

E. L. STEPHENSON  
CONSULTING GEOPHYSICIST  
1701 LANDER STREET  
RENO, NEVADA

GENERAL EXPLORATION  
MINING GEOPHYSICS  
MINING GEOLOGY

(229)  
item 1  
see map files.

PHONE FAIRVIEW 2-2718

MEMORANDUM FOR THE STANDARD SLAG COMPANY

GROUND MAGNETIC SURVEY OF THE GREEN SPRING ANOMALY, NYE COUNTY, NEVADA

The Green Spring magnetic anomaly is located on the outwash slope off the west base of the Paradise Range, Nye County, Nevada, a short distance north of the Phelps-Stokes iron deposit. The anomaly was discovered in October, 1960, by James Simmons in the course of airborne prospecting with a Varian M-49 magnetometer for Lindsay and Gordon Smith. In November the ground was staked by or for the Smiths, and, on the basis of a prior understanding, The Standard Slag Company now has an option on the property.

In the latter part of December, 1960, E. E. Nelson and T. L. Katzer made a ground magnetic survey of the anomaly for The Standard Slag Company, using the writer's Askania vertical magnetometer. The purpose of this survey was to determine precisely the location, nature, and intensity of the anomaly, inasmuch as such information is not provided by this type of airborne readings, and to obtain information as to the approximate size and depth of the magnetic body. All of the essential field data are presented on the accompanying sheet of magnetic profiles and map (in pocket), and estimates of size and depth are given herein. This memorandum makes no recommendations, however, but merely presents the above information for use by engineers of The Standard Slag Company.

Little or nothing is known of the geology in the vicinity of the Green Spring anomaly, as bedrock is completely covered by a

mantle of outwash sand, gravel, and boulders of unknown thickness. The Paradise Range to the east and the hills to the west are composed of Paleozoic metavolcanic rocks, Mesozoic sedimentary rocks, and Mesozoic and Tertiary intrusive rocks. Presumably these same rocks underlie the intervening valley where the anomaly occurs. If the anomaly is caused by a body of iron ore, the deposit probably is a replacement similar to Phelps-Stokes, which also occurs in these rocks.

As shown on the magnetic map, the magnetometer survey comprises 19 traverses ranging in length from 2,000 feet to 4,500 feet, spaced at 100-foot intervals and bearing about N. 15° W. On most of these lines measurements were made at 100-foot intervals, but on a few of the outside lines a 200-foot interval was used. As the anomaly is broad and low, the magnetic map is contoured on a small interval of 500 gammas and the magnetic profiles are plotted on a horizontal scale of 1,000 feet to the inch and a vertical scale of 1,000 gammas to the inch.

The magnetic map shows that the anomaly is oriented with the grid and is nearly square in plan, measuring about 1,800 feet in both directions across the 2,000-gamma contour. The relative peak value of magnetic intensity is about 4,300 gammas, but the 4,000-gamma peak closure is small. On the north the intensity decreases steadily to values of 1,000 to 500 gammas or less, and it reaches negative values on the 1300E line. On the south the decrease is somewhat less abrupt and the intensity levels off in the general range of 2,000 gammas, as illustrated by the 500E, 1600E, and 2100E lines. This asymmetry of the curves and the different levels of intensity on

the north and south suggest the presence of a contact at depth, presumably a fault, between two rocks of differing magnetic susceptibility. The body that produces the anomaly, then, was formed in or along this postulated contact zone.

Calculations of the depth to the magnetic body are rendered somewhat uncertain by the asymmetry of the magnetic peak, by the differing levels of intensity on the borders, and by the complete lack of information as to the magnetic susceptibility of the body. In general the south side of the anomaly gives values that probably are too small, whereas the north side gives values that may be too large. Calculations based on eight of the most complete and representative curves in the central part of the anomaly, and on the assumption of a strongly magnetic body, give an average depth on the north of 733 feet and on the south of 631 feet. The general average of all determinations is 682 feet. The true depth probably is on the order of 700 feet but could be greater.

The material overlying the magnetic body may be all alluvium, that is, the body may lie at the buried rock surface. Certain features of the magnetic anomaly, however, suggest that a rock pediment may be present at relatively shallow depth along the west base of the Paradise Range, in which event the magnetic body would lie well below the rock surface.

Estimates or calculations of the size of a buried body, based on an anomaly of this type, are very uncertain and are subject to possible large errors. The anomaly apparently represents a rather

large body, and estimates based on the higher magnetic contours and the form of certain of the profiles suggest the possibility that tonnages may range from 4,000,000 to perhaps 10,000,000 tons per 100 feet of depth within the magnetic body. These figures can be seriously in error if the true magnetic susceptibility differs greatly from the assumed value or if certain other factors vary.

This magnetic anomaly could be caused by a variety of geologic features, including some that would be of no economic value, such as a buried volcanic neck or certain types of volcanic flows that might lie at fairly shallow depths. Considering the general environment, however, and in particular the magnetic results, it seems probable that the anomaly is caused by magnetite mineralization at depth. Drilling will be necessary for more exact geologic determinations.

Reno, Nevada  
January 23, 1960

E. L. Stephenson  
E. L. Stephenson  
Consulting Geophysicist

Copies to: Youngstown Office  
Gabbs Office  
Reno Files