}{\text{meter count}}$ oersted.

PROCEDURE

The Whitey 1 - 5 and 7, and the H 1 - 23 mineral claims are contiguous in a general north-south direction along Keen Creek. The following procedure was used to conduct the geophysical survey:

1. A baseline was surveyed by compass and chain following the location line. Markers were flagged at 400 foot intervals for the grid. The survey provided data for plotting the claim boundaries.
2. Cross lines were run east-west on compass headings at right angles to the base line and stations chained and marked at 100 foot intervals.
3. The grid lines were marked east or west of the base line in 'hundreds'. The base line zero was established at the north extremity of the Whitey claims and the south extremity of the H claims. From this point the grid lines are numbered south to line 56S (5600 feet south of point zero) and north to line 212N (21200 feet north of point zero).
4. Readings were taken at 100 foot intervals at each station, the stations were marked and flagged with tape.
5. The readings were converted to gamma value from the calibration charts for this instrument.
6. The data was plotted on a map prepared from the survey, contoured at 100 gamma intervals.

7. A total of 39 miles of line were completed on this survey.

ANALYSIS OF RESULTS

The resulting geophysical map yielded five separate zones of significance as follows: From north to south -

1. 208N 12W:

This anomaly measures 400 feet east-west by 200 feet north-south. The peak records a high of over 500 gamma above background with the greater part in the 300-400 gamma range. It is located on the sedimentary-intrusive contact and cuts the contact zone east-west indicative of a possible vein system conforming to a fracture pattern. The zone is within 1500 feet of the Cork-Province Mine, and could be a mineralized section genetically related to the Cork-Province deposit. The overburden and/or transported material with magnetite content as a possible cause of this anomaly could not be considered. The cause is definitely due to a condition in the rock itself - the sediments of the Slocan series - limestone carrying other minerals. The anomaly is in line with the Black Fox workings to the east.

2. 188N 14W
176N 11W
163N 14W
156N 14W
148N 14W

This anomalous zone consisting of a series of anomalies measures 4800 feet in length and over 800 feet in width. They follow the limestone-granite contact zone for this distance. Normally, this would result in elongated almost parallel lines of low magnetic intensity, and just east of the anomalies, this condition is evident. The five highlights noted above are due to abnormal conditions, in particular the anomaly at line 168N which takes on an east-west structural trend. The intensity recorded above background was over 600 gamma as was the 176N and 148N anomalies. All are worthy of further investigation in the search of mineralized bodies. The 168N anomaly appears to be due to pyrrhotite content possibly carrying valuable minerals, the shape is indicative of a vein system striking east-west and dipping to the north. The "high" is concealed by overburden to shallow depths on the west slope of Keen Creek.

This anomalous series is definitely related to the contact zone but the intensity recorded, and the shape of the zone derived from the readings indicates better than average possibilities of a series of cross fractures containing mineralization.

3. 140N 10W

A magnetic high of 400 gamma is shown over an area of 400 x 200 feet. It is of significance due to its trend across the contact or a change in strike of the contact. Either condition is interesting from a geologic viewpoint. If it crosses the contact, it could represent a vein system - if it follows a change in contact, there could be openings created in the intrusive "bend" which, in close proximity to the limestone, would provide favorable conditions for mineralization. The magnetic intensity of 400 gamma above background could be due in part to heavier overburden concealing the bedrock. In any event it is worthy of further investigation. It lies west of the old Daybreak mine.

4. 68N 13W

A small anomaly of 400 gamma intensity is recorded on H9 M.C. directly south of the old Silver Bell workings.

The anomaly is narrow (less than 100 feet) and shows a length of 200 feet. It could extend easterly below the creek to relate to the Silver Bell, but this is a speculation. It was selected due to its location and shape as well as intensity.

5. 40N 2E

This anomaly of a magnetic intensity of over 400 gamma measures 800' x 400' and is situated on H5 M.C., to the west of the BNA workings. It is due to mineralization at depth or to material in the overburden transported from mineralized bodies above. It lies on the east side of Keen Creek, and both possibilities must be considered. It is listed for completion.

Other anomalous conditions on the map were interpreted as structural features and/or caused by variation in depth of overburden over bedrock of constant magnetic intensity.

CONCLUSIONS

The five anomalous zones selected in the area surveyed were of greater significance; the first three are directly related to the intrusive-sedimentary contact zone while they are not caused by the contact itself. The magnitude of the magnetic intensity presents the possibility of mineralization, the shape of the anomalies are indicative of vein deposits - common to the known former producers. The last two anomalies described are in an intrusive area and are caused possibly by mineralization - similar to the known zones observed at the old Index Mine - vein system in an intrusive mass. The most interesting zone is described as No.2, a system of five zones related to form a large anomaly 4800 feet in length. The zones are worthy of further investigation to determine the cause of the condition measured.

RECOMMENDATIONS

The program recommended at this time consists of stripping and trenching of the anomalous zones employing a bulldozer (D7 or equivalent). A gas operated rock drill may be used to drill and blast cuts in bedrock to assist in geological mapping. Reconnaissance prospecting should be

carried out to the west of Keen Creek and geological mapping using air photos as a guide and the existing stations as tie-in points may be carried out and mapped on 200 scale with detail mapping on 40 scale.

A camp suitable for five men may be established on the property.

A second phase of exploratory work should include a diamond drilling program to test the five anomalous zones at depth. At least ten holes to depths of 200 - 250 feet would be required at locations selected as a result of the bulldozer work and geological mapping.

ESTIMATESPhase 1

Bulldozer stripping, trenching and road construction	\$ 10,000.00
Drilling and blasting (equipment and labor)	3,000.00
Prospecting, sampling, assays	1,500.00
Geological mapping and reconnaissance	2,000.00
Camp and supplies	2,500.00
Transportation	1,000.00
Supervision, engineering and reports	2,000.00
Miscellaneous and contingencies	3,000.00
	<hr/>
TOTAL PHASE 1	\$ 25,000.00

Phase 2

Diamond drilling 2500' AX	25,000.00
Sampling, core logging, engineering	6,000.00
Transportation	2,000.00
Camp and supplies	5,000.00
Miscellaneous and contingencies	5,000.00
	<hr/>
TOTAL PHASE 2	\$ 43,000.00

The time required to complete Phase 1 is estimated to be six to eight weeks, and Phase 2, ten to twelve weeks. The fieldwork should be conducted under direction of an engineer or geologist at the site.

x CORE PROVINCE

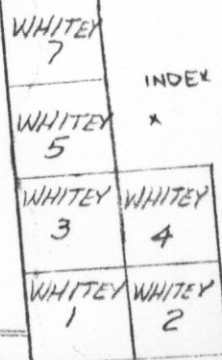
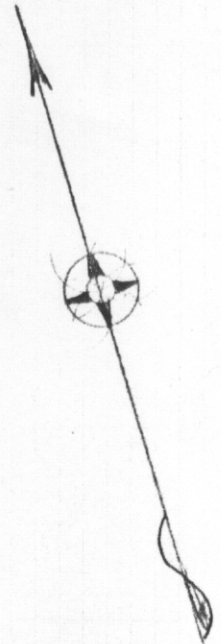
x BLACK FOX

x DAYBREAK

x SILVER BELL

x BNA

x SILVER BEAR



ANDEX MINES LTD.

VANCOUVER, B. C.

H1-23 & WHITEY 1-5 & 7 MC's

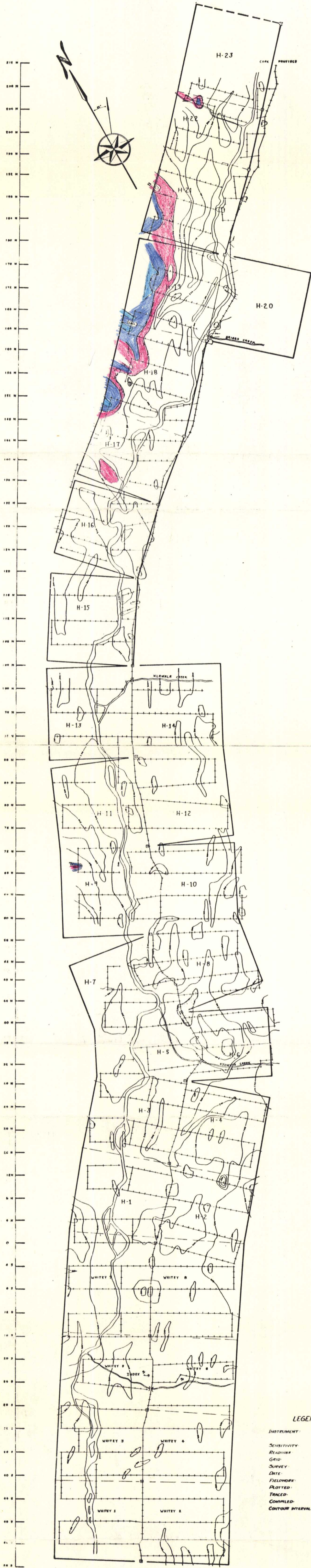
KEEN CREEK AREA

SLOCAN MINING DIVISION

SCALE: 1" = 1/2 MI

APR 1966

66-144



LEGEND

INSTRUMENT: PROTON MAGNETOMETER
 TYPE 592 J ELSEC
 SENSITIVITY: ± 0.5 GAMMA
 READINGS: TOTAL MAGNETIC FIELD
 GRID: 400 x 100'
 SURVEY: COMPASS & CHAIN
 DATE: JUNE 1966
 FIELDWORK: TR ED WR HC
 PLOTTED: TR ED
 TRACED: ED
 COMPILED: HC
 CONTOUR INTERVAL: 100 F

Department of
 Mines and Petroleum Resources
 ASSESSMENT REPORT
 NO. 858 MAP #2

858

ANDEX MINES LTD. NPL
 VANCOUVER, B.C.
 GEOPHYSICAL SURVEY
 WHITEY & H GROUP M.C.S.
 KEEN CREEK AREA, B.C.
 S.L. & M. MINING DIVISION B.C.
 SCALE: 1" = 400 FEET JULY 1966
 144-3