31M05NE0092 63.162 BUCKE

MAGNETOMETER SURVEY

63.162

COLEBUCKE MINES LIMITED

Magnetometer Survey of Claims, T. 28427-30; and Claim No. T.28757
Bucke Township, Ontario

Location and Accessibility:

Claim T.28757 is located at Watson Falls on the South Wabi Creek about 4½ miles west of the Town of Haileybury. Claims T.28427-30 are located about a mile further west. The claims lie along the second-class gravel road running west from Haileybury to the Montreal River, and may be reached directly by car.

Topography:

The area of the map sheet attached to this report is one of low topographic relief, elevations ranging from about 290 feet to 340 feet above the low water elevation of Lake Temiskaming. The elevation of the west bank-seat of the bridge over the South Wabi Creek is 871 feet above sea-level. Elevations increase gradually to the west, through a fairly abrupt climb of about 40 feet at the hair-pin bend on the road, to 918 feet at the north-west corner of the sheet. South of the bridge, about 100 acres along the creek valley have been cleared for farming. The few small clearings along the road mark the only other sizeable areas that do not consist of rock outcrop or tag-alder swamp. Forest cover is scanty and poor. Small jack pines, none over 6 inches in diameter, are scattered over the outcrop areas. Second-growth white birches and poplar, the latter sometimes reaching a foot in diameter, grow fairly thickly between outcrop and swamp.

Geology: (Referring to the key map inset on the attached map sheet.)

Diabase outcrops to the North, East, and South of the area. West of the fault marked *a-a* the diabase sill dips to the south-east; and dips to the north-west, east of the same fault. The diabase underlies the sediments, and a metamorphosed band of sediments, indicated by the development of desmosite and spilosite, occurs along the contact of the sediments with the diabase sill. South of the South Wabi Creek the diabase meets the sediments along a fault contact, striking a few degrees north of east.

The sediments lying within this amphitheatre of diabase occur in the following succession:

- Impure pink quartzite,
- Pink slatey greywacke & quartzitic greywacke interbedded with bands of pink quartzite.
- Pink slatey greywacke.
- Green slatey greywacke.

These rocks, lying above the Cobalt series in the lower Huronian, have been called the Firstbrook Group by W. C. Martin. The Group, in general, dips gently to the south-west, becoming progressively thicker in that direction. Temiskaming sediments (coloured green on the map) have been found along the contact of the north diabase limb, outcropping through surrounding rocks of the Cobalt Series and Firstbrook Group.

A diorite-diabase dike, swelling in places to 150 feet in width, traverses the area with a strike of from N 14 degrees W to N 17 degrees W. This dike has been traced from Sharp Lake in Coleman Township to the south boundary of Hudson Township, a distance of 6 miles. It cuts both diabase and sediments. A narrower dike, 30 to 40 feet wide, of fairly fine-grained dark green diabase, containing much epidote, strikes across the area at about N 37 degrees W, cutting everything in its path including the wider dike. A feature of this dike is its close parallelism to the Cross Lake Fault (*d-d* on the map.)

Chalcopyrite, pyrite and chalcocite show in a number of old pits along the wider or "main dike. Cobalt bloom can be seen in one or two places near the intersection of the dikes.

Magnetometer Survey:

Reasons for Survey:

A geological reconnaissance, carried out in early May, 1948, disclosed features of sufficient interest to justify a detailed study of the area. It was decided to carry out a magnetometer survey at the same time as geological mapping in order:

(1) To enlarge the geological picture as mapping proceeded,

and (2) To indicate unlikely areas, and possibly to aid in the selection of favourable areas for drilling.

Planning the Survey:

Spacing and Direction of Traverse Lines

Economic considerations dictated that traverse lines should be as widely spaced as practicable. The thin forest cover made it unneccessary insofar as visibility for geological mapping was concerned to space the lines closer than 400 feet; and it was considered that the flatly dipping sediments in the area would allow as wide a spacing for the magnetometer traverses. Since about 50% of the ground was held under option from various owners, it was felt desirable that line cutting should include the clearing-out of propert boundaries. This condition determined that the picket lines, like the property boundaries, should run north-south, or east-west, and that a fair degree of accuracy should be maintai in their location. At that time so little was known of the geology of the area that there was nothing to choose between running the lines N-S, E-W, or in any other direction. A review of the above considerations decided running the picket lines N-S from a main east-west base line. Property boundaries were to be cut out first, and picket lines within property or claim boundaries, laid out 400 and 800 feet from one of the corner posts, so that each 40 acre block of ground would be cut into 3 N-S strips, two of width 400 feet, and the third 520 feet wide.

Surveying:

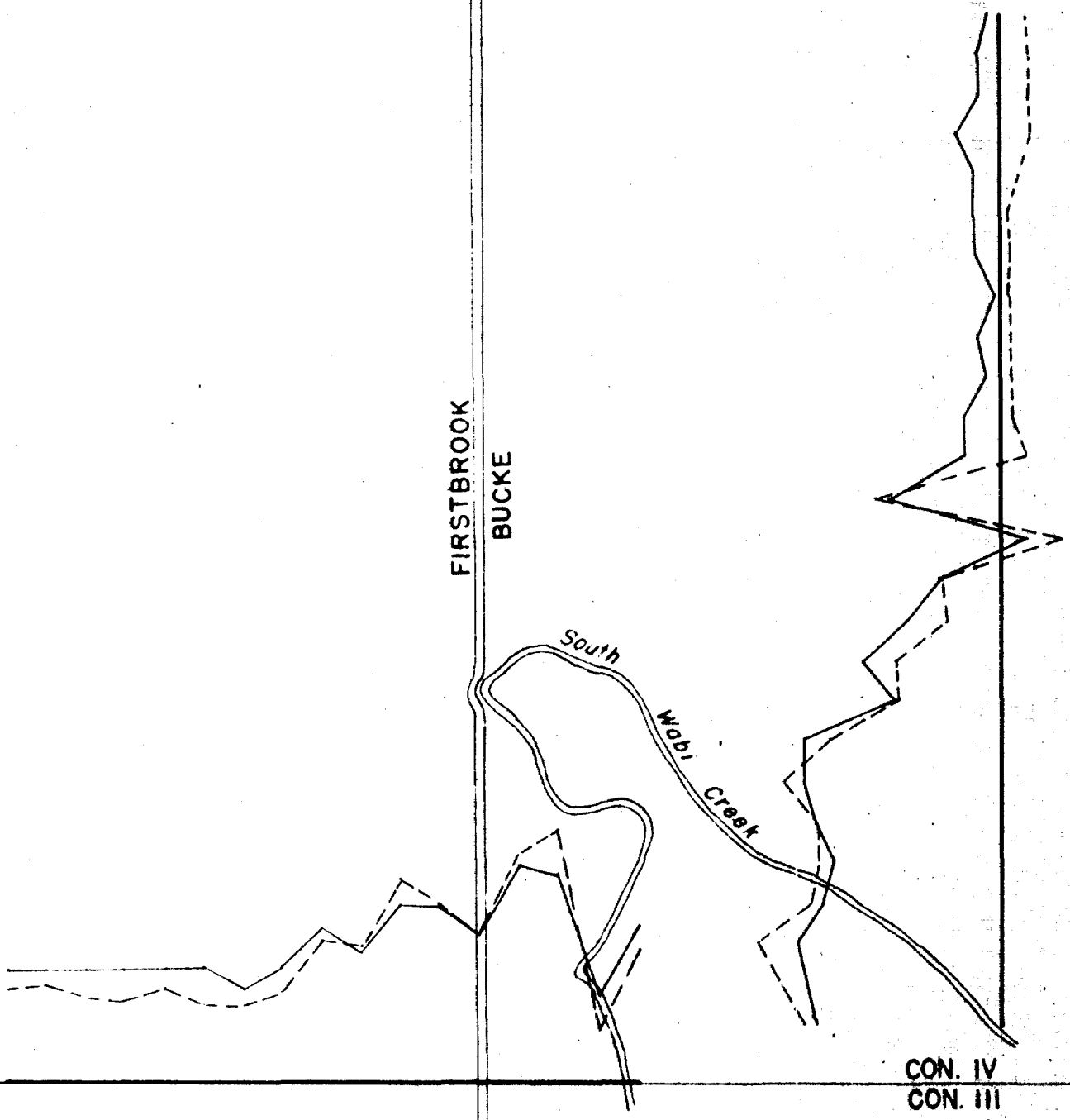
Surveying would be required in order to guide the position and direction of main pick lines and for topographical mapping control. In the latter connection, as we already possessed air photo coverage of the area on a scale of approximately 1 inch - 1320 feet (Ontario Forest Resources Inventory) it was proposed to utilize these photographs in the following manner:

The minimum amount of surveying would be done to enable three or four prominent point appearing in each photograph of adjacent stereoscopic pairs., to be located on a gridded but otherwise blank 200 scale tracing. The centre points of each photograph would be located on the tracing by 3 or 4 point graphical resections. Then, by orienting pairs of photographs on their respective centre points located on the tracing, topographical detail would be filled in by drawing intersecting rays from the centre points through identical features on each photograph.

Unfortunately, the enlargement from a scale of 1" -1320' to a scale of 1" - 200' prov too great, the "triangles of error" produced at intersections being in many cases of excessive size. The method however was useful to supplement detail obtained in the normal manner by chaining along picket lines, and in obtaining detail outside the area covered by picket lines, which otherwise would have been inaccessible.

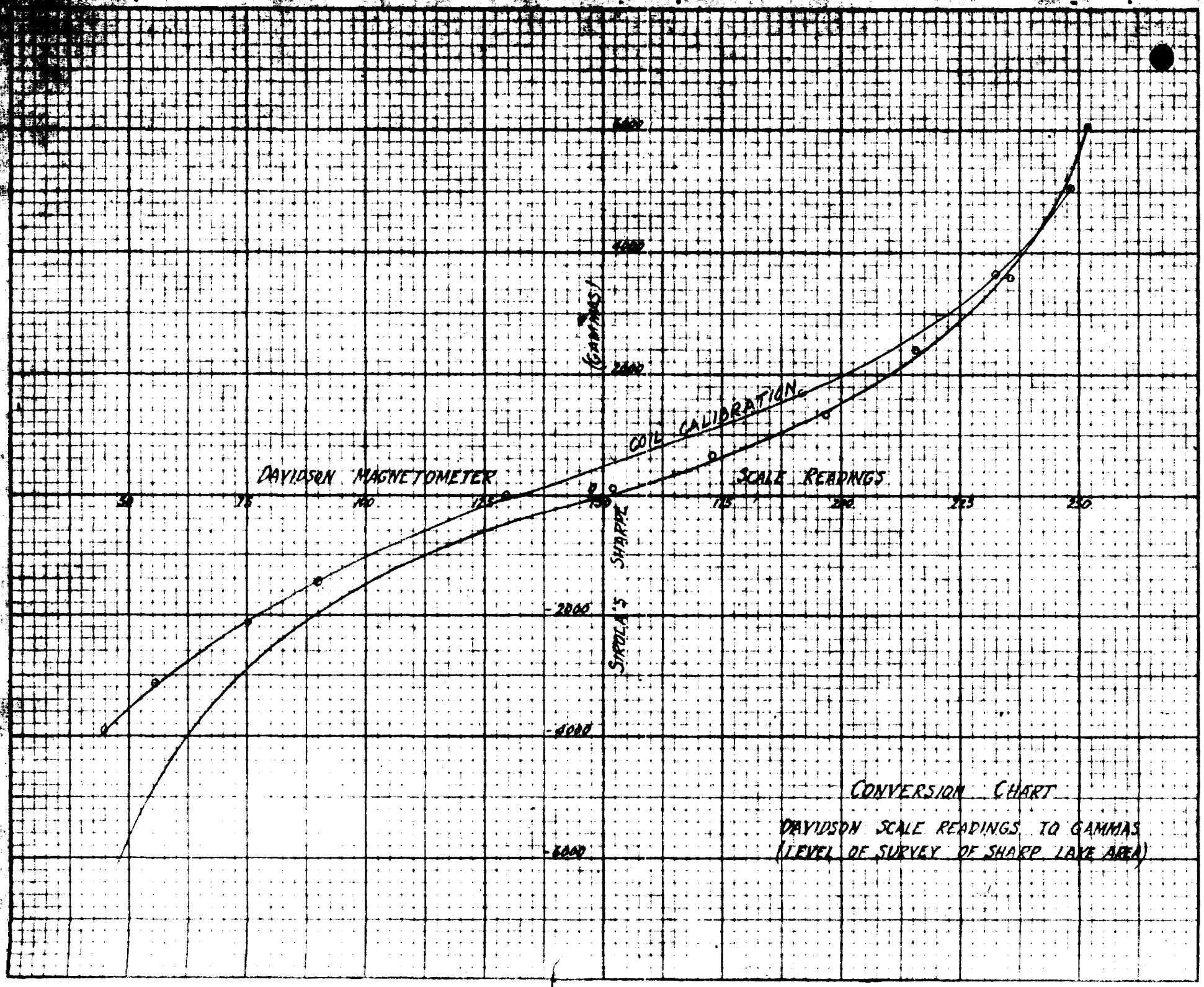
Choice of Instrument:

Two instruments were available: A Sharpe vertical intensity magnetometer; and a Davidson "super-dip" magnetometer. It was felt desirable to use the Davidson machine for number of reasons, which included the economic advantages to be derived from the simplicit of operation and speed of the instrument, but some doubt was felt as to whether a "super-d type instrument would be sufficiently sensitive for work over sediments of low magnetic susceptibilities, where it was expected any anomalies encountered would be of a low order. In order to reach a decision, two traverses were chosen, over which the two instruments



Sensitivities
Sharpe 25 γ / S.D.
Davidson 29 γ / S.D.

COLEBUCKE MINES LTD.
COMPARISON OF SHARPE & DAVIDSON MAGNETO-METERS
JUNE 17 - 18, 1948
Sharpe - Broken Line Davidson - Solid Line
SCALE ~ Horizontal - 1" = 400'
Vertical - 1" = 400 γ



CONVERSION CHART

DAVIDSON SCALE READINGS TO GAMMAS

(LEVEL OF SURVEY OF SHARP LAKE AREA)

HUGHES OWENS

were run on June 17th and 18th. The instruments followed one another closely, so that there was the minimum time interval between comparative readings. Both sets of readings were corrected for diurnal changes. The results of the tests are shown on the sketch attached as Page 3 of this report. It was concluded that the Davidson magnetometer was quite suitable for the job in hand.

Tying in the Survey:

All magnetometer work in the Cobalt District up to this time had been tied into a main control station established near Sharp Lake in Coleman Township on March 17th, 1948. In addition to "tie-ins" made in the ordinary way between different surveys, the different instruments used were reduced to a common working level by field comparisons made across the effective range of magnetic intensities in the district. For this purpose, a Sharpe instrument, the property of J. Sirola of Cobalt, was chosen as the "standard", and a "calibration range", consisting of magnetic stations over which readings of magnetic intensity ranging from low to very high were obtained, was laid out along the N-S road between Firstbrook and Bucke Townships.

The conversion chart which was used for converting scale readings of the Davidson magnetometer to the level of the "standard instrument" is illustrated on Page 4.

In theory, coil calibrations of the different instruments would seem to offer a simpler solution, but in practice they were not found to be as satisfactory as the above method. For one thing, the "calibration range" was always available for tests which could be carried out on an instrument by one man, whereas a coil calibration involved the assembling of men and material at a given place at a certain time.

From the conversion chart, it will be seen that between readings of 110 and 200 on the scale of the Davidson magnetometer, its sensitivity was approximately 29 gammas per division.

e.g.:	Scale Division	Gammas
	200	plus 1500
	110	minus 1100
Difference:	90	2600

$$\frac{2600}{90} = 29 \text{ gammas / div.}$$

Using the curve derived from the coil calibration, the result is the same.

Execution of Survey: (See Appendix "B")

Line Cutting: Between June 11th and July 13th, 1948 line cutting amounted to about $10\frac{1}{2}$ miles. A further $1\frac{1}{2}$ miles were cut on February 23rd and [illegible], 1949.

Magnetometer Readings: Work was started on July 9th and continued without interruption until July 22nd. During this period, a total of $11\frac{1}{2}$ miles of readings at 100 foot intervals were taken. Approximately a mile of readings or about 60 stations, were read in an average working day with a 2-man crew.

Work was resumed between November 11th and 16th in order to thicken up readings, in the vicinity of a low magnetic anomaly, and again between February 28th and March 2nd, when a further mile and a half of readings were taken.

A total of 781 magnetic stations was established during the survey. All readings were corrected for diurnal variations of magnetic intensity.

Geological Mapping: Mapping was done from the picket lines, the chainage pickets providing locations from which detail was sketched in, and points of origin and closure for short compass and pacing traverses. Ten days were spent on this work between July 2nd and August 5th.

Execution of Survey (Cont'd.)

Surveying: Six and one half miles of traversing was carried out in 14 man-days between June 15th and 24th. This work supplied sufficient control for the mapping which followed.

Draughting and Computing: Office work, including draughting and computing, was kept up to date as far as possible with work in the field, the idea of "saving it up for a rainy day" being largely abandoned in favour of the advantages which accrue from calculating and plotting field notes while they are fresh. 18 man-days were spent on each of the above during the survey.

Conclusions:

1. Effect of Underlying diabase: Nipissing diabase, generally of high magnetic susceptibility, underlies sediments of low susceptibility throughout the area covered by the survey. It was argued during the early stages of the work, that the magnetic reading at any point would have no significance other than indicating in a rough way the thickness of sediments covering the diabase at that point. In other words, the magnetic intensity would vary inversely as the thickness of sediments increased. This argument was disproved by running a magnetic traverse a mile to the west along the extension of the line between claims T.28427 and T.28428. The magnetic profile along this line is shown in the section with this report, from which it is seen that the magnetic profile rises gently with an increase in depth of sediments towards the west in Firstbrook Township. It was concluded that the effect of the underlying diabase was, if anything, to complicate rather than control the interpretation of magnetic readings.

2. Dikes: The "main dike" is clearly indicated as a magnetic low (See plan and section with this report.)

The more north-westerly striking epidote dike was crossed by N-S and E-W traverses where it outcrops in the northwest corner of the map sheet. Magnetic indications were weak and contradictory.

3. Faulting: The area is traversed by four north-easterly striking faults, marked A-A, B-B, C-C, D-D on the map, the topographic expressions of which can be traced for considerable distances on air photographs and on the ground. The magnetically low area, the long axis of which lies astride Fault C-C (called, the "Central Fault") is a feature of possible economic significance.

T. C. Keefer
P. Eng.

APRIL 6/49

COLEBUCKE MINES LIMITED

Magnetometer Survey of Claims T.28427-30 and T. 28757

Bucke Township - Ontario

June 11th, 1948 - March 10th, 1949

Man Days required on Survey

(a)	Line Cutters Contractor -	Gordon Davies	62 man days
(b)	Instrument Operators and Technical Assist.		
	Chief Operators:	J. W. Macdonald J. G. Armstrong	36 man days
(c)	Consultants:		
	(i) Field Work:	T. C. Keefer G. F. Greenacre	
	(ii) Office Work:	T. C. Keefer C. F. Cockshutt	18 man days
(d)	Draughtsmen:	W. M. Glazier, T. C. Keefer	18 " "
(e)	Surveyors:	T. C. Keefer G. F. Greenacre W. M. Glazier	14 " "
(f)	Geological Mapping:	T. C. Keefer	10 " "
			158 man days.

The survey covers an area of 520 acres or 13 claims. Dividing the total number of man days spent on the survey by the number of claims covered by the survey, we have 158/13 or 12(plus) man days per claim.

Assessment work credit per claim is 12(plus)X 4, or 48 days.

40 days work was actually recorded against each claim on account of the survey.

Appendix "B" attached, gives a more detailed break-down of the number of days work performed.

T. C. Keefer.
P. Engineer.

Appendix "B"

COLEBUCKE MINES LIMITED

Magnetometer Survey of Claims T.28427-30 & T.28757

Bucke Township, Ontario

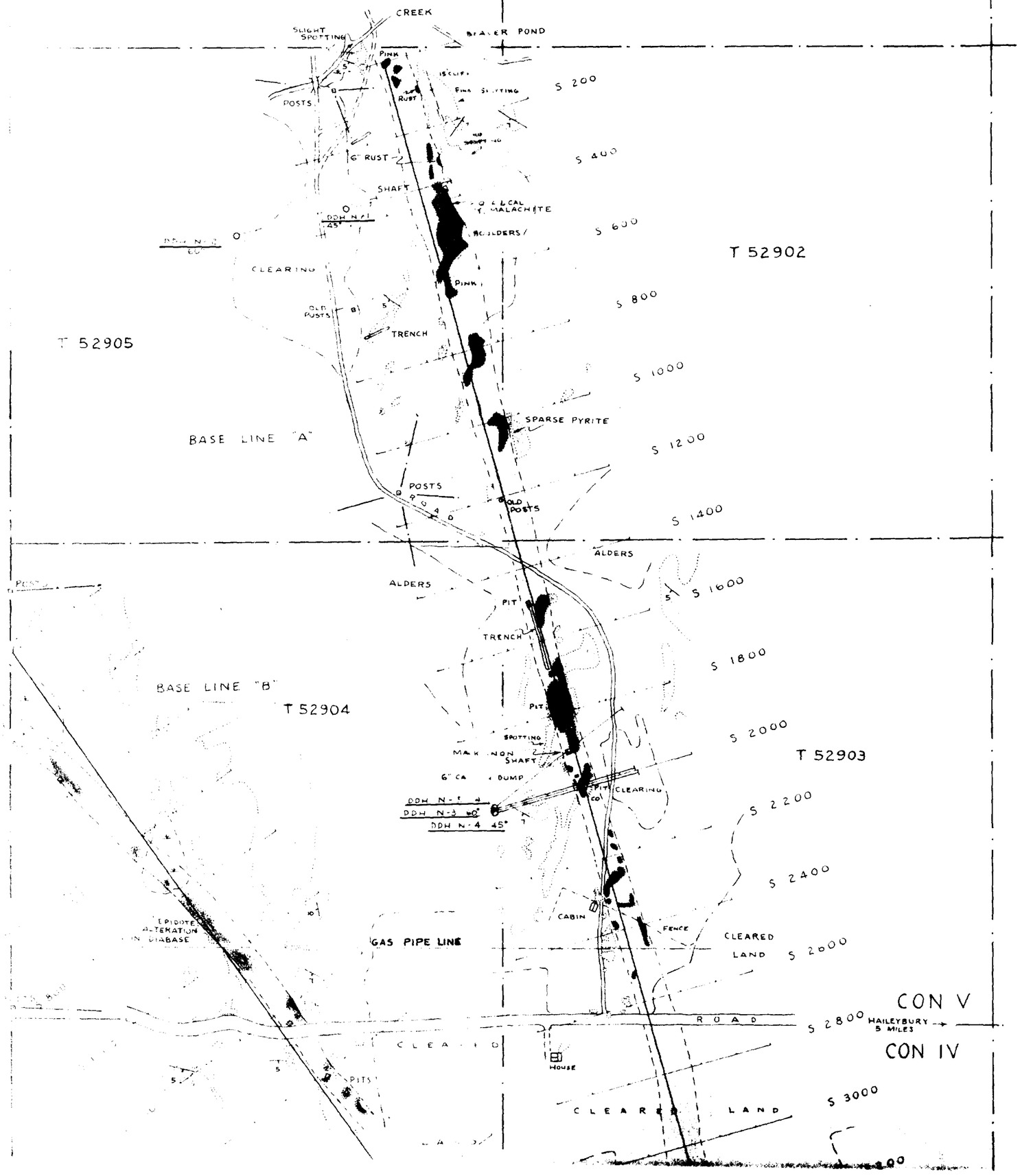
Work Distribution in Man Days from June 10th, 1948 to March 10/49

Date	Line Cutting	Magnet. Rdngs.	Geol. Mapping	Surveying	Draughting	Computi
1948						
June 11	2				1	
" 12	2				1	
" 14	2				1	
" 15	2			2		
" 16	2			2		
" 17	2					
" 18		3				
" 19				3½		
" 21				3		
" 22				2	1	
" 23						2
" 24	2			2		
" 25						2
" 26	2					
" 28	4					1
" 29	4					2
" 30	4				1	1
July 2	4		1		1	
" 3	2				1	
" 5	4				1	
" 6	4					
" 7	4					
" 8	4		1		1	
" 9	2	2			1	
" 10	2	2	1			
" 12	2	2	1		1	
" 13	2	2				
" 14		2				
" 15		2			1	1
" 16		2	1			
" 17		2				1
" 19		2				1
" 20		2				1
" 21		2				1
" 22		1				
" 29			1			
" 30					1	
Aug. 2			1			
" 3			1			
" 4			1			
" 5			1			
" 6					1	
Nov. 11		1				
" 12		1				
" 13					1	1
" 15		2				
" 16		1			1	
" 18						1

(Cont'd. Page 2)

Date	Line Cutting	Magnet. Rdngs.	Geol. Mapping	Surveying	Draughting	Computing
1949						
Feb. 23	2					
" 24	2					
" 28		2				
Mar. 1		2				
" 2		1				
" 7						1
" 9					1	1
" 10					1	1
	62	36	10	14	18	18

158



31M05NE0092 63.162 BUCKE

17" x 23"
Scale: 1" = 200'

T 28427

T 28428

T 28429

T 28430

T 28757

P 2122

P 1612

P 2141

FAULT

CENTRAL

KEY MAP

LEGEND

6 diabase dike, containing epidote

5 Chlorite / Diabase dike

4 Diabase - (Nipissing)

3 Slatey greywacke, greywacke, impure red quartzite

2 Timiskaming

Symbols

Road

Track

Clearing

Swamp

Outcrop

Rock bluff, cliff

Geological boundary, defined ---- assumed

Strike & dip of bedding

Normal fault, strike & dip

Thrust fault, strike & dip

Fault, magnetic alignment

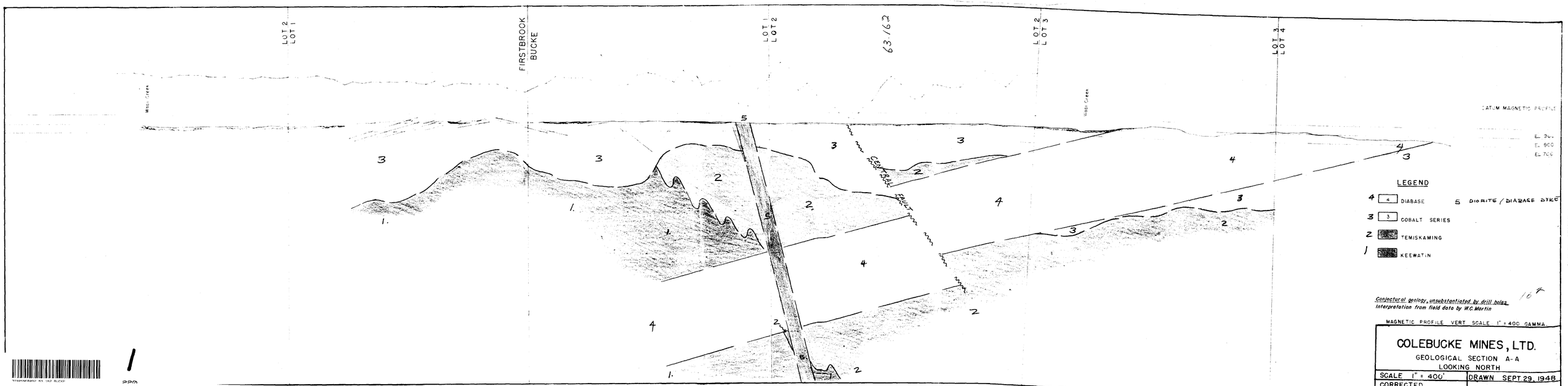
Survey station

Magnetometer reading

COLEBUCKE MINES, LTD.

SHEET BIV.1-3

SCALE 1" = 200'	DATE JULY 5, 1948
DRAWN BY W.M.G.	DRAWING NO. CB3-5
CORRECTED BY	



COLEBUCKE MINES, LTD.

GEOLOGICAL SECTION A-A
LOOKING NORTH

SCALE 1" = 400'	DRAWN SEPT 29, 1948
CORRECTED	DRAWING NO.
APPROVED	

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