435

REPORT OF GEOPHYSICAL SURVEY

CC #50 AND J.L. #100

CLAIM GROUPS

LIARD MINING DIVISION

By G.W.H. Norman, P. Eng.

July and August, 1962

104G/3W

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REPORT OF GEOPHYSICAL SURVEY

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July 1st to August 21st, 1962.

INTRODUCTION

This report presents the results of an Airborne Magnetometer Survey carried out on the CC #50 and J.L. #100 claim groups during July and August, 1962. The magnetometer used for the airborne work was a Varian type developed at Palo Alto, California. Poor flying weather during execution of the work added considerably to the cost.

LOCATION

The CC #50 and J.L. #100 claim groups are located at the headwaters of Galore Creek, a tributary of the Scud River. The Scud River flows northwest into Stikine River about 50 miles north of the B. C. Alaska boundary. The claim groups are 24 miles southeast of the Scud-Stikine river junction.

DESCRIPTION OF INSTRUMENT

The instrumentation of the Varian magnetometer is based on the effect of the earth's magnetic field on atomic nuclei.

The atomic nuclei are protons or combinations of protons of which the simplest are the protons of hydrogen atoms. Kerosene provides an adequate source of hydrogen atoms with advantages for Varian type magnetometers over other materials containing hydrogen. The kerosene is placed in a cylindrical container and towed 50 to 100 feet below the aircraft. It is thus removed from local disturbing forces in the aircraft. The container is surrounded by a coil through which at one second intervals a current is forced to flow. When the current in the coil is cut off the hydrogen protons are oriented in space by the controlling forces of the earth's magnetic field. When the current flows through the coil a strong local magnetic field is set up to act on the hydrogen nuclei. This local field is sufficient to completely counteract the earth's magnetic field. The effect on the protons when the current is cut off and they reconform to the earth's magnetic field provides a means, with appropriate electronic instrumentation of measuring the strength of the earth's magnetic field.

The instrument is coupled with a continuous recording device provided with a metric chart about 6 inches wide travelling either one or four feet per second as required. Readings are taken by the instrument at intervals one second apart when the current in the coil is cut off. In an aircraft travelling 60 miles per hour, successive readings would be 88 feet apart. With a helicopter travelling 45 miles per hour the readings would be 66 feet apart.

The scale of the metric chart is 50 gammas per centimeter which allows for changes of 600 gammas across the width of the chart. When the differences in reading exceed 600 gammas the recorder automatically steps up or down to change the datum or centre line of the chart by 250 gammas.

The instrument measures the total intensity of the earth's field in gammas. The average total field is approximately 57,000 gammas. The settings of the instrument provide a course setting with 5,000 gamma intervals starting at 45,000 gammas, and self switching setting from 0 to 5,000 gammas. The instrument has, therefore, an automatic range of 5,000 gammas before manual changes to other settings are required.

WORK PERFORMED

The airborne survey was carried out by a Varian type proton precession magnetometer mounted in a Bell G2 Helicopter. The helicopter was under charter from Pacific Helicopters Ltd. of Vancouver. The work was supervised by G. W. H. Norman for Newmont Mining Corporation acting under an agreement with Southwest Potash Corporation, owner of the claims.

Installation of the magnetometer in the helicopter was carried out by George McLaughlin, formerly electronic specialist and engineer for McPhar Geophysics Limited of Ontario and now on the staff of Newmont Exploration Limited.

Mr. McLaughlin spent the period June 29th to July 7th, 1962, on the magnetometer survey. Charles Elliot, geophysicist on the staff of Newmont Exploration Limited, worked on the project during the period August 7th to August 11th, 1962. G. W. H. Norman supervised and planned the survey and processed the charts for the preparation of a isogam contoured map to illustrate the results of the work, which totalled 18 days from July 1st to 7th, August 7th to 12 and August 17th to 21st, 1962.

WORK PROCEDURES

The claims cover a strip of glacier, at the headwaters of Galore Creek, and the adjoining valley sides from the ice at 2500 feet to 6000 feet above sea level. Due to the steepness of the valley sides and irregularities of the surface due to the minor valleys and canyons cut by side streams, straight flight lines could not be flown.

The first nine lines on July 3rd were flown at definite contour intervals with the pilot of the helicopter flying at a constant elevation. These lines were flown with George McLaughlin as operator of the magnetometer and navigator. For navigational purposes a contoured map of the claims on about 2000 feet to the inch was used. In order to plot the flight lines on the contoured map, all streams and stream junctions were marked on the chart by a manually operated fiducial marker. A small bellows, held in the hand of the operator, makes small ticks when pressed on an otherwise straight red ink line on the right side of the chart.

One or more ticks can be made with the marker to identify any special point along the line. The start and finish of each line were indicated by ticks of certain lengths.

The instrument was flown approximately 200 feet above the ground. The cable of the instrument bird had a length of 50 feet which positioned the helicopter 250 feet above ground. A check of the altimeter in the helicopter on the ground provided a means of plotting the line on the contoured map. This method proved adequate for the internal part of the lines but difficulties were encountered in determining the exact start and ends of the lines.

On august 12th, the lines were reflown using aerial photographs on a scale of about 4000 feet to the inch. Due to the almost identical appearance and shape of snow banks on the photos and on the ground, navigation and location of the lines on the photographs proved to be simple and quite accurate. Six lines were flown on August 12th by G. W. H. Norman.

The lines flown ranged from 500 to 1500 feet apart which would give an average of 1000 feet apart.

RESULTS

The first nine lines by McLaughlin as indicated in attached profiles 1-4, 6-9 inclusive (end pocket), show a definite magnetic high peaking (maximum 1250 gammas) in the general vicinity of Copper Canyon Creek. Profile 2 is a line down the centre of the glacier and the high is clearly indicated even on this line.

The general feature of this high is a gradual increase westward in the magnetic readings to the high point of the profile and a more abrupt decrease on the west side of the high. This type of curve suggests a steeply east dipping zone and is in agreement with the general east dip of the rocks at the north side of the glacier.

The ends of six lines by Norman could be located more precisely than those by McLaughlin and an isogam contour map was constructed from these lines (see map end pocket). The contour map agrees with the profiles in showing a magnetic high extending east of south from the upper part of Doghouse Creek across the central part of Copper Canyon Creek. The contoured high has a more gradual build up on the east side indicative of a steep east dip.

The high on the contour map is approximately 1000 gammas. The difference between this peak and the highest peak 1250 gammas on the profiles may be due to a difference in altitude of the magnetometer or the lines for the contour map did not cut across the highest part of the anomaly.

The magnetic high lies over a syenite mineralized with magnetite, pyrite and chalcopyrite. The syenite ends against an east dipping fault. The magnetic high is produced by the syenite mass and the east dipping fault apparently explains the shape of the magnetic profiles.

Further work will be required to find out any relationship of the high to the intensity of mineralization.

G. W. H. Norman, P. Eng.

August 22nd, 1962.

DOMINION OF CANADA:

PROVINCE OF BRITISH COLUMBIA.

TO WIT:

In the Matter of costs and charges incurred in the airborne magnetometer coverage of the CC #50 and JL 100 claim groups at the headwaters of Galore Creek, Liard Mining Division

I, G. W. H. Norman, P. Eng.,

of 604 - 744 West Hastings Street, Vancouver 1,

in the Province of British Columbia, do solemnly declare that the costs, charges and related expenses of the magnetometer survey were as follows:

Newmont Exploration Limited, Charges:

Services of geophysical engineers (electronic experts) George McLaughlin 9 days and Charles Elliot 5 days	$1,000.00
Varian type magnetometer 2 weeks @ $400 per month	200.00

Pacific Helicopters Limited, Charges:

8¾ hours @ $108.00 per hour	945.00

Newmont Mining Corporation of Canada Limited, Charges:

G.W.H. Norman, project engineer, 18 days	1,000.00
Food and camping facilities	300.00
	$3,445.00

And I make this solemn declaration conscientiously believing it to be true, and knowing that it is of the same force and effect as if made under oath and by virtue of the "Canada Evidence Act."

Declared before me at the City of Vancouver, in the Province of British Columbia, this 22nd day of August, 1962, A.D.

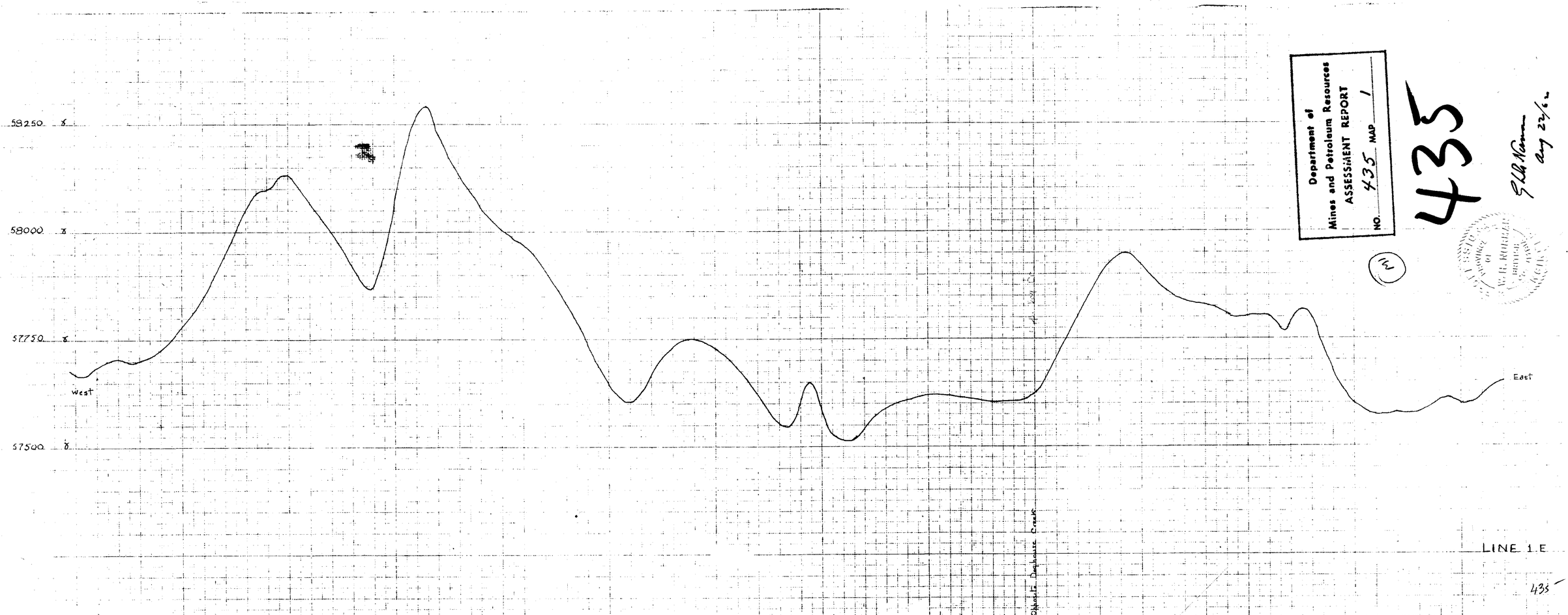
G. W. H. Norman

Shirley Jeannotte

~~A Commissioner, etc.~~

~~A Commissioner for taking Affidavits within British Columbia or A Notary Public in and for the Province of British Columbia.~~

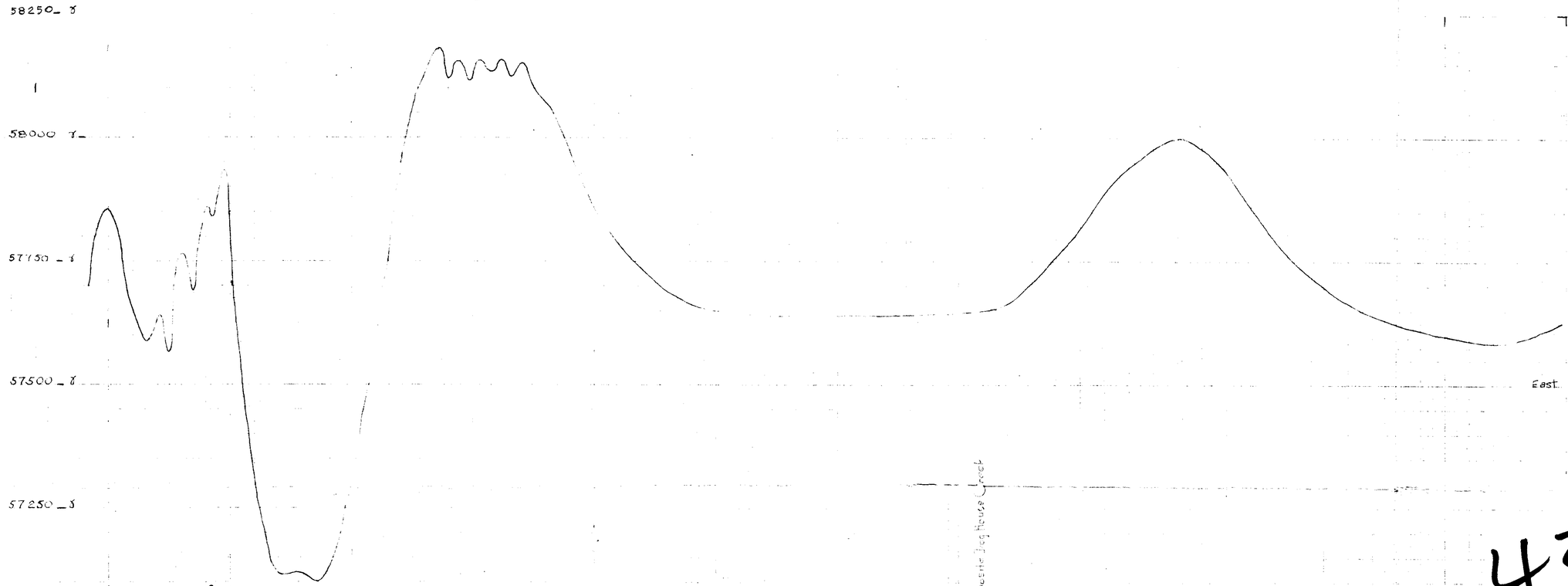
Sub-mining Recorder



435

LINE 1.E

435



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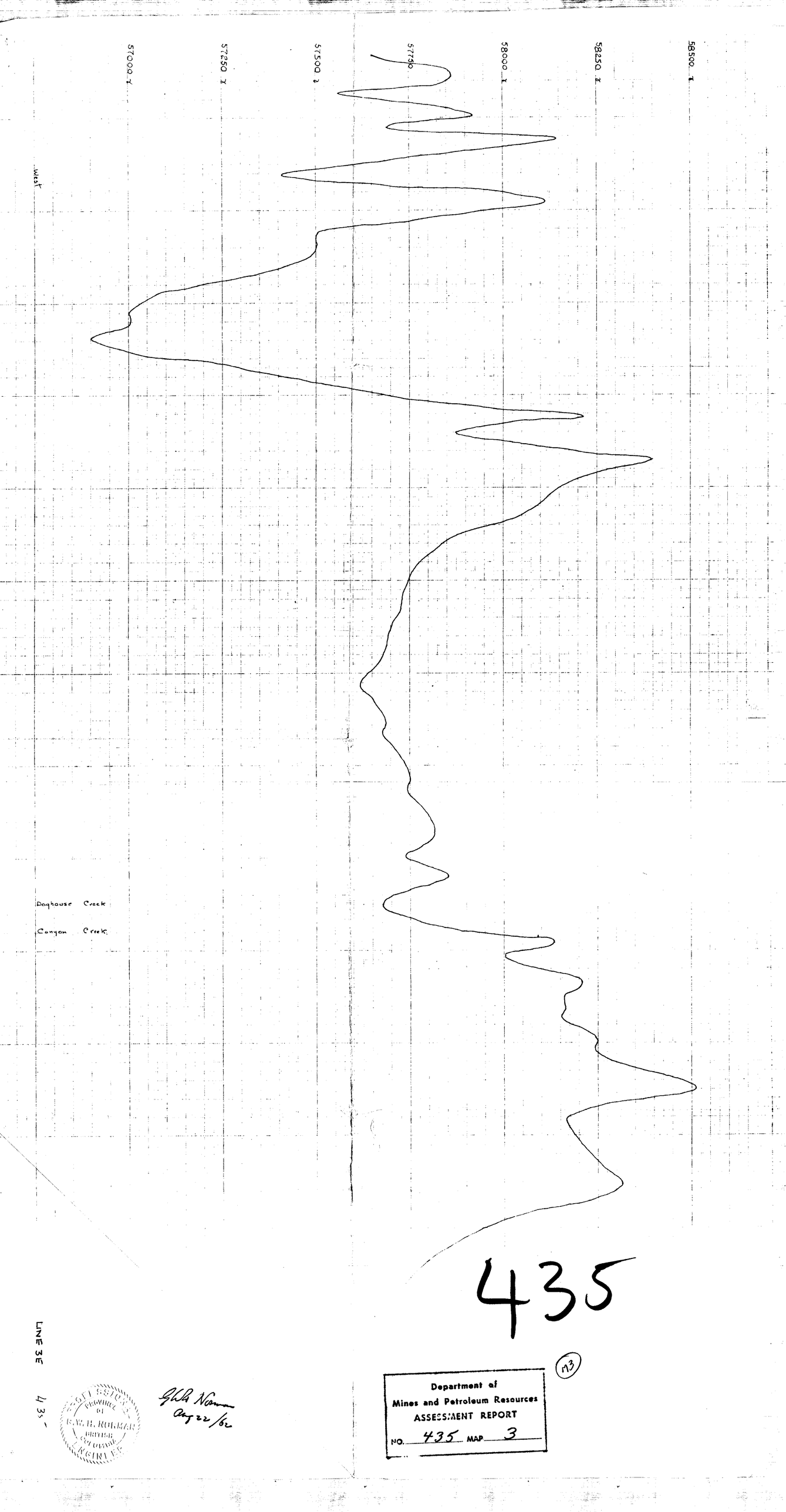
LINE 2 W

435



435

LINE 3E

(73)

G.W.H. Norman
Aug 22/62

West

East

Dogface Creek

Cobber Canyon Creek

435

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Mines and Petroleum Resources
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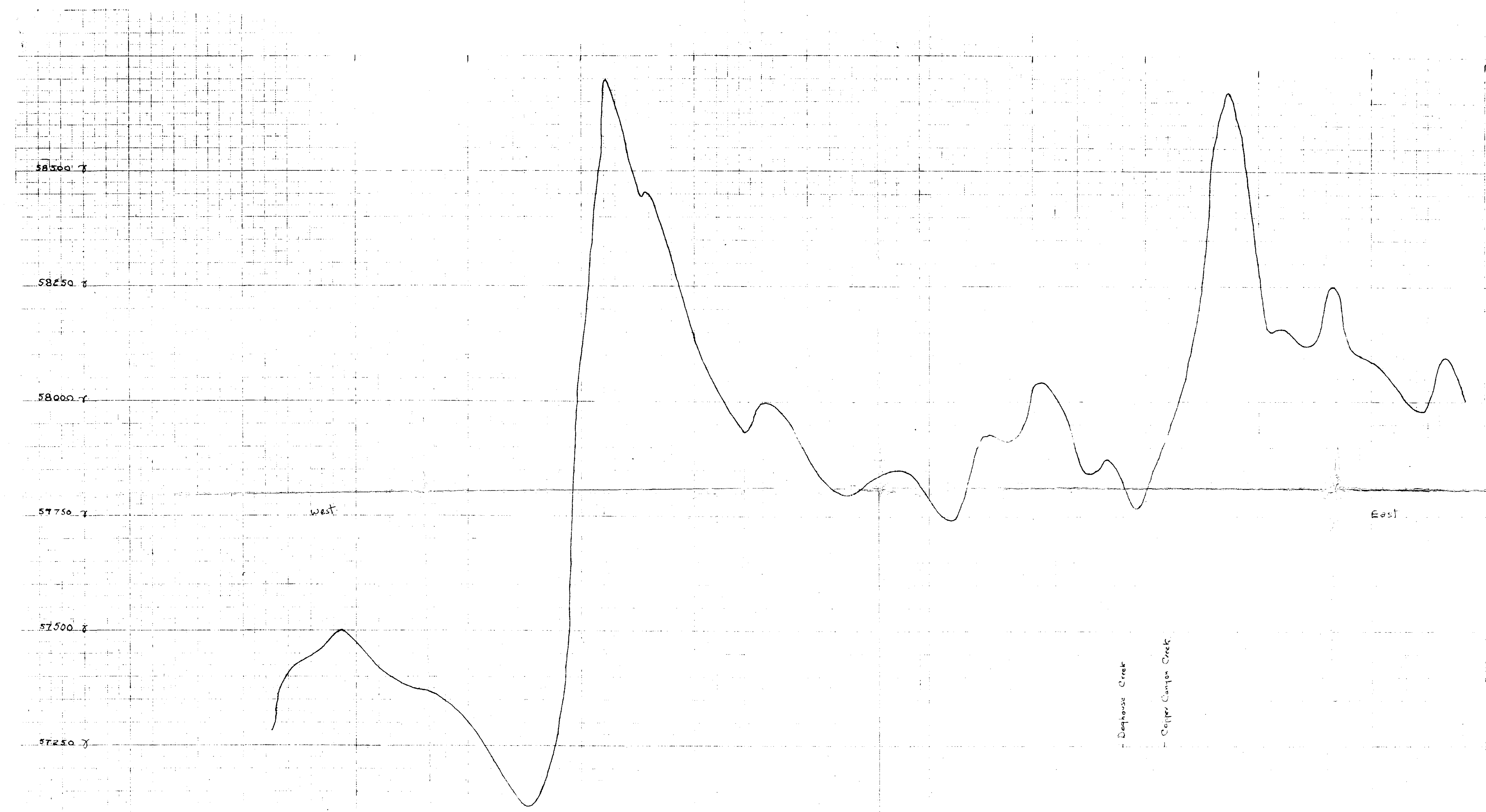
LINE 4W

435

58250
58000
57750
57500
West
57250
Doghouse Creek
Copper Canyon Creek
East
LINE 6 W
435
Department of Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 435 MAP 5
Aug 22/62

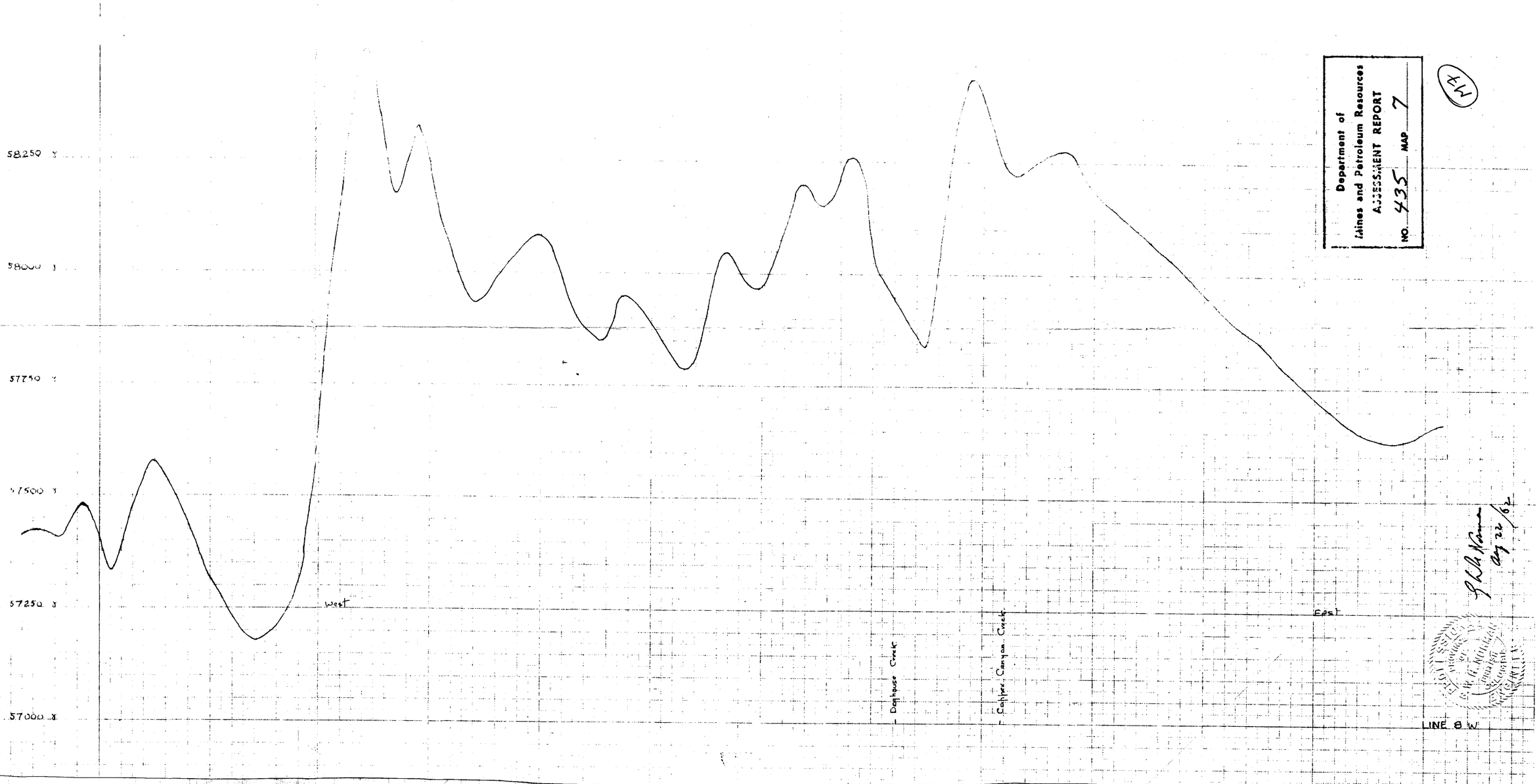


LINE 7 E

435

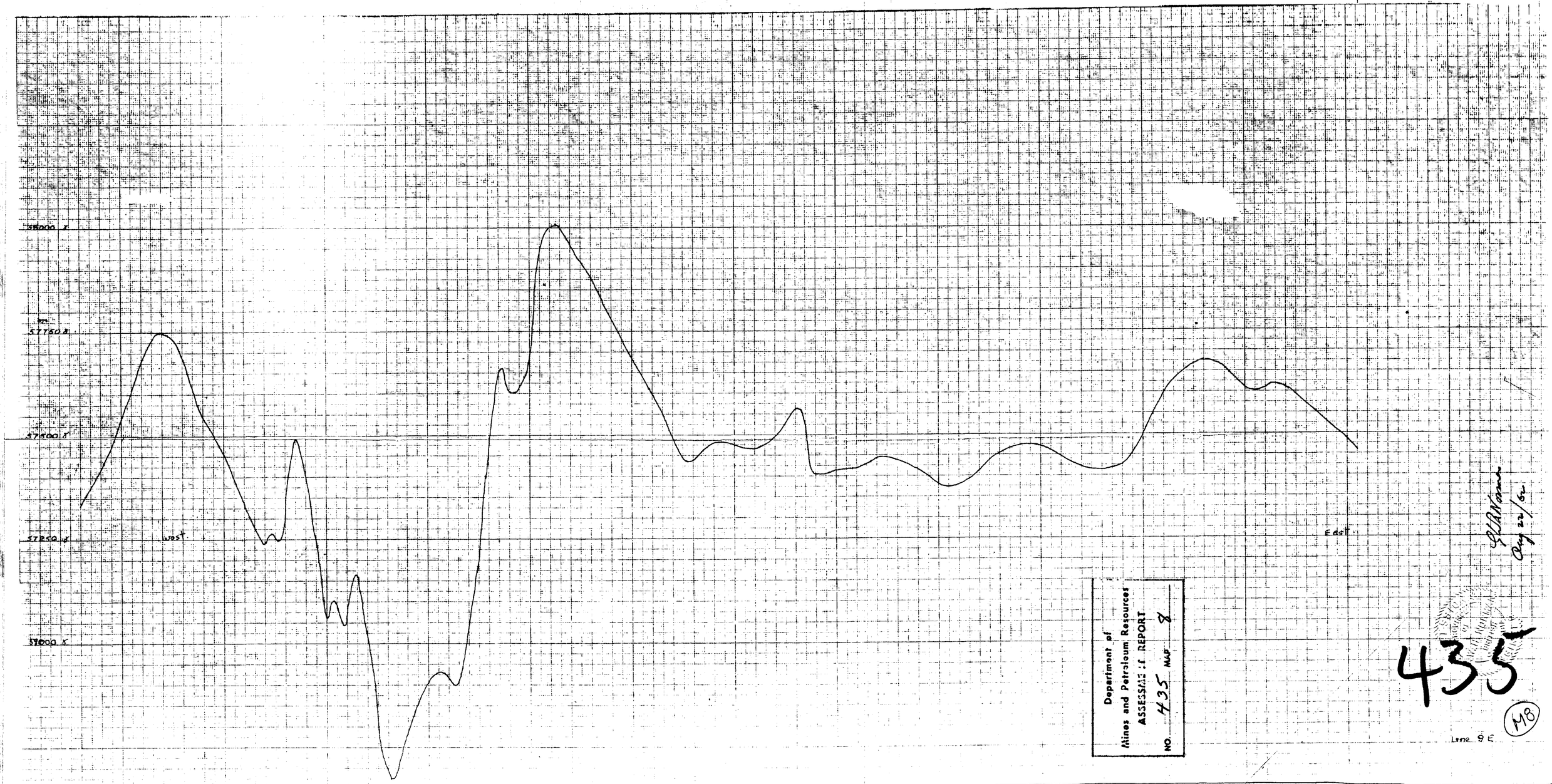
Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 435 MAP 6

435



(7M)

P.H.B. Nixon
Aug 22/62



Department of
Mines and Petroleum Resources
ASSESSMENT REPORT
NO. 435 MAP 8

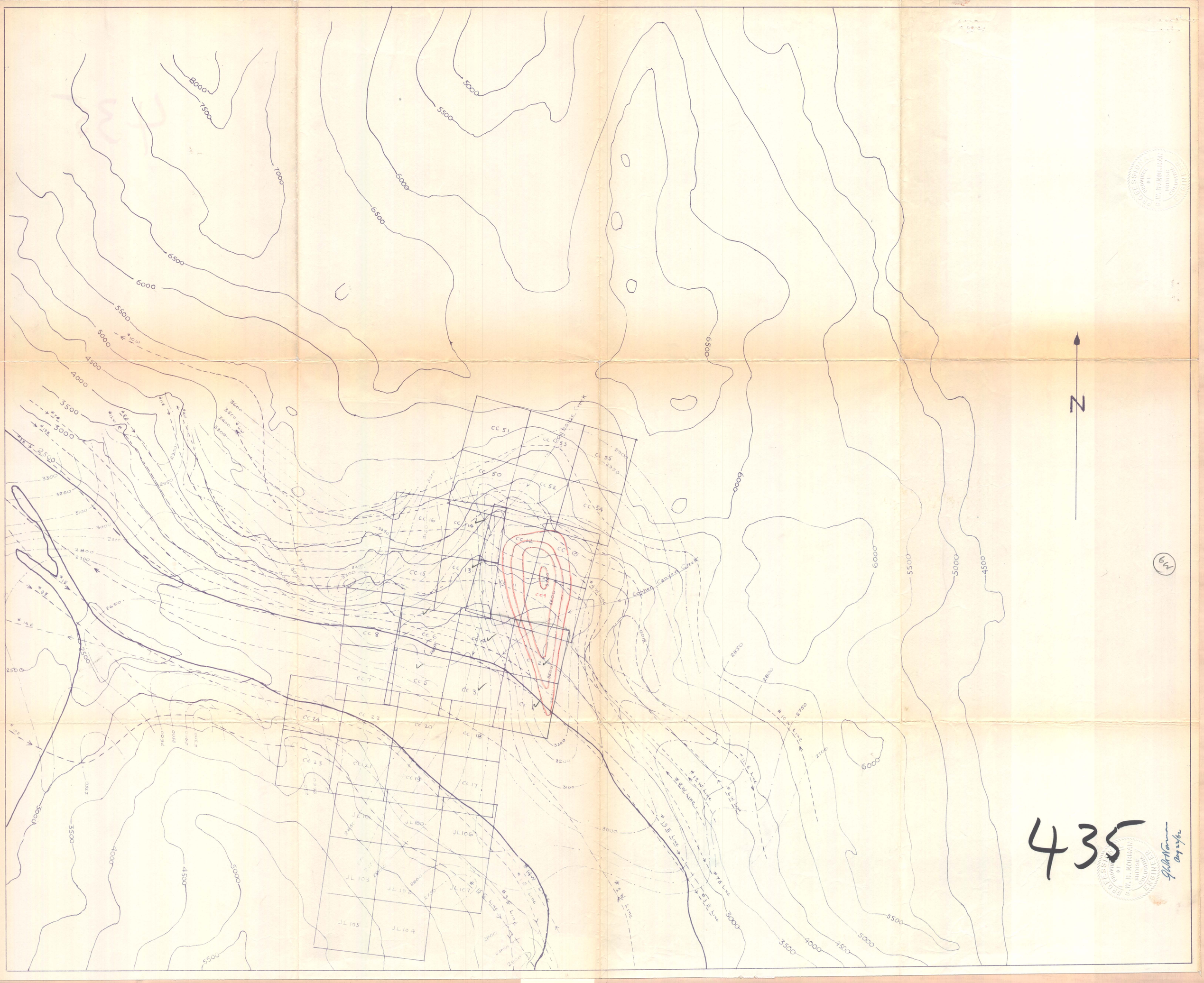
Aug 22/60

435

(M8)

Line 9E

435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CC 18
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CC 21
CC 19
CC 17
JL 101
JL 102
JL 106
JL 103
JL 108
JL 107
JL 105
JL 104
Copper Canyon Creek
#14E
#12E
#10E
#8E
#6E
#4E
#2E
#1E
#2W
#4W
#6W
#8W
#10W
#12W
#13E
#11E
#9E
#7E
#5E
#3E
#1W
#2W
N
435