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UNIVERSITY OF NEVADA
NEVADA BUREAU OF MINES AND GEOLOGY
RENO, NEVADA 89507

REPORT FOR JONATHAN CYKMAN ON A MAGNETOMETER SURVEY
ON THE THOMAS IRON DEPOSIT, PERSHING COUNTY, NEVADA.
by E. L. Stephenson (November 1951)

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PERSHING COUNTY, NEVADA

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Contents

Illustrations

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By

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Consulting Geophysicist

INTRODUCTION

This report presents the results of a magnetometer survey made for Mr. Jonathan Cykman on the Thomas iron deposit, Pershing County, Nevada. The deposit is located in the SW¼ Section 29, T. 26 N., R. 34 E., M.D.M. It consists of an elongate body of very high-grade iron ore, apparently a mixture of magnetite and hematite. Not much is known as yet concerning the geology of the deposit, but it differs markedly from the other known iron ore deposits of this district, most of which are irregular replacements of magnetite in diorite or gabbro. The Thomas deposit may be a replacement in sedimentary rocks.

The deposit was first opened and is still being developed by Mr. H. S. Thomas, who holds the S½ of Section 29 under lease from the Southern Pacific Railway Company. The present workings consist of several small open cuts near the north end of the deposit, from which daily shipments now are being made.

Although the apex of the body is very close to the surface, only one small exposure of ore occurred originally, and the only present exposures are in the open cuts. The purpose of the magnetometer survey was to trace a possible southerly extension of the deposit, between the Thomas cuts and the south line of Section 29; to determine

the location of the apex and the approximate thickness of ore; and, on the basis of this data, to make locations for diamond drill holes to test the deposit for grade and tonnage.

Magnetic measurements were made over a total strike distance of 1300 feet, extending from the cuts nearly to the south line of the section, as shown on the index map. The field work was done during the third week of October 1951. All measurements were made with a standard Askania vertical magnetometer, having a sensitivity of approximately 30 gammas[1/] per scale division.

1/ 1 gamma = 0.00001 gauss, the unit of magnetic intensity. The earth's magnetic field has a total intensity of approximately 0.6 gauss, or 60,000 gammas.

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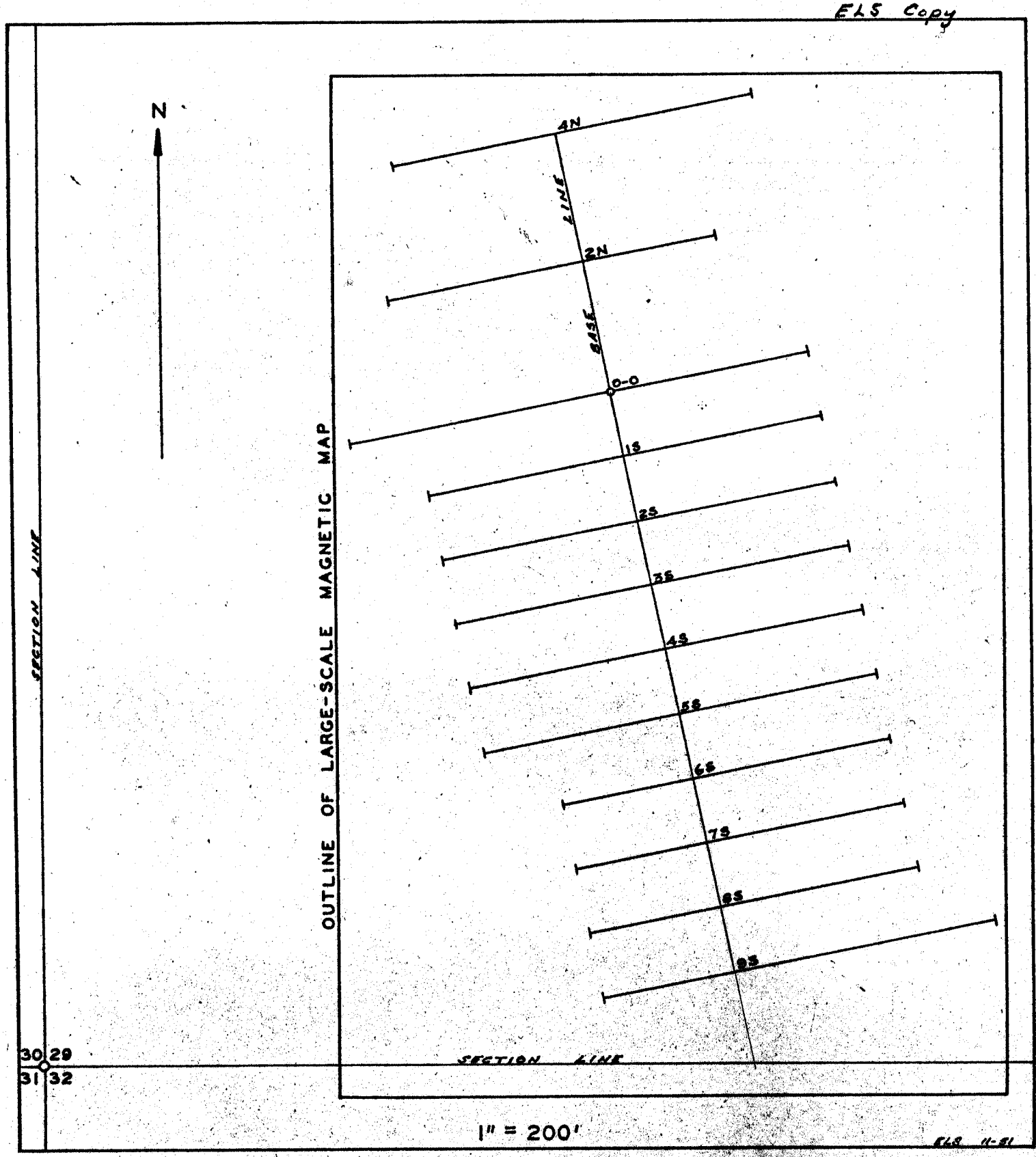

INDEX MAP SHOWING LOCATION OF MAGNETOMETER GRID, THOMAS IRON DEPOSIT.

GEOLOGY

No detailed geologic study has been made of the Thomas iron deposit, but exposures in the present open cuts at the north end indicate that the body differs markedly from the numerous other known iron ore bodies in this general district. Most of the latter are irregular and disconnected replacement lenses of magnetite in igneous rocks, which have been described as either diorite or gabbro. The Thomas ore has the general appearance of hematite, although the magnetic readings show that it contains a high percentage of magnetite. It also has a bedded aspect and a general uniformity and continuity along the strike, suggesting that it may be a replacement of a sedimentary rock, presumably limestone. Further detailed studies, including microscopic examinations, will be necessary to determine the exact nature of this ore.

The north end of the body lies at the southwest base of a low hill of diorite, which contains small lenses and veins of magnetite. To the east and south there also are a few small knobs of diorite rich in fine-grained magnetite. Aside from these exposures, all of the rocks, including the main ore body, are completely covered by a thin veneer consisting of valley alluvium, and, in particular, of the gravels of old Lake Lahontan. In the area of the Thomas cuts the ore was covered by a few feet of lake gravel, and the top of the ore body shows the effects of wave action. The magnetic data indicate that the top of the body is similarly near the surface to the south, at least as far as the south line of Section 29.

In the cuts and for some distance to the south the body strikes a few degrees east of south. In the two eastern cuts it dips steeply eastward beneath a diorite hanging wall. A split, or horse,

occurs in this area, and a new cut now is being made in the segment of ore west of the split, but the true footwall is not yet well exposed. South of the cuts the two segments merge, and in general the body seems to be a unit, having an average width on the order of 50 to 100 feet or more. The magnetic data indicate that the body extends to a very considerable depth.

MAGNETOMETER SURVEY

Plan of the survey

The plan of the magnetometer survey is shown on the index map, which shows the relationship of the grid to the land boundaries, and on the accompanying large-scale magnetic map. An arbitrary zero point was selected about 200 feet south of the Thomas cuts, and a base line was laid out and staked approximately along the extension of the exposed hanging wall in the east cuts. Magnetic measurements were made at 25- and 50-foot intervals along a series of traverses run normal to the base line and the strike of the deposit.

The 0-line is 700 feet long, extending from 400W to 300E. Two traverses were run at 200-foot intervals north of this line. The 200N traverse, 500 feet long, runs across the partly stripped area just south of the cuts, and the 400N line, 550 feet long, runs just north of the two southern cuts, across the exposed segments of ore and the split.

South of the 0-line, traverses were run at 100-foot intervals to 900S, or approximately 140 feet north of the south line of Section 29. The central lines, from 100S to 500S, are 600 feet long, extending from 300W to 300E. To the south the deposit has a more easterly trend, and the traverses were run only to 200W. The 900S line was extended to 400E, in order to complete the magnetic curve. On all of the lines, stakes for field reference were driven at the 200W and 200E points, in addition to the stakes on the base line.

Results of the survey

The results of the magnetometer survey are shown on the accompanying magnetic map, which constitutes the principal part of this report. It is drawn on a scale of 50 feet to the inch and contoured on an interval of 2000 gammas.

In general, the ore body is marked by a sharp, strong, well-defined positive magnetic anomaly that extends entirely across the surveyed area and continues both north and south of the grid boundaries, showing the body to be essentially a continuous band exceeding 1300 feet in length. The profiles, or magnetic sections, suggest thicknesses on the order of 50 to 100 feet and more. The anomaly is somewhat asymetrical, with a steeper magnetic slope on the west, indicating that the body probably maintains its steep easterly dip. The lack of any strongly negative borders indicates that the body extends to a very considerable depth, probably on the order of hundreds of feet.

On the 400N line two sharp positive peaks occur over the two segments of ore, and the split is marked by magnetic sags centering at 50W and 100W. The 200N line, however, shows a single broad, strong peak, indicating that here the ore occurs in a single body that probably exceeds 100 feet in thickness.

To the south, the anomaly continues as a single unit, varying somewhat in magnetic strength and indicated thickness, as far as the 300S line. The 400S line shows only a relatively small anomaly, and the pattern of the magnetic contours strongly suggests the presence of a cross-fault that appears to strike about N. 60° W., as shown in red on the map. This postulated fault offsets the ore zone eastward on the south, and near the 400S line the ore may be partly faulted out.

South of the postulated fault, the 500S traverse again shows a single strong anomaly. The anomaly also is fairly strong on the 600S and 700S lines, but here the peak is broken by a magnetic sag, shown by the hachured contour on the map, suggesting that the body probably is broken by a split. The 800S and 900S lines show a single major peak, but they also show a fairly abrupt change in trend, the magnetic zone swinging rather strongly eastward. Field time did not permit the making of additional measurements to determine whether this eastward trend continues to the south.

Although the anomalies on the individual traverses indicate considerable variations in thickness, it should be emphasized that the changes in total magnetic strength do not necessarily mean corresponding variations in grade of ore. In a body such as this, composed partly of hematite, the changes in magnetic strength from line to line may be simply expressions of changes in the magnetite content of the ore, rather than in the total iron. In part, the magnetic changes also may be caused by variations in the depth to the top of the body. Drilling and sampling of the deposit will be necessary to determine more fully the significance of these local magnetic variations.

RECOMMENDATIONS

The next step in the development of the Thomas iron deposit will be diamond drilling. In earlier conferences, and on the basis of field magnetic profiles only, locations were made for four inclined diamond drill holes, to be drilled from the east, or hanging wall side of the body. The locations of these holes, which are shown in red on the magnetic map, are as follows:

D.D.H. No. 1	2000-10E	-40°
D.D.H. No. 2	1000-40E	-40°
D.D.H. No. 3	4000-80E	-45°
D.D.H. No. 4	7000-95E	-43°

The final interpretations, in particular on the basis of the new magnetic map, indicate that three of these holes are satisfactory, namely, drill holes No. 1, No. 2, and No. 4. It is recommended that these holes be drilled as planned.

The magnetic map indicates that drill hole No. 3 would go into the postulated fault zone, which most likely would mean difficult drilling and a poor test of the ore body. It is therefore recommended that this hole be moved 100 feet south, to the 5000 traverse, coordinates and angle of inclination to remain the same. The new location also is shown in red on the map. This hole will furnish a good test of the main block of ore south of the postulated fault.

After these four holes have been drilled, a review of the magnetic and geologic data can be made, and any further drilling or other testing that seems warranted can be planned.

Reno, Nevada
November 1951

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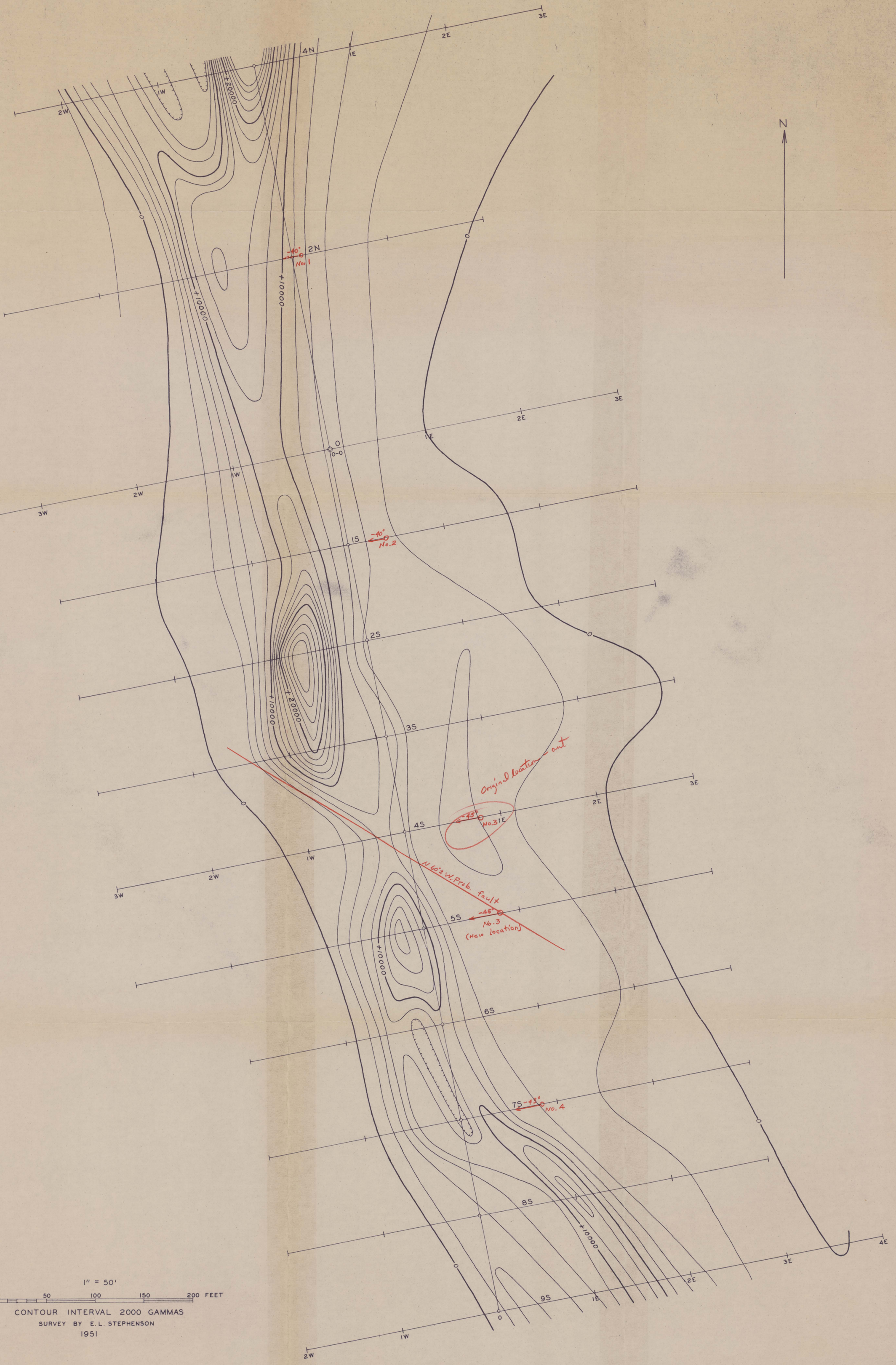

1" = 50'

0 50 100 150 200 FEET

CONTOUR INTERVAL 2000 GAMMAS

SURVEY BY E. L. STEPHENSON

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SEC. 29
SEC. 32

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MAGNETIC MAP OF A PART OF THE THOMAS IRON DEPOSIT, CHURCHILL COUNTY, NEVADA

283

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