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# Analytical data on samples collected at Ambrosia Lake, New Mexico--1958 through 1962

By Harry C. Granger

Open-File Report

1966

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# Analytical data on samples collected at Ambrosia Lake, New Mexico--1958 through 1962

Harry C. Granger

## Introduction

During the period from 1958 through 1962, members of the Geological Survey collected and analyzed several hundred rock samples from the Ambrosia Lake uranium mining district, New Mexico, and nearby areas (fig. 1). All of the analytical data derived from this sampling program are being made public here.

From 1958 to 1960, geologists H. C. Granger, E. S. Santos, F. B. Moore, and B. G. Dean were associated with the project. From 1960 through 1962, the sampling and detailed study of the deposits was done by Granger and Santos.

Interpretation and evaluation of the analytical data is being done at the present time. Several papers, based in part on the sample data contained herein, have already been published (Granger and others, 1961; Granger and Santos, 1963; and Granger, 1963) and it is anticipated that we will prepare some papers in the future using parts of these data. In the meantime, this open-file report was prepared so that anyone interested in the samples and their application to the study of uranium geology in the district may obtain the analytical results.

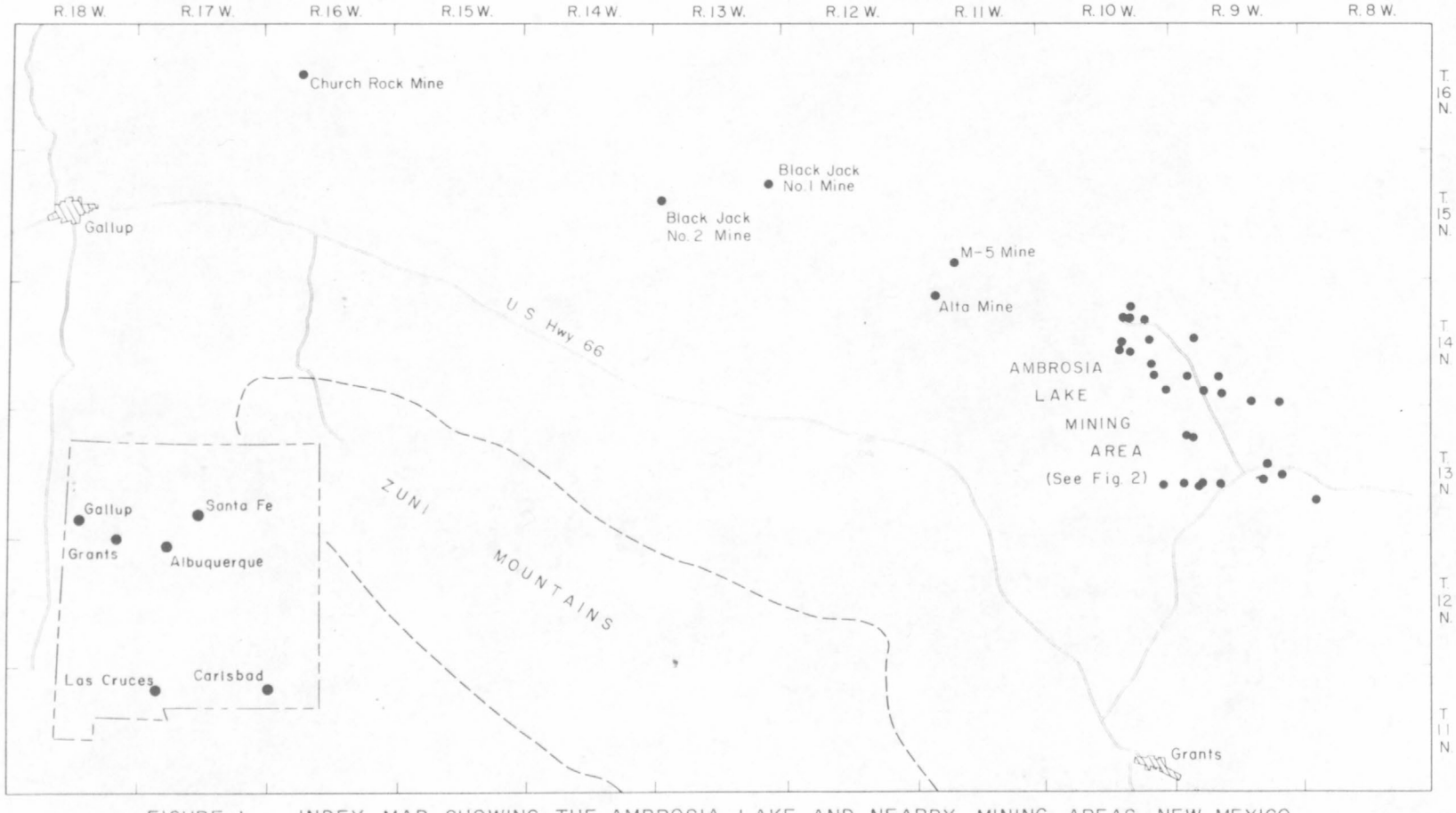



FIGURE 1.-- INDEX MAP SHOWING THE AMBROSIA LAKE AND NEARBY MINING AREAS, NEW MEXICO

This compilation is intended to be purely descriptive and no interpretation is attempted. A certain statistical treatment, however, is implicit in the graphs of selected element distribution of many of the suites.

For descriptions of the geologic setting of the Ambrosia Lake district and details of the uranium deposits the reader is referred to Granger and others (1961) and the Society of Economic Geologists Memoir 15, edited by V. C. Kelley (1963).

Permission to sample and report the results was graciously extended by the officials of all the mining companies active in the Ambrosia Lake district. To them I wish to express my sincerest appreciation. Analysts are listed in table 1.

Table 1.--List of analysts

| Analyzed for[1] | Analysts |
|---|---|
| U | H. H. Lipp; D. L. Ferguson; E. J. Fennelly; J. J. Warr, Jr. (uraninite only) |
| eU[2] | L. M. Lee; W. Mountjoy; E. J. Fennelly |
| V | H. H. Lipp; W. D. Goss; W. Mountjoy; A. J. Bartel |
| Mo | D. L. Ferguson; C. Huffman |
| Se | G. T. Burrow; L. F. Rader, Jr. |
| C | I. C. Frost |
| S | I. C. Frost |
| As | C. Huffman |
| Pb | H. H. Lipp; J. B. McHugh; J. J. Warr, Jr. (uraninite only) |
| Fe (total) | W. D. Goss; D. L. Skinner |
| 66 elements[3] | J. C. Hamilton; N. M. Conklin; R. G. Havens; H. J. Worthing (uraninite only) |
| U-daughters[4] | J. N. Rosholt, Jr. |

1/ Wet, chemical analyses with the following exceptions:

2/ eU determined by $\beta$-$\gamma$ radiometric analysis.

3/ 66 elements analyzed for by semiquantitative spectrographic means.

4/ Radiogenic daughter products of uranium determined by radiochemical analysis. (See Rosholt, 1957.)

## Sampling

Most samples were collected in suites to provide element distribution data on specific features associated with the ore bodies. Some isolated selected samples were taken, however, for other reasons.

The samples were generally cut quite readily with a geologist's pick and collected in clean cotton sample sacks. The mine walls from which the samples were taken were ordinarily rather fresh and clean but where dust or efflorescent minerals formed a coating on the wall, it was commonly cleaned prior to sampling at the discretion of the sampler.

All samples, with the exception of drill cores, were collected by Granger, Santos, Dean, or Moore.

An over-riding philosophy in the sampling program was to sample relatively uncomplicated simple features by means of suites which would completely span the feature and extend into adjacent rocks to such a distance that no more significant change in element distribution would be expectable. This goal was difficult to attain in sample suites where it was desirable to investigate more complicated, anomalous relations; these were commonly not completely exposed and presented individual problems that prevented simple, systematic sampling. Interpretation of element distribution in these instances is rarely as clear as in the simpler situations.

## Analytical methods

Nearly all samples were analyzed in the Denver laboratories of the Geological Survey. A few were analyzed in Washington. The procedures followed were standard procedures in practice at the time the samples were submitted.

Prior to 1962 total carbon (the sum of carbon in organic substances and carbonate-bearing minerals) was determined gasometrically after a sodium peroxide fusion. This determination had variations of as much as ± 0.3 percent in contrast to the mineral carbon analyses, which are determined gasometrically after digesting the sample in hydrochloric acid and have variations of only 0.01 percent. Any error in the total carbon determination is directly reflected in the organic carbon determination which is calculated as the difference between total and mineral carbon. Since early 1962, however, the total carbon analyses have been done by an induction furnace method and the probable error has been reduced to ± 0.05 percent C. Many of the earlier samples have been reanalyzed and corrected but, in general, the total and organic carbon analyses on samples numbered prior to 1962 (see p. 7) should be considered less precise than the later analyses.

During the early analyses it was learned that samples with organic carbon contents lower than the limits of accuracy could be recognized visually by their light shades. Many samples, therefore, were not analyzed for carbon at the discretion of the analyst. Some of these undoubtedly contained enough organic carbon to be detected by the present analytical methods but have not been so analyzed.

Results of most of the semiquantitative spectrographic analyses are reported in percent to the nearest number in the series 7, 3, 1.5, 0.7, 0.3, 0.15, etc., which represent approximate midpoints of group data on a geometric scale. The assigned group for semiquantitative results will include the true value about 60 percent of the time. A few of the data are reported in the series 1, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc., and the assigned group will include the true value about 30 percent of the time.

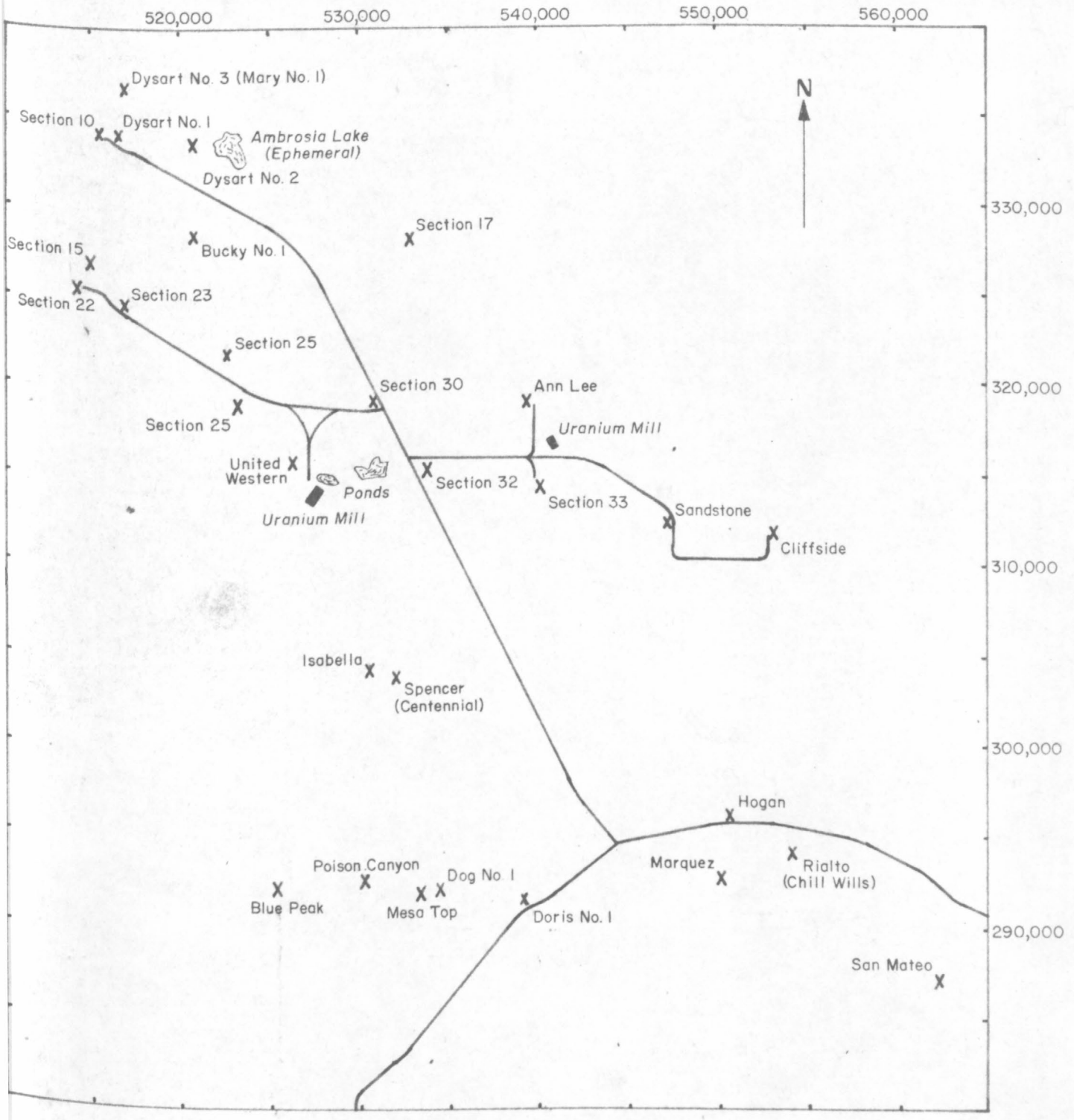



**Figure 2.--Index map of the Ambrosia Lake mining area showing uranium mines and the U.S. Atomic Energy Comm. survey grid.**

## Presentation of data

Each sample and sample suite is described in terms of sample locality, physical properties, and chemical composition. Wherever a sample suite has some continuity and seems to show some significant relationships between element distribution and geologic features, it has been illustrated and described as a suite. The distribution of selected elements in the suite has generally been shown by means of a graph. Isolated samples and some sample suites which seem to have little continuity or validity as suites are described separately as miscellaneous samples.

Largely because of the variety of processes that have acted on the rocks since the original or primary deposits were formed, as well as original differences, the samples cannot all be considered to be geologically similar; and by the same token, care should be exercised in dealing statistically with these data.

Some idea of the number of combinations of geologically significant characteristics can be gained from the following diagram.

| | Oxidized (or near oxidation) | Unoxidized | Below water table | Above water table | Mudstone | Jordisite-bearing rock |
|---|---|---|---|---|---|---|
| Prefault ore-bearing rock | x | x | x | x | x | x |
| Postfault ore-bearing rock | x | x | x | x | x | |
| Mudstone | x | x | x | x | | x |
| Barren rock | x | x | x | x | x | |
| Jordisite-bearing rock | x | x | x | x | x | |

It is assumed that the reader will most likely want to distinguish the samples on the basis of sample locality, composition of host rock, and type of ore. For this reason the miscellaneous samples and sample suites are listed in the Contents according to the mine in which they were collected. A few samples selected from diamond drill cores are also listed. All the mudstone and mudstone conglomerate samples are listed in table 2 and prefault, postfault, and barren rock suites are listed in table 3. As a further aid some of the samples and suites are distinguished by a letter in parentheses which indicates that one or more samples in the suite are mudstone (m), oxidized (o), or molybdenum-rich (j). Individual miscellaneous samples are not indexed as to prefault, postfault, or barren rock (table 3) as these are easily distinguished in the miscellaneous sample tables.

Table 4 separates the samples into two groups based on stratigraphic position. In most places there are one or more prominent mudstones several tens of feet below the top of the Westwater Canyon Member. Near the outcrop in the southern part of the district the sandstone above such a mudstone is locally called the Poison Canyon sandstone (Zitting and others, 1957). In the remainder of the district sandstones above the topmost, prominent, relatively continuous mudstone are locally referred to as Poison Canyon equivalents. In table 4 samples collected above such a mudstone are distinguished from those below.

Table 2.--Index of mudstone samples, listed by mine

| Suites | | Miscellaneous | |
|---|---|---|---|
| Mudstone | Mudstone conglomerate | Mudstone | Mudstone conglomerate |
| Sec. 30 mine<br>31F60<br><br>Cliffside mine<br>27G61h<br>27G61i<br><br>Dysart No. 1 mine<br>7G58b<br>7G58c<br><br>Marquez mine<br>11d59h<br><br>Mary No. 1 mine<br>33G61a<br>33G61b<br><br>Poison Canyon mine<br>91G61c<br>91G61d<br><br>Drill cores<br>66G62b<br>66G62c<br>66G62d<br>69G62c<br>69G62d<br>69G62e | Sec. 22 mine<br>63G59b<br><br>Sec. 30 mine<br>8-21-59h<br>60F60<br>61F60<br>70F60<br>71F60<br>76F60<br>77F60<br><br>Ann Lee mine<br>86ES59-4<br><br>Sec. 32 mine<br>9-3-59I(j)[1]<br>9-5-59a<br><br>Bucky No. 1 mine<br>19G58d<br><br>Cliffside mine<br>26G61q<br><br>Dysart No. 1 mine<br>1G58a<br>1G58b<br><br>Marquez mine<br>11d59E<br>13d59D<br>13d59G<br>14d59C<br>15d59A<br>15d59B<br><br>M-5 mine<br>57G61c<br>57G61f<br><br>Drill core<br>69G62b | Sec. 17 mine<br>77G61b<br><br>Sec. 23 mine<br>62G62b<br>63G62<br><br>Sec. 30 mine<br>9-9-59c<br><br>Alta mine<br>68G61<br><br>Ann Lee mine<br>82ES59(j)<br>80G61<br><br>Hogan mine<br>47G61(j)<br><br>M-5 mine<br>59G61<br>60G61<br><br>Poison Canyon mine<br>38G62 | Sec. 10 mine<br>5ES59C<br><br>Sec. 24 mine<br>4G61<br><br>Sec. 30 mine<br>100G61(j)<br><br>Ann Lee mine<br>62ES59a<br>62ES59b(j)<br><br>Black Jack No. 1<br>16G61(j)<br><br>Marquez mine<br>40G58<br>36d59<br>38d59A<br>45d59<br>52d59<br><br>Mesa Top mine<br>54d59 |

[1] (j) signifies a jordisite-bearing or molybdenum-rich sample.

Table 3.--Index of prefault ore, postfault ore, and barren rock suites, listed by mine

## Prefault ore suites

Sec. 10 mine
3ES59
7ES59(o)[1/]
11ES59(o)

Sec. 15 mine
9G59(o)
19G59
22G59
25G59
34G59

Sec. 17 mine
20G60

Sec. 22 mine
59G59(o)
61G59

Sec. 23 mine
62G61
63G61
122G61(o)
40G62

Sec. 25 mine
129G61
47G62

Sec. 30 mine
8-17-59
8-21-59
5-9 and 47-49F60
31-39F60
40-46F60
50-63F60
64-74F60
75-86F60

Sec. 32 mine
9-3-59A-F(j)[1/]
9-3-59H-L(m, o)[1/]
9-5-59

Ann Lee mine
28ES59
29ES59(j)
72ES59(j)
81ES59
85ES59
86ES59
87ES59
1ES60(j)
2ES60

Blue Peak mine
87G61(o)

Bucky No. 1 mine
18G58
19G58(o)
20G58(j)

Cliffside mine
26G61(o)
27G61(m)

Dog No. 1 mine
50G61

Doris No. 1 mine
30G62(o)

Dysart No. 1 mine
1G58(m)
2G58(o)
4G58(j)
7G58(m)
22ES59(o)
59ES59(j)

Marquez mine
26G58(j)
113G61(j)
10d59
11d59(m)
13d59(m)
14d59(j)
15d59

M-5 mine
57G61(o)

Sandstone mine
34G61(j)
37G61(j)

San Mateo mine
40G61

## Postfault ore suites

Sec. 15 mine
16G59
17G59
18G59
21G59
39G59(o)
40G59

Sec. 22 mine
45G59(o)
49G59(o)
54G59
55G59(o)
63G59(m)

Cliffside mine
28G61(o)

Dysart No. 1 mine
89ES59
91ES59

Isabella mine
12d60
13d60(o)

Mary No. 1 mine
28G62
29G62

## Barren suites

Sec. 15 mine
29G59(o)
30G59(o)

Sec. 22 mine
50G59
56G59

Mary No. 1 mine
33G61(m)

Poison Canyon mine
91G61(m)

Drill core
66G62(m)
69G62(m)

---

1/ (m) signifies a mudstone sample in the suite.

(j) signifies a jordisite-bearing or molybdenum-rich sample in the suite.

(o) signifies partial oxidation or proximity to oxidized rock.

Table 4.--Index of stratigraphic position of samples listed by mine[2/]

Samples from these mines were collected from the Poison Canyon sandstone, or its equivalents[1/]

Sec. 10 (sec. 10, T. 14 N., R. 10 W.)

17 (sec. 17, T. 14 N., R. 9 W.)

30 (sec. 30, T. 14 N., R. 9 W.)

Alta (sec. 15, T. 14 N., R. 11 W.)

Ann Lee (sec. 28, T. 14 N., R. 9 W.)

Black Jack No. 1 (?) (sec. 12, T. 15 N., R. 13 W.)

Blue Peak (sec. 24, T. 13 N., R. 10 W.)

Bucky No. 1 (sec. 14, T. 14 N., R. 10 W.)

Centennial (sec. 8, T. 13 N., R. 9 W.)

Dog No. 1 (sec. 20, T. 13 N., R. 9 W.)

Doris No. 1 (sec. 21, T. 13 N., R. 9 W.)

Dysart No. 1 (sec. 11, T. 14 N., R. 10 W.)

Hogan (sec. 14, T. 13 N., R. 9 W.)

Isabella (sec. 7, T. 13 N., R. 9 W.)

Marquez (sec. 23, T. 13 N., R. 9 W.)

Mary No. 1 (sec. 11, T. 14 N., R. 10 W.)

Mesa Top (sec. 20, T. 13 N., R. 9 W.)

M-5 (sec. 32, T. 15 N., R. 11 W.)

Poison Canyon (sec. 19, T. 13 N., R. 9 W.)

San Mateo (sec. 30, T. 13 N., R. 9 W.)

United Western (sec. 36, T. 14 N., R. 10 W.)

Table 4.--Index of stratigraphic position of samples listed by mine[2]--Continued

Samples from these mines were collected below the Poison Canyon sandstone, or its equivalents[1]

Sec. 15 (sec. 15, T. 14 N., R. 10 W.)

22 (sec. 22, T. 14 N., R. 10 W.)

23 (sec. 23, T. 14 N., R. 10 W.)

24 (sec. 24, T. 14 N., R. 10 W.)

25 (sec. 25, T. 14 N., R. 10 W.)

32 (sec. 32, T. 14 N., R. 9 W.)

33 (sec. 33, T. 14 N., R. 9 W.)

Cliffside (sec. 36, T. 14 N., R. 9 W.)

Sandstone (sec. 34, T. 14 N., R. 9 W.)

---

1/ Throughout most of the district sandstones of the Westwater Canyon Member above the topmost prominent mudstone layer are assumed to be the equivalent of the Poison Canyon sandstone of Zitting and others (1957), which was named from exposures in the southern part of the district.

2/ In some mines ore is found at several stratigraphic intervals throughout the Westwater Canyon Member, but prior to 1962 our sampling had been restricted to the dominant ore bodies in each mine.

Most of the samples are numbered in such a way as to define the suite, sampler, collection year, and position in the suite. For example, a sample number such as 54G59c represents the third (c) sample in suite No. 54, cut by Granger in 1959. Samplers Granger, Santos, Dean, and Moore are represented by the symbols G, ES, d, and F, respectively. In some suites a suffix number (1, 2, 3, etc.) is used to show position in the suite instead of the letters, a, b, c, etc. Moore numbered some of his early samples on the basis of the date taken; for example: 8-17-59A.

The Ambrosia Lake district has been surveyed on a grid system (fig. 2) devised by the U.S. Atomic Energy Commission and many of the mining companies have utilized this grid in compiling maps of their properties and mine workings. Wherever possible the sample localities are defined by using this grid system as shown on Company maps, and the elevation of the sample relative to mean sea level. This provides an excellent method of locating the sample sites in space and avoids the use of individual mine terminology which may be temporary in nature.

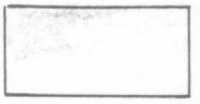
Some property owners do not show the U.S. AEC grid on their maps, but use their own grid system or some other means of survey location. For samples taken on these properties the local survey system was employed. In the southern and southeastern part of the district, for example, some properties are surveyed on a grid that originates at one corner of the section in which the mine is located.

## Explanation of illustrations

Most of the illustrations consist of a geologic diagram and one or two graphs. The geologic diagrams are vertical cross sections, to scale, of geologic features exposed on the mine walls in the immediate vicinity of the samples. The accompanying graphs show plots of analytical data for selected elements in the sample suites. The vertical scale (ordinate) of the graphs generally shows the relative positions of the samples to each other on the same scale as the diagram, although in some instances the scale has been changed for clarity. The horizontal scales (abscissa) of the graphs show the compositions in percent of the samples, in terms of certain selected extrinsic(?) elements, plotted on a logarithmic scale.

The plotted elements commonly occupy about the same range of values so that many of the graphs are quite cluttered. To help relieve this problem, two graphs accompany most of the diagrams, and the relations of separate groups of elements to uranium are shown on each graph.

Nearly all of the diagrams are accompanied by a brief explanation but this is supplemented by a master explanation (fig. 3) which shows the meaning of symbols and patterns that many of the diagrams have in common.



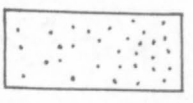
Generally indicates prefault carbonaceous uranium ore. The intensity of shading represents the value of grayness of the rock. In some instances the shading may represent some other factor than uranium ore which gives the rock various shades of gray. No shading at all indicates low-grade or barren sandstone



Molybdenum-rich rock, believed to contain the amorphous mineral jordisite which imparts a very dark-gray to black shade



Mudstone and mudstone fragments



Rock in which pyrite is oxidized to hematite or limonite (hydrous iron oxides)



Attitude of bedding and crossbedding. Shown on only a few illustrations



Diastem, local disconformity, or prominent bedding plane




Channel sample, showing "number"




Grab sample, showing "number"



Arrow shown on graphs only. Indicate values below the threshold of detectability

Figure 3.--Explanation of symbols, where not explained on individual illustrations.

## Sample descriptions

Sample descriptions are based in large part on megascopic and microscopic laboratory examination. Nearly all of the samples are either feldspathic and arkosic sandstones or montmorillonitic mudstones. Grain size was determined by direct comparison with a grain-size chart containing examples of size classifications corresponding to the Wentworth scale as given in modified form in Krumbein and Pettijohn (1938, p. 80). Color was determined by direct comparison with the "Rock-color Chart" (Goddard and others, 1948). Since rocks are ordinarily not uniformly one color and the rock colors rarely match precisely the colors in the color chart, the recorded colors represent only the best possible match, in the operator's opinion. No attempt was made to interpolate between colors illustrated in the color chart.

Other described properties of the rocks were generally considered to be the dominant characteristics readily discernible in hand specimen and under a binocular microscope at 45X magnification or less. Identification of various rock components is based on experience gained through examination of thin sections of many samples from the Ambrosia Lake district and numerous mineral identifications by X-ray and optical methods.

References

Goddard, E. N., chmn., and others, 1948, Rock-color chart: Washington, National Research Council.

Granger, H. C., Santos, E. S., Dean, B. G., and Moore, F. B., 1961, Sandstone-type uranium deposits at Ambrosia Lake, New Mexico--an interim report: Econ. Geology, v. 56, p. 1179-1210.

Granger, H. C., 1963, Radium migration and its effect on the apparent age of uranium deposits at Ambrosia Lake, New Mexico: Art. 17 in U.S. Geol. Survey Prof. Paper 475-B, p. B60-B63.

Granger, H. C., and Santos, E. S., 1963, An ore-bearing cylindrical collapse structure in the Ambrosia Lake uranium district, New Mexico: Art. 100 in U.S. Geol. Survey Prof. Paper 475-C, p. C156-C161.

Kelley, V. C., ed., 1963, Geology and technology of the Grants Uranium region: Memoir 15, The Soc. of Econ. Geologists, 277 p.

Krumbein, W. C., and Pettijohn, F. J., 1938, Manual of Sedimentary Petrography: D. Appleton-Century Company, New York.

Rosholt, J. N., Jr., 1957, Quantitative radiochemical methods for determination of the sources of natural radioactivity: Anal. Chem., v. 29, p. 1398-1408.

Zitting, R. T., and others, 1957, Geology of the Ambrosia Lake area uranium deposits, McKinley County, New Mexico: Mines Mag., v. 47, p. 53-58.

Suite No.-- 3ES59 ( A through C ) See fig. 5.

Serial No's.-- 272,709 through 272,711

Mine-- Sec. 10

Level--

Sec. 10 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 333,765 N. x 515,860 E.

Mine location-- West wall of room extending south from 467

Sample elevation-- 6,790 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- the feathery lateral termination of a prefault ore layer.

Sample descriptions:

A.--Light-brown, fine- to medium-grained, poorly sorted sandstone, with dark-grayish-brown laminae. Authigenic carbonaceous material coats sand grains and fills some interstices in the dark laminae. Disseminated pyrite common in the dark laminae, sparse elsewhere. Kaolinite nests sparse. Calcite cement abundant, especially in the light-brown rock.

B.--Light-brown, medium- to coarse-grained sandstone. Disseminated pyrite is sparse. Kaolinite nests are abundant, especially in the light-brown rock.

C.--Same as sample "B."

Suite No. 3ES 59

| Serial no. | 2720 709 | 710 | 711 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | | | | | | | |
| U | 0.24 | 0.048 | 0.043 | | | | | | | |
| eU | 0.14 | 0.049 | 0.043 | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | | | | | | | |
| $C_{Min.}$ | 2.26 | 0.60 | 0.78 | | | | | | | |
| $C_{Org.}$ | — | — | — | | | | | | | |
| Se | 0.0333 | 0.0163 | 0.0363 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | | | | | | | |
| Fe | .7 | .3 | .3 | | | | | | | |
| Mg | .3 | .15 | .15 | | | | | | | |
| Ca | 2. | 1.5 | 3. | | | | | | | |
| Na | 1.5 | .7 | 1.5 | | | | | | | |
| K | 3. | 3. | 3. | | | | | | | |
| Ti | .07 | .07 | .07 | | | | | | | |
| Mn | .15 | .03 | .07 | | | | | | | |

Suite No. 3E559 --Continued

| Serial no. / Field no. | 272, 702 A | 710 B | 711 C | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .03 | .07 | .07 | | | | | | | |
| Be | 0 | 0 | 0 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | <.005 | 0 | 0 | | | | | | | |
| Cr | .0007 | .0003 | .0003 | | | | | | | |
| Cu | .003 | .003 | .0015 | | | | | | | |
| Ga | .0003 | .0003 | .0003 | | | | | | | |
| Ge | 0 | 0 | 0 | | | | | | | |
| La | 0 | 0 | 0 | | | | | | | |
| Mo | 0 | 0 | 0 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .0015 | .0015 | .0015 | | | | | | | |
| Sc | 0 | 0 | 0 | | | | | | | |
| Sr | .03 | .015 | .015 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .15 | .07 | .03 | | | | | | | |
| Y | .003 | 0 | 0 | | | | | | | |
| Yb | - | - | .00015 | | | | | | | |
| Zr | .007 | .007 | .003 | | | | | | | |

**Suite No.--** 7ES59 ( A **through** F )

**Serial No's.--** 272,714 **through** 272,719

**Mine--** Sec. 10

**Level--**

**Sec.** 10 , **Twp.** 14 , **Rge.** 10 --

**U.S.A.E.C. Coordinates--** 334,255 **N. x** 515,530 **E.**

**Mine location--** West rib west of Δ 155. NW corner of mine.

**Sample elevation--** 6,650 ft

**Premining water table elevation--** ~6,525 ft

**Sampled to test element distribution in--** a partly oxidized prefault ore layer near its lateral termination (pinch-out). This ore may be enriched by postfault ore.

**Sample descriptions:**

A.--Dark-grayish-brown, coarse-grained sandstone. Authigenic carbonaceous material stains clay that coats many of the sand grains. Kaolinite nests and pyrite are sparse.

B.--Moderate-yellowish-brown, coarse- to very coarse grained sandstone. Abundant interstitial clay stained yellowish by limonite. Very sparse clusters of montroseite. Pyrite all destroyed.

C.--Dark-gray to black, coarse- to very coarse grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills some interstices. Disseminated pyrite and kaolinite nests are sparse. A little limonite stain and sparse flecks of a yellow secondary uranium mineral are present.

D.--Light-brown, coarse- to very coarse grained sandstone. A few scattered blebs of authigenic carbonaceous material are present. Kaolinite nests are sparse to

Suite No. 7ES59 . Sample descriptions (Continued)

common. All pyrite seems to be oxidized.

E.--Dark-brown mudstone conglomerate. Authigenic carbonaceous material is abundant in the sandstone matrix. Kaolinite nests and disseminated pyrite are sparse.

F.--Light-reddish-brown, coarse- to very coarse grained sandstone. A few small blebs of authigenic carbonaceous material remain after oxidation. Pyrite is all oxidized to limonite specks and stain.

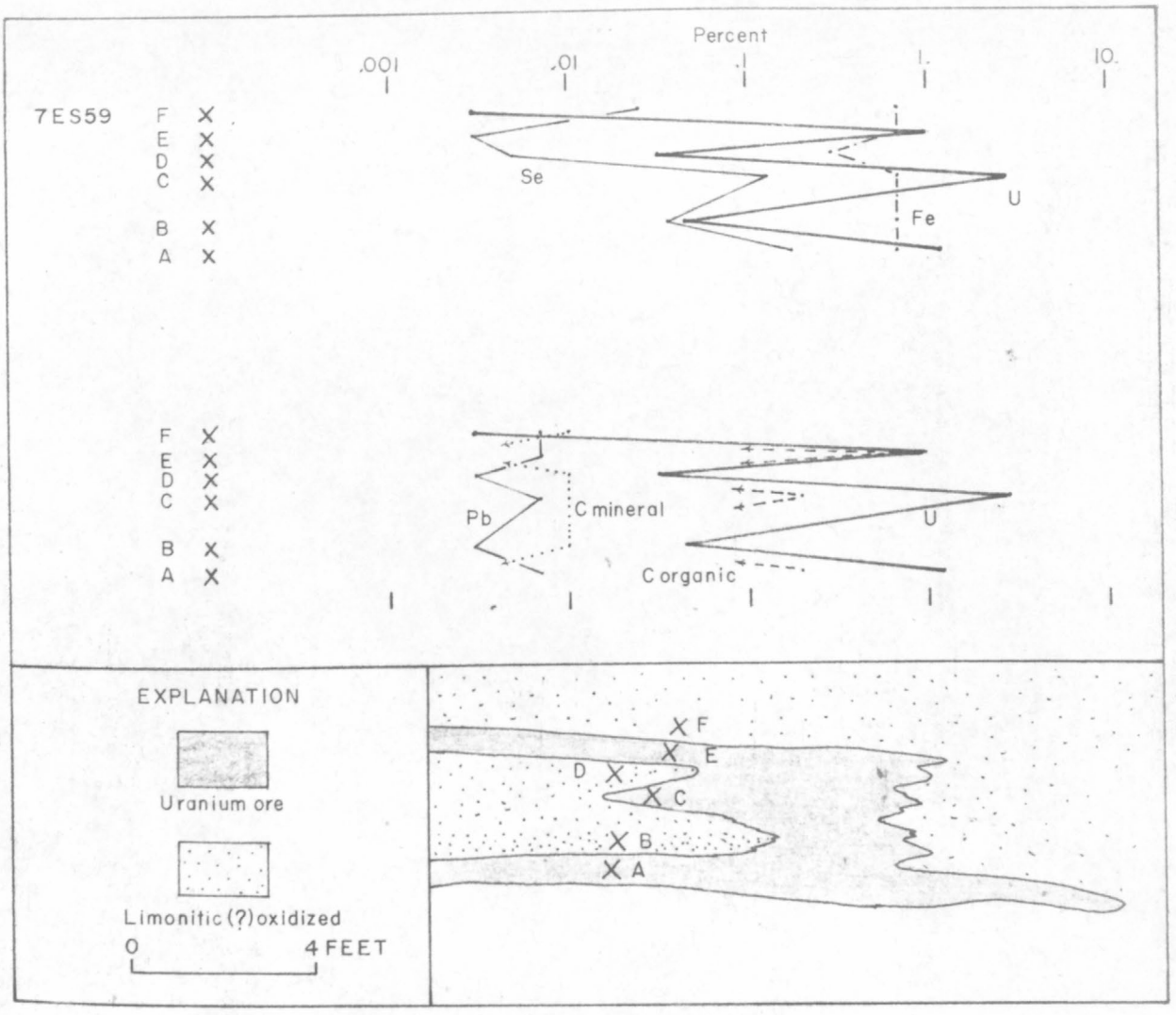



Figure 4.--Sample suite 7ES59, Section 10 mine.

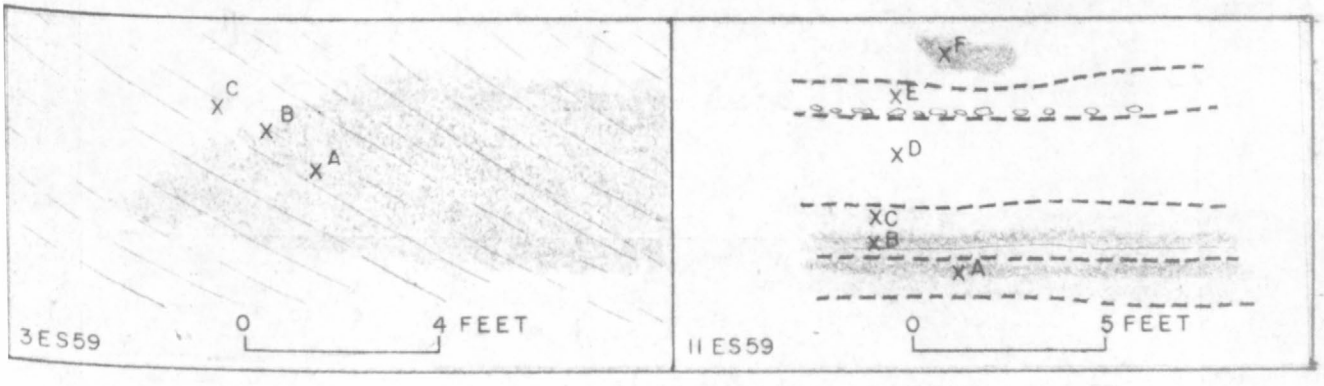



Figure 5.--Sample suites 3ES59 and 11ES59, Section 10 mine.

Suite No. 7ES59

| Serial no. / Field no. | 272, 714 A | 272, 715 B | 272, 716 C | 272, 717 D | 272, 718 E | 272, 719 F | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 1.19 | .043 | 2.64 | .031 | .99 | .003 | | | | |
| eU | .76 | .073 | 1.61 | .023 | .83 | .010 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePo^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .2 | — | .2 | — | .8 | — | | | | |
| $C_{Min.}$ | .0 | .01 | .01 | .01 | .0 | .01 | | | | |
| $C_{Org.}$ | .2 | — | .2 | — | .8 | — | | | | |
| Se | .1768 | .0354 | .1323 | .0050 | .0030 | .0240 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Fe | .7 | .7 | .7 | .3 | .7 | .7 | | | | |
| Mg | .3 | .15 | .15 | .15 | .3 | .15 | | | | |
| Ca | .15 | .15 | .15 | .07 | .15 | .15 | | | | |
| Na | 1.5 | 1.5 | .7 | .7 | 1.5 | 1.5 | | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Ti | .15 | .07 | .07 | .03 | .07 | .03 | | | | |
| Mn | .015 | .015 | .015 | .015 | .015 | .015 | | | | |

Suite No. 7ES59 --Continued

| Serial no. | 2722 714 | 715 | 716 | 717 | 718 | 719 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | .00015 | .00015 | .00015 | .0003 | .0003 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.005 | 0 | <.005 | 0 | <.005 | 0 | | | | |
| Cr | .0007 | .0003 | .0007 | .0003 | .0007 | .0003 | | | | |
| Cu | .0007 | .0003 | .0007 | .0003 | .0007 | .0007 | | | | |
| Ga | .0007 | .0003 | .0003 | .0003 | .0007 | .0003 | | | | |
| Ge | <.005 | 0 | <.005 | 0 | <.005 | 0 | | | | |
| La | .003 | 0 | .003 | 0 | .003 | .003 | | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | .007 | .003 | .007 | .003 | .007 | .007 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .03 | .015 | .03 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .15 | .07 | .3 | .15 | .15 | .07 | | | | |
| Y | .003 | 0 | .0015 | 0 | 0 | 0 | | | | |
| Yb | — | — | — | — | — | — | | | | |
| Zr | .007 | .007 | .015 | .007 | .007 | .007 | | | | |

Suite No.-- 11ES59 ( A through F ) See fig. 5.

Serial No's.-- 272,720 through 272,725

Mine-- Sec. 10

Level--

Sec. 10 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 333,410 N. x 515,605 E.

Mine location-- Corner due N. of Sta. A-149

Sample elevation-- 6,735 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- Thin black prefault ore extending into low-grade postfault redistributed ore.

Sample descriptions:

A.--Medium-gray, fine-grained, silty sandstone. Kaolinite nests and disseminated pyrite are sparse.

B.--Dark-gray to black, medium-grained sandstone. Authigenic carbonaceous material coats sand grains and locally fills interstices. Calcite cement is abundant. Kaolinite nests and pyrite are common.

C.--Medium-gray and yellowish-brown, medium-grained, partly oxidized sandstone. Authigenic carbonaceous material occurs as remanent widely scattered blebs. Sand grains in the yellowish areas are coated with a thin limonitic film. Calcite cement is abundant. Kaolinite nests are sparse. A little disseminated pyrite remains in the gray areas. Sparse aggregates of yellow secondary uranium(?) minerals were noted in the interstices.

D.--Dark-yellowish-orange, medium- to coarse-grained sandstone. Abundant films and

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Suite No. 11ES59 . Sample descriptions (Continued)

stains of limonite coat sand grains. Hematite(?) specks and films are sparse. Kaolinite nests are common. Hematite(?) pseudomorphs after pyrite are sparse. Calcite cement is sparse.

E.--Medium-gray, medium- to coarse-grained sandstone. Abundant authigenic carbonaceous material coats sand grains and fills some interstices. Poikiloblastic calcite is abundant. Kaolinite nests and very fine grained pyrite are sparse.

F.--Dark-gray, poorly sorted conglomeratic sandstone. Abundant authigenic carbonaceous material coats sand grains and fills interstices. Kaolinite nests are sparse and some are weakly stained yellow by secondary uranium (?) minerals. Anhedral disseminated pyrite is abundant.

Suite No. 11ES59

| Serial no. / Field no. | 272, 720 A | 721 B | 722 C | 723 D | 724 E | 725 F | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | ~~.002~~ ~~.008~~ | .20 | .021 | .001 | .38 | .73 | | | | |
| eU | .012 | .14 | .031 | .005 | .25 | .47 | | | | |
| ePa231 | | | | | | | | | | |
| eTh230 | | | | | | | | | | |
| eRa226 | | | | | | | | | | |
| eRn222 | | | | | | | | | | |
| ePb210 | | | | | | | | | | |
| | | | | | | | | | | |
| CTotal | .2 | 1.6 | — | — | 3.1 | 1.0 | | | | |
| CMin. | ~~.13~~ | 1.38 | 2.68 | .10 | 2.95 | .20 | | | | |
| COrg. | ~~<.2~~ | .2 | — | — | <.2 | .8 | | | | |
| Se | .0012 | .0025 | .0142 | .0008 | .0015 | .0188 | | | | |
| Mo | <.001 | <.001 | <.001 | <.001 | .033 | <.001 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 1.5 | 1.5 | 3. | 1.5 | | | | |
| Fe | .3 | 1.5 | .3 | .3 | .3 | 1.5 | | | | |
| Mg | 1.5 | .3 | .02 | .15 | .15 | .3 | | | | |
| Ca | .7 | 3. | 3. | .3 | 2. | .7 | | | | |
| Na | .7 | .7 | .7 | .7 | 1.5 | .7 | | | | |
| K | 1.5 | 3. | 1.5 | 1.5 | 3. | 1.5 | | | | |
| Ti | .3 | .03 | .015 | .02 | .07 | .07 | | | | |
| Mn | .03 | .02 | .07 | .002 | .15 | .015 | | | | |

Suite No. 11ES59 --Continued

| Serial no. / Field no. | 272, 720 A | 721 B | 722 C | 723 D | 724 E | 725 F | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .03 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | 0 | 0 | .0015 | .0015 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | d | | | | |
| Co | .0007 | 0 | 0 | 0 | <.005 | <.005 | | | | |
| Cr | .0015 | .0003 | .0003 | .0015 | .0007 | .0007 | | | | |
| Cu | .0007 | .0007 | .0003 | .0007 | .0007 | .0015 | | | | |
| Ga | .0003 | .0003 | .00015 | .00015 | .0003 | .0007 | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | <.005 | | | | |
| La | 0 | 0 | 0 | 0 | .003 | .003 | | | | |
| Mo | 0 | .0007 | 0 | 0 | .015 | 0 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | d | | | | |
| Ni | .0003 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | 0 | .003 | .0015 | .0015 | .007 | .007 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .03 | .03 | .015 | .03 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .015 | .02 | .03 | .015 | .07 | .15 | | | | |
| Y | .0015 | .003 | .0015 | 0 | .0015 | .007 | | | | |
| Yb | .00015 | — | .00015 | .00015 | — | — | | | | |
| Zr | .03 | .003 | .0015 | .007 | .007 | .007 | | | | |

Suite No.-- 9G59 ( a through i )

Serial No's.-- 271,570 through 271,578

Mine--Section 15

Level-- 536 level

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,600 N. x 514,605 E.

Mine location--

Sample elevation-- 6,520 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--thin prefault ore layer enclosed by oxidized (postfault) sandstone.

Sample descriptions:

a.--Pale- to dark-yellowish-orange and grayish-orange, fine- to medium-grained oxidized sandstone. Kaolinite nests as much as 6 mm across are common. Rock is friable.

b.--Same as "a" except a little harder and there is a larger proportion of medium grains.

c.--Very pale-orange to very light-gray, medium-grained, bleached sandstone with streaks and patches of moderate red (Se) stain. Nearby this zone is characterized by red stain on oxidized sandstone without apparent bleaching. Well cemented by poikiloblastic calcite; grains to .5 cm across.

d.--Grayish-black, fine- to medium-grained ore sandstone. Well cemented by poikiloblastic calcite with smaller grain size than in "c." Sparse very finely disseminated pyrite.

.--Same as "d."

Suite No. 9G59 . Sample descriptions (Continued)

f.--Same as "d."

g.--Same as "c."

h.--Same as "a."

i.--Same as "a."

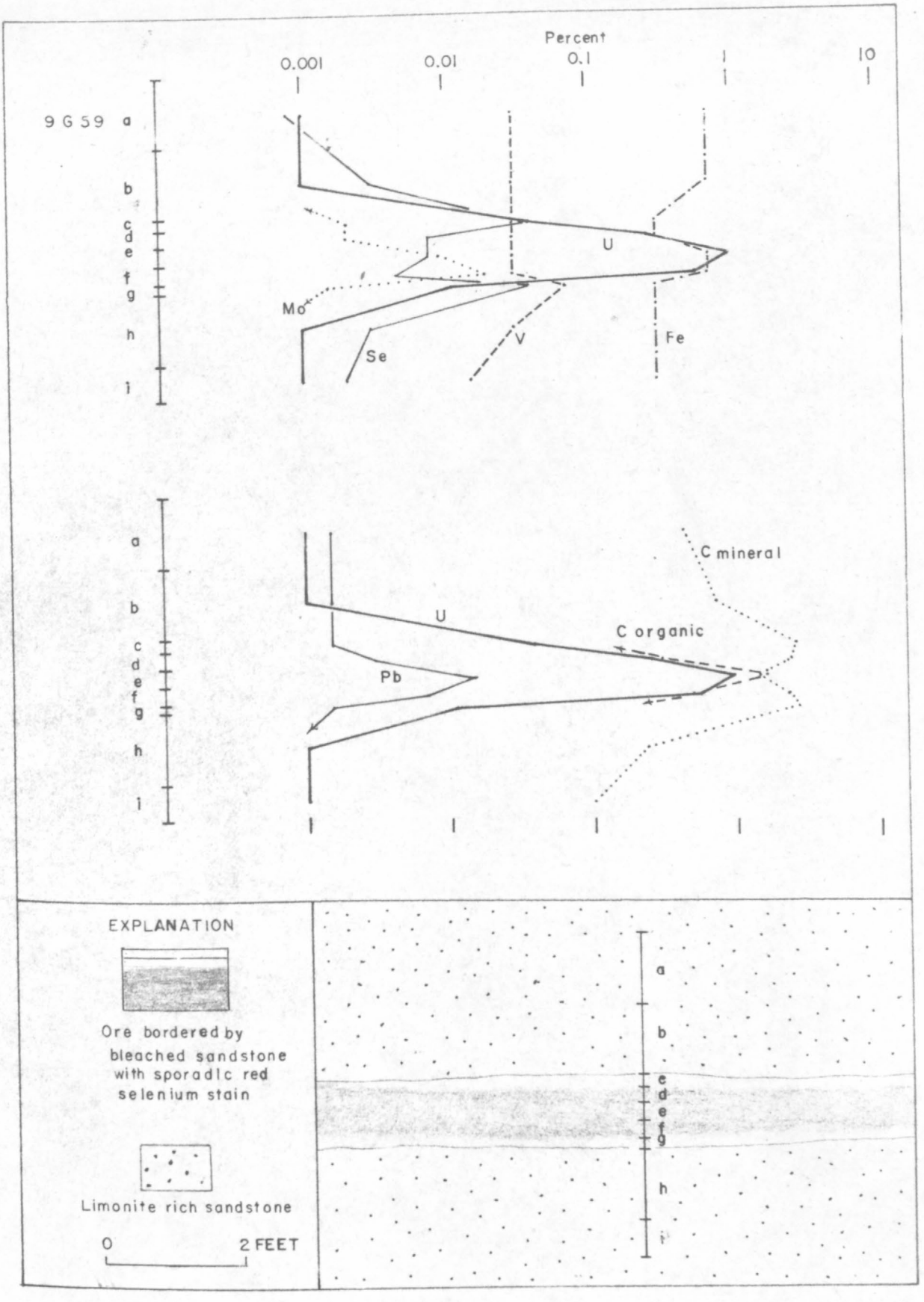



Figure 6.--Sample suite 9G59, Section 15 mine.

Suite No. 9659

| Serial no. / Field no. | 5570 a | 5571 b | 5572 c | 5573 d | 5574 e | 5575 f | 5576 g | 5577 h | 5578 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.001 | 0.001 | 0.038 | 0.26 | 0.99 | 0.57 | 0.011 | 0.001 | 0.001 | |
| eU | 0.006 | 0.014 | 0.053 | 0.17 | 0.57 | 0.34 | 0.047 | 0.027 | 0.004 | |
| $ePa^{231}$ | 0.001 | 0.008 | ~~0.045~~ <0.001 | 0.24 | 0.99 | 0.65 ~~0.12~~ | 0.010 ~~0.5~~ | 0.014 | 0.005 | |
| $eTh^{230}$ | 0.002 | <0.001 | 0.040 | 0.23 | 0.94 | 0.61 | 0.012 | <0.001 | 0.001 | |
| $eRa^{226}$ | 0.011 | 0.042 | 0.14 | 0.21 | 0.51 | 0.37 | 0.10 | 0.072 | 0.007 | |
| $eRh^{222}$ | 0.01 | 0.03 | 0.08 | 0.10 | 0.23 | 0.19 | 0.08 | 0.05 | 0.01 | |
| $ePb^{210}$ | 0.007 | 0.042 | 0.11 | 0.18 | 0.47 | 0.33 | 0.10 | 0.062 | 0.007 | |
| | | | | | | | | | | |
| $C_{Total}$ | 0.43 | 0.72 | 2.54 | 2.6 | 3.1 | 2.7 | 2.67 | 0.35 | 0.15 | |
| $C_{Min.}$ | 0.43 | 0.72 | 2.53 | 2.31 | 1.45 | 2.21 | 2.67 | 0.23 | 0.10 | |
| $C_{Org.}$ | 0 | 0 | 0.01? | 0.3 | 1.6 | 0.5 | 0 | 0.12? | 0.05? | |
| Se | 0.0008 | 0.0030 | 0.0350 | 0.0075 | 0.0075 | 0.0045 | 0.0385 | 0.0030 | 0.0020 | |
| $V_2O_5$ | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | |
| Mo | <0.001 | <0.001 | 0.002 | 0.002 | 0.009 | 0.019 | <0.001 | <0.001 | <0.001 | |
| S[1] | <0.01 | <0.01 | 0.11 | 0.28 | 0.42 | 0.50 | 0.15 | <0.01 | <0.01 | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Fe | .2 | .2 | .3 | .3 | .7 | .7 | .3 | .3 | .3 | |
| Mg | .15 | .15 | .15 | .15 | .3 | .15 | .15 | .15 | .07 | |
| Ca | 3. | 3. | 2. | 7. | 3. | 2. | 2. | 3. | .7 | |
| Na | .7 | 1.5 | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | .3 | |
| K | 1.5 | 3. | 3. | 1.5 | 3. | 3. | 3. | 1.5 | .7 | |
| Ti | .07 | .07 | .03 | .03 | .03 | .03 | .03 | .07 | .03 | |
| Mn | .015 | .03 | .02 | .07 | .03 | .07 | .15 | .015 | .007 | |

[1] - $HNO_3$ - soluble S

Suite No. 9659--Continued

| Serial no. / Field no. | 571, 570 a | 571 b | 572 c | 573 d | 574 e | 575 f | 576 g | 577 h | 578 i |
|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .03 | .07 | .07 | .07 | .07 | .03 |
| Be | 0 | 0 | 0 | 0 | .00015 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 | 0 | 0 |
| Cr | .0007 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 |
| Cu | .0003 | .0003 | .0007 | .0007 | .0007 | .0007 | 0003 | .0003 | .0003 |
| Ga | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | 0 |
| Ge | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | .003 | .003 | 0 | 0 | 0 |
| Mo | 0 | 0 | .0015 | .0015 | .007 | .015 | .0015 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .0015 | .0015 | .0015 | .003 | .015 | .007 | .0015 | 0 | 0 |
| Sc | 0 | 0 | 0 | 0 | 0 | .0007 | 0 | 0 | 0 |
| Sr | .015 | .015 | .03 | .03 | .015 | .03 | .015 | .015 | .003 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .03 | .03 | .03 | .03 | .03 | .07 | .03 | .015 |
| Y | 0 | 0 | .003 | 0 | 0 | .007 | .0015 | 0 | 0 |
| Yb | .00015 | .00015 | .0003 | 0 | 0 | .0007 | — | 0 | 0 |
| Zr | .015 | .007 | .007 | .003 | .003 | .003 | .003 | .007 | .015 |

Suite No.-- 16G59 ( a through e )

Serial No's.-- 271,921 through 271,925

Mine-- Sec. 15

Level-- Sublevel area

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 327,135 N. x 514,880 E.

Mine location--

Sample elevation-- 6,625 ft

Premining water table elevation--

Sampled to test element distribution in--a paramontroseite-filled joint above a mudstone conglomerate layer that may have controlled a perched water body during the vanadium mineralization.

Sample descriptions: All samples scraped from joint surface.

a.--Essentially barren joint.

b.--Joint walls impregnated with medium-dark-gray material.

c.--Joint wall coated with grayish-black material, a few scattered, amber, barite crystals, and a ~~dessicated~~ desiccated, cracked dull-greenish-gray clay.

d.--Grayish-black paramontroseite.

e.--Shiny black paramontroseite.

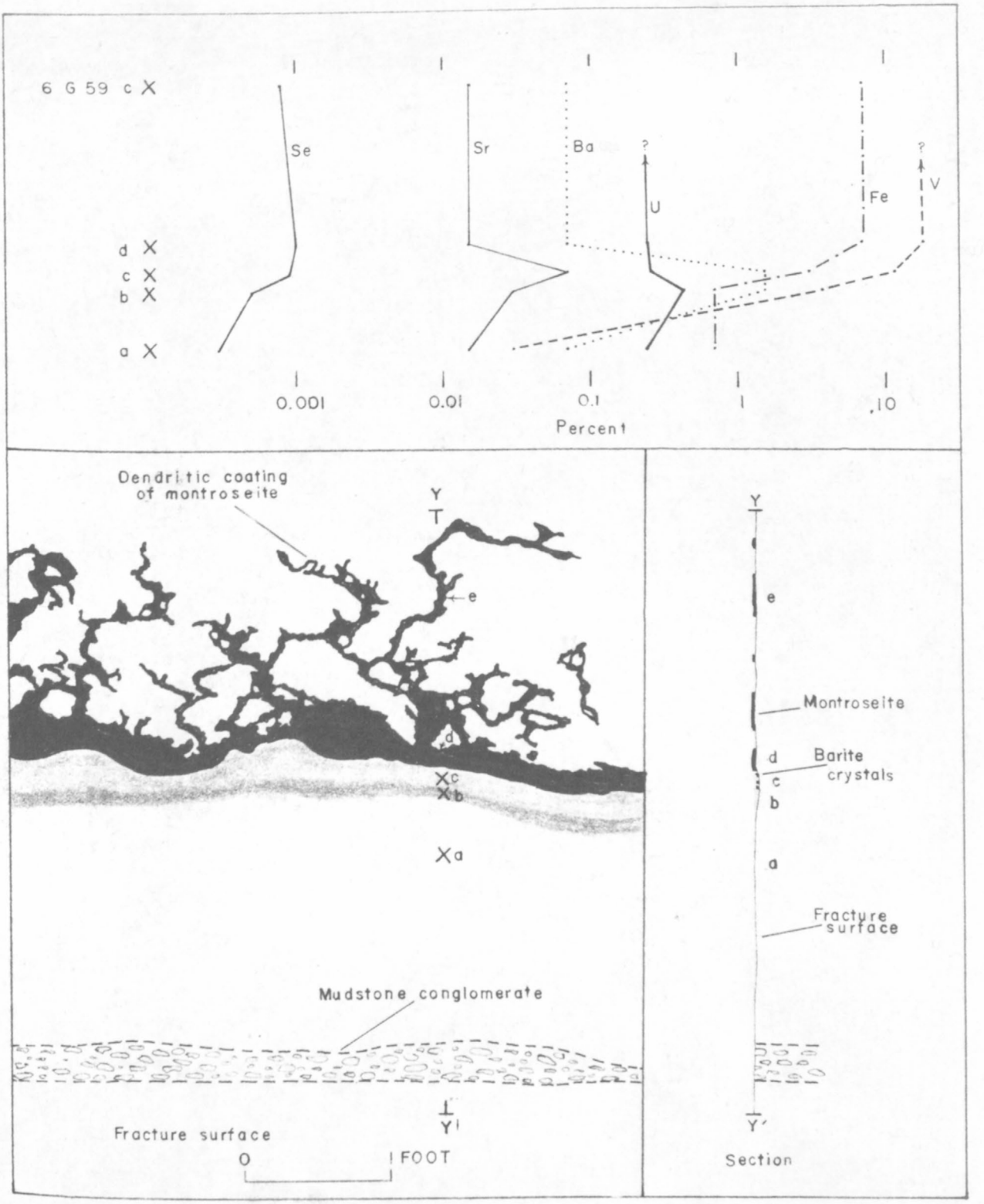



Figure 7.--Sample suite 16G59, Section 15 mine.

Suite No. 16659

| Serial no. | 27½ 921 | 922 | 923 | 924 | 925 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | | | | | |
| U | 0.23 | 0.42 | 0.25 | 0.24 | 0.35 | | | | | |
| eU | 0.10 | — | — | — | — | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | <.1 | 5.6 | 21.0 | 32.1 | — | | | | | |
| $C_{Total}$ | <.2 | .6 | .4 | .4 | .5 | | | | | |
| $C_{Min.}$ | .13 | .56 | .35 | .25 | .40 | | | | | |
| $C_{Org.}$ | <.2 | <.2 | <.2 | <.2 | <.2 | | | | | |
| Se | .0003 | .0005 | .0009 | .0010 | .0008 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | | | |
| Fe | .7 | .7 | 3. | 7. | 7. | | | | | |
| Mg | .15 | .15 | .7 | .3 | .3 | | | | | |
| Ca | .7 | 3. | 3. | 1.5 | 1.5 | | | | | |
| Na | .7 | .7 | .7 | .7 | .7 | | | | | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | | | |
| Ti | .07 | .07 | .07 | .03 | .03 | | | | | |
| Mn | .007 | .03 | .03 | .03 | .03 | | | | | |

Suite No. 16659 --Continued

| Serial no. / Field no. | 271, 921 a | 922 b | 923 c | 924 d | 925 e | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | 1.5 | 1.5 | .07 | .07 | | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | <.05 | <.05 | 0 | <.05 | | | | | |
| Co | 0 | <.005 | <.005 | <.005 | <.005 | | | | | |
| Cr | .0003 | .0015 | .003 | .003 | .0015 | | | | | |
| Cu | .0007 | .0007 | .0007 | .0003 | .0003 | | | | | |
| Ga | .0003 | .00015 | .0007 | .0015 | .0015 | | | | | |
| Ge | 0 | <.005 | <.005 | <.005 | <.005 | | | | | |
| La | 0 | 0 | 0 | 0 | 0 | | | | | |
| Mo | .0007 | 0 | 0 | 0 | 0 | | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nd | 0 | <.02 | <.02 | <.02 | <.02 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .0015 | 0 | .0015 | d | d | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .03 | .07 | .015 | .015 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .03 | 1.5 | M | M | M | | | | | |
| Y | 0 | 0 | 0 | 0 | 0 | | | | | |
| Yb | .00015 | — | — | — | — | | | | | |
| Zr | .007 | .015 | <.005 | .007 | <.005 | | | | | |

Suite No.-- 17G59 ( a through i )

Serial No's.-- 271,926 through 271,934

Mine-- Sec. 15

Level-- Sublevel area

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 327,100 N. x 514,980 E.

Mine location--

Sample elevation-- 6,625 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution ~~in~~-- across a paramontroseite-filled joint.

Sample descriptions:

a.--Light-brownish-gray, medium-grained sandstone. Kaolinite nests, 2-4 mm across, are common. Disseminated perched pyrite grains and paramontroseite needles are common. A thin brownish-gray coating on many sand grains is probably coffinite. Poikiloblastic calcite cement is abundant.

b through i.--All very similar to "a." Sample "e" contains somewhat more paramontroseite as a joint filling and impregnation for a few millimeters into the wall rock.

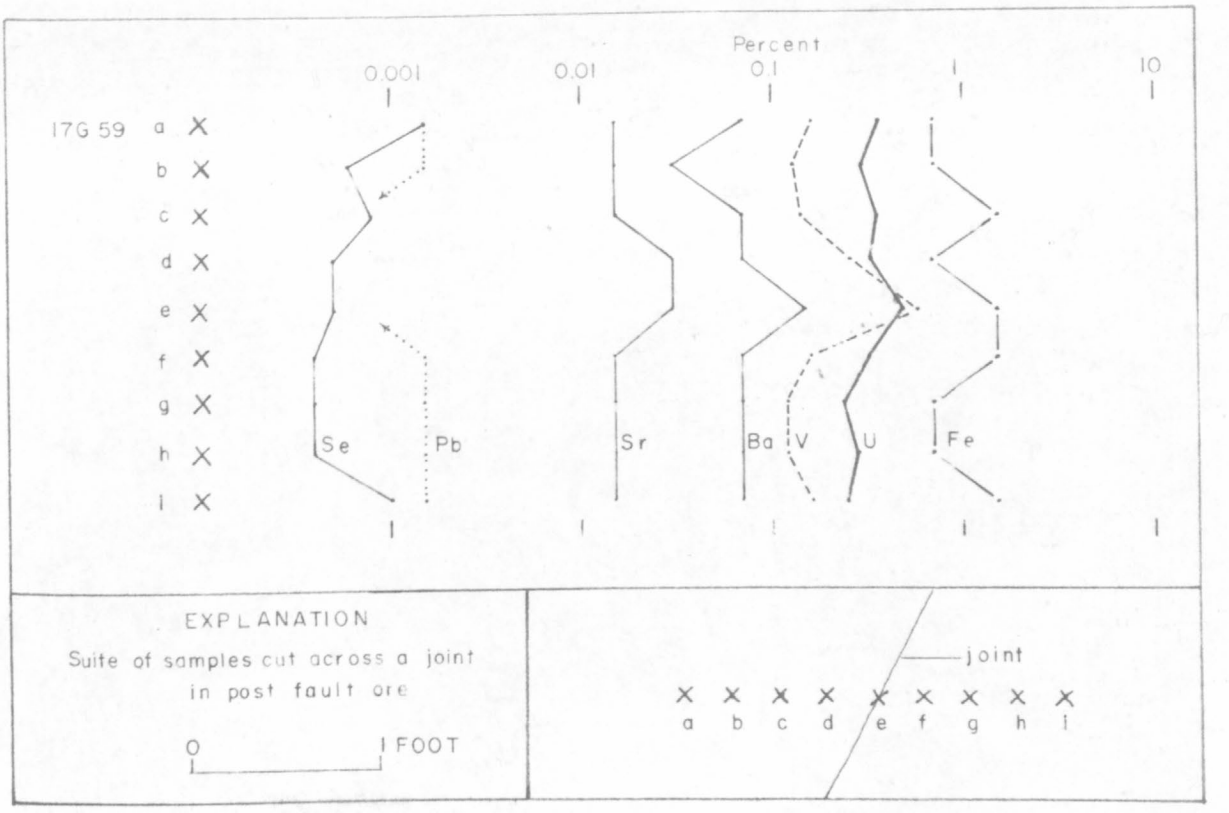



Figure 8.--Sample suite 17G59, Section 15 mine.

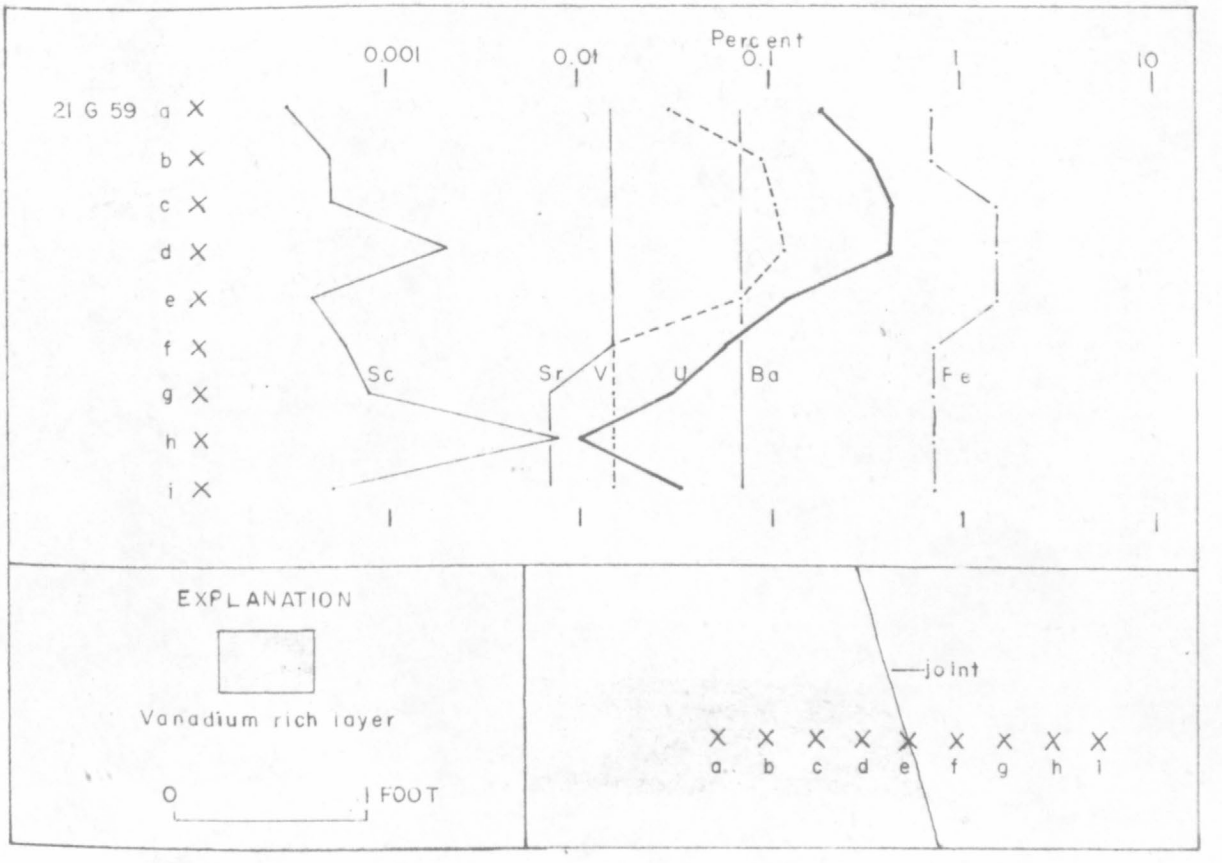



Figure 9.--Sample suite 21G59, Section 15 mine.

Suite No. 17659

| Serial no. / Field no. | 271, 926 a | 927 b | 928 c | 929 d | 930 e | 931 f | 932 g | 933 h | 934 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.30 | 0.35 | 0.32 | 0.50 | 0.31 | 0.23 | 0.28 | 0.24 | | |
| eU | .22 | .23 | .23 | .26 | .47 | .22 | .17 | .20 | .18 | |
| $ePa^{231}$ | | | .37 | | .73 | | .17 | | .11 | |
| $eTh^{230}$ | | | .40 | | .59 | | .21 | | .11 | |
| $eRa^{226}$ | | | .41 | | .43 | | .17 | | .26 | |
| $eRn^{222}$ | | | .25 | | .45 | | .12 | | .21 | |
| $ePb^{210}$ | | | .20 | | .41 | | .14 | | .19 | |
| $V_2O_5$ | .30 | .24 | .25 | .46 | 1.05 | .30 | .22 | .21 | .30 | |
| $C_{Total}$ | 1.1 | .8 | — | — | .4 | — | — | — | — | |
| $C_{Min.}$ | .98 | .78 | .43 | .54 | .33 | .34 | .81 | .82 | .16 | |
| $C_{Org.}$ | <.2 | <.2 | — | — | <.2 | — | — | — | — | |
| Se | .0015 | .0006 | .0008 | .0005 | .0005 | .0004 | .0002 | .0004 | .0010 | |
| ~~$Pa^{231}$~~ | | | ~~.37~~ | | ~~.73~~ | | ~~.17~~ | | ~~.11~~ | |
| ~~$Ta^2$~~ | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 7. | 3. | 3. | 3. | 3. | 3. | |
| Fe | .7 | .7 | 1.5 | .7 | 1.5 | 1.5 | .7 | .7 | 1.5 | |
| Mg | .3 | .15 | .3 | .3 | .3 | .3 | .3 | .3 | .3 | |
| Ca | 7. | 3. | 3. | 7. | 3. | 3. | 3. | 3. | 1.5 | |
| Na | .7 | .7 | .7 | 1.5 | .7 | .7 | .7 | 1.5 | .7 | |
| K | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .07 | .07 | .07 | .07 | .15 | .15 | .07 | .07 | .07 | |
| Mn | .03 | .03 | .015 | .015 | .015 | .015 | .03 | .03 | .015 | |

Suite No. 17659 --Continued

| Serial no. | 27½ 926 | 927 | 928 | 929 | 930 | 931 | 932 | 933 | 934 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .03 | .07 | .07 | .15 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | <.05 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | |
| Cu | .0003 | .0003 | .0007 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Ga | .0003 | .00015 | .00015 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Ge | 0 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | 0 | 0 | 0 | 0 | .0015 | 0 | 0 | 0 | |
| Nd | <.02 | 0 | 0 | 0 | 0 | <.02 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .0015 | .0015 | d | d | d | .0015 | .0015 | .0015 | .0015 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .03 | .03 | .015 | .015 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .15 | .15 | .15 | .3 | .7 | .15 | .15 | .15 | .15 | |
| Y | 0 | 0 | .0015 | .0015 | 0 | d | .0015 | d | 0 | |
| Yb | — | — | — | — | — | — | — | — | — | |
| Zr | .007 | .015 | .015 | .015 | .015 | .015 | .007 | .007 | .015 | |

Suite No.-- 18G59 ( a through h )

Serial No's.-- 271,935 through 271,942

Mine-- Sec. 15

Level-- Sublevel area

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 327,135 N. x 514,805 E.

Mine location--

Sample elevation-- 6,625 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in-- a dark layer in a postfault ore body.

Sample descriptions: Descriptions not recorded.

Samples c through f represent a darker gray layer exposed on the mine wall, on which a sparse greenish-yellow efflorescent coating had formed. The layer is within a postfault ore body. The rock surface was cleaned with a pick before sampling to eliminate the efflorescent material.

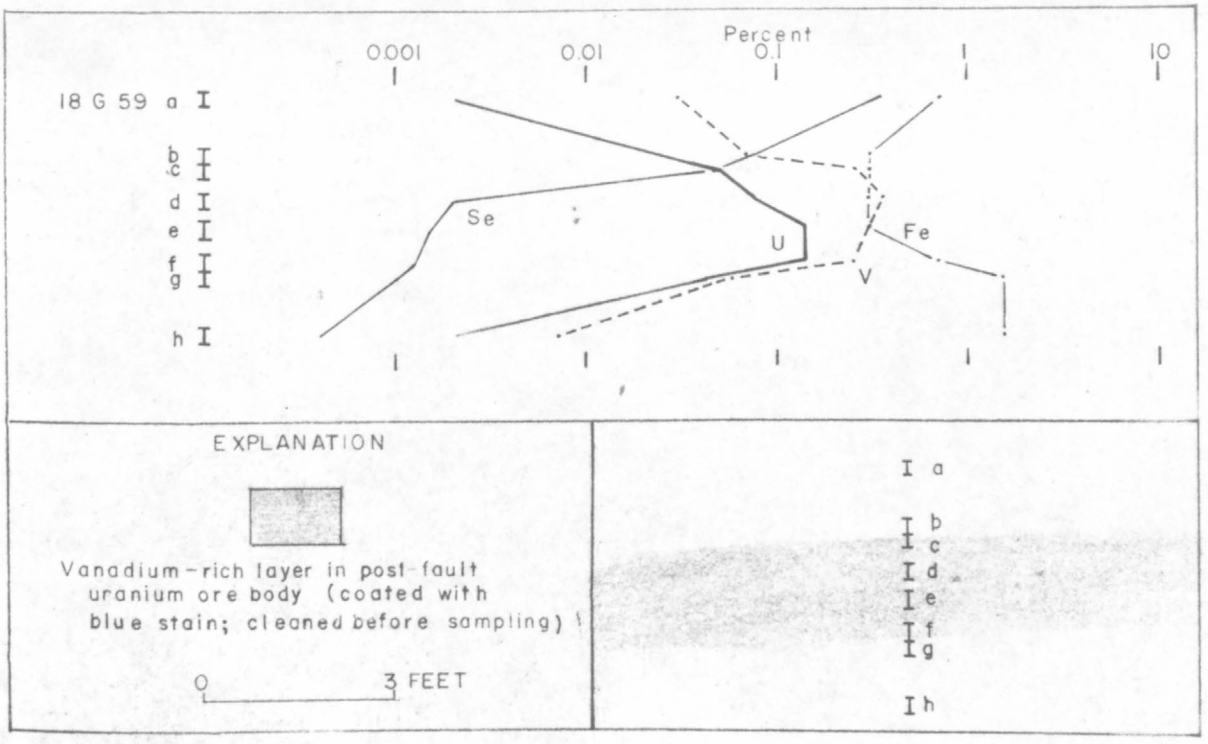



**Figure 10.--Sample suite 18G59, Section 15 mine.**

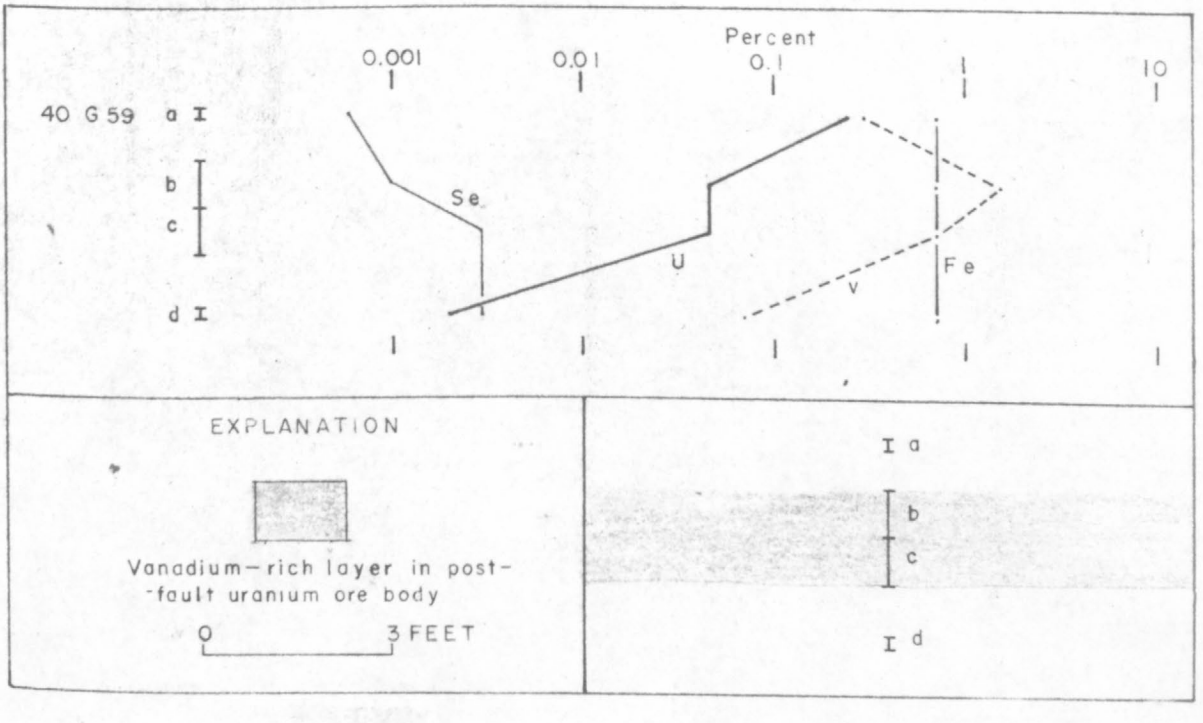



**Figure 11.--Sample suite 40G59, Section 15 mine.**

Suite No. 18659

| Serial no. | 27, 235 | 936 | 237 | 238 | 239 | 240 | 24, | 242 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | | |
| U | 2.002 | 0.024 | 0.049 | 0.072 | 0.14 | 0.14 | 0.048 | 0.002 | | |
| eU | .007 | .027 | .041 | .049 | .094 | .088 | .042 | .011 | | |
| ePa$^{231}$ | .005 | .020 | .071 | .048 | .15 | .10 | .057 | .004 | | |
| eTh$^{230}$ | .003 | .020 | .044 | .032 | .14 | .043 | .052 | .002 | | |
| eRa$^{226}$ | .006 | .018 | .050 | .027 | .057 | .058 | .037 | .017 | | |
| eRh$^{222}$ | .01 | .02 | .04 | .02 | .05 | .04 | .03 | .01 | | |
| ePb$^{210}$ | .008 | .017 | .042 | .022 | .042 | .044 | .032 | .013 | | |
| $P_2O_5$ | < .1 | .12 | .42 | .63 | .53 | .45 | .10 | < .1 | | |
| C$_{Total}$ | — | — | — | .9 | .4 | — | — | — | | |
| C$_{Min.}$ | .32 | .10 | .13 | .84 | .39 | .37 | .02 | .13 | | |
| C$_{Org.}$ | — | — | — | < .2 | < .2 | — | — | — | | |
| Se | .3600 | .0760 | .0470 | .0020 | .0015 | .0012 | .0010 | .0004 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Fe | .7 | .3 | .3 | .3 | .3 | .7 | 1.5 | 1.5 | | |
| Mg | .15 | .15 | .15 | .15 | .15 | 3 | .3 | .3 | | |
| Ca | 3. | .3 | .7 | 7. | 3. | 3. | .15 | .7 | | |
| Na | 1.5 | .7 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| K | 3 | 1.5 | 1.5 | 3. | 3. | 3. | 3. | 3. | | |
| Ti | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Mn | .015 | .007 | .007 | .03 | .015 | .015 | .007 | .015 | | |

Suite No. 18659 --Continued

| Serial no. / Field no. | 271, 235 a | 236 b | 237 c | 238 d | 239 e | 240 f | 241 g | 242 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .03 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 | 0 | | |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0015 | .0007 | .0015 | | |
| Cu | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0007 | .0007 | | |
| Ga | .0007 | .00015 | .00015 | .00015 | .0003 | .0003 | .0007 | .0007 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | .0015 | 0 | 0 | d | d | d | d | d | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | | |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .03 | .07 | .15 | .3 | .3 | .3 | .07 | .007 | | |
| Y | d | d | d | d | d | 0 | d | .0015 | | |
| Yb | — | — | — | — | — | — | — | .00015 | | |
| Zr | .007 | .007 | .003 | .003 | .003 | .007 | .007 | .007 | | |

Suite No.-- 19G59 ( a through i )

Serial No's.-- 271,952 through 271,960

Mine-- Sec. 15

Level-- 514E level

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,450 N. x 515,700 E.

Mine location--

Sample elevation-- 6,590 ft

Premining water table elevation--

Sampled to test element distribution in-- a prefault unoxidized ore layer.

Sample descriptions: Detailed descriptions not recorded.

a, b, h, and i.--Are friable, light-colored barren sandstone.

c and g.--Are brownish ore marginal to the darker central part of the ore layer.

d, e, and f.--Are prefault ore samples characterized by abundant dark-gray authigenic carbonaceous material.

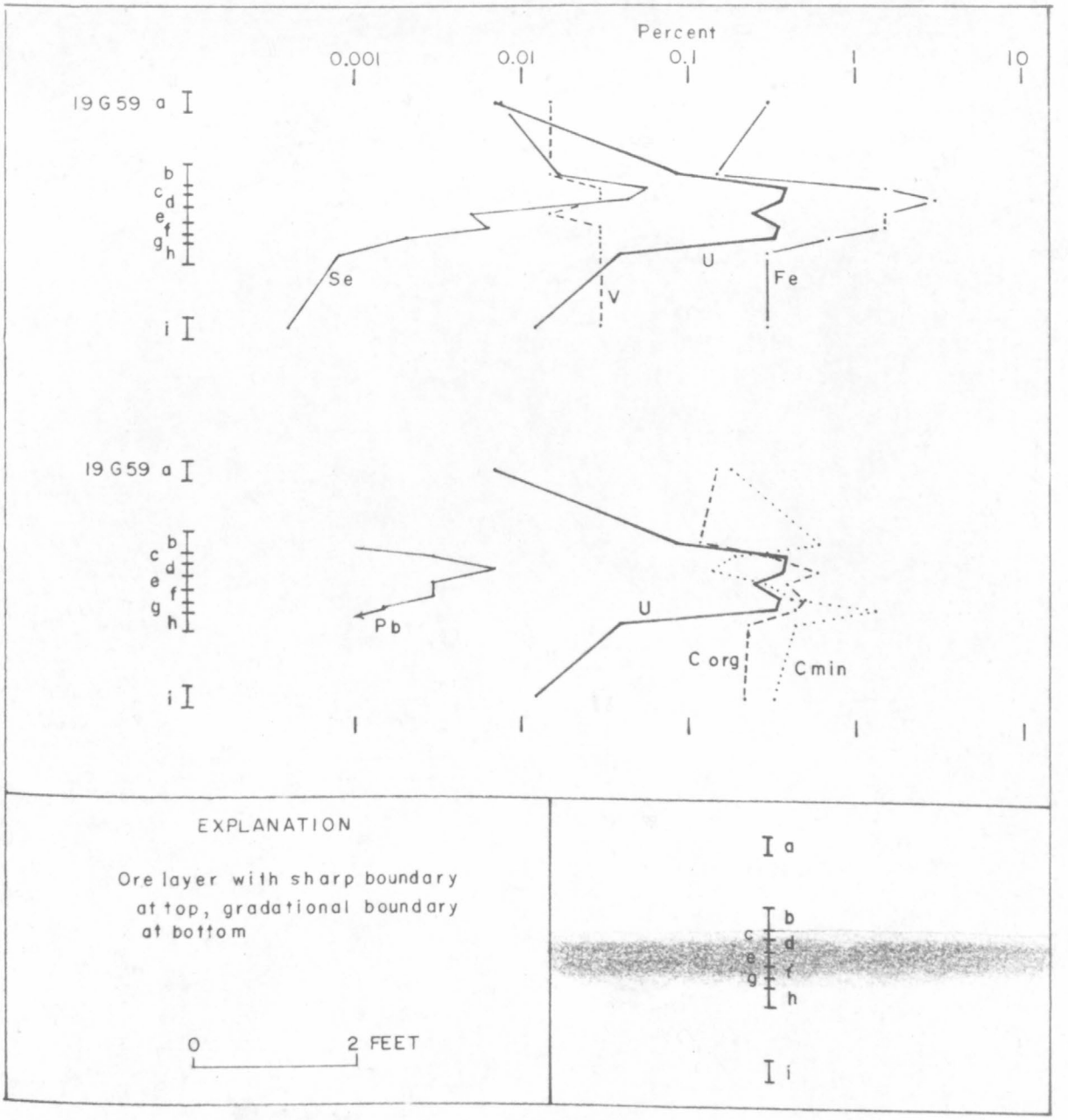



Figure 12.--Sample suite 19G59, Section 15 mine.

Suite No. 19659

| Serial no. / Field no. | 952 a | 953 b | 954 c | 955 d | 956 e | 957 f | 958 g | 959 h | 960 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.007 | 0.084 | 0.40 | 0.37 | 0.24 | 0.35 | 0.33 | 0.039 | 0.012 | |
| eU | .022 | .082 | .29 | .26 | .17 | .29 | .24 | .059 | .028 | |
| $ePa^{231}$ | .022 | .092 | .48 | .41 | .29 | .41 | .40 | .044 | .015 | |
| $eTh^{230}$ | .005 | .089 | .46 | .30 | .15 | .37 | .35 | .050 | .008 | |
| $eRa^{226}$ | .037 | .085 | .29 | .25 | .20 | .27 | .22 | .11 | .040 | |
| $eRn^{222}$ | .04 | .07 | .20 | .15 | .11 | .18 | .13 | .06 | .03 | |
| $ePb^{210}$ | .041 | .08 | .35 | .23 | .19 | .49 | .34 | .12 | .069 | |
| $V_2O_5$ | < .1 | < .1 | < .1 | < .1 | < .1 | .11 | < .1 | < .1 | < .1 | |
| $C_{Total}$ | .33 | .72 | .5 | .7 | .7 | .9 | 1.79 | .65 | .52 | |
| $C_{Min.}$ | .18 | .60 | .19 | .14 | .29 | .41 | 1.36 | .43 | .31 | |
| $C_{Org.}$ | .15 | .12 | .31 | .6 | .4 | .5 | .43 | .22 | .21 | |
| Se | .0075 | .0165 | .0558 | .0426 | .0050 | .0062 | .0020 | .0008 | .0004 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 1.5 | 3. | 3. | 3. | 3. | 1.5 | 1.5 | 1.5 | |
| Fe | .3 | .15 | 1.5 | 3. | 1.5 | 1.5 | .7 | .3 | .3 | |
| Mg | .07 | .07 | .15 | .15 | .15 | .15 | .07 | .07 | .07 | |
| Ca | .7 | 3. | .7 | .7 | .7 | 3. | 3. | 3. | .7 | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .07 | .03 | .07 | .07 | .03 | .07 | .07 | .03 | .03 | |
| Mn | .007 | .015 | .007 | .007 | .007 | .015 | .015 | .007 | .007 | |

Suite No. 19459 --Continued

| Serial no. / Field no. | 271, 952 a | 953 b | 954 c | 955 d | 956 e | 957 f | 958 g | 959 h | 960 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | <.005 | <.005 | 0 | <.005 | <.005 | 0 | 0 | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0003 | .0007 | .0007 | .0003 | .0003 | |
| Cu | .00015 | .00015 | .0003 | .0007 | .0003 | .0015 | .0007 | .0015 | .0003 | |
| Ga | .00015 | 0 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | .0007 | 0 | 0 | 0 | 0 | |
| Pb | 0 | 0 | .003 | .007 | .003 | .003 | .0015 | 0 | 0 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .007 | .007 | .007 | .007 | .007 | .007 | .015 | .015 | .007 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .015 | .015 | .03 | .03 | .015 | .03 | .03 | .03 | .03 | |
| Y | 0 | 0 | .007 | .003 | .007 | .007 | .003 | 0 | 0 | |
| Yb | .00015 | .00015 | .0007 | .0003 | .0003 | .0007 | .0003 | .00015 | .00015 | |
| Zr | .015 | .007 | .015 | .015 | .007 | .015 | .007 | .003 | .003 | |

Suite No.-- 21G59 ( a through i ) See fig. 9.

Serial No's.-- 271,943 through 271,951

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,555 N. x 514,850 E.

Mine location--

Sample elevation--6,525 ft

Premining water table elevation-- ~ 6,550 ft

Sampled to test element distribution ~~in~~--across a fracture in a postfault ore body below the water table.

Sample descriptions: Detailed descriptions not recorded.

Samples a through d are in a pale-brown layer that is apparently missing in samples f through i directly across the fracture.

Suite No. 21659

| Serial no. | 21, 943 | 944 | 945 | 946 | 947 | 948 | 949 | 950 | 951 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| U | 0.18 | 0.32 | 0.42 | 0.41 | 0.12 | 0.057 | 0.030 | 0.010 | 0.032 | |
| eU | .15 | .28 | .38 | .37 | .12 | .060 | .042 | .033 | .041 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | <.1 | .16 | .19 | .22 | <.1 | <.1 | <.1 | <.1 | <.1 | |
| $C_{Total}$ | — | — | — | — | — | — | — | — | — | |
| $C_{Min.}$ | .65 | .32 | .30 | .21 | .42 | .41 | .35 | .32 | .18 | |
| $C_{Org.}$ | — | — | — | — | — | — | — | — | — | |
| Se | .0003 | .0005 | .0005 | .0020 | .0004 | .0006 | .0008 | .0075 | .0005 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 1.5 | 3. | 3. | |
| Fe | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | .7 | .7 | .7 | |
| Mg | .15 | .15 | .15 | .3 | .3 | .15 | .07 | .15 | .07 | |
| Ca | 3. | 1.5 | 1.5 | .7 | 3. | 3. | 1.5 | .7 | .7 | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | |
| K | 3. | 3. | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .07 | .07 | .07 | .07 | .07 | .07 | .03 | .03 | .07 | |
| Mn | .015 | .007 | .007 | .007 | .015 | .007 | .007 | .007 | .007 | |

Suite No. 21659 --Continued

| Serial no. / Field no. | 943 a | 944 b | 945 c | 946 d | 947 e | 948 f | 949 g | 950 h | 951 i |
|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | 0 | 0 |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 |
| Cu | .0003 | .0007 | .0003 | .0003 | .0007 | .0007 | .0003 | .0003 | .0003 |
| Ga | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .00015 | .00015 | .0003 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | d | d | d | d | d | d | d | d | d |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .007 | .007 | .007 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .07 | .07 | .07 | .07 | .015 | .015 | .015 | .015 |
| Y | d | 0 | 0 | 0 | .0015 | 0 | 0 | 0 | 0 |
| Yb | .00015 | — | — | — | — | 0 | 0 | 0 | 0 |
| Zr | .007 | .003 | .007 | .007 | .003 | .007 | .003 | .003 | .003 |

Suite No.-- 22G59 ( a through h )

Serial No's.-- 271,961 through 271,968

Mine-- Sec. 15

Level-- 536E

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,430 N. x 515,330 E.

Mine location--

Sample elevation-- 6,560 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--a prefault ore layer.

Sample descriptions: Detailed descriptions not recorded.

Samples a, b, and h are in light-colored, seemingly barren sandstone.

Sample c is brownish ore marginal to the ore layer.

Sample "d" is in dark-gray ore and between "d" and "g" the ore grades from dark gray to yellowish brown and has a leached appearance.

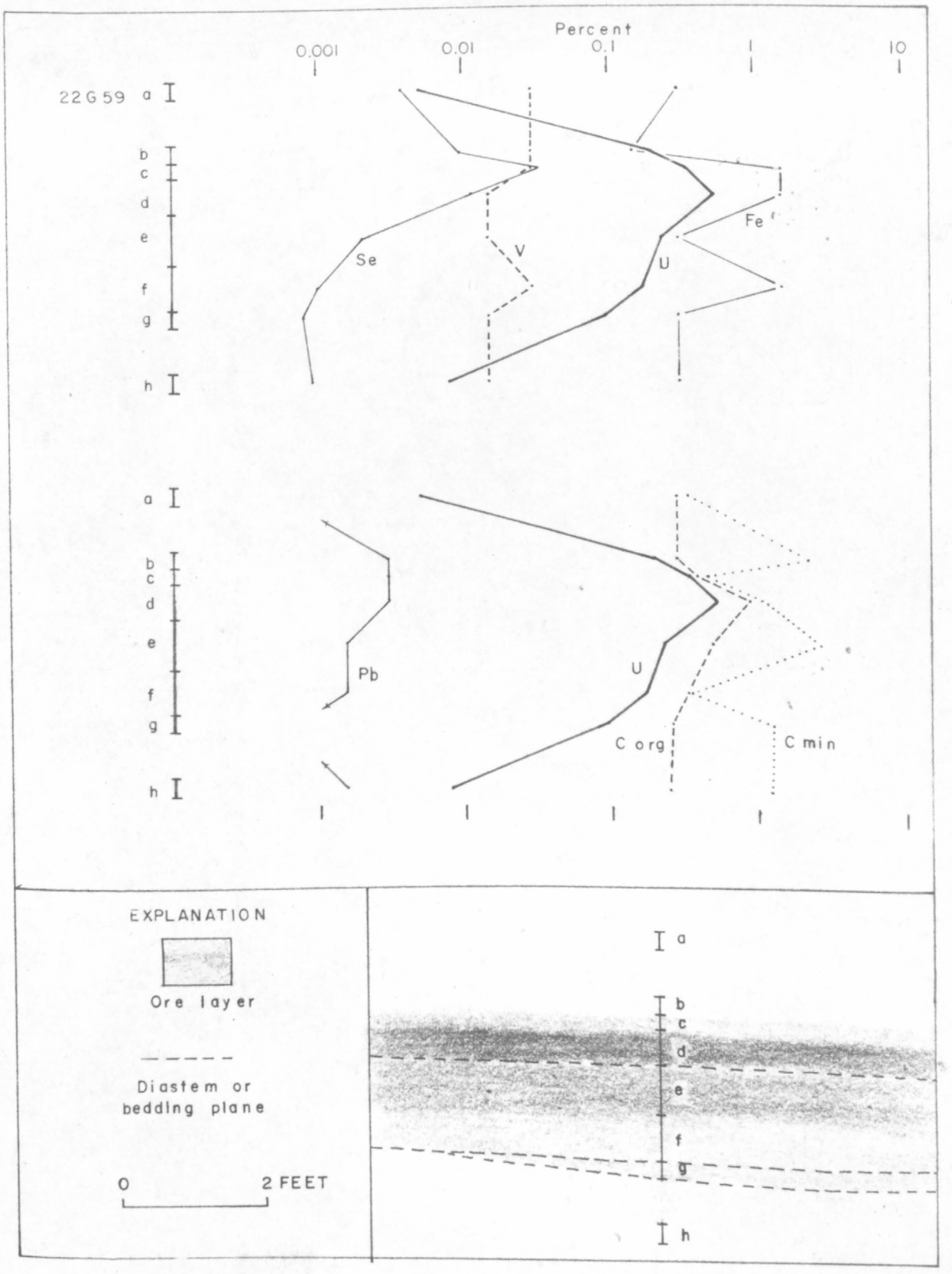



Figure 13.--Sample suite 22G59, Section 15 mine.

Suite No. 22659

| Serial no. / Field no. | 271, 961 a | 962 b | 963 c | 964 d | 965 e | 966 f | 967 g | 968 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.005 | 0.20 | 0.33 | 0.51 | 0.22 | 0.17 | 0.093 | 0.008 | | |
| eU | .026 | .18 | .29 | .31 | .20 | .12 | .089 | .025 | | |
| $ePa^{231}$ | .008 | .28 | .38 | .49 | .27 | .14 | .10 | .029 | | |
| $eTh^{230}$ | .004 | .22 | .41 | .48 | .21 | .19 | .11 | .004 | | |
| $eRa^{226}$ | .047 | .25 | .38 | .36 | .28 | .16 | .13 | .044 | | |
| $eRn^{222}$ | .03 | .09 | .18 | .23 | .20 | .12 | .09 | .04 | | |
| $ePb^{210}$ | .045 | .21 | .32 | .33 | .26 | .15 | .10 | .046 | | |
| $\sqrt{}_2O_5$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | $\leq .1$ | | |
| $C_{Total}$ | .61 | 2.45 | .8 | 1.9 | 3.1 | .65 | 1.50 | 1.46 | | |
| $C_{Min.}$ | .33 | 2.17 | .45 | 1.05 | 2.64 | .33 | 1.25 | 1.22 | | |
| $C_{Org.}$ | .28 | .28 | .4 | .9 | .5 | .32 | .25 | .24 | | |
| Se | .0038 | .0095 | .0319 | .0117 | .0020 | .0010 | .0008 | .0009 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 3. | 1.5 | 3. | | |
| Fe | .3 | .15 | 1.5 | 1.5 | .3 | 1.5 | .3 | .3 | | |
| Mg | .07 | .07 | .07 | .15 | .07 | .15 | .07 | .07 | | |
| Ca | .7 | 3. | 3. | 3. | 7. | .7 | 3. | 3. | | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 3. | | |
| Ti | .03 | .07 | .07 | .07 | .03 | .03 | .03 | .03 | | |
| Mn | .015 | .03 | .015 | .015 | .07 | .015 | .015 | .015 | | |

Suite No. 22659 --Continued

| Serial no. | 271 961 | 962 | 963 | 964 | 965 | 966 | 967 | 968 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .03 | .07 | .03 | .03 | .07 | .07 | .07 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | 0 | | |
| Cr | .0003 | .0007 | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 | | |
| Cu | .00015 | .0007 | .0003 | .0003 | .0003 | .0007 | .0007 | .0007 | | |
| Ga | 0 | 0 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | 0 | .003 | .003 | .003 | .0015 | .0015 | 0 | .0015 | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sr | .015 | .03 | .015 | .015 | .03 | .015 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .03 | .03 | .03 | .015 | .015 | .03 | .015 | .015 | | |
| Y | 0 | 0 | .007 | .0015 | 0 | .003 | .0015 | .0015 | | |
| Yb | .00015 | .00015 | .0007 | .0003 | 0 | .0003 | .00015 | .00015 | | |
| Zr | .003 | .007 | .007 | .015 | .003 | .003 | .003 | .003 | | |

Suite No.-- 25G59 ( a through l )

Serial No's.-- 276,625 through 276,636

Mine-- Sec. 15

Level-- Sublevel above 514E

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,650 N. x 515,490 E.

Mine location-- #4 x c off #7 incline.

Sample elevation-- ~6,615 ft

Premining water table elevation-- ~6,550

Sampled to test element distribution in-- a prefault ore layer containing "mottled ore" at an S-type roll.

Sample descriptions:

a.--Light-gray, medium- to very coarse-grained sandstone. Kaolinite nests several millimeters across are common. Calcite cement and disseminated pyrite are sparse.

b.--Light-gray to light-olive-gray, medium-grained sandstone. Very little kaolinite, calcite cement, or disseminated pyrite.

c.--Light-gray to medium-light-gray, medium- to fine-grained sandstone. Well cemented with poikiloblastic calcite. Pyrite is sparse. Some sand grains, in streaks parallel to the bedding, have a thin gray coat of unknown material.

d.--Medium-gray to medium-light-gray, fine- to medium-grained sandstone. Similar to "c" except that nearly all the sand grains have a thin gray coating.

e.--Mottled dark-gray and very light-gray, fine- to medium-grained sandstone. Sand grains in the dark-gray zones are coated with authigenic carbonaceous material. A little disseminated pyrite is present. The entire rock is cemented by

Suite No. 25G59 . Sample descriptions (Continued)

"poikiloblastic" calcite.

f.--Medium-gray to medium-light-gray, fine- to medium-grained ore sandstone. Each sand grain is coated with authigenic carbonaceous material. A little disseminated pyrite is present. Remaining pore spaces are filled with kaolinite.

g.--Same as "f" except that rock is a uniform medium gray.

h.--Same as "e."

i.--Medium-light-gray, fine- to medium-grained sandstone. Calcite cement is abundant. Kaolinite nests are common.

j.--Pale-yellowish-brown, medium-grained sandstone. Quartz overgrowths are common. Some disseminated pyrite. A few kaolinite nests.

k.--Yellowish-gray to light-olive-gray, fine- to medium-grained sandstone. Quartz overgrowths are sparse. A little disseminated pyrite is present.

l.--Very light gray, fine- to medium-grained sandstone. Quartz overgrowths abundant. Sparse pyrite and kaolinite.

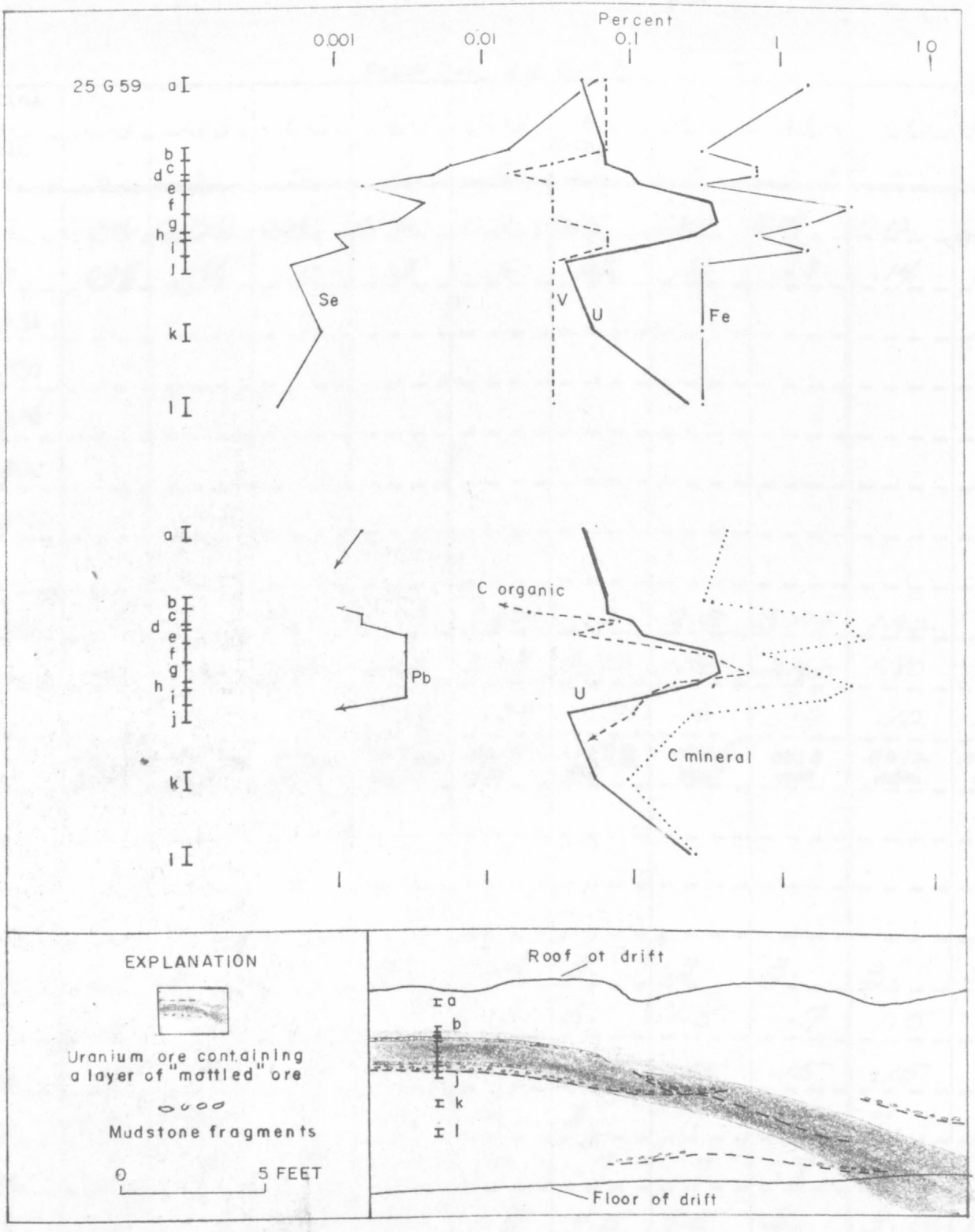



Figure 14.--Sample suite 25G59, Section 15 mine.

Suite No. 25659

| Serial no. | 276, 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | j |
| U | 0.046 | 0.066 | 0.068 | 0.10 | 0.11 | 0.34 | 0.39 | 0.27 | 0.12 | 0.036 |
| eU | .095 | .078 | .13 | .13 | .11 | .22 | .26 | .23 | .14 | .068 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | 2.97 | 2.73 | 3.32 | 1.0 | 2.3 | 3.09 | 1.92 | .34 |
| $C_{Min.}$ | .42 | .30 | 2.95 | 2.65 | 3.28 | 0.73 | 1.69 | 2.90 | 1.80 | .24 |
| $C_{Org.}$ | — | — | .02 | .08 | .04 | .3 | .6 | .19 | .12 | .10 |
| Se | .060 ~~.600~~ ** | .015 ~~.150~~ ** | .0060 ~~.060~~ | .0045 ~~.045~~ ** | .0015 ~~.015~~ | .0010 ~~.010~~ | .0025 ~~.025~~ | .0010 ~~.010~~ | .0012 ~~.012~~ | .0005 ~~.005~~ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 3. | 3. | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. |
| Fe | 1.5 | .3 | .7 | .7 | .3 | 3. | 1.5 | .7 | 1.5 | .3 |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .07 |
| Ca | 1.5 | 1.5 | M | M | M | 3. | 7. | 7. | 7. | .7 |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 3. | 3. | 1.5 |
| Ti | .15 | .07 | .07 | .15 | .07 | .07 | .15 | .07 | .15 | .07 |
| Mn | .015 | .03 | .3 | .3 | .3 | .03 | .15 | .3 | .15 | .015 |

Suite No. 25659 --Continued

| Serial no. | 276, 625 | 626 | 627 | 628 | 629 | 630 | 631 | 632 | 633 | 634 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | j |
| B | 0 | 0 | 0 | d | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .03 | .07 | .03 | .07 | .03 | .03 | .07 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | .0007 | .0007 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | 0 |
| Cr | .0007 | .0007 | .0003 | .0007 | .0003 | .0003 | .0007 | .0007 | .0007 | .0003 |
| Cu | .0015 | .0007 | .0007 | .0015 | .0007 | .0007 | .0015 | .0007 | .0007 | .0015 |
| Ga | .0003 | d | d | d | d | d | d | d | d | d |
| Ge | 0 | 0 | 0 | 0 | 0 | <.002 | <.002 | <.002 | <.002 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | d | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .0015 | d | .0015 | .0015 | .003 | .003 | .003 | .003 | .003 | d |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .015 | .03 | .03 | .015 | .015 | .015 | .015 | .03 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .07 | .03 | .015 | .03 | .03 | .03 | .07 | .07 | .03 |
| Y | d | .0015 | .007 | .003 | .0015 | d | .0015 | d | .003 | .0015 |
| Yb | — | — | .0007 | .0003 | d | d | d | — | .0003 | .00015 |
| Zr | .007 | .07 | .003 | .03 | .007 | .007 | .007 | .003 | .07 | .03 |

Suite No. 25659 (continued)

| Serial no. | 176, 635 | 634 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | k | l | | | | | | | | |
| U | 0.054 | 0.23 | | | | | | | | |
| eU | .066 | .14 | | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | | | | | | | | |
| $C_{Min.}$ | .09 | .24 | | | | | | | | |
| $C_{Org.}$ | — | — | | | | | | | | |
| Se | .0008 ~~S~~ | .0004 ~~#~~ | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 3. | | | | | | | | |
| Fe | .3 | .3 | | | | | | | | |
| Mg | .07 | .07 | | | | | | | | |
| Ca | .7 | .7 | | | | | | | | |
| Na | .3 | .7 | | | | | | | | |
| K | .7 | 1.5 | | | | | | | | |
| Ti | .15 | .07 | | | | | | | | |
| Mn | .015 | .015 | | | | | | | | |

Suite No. 25659 --Continued

| Serial no. / Field no. | 276, 635 k | 636 l | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | | | | | | | | |
| Ba | .03 | .07 | | | | | | | | |
| Be | 0 | 0 | | | | | | | | |
| Bi | 0 | 0 | | | | | | | | |
| Ce | 0 | 0 | | | | | | | | |
| Co | 0 | <.001 | | | | | | | | |
| Cr | .0003 | .0003 | | | | | | | | |
| Cu | .0003 | .0015 | | | | | | | | |
| Ga | 0 | 0 | | | | | | | | |
| Ge | 0 | <.002 | | | | | | | | |
| La | 0 | 0 | | | | | | | | |
| Mo | 0 | 0 | | | | | | | | |
| Nb | .0015 | 0 | | | | | | | | |
| Nd | 0 | 0 | | | | | | | | |
| Ni | 0 | 0 | | | | | | | | |
| Pb | d | 0 | | | | | | | | |
| Sc | 0 | 0 | | | | | | | | |
| Sr | .007 | .015 | | | | | | | | |
| Tl | 0 | 0 | | | | | | | | |
| V | .03 | .03 | | | | | | | | |
| Y | d | d | | | | | | | | |
| Yb | d | d | | | | | | | | |
| Zr | .007 | .007 | | | | | | | | |

Suite No.-- 29G59 ( a through i )

Serial No's.-- 276,653 through 276,661

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,540 N. x 515,130 E.

Mine location--

Sample elevation-- ~6,540 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--unoxidized and oxidized barren sandstone at the interface.

Sample descriptions:

a.--Very light gray, medium- to coarse-grained sandstone. Some disseminated pyrite and a few kaolinite nests.

b.--Same as "a."

c.--Same as "a."

d.--Same as "a" with a few scattered specks of limonite.

e.--Grayish-orange to dark-yellowish-orange, medium- to coarse-grained oxidized sandstone. Limonite is disseminated throughout as minute specks and stains on the sand grains. Kaolinite nests common.

f.--Same as "e."

g.--Same as "e."

h.--Same as "e."

--Grayish-orange to pale-yellowish-orange, medium- to coarse-grained oxidized

Suite No. 29G59 . Sample descriptions (Continued)

sandstone. Kaolinite nests are unstained but each sand grain is coated with a limonite film.

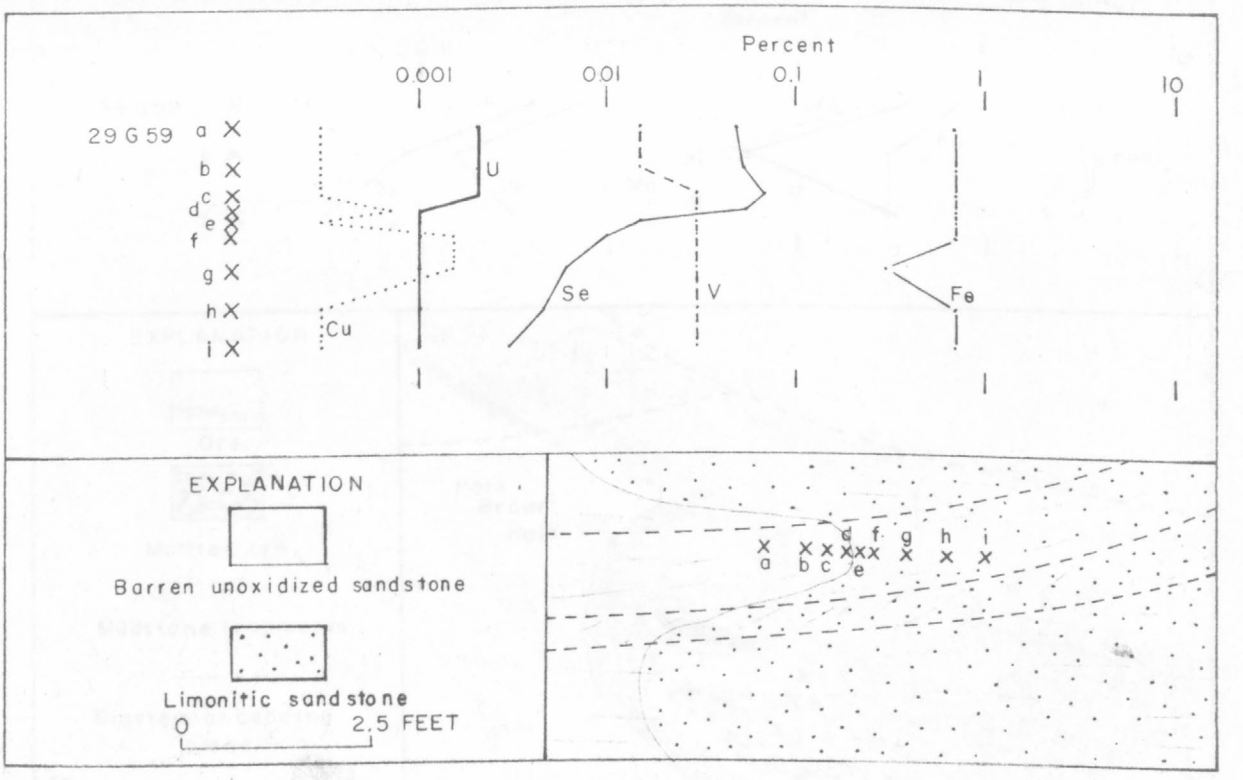



Figure 15.--Sample suite 29G59, Section 15 mine.

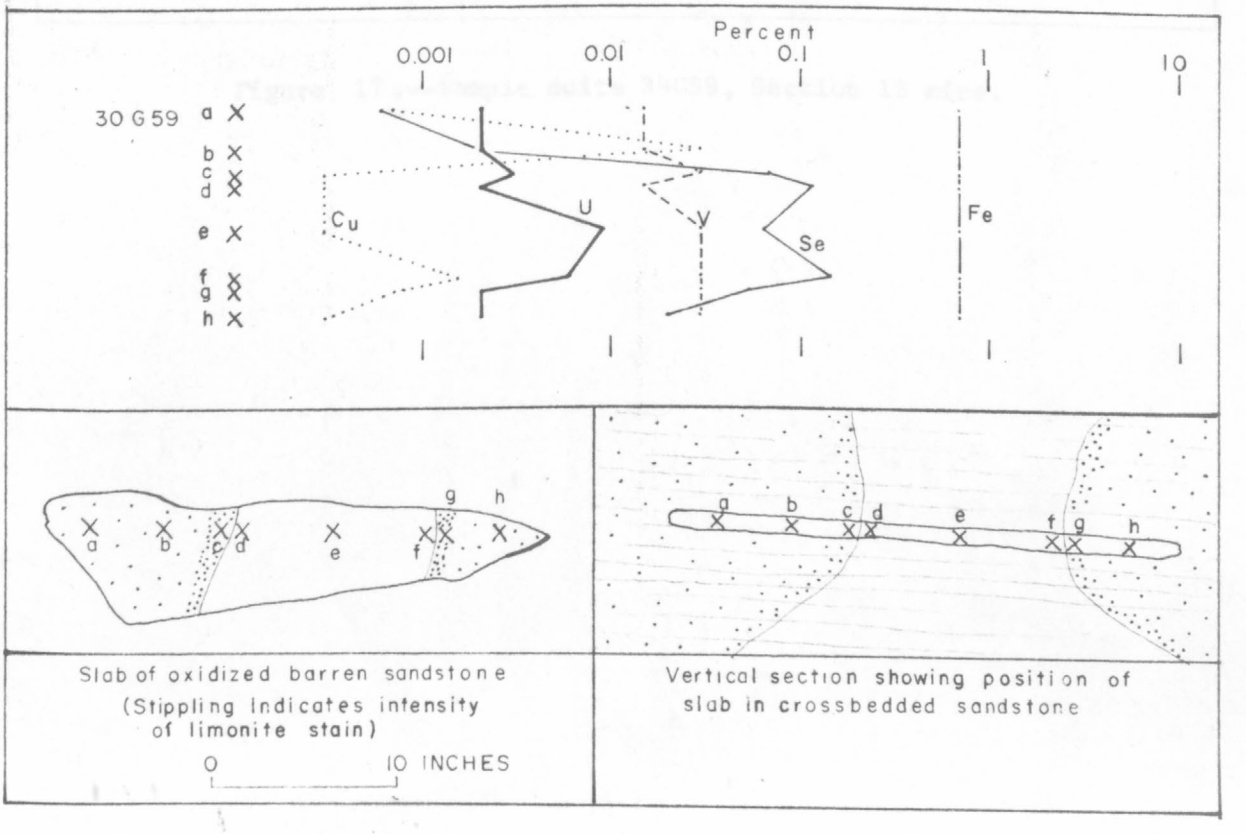



Figure 16.--Sample suite 30G59, Section 15 mine.

Suite No. 29659

| Serial no. / Field no. | 276, 653 a | 654 b | 655 c | 656 d | 657 e | 658 f | 659 g | 660 h | 661 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.002 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | |
| eU | .005 | .004 | .003 | .003 | .003 | .003 | <.001 | .002 | .003 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | | | | | | | |
| $C_{Min.}$ | | | | | | | | | | |
| $C_{Org.}$ | | | | | | | | | | |
| Se | .048 | .052 | .069 | .053 | .015 | .010 | .0060 | .0045 | .0030 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Fe | .7 | .7 | .7 | .7 | .7 | .7 | .3 | .7 | .7 | |
| Mg | .07 | .07 | .07 | .15 | .07 | .07 | .15 | .07 | .07 | |
| Ca | 1.5 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | .7 | 1.5 | .7 | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | |
| K | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .15 | .15 | .15 | .15 | .15 | .15 | .07 | .15 | .15 | |
| Mn | .015 | .015 | .015 | .03 | .015 | .015 | .015 | .015 | .015 | |

Suite No. 29659 --Continued

| Serial no. | 276, 653 | 654 | 655 | 656 | 657 | 658 | 659 | 660 | 661 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| B | d | 0 | 0 | 0 | d | d | 0 | 0 | d | |
| Ba | .01 | .03 | .03 | .03 | .01 | .03 | .01 | .01 | .03 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cr | .0007 | .0003 | .0007 | .0007 | .0003 | .0003 | .0003 | .0007 | .0003 | |
| Cu | .0003 | .0003 | .0003 | .0007 | .0003 | .0015 | .0015 | .0003 | .0003 | |
| Ga | d | d | d | d | d | d | d | d | d | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | 0 | .0015 | .0015 | 0 | 0 | 0 | 0 | .0015 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .007 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .015 | .015 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | |
| Y | d | 0 | 0 | 0 | d | .0015 | 0 | d | d | |
| Yb | d | 0 | 0 | 0 | d | — | 0 | d | d | |
| Zr | .007 | .015 | .03 | .07 | .015 | .015 | .007 | .03 | .03 | |

Suite No.-- 30G59 ( a through h ) See fig. 16.

Serial No's.-- 276,662 through 276,669

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,675 N. x 514,825 E.

Mine location--

Sample elevation-- 6,525 ft

Premining water table elevation--

Sampled to test element distribution ~~in~~--at the interface between oxidized and unoxidized barren sandstone.

Sample descriptions:

a.--Pale- to dark-yellowish-orange, medium- to fine-grained oxidized sandstone. Each sand grain coated with a film of limonite. Kaolinite nests are largely white but locally stained with limonite.

b.--Same as "a."

c.--Same as "a."

d.--Medium-light-gray to pale-yellowish-brown, medium- to fine-grained sandstone. Quartz overgrowths, disseminated pyrite, and kaolinite nests are common. Paramontroseite(?) needles are perched on some of the sand grains.

e.--Same as "d."

f.--Same as "d."

g.--Same as "a" except that a few paramontroseite(?) needles have survived oxidation.

--Same as "a."

Suite No. 30459

| Serial no. / Field no. | 276, 662 a | 663 b | 664 c | 665 d | 666 e | 667 f | 668 g | 669 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.002 | 0.002 | 0.003 | 0.002 | 0.009 | 0.006 | 0.002 | 0.002 | | |
| eU | .005 | .007 | .005 | .005 | .013 | .011 | .010 | .009 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | | | | | | | |
| $C_{Min.}$ | — | — | — | — | — | — | — | — | | |
| $C_{Org.}$ | — | — | — | — | — | — | — | — | | |
| Se | .0006 | .0020 | .069 | .11 | .062 | .14 | .052 | .020 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Fe | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | | |
| Mg | .15 | .07 | .15 | .15 | .15 | .15 | .15 | .15 | | |
| Ca | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| Na | .7 | .3 | .7 | .7 | .7 | .7 | .7 | .7 | | |
| K | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| Ti | .15 | .15 | .3 | .15 | .15 | .15 | .15 | .15 | | |
| Mn | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | | |

Suite No. 30659 --Continued

| Serial no. / Field no. | 276, 662 a | 663 b | 664 c | 665 d | 666 e | 667 f | 668 g | 669 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | d | 0 | 0 | 0 | 0 | d | 0 | 0 | | |
| Ba | .03 | .03 | .03 | .07 | .07 | .07 | .07 | .07 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Cr | .0007 | .0007 | .0007 | .007 | .0007 | .0007 | .0007 | .0007 | | |
| Cu | .0007 | .03 | .0003 | .0003 | .0003 | .0015 | .0007 | .0003 | | |
| Ga | d | d | d | d | d | d | d | d | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nb | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sr | .015 | .007 | .015 | .015 | .015 | .015 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .015 | .015 | .03 | .015 | .03 | .03 | .03 | .03 | | |
| Y | 0 | d | .0015 | 0 | d | 0 | d | d | | |
| Yb | 0 | d | — | — | — | — | — | — | | |
| Zr | .07 | .03 | .07 | .007 | .007 | .007 | .015 | .015 | | |

Suite No.-- 34G59 ( a through c )

Serial No's.-- 276,637 through 276,639

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,705 N. x 515,280 E.

Mine location-- 479 drift; N. wall.

Sample elevation-- 6,605 ft

Premining water table elevation--~6,550 ft

Sampled to test element distribution in--so-called "mottled ore." This is a concretion-like form that commonly occurs along S-type rolls in prefault ore in this mine.

Sample descriptions:

a.--Mottled, very light gray and grayish-black, medium-grained sandstone with a few scattered coarse grains. Thick coat of authigenic carbonaceous material on sand grains in the grayish-black areas. The entire rock is cemented by poikiloblastic calcite but there is less calcite in the grayish-black areas because the pores are partly filled with carbonaceous material.

b.--Very light gray, medium-grained sandstone with a moderate red stain or coating on some of the sand grains. Disseminated pyrite is very sparse. "Poikiloblastic" calcite cement is abundant.

c.--Medium-dark-gray, medium-grained sandstone with scattered coarse grains. Each sand grain coated with authigenic carbonaceous material. Disseminated pyrite is sparse. "Poikiloblastic" calcite cement is common.

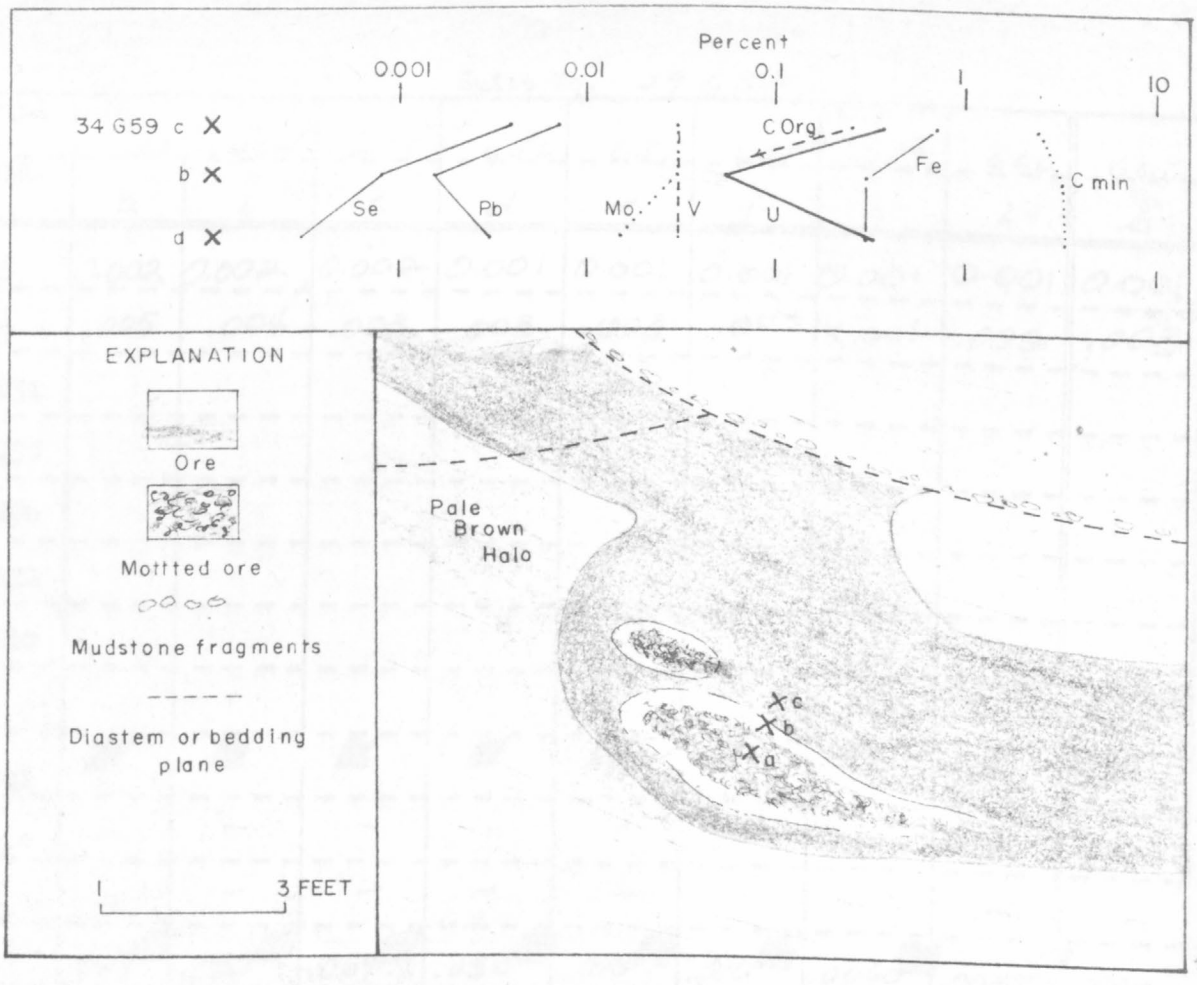



**Figure 17.--Sample suite 34G59, Section 15 mine.**

Suite No. 34659

| Serial no. / Field no. | 276, 637 a | 638 b | 639 c | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.31 | 0.052 | 0.36 | | | | | | | |
| eU | 0.26 | 0.19 | 0.25 | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 3.12 | 3. | 2.58 | | | | | | | |
| $C_{Min.}$ | 3.14 | 3.07 | 2.36 | | | | | | | |
| $C_{Org.}$ | 0 | 0 | .25 | | | | | | | |
| Se | ~~3~~ .0003 | ~~3~~ .0008 | ~~3~~ .0038 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | | | | | | | |
| Fe | .3 | .3 | .7 | | | | | | | |
| Mg | .15 | .15 | .3 | | | | | | | |
| Ca | M | M | ?. | | | | | | | |
| Na | .7 | .15 | .15 | | | | | | | |
| K | 1.5 | 3. | 3. | | | | | | | |
| Ti | .07 | .07 | .07 | | | | | | | |
| Mn | .3 | .3 | .15 | | | | | | | |

Suite No. 34659 --Continued

| Serial no. | 276 637 | 638 | 639 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | | | | | | | |
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .07 | .07 | .07 | | | | | | | |
| Be | 0 | 0 | 0 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | <.001 | 0 | <.001 | | | | | | | |
| Cr | .0003 | .0007 | .0003 | | | | | | | |
| Cu | .0003 | .0003 | .0003 | | | | | | | |
| Ga | d | d | d | | | | | | | |
| Ge | <.002 | 0 | <.002 | | | | | | | |
| La | 0 | 0 | 0 | | | | | | | |
| Mo | .015 | .03 | .03 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .003 | .0015 | .007 | | | | | | | |
| Sc | 0 | 0 | 0 | | | | | | | |
| Sr | .03 | .03 | .03 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .015 | .015 | .015 | | | | | | | |
| Y | d | 0 | d | | | | | | | |
| Yb | d | 0 | d | | | | | | | |
| Zr | .003 | .007 | .003 | | | | | | | |

Suite No.-- 39G59 ( a through g )

Serial No's.-- 277,966 through 277,972

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 327,060 N. x 514, 740 E.

Mine location--

Sample elevation-- 6,575 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--an oxidized fracture within a postfault ore body.

Sample descriptions:

a.--Light-gray, medium- to coarse-grained sandstone. Kaolinite nests a few millimeters across are abundant. Calcite cement is sparse. Minute disseminated pyrite grains are common.

b.--Pale-yellowish-orange and light-gray, medium- to coarse-grained oxidized sandstone. Pyrite partly oxidized in the yellowish-orange areas and a thin stain coats the sand grains. Calcite cement missing. Kaolinite nests same as "a."

c.--Dusky-yellow, medium-grained, oxidized sandstone with scattered coarse-and very coarse grains. All sand grains coated with a thin film of limonite(?)-stained clay except where protected by kaolinite nests which are largely unstained. Calcite cement is sparse.

d.--Moderate olive-brown, medium-grained sandstone. Each sand grain coated with a thick film of a claylike moderate-olive-brown material. This material also seems

Suite No. 39G59 . Sample descriptions (Continued)

to stain the kaolinite nests.

e.--Same as "c."

f.--Adjacent to sample "e" this sample is similar to "d," but grades to a dark-gray medium-grained sandstone adjacent to "g." Each sand grain in the dark-gray zone is coated with a film of nearly black submetallic material (that may be montroseite). A little pyrite is present and seems to be perched on the black film.

g.--Same as "a."

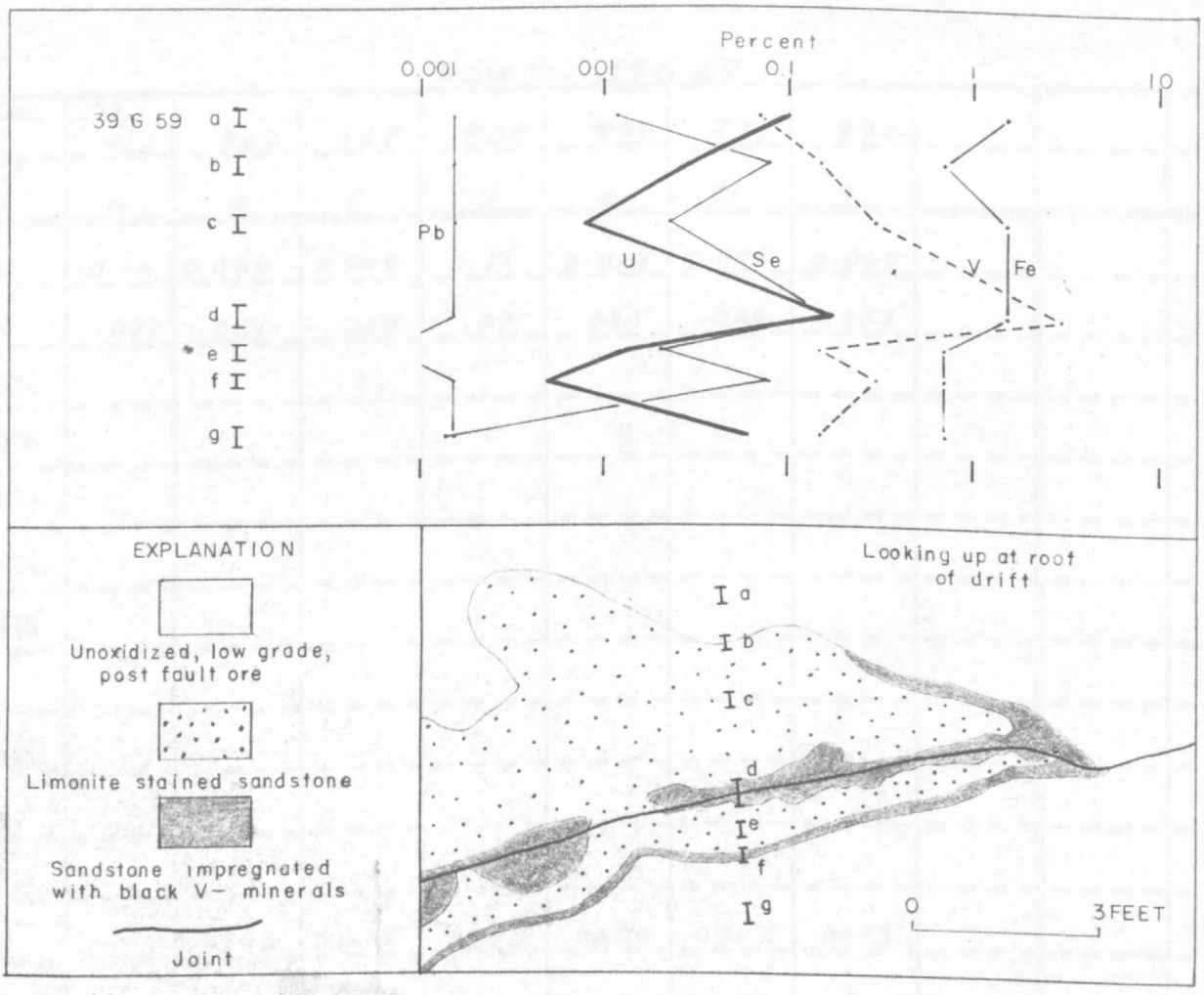



**Figure 18.--Sample suite 39G59, Section 15 mine.**

Suite No. 39659

| Serial no. / Field no. | 277, 966 a | 967 b | 968 c | 969 d | 970 e | 971 f | 972 g | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.10 | 0.030 | 0.008 | 0.17 | 0.013 | 0.005 | 0.060 | | | |
| eU | .077 | .051 | .027 | .27 | .025 | .022 | .053 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | | | | | | | |
| $C_{Min.}$ | | | | | | | | | | |
| $C_{Org.}$ | | | | | | | | | | |
| Se | .0115 | .0796 | .0215 | .1595 | .0200 | .0745 | .0013 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 7. | 7. | 7. | 7. | 7. | 7. | | | |
| Fe | 1.5 | .7 | 1.5 | 1.5 | .7 | .7 | .7 | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .07 | .07 | | | |
| Ca | 3. | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | | | |
| Na | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | | | |
| Ti | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | | |
| Mn | .03 | .015 | .015 | .03 | .015 | .015 | .015 | | | |

Suite No. 39659 --Continued

| Serial no. | 277 966 | 967 | 968 | 969 | 970 | 971 | 972 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ba | .07 | .07 | .07 | .3 | .07 | .07 | .07 | | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Bi | 0 | 0 | 0 | <0.05 | 0 | 0 | 0 | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Co | <.002 | 0 | 0 | <.002 | 0 | 0 | d | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | | | |
| Cu | .0007 | .0003 | .0007 | .0003 | .0003 | .0007 | .0003 | | | |
| Ga | d | d | d | d | d | d | d | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Pb | .0015 | .0015 | .0015 | .0015 | d | .0015 | .0015 | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Sr | .03 | .03 | .03 | .03 | .03 | .03 | .03 | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| V | .07 | .15 | .3 | .3 | .15 | .3 | .15 | | | |
| Y | .0015 | .0015 | .0015 | .0015 | d | d | d | | | |
| Yb | .00015 | — | — | — | — | — | — | | | |
| Zr | .003 | .015 | .003 | .003 | .007 | .007 | .003 | | | |

Suite No.-- 40G59 ( a through d ) See fig. 11.

Serial No's.-- 276,640 through 276,643

Mine-- Sec. 15

Level--

Sec. 15 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 327,140 N. x 515,060 E.

Mine location-- 401 drift

Sample elevation-- 6,700 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--a vanadium-rich layer within a postfault ore body.

Sample descriptions:

a.--Light-olive-gray, coarse- to medium-grained sandstone. Very sparse disseminated pyrite. Needles and rosettes of paramontroseite perched on sand grains are common. Kaolinite nests are common.

b.--Medium-gray to medium-dark-gray, medium- to very coarse grained sandstone. Sand grains are coated with a grayish film. Perched crystals of paramontroseite or häggite are abundant. Sparse pyrite. Kaolinite nests are common and locally stained yellowish by vanadium(?).

c.--Same as "b."

i.--Light-olive-gray, medium- to very coarse grained sandstone with some yellowish to orange stains. White clay is present but not as "nests."

Suite No. 40659

| Serial no. / Field no. | 276, 640 a | 641 b | 642 c | 643 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.23 | 0.046 | 0.046 | 0.002 | | | | | | |
| eU | .14 | .045 | .031 | .013 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .6 | .9 | .5 | — | | | | | | |
| $C_{Min.}$ | .35 | .64 | .60 | .40 | | | | | | |
| $C_{Org.}$ | .25 | .26 | <.2 | — | | | | | | |
| Se | .0006 ~~6~~ | .0010 ~~10~~ | .0030 ~~30~~ | .0030 ~~30~~ | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 7. | 7. | 7. | | | | | | |
| Fe | .7 | .7 | .7 | .7 | | | | | | |
| Mg | .3 | .15 | .15 | .15 | | | | | | |
| Ca | 1.5 | 3. | 1.5 | 1.5 | | | | | | |
| Na | .15 | 1.5 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 3. | 3. | | | | | | |
| Ti | .07 | .07 | .07 | .07 | | | | | | |
| Mn | .07 | .03 | .03 | .015 | | | | | | |

Suite No. 40659 --Continued

| Serial no. | 276, 640 | 641 | 642 | 643 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | | | | | | |
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .07 | .15 | .07 | .07 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | <.001 | 0 | 0 | 0 | | | | | | |
| Cr | .0003 | .0003 | .0007 | .0003 | | | | | | |
| Cu | .0007 | .0007 | .0007 | .0003 | | | | | | |
| Ga | d | d | d | d | | | | | | |
| Ge | <.002 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | .0015 | .0015 | .0015 | .0015 | | | | | | |
| Sc | 0 | 0 | 0 | 0 | | | | | | |
| Sr | .015 | .03 | .03 | .03 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .3 | .5 | .7 | .07 | | | | | | |
| Y | d | d | d | .0015 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .007 | .007 | .007 | .007 | | | | | | |

Suite No.-- 20G60 ( a through h )

Serial No's.-- 281,442 through 281,449

Mine-- Sec. 17

Level--

Sec. 17 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- not recorded N. x E.

Mine location-- 1 West stope

Sample elevation-- not recorded.

Premining water table elevation--~6,475 ft.

Sampled to test element distribution in--a prefault ore layer.

Sample descriptions:

a--Very light gray to white, fine-grained sandstone. Clean-appearing sandstone with very finely disseminated pyrite and small scattered kaolinite nests.

b--Very light gray to light-gray, fine to very fine grained sandstone. Disseminated pyrite and very small kaolinite nests are common.

c--Very light gray to light-gray, medium-grained sandstone with scattered coarse grains. Sparse disseminated pyrite. Kaolinite nests are 1 to 4 mm across. Rock very friable

d--Dark-gray to medium-dark-gray, coarse-grained to medium-grained ore sandstone. Disseminated pyrite is common. All sand grains are coated with what seems to be clay, impregnated with authigenic carbonaceous material. Intergranular spaces sparsely filled with more vitreous-appearing authigenic carbonaceous material. Rock is very friable.

e--Same as "d."

Suite No. 20G60 . Sample descriptions (Continued)

f.--Medium-light-gray, coarse- to medium-grained ore sandstone. The carbon-stained clay(?) coating on sand grains is thinner than in "d" and there seems to be no interstitial carbonaceous material. Otherwise similar to "d" and "e."

g.--Light-gray to very light gray, coarse-grained sandstone. Kaolinite nests are large and abundant. Rock is friable.

h.--Same as "g" except that grain size ranges from coarse to very coarse.

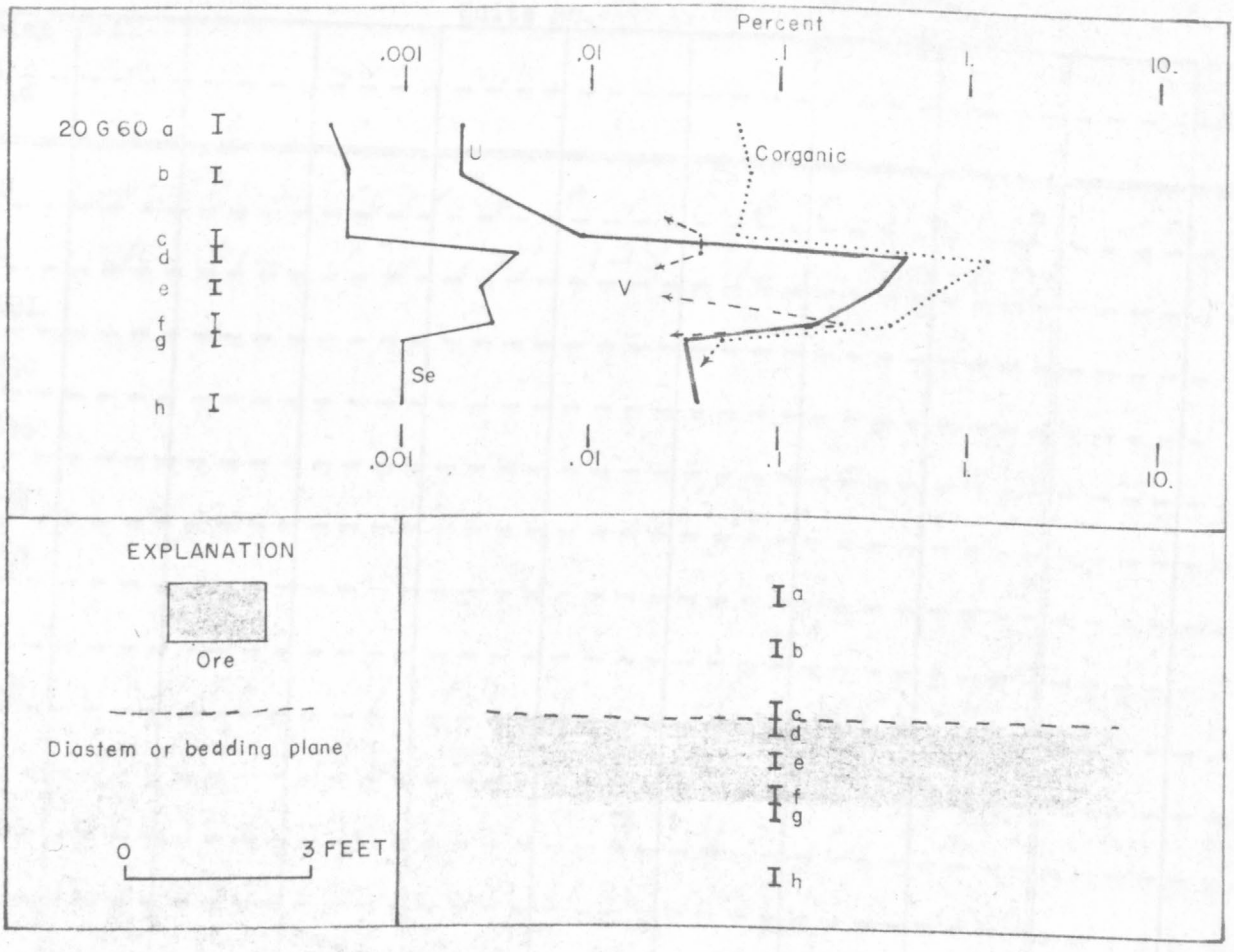



Figure 19.--Sample suite 20G60, Section 17 mine.

Suite No. 20 G 60

| Serial no. / Field no. | 441, 442 a | 443 b | 444 c | 445 d | 446 e | 447 f | 448 g | 449 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | .002 | .002 | .009 | 0.46 | 0.34 | 0.16 | 0.031 | 0.037 | | |
| eU | .010 | .015 | .036 | .27 | .25 | .12 | .050 | .037 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .08 | .08 | .07 | 1.2 | 0.7 | .4 | .05 | — | | |
| $C_{Min.}$ | .02 | <.01 | .01 | <.01 | <.01 | .01 | <.01 | <.01 | | |
| $C_{Org.}$ | .06 | .07 | .06 | 1.2 | 0.7 | .4 | .05 | — | | |
| Se | .004 | .005 | .005 | .0040 | .0075 | .0030 | .0010 | .0010 | | |
| $V_2O_5$ | <.05 | <.05 | .06 | .06 | <.05 | .34 | <.05 | <.05 | | |
| Mo | <.001 | <.001 | <.001 | <0.001 | <.001 | <.001 | <.001 | <.001 | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

U. Carbon not determined because of light color of sample

Suite No. 20660 --Continued

| Serial no. / Field no. | 281 4412 a | 4413 b | 4414 c | 4415 d | 4416 e | 4417 f | 4418 g | 4419 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | | | | | | | | | | |
| Ba | | | | | | | | | | |
| Be | | | | | | | | | | |
| Bi | | | | | | | | | | |
| Ce | | | | | | | | | | |
| Co | | | | | | | | | | |
| Cr | | | | | | | | | | |
| Cu | | | | | | | | | | |
| Ga | | | | | | | | | | |
| Ge | | | | | | | | | | |
| La | | | | | | | | | | |
| Mo | | | | | | | | | | |
| Nb | | | | | | | | | | |
| Nd | | | | | | | | | | |
| Ni | | | | | | | | | | |
| Pb | | | | | | | | | | |
| Sc | | | | | | | | | | |
| Sr | | | | | | | | | | |
| Tl | | | | | | | | | | |
| V | | | | | | | | | | |
| Y | | | | | | | | | | |
| Yb | | | | | | | | | | |
| Zr | | | | | | | | | | |

Suite No.-- 45G59 ( $a_1$ through $a_3$ )

Serial No's.-- 276,644 through 276,646

Mine-- Sec. 22

Level-- 6,450 ft

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 325,875 N. x 514,360 E.

Mine location--

Sample elevation-- 6,470 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--a large calcite concretion enclosed by a postfault ore body.

Sample descriptions:

$a_1$.--Light-brownish-gray to brownish-gray, medium- and fine-grained sandstone. Quartz overgrowths are common. Perched black häggite(?) crystals are abundant on sand grains. A little disseminated pyrite and calcite cement are present.

$a_2$.--Light-gray to very light gray, medium- and fine-grained sandstone. Abundant calcite cement and a little disseminated pyrite are present. Scattered specks of dark-yellowish-orange limonite(?) are common.

$a_3$.--Very light gray to white, medium- and fine-grained sandstone. Clean-looking sandstone thoroughly cemented by calcite.

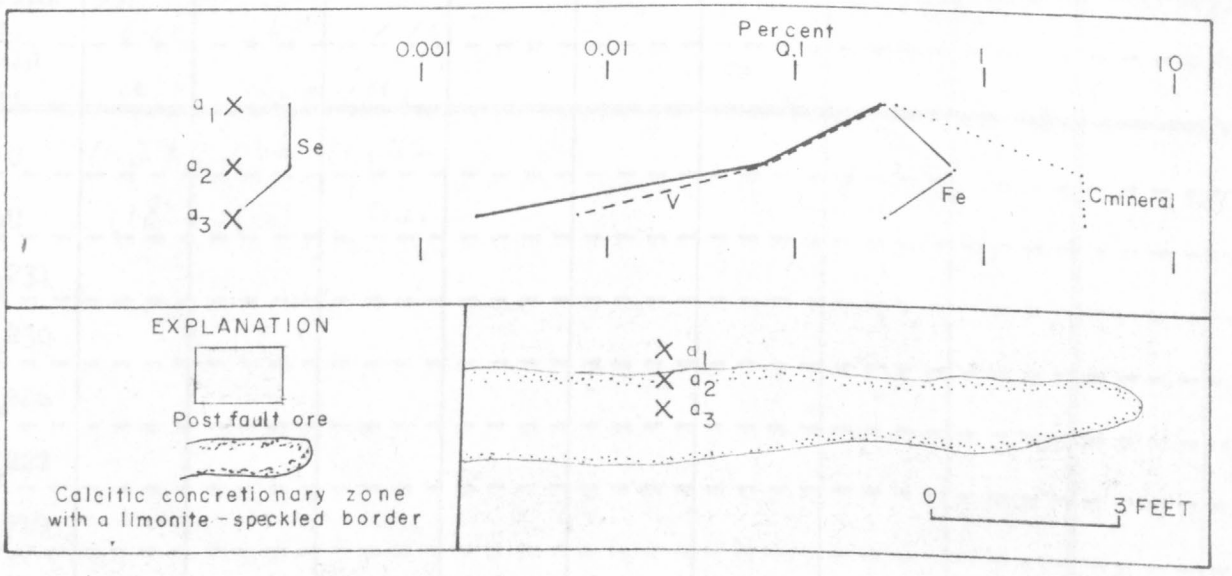



**Figure 20.--Sample suite 45G59, Section 22 mine.**

Suite No. 45659

| Serial no. | 276644 | 645 | 646 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | $a_1$ | $a_2$ | $a_3$ | | | | | | | |
| U | 0.27 | 0.068 | 0.002 | | | | | | | |
| eU | .18 | .061 | .020 | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 0.5 | 1/ | 1/ | | | | | | | |
| $C_{Min.}$ | .33 | 3.08 | 3.17 | | | | | | | |
| $C_{Org.}$ | .2 | — | — | | | | | | | |
| Se | .0002 ~~B~~ | .0002 ~~B~~ | .0001 ~~B~~ | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 1.5 | 3. | | | | | | | |
| Fe | .3 | .7 | .3 | | | | | | | |
| Mg | .15 | .15 | .07 | | | | | | | |
| Ca | 1.5 | M | M | | | | | | | |
| Na | .7 | .7 | .7 | | | | | | | |
| K | 3. | 1.5 | 3. | | | | | | | |
| Ti | .07 | .07 | .03 | | | | | | | |
| Mn | .015 | .07 | .3 | | | | | | | |

1/ Carbon not determined because of light color of sample

Suite No. 45659 --Continued

| Serial no. / Field no. | 276, 644 a1 | 645 a2 | 646 a3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .07 | .03 | .03 | | | | | | | |
| Be | 0 | 0 | 0 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | <.001 | 0 | 0 | | | | | | | |
| Cr | .0003 | .0015 | .0007 | | | | | | | |
| Cu | .0007 | .0007 | .0003 | | | | | | | |
| Ga | d | d | d | | | | | | | |
| Ge | 0 | 0 | 0 | | | | | | | |
| La | 0 | 0 | 0 | | | | | | | |
| Mo | 0 | 0 | 0 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | 0 | 0 | 0 | | | | | | | |
| Sc | 0 | 0 | 0 | | | | | | | |
| Sr | .015 | .015 | .03 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .3 | .07 | .007 | | | | | | | |
| Y | 0 | d | .0015 | | | | | | | |
| Yb | — | — | .00015 | | | | | | | |
| Zr | .007 | .003 | .003 | | | | | | | |

Suite No.-- 49059 ( a through f )

Serial No's.-- 276,647 through 276,652

Mine-- Sec. 22

Level-- 6,350 ft

Sec. 22, Twp. 14, Rge. 10 --

U.S. AEC Coordinates-- 324,720 N. x 514,365 E.

Mine location--

Sample elevation-- 6,365 ft

Premining water table elevation--~6,550 ft

Sampled to test element distribution in--a stratigraphically low ore layer near oxidized sandstone. Chemical analyses suggest that this is postfault ore.

Sample descriptions:

a.--Very light gray, coarse- to medium-grained sandstone. Kaolinite nests, 2-3 mm across, are common. Very fine pyrite and black häggite(?) crystals are perched on sand grains. Rock is porous, friable, and clean-looking.

b.--Medium-gray to medium-light-gray, medium-grained sandstone. Most sand grains are coated with a gray film. Otherwise similar to "a" except that häggite(?) crystals seem to be sparse.

c.--Medium-gray to medium-dark-gray sandstone similar to "b" except that the gray film on the sand grains seems to be thicker.

d.--Same as "c" but with a few scattered specks of limonite (after pyrite?).

e.--Light-gray to medium-light-gray, medium-grained sandstone with a faint brownish caste. Kaolinite nests, 2-3 mm across, are common. Clean-appearing sandstone with considerable clay and a little disseminated pyrite.

Suite No. 49059 . Sample descriptions (Continued)

f.--Light-gray to very light gray, medium-grained sandstone. Kaolinite nests, 2-3 mm across, are common. Some sand grains seem to be coated with a very light gray clay. Disseminated pyrite is common.

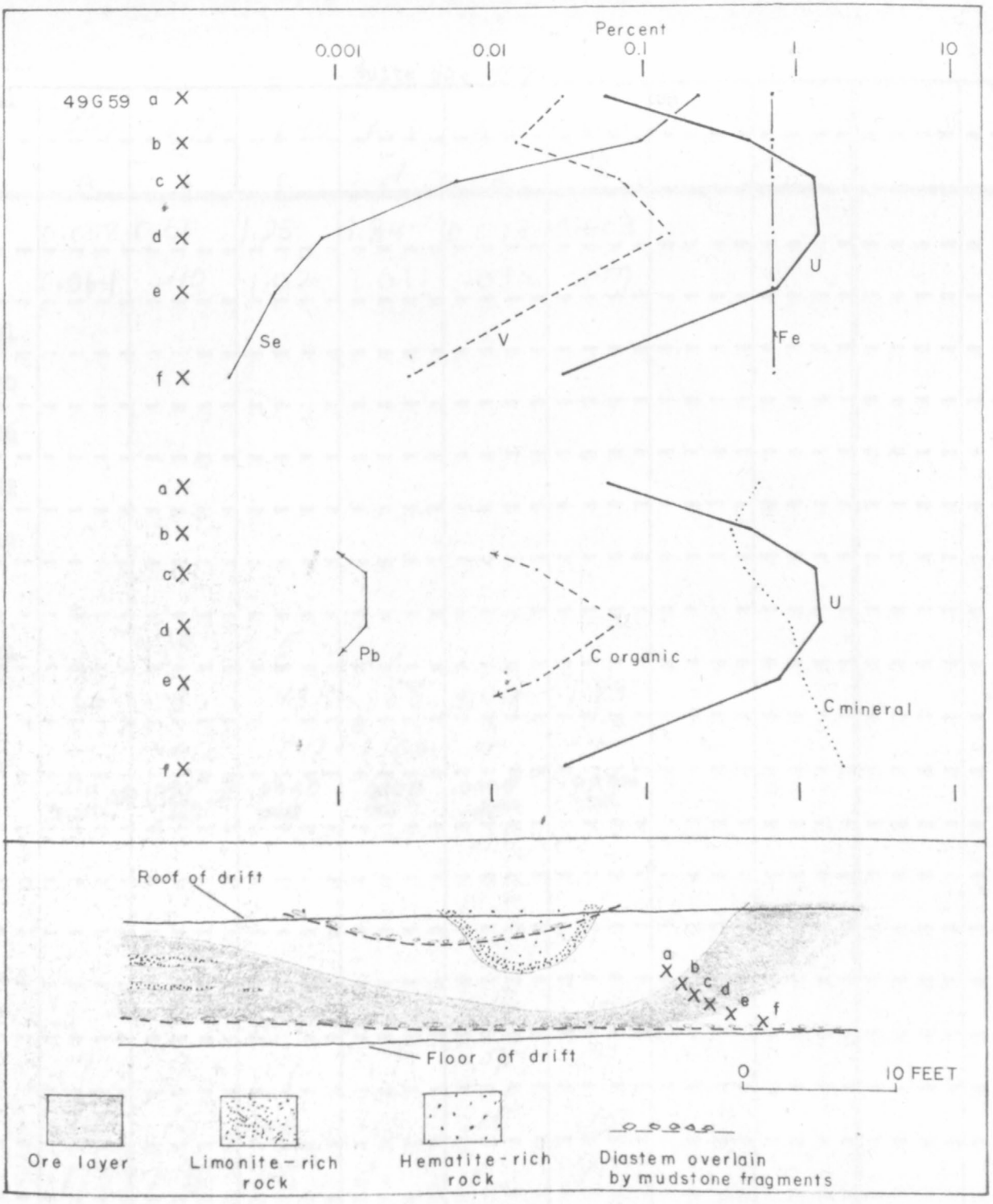



**Figure 21.--Sample suite 49G59, Section 22 mine.**

Suite No. 49659

| Serial no. / Field no. | 276, 647 a | 648 b | 649 c | 650 d | 651 e | 652 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.058 | 0.50 | 1.25 | 1.34 | 0.073 | 0.003 | | | | |
| eU | 0.064 | .40 | 1.02 | 1.01 | .075 | .009 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | .39 | .5 | .9 | | | | | | |
| $C_{Min.}$ | .55 | .37 | .43 | .88 | 1.02 | 1.83 | | | | |
| $C_{Org.}$ | — | .02 | .07 | .02 | — | — | | | | |
| Se | ~~.210~~ | ~~.095~~ | ~~.0060~~ | ~~.0008~~ | ~~.0004~~ | ~~.0002~~ | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Fe | .7 | .7 | .7 | .7 | .7 | .7 | | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | | | | |
| Ca | 1.5 | 1.5 | 1.5 | 3. | 3. | 7. | | | | |
| Na | .7 | .7 | .7 | .7 | .7 | 1.5 | | | | |
| K | 3. | 1.5 | 1.5 | 3. | 3. | 3. | | | | |
| Ti | .07 | .07 | .07 | .15 | .07 | .03 | | | | |
| Mn | .015 | .015 | .03 | .03 | .03 | .07 | | | | |

1/ Carbon not determined because of light color of sample

Suite No. 49G59 --Continued

| Serial no. / Field no. | 646, 647 a | 648 b | 649 c | 650 d | 651 e | 652 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | L | L | d | 0 | 0 | 0 | | | | |
| Ba | .03 | .03 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Bi | 0 | 0 | <.002 | <.002 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | 0 | <.001 | <.001 | <.001 | 0 | 0 | | | | |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0003 | | | | |
| Cu | .0003 | .0003 | .0003 | .0007 | .0003 | .0003 | | | | |
| Ga | d | d | d | d | d | d | | | | |
| Ge | 0 | <.002 | <.005 | <.005 | 0 | 0 | | | | |
| La | 0 | 0 | 0 | 0 | 0 | .003 | | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | d | d | .0015 | .0015 | d | 0 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .015 | .015 | .03 | .015 | .03 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .03 | .015 | .07 | .15 | .03 | .003 | | | | |
| Y | d | d | d | .0015 | .0015 | .0015 | | | | |
| Yb | d | d | — | — | — | .0015 | | | | |
| Zr | .015 | .015 | .015 | .007 | .007 | .003 | | | | |

Suite No.-- 50G59 ( a through c )

Serial No's.-- 277,973 through 277,975

Mine-- Sec. 22

Level-- 6,350 level

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,670 N. x 514,400 E.

Mine location--

Sample elevation-- ~ 6,350 ft

Premining water table elevation--~6,550 ft

Sampled to test element distribution in--the varicolored interface between strongly oxidized and unoxidized sandstone.

Sample descriptions:

a.--Light-gray, fine-grained unoxidized sandstone. Scattered kaolinite nests 1-3 mm across. Extremely fine disseminated metallic minerals are common and an X-ray pattern of the heavies indicates that pyrite, ferroselite, and anatase are present. Calcite cement is sparse to absent.

b.--Moderate yellow, fine-grained sandstone. Kaolinite nests identical with "a." Kaolinite is not stained and neither are sand grains they enclose. Most other sand grains are coated with a film of hydrous iron oxide. Metallic minerals are only partly destroyed by oxidation. Ferroselite noted in thin sections. Calcite cement is sparse.

c.--Moderate red, fine-grained oxidized sandstone. Kaolinite nests identical with "a" and "b." All sand grains coated with a red hematite film. Metallic minerals destroyed except immediately adjacent to "b" where some are only partly oxidized. Calcite cement is common, but fine grained.

Suite No.-- 56G59 ( a through c )

Serial No's.-- 277,976 through 277,978

Mine-- Sec. 22

Level-- 6,400 ft level

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,650 N. x 514,275 E.

Mine location--

Sample elevation-- 6,400± ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--the varicolored interface between strongly oxidized and unoxidized sandstone.

Sample descriptions:

a.--Very light gray, fine- to medium-grained sandstone. Kaolinite nests about 3-4 mm across are abundant. Very fine grained pyrite and ferroselite(?) are abundant. Anatase aggregates are sparse. Fine-grained calcite cement is common.

b.--Pale-yellowish-orange, fine- to medium-grained oxidized sandstone. Sand grains not enclosed by kaolinite are coated with a clay-like yellowish layer and most metallic minerals are destroyed. Ferroselite noted in thin sections. Otherwise identical to "a."

c.--Moderate red, fine- to medium-grained oxidized sandstone. Nearly identical to "b" except for the color of coating on sand grains.

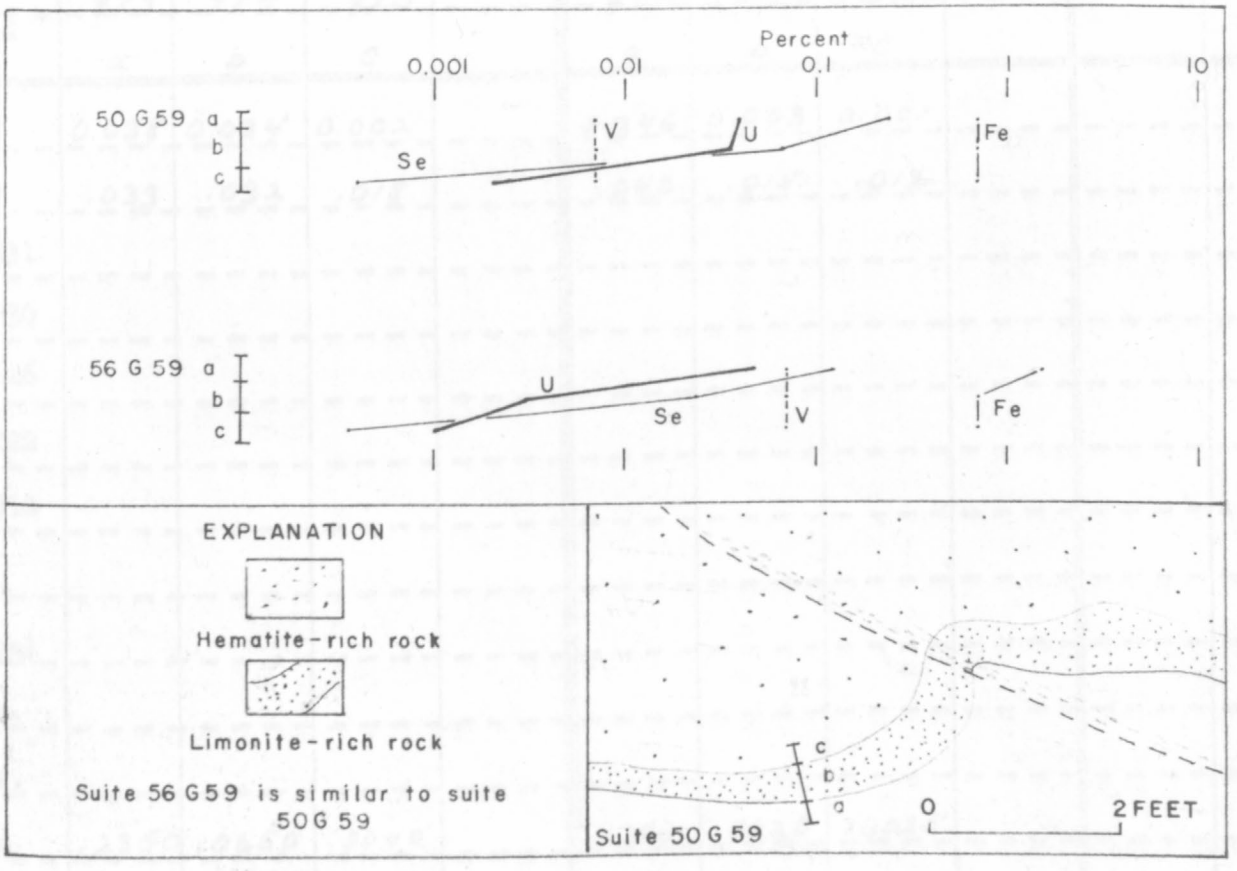



**Figure 22.--Sample suites 50G59 and 56G59, Section 22 mine.**

50459 Suite No. 56459

| Serial no. | 277 973 | 974 | 975 | | 277 976 | 977 | 978 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | | a | b | c | | | |
| U | 0.038 | 0.034 | 0.002 | | 0.046 | 0.003 | 0.001 | | | |
| eU | .033 | .032 | .018 | | .040 | .015 | .012 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | | | | | | | |
| $C_{Min.}$ | | | | | | | | | | |
| $C_{Org.}$ | | | | | | | | | | |
| Se | .2350 | .0650 | .0040 | | .1200 | .0220 | .0035 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 3 | 3 | | 3 | 3 | 3 | | | |
| Fe | .7 | .7 | .7 | | 1.5 | .7 | .7 | | | |
| Mg | .15 | .15 | .15 | | .15 | .15 | .15 | | | |
| Ca | 1.5 | 1.5 | 1.5 | | 3 | 3 | 3 | | | |
| Na | .7 | .7 | .7 | | .7 | .7 | 1.5 | | | |
| K | 1.5 | 1.5 | 1.5 | | 1.5 | 1.5 | 3 | | | |
| Ti | .3 | .3 | .7 | | .15 | .15 | .15 | | | |
| Mn | .015 | .03 | .03 | | .07 | .03 | .03 | | | |

Suite No. --Continued

50 G.59 56 G.59

| Serial no. | 277, 973 | 974 | 975 | | 277, 976 | 977 | 978 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | | a | b | c | | | |
| B | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Ba | .03 | .03 | .03 | | .03 | .07 | .07 | | | |
| Be | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Bi | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Ce | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Co | 0 | 0 | 0 | | d | d | 0 | | | |
| Cr | .0007 | .0007 | .0015 | | .0003 | .0003 | .0003 | | | |
| Cu | .0007 | .0007 | .0007 | | .0003 | .0003 | .0003 | | | |
| Ga | d | d | d | | d | d | d | | | |
| Ge | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| La | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Mo | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Nb | 0 | 0 | .0015 | | 0 | 0 | 0 | | | |
| Nd | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Ni | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Pb | .0015 | .0015 | .0015 | | d | d | d | | | |
| Sc | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| Sr | .015 | .015 | .015 | | .015 | .03 | .03 | | | |
| Tl | 0 | 0 | 0 | | 0 | 0 | 0 | | | |
| V | .007 | .007 | .007 | | .07 | .07 | .07 | | | |
| Y | .0015 | .0015 | .0015 | | d | d | d | | | |
| Yb | .00015 | .0003 | .0003 | | — | — | — | | | |
| Zr | .03 | .03 | .07 | | .007 | .015 | .007 | | | |

Suite No.-- 54G59 ( a through f )

Serial No's.-- 276,670 through 276,675

Mine-- Sec. 22

Level-- 6,450

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 525,765 N. x 514,225 E.

Mine location--

Sample elevation-- 6,460 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in-- postfault ore coated with an efflorescent blue stain (a-c) and unstained ore (d-f) where cut by a häggite(?)-filled joint.

Sample descriptions:

a.--Medium-light-gray, medium- to fine-grained sandstone. Very little disseminated pyrite. Minute black grains (häggite?) without evident crystal form are abundantly perched on sand grains.

b.--Medium-gray, medium- to fine-grained sandstone. Similar to "a" except that the black mineral is more abundant and locally fills the interstices.

c.--Similar to "a."

d.--Light-gray to light-brownish-gray, medium- to fine-grained sandstone. Otherwise similar to "a."

e.--Same as "d" except that the black mineral (häggite?) is locally more abundant and fills interstices.

f.--Same as "d."

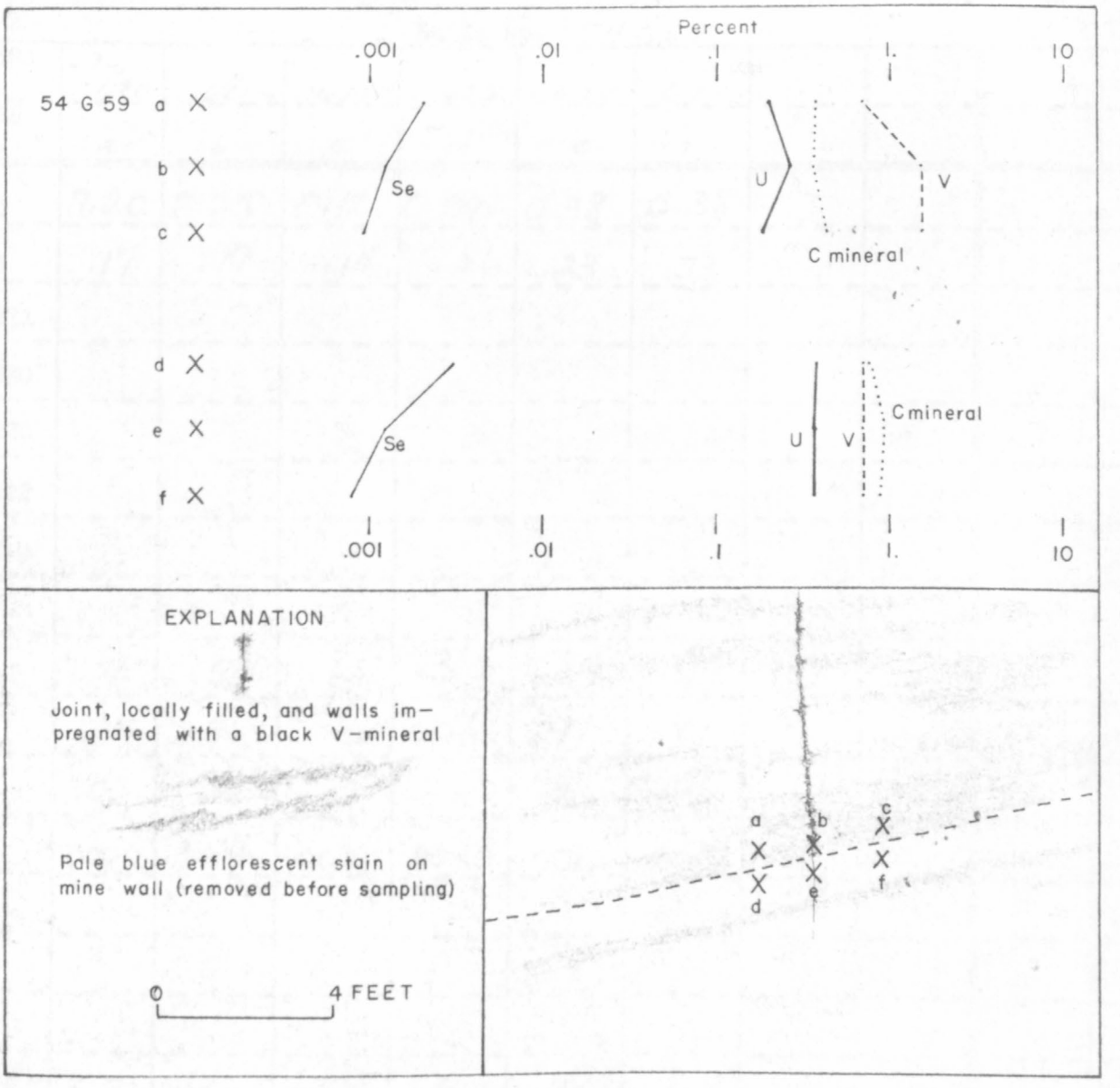



Figure 23.--Sample suite 54G59, Section 22 mine.

Suite No. 54659

| Serial no. / Field no. | 670 a | 671 b | 672 c | 673 d | 674 e | 675 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.20 | 0.25 | 0.18 | 0.39 | 0.38 | 0.38 | | | | |
| eU | .17 | .19 | .14 | .26 | .23 | .23 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .4 | .54 | .67 | 1/ | 1.04 | .97 | | | | |
| $C_{Min.}$ | .37 | .36 | .42 | .76 | .91 | .89 | | | | |
| $C_{Org.}$ | .03 | .18 | .25 | — | .13 | .08 | | | | |
| Se | .0020 | .0012 | .0009 | .0030 | .0017 | .0008 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Fe | 1.5 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | | | | |
| Ca | 1.5 | 1.5 | 1.5 | 3. | 3. | 3. | | | | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | | | | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | | |
| Ti | .15 | .15 | .15 | .15 | .15 | .15 | | | | |
| Mn | .015 | .015 | .03 | .03 | .03 | .03 | | | | |

1/ Carbon not determined because of light color of sample

Suite No. 54G59 --Continued

| Serial no. / Field no. | 176, 670 a | 671 b | 672 c | 673 d | 674 e | 675 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .03 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | | | | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | | | | |
| Cu | .0007 | .0007 | .0003 | .0007 | .0015 | .0015 | | | | |
| Ga | d | d | d | d | d | d | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nb | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | d | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | 0 | 0 | d | d | d | d | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .7 | 1.5 | 1.5 | .7 | .7 | .7 | | | | |
| Y | 0 | 0 | 0 | d | .0015 | d | | | | |
| Yb | — | — | — | — | — | — | | | | |
| Zr | .007 | .007 | .015 | .007 | .015 | .007 | | | | |

Suite No.-- 55G59 ( a through d )

Serial No's.-- 276,676 through 276,679

Mine-- Sec. 22

Level-- 6,450 level

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 326,130 N. x 514,350 E.

Mine location--

Sample elevation-- 6,470 ft

Premining water table elevation--~6,550 ft

Sampled to test element distribution in-- intense vanadium mineralization in a jointed zone.

Sample descriptions:

a.--Dark-gray to grayish-black, medium- to fine-grained sandstone. Overgrowths on some quartz grains. Calcite cement locally. Sparse kaolinite nests. Both sand grains and some of the calcite are coated with a black vanadium mineral. Quartz grains contained within kaolinite nests are not coated. Pascoite occurs on local joint surfaces.

b.--Dark-yellowish-orange, medium- to fine-grained, partly oxidized sandstone. Specks and films of limonite are distributed on sand grains in zones; they are not ubiquitous. Clusters of paramontroseite(?) needles, perched on sand grains, are common. Kaolinite nests are locally iron stained.

c.--Very similar to "b" but perhaps less paramontroseite is present.

d.--Light-gray, medium- to fine-grained sandstone. Some quartz overgrowths. Yellow stain and flecks of a yellow mineral (pascoite?) are finely disseminated throughout.

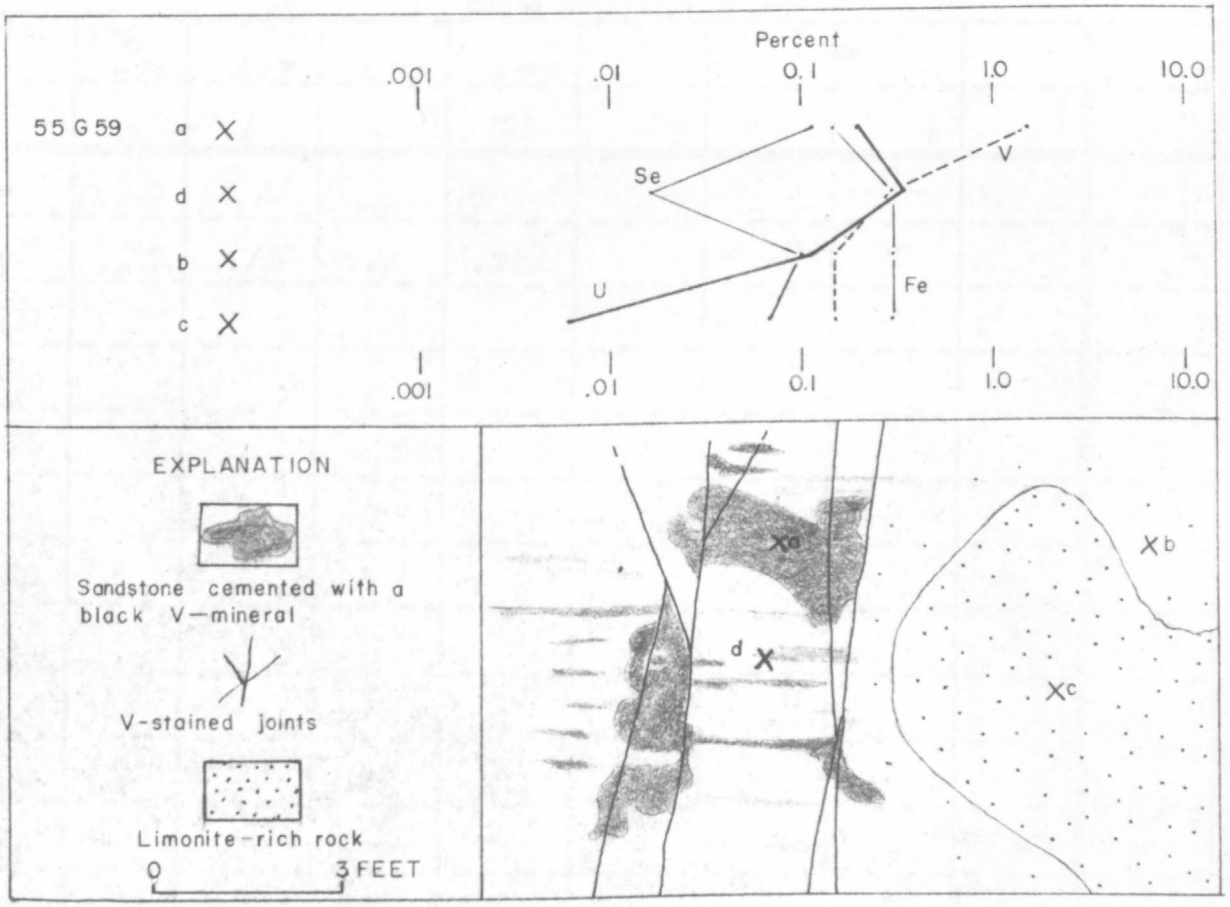



Figure 24.--Sample suite 55G59, Section 22 mine.

Suite No. 55659

| Serial no. / Field no. | 676 a | 677 b | 678 c | 679 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.20 | 0.11 | 0.006 | 0.34 | | | | | | |
| eU | .22 | .15 | .11 | .23 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 1/ | 1/ | 1/ | 1/ | | | | | | |
| $C_{Min.}$ | .35 | .38 | .34 | .33 | | | | | | |
| $C_{Org.}$ | — | — | — | — | | | | | | |
| Se | .11 | .10 | .068 | .016 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | | | | | | |
| Fe | .15 | .3 | .3 | .3 | | | | | | |
| Mg | .15 | .15 | .15 | .07 | | | | | | |
| Ca | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| Na | .7 | .7 | .7 | .7 | | | | | | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| Ti | .07 | .3 | .07 | .07 | | | | | | |
| Mn | .03 | .015 | .015 | .015 | | | | | | |

1/ Carbon not determined because of light color of sample

Suite No. 55659 --Continued

| Serial no. | 676, 676 | 677 | 678 | 679 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | | | | | | |
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .07 | .07 | .07 | .07 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | <.007 | <.002 | <.002 | <.007 | | | | | | |
| Cr | .0003 | .0007 | .0003 | .0003 | | | | | | |
| Cu | .0003 | .0007 | .0007 | .0015 | | | | | | |
| Ga | d | d | d | d | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | .0015 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | d | d | 0 | 0 | | | | | | |
| Sc | d | 0 | 0 | 0 | | | | | | |
| Sr | .015 | .015 | .015 | .015 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .15 | .15 | .15 | .3 | | | | | | |
| Y | 0 | .0015 | 0 | .0015 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .007 | .015 | .007 | .007 | | | | | | |

Suite No.-- 59059 ( a through h )

Serial No's.-- 276,680 through 276,687

Mine-- Sec. 22

Level-- 6,400 ft

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 325,145 N. x 514,270 E.

Mine location--

Sample elevation-- 6,415 ft

Premining water table elevation-- 6,550± ft

Sampled to test element distribution in-- prefault ore layer near oxidized sandstone.

Sample descriptions:

a.--Mottled dark-yellowish-orange and very light gray, coarse- to fine-grained oxidized sandstone. Most sand grains that are not protected by kaolinite nests are limonite coated.

b.--Pale-red, very pale orange, and very light gray, partly oxidized sandstone. Composed of clay and mudstone fragments in a coarse to very coarse matrix.

c.--Light- to very light gray, coarse- to medium-grained sandstone. Well cemented with poikiloblastic calcite. Sparse disseminated pyrite generally associated with scattered darker stained areas.

d.--Medium-dark-gray, medium- to fine-grained ore sandstone. Well cemented with calcite. Most sand grains coated with authigenic carbonaceous material. Pyrite is scarce.

e.--Similar to "d" but calcite is scarce and the carbonaceous material has a brownish hue.

Suite No. 59G59 . Sample descriptions (Continued)

f.--Same as "e."

g.--Light-gray, fine-grained sandstone with a few kaolinite nests and sparse disseminated pyrite.

h.--Similar to "g" but with considerable poikiloblastic calcite cement and very sparse pyrite.

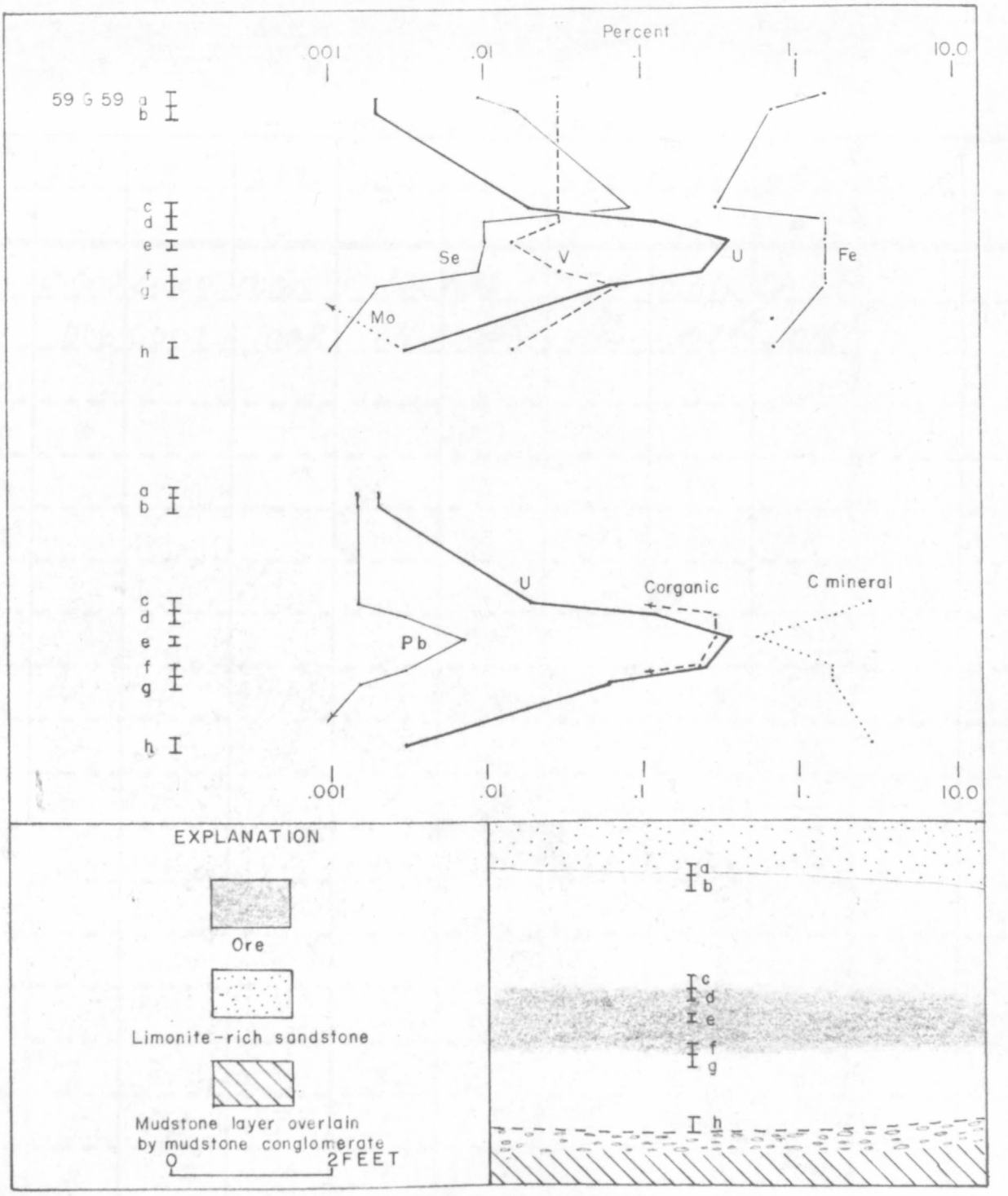



Figure 25.--Sample suite 59G59, Section 22 mine.

Suite No. 59659

| Serial no. / Field no. | 276, 680 a | 681 b | 682 c | 683 d | 684 e | 685 f | 686 g | 687 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.002 | 0.002 | 0.018 | 0.12 | 036 | 0.24 | 0.06 | 0.003 | | |
| eU | .006 | <.001 | .028 | .11 | .24 | .18 | .074 | .008 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePo^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 1/ | 1/ | 2.74 | 1.9 | 0.8 | 1.8 | 1.64 | 1/ | | |
| $C_{Min.}$ | — | — | 2.84 | 1.62 | .52 | 1.58 | 1.57 | 2.88 | | |
| $C_{org.}$ | — | — | 0 | .3 | .3 | .22 | .07 | — | | |
| Se | .0090 | .016 | .082 | .010 | .010 | .0090 | .0020 | .0010 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Fe | 1.5 | .7 | .3 | 1.5 | 1.5 | 1.5 | 1.5 | .7 | | |
| Mg | .3 | .3 | .15 | .3 | .3 | .3 | .15 | .15 | | |
| Ca | 3. | 3. | M | 7. | 1.5 | 2. | 2. | M | | |
| Na | 1.5 | 1.5 | .7 | .7 | .7 | .7 | .7 | .7 | | |
| K | 3. | 3 | 3. | 3. | 1.5 | 3. | 3. | 1.5 | | |
| Ti | .07 | .07 | .15 | .15 | .07 | .15 | .15 | .15 | | |
| Mn | .03 | .07 | .15 | .07 | .03 | .07 | .15 | .15 | | |

1/ Carbon not determined because of light color of sample

Suite No. 57659 --Continued

| Serial no. | 576 680 | 681 | 682 | 683 | 684 | 685 | 686 | 687 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .07 | .03 | .07 | .07 | .07 | .03 | .03 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | .0007 | d | d | <.002 | <.002 | <.002 | d | 0 | | |
| Cr | .0003 | .0007 | .0007 | .0007 | .0003 | .0007 | .0015 | .0015 | | |
| Cu | .0007 | .0015 | .0007 | .0007 | .0015 | .0007 | .003 | .0007 | | |
| Ga | .0002 | .0002 | d | d | d | d | d | d | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | .007 | 0 | 0 | 0 | .003 | .003 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | d | d | 0 | .0003 | .0003 | .0015 | 0 | | |
| Pb | .0015 | .0015 | .0015 | .003 | .007 | .003 | .0015 | d | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sr | .03 | .03 | .03 | .03 | .015 | .03 | .03 | .03 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .03 | .03 | .03 | .03 | .015 | .03 | .07 | .015 | | |
| Y | d | d | .0015 | .007 | .003 | .007 | .0015 | d | | |
| Yb | — | — | — | .0007 | .0003 | .0007 | — | — | | |
| Zr | .007 | .007 | .003 | .015 | .007 | .015 | .015 | .03 | | |

Suite No.-- 61059 ( a through i )

Serial No's.-- 276,688 through 276,696

Mine-- Sec. 22

Level-- 6,400 ft

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,845 N. x 514,500 E.

Mine location--

Sample elevation-- 6,415 ft

Premining water table elevation--~6,550 ft

Sampled to test element distribution in--a prefault ore layer enclosed by, what happened to be, an aureole of postfault ore.

Sample descriptions:

a.--Very light gray, medium-grained sandstone. Small kaolinite nests common. Clean-looking sandstone with very little pyrite and extremely sparse paramontroseite(?) needles perched on sand grains.

b.--Same as "a."

c.--Dark-gray, medium-grained ore sandstone. Most sand grains are coated with authigenic carbonaceous material. Calcite is prevalent and kaolinite nests are small and sparse.

d.--Medium-dark-gray sandstone. Otherwise the same as "c."

e.--Same as "d."

f.--Same as "d."

g.--Somewhat mottled, medium-dark-gray, grayish-black, and pale-yellowish-brown, medium-grained sandstone. The lighter hued areas are generally similar to "h."

Suite No. 61G59, Sample descriptions (Continued)

Sand grains are thickly to thinly coated with black to brown authigenic carbonaceous material.

h.--Very light gray, coarse- to very coarse grained sandstone. Clean-looking sandstone with scattered kaolinite nests and some quartz overgrowths.

i.--Same as "h."

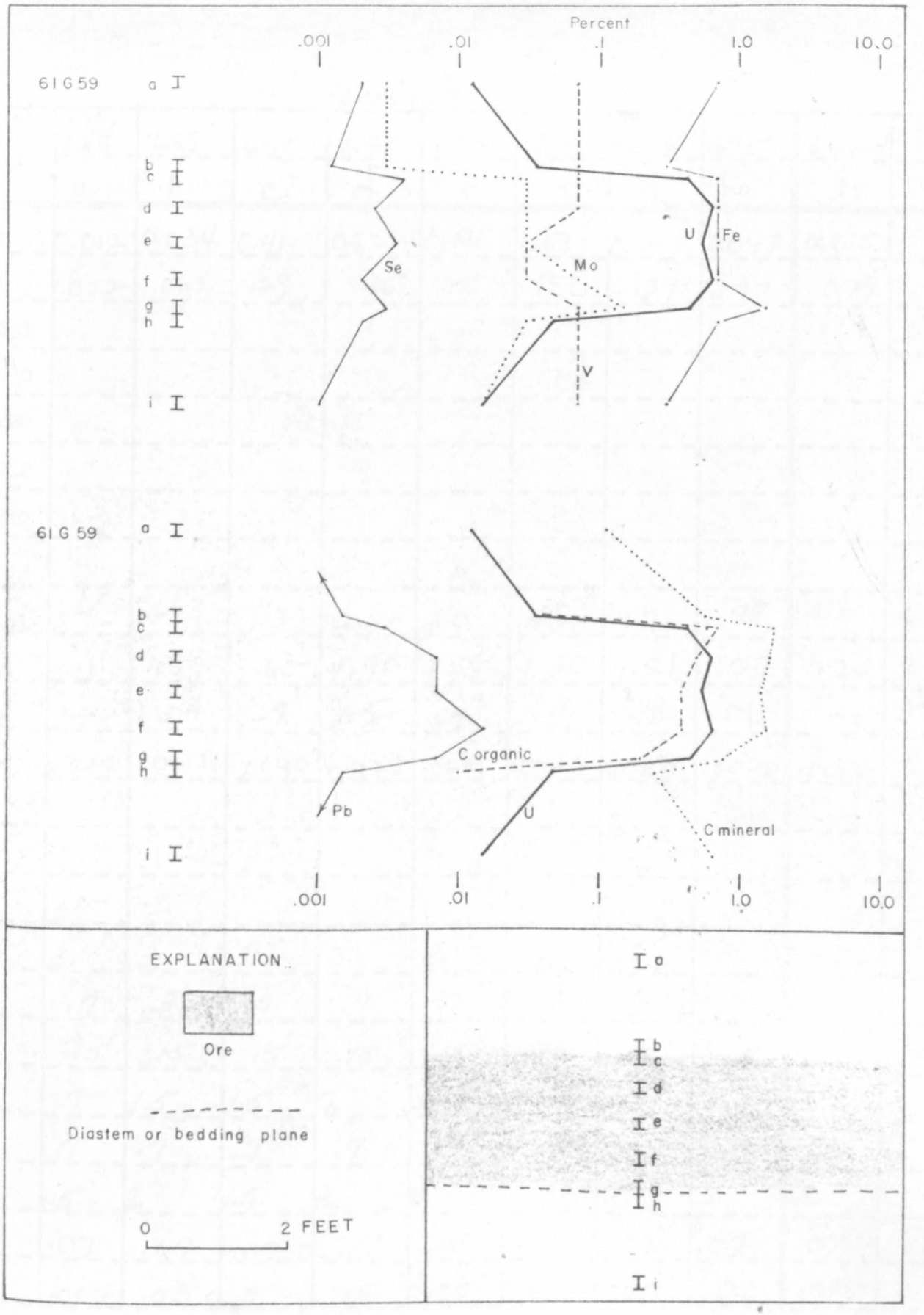



Figure 26.--Sample suite 61G59, Section 22 mine.

Suite No. 61659

| Serial no. / Field no. | 276, 688 a | 689 b | 690 c | 691 d | 692 e | 693 f | 694 g | 695 h | 696 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.012 | 0.034 | 0.41 | 0.62 | 0.54 | 0.63 | 0.41 | 0.047 | 0.015 | |
| eU | .027 | .062 | .29 | .45 | .43 | .51 | .29 | .077 | .029 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $C_{Total}$ | —/ | .63 | 1.3 | 2.2 | 2.0 | 1.8 | 1.7 | .78 | —/ | |
| $C_{Min.}$ | .11 | .59 | .60 | 1.70 | 1.59 | 1.40 | 1.51 | .77 | .24 | |
| $C_{Org.}$ | — | .04 | .7 | .5 | .4 | .4 | .2 | .01 | — | |
| Se | .0020 | .0012 | .0040 | .0025 | .0035 | .0020 | .0030 | .0020 | .0010 | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Fe | .7 | .3 | .7 | .7 | .7 | .7 | 1.5 | .7 | .3 | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .07 | |
| Ca | .7 | 1.5 | 1.5 | 7. | 3. | 3. | 7. | 3. | .7 | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | |
| K | 1.5 | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | |
| Ti | .07 | .07 | .07 | .03 | .03 | .03 | .03 | .07 | .07 | |
| Mn | .007 | .03 | .07 | .15 | .07 | .07 | .07 | .03 | .015 | |

—/ Carbon not determined because of light color of sample

Suite No. 61659 --Continued

| Serial no. / Field no. | 276, 688 a | 689 b | 690 c | 691 d | 692 e | 693 f | 694 g | 695 h | 696 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | .00015 | .00015 | .00015 | .00015 | .00015 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | <.002 | <.002 | <.002 | <.002 | <.002 | — | 0 | |
| Cr | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | |
| Cu | .0007 | .0007 | .0007 | .0007 | .0003 | .0007 | .0007 | .0007 | .0003 | |
| Ga | d | d | d | d | d | .0003 | d | d | d | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | .003 | .003 | .03 | .03 | .03 | .07 | .15 | .003 | .0015 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | d | .0015 | .003 | .007 | .007 | .015 | .007 | .0015 | d | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .03 | .03 | .03 | .03 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .07 | .07 | .07 | .07 | .03 | .03 | .07 | .07 | .07 | |
| Y | .0015 | .003 | .0015 | 0 | 0 | 0 | .003 | .0015 | 0 | |
| Yb | — | .0003 | — | — | — | — | .0003 | — | — | |
| Zr | .015 | .007 | .007 | .003 | .003 | .007 | .003 | .003 | .015 | |

Suite No.-- 63G59 ( a through f )

Serial No's.-- 276,697 through 276,702

Mine-- Sec. 22

Level-- Incline over 6,450 ft level

Sec. 22 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,875 N. x 514,460 E.

Mine location--

Sample elevation-- 6,470 ft

Premining water table elevation-- 6,550± ft

Sampled to test element distribution in--postfault ore showing a color gradation into barren-appearing sandstone.

Sample descriptions:

a.--Very light gray, medium- to fine-grained sandstone. Kaolinite nests and finely disseminated pyrite are common.

b.--Very light gray, medium-grained sandstone with scattered greenish-gray mudstone granules and pebbles. Kaolinite nests are abundant.

c.--Grades from light-brownish-gray at top to light-olive-gray at bottom. Largely medium-grained with abundant greenish-gray to white clay. Finely disseminated pyrite and minute prismatic needles of paramontroseite(?) perched on sand grains are common. Also some perched grains that may be anatase.

d.--Pale-yellowish-brown and light-brownish-gray, medium-grained sandstone. Quartz overgrowths scarse. Finely disseminated pyrite is common and minute prismatic needles of paramontroseite(?) perched on sand grains are abundant. Some anatase may be present.

Suite No. 63G59 . Sample descriptions (Continued)

e.--Light-olive-gray to light-gray, medium-grained sandstone with some scattered coarse and fine grains. Quartz overgrowths are common. Finely disseminated pyrite and minute prismatic needles of paramontroseite perched on sand grains are common.

f.--Light-brownish-gray to very light gray, medium- to coarse-grained sandstone. Similar to "e" but with less paramontroseite(?).

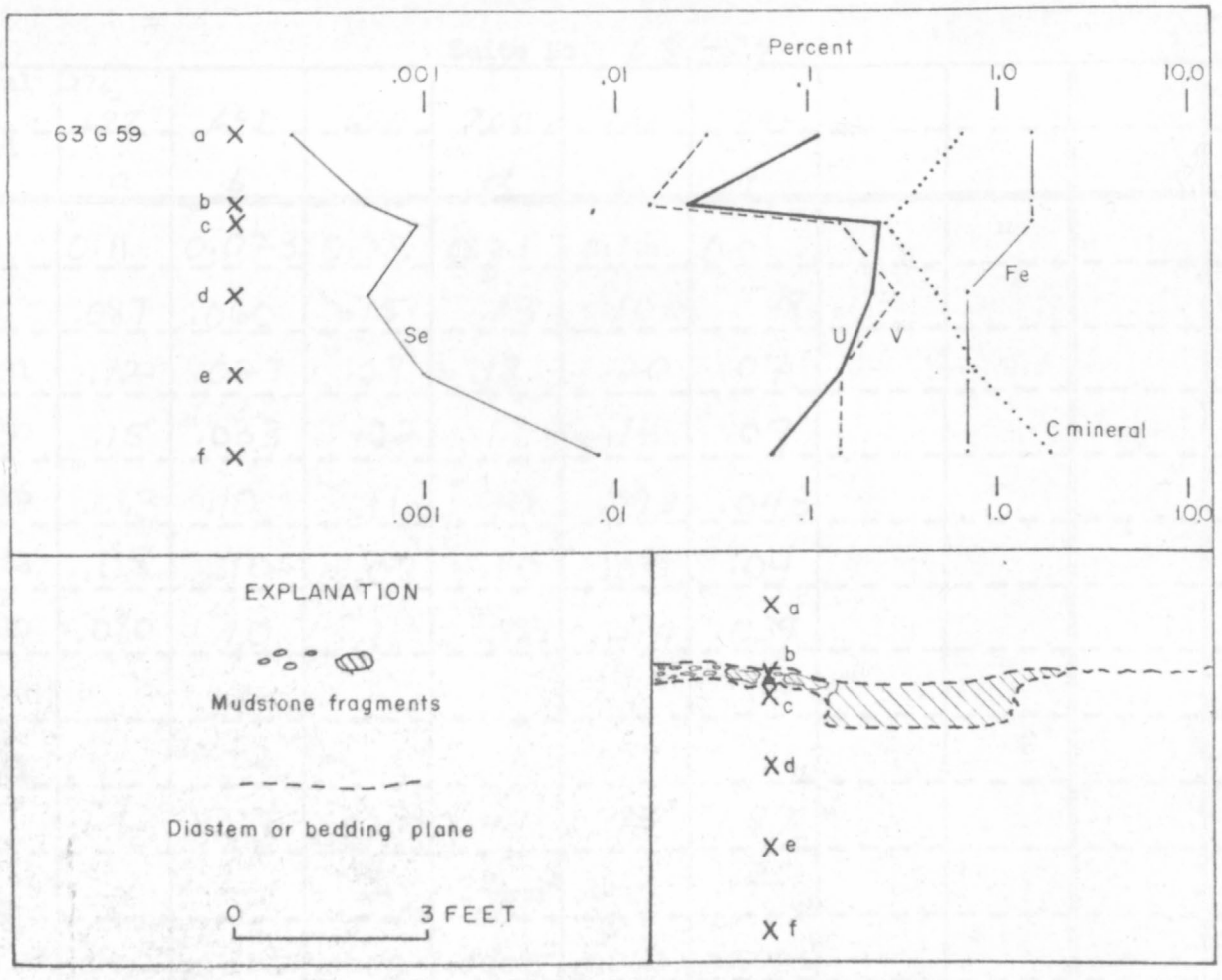



Figure 27.--Sample suite 63G59, Section 22 mine.

Suite No. 63659

| Serial no. / Field no. | 276, 697 a | 698 b | 699 c | 700 d | 701 e | 702 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.11 | 0.023 | 0.23 | 0.21 | 0.15 | 0.065 | | | | |
| eU | .087 | .060 | .15 | .13 | .10 | .048 | | | | |
| $ePa^{231}$ | .12 | .027 | .27 | .18 | .20 | .07 | | | | |
| $eTh^{230}$ | .15 | .033 | .22 | .17 | .16 | .07 | | | | |
| $eRa^{226}$ | .083 | .10 | .11 | .10 | .093 | .043 | | | | |
| $eRh^{222}$ | .08 | .10 | .07 | .10 | .08 | .04 | | | | |
| $ePb^{210}$ | .080 | .10 | .11 | .087 | .090 | .039 | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | | | | | | | |
| $C_{Min.}$ | .64 | .33 | .25 | .49 | .78 | 1.89 | | | | |
| $C_{Org.}$ | — | — | — | — | — | — | | | | |
| Se | .0002 | .0005 | .0009 | .0005 | .0010 | .0080 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Fe | 1.5 | 1.5 | 1.5 | .7 | .7 | .7 | | | | |
| Mg | .15 | .3 | .15 | .07 | .07 | .15 | | | | |
| Ca | 3. | 1.5 | .7 | 1.5 | 3. | 1.5 | | | | |
| Na | .7 | .7 | .7 | .7 | .7 | 1.5 | | | | |
| K | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 3. | | | | |
| Ti | .15 | .3 | .07 | .15 | .15 | .07 | | | | |
| Mn | .03 | .03 | .005 | .03 | .03 | .015 | | | | |

1/ Carbon not determined because of light color of sample.

Suite No. 63659 --Continued

| Serial no. / Field no. | 276. 697 a | 628 b | 699 c | 700 d | 701 e | 702 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | d | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.002 | .0007 | <.002 | <.002 | d | 0 | | | | |
| Cr | .0003 | .015 | .0015 | .0003 | .0007 | .0003 | | | | |
| Cu | .0007 | .0015 | .0007 | .0003 | .0007 | .0007 | | | | |
| Ga | d | .0007 | d | d | d | d | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| La | 0 | .003 | 0 | 0 | 0 | 0 | | | | |
| Mo | 0 | 0 | .0007 | 0 | 0 | 0 | | | | |
| Nb | 0 | .0015 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | .0007 | 0 | 0 | 0 | 0 | | | | |
| Pb | 0 | 0 | 0 | 0 | 0 | d | | | | |
| Sc | 0 | .0007 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .03 | .015 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .03 | .015 | .15 | .3 | .15 | .15 | | | | |
| Y | 0 | .003 | 0 | 0 | d | 0 | | | | |
| Yb | — | .0003 | — | — | — | — | | | | |
| Zr | .015 | .03 | .015 | .015 | .03 | .007 | | | | |

Suite No.-- 62G61 ( a through i )

Serial No's.-- 294,440 through 294,448

Mine-- Sec. 23

Level-- 650 level

Sec. 23 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,855 N. x 516,780 E.

Mine location--

Sample elevation-- ~6,400 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in--the original and dislocated parts of a primary ore layer (see also sample suite 63G61).

Sample descriptions:

a.--Medium-gray, fine-grained sandstone. A thin dull-gray film coats most sand grains. Pyrite is sparse.

b.--Same as "a."

c.--Same as "a."

d.--Light-olive-gray, fine-grained sandstone. Pyrite and quartz overgrowths are sparse.

e.--Same as "d."

f.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material forms a dull-dark-gray coat on most sand grains. Disseminated pyrite, quartz overgrowths, and very small kaolinite nests are sparse.

g.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material forms a dull-dark-gray coat on most sand grains. Pyrite is a little more common than in "f."

Suite No. 62G61 . Sample descriptions (Continued)

h.--Yellowish-gray, fine-grained sandstone. Disseminated pyrite, quartz overgrowths, and small kaolinite nests are generally sparse.

i.--Same as "h."

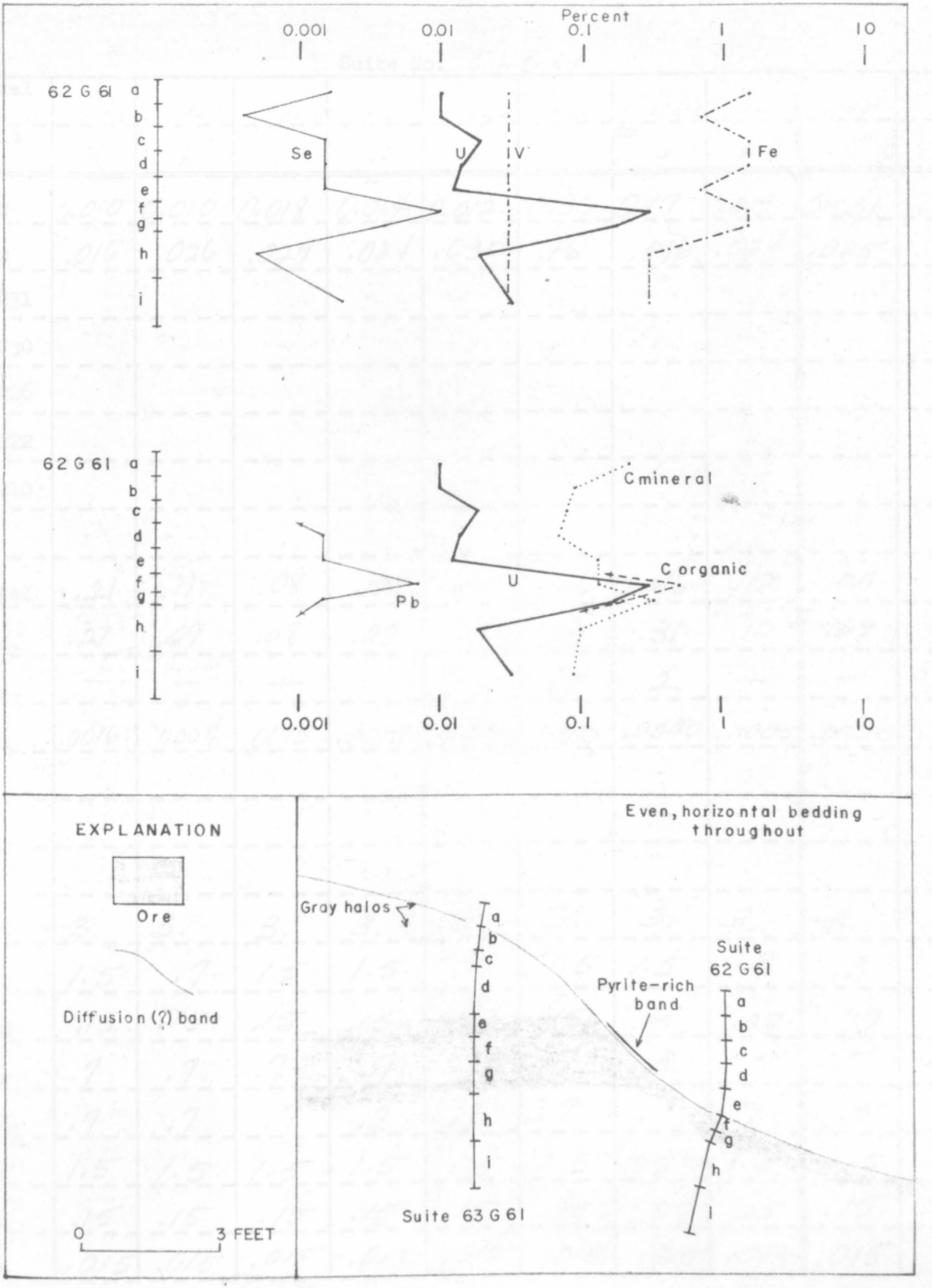



Figure 28.--Sample suite 62G61, Section 23 mine.

Suite No. 62661

| Serial no. | 294, 440 | 441 | 442 | 443 | 444 | 445 | 446 | 447 | 448 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| U | 0.010 | 0.010 | 0.018 | 0.014 | 0.012 | 0.30 | 0.17 | 0.019 | 0.031 | |
| eU | .016 | .026 | .029 | .024 | .030 | .16 | .096 | .024 | .025 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .21 | .11 | .08 | .12 | .11 | .66 | .46 | .12 | .09 | |
| $C_{Min.}$ | .21 | .09 | .08 | .07 | .13 | .13 | .31 | .10 | .09 | |
| $C_{Org.}$ | — | — | — | — | — | .5 | .2 | — | — | |
| Se | .0016 | .0004 | .0015 | .0015 | .0015 | .0100 | .0040 | .0005 | .0020 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Fe | 1.5 | .7 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | .3 | .3 | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .07 | .07 | |
| Ca | .7 | .7 | .7 | .7 | .7 | .7 | 3. | .7 | .7 | |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | 1.5 | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .15 | .15 | .15 | .15 | .15 | .15 | .07 | .15 | .15 | |
| Mn | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | |

Suite No. 62661 --Continued

| Serial no. / Field no. | 29-1, 440 a | 441 b | 442 c | 443 d | 444 e | 445 f | 446 g | 447 h | 448 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | .0015 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | .0003 | 0 | <.002 | <.002 | 0 | 0 | |
| Cr | .0007 | .0003 | .0003 | .0003 | .0007 | .0007 | .0003 | .0007 | .0007 | |
| Cu | .0007 | .0003 | .0007 | .0007 | .0003 | .0007 | .0007 | .0007 | .0003 | |
| Ga | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | .0003 | 0 | 0 | |
| Pb | 0 | 0 | 0 | .0015 | .0015 | .007 | .0015 | 0 | 0 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | |
| Y | 0 | 0 | 2 | 0 | 0 | .007 | .007 | 0 | 0 | |
| Yb | 0 | 0 | 0 | 0 | 0 | .0007 | .0003 | 0 | 0 | |
| Zr | .015 | .03 | .007 | .007 | .007 | .03 | .003 | .015 | .007 | |

Suite No.-- 63G61 ( a through i )

Serial No's.-- 294,449 through 294,457

Mine-- Sec. 23

Level-- 650 level

Sec. 23 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 324,865 N. x 516,780 E.

Mine location--

Sample elevation-- ~ 6,400 ft

Premining water table elevation-- ~ 6,550 ft

Sampled to test element distribution in--the original and dislocated parts of a primary ore layer (see also sample suite 62G61).

Sample descriptions:

a.--Medium-gray, fine-grained sandstone. Sand grains are coated with a thin gray film. Pyrite is sparse to common.

b.--Medium-light-gray and light-olive-gray, fine-grained sandstone. Sand grains are partly coated with a thin dull-gray film. Pyrite is sparse. Kaolinite nests are sparse to common but small.

c.--Medium-gray, fine-grained sandstone similar to sample "b."

d.--Pale-yellowish-brown, fine-grained sandstone. Similar to sample "b."

e.--Dark-gray, fine-grained ore sandstone. All sand grains coated with a dull-dark-gray film of authigenic carbonaceous material. Disseminated pyrite is common.

f.--Same as "e," but with a thicker coating of authigenic carbonaceous material on sand grains.

--Grayish-brown to pale-brown, fine-grained ore sandstone. Brownish authigenic

carbonaceous material coats most sand grains and also occurs as scattered black blebs in the interstices. Pyrite is common and very fine grained.

h.--Pale-yellowish-brown, fine-grained sandstone. A few scattered blebs of authigenic carbonaceous material were noted. Disseminated pyrite is common. Calcite cement and small kaolinite nests are sparse to common.

i.--Pale-yellowish-brown, fine-grained sandstone similar to "h," but with a much higher content of calcite cement.

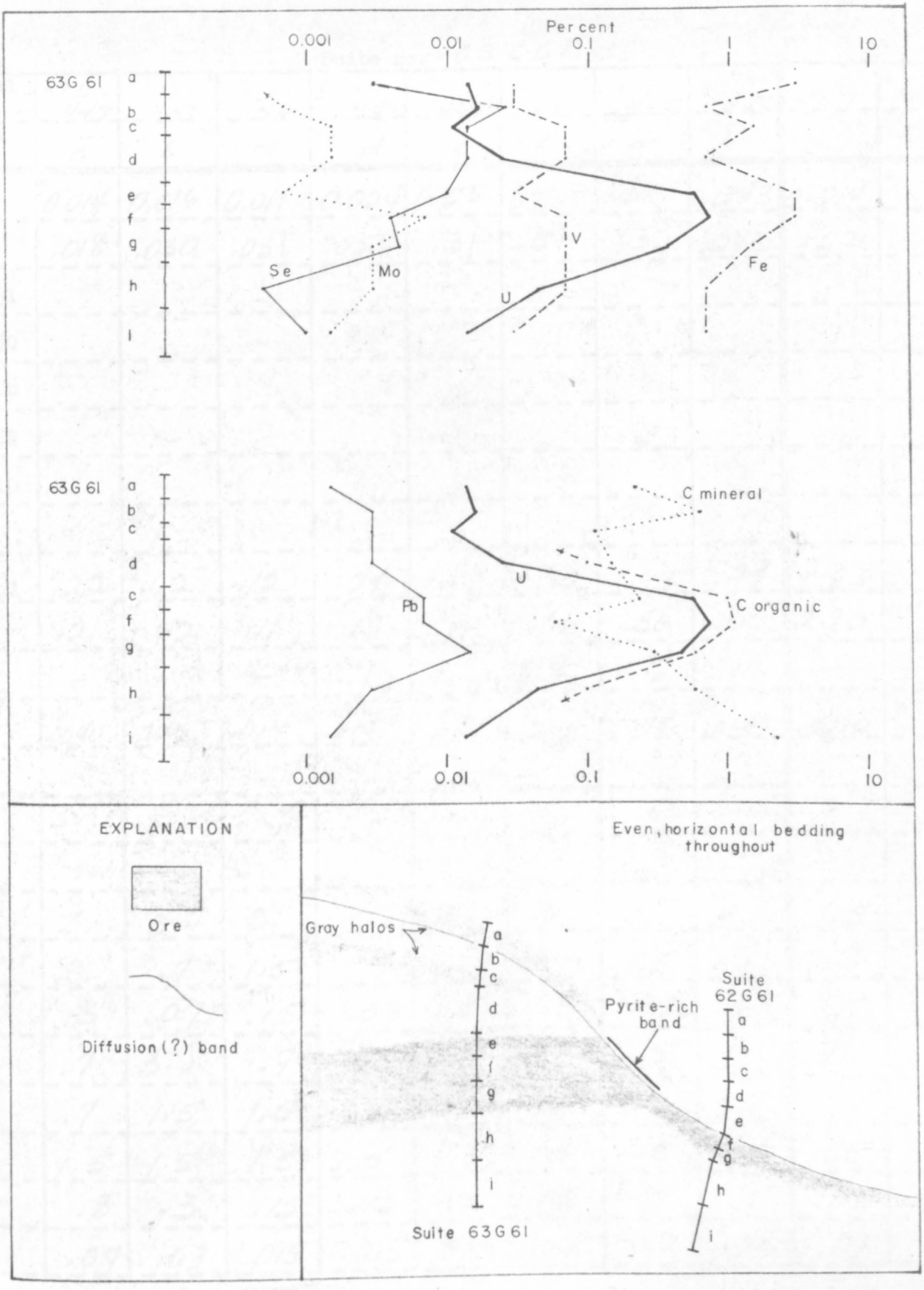



Figure 29.--Sample suite 63G61, Section 23 mine.

Suite No. 63661

| Serial no. / Field no. | 294, 449 a | 450 b | 451 c | 452 d | 453 e | 454 f | 455 g | 456 h | 457 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.014 | 0.016 | 0.011 | 0.024 | 0.55 | 0.72 | 0.38 | 0.043 | 0.014 | |
| eU | .018 | .030 | .031 | .056 | .31 | .51 | .32 | .043 | .021 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .22 | .62 | .12 | .24 | 1.17 | 1.22 | .93 | .74 | 2.03 | |
| $C_{Min.}$ | .21 | .62 | .11 | .15 | .23 | .06 | .30 | .60 | 2.10 | |
| $C_{Org.}$ | — | — | — | .1 | 1. | 1.1 | .6 | .1 | — | |
| Se | .0040 | .025 | .014 | .014 | .010 | .0040 | .0045 | .0005 | .0010 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 1.5 | |
| Fe | 3. | .7 | 1.5 | .7 | 3. | 3. | 1.5 | .7 | .7 | |
| Mg | .3 | .07 | .15 | .07 | .3 | .3 | .15 | .07 | .07 | |
| Ca | .7 | 3. | .7 | 1.5 | 1.5 | .7 | 1.5 | 3. | 7. | |
| Na | .7 | 1.5 | 1.5 | .7 | .7 | 1.5 | .7 | .7 | .7 | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Ti | .3 | .3 | .15 | .15 | .15 | .15 | .15 | .15 | .03 | |
| Mn | .07 | .03 | .015 | .015 | .015 | .015 | .03 | .03 | .07 | |

Suite No. 63661 --Continued

| Serial no. / Field no. | 294,449 a | 450 b | 451 c | 452 d | 453 e | 454 f | 455 g | 456 h | 457 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | .00015 | .0003 | .0003 | .00015 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | .0003 | .0003 | .0007 | .0003 | <.002 | <.002 | <.002 | .0003 | 0 | |
| Cr | .0015 | .0007 | .0003 | .0007 | .03 | .0007 | .0007 | .0007 | .0007 | |
| Cu | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | |
| Ga | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | 0 | .0007 | .0015 | .0015 | .0007 | .007 | .003 | .003 | .0015 | |
| Nb | .003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | .0003 | 0 | 0 | .0003 | |
| Pb | .0015 | .003 | .003 | .003 | .007 | .007 | .015 | .003 | .0015 | |
| Sc | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .007 | .015 | .007 | .007 | .007 | .007 | .007 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .03 | .03 | .07 | .07 | .03 | .07 | .07 | .07 | .03 | |
| Y | .0015 | .0015 | .0015 | .0015 | .007 | .0015 | .003 | .003 | 0 | |
| Yb | .0003 | .0003 | .00015 | .00015 | <.001 | <.001 | <.001 | .0003 | 0 | |
| Zr | .03 | .07 | .03 | .03 | .015 | .007 | .015 | .007 | .007 | |

Suite No.-- 122G61 ( a through o )

Serial No's.-- 294,171 through 294,185

Mine-- Sec. 23'

Level-- 650 E, upper Trackless

Sec. 23 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 325,110 N. x 518,410 E.

Mine location-- 104 S. off 1,100 E. opposite 1,050 drift

Sample elevation-- 6,480 ft

Premining water table elevation-- ~ 6,550 ft

Sampled to test element distribution in--an oxidized and leached prefault ore layer.

Sample descriptions:

a.--Pale-yellowish-brown, medium-grained, oxidized sandstone. Quartz overgrowths and kaolinite nests are common.

b.--Light-brown, medium-grained sandstone. Many sand grains are sparsely coated with a limonitic stain. Calcite cement and quartz overgrowths are sparse. Kaolinite nests are abundant.

c.--Pale-brown, fine-grained sandstone. Blebs of dark-gray authigenic carbonaceous material fill some interstices and a brownish material coats many sand grains. Specks and stain of hematite are common. Quartz overgrowths and kaolinite nests are sparse.

d.--Medium-dark-gray, fine-grained sandstone. Dull-appearing authigenic carbonaceous material coats many sand grains and forms scattered blebs that fill interstices. Disseminated pyrite is common. Quartz overgrowths and kaolinite nests are sparse.

Suite No. 122G61 . Sample descriptions (Continued)

e.--Medium-dark-gray, fine-grained sandstone. Dull authigenic carbonaceous material forms a gray film on sand grains and sparse dark-gray blebs that fill interstices. Disseminated pyrite is common. Kaolinite aggregates are sparse.

f.--Pale-yellowish-brown, fine-grained sandstone. Limonite stain is common. Kaolinite nests are sparse.

g.--Similar to "f."

h.--Pale reddish-brown, fine-grained sandstone. Hematite specks and stain are common. Calcite cement and kaolinite aggregates are common. Quartz overgrowths are sparse.

i.--Pale-yellowish-brown, medium-grained sandstone. Limonite stain is common on sand grains. Quartz overgrowths and kaolinite nests are common. A few scattered aggregates of anatase were noted.

j.--Pale-yellowish-brown, medium-grained sandstone. Poikiloblastic calcite cement is common. Quartz overgrowths and kaolinite nests are common. A white clay other than kaolinite coats most sand grains and forms a weak cement.

k.--Grayish-red, fine-grained sandstone. A few sparse dark-gray blebs of authigenic carbonaceous material were noted in the interstices. Hematite specks and stain are abundant. Kaolinite nests and calcite cement are common.

l.--Grayish-red, medium-grained sandstone. Authigenic carbonaceous material forms a dark-gray coating on many sand grains. Hematite forms an abundant film on sand grains. Poikiloblastic calcite cement is abundant, and kaolinite nests are common.

m.--Pale-yellowish-orange, fine-grained sandstone. Kaolinite nests are common. A few scattered aggregates of anatase were noted. Quartz overgrowths are sparse.

n.--Light-brown, fine-grained sandstone. Limonite stains are abundant. Kaolinite nests are common. Quartz overgrowths and anatase aggregates are sparse.

o.--Light-brown, fine-grained sandstone. Quartz overgrowths, kaolinite aggregates, and hematite specks and stain are common.

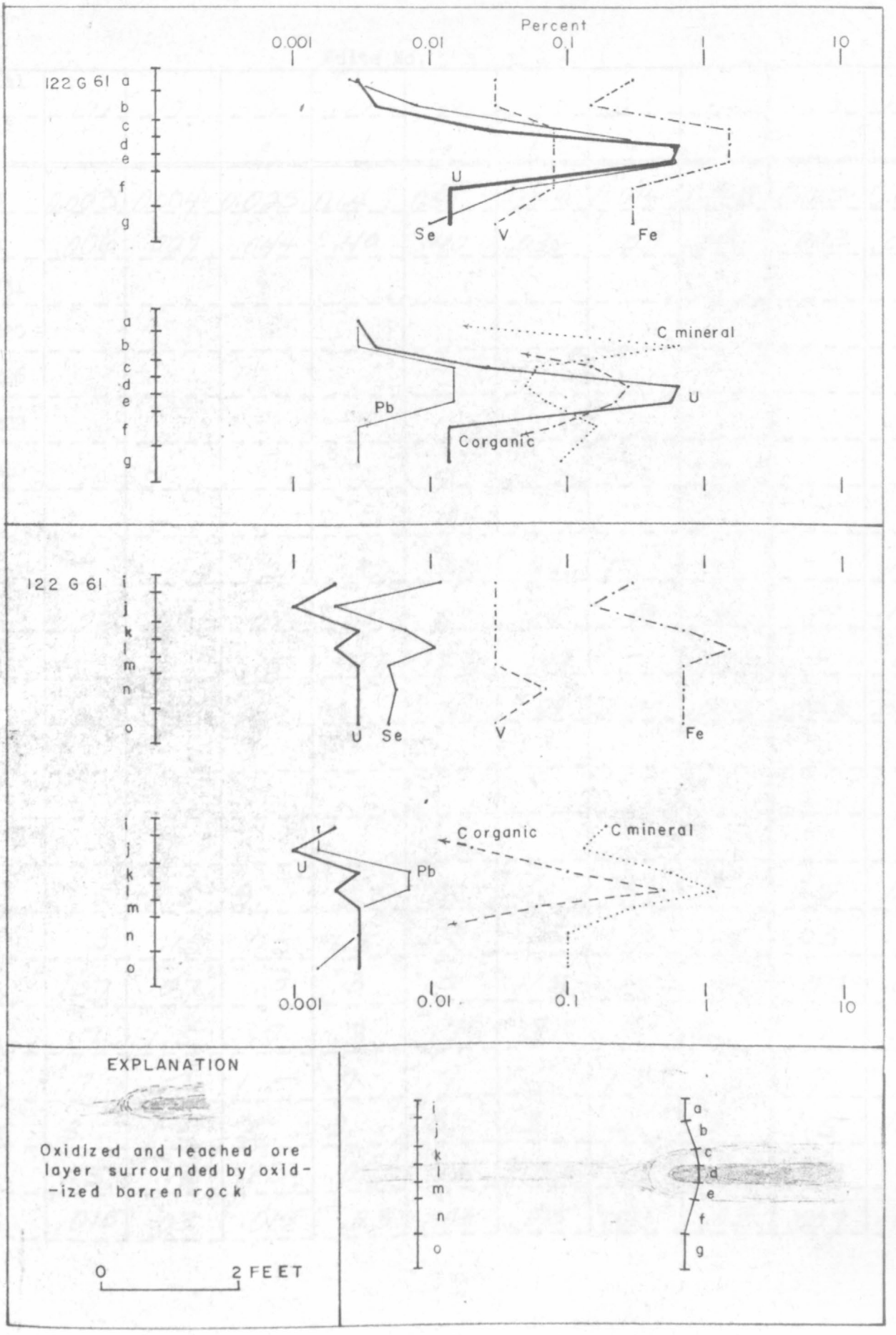



Figure 30.--Sample suite 122G61, Section 23 mine.

Suite No. 122661

| Serial no. | 294, 171 | 172 | 173 | 174 | 175 | 176 | 177 | 178 | 179 | 180 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | j |
| U | 0.003 | 0.004 | 0.025 | 0.64 | 0.58 | 0.014 | 0.014 | 0.005 | 0.002 | 0.001 |
| eU | .006 | .009 | .044 | .40 | .40 | .036 | .023 | .006 | .003 | .004 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | .21 | .32 | .29 | .24 | — | — | — | .15 |
| $C_{Min.}$ | <.02 | .64 | .06 | .05 | .07 | .16 | .09 | .91 | .19 | .13 |
| $C_{Org.}$ | — | — | .15 | .27 | .22 | .08 | — | — | — | .02 |
| Se | .0025 | .0080 | .09 | .61 | .61 | .04 | .0100 | .0018 | .020 | .0020 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | 1.5 | 1.5 |
| Fe | .3 | .15 | 1.5 | 1.5 | 1.5 | .3 | .3 | 1.5 | .3 | .15 |
| Mg | .07 | .07 | .3 | .3 | .3 | .15 | .15 | .15 | .07 | .07 |
| Ca | .7 | 1.5 | .7 | .3 | .7 | .7 | .7 | 3. | .7 | .7 |
| Na | .7 | .7 | 1.5 | .7 | .7 | .7 | 1.5 | 1.5 | .7 | .7 |
| K | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | 1.5 | 1.5 |
| Ti | .15 | .15 | .15 | .07 | .15 | .07 | .15 | .15 | .07 | .07 |
| Mn | .015 | .03 | .015 | .03 | .03 | .015 | .015 | .03 | .007 | .007 |

Suite No. 122661 --Continued

| Serial no. / Field no. | 294, 121 a | 122 b | 123 c | 124 d | 125 e | 126 f | 127 g | 128 h | 129 i | 180 j |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .15 | .07 | .03 | .03 |
| Be | 0 | 0 | .00015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | .0007 | <.005 | <.005 | 0 | 0 | 0 | 0 | 0 |
| Cr | .0003 | .0003 | .0007 | .00015 | .003 | .0003 | .0003 | .0007 | .0003 | .0003 |
| Cu | .0007 | .0007 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0007 | .0007 |
| Ga | .0007 | .0007 | .0015 | .0015 | .0015 | .0015 | .0015 | .0007 | .0003 | .0003 |
| Ge | 0 | 0 | 0 | <.005 | <.005 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | .007 | .007 | 0 | 0 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .003 | .003 | .015 | .015 | .015 | .003 | .003 | .003 | .0015 | .0015 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .007 | .015 | .015 | .015 | .015 | .015 | .015 | .03 | .007 | .007 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .03 | .07 | .07 | .07 | .07 | .03 | .015 | .03 | .03 |
| Y | .0015 | .0015 | .007 | .007 | .007 | 0 | 0 | .003 | .0015 | .0015 |
| Yb | .00015 | .00015 | .0007 | .0007 | .0007 | .00015 | .00015 | .0003 | .0003 | .00015 |
| Zr | .003 | .007 | .007 | .003 | .015 | .007 | .003 | .003 | .007 | .015 |

Suite No. 122 G61 continued

| Serial no. / Field no. | 294, 181 k | 182 l | 183 m | 184 n | 185 o | | | | |
|---|---|---|---|---|---|---|---|---|---|
| U | 0.003 | 0.002 | 0.003 | 0.003 | 0.003 | | | | |
| eU | .007 | .004 | .006 | .005 | .006 | | | | |
| $ePa^{231}$ | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | |
| | | | | | | | | | |
| $C_{Total}$ | .63 | 1.56 | .09 | .04 | — | | | | |
| $C_{Min.}$ | .56 | 1.10 | .03 | .10 | .10 | | | | |
| $C_{Org.}$ | .1 | .5 | .06 | 0 | — | | | | |
| Se | .0065 | .0105 | .0050 | .0055 | .0050 | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Al | 1.5 | 1.5 | 3. | 3. | 1.5 | | | | |
| Fe | .7 | 1.5 | .7 | .7 | .7 | | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | | | | |
| Ca | 1.5 | 3. | .7 | .3 | .7 | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | .7 | | | | |
| K | 3. | 3. | 3. | 3. | 3. | | | | |
| Ti | .03 | .07 | .07 | .07 | .07 | | | | |
| Mn | .015 | .07 | .007 | .007 | .007 | | | | |

Suite No. 122661 --Continued

| Serial no. / Field no. | 2941 L81 k | L82 l | L83 m | L84 n | L85 o | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .03 | .07 | .07 | .03 | | | | | |
| Be | 0 | 0 | .00015 | 0 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | 0 | 0 | 0 | 0 | 0 | | | | | |
| Cr | .00015 | .0003 | .0003 | .0003 | .0007 | | | | | |
| Cu | .0007 | .0007 | .0007 | .0007 | .0007 | | | | | |
| Ga | .0007 | .0007 | .0015 | .0007 | .0007 | | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | | | | | |
| La | 0 | 0 | 0 | 0 | 0 | | | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .007 | .007 | .003 | .003 | .0015 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .03 | .015 | .015 | .007 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .03 | .03 | .03 | .07 | .03 | | | | | |
| Y | .003 | .003 | .0015 | 0 | 0 | | | | | |
| Yb | .0003 | .0003 | .0003 | — | .00015 | | | | | |
| Zr | .003 | .007 | .007 | .015 | .007 | | | | | |

Suite No.-- 40G62 ( a through i )

Serial No's.-- 302,950 through 302,958

Mine-- Sec. 23

Level-- 650 level - slusher development

Sec. 23 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 325,675 N. x 516,165 E.

Mine location-- 1,500 W, off 14 N, near station B-301

Sample elevation-- not recorded

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in-- a prefault S-type ore roll.

Sample descriptions:

a.--Light-gray, fine-grained sandstone. There may be a little pyrite but most of the disseminated sulfide mineral seems to be twinned marcasite. Kaolinite nests are common to abundant and calcite cement is locally abundant.

b.--Yellowish-gray, fine-grained sandstone. A little marcasite is present. Small kaolinite nests are common.

c.--Very light gray, fine-grained sandstone. Sparse scattered interstitial filling of pyrite. Small kaolinite nests are common and calcite cement is abundant.

d.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material coats the sand grains and fills some interstices. Very sparse cementing aggregates of pyrite enclose from 10 to 50 sand grains. Kaolinite as minute specks is common. Fine-grained calcite cement is abundant.

e--Medium-gray to medium-dark-gray, fine-grained ore sandstone. Authigenic carbonaceous

Suite No. 40G62 . Sample descriptions (Continued)

material, with a clay-like texture, fills some interstices. Pyrite is very sparse. Fine-grained calcite cement is abundant.

f.--Medium- to medium-light-gray, fine-grained ore sandstone. Authigenic carbonaceous material is non-uniformly distributed and fills some interstices and may stain some clay. Pyrite, largely as formless blebs, is abundant. Very small kaolinite nests are common. Calcite cement is common.

g.--Yellowish-gray, fine-grained sandstone. Extremely fine-grained disseminated pyrite crystals are common. Small nests of kaolinite are common.

h.--Similar to "g" but less pyrite.

i.--Same as "h."

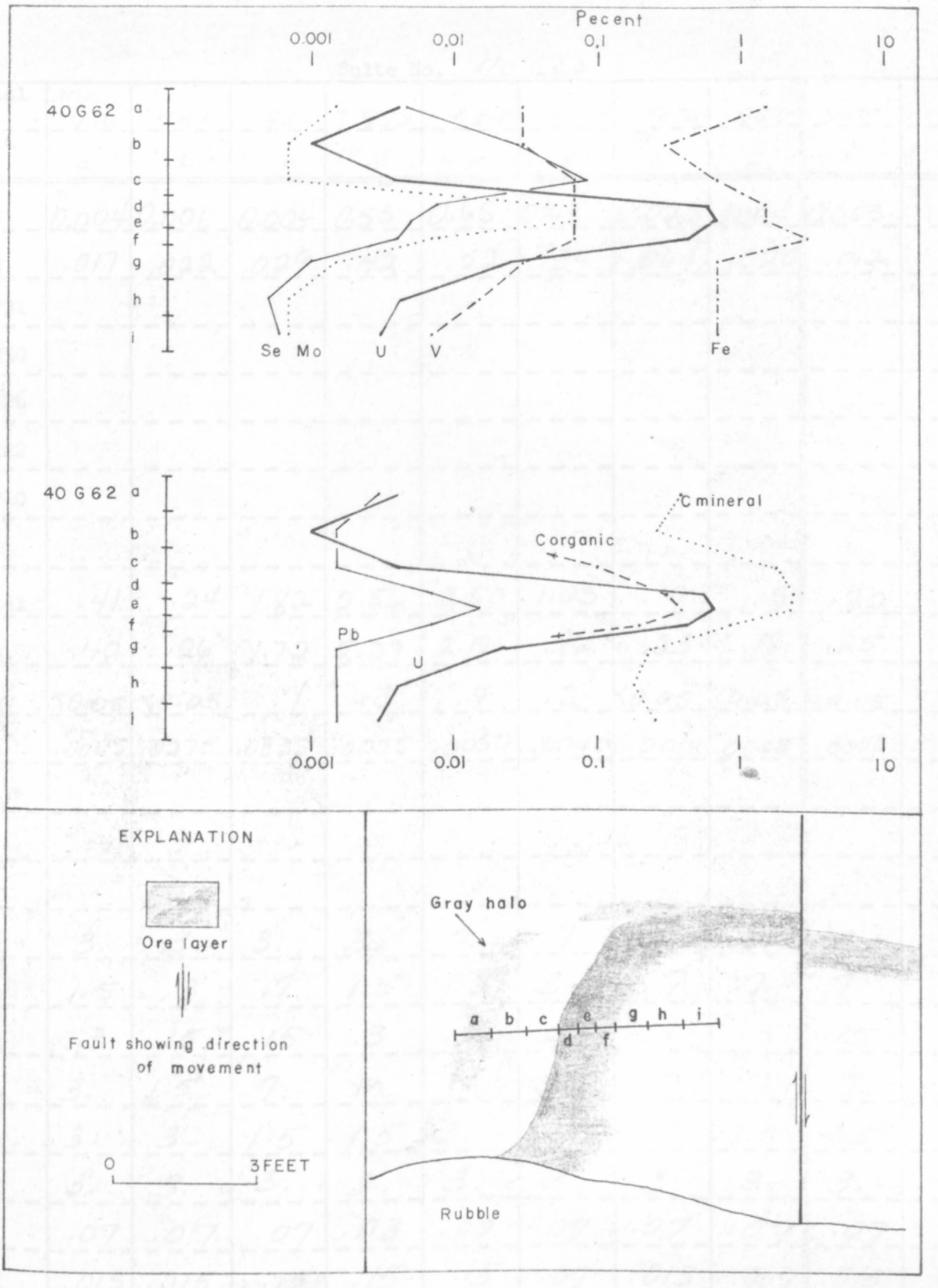



Figure 31.--Sample suite 40G62, Section 23 mine.

Suite No. 40662

| Serial no. / Field no. | 302, 250 a | 951 b | 952 c | 953 d | 954 e | 955 f | 956 g | 957 h | 958 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.004 | 0.001 | 0.004 | 0.55 | 0.65 | 0.43 | 0.023 | 0.004 | 0.003 | |
| eU | .017 | .022 | .029 | .42 | .52 | .34 | .063 | .020 | .012 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .41 | .24 | 1.82 | 2.56 | 2.60 | 1.03 | .19 | .15 | .20 | |
| $C_{Min.}$ | .40 | .26 | 1.72 | 2.29 | 2.19 | .86 | .23 | .18 | .25 | |
| $C_{Org.}$ | <0.05 | <0.05 | .1 | .3 | .4 | .2 | <0.05 | <0.05 | <0.05 | |
| Se | .0045 | .0275 | .0835 | .0075 | .0050 | .0040 | .0010 | .0005 | .0006 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 7. | 7. | 3. | 3. | 3. | |
| Fe | 1.5 | .3 | .7 | 1.5 | 1.5 | 3. | .7 | .7 | .7 | |
| Mg | .3 | .15 | .15 | .3 | .3 | .3 | .3 | .15 | .15 | |
| Ca | 3. | 1.5 | 7. | M. | M | 3. | .7 | .7 | .7 | |
| Na | 3. | 3. | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Ti | .07 | .07 | .07 | .03 | .07 | .07 | .07 | .07 | .07 | |
| Mn | .015 | .015 | .15 | .15 | .15 | .07 | .015 | .007 | .015 | |

Suite No. 40662 --Continued

| Serial no. / Field no. | 302, 950 a | 951 b | 952 c | 953 d | 954 e | 955 f | 956 g | 957 h | 958 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | .00015 | .00015 | .00015 | .00015 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | |
| Cr | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | .007 | .0007 | .0015 | |
| Cu | .003 | .003 | .0015 | .0015 | .0015 | .0015 | .003 | .003 | .0015 | |
| Ga | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | |
| Ge | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | .003 | .003 | 0 | 0 | 0 | 0 | |
| Mo | .0015 | .0007 | .0007 | .07 | .07 | .007 | .0015 | .0007 | .0007 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .003 | .0015 | .0015 | .007 | .015 | .007 | .0015 | .0015 | .0015 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .03 | .03 | .03 | .03 | .015 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .03 | .03 | .07 | .07 | .07 | .07 | .03 | .015 | .007 | |
| Y | 0 | 0 | 0 | .0015 | 0 | .0015 | .0015 | .0015 | 0 | |
| Yb | .00015 | .00015 | — | — | — | — | .00015 | 0 | 0 | |
| Zr | .003 | .007 | .003 | .003 | .003 | .007 | .007 | .003 | .007 | |

Suite No.-- 129G61 ( a through k )

Serial No's.-- 294,479 through 294,489

Mine-- Sec. 25

Level-- 745 E

Sec. 25 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 317,370 N. x 524,350 E.

Mine location-- 21 ft N of sta. 767; N wall

Sample elevation-- not recorded

Premining water table elevation-- ~ 6,550 ft

Sampled to test element distribution in--a stratigraphically low prefault ore layer

Sample descriptions:

a.--Yellowish-gray, medium-grained sandstone. Disseminated pyrite and kaolinite nests, less than 2 mm across, are common. Calcite is very sparse. A little anatase was noted.

b.--Light- to medium-light-gray, poorly sorted, medium-grained sandstone. Quartz overgrowths are sparse and pyrite is very sparse. Kaolinite nests less than 2 mm across are common. A very thin film of very light gray clay coats all sand grains.

c.--Greenish-gray, medium-grained sandstone. Disseminated pyrite grains are sparse. Kaolinite nests, are less than 1 mm across and very sparse. Quartz overgrowths are also very sparse. A few anatase aggregates were noted. A thin gray clay film coats most sand grains.

d.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material forms a dull-dark-gray coat on all sand grains. Calcite cement locally is sparse to common,

Suite No. 129G61 . Sample descriptions (Continued)

e.--Mottled olive-gray and medium-dark-gray, fine- to medium-grained ore sandstone. Authigenic carbonaceous material fills some interstices and coats sand grains in the dark-gray areas and a thin film of an olive-gray clay coats sand grains elsewhere. Disseminated pyrite is sparse. Quartz overgrowths are common and the crystal faces seem to be overlain by the olive clay and, perhaps, by the carbonaceous material.

f.--Seems to be identical to "e," but perhaps, contains more pyrite and a little calcite.

g.--Medium-dark-gray, fine-grained ore sandstone. Scattered blebs of grayish-black authigenic carbonaceous material fills some interstices and forms a gray film on the sand grains. Disseminated pyrite is common.

h.--Mottled medium-gray and dark-gray, fine-grained sandstone. Authigenic carbonaceous material forms scattered small blebs in the interstices of the darker areas and an olive-gray clay-like material coats sand grains elsewhere. Disseminated pyrite is common to abundant.

i.--Mottled light-olive-gray and medium-dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material forms a dull brownish-gray clay-like film on sand grains and grayish blebs in the interstices of the darker areas. Pyrite is sparse. Kaolinite forms widely scattered nests less than 0.5 mm across.

j.--Light-olive-gray to yellowish-gray, medium-grained sandstone. A light-gray clay film coats all sand grains. Pyrite is sparse. Kaolinite nests, 2-3 mm across are common.

k.--Light-olive-gray to yellowish-gray, fine-grained sandstone. Pyrite is sparse. Kaolinite nests, less than 2 mm across, are common. Quartz overgrowths are common.

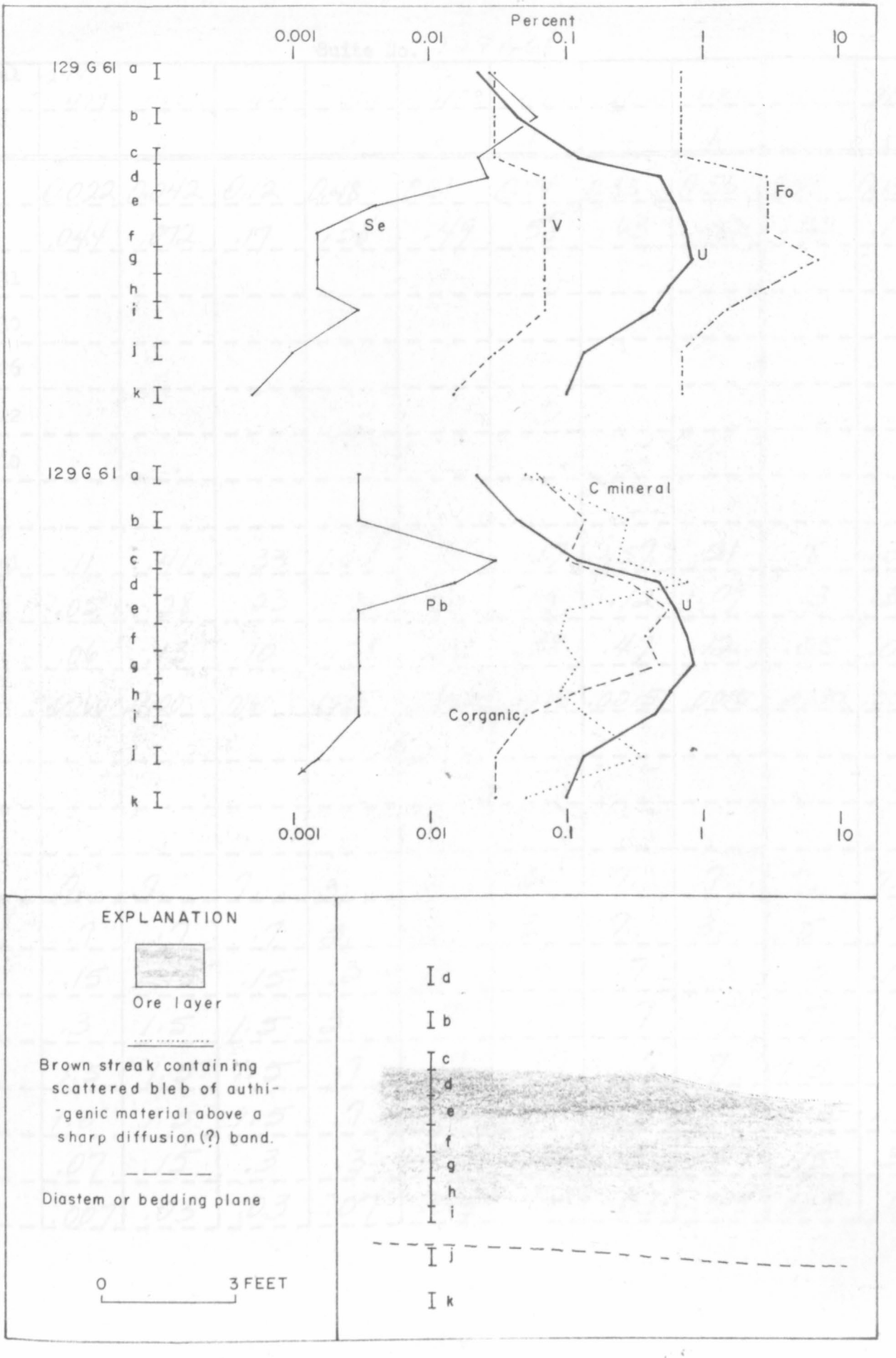



Figure 32.--Sample suite 129G61, Section 25 mine.

Suite No. 124661

| Serial no. / Field no. | 479 a | 480 b | 481 c | 482 d | 483 e | 484 f | 485 g | 486 h | 487 i | 488 j |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.022 | 0.042 | 0.12 | 0.48 | 0.61 | 0.74 | 0.83 | 0.56 | 0.43 | 0.13 |
| eU | .044 | .072 | .17 | .38 | .49 | .58 | .63 | .42 | .32 | .14 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .11 | .41 | .33 | 1.04 | .64 | .47 | .59 | .21 | .18 | .38 |
| $C_{Min.}$ | .05 | .28 | .23 | .76 | .10 | .09 | .12 | .09 | .13 | .35 |
| $C_{Org.}$ | .06 | .13 | .10 | .28 | .54 | .38 | .47 | .12 | .05 | .03 |
| Se | .0260 | .0600 | .0160 | .0175 | .0040 | .0015 | .0015 | .0015 | .0030 | .0010 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 3. | 3. | 3. | 7. | 7. | 7. | 7. |
| Fe | .7 | .7 | .7 | 3. | 3. | 3. | 7. | 3. | 1.5 | .7 |
| Mg | .15 | .15 | .15 | .3 | .3 | .3 | .7 | .3 | .3 | .15 |
| Ca | .3 | 1.5 | 1.5 | 3. | .7 | .7 | .7 | .7 | .7 | 1.5 |
| Na | 1.5 | 1.5 | 1.5 | .7 | .7 | .7 | .7 | .7 | 1.5 | 1.5 |
| K | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Ti | .07 | .15 | .3 | .3 | .15 | .15 | .3 | .07 | .15 | 3 |
| Mn | .007 | .03 | .03 | .07 | .015 | .015 | .03 | .015 | .015 | .03 |

Suite No. 129661 --Continued

| Serial no. / Field no. | 479 a | 480 b | 481 c | 482 d | 483 e | 484 f | 485 g | 486 h | 487 i | 488 j |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0015 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | .0003 | .0007 | <.003 | <.003 | <.003 | <.003 | <.003 | <.003 | <.003 | <.003 |
| Cr | .0007 | .0007 | .0015 | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0015 |
| Cu | .0007 | .003 | .0007 | .0015 | .0007 | .0015 | .0007 | .0007 | .0007 | .0015 |
| Ga | .0015 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | .0015 | .0015 | 0 | 0 | 0 | .0015 | 0 | 0 | .0015 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0003 | .0003 | .0003 |
| Pb | .003 | .003 | .03 | .015 | .003 | .003 | .003 | .003 | .003 | .0015 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .03 | .03 | .07 | .07 | .07 | .07 | .07 | .07 | .03 |
| Y | 0 | .0015 | .003 | .007 | 0 | .0015 | .0015 | .007 | .007 | 0 |
| Yb | 0 | .0003 | .0007 | <.003 | <.003 | <.003 | <.003 | <.003 | <.003 | 0 |
| Zr | .015 | .015 | .015 | .03 | .03 | .015 | .03 | .007 | .007 | .007 |

Suite No. 129 G 61 continued

| Serial no. / Field no. | 294, 489 / R. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.099 | | | | | | | | | |
| eU | .083 | | | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .08 | | | | | | | | | |
| $C_{Min.}$ | .05 | | | | | | | | | |
| $C_{Org.}$ | .03 | | | | | | | | | |
| Se | .0005 | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | | | | | | | | | |
| Fe | .7 | | | | | | | | | |
| Mg | .07 | | | | | | | | | |
| Ca | .3 | | | | | | | | | |
| Na | .7 | | | | | | | | | |
| K | 1.5 | | | | | | | | | |
| Ti | .15 | | | | | | | | | |
| Mn | .007 | | | | | | | | | |

Suite No. 129641 --Continued

| Serial no. | 294, 429 |
|---|---|
| Field no. | k |
| B | 0 |
| Ba | .07 |
| Be | 0 |
| Bi | 0 |
| Ce | 0 |
| Co | .0007 |
| Cr | .0007 |
| Cu | .0003 |
| Ga | .0003 |
| Ge | 0 |
| La | 0 |
| Mo | 0 |
| Nb | .0007 |
| Nd | 0 |
| Ni | 0 |
| Pb | 0 |
| Sc | 0 |
| Sr | .007 |
| Tl | 0 |
| V | .015 |
| Y | 0 |
| Yb | 0 |
| Zr | .003 |

Suite No.-- 47G62 ( a through i )

Serial No's.-- 302,959 through 302,967

Mine-- Section 25

Level-- Slusher level above main E haulage level

Sec. 25 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 316,925 N. x 524,605 E.

Mine location--24 S off 91 E, near station A-23

Sample elevation--not recorded

Premining water table elevation--about 6,550 ft

Sampled to test element distribution in--stratigraphically low prefault ore layer. Ore is about 18 inches above base of the Westwater Canyon Member.

Sample descriptions:

a.--Light to very light gray, fine- to medium-grained sandstone. Kaolinite nests are common but quite small. Each quartz grain is coated with a film of light-gray clay other than kaolinite. Minute disseminated pyrite grains are common. Calcite is very scarce. Rock is friable.

b.--Light- to medium-light-gray, fine-grained sandstone. Each quartz grain is coated with a film of light-gray clay other than kaolinite. Disseminated pyrite is sparse. Fine, clear crystals (of gypsum?) in all interstices. Sparse anatase, Rock is friable.

c.--Light- to medium-gray, fine- to medium-grained sandstone. Each sand grain coated with a film of light-gray clay other than kaolinite. Kaolinite nests sparse and small. Sparse quartz overgrowths. Extremely fine disseminated pyrite is abundant. Sparse aggregates of minute dark-brown anatase crystals. Rock is friable.

Suite No. 47G62 . Sample descriptions (Continued)

d.--Dark-gray to grayish-black, fine-grained sandstone. Grains coated and some interstices filled with authigenic carbonaceous material. Very small, scattered kaolinite aggregates. Disseminated pyrite common. Calcite sparse. Rock is poorly cemented.

e.--Similar to "d" except for some medium-grained sandstone.

f.--Medium-dark-gray, fine-grained sandstone. Grains coated and some interstices filled with authigenic carbonaceous material. Disseminated pyrite and quartz overgrowths are sparse. Kaolinite nests are very small and widely scattered. Calcite cement is common as poikiloblasts as much as 1 cm across. Rock is generally friable, however.

g.--Light-gray to medium-light-gray, medium-grained sandstone. A little authigenic carbonaceous material locally fills interstices. Pyrite and small kaolinite nests are common. Quartz overgrowths are common to abundant. A few anatase aggregates are present. Rock is friable.

h.--Light-gray, fine- to medium-grained sandstone. Small scattered kaolinite nests. Quartz overgrowths common to abundant. Extremely fine disseminated pyrite is sparse. Rock is very friable.

i.--Medium-light-gray, medium-grained sandstone. Very small scattered specks of kaolinite. Each sand grain coated with a film of light-gray clay other than kaolinite. Disseminated pyrite is sparse. Quartz overgrowths are common to abundant. Rock is very friable.

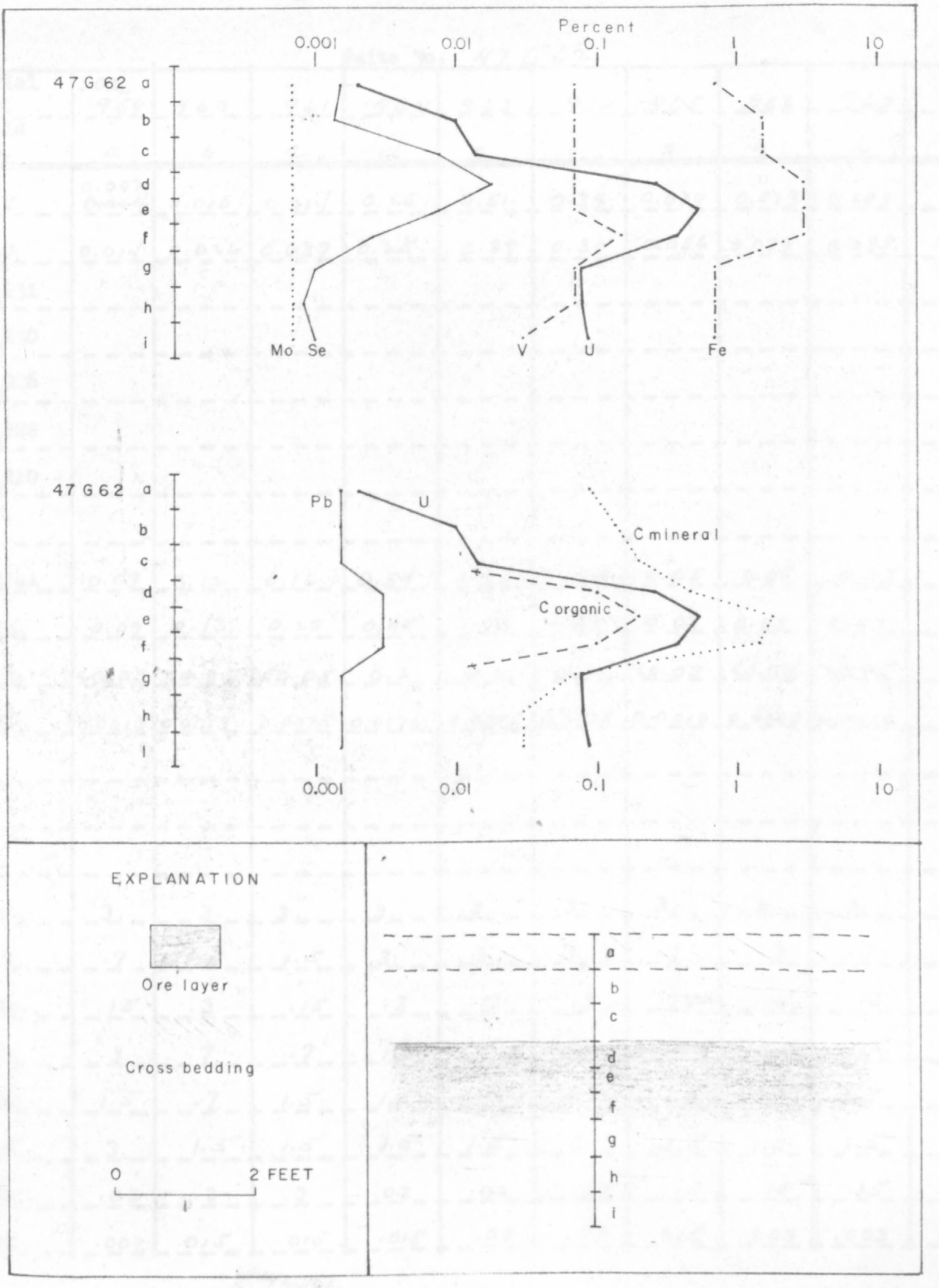



Figure 33.--Sample suite 47G62, Section 25 mine.

Suite No. 47662

| Serial no. / Field no. | 302,959 a | 960 b | 961 c | 962 d | 963 e | 964 f | 965 g | 966 h | 967 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.002 ~~0.014~~ | 0.010 | 0.014 | 0.25 | 0.51 | 0.39 | 0.077 | 0.079 | 0.082 | |
| eU | 0.014 | 0.026 | 0.037 | 0.25 | 0.39 | 0.30 | 0.084 | 0.079 | 0.078 | |
| $eRa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 0.09 | 0.12 | 0.16 | 0.54 | 1.94 | 1.54 | 0.06 | 0.05 | 0.03 | |
| $C_{Min.}$ | 0.09 | 0.13 | 0.20 | 0.45 | 1.73 | 1.45 | 0.02 | 0.03 | 0.03 | |
| $C_{Org.}$ | <0.05 | <0.05 | <0.05 | 0.1 | 0.2 | 0.1 | <0.05 | <0.05 | <0.05 | |
| Se | 0.0015 | 0.0013 | 0.0075 | 0.0175 | 0.0075 | 0.0025 | 0.0010 | 0.0008 | 0.0010 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Fe | .7 | 1.5 | 1.5 | 3. | 3. | 3. | .2 | .7 | .7 | |
| Mg | .15 | .3 | .15 | .3 | .3 | .3 | .15 | .15 | .15 | |
| Ca | .3 | .2 | .7 | 1.5 | .7 | .7 | .15 | .15 | .15 | |
| Na | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| K | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | |
| Ti | .03 | .3 | .3 | .07 | .07 | .07 | .15 | .15 | .15 | |
| Mn | .007 | .015 | .015 | .015 | .07 | .07 | .015 | .003 | .003 | |

Suite No. 47662--Continued

| Serial no. / Field no. | 302, 939 a | 940 b | 941 c | 942 d | 943 e | 944 f | 945 g | 946 h | 947 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .03 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | |
| Cr | .0003 | .0007 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | .0015 | |
| Cu | .0007 | .003 | .003 | .003 | .003 | .0015 | .003 | .003 | .003 | |
| Ga | .0015 | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0007 | .0007 | |
| Ge | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 | |
| Mo | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .0015 | .0015 | .0015 | .003 | .003 | .003 | .0015 | .0015 | .0015 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .015 | .03 | .03 | .007 | .007 | .007 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .07 | .07 | .07 | .07 | .07 | .15 | .07 | .07 | .03 | |
| Y | .0015 | 0 | 0 | .007 | .0015 | .007 | 0 | 0 | 0 | |
| Yb | — | — | — | — | — | — | — | — | .0015 | |
| Zr | .007 | .007 | .007 | .07 | .007 | .007 | .007 | .003 | .003 | |

Suite No.-- 8-17-59 ( A through C )

Serial No's.-- 278,055 through 278,058

Mine-- Sec. 30

Level-- 1st (1-4 level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,415 N. x 531,115 E.

Mine location-- 440 N x 185 E

Sample elevation-- 6,495 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution ~~in~~--at abrupt termination of a prefault ore layer.

Sample descriptions: (Rock Color Chart not used)

A.--Light-gray and light-tan, fine-grained sandstone. A little disseminated pyrite.

B.--Similar to sample "A" but with considerable calcite cement.

$B_2$.--Gray, fine-grained ore sandstone. Very little disseminated pyrite. Authigenic carbonaceous material coats sand grains.

C.--Similar to sample "B."

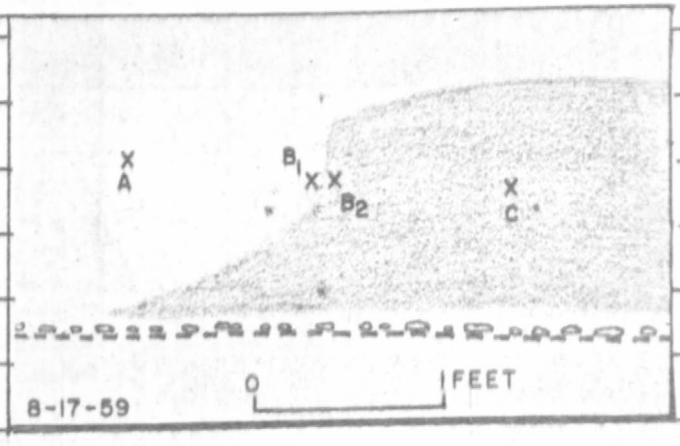



Figure 34.--Sample suite 8-17-59, Sec. 30 mine.

Suite No. 8-17-59

| Serial no. | 278, 055 | 056 | 057 | 058 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B, | $B_2$ | C | | | | | | |
| U | — | — | — | 0.22 | | | | | | |
| eU | 0.012 | — | — | .18 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | .42 | | | | | | |
| $C_{Min.}$ | — | — | — | .09 | | | | | | |
| $C_{Org.}$ | — | — | — | .31 | | | | | | |
| Se | — | — | — | .0190 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| $U^{spect.}$ | 0 | 0 | .3 | .3 | | | | | | |
| Al | 7.0 | 7.0 | 7.0 | 7.0 | | | | | | |
| Fe | .7 | .3 | .3 | 1.5 | | | | | | |
| Mg | .15 | .07 | .15 | .15 | | | | | | |
| Ca | 1.5 | 7. | .7 | .7 | | | | | | |
| Na | 1.5 | 1.5 | 1.5 | .7 | | | | | | |
| K | 3. | 3. | 3. | 1.5 | | | | | | |
| Ti | .15 | .07 | .15 | .15 | | | | | | |
| Mn | .015 | .07 | .015 | .05 | | | | | | |

Suite No. 8-17-59 --Continued

| Serial no. / Field no. | 278, 055 A | 056 $B_1$ | 057 $B_2$ | 058 C | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | 0.07 | 0.07 | 0.07 | 0.07 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | 0 | 0 | <.002 | <.002 | | | | | | |
| Cr | .0007 | .0007 | .0007 | .0007 | | | | | | |
| Cu | .03 | .03 | .03 | .03 | | | | | | |
| Ga | d | d | d | d | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | 0 | .0015 | .0015 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | .0007 | 0 | | | | | | |
| Pb | d | .0015 | .003 | .0015 | | | | | | |
| Sc | 0 | 0 | d | 0 | | | | | | |
| Sr | .015 | .03 | .015 | .015 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .07 | .07 | .07 | .07 | | | | | | |
| Y | d | d | .015 | .003 | | | | | | |
| Yb | — | — | .0015 | .0003 | | | | | | |
| Zr | .015 | .003 | .007 | .03 | | | | | | |

Suite No.-- 8-21-59 ( F through P )

Serial No's.-- 278,070 through 278,081

Mine-- Sec. 30

Level-- 1st (1-4 level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,775 N. x 531,480 E.

Mine location-- 550 E. x 195 S.

Sample elevation-- 6,500 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in--a prefault ore body

Sample descriptions:

F.--Dark-gray, medium- to coarse-grained ore sandstone. Authigenic carbonaceous material coats the sand grains.

G.--Light-gray to gray, coarse-grained sandstone. Spans the visible margin of the ore layer so that authigenic carbonaceous material is common in one half and not in the other. Disseminated pyrite is common in the gray part and sparse in the light gray.

H.--Light-brownish-gray, coarse- to very coarse grained sandstone. Mudstone fragments are common. Pyrite is sparse except in the mudstone where it is locally abundant. Kaolinite nests are abundant.

I.--Dark-gray, medium-grained ore sandstone. Authigenic carbonaceous material coats all sand grains and fills many interstices. Disseminated pyrite is common.

J.--Light-grayish-brown, coarse-grained sandstone. Rather clean-appearing sandstone with sparse disseminated pyrite.

Suite No. 8-21-59, Sample descriptions (Continued)

L.--Dark-gray to black, coarse-grained ore sandstone. Authigenic carbonaceous material coats all sand grains and fills many interstices. Disseminated pyrite is sparse to common.

M.--Very similar to sample "L."

N.--Very similar to sample "L."

O.--Very similar to sample "L."

P.--Very similar to sample "L."

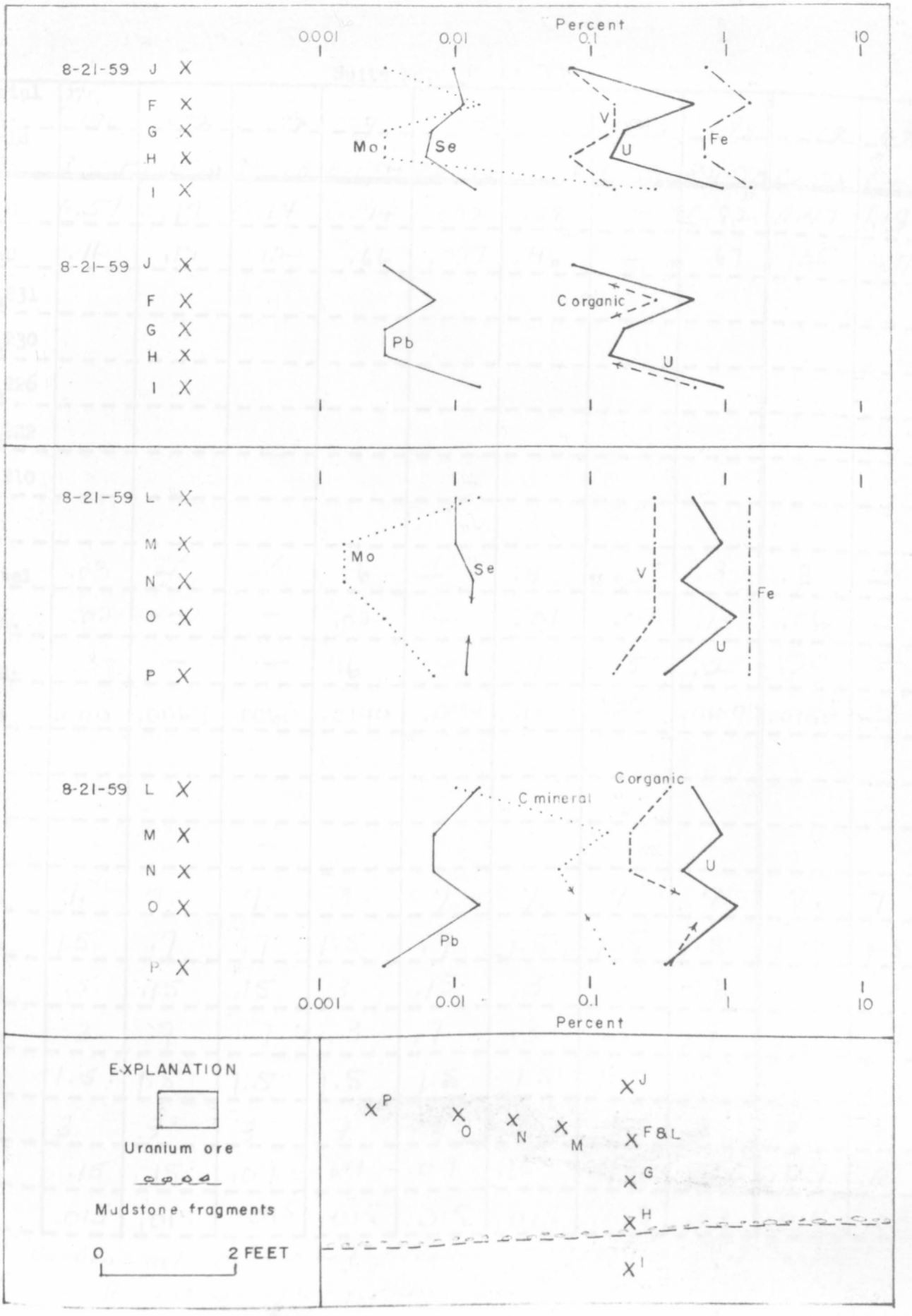



Figure 35.--Sample suite 8-21-59, Section 30 mine.

Suite No. 8-21-59

| Serial no. | 278, 070 | 072 | 073 | 074 | 075 | 076 | 077 | 078 | 079 | 080 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 8-21-59F | 8-21-59G | 8-21-59H | 8-21-59I | 8-21-59J | 8-21-59L | 8-21-59K | 8-21-59M | 8-21-59N | 8-21-59O |
| U | 0.57 | 0.17 | 0.14 | 0.94 | 0.072 | 0.58 | — | 0.92 | 0.47 | 1.19 |
| eU | .46 | .19 | .12 | .66 | .097 | .46 | — | .67 | .35 | .79 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .03 | 1/ | 1/ | .6 | 1/ | .4 | .5 | .3 | .3 | 1/ |
| $C_{Min.}$ | .02 | — | — | .02 | — | .01 | .02 | .13 | .06 | — |
| $C_{Org.}$ | .3 | — | — | .6 | — | .4 | .5 | .2 | .2 | — |
| Se | .0110 | .0067 | .0060 | .0140 | .0094 | .0100 | 2/ | .0100 | .0130 | 2/ |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | .3 | 7. | 7. | 7. | 7. | 7. | 7. |
| Fe | 1.5 | .7 | .7 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Mg | .3 | .15 | .15 | .3 | .15 | .3 | .3 | .3 | .3 | .3 |
| Ca | .3 | .7 | .7 | .3 | .7 | .3 | .3 | .7 | .7 | .7 |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 3 | 1.5 | 1.5 |
| K | 3. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Ti | .15 | .15 | .07 | .07 | .07 | .15 | .15 | .15 | .07 | .07 |
| Mn | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .03 | .015 | .03 |

1/ Carbon not determined because of light color of sample

2/ Insufficient sample for analysis

Suite No. 8-21-59 --Continued

| Serial no. | 278, 072 | 072 | 073 | 074 | 075 | 076 | 079 | 078 | 077 | 080 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 8-21-59F | 8-21-59G | 8-21-59H | 8-21-59I | 8-21-59J | 8-21-59K | 8-21-59L | 8-21-59M | 8-21-59N | 8-21-59O |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .15 | .15 | .07 | .15 | .07 | .07 | .07 | .15 | .07 |
| Be | .0003 | .0003 | .00015 | .0003 | .00015 | .0003 | .0003 | .0003 | .0003 | .0003 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 |
| Cu | .0015 | .0015 | .0015 | .0015 | .0015 | .0007 | .0007 | .0007 | .0015 | .0015 |
| Ga | .0007 | d | d | d | .0003 | .0003 | d | .0003 | .0003 | .0003 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | .007 | 0 | 0 | .007 | 0 | .007 | .007 | .015 | .007 | .015 |
| Mo | .015 | .003 | .003 | .3 | .003 | .015 | .007 | .0015 | .0015 | .003 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .007 | .003 | .003 | .015 | .003 | .015 | .007 | .007 | .007 | .015 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .15 | .15 | .07 | .15 | .07 | .3 | .15 | .3 | .3 | .3 |
| Y | .0015 | .003 | .0015 | .0015 | .003 | .0015 | .0015 | .0015 | .0015 | .0015 |
| Yb | — | — | — | — | — | — | — | — | — | — |
| Zr | .007 | .015 | .003 | .007 | .007 | .007 | .003 | .003 | .007 | .015 |

Suite No. 8-21-59

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Serial no. | 278, | | | | | | | | | |
| Field no. | 081 8-21-59P | | | | | | | | | |
| U | 0.35 | | | | | | | | | |
| eU | 0.20 | | | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .5 | | | | | | | | | |
| $C_{Min.}$ | .15 | | | | | | | | | |
| $C_{Org.}$ | .4 | | | | | | | | | |
| Se | 0120 | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | | | | | | | | | |
| Fe | 1.5 | | | | | | | | | |
| Mg | .15 | | | | | | | | | |
| Ca | .7 | | | | | | | | | |
| Na | 1.5 | | | | | | | | | |
| K | 3 | | | | | | | | | |
| Ti | .07 | | | | | | | | | |
| Mn | .015 | | | | | | | | | |

Suite No. 8-21-59 --Continued

| Serial no. | 278 |
|---|---|
| Field no. | 8-21-59P |
| B | 0 |
| Ba | .15 |
| Be | .00015 |
| Bi | 0 |
| Ce | 0 |
| Co | <.002 |
| Cr | .0003 |
| Cu | .0015 |
| Ga | d |
| Ge | 0 |
| La | 0 |
| Mo | .007 |
| Nb | 0 |
| Nd | 0 |
| Ni | 0 |
| Pb | .003 |
| Sc | .0007 |
| Sr | .03 |
| Tl | 0 |
| V | .15 |
| Y | .015 |
| Yb | .0015 |
| Zr | .007 |

Suite No.-- 5-9F60 and 47-49F60

Serial No's.-- 280,516 through 280,520 and 281,354 through 281,356

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,735 N. x 531,110 E.

Mine location-- 230 S x 150 SE

Sample elevation-- 6,505 ft

Premining water table elevation--~6,525 ft

Sampled to test element distribution in--prefault ore layer

Sample descriptions:

47F60.--Pinkish-gray, coarse-grained sandstone. Disseminated grains and small masses of pyrite are common. Quartz overgrowths, kaolinite nests, and calcite cement are common to abundant.

48F60.--Light-olive-gray, medium-grained sandstone. Disseminated pyrite and kaolinite nests are sparse. Many sand grains are coated by a light-gray clay and small scattered aggregates of detrital(?) clay are interstitial to the sand grains.

5F60.--Pale-yellowish-brown, medium-grained sandstone. Disseminated pyrite is sparse and kaolinite nests are common.

6F60.--Olive-gray, medium-grained ore sandstone. Sand grains are stained by a thin brownish film of authigenic carbonaceous material. Kaolinite nests are sparse and disseminated pyrite is common.

F60.--Medium-dark-gray, fine- to medium-grained ore sandstone. Authigenic

carbonaceous material forms a gray to dark-brown coat on sand grains and sparse interstitial filling. Disseminated pyrite is common.

8F60.--Similar to 7F60 except for the presence of sparse small kaolinite nests.

9F60.--Yellowish-gray, medium-grained sandstone. Disseminated pyrite grains are sparse. Kaolinite nests are common and both fine-grained and poikiloblastic calcite cements are abundant. A few anatase aggregates were noted.

49F60.--Pale-yellowish-brown, fine-grained and coarse-grained sandstones. Disseminated pyrite and kaolinite nests are common in the coarser facies and less so in the finer facies. Calcite cement is sporadic.

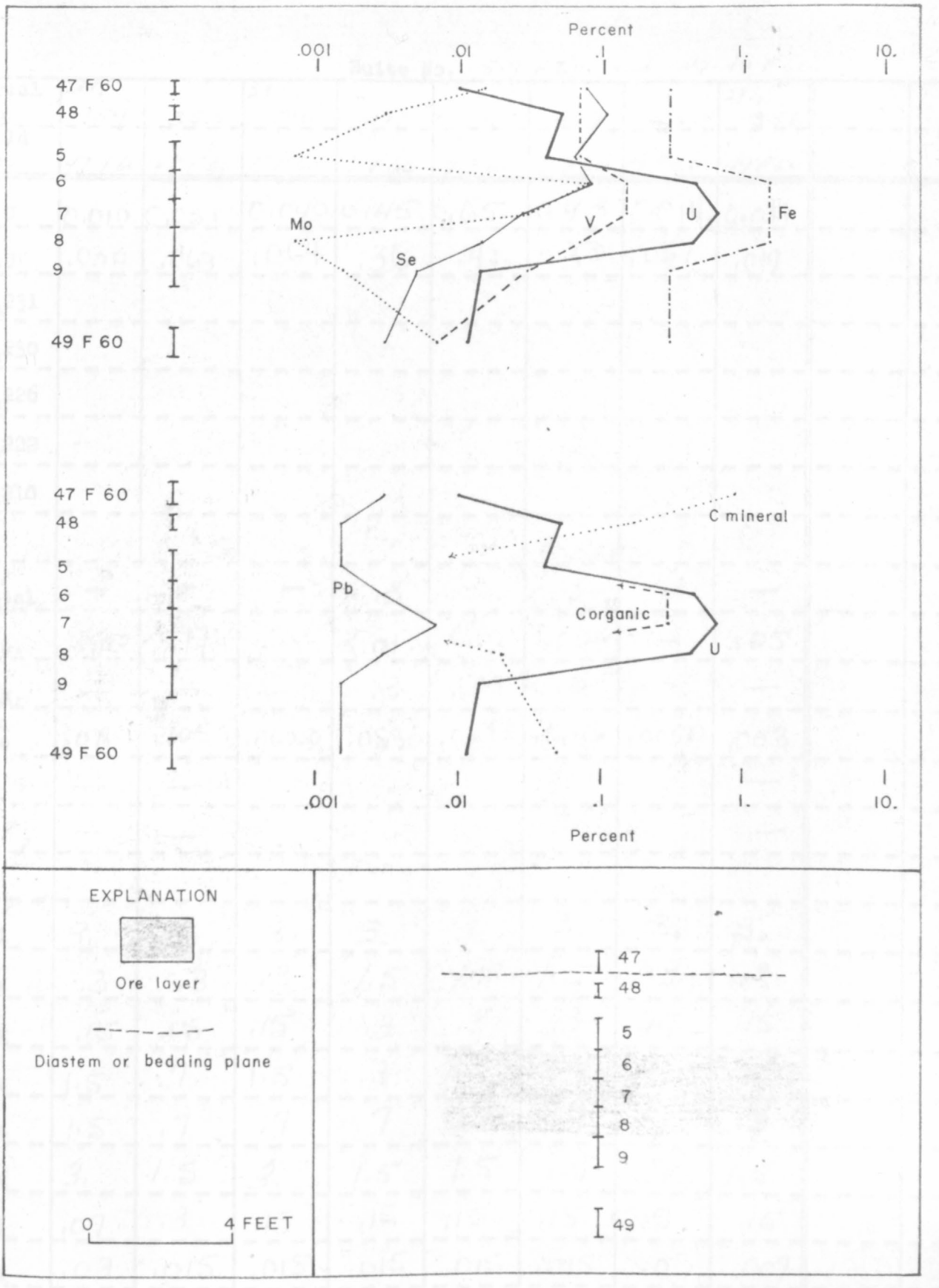



Figure 36.--Sample suite 5-9 and 47-49F60, Section 30 mine.

Suite No. 5-9 F60 and 47-49 F60

| Serial no. / Field no. | 281, 354 / 47 F60 | 355 / 48 F60 | 280, 516 / 5 F60 | 512 / 6 F60 | 518 / 7 F60 | 519 / 8 F60 | 520 / 9 F60 | 281, 356 / 49 F60 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.010 | 0.051 | 0.040 | 0.45 | 0.65 | 0.43 | 0.014 | 0.011 | | |
| eU | .030 | .063 | .064 | .36 | .42 | .30 | .051 | .019 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | .3 | .3 | <.2 | — | — | | |
| $C_{Min.}$ | .90 | .17 | — | <.01 | <.01 | .02 | — | .05 | | |
| $C_{Org.}$ | — | — | — | .3 | .3 | <.2 | — | — | | |
| Se | .078 | .105 | .0628 | .0830 | .0275 | .0146 | .0050 | .003 | | |
| $V_2O_5$ | — | — | | | | | | — | | |
| $Fe_2O_3$ | — | — | | | | | | — | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Fe | .3 | .3 | .3 | 1.5 | 1.5 | 1.5 | .3 | .3 | | |
| Mg | .15 | .15 | .15 | .3 | .3 | .3 | .15 | .15 | | |
| Ca | 1.5 | .7 | 1.5 | .3 | .3 | .7 | 3. | .3 | | |
| Na | 1.5 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | | |
| K | 3. | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 3. | 1.5 | | |
| Ti | .07 | .3 | .15 | .15 | .15 | .15 | .15 | .15 | | |
| Mn | .03 | .015 | .015 | .015 | .015 | .015 | .03 | .007 | | |

5-9F-60 & 47-49F60

Suite No. --Continued

| Serial no. / Field no. | 387, 354 47F60 | 355 48F60 | 280, 516 5F60 | 517 6F60 | 518 7F60 | 519 8F60 | 520 9F60 | 387, 356 49F60 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Be | .0003 | .00015 | d | .00015 | .00015 | .00015 | 0 | .00015 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | 0 | 0 | <.002 | <.002 | <.002 | 0 | 0 | | |
| Cr | .0003 | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0003 | | |
| Cu | .007 | .0015 | .0007 | .0003 | .0003 | .0003 | .0003 | .0015 | | |
| Ga | .0003 | d | d | d | d | d | d | d | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | .003 | .003 | 0 | 0 | 0 | | |
| Mo | .015 | .003 | .0007 | .07 | .03 | .0007 | .0015 | .007 | | |
| Nb | 0 | .0015 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | 0 | d | 0 | 0 | 0 | 0 | | |
| Pb | .003 | .0015 | .0015 | .003 | .007 | .003 | .0015 | .0015 | | |
| Sc | 0 | 0 | 0 | 0 | d | .0007 | 0 | 0 | | |
| Sr | .03 | .015 | .015 | .015 | .015 | .015 | .03 | .007 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .07 | .07 | .07 | .15 | .15 | .07 | .03 | .007 | | |
| Y | 0 | .0015 | .003 | .003 | .003 | .015 | .0015 | 0 | | |
| Yb | — | .0003 | .0003 | .0003 | .0003 | .0015 | .00015 | .00015 | | |
| Zr | .007 | .07 | .07 | .015 | .03 | .03 | .015 | .03 | | |

Suite No.-- 31-39F60 (____ through ____)

Serial No's.-- 281,357 through 281,365

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30, Twp. 14, Rge. 9 --

U.S. AEC Coordinates-- 319,090(?) N. x 530,370(?) E.

Mine location-- 120 W x 560 NW(?) /possibly 120 N x 560 W7

Sample elevation-- ~6,505 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in--a prefault ore layer

Sample descriptions:

31F60.--Greenish-gray mudstone.

32F60.--Light-olive-gray, fine-grained sandstone. Disseminated pyrite is common and kaolinite nests are small and sparse.

33F60.--Yellowish-gray, medium-grained sandstone. Disseminated pyrite is sparse. Fine-grained calcite cement is common. A light-gray interstitial clay cement is common to abundant.

34F60.--Olive-gray, medium-grained ore sandstone, with scattered dark-gray mudstone fragments. Dull-brown authigenic carbonaceous material forms a thin film on most sand grains and stains the mudstone fragments. Disseminated pyrite is common to abundant. Poikiloblastic calcite cement is abundant.

35F60.--Medium-dark-gray, medium-grained ore sandstone. Nearly black authigenic carbonaceous material coats the sand grains and fills most interstices. Disseminated pyrite is common.

Suite No. 31-39F60, Sample descriptions (Continued)

36F60.--Dark-gray, medium-grained ore sandstone similar to 35F60.

37F60.--Yellowish-brown, medium-grained sandstone. Disseminated pyrite is sparse to common. Kaolinite nests are sparse. Calcite cement is locally abundant.

38F60.--Light-olive-gray, medium-grained sandstone. Most sand grains are coated with a thin film of light-gray clay. Disseminated pyrite is common and kaolinite nests are small and sparse.

39F60.--Light-olive-gray, very coarse grained sandstone with scattered granules. Kaolinite nests are abundant. Pyrite is common to abundant. Sand grains are coated with a film of light-gray clay.

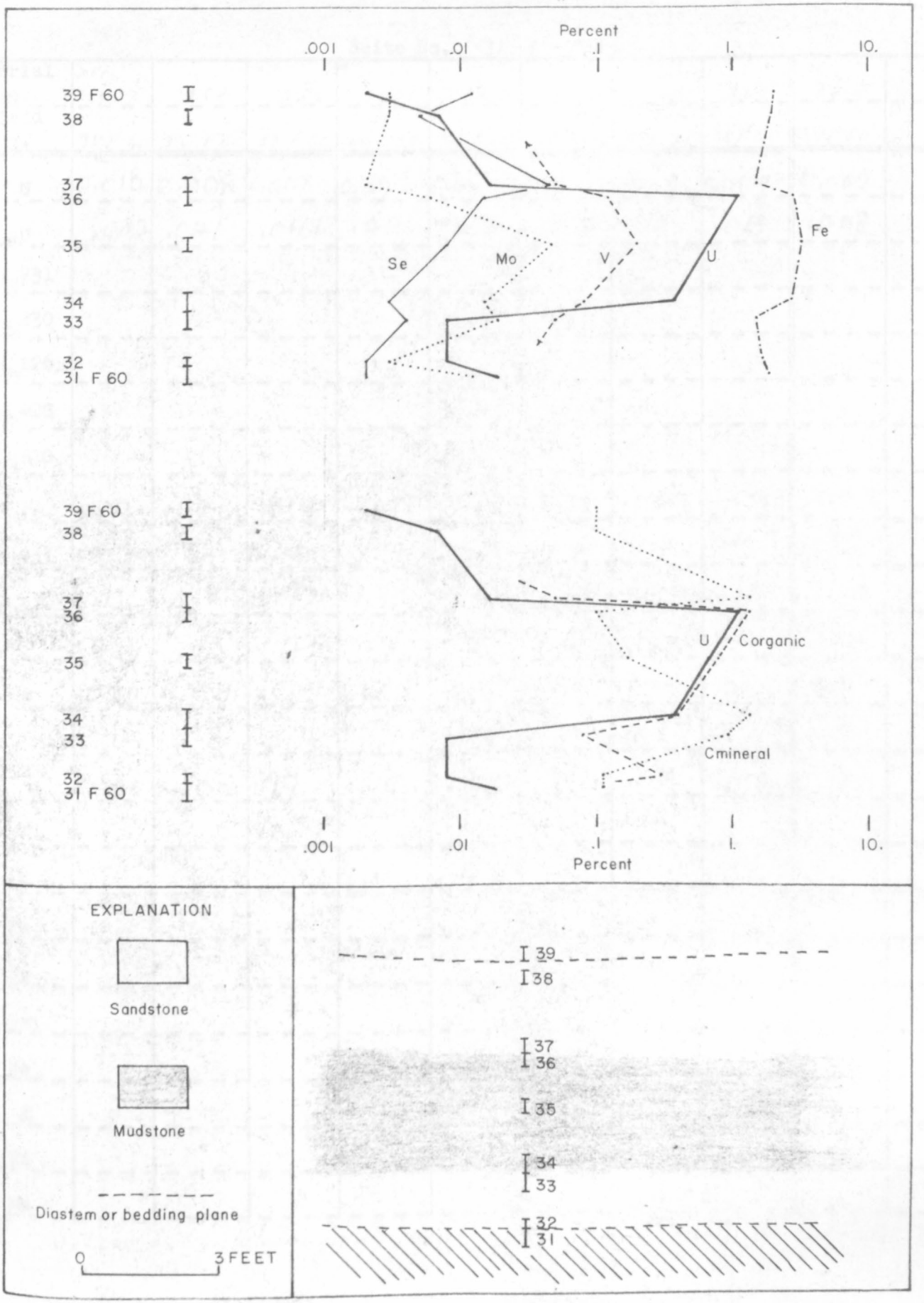



Figure 37.--Sample suite 31-39F60, Section 30 mine.

Suite No. 31-39 F60

| Serial no. / Field no. | 357 / 31 F60 | 358 / 32 F60 | 359 / 33 F60 | 360 / 34 F60 | 361 / 35 F60 | 362 / 36 F60 | 363 / 37 F60 | 364 / 38 F60 | 365 / 39 F60 |
|---|---|---|---|---|---|---|---|---|---|
| U | 0.018 | 0.008 | 0.008 | 0.39 | 0.69 | 1.08 | 0.016 | 0.007 | 0.002 |
| eU | .032 | .021 | .047 | .22 | .50 | .63 | .13 | .013 | .008 |
| $ePa^{231}$ | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | |
| Mo | .012 | .003 | .019 | .015 | .045 | .006 | .007 | .003 | .003 |
| $C_{Total}$ | <.02 | .4 | 1.0 | 1.7 | 1.0 | 1.4 | 1.4 | 1/ | 1/ |
| $C_{Min.}$ | .11 | .11 | .92 | 1.30 | 0.17 | .10 | 1.35 | .10 | .10 |
| $C_{Org.}$ | <0.2 | .3 | <.2 | .4 | .8 | 1.3 | <0.2 | — | — |
| Se | .002 | .002 | .004 | .003 | .008 | .015 | .043 | .005 | .012 |
| $Fe_2O_3$ | 2.6 | 2.3 | 2.2 | 3.9 | 4.4 | 4.0 | 2.1 | 2.7 | 2.9 |
| $V_2O_5$ | <0.05 | <.05 | .09 | .15 | .36 | .21 | .08 | <.05 | <.05 |
| | | | | | | | | | |
| Al | | | | | | | | | |
| Fe | | | | | | | | | |
| Mg | | | | | | | | | |
| Ca | | | | | | | | | |
| Na | | | | | | | | | |
| K | | | | | | | | | |
| Ti | | | | | | | | | |
| Mn | | | | | | | | | |

1/ Carbon not determined because of light color of sample.

Suite No.-- 40-46F60 ( ____ through ____ )

Serial No's.-- 281,823 through 281,829

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,410 N. x 530,990 E.

Mine location-- BT-1, 30 ft NE of 130 NW

Sample elevation-- 6,515 ft

Premining water table elevation-- ~6,525 ft.

Sampled to test element distribution in-- prefault ore layer.

Sample descriptions:

40F60.--Light-gray, very fine grained sandstone. Sand grains are coated with a thin clay film. Disseminated pyrite, kaolinite nests, and quartz overgrowths are sparse to very sparse.

41F60.--Medium-gray to very light gray, very fine grained sandstone. Clay films on sand grains seem to be stained by authigenic carbonaceous material. Pyrite is common; kaolinite nests are extremely small and sparse.

42F60.--Dark-gray, fine- and medium-grained ore sandstone. Authigenic carbonaceous material fills most interstices. Disseminated pyrite seems to be sparse but is commonly concealed by carbonaceous material. Kaolinite nests are sparse.

43F60.--Same as 42F60 except kaolinite nests are missing.

44F60.--Same as 43F60.

F60.--Light-olive-gray, coarse-grained sandstone. Light-colored clay forms films on

sand grains and locally fills interstices. Disseminated pyrite is sparse to common.

46F60.--Medium-gray, medium-grained sandstone. A little authigenic carbonaceous material seems to stain clay and form small blebs. Disseminated pyrite is sparse to common.

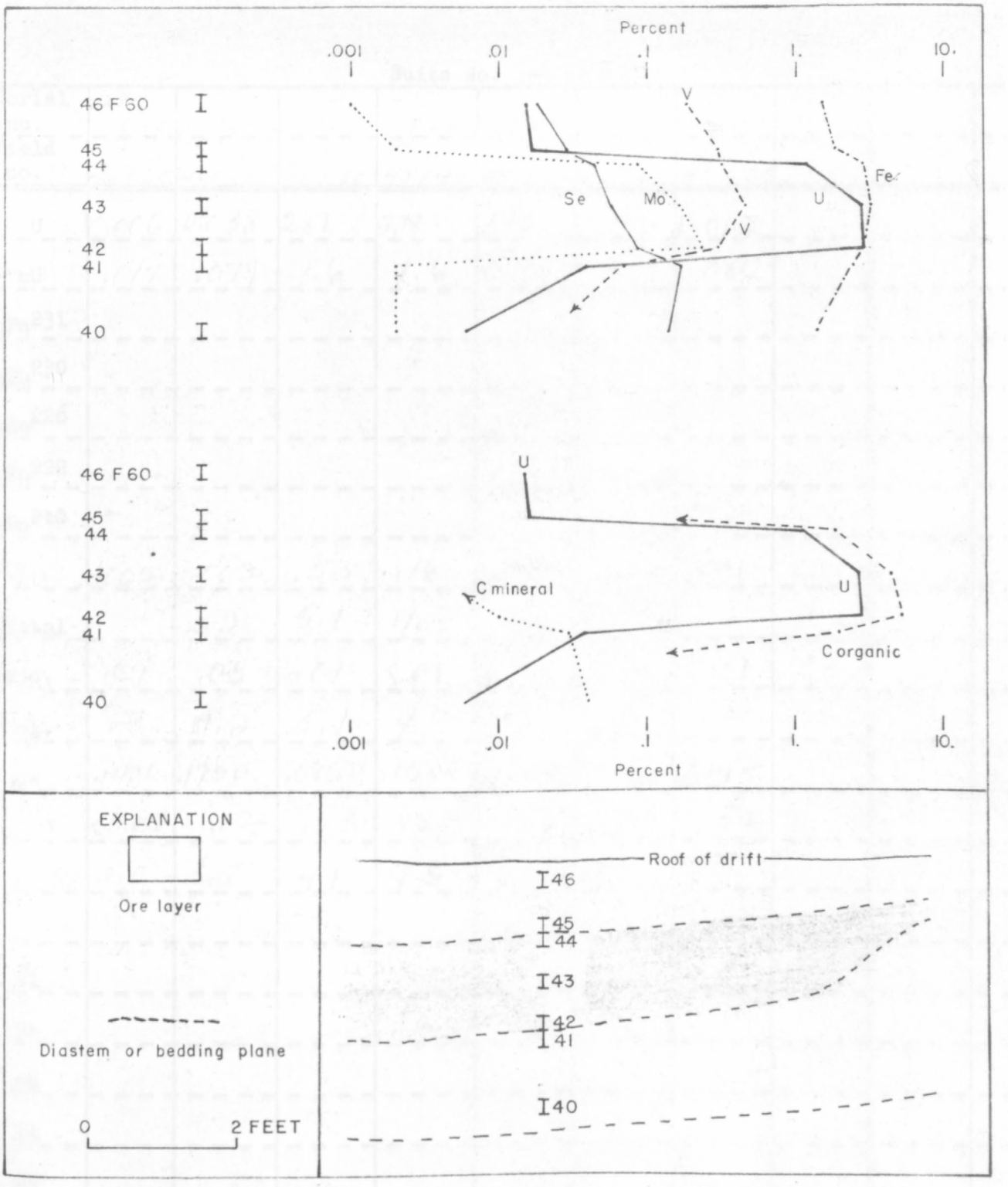



Figure 38.--Sample suite 40-46F60, Section 30 mine.

Suite No. 40-46 F60

| Serial no. / Field no. | 281, 823 / 40 F60 | 824 / 41 F60 | 825 / 42 F60 | 826 / 43 F60 | 827 / 44 F60 | 828 / 45 F60 | 829 / 46 F60 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.006 | 0.038 | 2.87 | 2.78 | 1.17 | 0.016 | 0.015 | | | |
| eU | .014 | .079 | 1.6 | 1.6 | 0.73 | .13 | .080 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Mo | .002 | .002 | .23 | .16 | .088 | .002 | .001 | | | |
| $C_{Total}$ | — | .2 | 5.1 | 4.3 | 1.8 | <0.2 | — | | | |
| $C_{Min.}$ | .04 | .03 | .01 | <.01 | <.01 | <.01 | <.01 | | | |
| $C_{Org.}$ | — | 0.2 | 5.1 | 4.3 | 1.8 | <.2 | — | | | |
| Se | .1400 | .1700 | .0850 | .0580 | .0425 | .0290 | .0175 | | | |
| $V_2O_5$ | <0.05 | .12 | .53 | .81 | .55 | .53 | .32 | | | |
| $Fe_2O_3$ | 2.0 | 3.5 | 4.1 | 4.5 | 4.2 | 2.6 | 2.1 | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 50-63F60 ( ____ through ____ )

Serial No's.-- 281,830 through 281,843

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,260 N. x 531,470 E.

Mine location-- 300 SE x BT-9

Sample elevation-- 6,515 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in--prefault ore layer

Sample descriptions:

50F60.--Yellowish-gray, fine-grained sandstone. Disseminated pyrite is very fine grained and sparse. Kaolinite nests are small and common. Light-colored clays coat the sand grains with a thin film.

51F60.--Grayish-orange-pink, fine-grained, low-grade ore sandstone. Brown authigenic carbonaceous material locally stains clay which forms a film on sand grains. Disseminated pyrite is sparse.

52F60.--Medium-gray, fine-grained ore sandstone. Authigenic carbonaceous material partly fills many interstices and forms a film on many sand grains. Disseminated pyrite is common.

53F60.--Light-gray, fine-grained sandstone. A little brownish authigenic carbonaceous material locally stains interstitial clays. Kaolinite nests are sparse. Disseminated pyrite is common.

Suite No. 50-63F60 . Sample descriptions (Continued)

54F60.--Yellowish-gray, medium-grained, poorly sorted sandstone. Local areas contain a little authigenic carbonaceous material which principally stains clays. Disseminated pyrite is sparse to common. Kaolinite nests are sparse.

55F60.--Yellowish-gray sandstone very similar to 54F60.

56F60.--Light-gray, medium-grained sandstone. A little authigenic carbonaceous material is present locally as clay stain. Disseminated pyrite is common, especially in a few scattered mudstone granules. Kaolinite nests are common.

57F60.--Dark-gray, medium-grained ore sandstone. Dull authigenic carbonaceous material coats sand grains and stains clay. Disseminated pyrite appears to be sparse but much is hidden by carbonaceous material. Kaolinite nests are sparse.

58F60.--Medium-dark-gray ore sandstone similar to 57F60 except that most interstices are filled with authigenic carbonaceous material and kaolinite nests are missing.

59F60.--Medium-gray, medium-grained ore sandstone similar to 58F60, but with less authigenic carbonaceous material.

60F60.--Dark-gray, coarse-grained ore sandstone. Authigenic carbonaceous material stains clay and fills most interstices. Light-gray mudstone granules are common. Disseminated pyrite is common in the mudstone granules but less common in the sandstone. Kaolinite nests are sparse.

61F60.--Light-brownish-gray, coarse-grained sandstone with scattered light-greenish-gray mudstone granules and pebbles. The clays in scattered areas are weakly stained by authigenic carbonaceous material. Disseminated pyrite is common, particularly in the mudstone. Poikiloblastic calcite cement is common. A few anatase aggregates were noted.

62F60.--Very similar to 61F60.

63F60.--Light-olive-gray, very coarse grained, poorly sorted sandstone with scattered

mudstone granules. Disseminated pyrite; kaolinite nests, and poikiloblastic calcite cement are common.

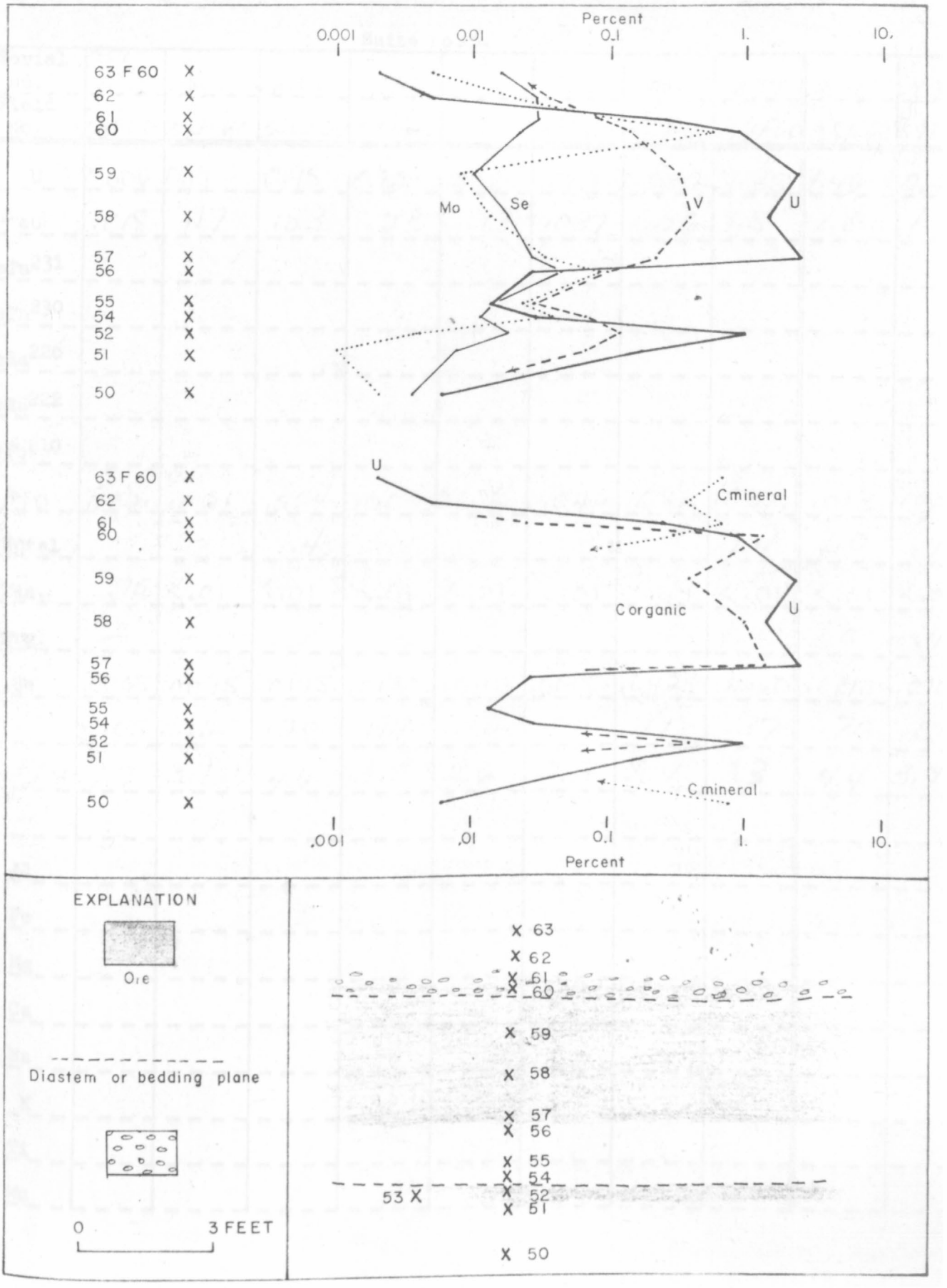



Figure 39.--Sample suite 50-63F60, Section 30 mine.

Suite No. 50F60 - 63F60

| Serial no. | 830 | 831 | 832 | 833 | 834 | 835 | 836 | 837 | 838 | 839 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 50F60 | 51F60 | 52F60 | 53F60 | 54F60 | 55F60 | 56F60 | 57F60 | 58F60 | 59F60 |
| U | 0.006 | 0.17 | 0.95 | 0.32 | .028 | .013 | .026 | 2.35 | 1.46 | 2.24 |
| eU | .018 | .17 | .53 | .23 | .13 | .037 | .35 | 1.5 | 1.8 | 1.2 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Mo | .002 | .001 | .004 | .003 | .036 | .022 | .082 | .032 | .013 | .008 |
| $C_{Total}$ | — | — | .4 | — | — | — | — | 1.4 | 1.0 | .4 |
| $C_{Min.}$ | .75 | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 | <.01 |
| $C_{Org.}$ | — | — | .4 | — | — | — | — | 1.4 | 1.0 | .4 |
| Se | .0035 | .0075 | .0175 | .0130 | .0110 | .0135 | .0425 | .0260 | .0175 | .0100 |
| $V_2O_5$ | <.05 | .12 | .20 | .17 | .12 | .05 | .17 | .37 | .70 | .54 |
| $Fe_2O_3$ | 1.7 | 2.1 | 4.6 | 3.3 | 2.6 | 2.3 | 3.4 | 3.3 | 4.4 | 3.7 |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No. 5CF 60 - 63F60 continued

| Serial no. / Field no. | 841, 840 60F 60 | 841 61F 60 | 842 62F 60 | 843 63F 60 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | .089 | .125 | .005 | .002 | | | | | | |
| eU | .60 | .23 | .02 | .010 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| MO | .56 | .11 | .0285 | .0155 | | | | | | |
| $C_{Total}$ | 1.5 | .9 | — | — | | | | | | |
| $C_{Min.}$ | .20 | .66 | .37 | .69 | | | | | | |
| $C_{Org.}$ | 1.3 | 0.2 | — | — | | | | | | |
| Se | .0220 | .0300 | .0285 | .0155 | | | | | | |
| $V_2O_5$ | .24 | .15 | .06 | <.05 | | | | | | |
| $Fe_2O_3$ | 3.7 | 3.3 | 2.3 | 2.0 | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 64-74F60 ( ____ through ____ )

Serial No's.-- 282,126 through 282,136

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- ~318,335 N. x ~531,030 E.

Mine location-- 130 NW, between BT-3 and BT-4

Sample elevation-- ~6,510 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- prefault ore layers

Sample descriptions:

64F60.--Dark-olive-gray to olive-gray, fine-grained ore sandstone. Authigenic carbonaceous material occurs as a thin brownish film on sand grains and as small scattered blebs in the interstices. Disseminated pyrite is common.

65F60.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material fills most interstices. Disseminated pyrite is sparse.

66F60.--Yellowish-gray, fine-grained, silty sandstone. Disseminated pyrite is sparse. A light-gray clay is common in the interstices.

67F60.--Same as 66F60.

68F60.--Streaked olive-gray and brownish-black, fine-grained sandstone. Authigenic carbonaceous material forms a brownish stain on most quartz grains and fills some of the interstices. Disseminated pyrite is common.

9F60.--Medium-dark-gray, medium-grained ore sandstone. Authigenic carbonaceous material

fills many interstices and coats the sand grains. Disseminated pyrite is common.

70F60.--Dark-gray, coarse-grained sandstone with scattered mudstone fragments. Authigenic carbonaceous material fills most interstices and coats sand grains. Disseminated pyrite is sparse to abundant.

71F60.--Similar to 70F60 but the grain size is coarser and more mudstone pebbles are present.

72F60.--Olive-black, very coarse grained sandstone with scattered granules and pebbles. Authigenic carbonaceous material fills most interstices. Disseminated pyrite appears to be sparse.

73F60.--Yellowish-gray, coarse-grained muddy sandstone with greenish-gray mudstone fragments. Disseminated pyrite is abundant in the mudstone fragments but sparse elsewhere.

74F60.--Yellowish-gray, medium- to coarse-grained sandstone. Disseminated pyrite is common.

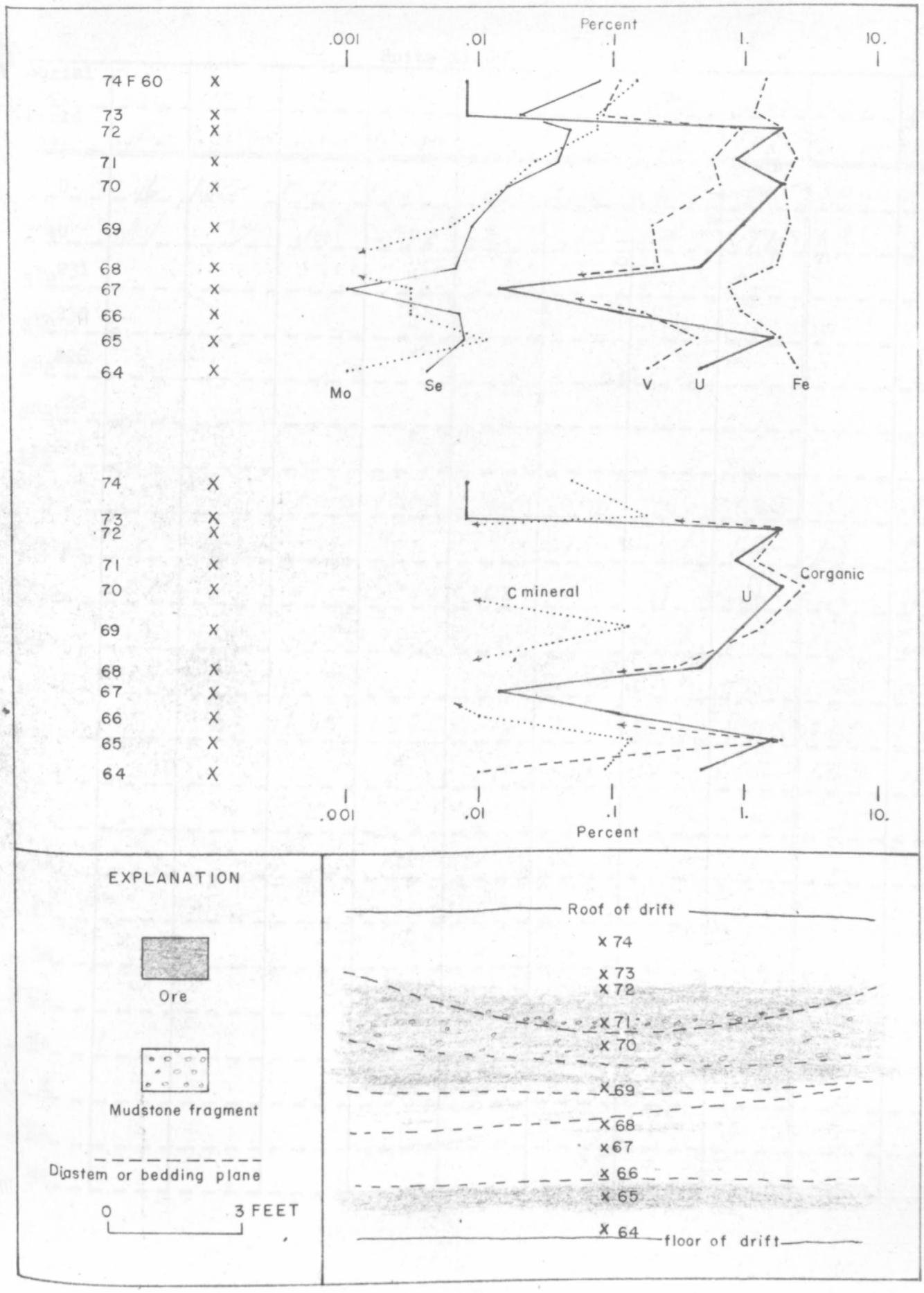



Figure 40.--Sample suite 64-74F60, Section 30 mine.

Suite No. 64-74 F 60

| Serial no. | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 64F60 | 65F60 | 66F60 | 67F60 | 68F60 | 69F60 | 70F60 | 71F60 | 72F60 | 73F60 |
| U | 0.46 | 1.53 | 0.11 | 0.014 | 0.46 | 0.98 | 1.90 | 0.86 | 1.82 | 0.008 |
| eU | .34 | .20 | .16 | .022 | .32 | .63 | 1.4 | .27 | 1.3 | .19 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Mo | .001 | .001 | .003 | .003 | <.001 | .006 | .016 | .025 | .075 | .075 |
| $C_{Total}$ | .1 | 2. | — | — | .3 | 1.4 | 2.7 | 1.2 | 1.8 | 0.1 |
| $C_{Min.}$ | .09 | .14 | .01 | <.01 | <.01 | .13 | <.1 | <.1 | <.1 | .18 |
| $C_{Org.}$ | <.2 | 1.9 | — | <.2 | 0.3 | 1.3 | 2.7 | 1.2 | 1.8 | <.2 |
| Se | .0040 | .0075 | .0070 | .0010 | .0065 | .0085 | .0160 | .0385 | .0460 | .0200 |
| $Fe_2O_3$ | 3.37 | 2.53 | 1.35 | 1.09 | 2.44 | 2.98 | 2.79 | 3.26 | 2.61 | 1.63 |
| $V_2O_5$ | .32 | .75 | .29 | <.05 | .40 | .36 | 1.13 | 1.02 | 1.63 | .15 |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Serial no. | 387, 136 | | | | | | | | | |
| Field no. | 74F60 | | | | | | | | | |
| U | 0.008 | | | | | | | | | |
| eU | .041 | | | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Mo | .15 | | | | | | | | | |
| $C_{Total}$ | .1 | | | | | | | | | |
| $C_{Min.}$ | .05 | | | | | | | | | |
| $C_{Org.}$ | <0.2 | | | | | | | | | |
| Se | .0795 | | | | | | | | | |
| $Fe_2O_3$ | 2.00 | | | | | | | | | |
| $P_2O_5$ | .19 | | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 75-86F60 (____ through ____)

Serial No's.-- 282,137 through 282,148

Mine-- Sec. 30

Level-- 1-4 level (1st level)

Sec. 30 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,560 N. x 531,350 E.

Mine location-- 590 N between 300 E and 350 E

Sample elevation-- 6,495 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- prefault ore layer

Sample descriptions:

75F60.--Light-olive-gray, medium- to coarse-grained sandstone. A few widely scattered blebs of authigenic carbonaceous material are present in the interstices. Kaolinite nests and disseminated pyrite are common.

76F60.--Medium-gray, medium to very coarse grained sandstone with scattered mudstone pebbles. Interstices are largely filled with greenish-gray clay. Kaolinite nests are large and common and pyrite is abundant, particularly in and adjacent to mudstone fragments.

77F60.--Similar to 76F60 but with less kaolinite and a greater variety of colors such as greenish, pinkish, and olive grays.

78F60.--Dark-gray, coarse-grained ore sandstone. Authigenic carbonaceous material fills most interstices. Disseminated pyrite is sparse.

79F60.--Medium-dark-gray, coarse to very coarse grained sandstone. Authigenic

Suite No. 75-86F60, Sample descriptions (Continued)

carbonaceous material coats sand grains and fills most interstices. Disseminated pyrite is abundant.

80F60.--Same as 79F60.

81F60.--Olive-gray to yellowish-gray, medium- to coarse-grained sandstone. Medium-gray clay fills most of the interstices. Authigenic carbonaceous material fills some of the interstices and stains the clay. Disseminated pyrite is abundant, especially in the interstitial clay.

82F60.--Dark-gray and olive-gray, fine- and medium-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills many interstices. Clay fills many interstices in the lighter colored areas. Disseminated pyrite is sparse to common.

83F60.--Dark-gray, fine- to medium-grained ore sandstone. Authigenic carbonaceous material forms a dull film on sand grains and stains clay. Disseminated pyrite is sparse.

84F60.--Medium-dark-gray ore sandstone similar to 83F60.

85F60.--Olive-gray, fine- to medium-grained ore sandstone. Authigenic carbonaceous material forms scattered interstitial blebs and stains clays. Disseminated pyrite is abundant and kaolinite nests are sparse.

86F60.--Very similar to 85F60, except for lesser amounts of carbonaceous material and pyrite.

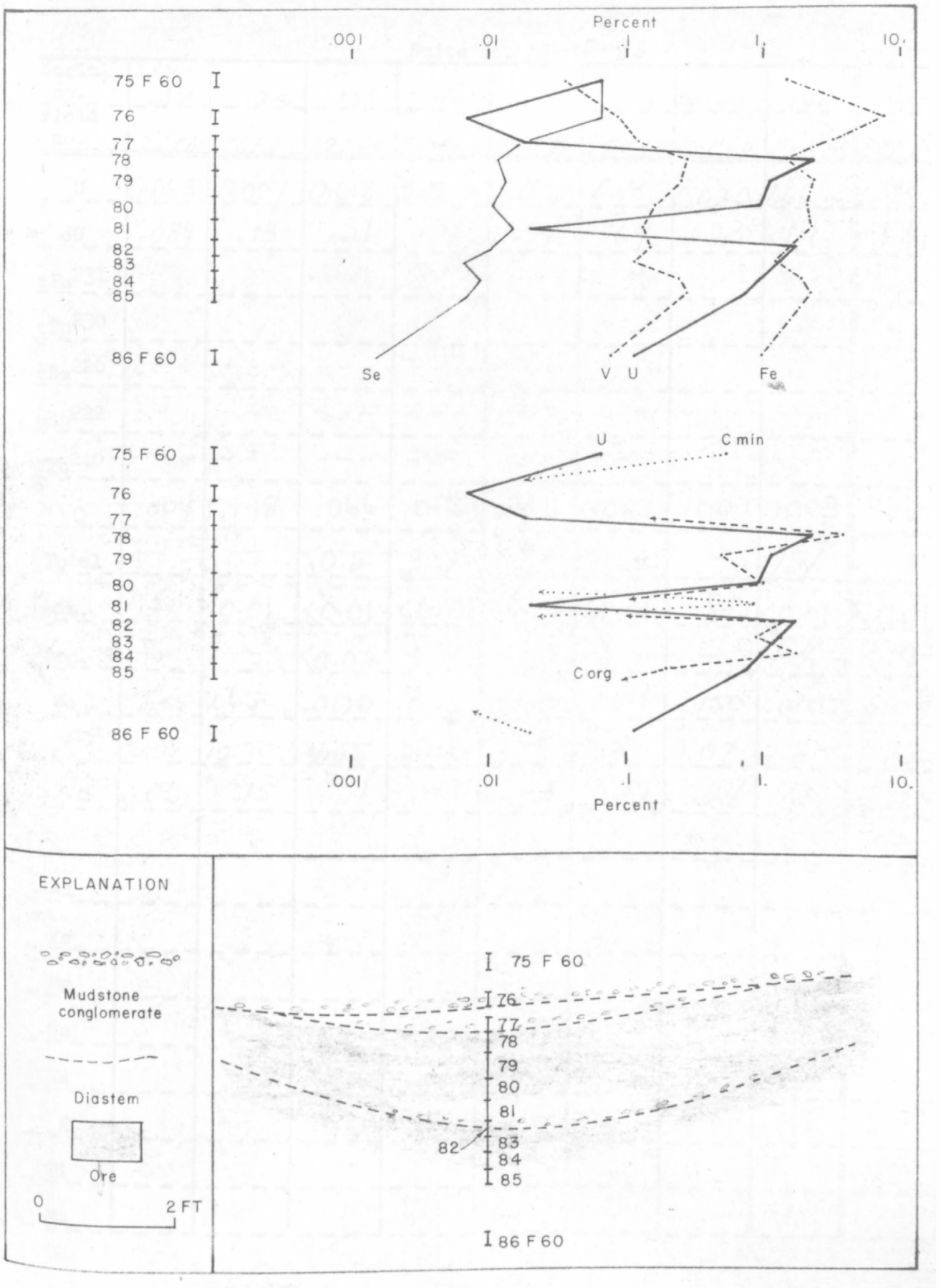



Figure 41.--Sample suite 75F60-86F60, Section 30 mine.

Suite No. 75-86 F60

| Serial no. | 282, 132 | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 75F60 | 76F60 | 77F60 | 78F60 | 79F60 | 80F60 | 81F60 | 82F60 | 83F60 | 84F |
| U | 0.065 | 0.007 | 0.018 | 2.18 | 1.11 | 0.95 | 0.020 | 1.66 | 1.35 | 0.95 |
| eU | .089 | .13 | .31 | 1.4 | .94 | .64 | .23 | 1.1 | 1.1 | .8 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| MO | .004 | .018 | .066 | .015 | .015 | .001 | .003 | .003 | .001 | .00 |
| $C_{Total}$ | — | — | <0.2 | 3.7 | .5 | 1.0 | — | 1.4 | .9 | 1. |
| $C_{Min.}$ | .53 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | .85 | <0.01 | <0.01 | <0.0 |
| $C_{Org.}$ | — | — | <0.02 | 3.7 | .5 | 1.0 | — | 1.4 | .9 | 1.7 |
| Se | .0655 | .0650 | .0170 | .0115 | .0130 | .0105 | .0150 | .0105 | .0065 | .008 |
| $Fe_2O_3$ | 2.09 | 0.70 | 4.55 | 2.08 | 3.19 | 2.89 | 3.07 | 2.20 | 1.83 | 2.71 |
| $V_2O_5$ | .06 | .15 | .21 | .50 | .43 | .29 | .24 | .27 | .20 | .4 |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No. 75-86 F 60

| Serial no. | 282, 147 | 148 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 85 F 60 | 86 F 60 | | | | | | | | |
| U | 0.12 | 0.11 | | | | | | | | |
| eU | .18 | .12 | | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Mo | .007 | <.001 | | | | | | | | |
| $C_{Total}$ | 0.2 | — | | | | | | | | |
| $C_{Min.}$ | <.01 | .02 | | | | | | | | |
| $C_{Org.}$ | 0.2 | — | | | | | | | | |
| Se | .0070 | .0015 | | | | | | | | |
| $Fe_2O_3$ | 3.04 | 1.42 | | | | | | | | |
| $V_2O_5$ | .49 | .14 | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 9-3-59 ( A through F )

Serial No's.-- 279,317 through 279,323

Mine-- Sec. 32

Level--

Sec. 32 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 315,280 N. x 534,380 E.

Mine location--

Sample elevation-- 6,385 ft

Premining water table elevation--~6,525 ft

Sampled to test element distribution in-- the termination of a prefault ore layer

Sample descriptions: (Rock Color Chart not used)

A.--Streaked dark-brown and near-white, fine-grained sandstone. The dark streaks contain authigenic molybdenum-bearing material as a grain coating.

B.--Light-tan to near-white, fine-grained sandstone. Disseminated pyrite, kaolinite nests, and calcite cement are sparse.

C.--Similar to sample "B" but with a little more pyrite.

C1.--Dark-brown, fine-grained ore sandstone. Dull dark-brown to black authigenic carbonaceous material coats most of the sand grains.

D.--Dark-brown to black, medium-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills many interstices. Poikiloblastic calcite cement is common. Disseminated pyrite is common.

E.--Dark-brown to gray, fine-grained ore sandstone. Authigenic carbonaceous material coats sand grains only in certain areas that give the sample a streaked to mottled

Suite No. 9-3-59 . Sample descriptions (Continued)

appearance. Otherwise similar to sample "D."

F.--Similar to sample "D" except for lack of calcite cement.

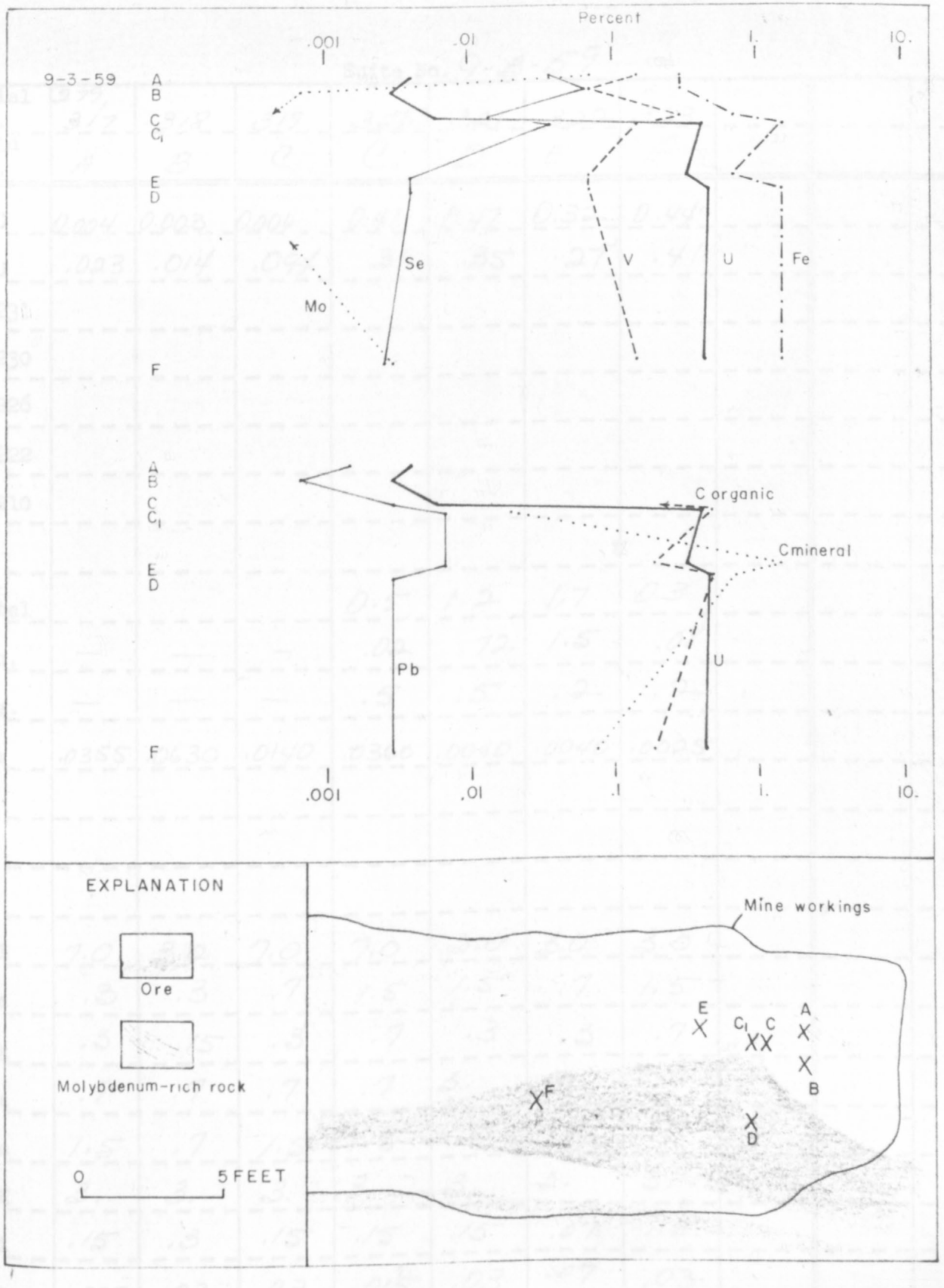



Figure 42.--Sample suite 9-3-59 (a-f), Section 32 mine.

Suite No. 9-3-59

| Serial no. / Field no. | 279, 317 A | 318 B | 319 C | 320 C, | 321 D | 322 E | 323 F | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.004 | 0.003 | 0.006 | 0.41 | 0.47 | 0.32 | 0.44 | | | |
| eU | .023 | .014 | .094 | .31 | .35 | .27 | .41 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | | | | 0.5 | 1.2 | 1.7 | 0.3 | | | |
| $C_{Min.}$ | — | — | — | .02 | .72 | 1.5 | .08 | | | |
| $C_{Org.}$ | — | — | — | .5 | .5 | .2 | .2 | | | |
| Se | .0355 | .0630 | .0140 | .0360 | .0040 | .0040 | .0025 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 3.0 | 7.0 | 7.0 | 3.0 | 3.0 | 3.0 | | | |
| Fe | .3 | .3 | .7 | 1.5 | 1.5 | .7 | 1.5 | | | |
| Mg | .3 | .15 | .3 | .7 | .3 | .3 | .7 | | | |
| Ca | .7 | .7 | .7 | .7 | 3. | 7. | .7 | | | |
| Na | 1.5 | .7 | 1.5 | 1.5 | .7 | .7 | .7 | | | |
| K | 3. | 3. | 3. | 3. | 3. | 2. | 3. | | | |
| Ti | .15 | .3 | .15 | .15 | .15 | .07 | .15 | | | |
| Mn | .007 | .03 | .03 | .015 | .03 | .07 | .03 | | | |

Suite No. 9-3-59 --Continued

| Serial no. | 279, 317 | 318 | 319 | 320 | 321 | 322 | 323 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | C, | D | E | F | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ba | .07 | .07 | .07 | .15 | .07 | .07 | .07 | | | |
| Be | .00015 | .00015 | .00015 | .0003 | .00015 | 0 | .0003 | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Co | .0007 | 0 | 0 | <.002 | <.002 | <.002 | <.002 | | | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0003 | .0007 | .0007 | | | |
| Cu | .0007 | .0003 | .0007 | .0007 | .0003 | .0003 | .0015 | | | |
| Ga | .0003 | d | d | .0007 | d | d | d | | | |
| Ge | 0 | 0 | 0 | <.005 | <.005 | <.005 | <.005 | | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Mo | .07 | .0007 | 0 | 0 | 0 | 0 | .003 | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Nd | 0 | 0 | 0 | — | 0 | 0 | 0 | | | |
| Ni | .0007 | .0003 | .0003 | .0015 | 0 | 0 | 0 | | | |
| Pb | .0015 | .0007 | .003 | .007 | .003 | .007 | .003 | | | |
| Sc | 0 | 0 | 0 | .0007 | 0 | 0 | 0 | | | |
| Sr | .03 | .015 | .03 | .03 | .03 | .03 | .015 | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| V | .15 | .07 | .3 | .15 | .07 | .07 | .15 | | | |
| Y | 0 | 0 | d | .03 | .0015 | .0015 | .0015 | | | |
| Yb | <.001 | <.001 | <.001 | .003 | .0003 | .0003 | <.001 | | | |
| Zr | .007 | .007 | .015 | .007 | .007 | .03 | .015 | | | |

Suite No.-- 9-3-59 ( H through L )

Serial No's.-- 279,324 through 279,329

Mine-- Sec. 32

Level--

Sec. 32 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 315,235 N. x 534,430 E.

Mine location--

Sample elevation-- 6,385 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- a prefault ore layer

Sample descriptions: (Rock Color Chart not used)

H.--Brown, medium- to coarse-grained ore sandstone. Authigenic carbonaceous material coats most grains. Kaolinite nests are common. Disseminated pyrite is sparse.

I.--Light-gray mudstone conglomerate with a very coarse grained matrix. Authigenic carbonaceous material (or a molybdenum-rich material) is sparse and sporadically distributed. Pyrite is sparse.

I-1.--Nearly black, medium-grained ore sandstone. Authigenic carbonaceous material coats all the sand grains and fills many interstices. Pyrite is common.

J.--Very similar to sample "I-1" except for lesser amounts of pyrite and authigenic carbonaceous material in the interstices.

K.--Dark-gray, medium-grained ore sandstone. Most sand grains are coated with authigenic carbonaceous material. Disseminated pyrite is sparse to common.

.--Grayish-brown, medium-grained sandstone very similar to sample "K" except that the film of authigenic carbonaceous material is very thin and has a brownish caste.

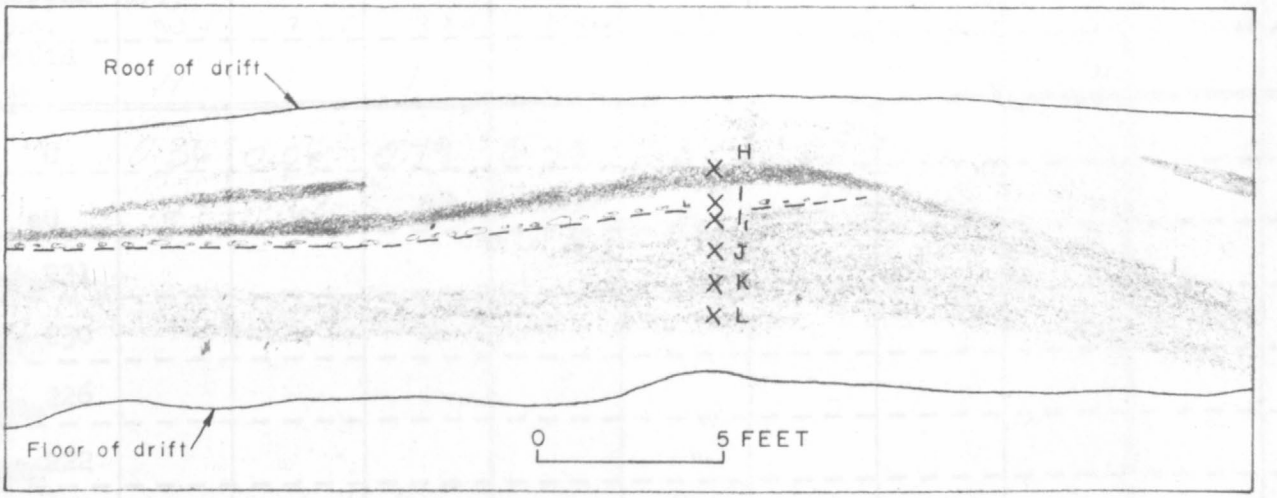



Figure 43.--Sample suite 9-3-59 H to L, Section 32 mine.

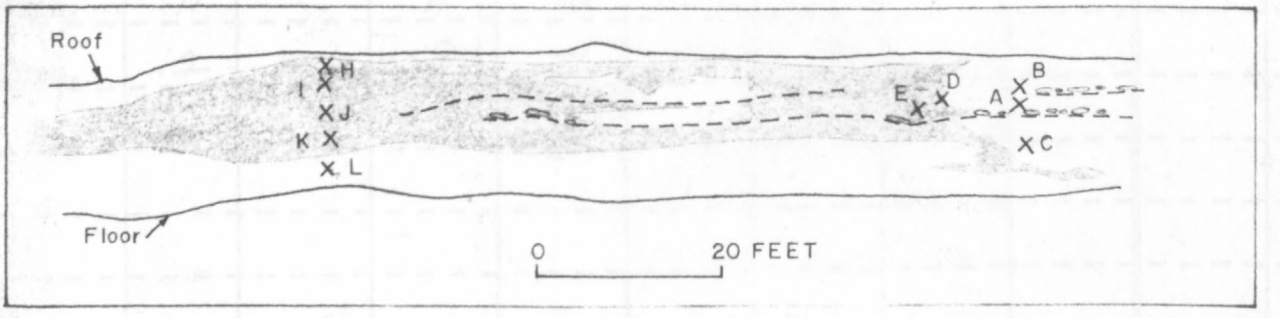



Figure 44.--Sample suite 9-5-59, Section 32 mine.

Suite No. 9-3-59

| Serial no. | 279, 324 | 325 | 326 | 327 | 328 | 329 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | H | I | I-1 | J | K | L | | | | |
| U | 0.36 | 0.06 | 0.79 | 0.55 | 0.31 | 0.35 | | | | |
| eU | .27 | .68 | .58 | .42 | .35 | .30 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 0.3 | – | 1.0 | 0.6 | 0.3 | 0.2 | | | | |
| $C_{Min.}$ | .11 | – | .11 | .16 | .05 | .12 | | | | |
| $C_{Org.}$ | .2 | – | .9 | .4 | .2 | <.2 | | | | |
| Se | .0020 | .0035 | .0025 | .0030 | .0035 | .0020 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 7.0 | 7.0 | 3.0 | 3.0 | 3.0 | | | | |
| Fe | 1.5 | 1.5 | 3. | 1.5 | 3. | 1.5 | | | | |
| Mg | .3 | .7 | .7 | .7 | .7 | .3 | | | | |
| Ca | .7 | .7 | .7 | .7 | .7 | .7 | | | | |
| Na | 1.5 | 1.5 | 1.5 | .7 | .7 | .7 | | | | |
| K | 3. | 3. | 3. | 3. | 1.5 | 3. | | | | |
| Ti | .07 | .15 | .07 | .07 | 1.5 | .07 | | | | |
| Mn | .015 | .03 | .03 | .03 | .07 | .015 | | | | |

Suite No. 9-3-59 --Continued

| Serial no. / Field no. | 279, 324 H | 325 I | 326 I-1 | 327 J | 328 K | 329 L | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | d | 0 | 0 | 0 | 0 | | | | |
| Ba | .15 | .07 | .07 | .07 | .03 | .07 | | | | |
| Be | .00015 | .0007 | .00015 | .00015 | d | 0 | | | | |
| Bi | 0 | 0 | <.002 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | | | | |
| Cr | .0003 | .0007 | .0003 | .0015 | .007 | .0007 | | | | |
| Cu | .0007 | .0007 | .0015 | .0007 | .0007 | .0003 | | | | |
| Ga | d | 0 | d | d | d | d | | | | |
| Ge | <.005 | 0 | <.005 | <.005 | <.005 | <.005 | | | | |
| La | 0 | 0 | .003 | 0 | 0 | 0 | | | | |
| Mo | 0 | .15 | .15 | .15 | .0015 | 0 | | | | |
| Nb | 0 | 0 | 0 | 0 | .003 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | .0003 | 0 | .0003 | 0 | 0 | | | | |
| Pb | .003 | .015 | .007 | .007 | .007 | .003 | | | | |
| Sc | 0 | d | 0 | 0 | .0007 | 0 | | | | |
| Sr | .03 | .03 | .03 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .03 | .3 | .07 | .07 | .15 | .07 | | | | |
| Y | .0015 | 0 | .0015 | .0015 | .003 | .0015 | | | | |
| Yb | .0003 | <.001 | .0003 | .0003 | <.001 | .00015 | | | | |
| Zr | .015 | .015 | .007 | .003 | .07 | .007 | | | | |

Suite No.-- 9-5-59 ( A through E ) See fig. 44.

Serial No's.-- 279,330 through 279,334

Mine-- Sec. 32

Level--

Sec. 32 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 315,335 N. x 533,405 E.

Mine location--

Sample elevation-- 6,370 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in--a "roll" face terminating prefault ore.

Sample descriptions: (Rock Color Chart not used)

A.--Tan to light-gray, medium-grained sandstone with small scattered mudstone fragments. Disseminated pyrite is sparse. Kaolinite nests are common.

B.--Similar to sample "A" but lacks the mudstone fragments and calcite cement is abundant.

C.--Tan to light-gray, coarse-grained, poorly sorted sandstone. Kaolinite nests are abundant. Disseminated pyrite is sparse.

D.--Nearly black, medium-grained ore sandstone. Authigenic carbonaceous material coats all the sand grains. Disseminated pyrite and calcite cement are sparse to common.

E.--Similar to sample "D" but with considerably more interstitial authigenic carbonaceous material.

Suite No.-- 9-5[redacted]-59 ( H through L )

Serial No's.-- 279,335 through 279,339

Mine-- Sec. 32

Level--

Sec. 32, Twp. 14, Rge. 9 --

U.S. AEC Coordinates-- 315,365 N. x 533,420 E.

Mine location--

Sample elevation-- 6,370 ft

Premining water table elevation--~6,525 ft

Sampled to test element distribution in--a prefault ore layer.

Sample descriptions:

H.--Streaked dark-brown and black, medium-grained ore sandstone. Authigenic carbonaceous material coats the sand grains and fills many interstices. Kaolinite nests and disseminated pyrite are sparse. Calcite cement is common.

I.--Dark-gray, medium-grained ore sandstone. Similar to sample "H" but less carbonaceous material.

J.--Brown, medium-grained ore sandstone. Authigenic carbonaceous material forms only a thin film on sand grains and stains clays. Otherwise similar to sample "H."

K.--Same as sample "H" with abundant calcite cement.

L.--Tan, medium- to coarse-grained, poorly sorted sandstone. Kaolinite nests are common. Pyrite and scattered calcite-cemented zones are sparse.

Suite No. 9-5-59

| Serial no. | 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | H | I | J | K | L |
| U | 0.005 | 0.001 | 0.001 | 0.56 | 0.57 | 0.29 | 0.52 | 0.30 | 0.89 | 0.001 |
| eU | .005 | .003 | .008 | .41 | .50 | .28 | .42 | .27 | .75 | .024 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | 1.3 | 1.8 | 1.9 | 1.3 | 0.8 | 2.0 | — |
| $C_{Min.}$ | — | — | — | 1.10 | 1.22 | 0.54 | .99 | .68 | 1.34 | — |
| $C_{Org.}$ | — | — | — | .2 | .6 | 1.4 | .3 | <.2 | .7 | — |
| Se | .0290 | .0020 | .0200 | .0340 | .0100 | .0040 | .0038 | .0030 | .0050 | .0020 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 3.0 | 7.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 7.0 |
| Fe | .7 | .7 | .7 | 1.5 | 1.5 | .7 | 1.5 | .7 | 1.5 | .3 |
| Mg | .3 | .15 | .15 | .3 | .3 | .3 | .3 | .15 | .3 | .15 |
| Ca | .7 | M | .7 | 3. | 3. | 1.5 | 3. | 3. | 7. | 1.5 |
| Na | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. |
| Ti | .15 | .07 | .07 | .07 | .07 | .15 | .07 | .07 | .07 | .07 |
| Mn | .007 | .15 | .007 | .07 | .07 | .03 | .03 | .03 | .07 | .015 |

Suite No. 9-5-59 --Continued

| Serial no. | 329, 330 | 331 | 332 | 333 | 334 | 335 | 336 | 337 | 338 | 339 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | H | I | J | K | L |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .03 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | .00015 | .00015 | .0003 | .00015 | .00015 | .00015 | .00015 | 0 |
| Bi | 0 | 0 | 0 | <.002 | <.002 | 0 | 0 | 0 | <.002 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | d | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | 0 |
| Cr | .0007 | .0003 | .0007 | .0003 | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 |
| Cu | .0007 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | .0003 |
| Ga | d | d | d | d | d | d | d | d | d | d |
| Ge | 0 | 0 | 0 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | 0 |
| La | 0 | 0 | 0 | .003 | 0 | 0 | 0 | 0 | .003 | 0 |
| Mo | d | d | .0007 | .0015 | .03 | .0015 | .003 | .007 | .07 | .015 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | .0003 | .0003 | .0003 | .0003 | .0003 | 0 | .0003 | .0003 | 0 | 0 |
| Pb | d | d | .0015 | .015 | .007 | .007 | .007 | .003 | .007 | .0015 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .03 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .015 | .07 | .07 | .07 | .07 | .07 | .07 | .15 | .03 |
| Y | .0015 | .0015 | d | .003 | .0015 | .0015 | d | .0015 | .0015 | 0 |
| Yb | .00015 | .00015 | .00015 | .0003 | .0003 | .0003 | .00015 | .00015 | <.001 | 0 |
| Zr | .015 | .003 | .007 | .003 | .007 | .03 | .003 | .003 | .007 | .007 |

Suite No.-- 28ES59 ( 1 through 6 ) See fig. 47.

Serial No's.-- 271,478 through 271,483

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,425 N. x 538,020 E.

Mine location-- Rm. 50, 10 ft S. of 1 N.

Sample elevation-- 6,415 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in--a crosscutting appendage of ore extending downward from a semi-concordant prefault ore layer.

Sample descriptions:

1.--Dark-gray, coarse-grained ore sandstone. Authigenic carbonaceous material coats sand grains. Disseminated pyrite is common to abundant. Kaolinite nests are common. Some anatase aggregates are present.

2.--Dark-gray, medium-grained ore sandstone. Authigenic carbonaceous material forms films on sand grains, interstitial blebs, and clay stain. Disseminated pyrite is common. Kaolinite nests are sparse.

3.--Dark-brown to black, coarse- to very coarse grained ore sandstone. Authigenic carbonaceous material largely occurs as friable interstitial blebs which may be, in part, stained clays. Disseminated pyrite is abundant. Kaolinite nests are sparse.

4.--Dark-brown to black, medium- to coarse-grained sandstone. Authigenic carbonaceous material largely in discrete interstitial blebs, but also partly coats some sand

Suite No. 28ES59 . Sample descriptions (Continued)

grains. Disseminated pyrite is abundant. Kaolinite nests are sparse.

5.--Pale-yellowish-brown, medium- to coarse-grained friable sandstone. Disseminated pyrite, calcite cement, and kaolinite nests are sparse.

6.--Similar to sample "5," but grain size is coarse to very coarse.

Suite No. 28 ES 59

| Serial no. | 271, 428 | 429 | 430 | 431 | 432 | 433 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | | | | |
| U | 0.69 | 0.56 | 0.33 | 0.76 | 0.015 | 0.053 | | | | |
| eU | .43 | .38 | .24 | .48 | .039 | .045 | | | | |
| $ePa^{231}$ | .62 | .48 | .33 | .68 | .027 | .054 | | | | |
| $eTh^{230}$ | .83 | .46 | .26 | .80 | .018 | .055 | | | | |
| $eRa^{226}$ | .39 | .50 | .34 | .60 | .076 | .062 | | | | |
| $eRn^{222}$ | .24 | .21 | .15 | .26 | .05 | .05 | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 1.2 | 1.1 | 1.0 | 1.6 | 0.6 | <.30 | | | | |
| $C_{Min.}$ | .13 | .21 | .33 | .10 | .44 | .22 | | | | |
| $C_{Org.}$ | 1.1 | .9 | .7 | 1.5 | <.3 | <.3 | | | | |
| Se | .0075 | .0060 | .0050 | .0050 | .0012 | .0015 | | | | |
| As | .0086 | .0080 | .0054 | .0075 | .0022 | .0021 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 7.0 | 7.0 | 7.0 | | | | |
| Fe | 1.5 | 1.5 | 1.5 | 1.5 | .3 | .3 | | | | |
| Mg | .3 | .7 | .15 | .3 | .15 | .15 | | | | |
| Ca | .7 | .7 | 1.5 | .7 | 3. | 1.5 | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | .7 | .7 | | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Ti | .07 | .15 | .07 | .3 | .07 | .07 | | | | |
| Mn | .03 | .015 | .015 | .015 | .015 | .015 | | | | |

Suite No. 28ES59 --Continued

| Serial no. | 271, 428 | 429 | 480 | 481 | 482 | 483 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | | | | |
| Be | .0003 | .0003 | .0003 | .0003 | .00015 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.005 | <.005 | <.005 | <.005 | 0 | 0 | | | | |
| Cr | .0003 | .0007 | .0003 | .0007 | .0003 | .0003 | | | | |
| Cu | .0015 | .0007 | .0003 | .0007 | .0003 | .0007 | | | | |
| Ga | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | | | | |
| Ge | <.005 | <.005 | <.005 | <.005 | 0 | 0 | | | | |
| La | .003 | .003 | 0 | .007 | 0 | .003 | | | | |
| Mo | .0007 | .0015 | .0007 | .007 | .003 | 0 | | | | |
| Nb | 0 | .0015 | 0 | .0015 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | .015 | .007 | .007 | .015 | .0015 | .0015 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .03 | .07 | .03 | .07 | .03 | .03 | | | | |
| Y | .0015 | .0015 | .0015 | .0015 | 0 | .0015 | | | | |
| Yb | .0003 | — | .0003 | — | .00015 | .0003 | | | | |
| Zr | .003 | .03 | .007 | .03 | .007 | .007 | | | | |

Suite No.-- 29ES59 ( 1 through 3 ) See fig. 47.

Serial No's.-- 271,484 through 271,486

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,290 N. x 538,670 E.

Mine location--W. rib of 2R off 9+70 haulageway at sta. 217.

Sample elevation--6,385 ft

Premining water table elevation-- ~6,500 ft

Sampled to test element distribution in--Molybdenum-rich (jordisite) sandstone that is essentially barren of uranium.

Sample descriptions:

1.--Black, coarse- to very coarse grained sandstone. Molybdenum-bearing material coats all sand grains and impregnates scattered clay blebs that are about the same size as the sand grains. Pyrite is sparse.

2.--Similar to sample "1" except that the stained blebs of clay are missing and the grain size is medium.

3.--Similar to sample "2" except that pyrite seems to be missing.

Suite No. 29ES59

| Serial no. / Field no. | 271 484 / 1 | 485 2 | 486 3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.003 | 0.018 | 0.017 | | | | | | | |
| eU | .005 | .027 | .013 | | | | | | | |
| $ePa^{231}$ | .010 | .027 | .011 | | | | | | | |
| $eTh^{230}$ | .002 | .017 | .011 | | | | | | | |
| $eRa^{226}$ | .008 | .038 | .023 | | | | | | | |
| $eRn^{222}$ | .01 | .03 | .01 | | | | | | | |
| $ePb^{210}$ | .007 | .041 | .019 | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | < .3 | < .3 | < .3 | | | | | | | |
| $C_{Min.}$ | .30 | .36 | .27 | | | | | | | |
| $C_{Org.}$ | < .3 | < .3 | < .3 | | | | | | | |
| Se | .0310 | .0375 | .0100 | | | | | | | |
| As | .0057 | .0051 | .0033 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 7.0 | 7. | | | | | | | |
| Fe | .3 | .3 | .15 | | | | | | | |
| Mg | .15 | .15 | .15 | | | | | | | |
| Ca | 3. | 3. | 1.5 | | | | | | | |
| Na | 1.5 | 1.5 | 1.5 | | | | | | | |
| K | 3. | 3. | 3. | | | | | | | |
| Ti | .03 | .07 | .07 | | | | | | | |
| Mn | .015 | .015 | .015 | | | | | | | |

Suite No. 29ES59 --Continued

| Serial no. | 27, 484 | 485 | 486 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | | | | | | | |
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .07 | .07 | .07 | | | | | | | |
| Be | 0 | 0 | 0 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | 0 | 0 | 0 | | | | | | | |
| Cr | .0003 | .0003 | .0003 | | | | | | | |
| Cu | .0003 | .0003 | .0003 | | | | | | | |
| Ga | .0003 | .0003 | .0003 | | | | | | | |
| Ge | 0 | 0 | 0 | | | | | | | |
| La | .003 | 0 | .003 | | | | | | | |
| Mo | .15 | .3 | .15 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .0015 | .0015 | .0015 | | | | | | | |
| Sc | 0 | 0 | 0 | | | | | | | |
| Sr | .015 | .015 | .015 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .015 | .03 | .015 | | | | | | | |
| Y | .0015 | .003 | 0 | | | | | | | |
| Yb | .00015 | .0003 | 0 | | | | | | | |
| Zr | .007 | .007 | .007 | | | | | | | |

Suite No.-- 72ES59 ( 1 through 15 )

Serial No's.-- 277,683 through 277,697

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,305 N. x 538,440 E.

Mine location-- Rm 33 and 9+70

Sample elevation-- 6,400 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in--a series of uranium-rich and molybdenum-rich ore layers.

Sample descriptions:

1.--Brownish-black, coarse-grained ore sandstone. Authigenic carbonaceous material forms brown film on sand grains and scattered black blebs in the interstices. Kaolinite nests are abundant. Disseminated pyrite and calcite cement are sparse.

2.--Same as sample "1."

3.--Light-olive-gray, coarse-grained sandstone. Authigenic carbonaceous material forms sparse specks on sand grains and appears to be remanents of a film. Kaolinite nests are abundant. Pyrite is sparse.

4.--Light-olive-gray, medium-grained sandstone. Similar to sample "3."

5.--Black, medium-grained sandstone. Authigenic molybdenum-rich material coats all sand grains. Disseminated pyrite and kaolinite nests are sparse.

6.--Grayish-black, medium-grained sandstone. Molybdenum-rich film coats sand grains. Disseminated pyrite, kaolinite nests, calcite cement, and quartz overgrowths are all sparse to common.

Suite No. 72ES59 . Sample descriptions (Continued)

7.--Similar to sample "6."

8.--Similar to sample "6."

9.--Similar to sample "6."

10. Dark-yellowish-brown, medium-grained sandstone. Yellowish-brown stain that permeates sandstone is probably molybdenum rich. Kaolinite nests, disseminated pyrite, and quartz overgrowths are sparse. Calcite cement is common.

11.--Light-olive-gray, coarse-grained sandstone. Quartz overgrowths, disseminated pyrite, calcite cement, kaolinite nests are sparse. Very sparse scattered blebs of authigenic carbonaceous material are found in the interstices.

12.--Grayish-black, coarse-grained sandstone. Molybdenum-rich film coats sand grains. Calcite cement and quartz overgrowths are common. Kaolinite nests are common.

13.--Similar to sample "12" but medium grained and containing less calcite.

14.--Dark-gray, fine-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills some interstices. Disseminated pyrite is common.

15.--Contact between grayish-black and light-olive-gray, fine- to medium-grained sandstone. Darker rock characterized by abundant authigenic carbonaceous material and calcite cement and sparse pyrite. Lighter rock contains abundant pyrite, sparse quartz overgrowths, and less calcite.

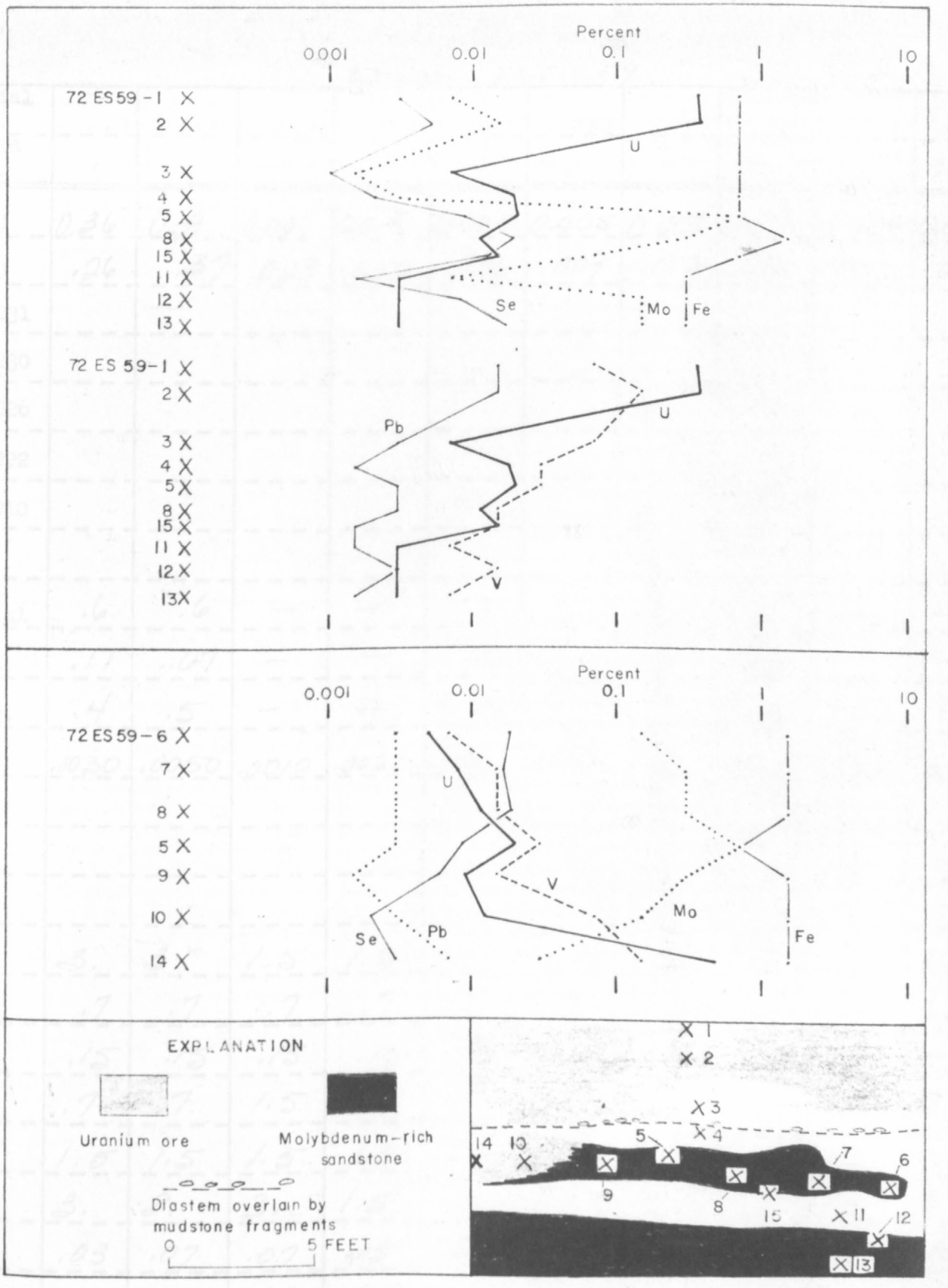



Figure 45.--Sample suite 72ES59, Ann Lee mine.

Suite No. 72ES59

| Serial no. | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| U | 0.36 | 0.39 | 0.007 | 0.018 | 0.020 | 0.005 | 0.008 | 0.011 | 0.009 | 0.012 |
| eU | .26 | .37 | .023 | .022 | .036 | .009 | .012 | .015 | .022 | .033 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .6 | .6 | — | — | .2 | — | — | <.2 | — | — |
| $C_{Min.}$ | .17 | .07 | — | — | .19 | — | — | .05 | — | — |
| $C_{Org.}$ | .4 | .5 | — | — | <.2 | — | — | <.2 | — | — |
| Se | .0030 | .0050 | .0010 | .0020 | .0085 | .0175 | .0165 | .0185 | .0060 | .0020 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Fe | .7 | .7 | .7 | .7 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 |
| Ca | .7 | .7 | 1.5 | .7 | .7 | 1.5 | .7 | .7 | .7 | 2. |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 |
| K | 3. | 3. | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 3. |
| Ti | .03 | .07 | .07 | .15 | .15 | .15 | .15 | .3 | .15 | .15 |
| Mn | .015 | .03 | .03 | .015 | .03 | .03 | .015 | .015 | .015 | .07 |

Suite No. 72E559--Continued

| Serial no. | 683 | 684 | 685 | 686 | 687 | 688 | 689 | 690 | 691 | 692 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .15 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | .0003 | .0003 | .00015 | .00015 | .00015 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.005 | <.005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cr | .0003 | .0003 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 |
| Cu | .0007 | .0015 | .0015 | .0007 | .003 | .0007 | .0007 | .0015 | .0007 | .0007 |
| Ga | .0003 | .0007 | d | d | d | d | d | d | d | d |
| Ge | <.005 | <.005 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | .003 | .003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mo | .007 | .015 | .0015 | .003 | .7 | .15 | .3 | .3 | .3 | .15 |
| Nb | 0 | 0 | 0 | .0015 | .0015 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | .0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .015 | .015 | .003 | .0015 | .003 | .003 | .003 | .003 | .0015 | .003 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .15 | .07 | .03 | .03 | .007 | .015 | .015 | .015 | .07 |
| Y | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0015 | 0 | 0 |
| Yb | — | — | — | .00015 | .00015 | .00015 | .00015 | .0003 | .00015 | — |
| Zr | .015 | .007 | .003 | .015 | .007 | .03 | .015 | .03 | .015 | .015 |

Suite No. 72ES59 cont'd

| Serial no. | 693 | 694 | 695 | 696 | 697 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 11 | 12 | 13 | 14 | 15 | | | | | |
| U | 0.003 | 0.003 | 0.003 | 0.47 | 0.015 | | | | | |
| eU | .005 | .004 | .004 | .31 | .013 | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | < .2 | .4 | 2.5 | | | | | |
| $C_{Min.}$ | — | — | .15 | .08 | 2.31 | | | | | |
| $C_{Org.}$ | — | — | < .2 | .3 | .2 | | | | | |
| Se | .0015 | .0080 | .0160 | .0030 | .0128 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.5 | 1.5 | 3. | 1.5 | 1.5 | | | | | |
| Fe | .3 | .3 | .3 | 1.5 | .7 | | | | | |
| Mg | .07 | .15 | .15 | .15 | .07 | | | | | |
| Ca | .7 | 3. | .7 | .7 | 7. | | | | | |
| Na | 1.5 | 1.5 | 1.5 | .7 | 1.5 | | | | | |
| K | 1.5 | 1.5 | 3. | 1.5 | 3. | | | | | |
| Ti | .15 | .15 | .15 | .15 | .15 | | | | | |
| Mn | .015 | .07 | .015 | .015 | .07 | | | | | |

Suite No. 72E539 --Continued

| Serial no. | 277, 623 | 624 | 625 | 626 | 627 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 11 | 12 | 13 | 14 | 15 | | | | | |
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | | | | | |
| Be | 0 | 0 | 0 | .00015 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | 0 | 0 | 0 | <.005 | 0 | | | | | |
| Cr | .0003 | .0003 | .0007 | .0007 | .0007 | | | | | |
| Cu | .0003 | .0007 | .0007 | .0007 | .0007 | | | | | |
| Ga | d | d | d | d | d | | | | | |
| Ge | 0 | 0 | 0 | <.005 | 0 | | | | | |
| La | 0 | 0 | 0 | .003 | 0 | | | | | |
| Mo | .007 | .15 | .15 | .03 | .07 | | | | | |
| Nb | 0 | 0 | 0 | .0015 | 0 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .0015 | .003 | .0015 | .007 | .0015 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .015 | .015 | .015 | .03 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .007 | .015 | .007 | .15 | .015 | | | | | |
| Y | 0 | 0 | 0 | .003 | 0 | | | | | |
| Yb | 0 | 0 | 0 | — | .00015 | | | | | |
| Zr | .015 | .007 | .015 | .07 | .03 | | | | | |

Suite No.-- 81ES59 ( 1 through 7 )

Serial No's.-- 277,049 through 277,055

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,185 N. x 538,410 E.

Mine location-- SE corner of pillar at 3L off Rm 34

Sample elevation-- 6,395 ft

Premining water table elevation-- ~6,500 ft

Sampled to test element distribution ~~xx~~---across a fracture in a prefault ore layer.

Sample descriptions:

1 to 7.--Grayish-black, medium- and coarse-grained, poorly sorted ore sandstone. Authigenic carbonaceous material fills most of the interstices. Pyrite and calcite are sparse. All samples are essentially identical.

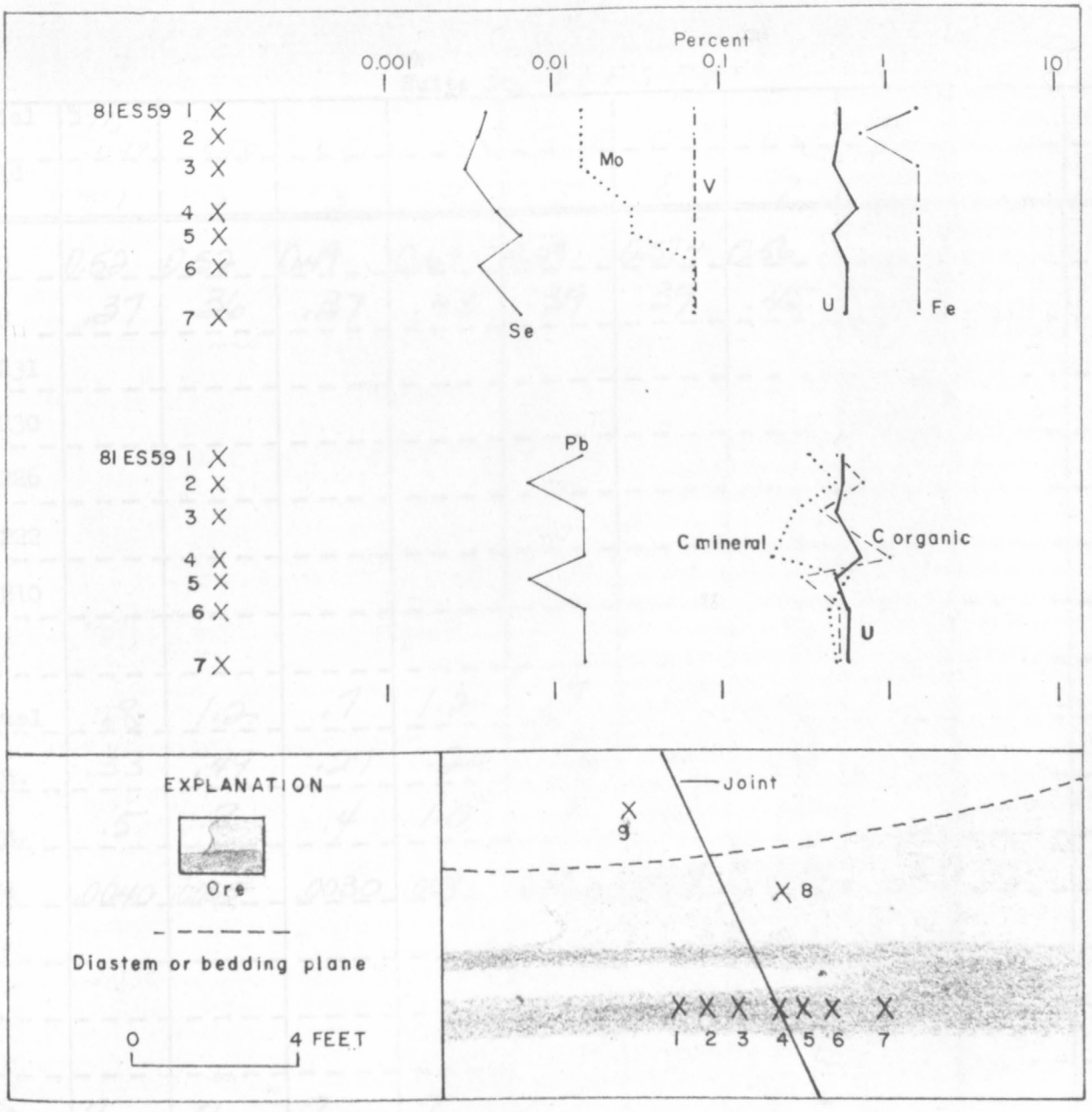



Figure 46.--Sample suite 81ES59, Ann Lee mine.

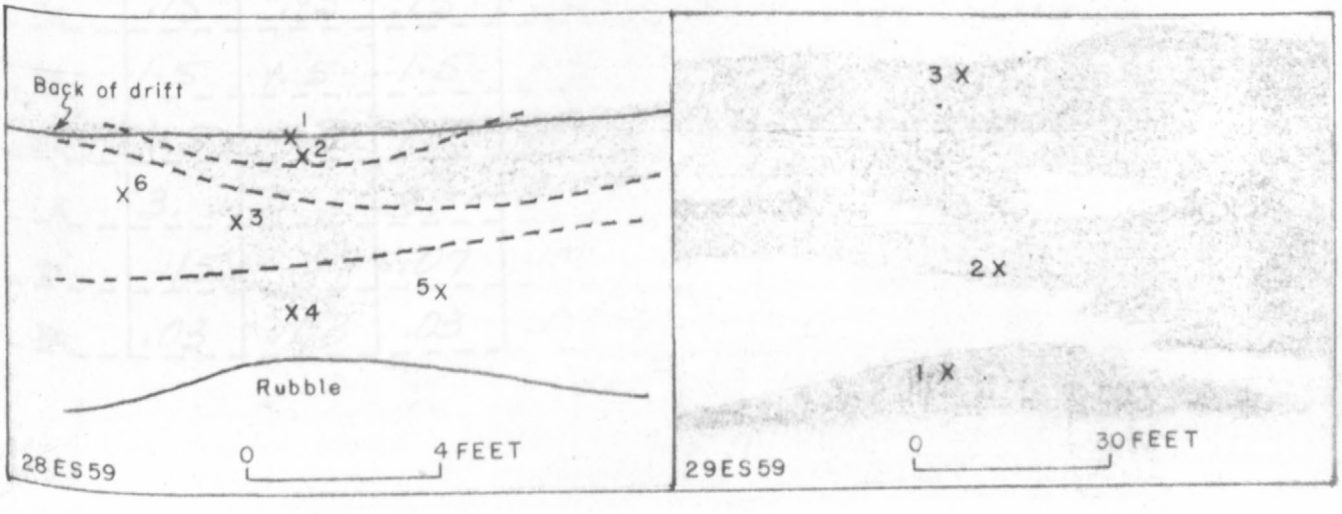



Figure 47.--Sample suites 28ES59 and 29ES59, Ann Lee mine.

Suite No. 81ES59

| Serial no. | 2779 049 | 050 | 051 | 052 | 053 | 054 | 055 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| U | 0.52 | 0.52 | 0.49 | 0.67 | 0.49 | 0.57 | 0.56 | | | |
| eU | .37 | .36 | .37 | .43 | .39 | .39 | .45 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .8 | 1.2 | .7 | 1.2 | .9 | .9 | 1.0 | | | |
| $C_{Min.}$ | .33 | .49 | .27 | .20 | .56 | .44 | .49 | | | |
| $C_{Org.}$ | .5 | .7 | .4 | 1.0 | .3 | .5 | .5 | | | |
| Se | .0040 | .0035 | .0030 | .0045 | .0062 | .0035 | .0062 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 7. | 7. | 7. | 7. | | | |
| Fe | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | .15 | | | |
| Ca | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | |
| Na | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | | | |
| Ti | .15 | .07 | .07 | .07 | .07 | .07 | .3 | | | |
| Mn | .03 | .03 | .03 | .03 | .03 | .03 | .07 | | | |

Suite No. 81 ES 59 --Continued

| Serial no. | 2749 | 2750 | 2751 | 2752 | 2753 | 2754 | 2755 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | | |
| Be | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | | | |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0007 | .0007 | | | |
| Cu | .0007 | .0007 | .0003 | .0007 | .0015 | .0007 | .0007 | | | |
| Ga | d | d | .0003 | .0003 | d | d | .0003 | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| La | .007 | .003 | .003 | .007 | .003 | .003 | .003 | | | |
| Mo | .015 | .015 | .015 | .03 | .03 | .07 | .07 | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Ni | .0007 | 0 | 0 | 0 | .0003 | .0003 | 0 | | | |
| Pb | .015 | .007 | .015 | .015 | .007 | .015 | .015 | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Sr | .03 | .03 | .03 | .03 | .03 | .03 | .03 | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| V | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | | |
| Y | .0015 | d | d | .0015 | .0015 | .0015 | .0015 | | | |
| Yb | — | — | — | — | — | — | — | | | |
| Zr | .007 | .007 | .007 | .007 | .007 | .007 | .015 | | | |

Suite No.-- 85ES59 ( 1 through 5 )

Serial No's.-- 277,060 through 277,064

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,250 N. x 539,275 E.

Mine location-- 2L and 10 NW

Sample elevation-- 6,368 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in--Post mining oxidation of primary ore with formation of secondary U and V minerals and stain, and limonite.

Sample descriptions:

1.--Moderate-yellowish-brown, coarse-grained ore sandstone. Authigenic carbonaceous material occurs as sparse remanent(?) interstitial blebs. Disseminated pyrite is common. Calcite cement is sparse.

2.--Pale-yellowish-brown, fine-grained ore sandstone. Authigenic carbonaceous material occurs as sparse remanent(?) interstitial blebs. Disseminated pyrite is sparse. Some areas are mottled by limonitic stain.

3.--Dark-yellowish-brown, coarse- to very coarse grained ore sandstone. Authigenic carbonaceous material forms a thin gray film on sand grains. The surface that was exposed in the mine is mottled with greenish and yellowish stains caused by secondary uranium and vanadium minerals(?). Kaolinite nests are common and locally stained yellowish.

--Pinkish-gray, medium- to fine-grained sandstone. Kaolinite nests are sparse.

Suite No. 85E359 . Sample descriptions (Continued)

5.--Pale-brown, coarse- to very coarse grained ore sandstone. Authigenic carbonaceous material forms a thin gray film or clay stain on sand grains, and a few black interstitial blebs. Disseminated pyrite is abundant. Kaolinite nests are sparse.

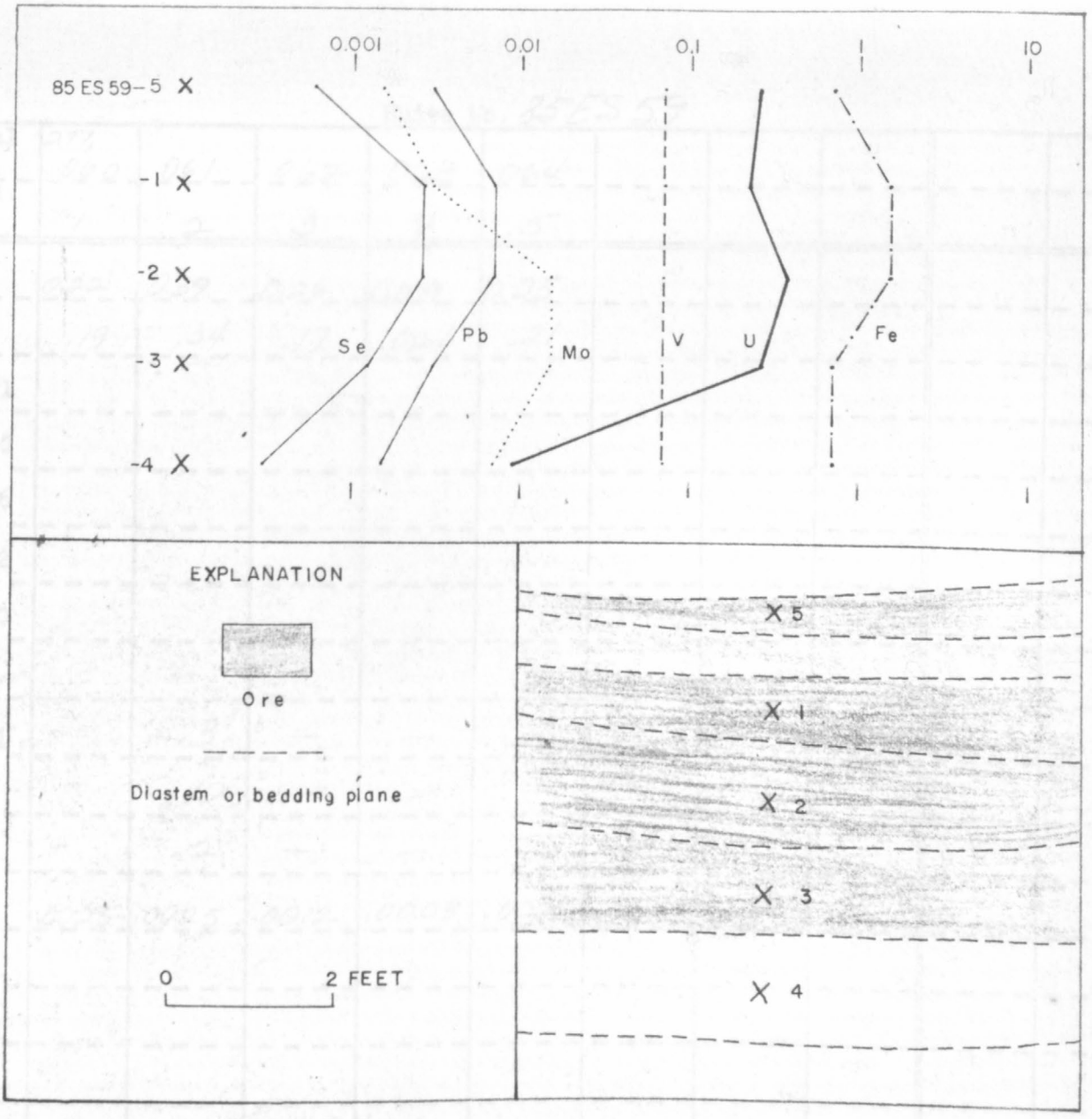



Figure 48.--Sample suite 85ES59, Ann Lee mine.

Suite No. 85ES59

| Serial no. | 277, 060 | 061 | 062 | 063 | 064 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | | | | | |
| U | 0.22 | 0.39 | 0.26 | 0.009 | 0.25 | | | | | |
| eU | .19 | .34 | .17 | .024 | .21 | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | .3 | — | — | — | | | | | |
| $C_{Min.}$ | — | .10 | — | — | — | | | | | |
| $C_{org.}$ | — | .2 | — | — | — | | | | | |
| Se | .0025 | .0025 | .0012 | .0003 | .0006 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | | | | | |
| Fe | 1.5 | 1.5 | .7 | .7 | .7 | | | | | |
| Mg | .15 | .3 | .15 | .15 | .15 | | | | | |
| Ca | 1.5 | .7 | .7 | 3 | 1.5 | | | | | |
| Na | 3. | 1.5 | 3. | 3. | 3. | | | | | |
| K | 3. | 2. | 3. | 3. | 3. | | | | | |
| Ti | .07 | .3 | .15 | .3 | .07 | | | | | |
| Mn | .03 | .015 | .015 | .007 | .03 | | | | | |

Suite No. 85ES57 --Continued

| Serial no. | 277, S62 | C61 | C62 | S63 | C64 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | | | | | |
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | | | | | |
| Be | .00015 | .0003 | .00015 | 0 | .00015 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | <.002 | <.002 | <.002 | 0 | <.002 | | | | | |
| Cr | .0003 | .0015 | .0003 | .0015 | .0003 | | | | | |
| Cu | .0007 | .0015 | .0015 | .0007 | .0003 | | | | | |
| Ga | .0003 | .0007 | .0003 | .0003 | .0003 | | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | | | | | |
| La | 0 | .007 | .003 | 0 | .003 | | | | | |
| Mo | .003 | .015 | .015 | .007 | .0015 | | | | | |
| Nb | 0 | .0015 | 0 | .0015 | 0 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .007 | .007 | .003 | .0015 | .003 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .03 | .03 | .03 | .03 | .03 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .07 | .07 | .07 | .07 | .07 | | | | | |
| Y | .0015 | .0015 | .003 | d | d | | | | | |
| Yb | — | — | .0003 | — | — | | | | | |
| Zr | .007 | .03 | .007 | .015 | .007 | | | | | |

Suite No.-- 86ES59 ( 1 through 6 )

Serial No's.-- 277,065 through 277,070

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,975 N. x 538,865 E.

Mine location-- 7 slant SW+40

Sample elevation-- 6,365 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in--thin high-grade ore layer (1.5 percent U) controlled by mudstone conglomerate bed (1.5 percent is indicated by Gamma-ray log according to Company's calculations). This is a local thickening of thin high-grade ore layer a few feet from pinchout. Layer is mostly 6 inches to 1 ft thick.

Sample descriptions:

1.--Grayish-brown, coarse-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills most interstices. Kaolinite nests and disseminated pyrite are sparse to common. Calcite cement is common.

2.--Grayish-black, coarse-grained ore sandstone. Similar to sample "1."

3.--Same as sample "2."

4.--Dusky-brown, very coarse grained sandstone matrix with mudstone pebbles. Authigeni carbonaceous material forms a thin brownish film on sand grains. Pyrite and kaolinite nests are sparse.

5.--Moderate-brown, medium- to coarse-grained ore sandstone. Authigenic carbonaceous material partly coats some sand grains and forms scattered interstitial blebs. Pyrite and kaolinite nests are sparse.

6.--Mottled-dusky-brown and pale-brown, very coarse sandstone matrix with mudstone

Suite No. 86ES59 . Sample descriptions (Continued)

pebbles. Authigenic carbonaceous material impregnates the darker sandstone. Calcite cement is abundant. Disseminated pyrite is common. Kaolinite nests are abundant and locally stained yellow by secondary uranium(?). A little hematite stain was noted.

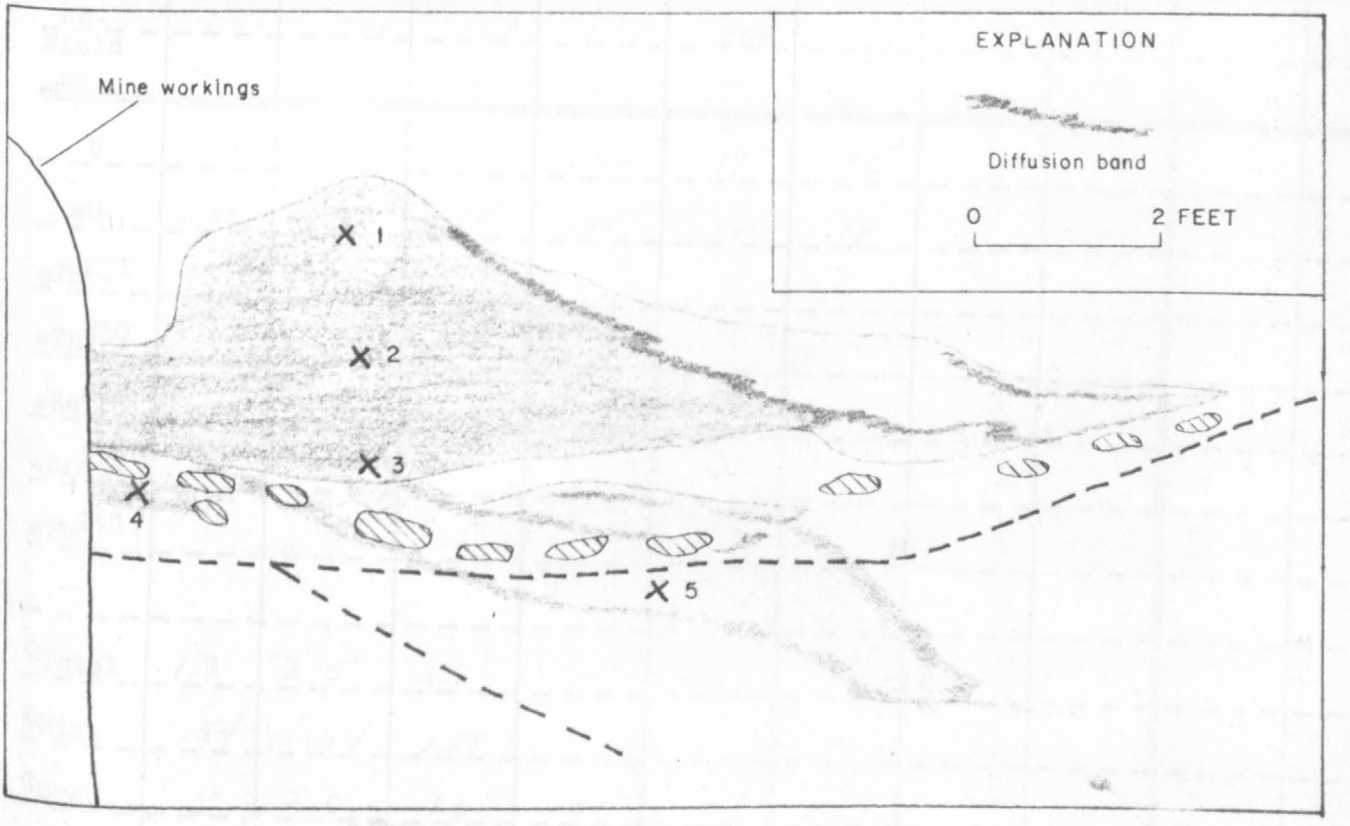



Figure 49.--Sample suite 86ES59, Ann Lee mine.

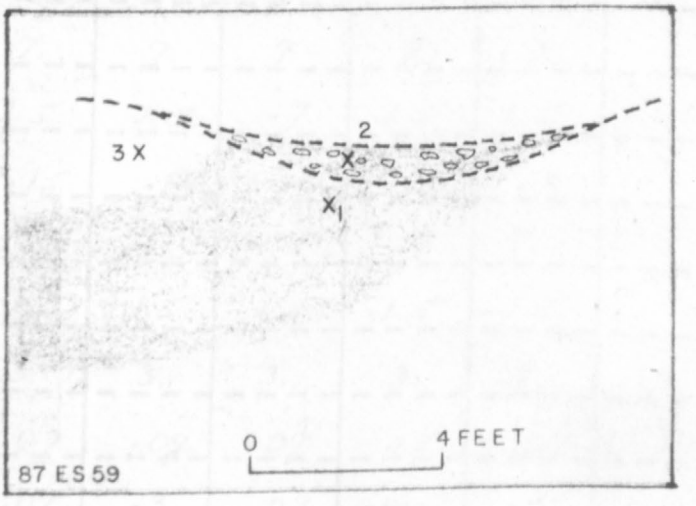



Figure 50.--Sample suite 87ES59, Ann Lee mine.

Suite No. 86ES59

| Serial no. | 2772 065 | 066 | 067 | 068 | 069 | 070 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | | | | |
| U | .38 | .87 | .70 | .22 | .17 | .30 | | | | |
| eU | .30 | .59 | .54 | .14 | .12 | .18 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 1.3 | 2.5 | 2.9 | – | – | – | | | | |
| $C_{Min.}$ | .54 | .54 | 1.88 | – | – | – | | | | |
| $C_{Org.}$ | .8 | 2.0 | 1.0 | – | – | – | | | | |
| Se | .0110 | .0075 | .0045 | .0045 | .0050 | .0035 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 7 | 7. | 7 | | | | |
| Fe | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .3 | | | | |
| Ca | 1.5 | 1.5 | 7. | 1.5 | .7 | 7. | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Ti | .07 | .07 | .07 | .07 | .15 | .07 | | | | |
| Mn | .07 | .07 | .3 | .07 | .015 | .15 | | | | |

Suite No. 86ES59 --Continued

| Serial no. | 277, 065 | 066 | 067 | 068 | 069 | 070 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .15 | .07 | .15 | .07 | .07 | | | | |
| Be | .00015 | .0003 | .0003 | .00015 | .00015 | .00015 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | .0007 | .0007 | | | | |
| Cu | .0015 | .0007 | .0015 | .0007 | .0015 | .0015 | | | | |
| Ga | d | .0003 | .0003 | .0003 | d | .0003 | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| La | 0 | .007 | .003 | 0 | 0 | 0 | | | | |
| Mo | .03 | .15 | .03 | .0015 | .0007 | .007 | | | | |
| Nb | 0 | 0 | 0 | ~~.0015~~ 0 | .0015 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | .0003 | .0003 | .0007 | 0 | 0 | .0007 | | | | |
| Pb | .007 | .015 | .015 | .003 | .003 | .003 | | | | |
| Sc | d | 0 | 0 | .0007 | d | .0007 | | | | |
| Sr | .03 | .03 | .03 | .03 | .015 | .03 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .07 | .07 | .15 | .015 | .007 | .015 | | | | |
| Y | .03 | .0015 | .0015 | .03 | .03 | .007 | | | | |
| Yb | .0015 | – | – | .0015 | .0007 | .0003 | | | | |
| Zr | .003 | .003 | .015 | .015 | .015 | .015 | | | | |

Suite No.-- 87ES59 ( 1 through 3 ) See fig 50.

Serial No's.-- 277,071 through 277,073

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 318,860 N. x 538,750 E.

Mine location-- Rm 8 and 5 NW

Sample elevation-- 6,365 ft

Premining water table elevation-- ~6,500 ft

Sampled to test element distribution in-- the termination of a prefault ore layer.

Sample descriptions:

1.--Brownish-black, fine-grained ore sandstone. Interstitial blebs of authigenic carbonaceous material are common. Disseminated pyrite is abundant. Kaolinite nests are sparse.

2.--Black, medium- to very coarse grained sandstone matrix in a mudstone conglomerate lens. Authigenic carbonaceous material abundantly coats sand grains and fills many interstices. Calcite cement is abundant. Kaolinite aggregates and disseminated pyrite are common to sparse.

3.--Pale-yellowish-brown, fine-grained sandstone. Minute interstitial blebs of authigenic carbonaceous material are very sparse. Kaolinite aggregates and disseminated pyrite are sparse.

Suite No. 87ES59--Continued

| Serial no. | 277, 071 | 072 | 073 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | | | | | | | |
| B | 0 | 0 | 0 | | | | | | | |
| Ba | 0.15 | 0.07 | 0.07 | | | | | | | |
| Be | .00015 | .00015 | .00015 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | <.002 | <.002 | 0 | | | | | | | |
| Cr | .0007 | .0003 | .0007 | | | | | | | |
| Cu | .0007 | .0007 | .0007 | | | | | | | |
| Ga | d | d | d | | | | | | | |
| Ge | 0 | 0 | 0 | | | | | | | |
| La | .003 | .007 | 0 | | | | | | | |
| Mo | .07 | .03 | .003 | | | | | | | |
| Nb | 0 | .0015 | .0015 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .007 | .007 | .0015 | | | | | | | |
| Sc | d | d | d | | | | | | | |
| Sr | .03 | .03 | .03 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .15 | .15 | .07 | | | | | | | |
| Y | .0015 | .0015 | .0015 | | | | | | | |
| Yb | — | — | — | | | | | | | |
| Zr | .015 | .007 | .015 | | | | | | | |

Suite No.-- 1ES60 ( 1 through 14 )

Serial No's.-- 281,381 through 281,394

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,145 N. x 538,310 E.

Mine location-- Rm 36 and 5L

Sample elevation-- 6,395 ft

Premining water table elevation-- ~6,500 ft

Sampled to test element distribution in-- successive layers of prefault uranium ore and molybdenum-rich sandstone.

Sample descriptions:

1.--Brownish-gray, very coarse grained ore sandstone. Authigenic carbonaceous material coats most sand grains and fills some interstices. Disseminated pyrite is sparse. Kaolinite aggregates are abundant.

2.--Same as sample "1."

3.--Pale-yellowish-brown, coarse-grained sandstone. Very sparse, thin authigenic carbonaceous material seems to coat scattered sand grains. Kaolinite aggregates are sparse.

4.--Same as sample "3."

5.--Similar to sample "3" but the grain size is very coarse and calcite is common to abundant.

6.--Pale-yellowish-brown, fine- to medium-grained sandstone. A little black material, probably molybdenum bearing, partly coats a few sand grains. Kaolinite nests and disseminated pyrite are sparse.

Suite No. 1ES60 . Sample descriptions (Continued)

7.--Grayish-black, fine- to medium-grained, molybdenum-bearing sandstone. Sand grains are abundantly coated with black molybdenum-bearing material. Small kaolinite aggregates and disseminated pyrite are sparse.

8.--Dark-gray sandstone similar to sample "7" except that pyrite seems to be missing.

9.--Similar to sample "7."

10.--Light-olive-gray, fine- to medium-grained sandstone. Black molybdenum-bearing material sparsely coats some sand grains. Kaolinite aggregates, calcite cement, and disseminated pyrite are sparse.

11.--Same as sample "10."

12.--Similar to sample "10" but with even less black molybdenum-bearing material.

13.--Olive-gray, fine- to medium-grained molybdenum-bearing sandstone. Sand grains are coated with a brown to black film of molybdenum-rich material. Small kaolinite aggregates and disseminated pyrite are sparse.

14.--Similar to sample "13."

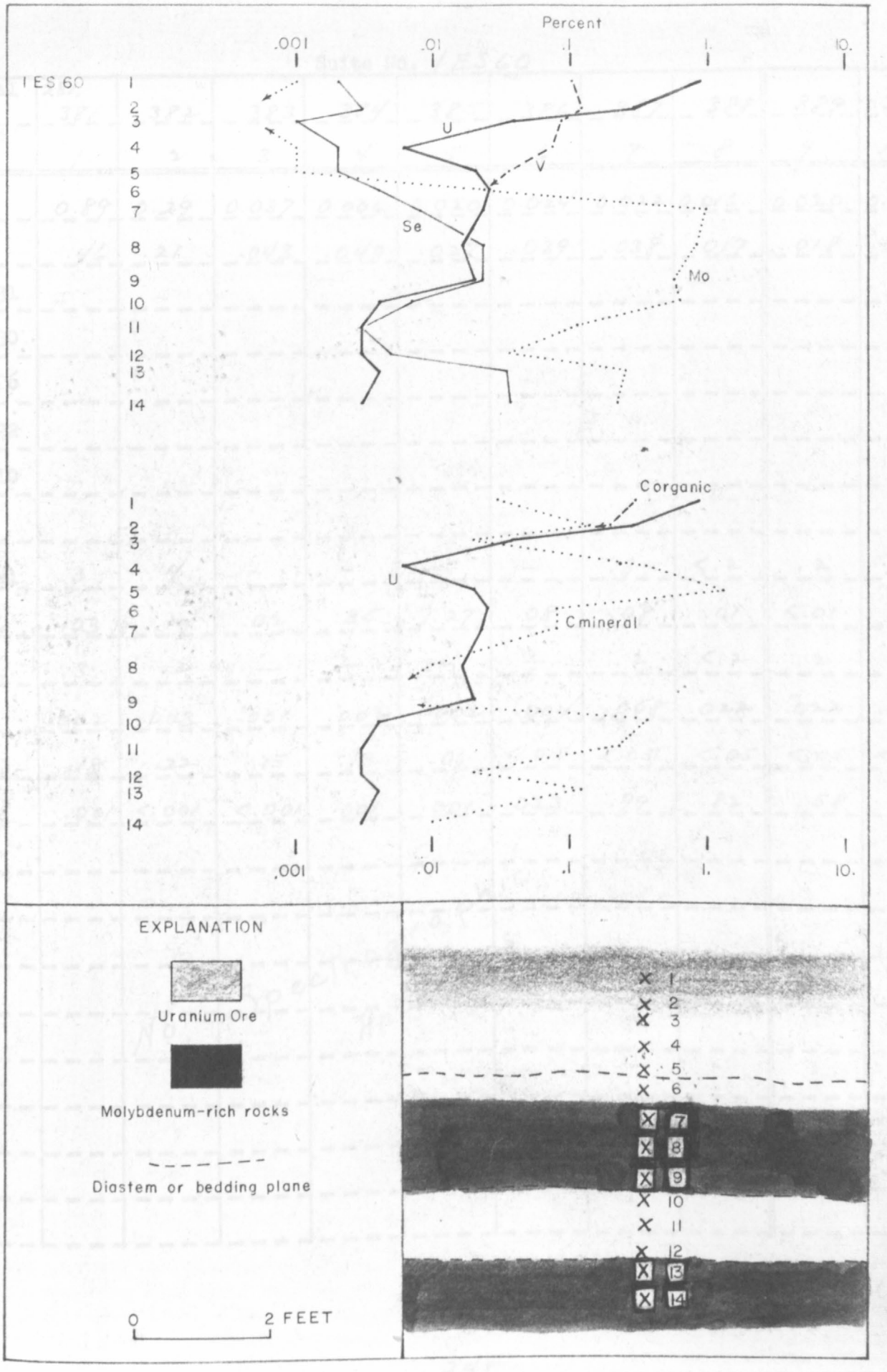



Figure 51.--Sample suite 1ES60, Ann Lee mine.

Suite No. 1E560

| Serial no. / Field no. | 381 / 1 | 382 / 2 | 383 / 3 | 384 / 4 | 385 / 5 | 386 / 6 | 387 / 7 | 388 / 8 | 389 / 9 | 390 / 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.89 | 0.29 | 0.037 | 0.006 | 0.020 | 0.024 | 0.022 | 0.016 | 0.020 | 0.004 |
| eU | .46 | .21 | .043 | .040 | .027 | .039 | .038 | .017 | .018 | .008 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .3 | .4 | — | — | — | — | .3 | <.2 | .2 | — |
| $C_{Min.}$ | .03 | .14 | .02 | .35 | 1.27 | .08 | .08 | .01 | <.01 | .37 |
| $C_{Org.}$ | .3 | .2 | — | — | — | — | .2 | <.2 | .2 | — |
| Se | .002 | .003 | .001 | .002 | .002 | .004 | .008 | .022 | .022 | .007 |
| $V_2O_5$ | .18 | .22 | .15 | .13 | .06 | <.05 | <.05 | <.05 | <.05 | <.05 |
| Mo | .001 | <.001 | <.001 | .001 | .001 | .023 | .92 | .82 | .58 | .61 |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

No Spectrographic Analysis

Suite No. 1ES60 cont'd

| Serial no. | 281, 391 | 392 | 393 | 394 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 11 | 12 | 13 | 14 | | | | | | |
| U | 0.003 | 0.003 | 0.004 | 0.003 | | | | | | |
| eU | .009 | .010 | .009 | .007 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | <.2 | <.2 | | | | | | |
| $C_{Min.}$ | .22 | .02 | .12 | .01 | | | | | | |
| $C_{Org.}$ | — | — | <.2 | <.2 | | | | | | |
| Se | .003 | .005 | .033 | .035 | | | | | | |
| $V_2O_5$ | <.05 | <.05 | <.05 | <.05 | | | | | | |
| Mo | .11 | .036 | .24 | .21 | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

No Spectrographic Analyses

Suite No.-- 2ES60 ( 1 through 10 )

Serial No's.-- 281,395 through 281,403

Mine-- Ann Lee

Level--

Sec. 28 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 319,300 N. x 538,460 E.

Mine location-- 9 + 70 and Rm 33

Sample elevation-- 6,395 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in--a prefault ore layer

Sample descriptions:

1.--Light-olive-gray, poorly sorted, fine to very coarse grained sandstone. Disseminated pyrite and calcite cement are common. Kaolinite nests are sparse.

2.--Light-olive-gray, poorly sorted, fine to very coarse grained sandstone. Similar to sample "1" except that calcite cement is more abundant.

3.--Missing

4.--Light-olive-gray, poorly sorted, medium to very coarse grained sandstone. Authigenic carbonaceous material forms a thin coating on most sand grains. Disseminated pyrite and calcite cement are common. Kaolinite nests are sparse.

5.--Similar to sample "4."

6.--Light-brownish-gray, fine-grained sandstone. Brown authigenic carbonaceous material forms a stain on most sand grains and a few interstices are filled with blebs of black authigenic carbonaceous material. Disseminated pyrite is sparse. Kaolinite nests and calcite cement are common.

Suite No. 2ES60 . Sample descriptions (Continued)

7.--Light-olive-gray, fine-grained sandstone. Similar to sample "6," but less calcite and kaolinite.

8.--Similar to sample "7," but with few blebs of and no stain from authigenic carbonaceous material.

9.--Similar to sample "8."

10.--Similar to sample "8."

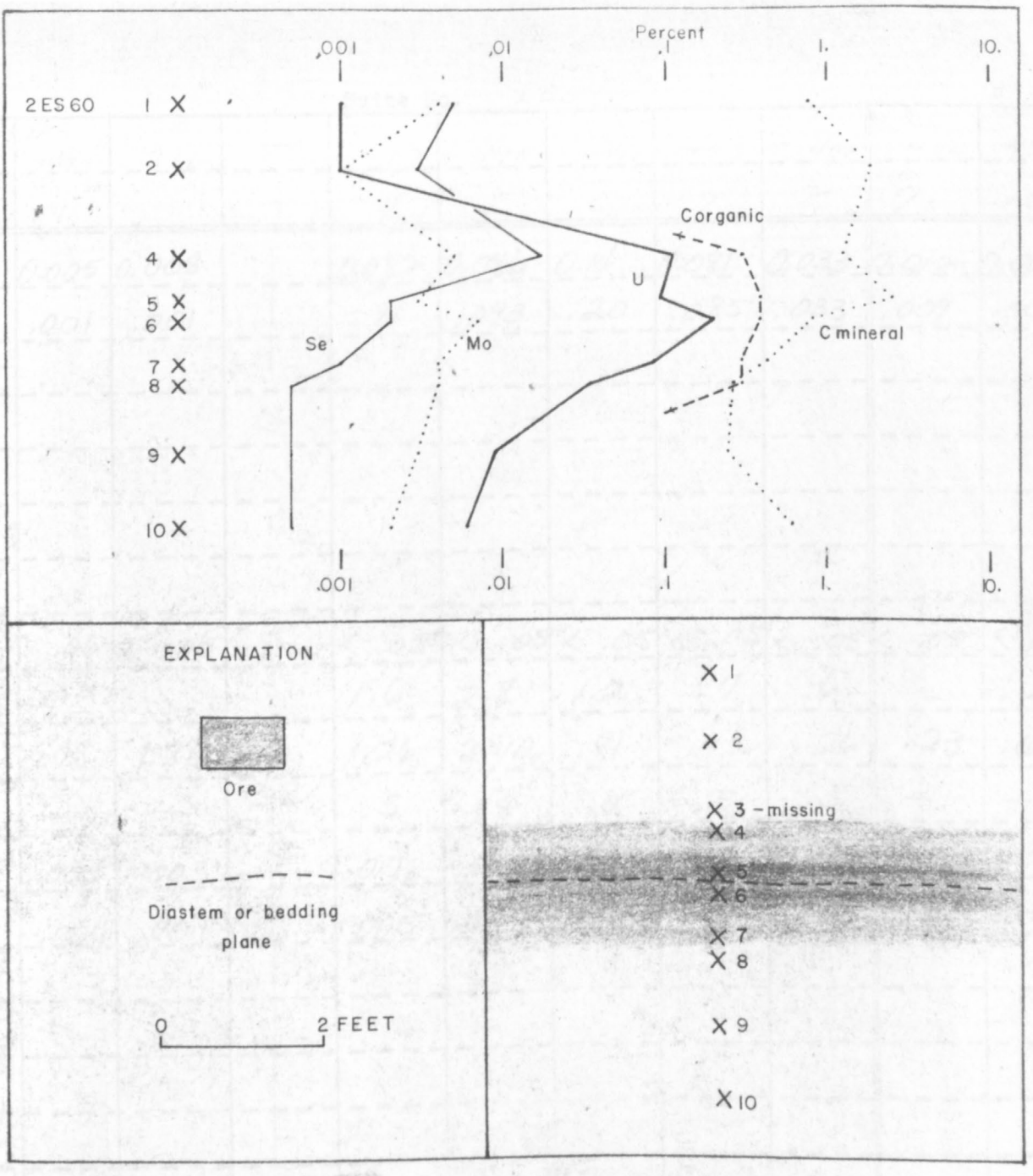



Figure 52.--Sample suite 2ES60, Ann Lee mine.

Suite No. 2ES 60

| Serial no. / Field no. | 2811 395 1 | 396 2 | — 3 | 397 4 | 398 5 | 399 6 | 400 7 | 401 8 | 402 9 | 403 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.005 | 0.008 | | 0.087 | 0.086 | 0.14 | 0.081 | 0.033 | 0.012 | 0.009 |
| eU | .001 | .001 | | .11 | .093 | .20 | .085 | .033 | .009 | .006 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | .06 | < .05 | | < .05 | < .05 | < .05 | < .05 | < .05 | < .05 | < .05 |
| $C_{Total}$ | — | — | | 1.6 | 2.8 | 1.2 | .7 | .6 | — | — |
| $C_{Min.}$ | .78 | 1.88 | | 1.26 | 2.40 | .81 | .42 | .26 | .23 | .60 |
| $C_{Org.}$ | — | — | | .3 | .4 | .4 | .3 | .3 | — | — |
| Se | .005 | .003 | | .017 | .002 | .002 | .001 | .0005 | .0005 | .0005 |
| Mo | .004 | .001 | | .005 | .003 | .007 | .004 | .004 | .003 | .007 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | No Spectrographic Analyses. | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 87G61 ( a through i )

Serial No's.-- 294,162 through 294,170

Mine-- Blue Peak mine

Level-- only one level

Sec. 24 , Twp. 13 , Rge. 10 --

U.S. AEC Coordinates-- _____ N. x _____ E.

Mine location-- N-trending adit in central part of mine

Sample elevation-- ~ 7,320 ft

Premining water table elevation--Morrison Formation is dry.

Sampled to test element distribution in--an oxidized, leached prefault "ore" layer that still contains considerable authigenic carbonaceous material.

Sample descriptions:

a.--Pale-yellowish-orange to very pale orange, fine-grained, oxidized sandstone. Kaolinite nests are sparse and about the same size as the sand grains. Interstitial clay is weakly limonite stained.

b.--Very pale orange and grayish-orange fine-grained sandstone. Interstitial clay is locally limonite stained. Kaolinite nests are very sparse to missing.

c.--Banded and mottled very pale orange to dark-yellowish-orange fine-grained sandstone. Limonite stains affect altered feldspars, in particular. Interstitial gypsum is common.

d.--Mottled yellowish-brown and dark-yellowish-brown oxidized "ore" sandstone flecked with grayish-black spots. Black authigenic carbonaceous material fills interstices in the grayish-black spots. Most other sand grains are stained by a limonite film.

e.--Mottled and banded moderate yellowish-brown and dark-yellowish brown, fine-grained

oxidized ore sandstone. Dark-gray authigenic carbonaceous material fills some of the interstices and coats some sand grains locally in the darker areas. A dark yellowish-brown film in the darker areas and a moderate yellowish-brown film in the lighter areas coats many sand grains. Interstitial gypsum is sparse to common.

f.--Dark-yellowish-brown, moderate-yellowish-brown, and dusky yellowish-brown fine-grained, oxidized ore sandstone with a few ½ to 4-mm-wide streaks that seem to be unoxidized. Authigenic carbonaceous material persists as small scattered blebs in the oxidized areas but forms interstitial cement in the unoxidized streaks. Rock is feldspar rich and most feldspar grains seem to be highly altered and limonite stained.

g.--Yellowish-gray, fine-grained oxidized sandstone. Kaolinite nests are very sparse and less than 1 mm across. Interstices are partly filled with a very pale limonite-stained clay.

h.--Mottled and banded very pale orange, dark-yellowish-orange, and grayish-orange fine-grained oxidized sandstone. This is a relatively clean-looking sandstone but much of the clay cement and the altered feldspars are limonite stained.

i.--Very pale orange, fine-grained, oxidized sandstone flecked with grayish-orange spots. Kaolinite nests are common and range up to about 2 mm across, but most are about sand-grain size. Much interstitial clay is limonite stained and altered feldspars are limonite stained in the grayish-orange areas.

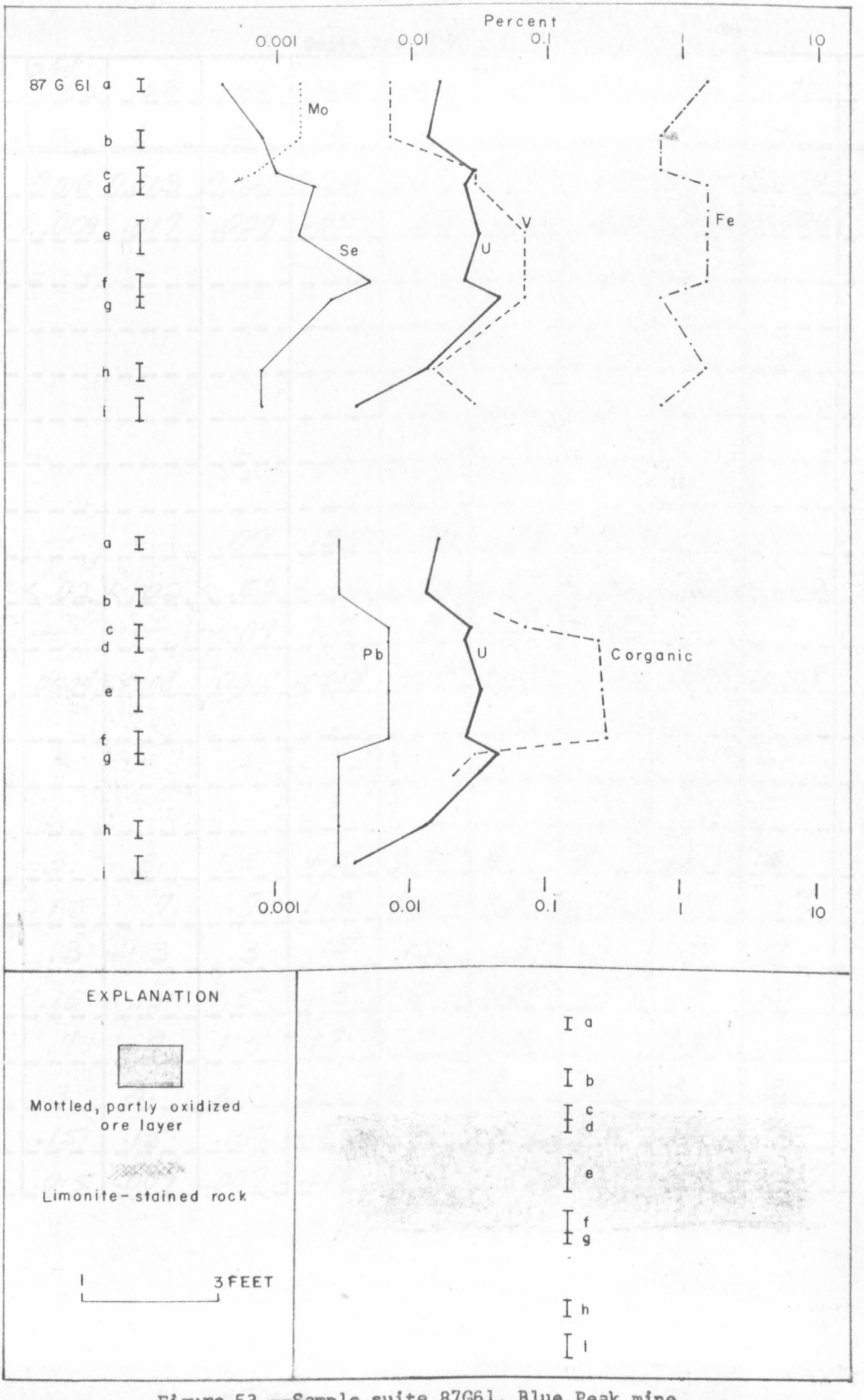



Figure 53.--Sample suite 87G61, Blue Peak mine.

Suite No. 87G61

| Serial no. 294 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| U | 0.016 | 0.013 | 0.029 | 0.024 | 0.031 | 0.024 | 0.043 | 0.013 | 0.004 | |
| eU | .009 | .017 | .027 | .027 | .030 | .026 | .030 | .016 | .004 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePo^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | .09 | .25 | .26 | .29 | .05 | — | — | |
| $C_{Min.}$ | < .02 | < .02 | < .02 | < .02 | < .02 | < .02 | < .02 | < .02 | < .02 | |
| $C_{Org.}$ | — | — | ~.07 | .2 | .3 | .3 | ~.03 | — | — | |
| Se | .0004 | .0008 | .0010 | .0018 | .0015 | .0050 | .0025 | .0008 | .0008 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 1.5 | 1.5 | 1.5 | 2. | 2. | 3. | 3. | |
| Fe | 1.5 | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | .7 | |
| Mg | .3 | .3 | .3 | .15 | .15 | .3 | .3 | .3 | .3 | |
| Ca | .15 | .15 | 1.5 | 1.5 | 1.5 | 1.5 | .7 | .7 | .3 | |
| Na | .7 | .7 | 1.5 | .7 | .7 | 1.5 | .7 | 1.5 | 1.5 | |
| K | 3. | 2. | 3. | 3. | 2. | 3. | 3. | 2. | 2. | |
| Ti | .15 | .15 | .15 | .15 | .15 | .07 | .15 | .15 | .15 | |
| Mn | .015 | .007 | .007 | .015 | .007 | .015 | .003 | .007 | .007 | |

Suite No. 87661 --Continued

| Serial no. | 294, 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | 170 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .03 | .03 | .03 | .03 | .03 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cr | .0007 | .0015 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Cu | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0003 | .0007 | .0015 | |
| Ga | .0015 | .0015 | .0015 | .0007 | .0007 | .0015 | .0007 | .0015 | .0015 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | .0015 | .0015 | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .003 | .003 | .007 | .007 | .007 | .007 | .003 | .003 | .003 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .015 | .015 | .03 | .03 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .007 | .007 | .03 | .03 | .07 | .07 | .07 | .015 | .03 | |
| Y | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | 0 | 0 | 0 | |
| Yb | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | 0 | .00015 | |
| Zr | .03 | .03 | .015 | .015 | .007 | .007 | .007 | .007 | .03 | |

Suite No.-- 18G58 ( a through c )

Serial No's.-- 268,920 through 268,922

Mine-- Bucky No. 1

Level-- shaft station level

Sec. 14 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 328,085 N. x 520,510 E.

Mine location--

Sample elevation-- 6,685 ft

Premining water table elevation-- ~6,550 ft

Sampled to test element distribution in-- a leached(?) prefault ore layer.

Sample descriptions:

a.--Medium-light gray, fine-grained sandstone. Distinct authigenic carbonaceous material was not recognized but it may lightly stain the medium-gray clay which seems to coat each sand grain. Finely disseminated pyrite is common.

b.--Grayish-black, fine-grained ore sandstone. Dull-black authigenic carbonaceous material fills many interstices, coats most sand grains, and stains clays. Disseminated pyrite and calcite cement are common.

c.--Very light-gray, fine-grained sandstone. Interstitial clay cement is common. A little disseminated pyrite is present. Calcite cement is common to sparse.

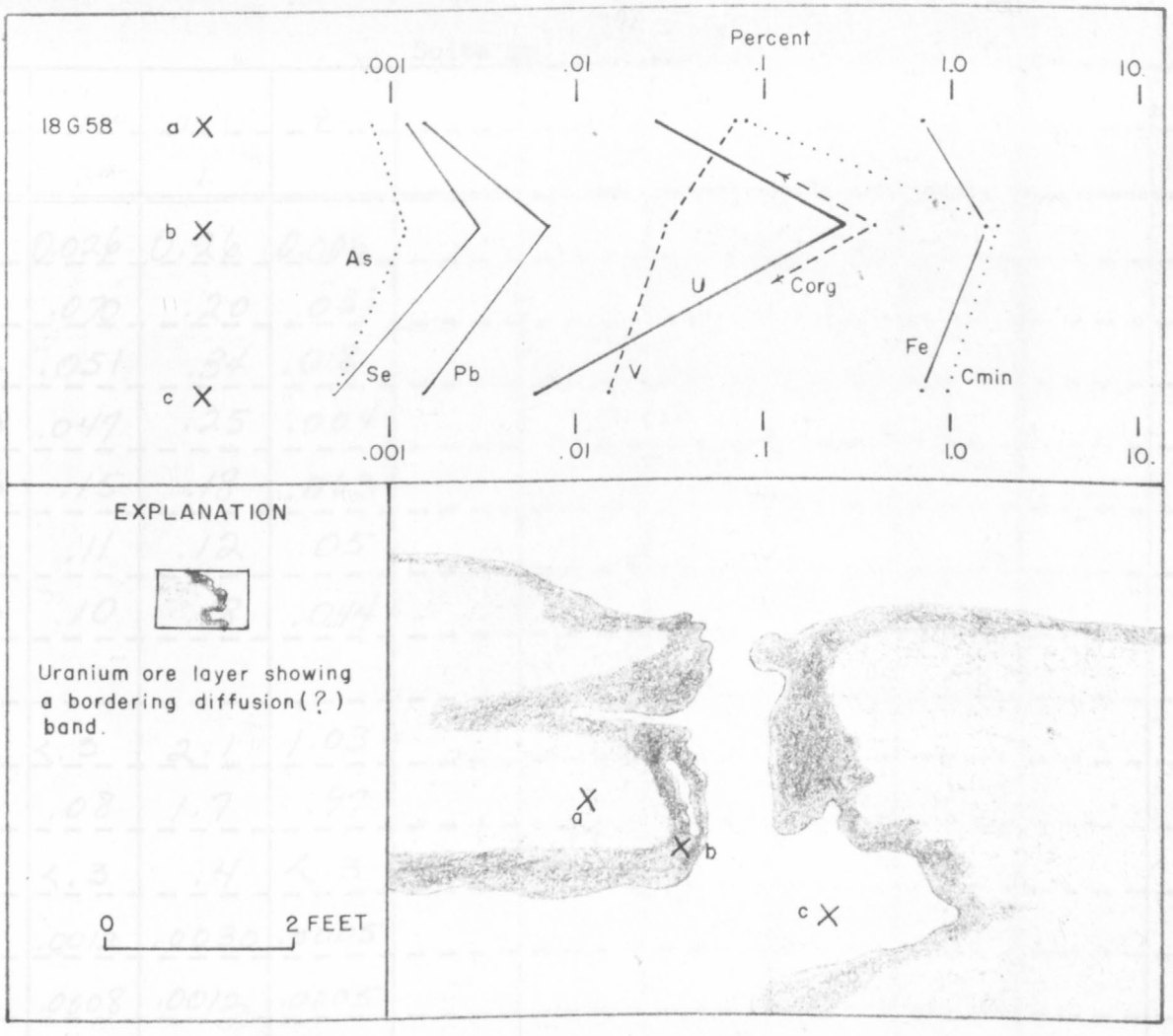



Figure 54.--Sample suite 18G58, Bucky No. 1 mine.

Suite No. 18658

| Serial no. / Field no. | 246, 920 a | 921 b | 922 c | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.026 | 0.26 | 0.006 | | | | | | | |
| eU | .070 | .20 | .031 | | | | | | | |
| $ePa^{231}$ | .051 | .34 | .018 | | | | | | | |
| $eTh^{230}$ | .047 | .25 | .004 | | | | | | | |
| $eRa^{226}$ | .15 | .18 | .063 | | | | | | | |
| $eRn^{222}$ | .11 | .12 | .05 | | | | | | | |
| $ePb^{210}$ | .10 | .18 | .044 | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | <.3 | 2.1 | 1.03 | | | | | | | |
| $C_{Min.}$ | .08 | 1.7 | .97 | | | | | | | |
| $C_{Org.}$ | <.3 | .4 | <.3 | | | | | | | |
| Se | .0012 | .0030 | .0005 | | | | | | | |
| As | .0008 | .0012 | .0005 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 7.0 | | | | | | | |
| Fe | .7 | 1.5 | .7 | | | | | | | |
| Mg | .3 | .7 | .3 | | | | | | | |
| Ca | .3 | 3. | 3. | | | | | | | |
| Na | .7 | .7 | .7 | | | | | | | |
| K | 1.5 | 1.5 | 3. | | | | | | | |
| Ti | .07 | .07 | .07 | | | | | | | |
| Mn | .007 | .07 | .07 | | | | | | | |

Suite No. 18458 --Continued

| Serial no. | 268 920 | 921 | 922 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | | | | | | | |
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .07 | .03 | .07 | | | | | | | |
| Be | 0 | 0 | 0 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | 0 | <.005 | 0 | | | | | | | |
| Cr | .015 | .0007 | .0003 | | | | | | | |
| Cu | .0007 | .0003 | .0003 | | | | | | | |
| Ga | .0003 | .0003 | .0003 | | | | | | | |
| Ge | 0 | <.005 | 0 | | | | | | | |
| La | 0 | 0 | 0 | | | | | | | |
| Mo | 0 | 0 | 0 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .0015 | .007 | .0015 | | | | | | | |
| Sc | 0 | 0 | 0 | | | | | | | |
| Sr | .007 | .015 | .015 | | | | | | | |
| Tl | 0 | 0 | 0 | | | | | | | |
| V | .07 | .03 | .015 | | | | | | | |
| Y | 0 | .0015 | 0 | | | | | | | |
| Yb | — | .00015 | .00015 | | | | | | | |
| Zr | .007 | .007 | .007 | | | | | | | |

Suite No.-- 19058 ( a through j )

Serial No's.-- 268,923 through 268,932

Mine-- Bucky No. 1

Level--Shaft station level

Sec. 14 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 328,100 N. x 520,540 E.

Mine location--

Sample elevation--6,685 ft.

Premining water table elevation--~6,550 ft

Sampled to test element distribution in--a roll-like septum between prefault ore layers.

Sample descriptions:

a.--Very light-gray, fine- to medium-grained sandstone. Disseminated pyrite is sparse to common. Kaolinite nests, 1-2 mm across are common. Relatively "clean" appearing sandstone.

b.--Medium-light gray, fine- to medium-grained sandstone. Similar to sample "a" except that it is thoroughly cemented by poikiloblastic calcite.

c.--Very light-gray to white, fine-grained, bleached-appearing sandstone. Fine-grained calcite cement is common.

d.--Similar to sample "c" but contains rounded black spots that seem to be impregnated by authigenic carbonaceous material. Mudstone fragments are increasingly common toward the lower part of the sample.

e.--Similar to sample "c" but with irregular areas that are stained grayish red by hematite(?). Mudstone fragments are common.

Suite No. 19G58 . Sample descriptions (Continued)

f.--Yellowish-gray to very light-gray, fine-grained sandstone. Well cemented by fine-grained calcite.

g.--Grayish-black, fine-grained sandstone. Each sand grain is coated with authigenic carbonaceous material. Disseminated pyrite is sparse.

h.--Very light-gray to pale-olive gray, fine- to medium-grained sandstone. Quartz overgrowths are common. Kaolinite nests are very small. Calcite cement ranges from poikiloblastic to fine-grained (poikiloblastic calcite seems to increase in abundance toward sample "i"). Disseminated pyrite is sparse.

i.--Grayish-black, medium-grained ore sandstone. Authigenic carbonaceous material coats all sand grains and fills most interstices. Kaolinite nests are small and widespread. Disseminated pyrite is common.

j.--Similar to sample "h" but medium grained.

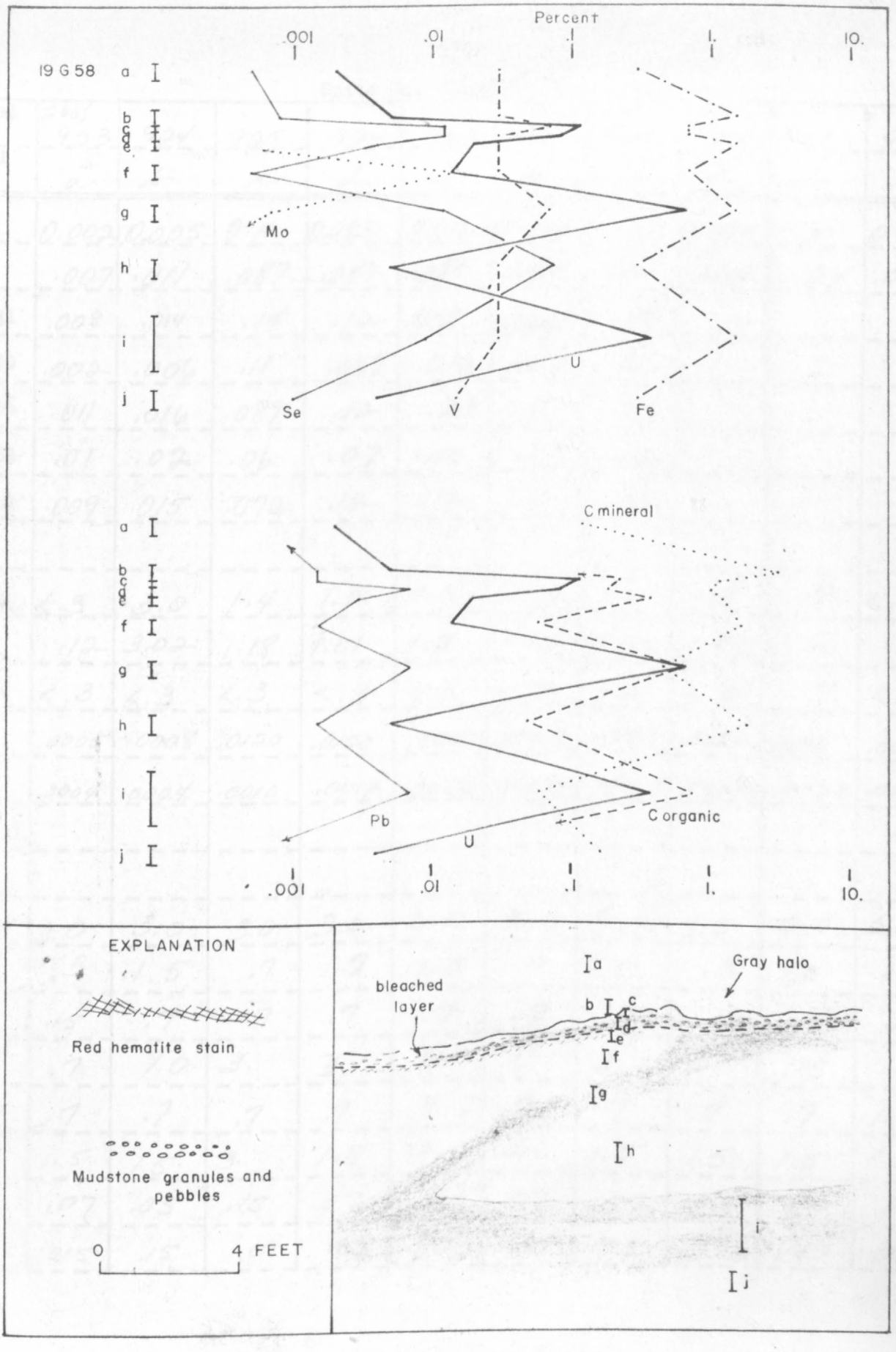



Figure 55.--Sample suite 19G58, Bucky No. 1 mine.

Suite No. 19658

| Serial no. / Field no. | 268, 923 a | 924 b | 925 c | 926 d | 927 e | 928 f | 929 g | 930 h | 931 i | 932 j |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.002 | 0.005 | 0.11 | 0.083 | 0.020 | 0.014 | 0.67 | 0.005 | 0.37 | 0.004 |
| eU | .007 | .011 | .087 | .087 | .086 | .054 | .36 | .029 | .24 | .021 |
| $ePa^{231}$ | .008 | .014 | .14 | .12 | .038 | .023 | .78 | | | |
| $eTh^{230}$ | .002 | .006 | .11 | .068 | .016 | .013 | .67 | | | |
| $eRa^{226}$ | .011 | .016 | .089 | .12 | .23 | .11 | .34 | | | |
| $eRn^{222}$ | .01 | .02 | .06 | .07 | .10 | .07 | .12 | | | |
| $ePb^{210}$ | .009 | .015 | .072 | .12 | .19 | .11 | .30 | | | |
| | | | | | | | | | | |
| $C_{Total}$ | <.3 | 3.0 | 1.4 | 1.2 | 1.5 | 1.7 | 1.1 | 1.8 | .8 | <.3 |
| $C_{Min.}$ | .12 | 3.02 | 1.18 | 1.01 | 1.21 | 1.64 | 0.46 | 1.85 | .06 | .16 |
| $C_{Org.}$ | <.3 | <.3 | <.3 | <.3 | <.3 | <.3 | .6 | <.3 | .7 | <.3 |
| Se | .0005 | .0008 | .0120 | .0120 | .0040 | .0050 | .0120 | .0730 | .0090 | .0010 |
| As | .0004 | .0004 | .0010 | .0012 | .0062 | .0049 | .0017 | .0002 | .0033 | .0006 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 1.5 | 3.0 | 3.0 |
| Fe | .3 | 1.5 | .7 | .7 | 1.5 | .7 | 1.5 | .3 | 1.5 | .3 |
| Mg | .15 | .7 | .7 | .7 | .7 | .7 | .7 | .15 | .7 | .15 |
| Ca | .7 | 7.0 | 3. | 3. | 3. | 7. | 3. | 3. | .15 | .3 |
| Na | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | .7 | 1.5 |
| K | 1.5 | 1.5 | 3. | 1.5 | 3. | 3. | 1.5 | 1.5 | 1.5 | 1.5 |
| Ti | .07 | .03 | .15 | .07 | .07 | .07 | .07 | .03 | .07 | .07 |
| Mn | .015 | .15 | .07 | .07 | .07 | .07 | .03 | .07 | .015 | .007 |

Suite No. 19658 --Continued

| Serial no. / Field no. | 268, 923 a | 924 b | 925 c | 926 d | 927 e | 928 f | 929 g | 930 h | 931 i | 932 j |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | d | d | d | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .03 | .03 | .03 | .07 | .03 | .03 | .03 | .03 | .07 |
| Be | 0 | 0 | 0 | .0003 | .00015 | .0003 | .00015 | 0 | .00015 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | 0 | <.005 | 0 | .0007 | <.005 | 0 | <.005 | 0 |
| Cr | .0003 | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0003 | .0003 | .0003 |
| Cu | .0003 | .0003 | .0007 | .0007 | .0003 | .0003 | .0003 | .0003 | .0007 | .0003 |
| Ga | d | .0003 | .0007 | .0007 | .0003 | .0007 | .0003 | .00015 | .0003 | .0003 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | .015 | .0007 | 0 | 0 | 0 |
| Nb | 0 | 0 | .0015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | 0 | .0015 | .0015 | .007 | .003 | .0015 | .007 | .0015 | .007 | 0 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .007 | .015 | .015 | .015 | .015 | .03 | .007 | .015 | .007 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .03 | .07 | .03 | .03 | .03 | .07 | .03 | .03 | .015 |
| Y | 0 | 0 | .007 | .007 | .0015 | 0 | .0015 | 0 | .003 | 0 |
| Yb | .00015 | .00015 | — | .0007 | .0003 | .00015 | — | 0 | .0003 | 0 |
| Zr | .015 | .007 | .015 | .015 | .007 | .007 | .015 | .0015 | .007 | .007 |

Suite No.-- 20G58 ( a through f )

Serial No's.-- 268,933 through 268,938

Mine--Bucky No. 1

Level-- Sublevel above main haulage

Sec. 14 , Twp. 14 , Rge. 9 --

U.S.A.E.C. Coordinates-- 328,116 N. x 520,760 E.

Mine location-- 70 ft, S. 15° W. from shaft

Sample elevation-- 6,690 ft.

Premining water table elevation--Well below sample locality; probably~6,550 ft.

Sampled to test element distribution in-- Thin, erratic, prefault ore layer containing both authigenic carbonaceous material and coalified plant fragments.

Sample descriptions: Locality characterized by abundant ilsemannite on mine walls above the ore layer.

a.--Dark-yellowish brown, medium- to very coarse-grained sandstone with scattered granules of quartz, feldspar, and mudstone. Rock appears to be weakly oxidized. Kaolinite nests 2-4 mm.across are common. Quartz overgrowths, faceted by minute triangular faces are common. Sparse clusters of minute anatase crystals are perched on sand grains.

b.--Nearly black medium- to coarse-grained sandstone with scattered, very small kaolinite nests. Sparse calcite.

c.--Light-olive gray, well-sorted, very fine-grained and lighter colored, poorly sorted, coarse- to very coarse-grained sandstone. Comminuted coaly plant material is present. Disseminated pyrite is common but locally seems to be partly oxidized in accumulations of coaly material.

Suite No. 20G58 . Sample descriptions (Continued)

d.--Same as "c" but more strongly cemented and much darker gray owing to introduced carbonaceous material which fills many of the pore spaces.

e.--Grayish-black, very fine- to medium-grained sandstone below a diastem at the base of "d." Nearly all interstices filled with authigenic carbonaceous material but coaly debris is missing.

f.--Light-gray, fine- to medium-grained sandstone with scattered coarse- to very coarse grains. Speckled with kaolinite nests. Some calcite cement.

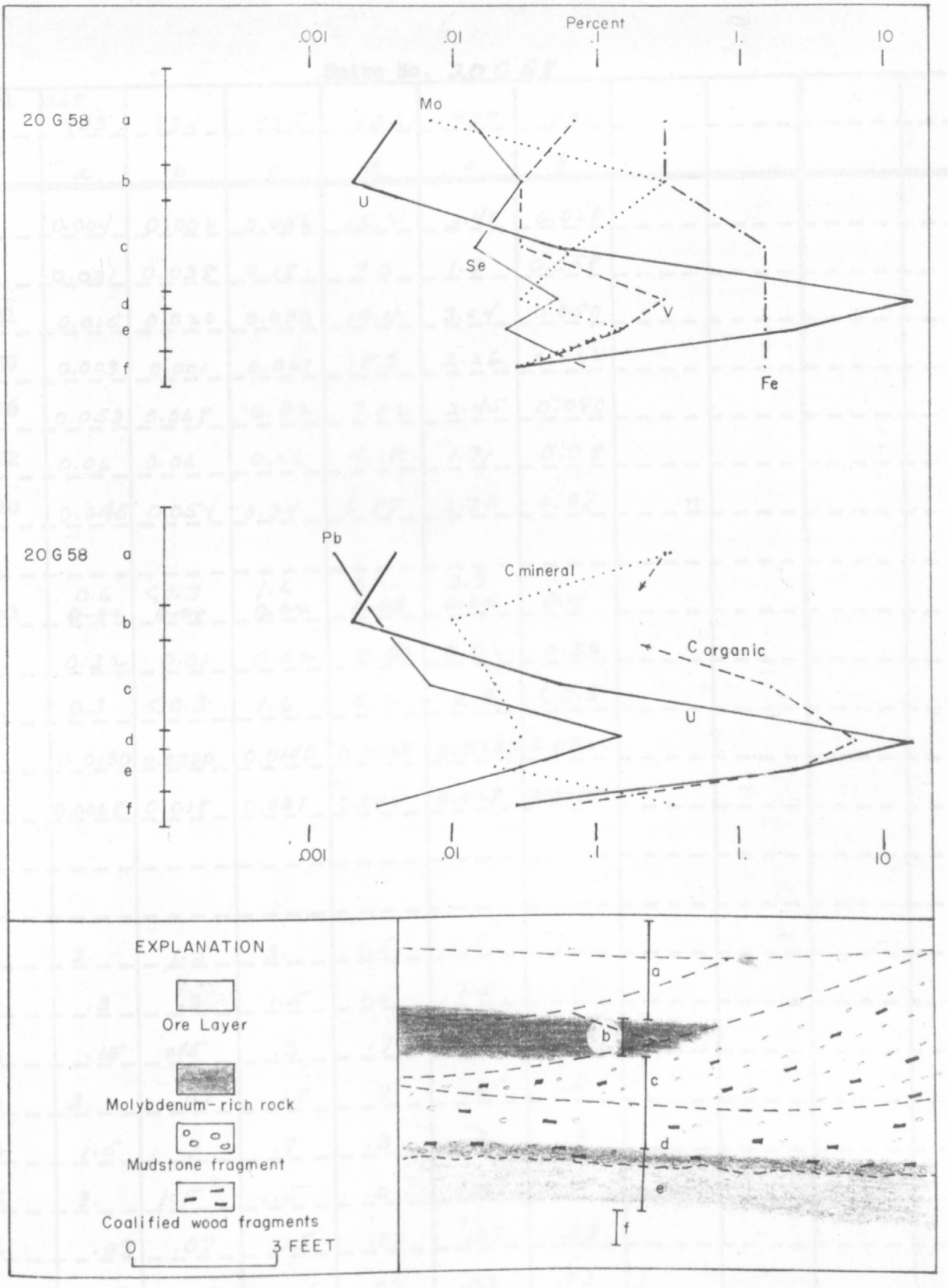



Figure 56.--Sample suite 20G58, Bucky No. 1 mine.

Suite No. 20658

| Serial no. / Field no. | 248, 933 a | 934 b | 935 c | 936 d | 937 e | 938 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.004 | 0.002 | 0.056 | 15.2 | 2.40 | 0.028 | | | | |
| eU | 0.031 | 0.038 | 0.18 | 7.0 | 1.8 | 0.058 | | | | |
| $eRa^{231}$ | 0.015 | 0.020 | 0.070 | 19.4 | 3.04 | 0.050 | | | | |
| $eTh^{230}$ | 0.003 | 0.001 | 0.041 | 18.3 | 2.26 | 0.022 | | | | |
| $eRa^{226}$ | 0.053 | 0.068 | 0.32 | 7.02 | 2.45 | 0.090 | | | | |
| $eRn^{222}$ | 0.06 | 0.06 | 0.26 | 4.18 | 1.71 | 0.08 | | | | |
| $ePb^{210}$ | 0.045 | 0.054 | 0.34 | 6.87 | 2.30 | 0.07 | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 0.6 ~~0.32~~ | <0.3 ~~0.01~~ | 1.6 ~~0.02~~ | 6.2 ~~0.03~~ | 2.3 ~~0.02~~ | 0.4 | | | | |
| $C_{Min.}$ | 0.32 | 0.01 | 0.02 | 0.03 | 0.02 | 0.38 | | | | |
| $C_{Org.}$ | 0.3 | <0.3 | 1.6 | 6.2 | 2.3 | <0.3 | | | | |
| Se | 0.0130 | 0.0300 | 0.0140 | 0.0520 | 0.0230 | 0.0820 | | | | |
| As | 0.0008 | 0.018 | 0.031 | 0.042 | 0.028 | 0.0038 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 1.5 | 3. | 1.5 | 1.5 | 3. | | | | |
| Fe | .3 | .3 | 1.5 | 1.5 | 1.5 | 1.5 | | | | |
| Mg | .15 | .15 | .3 | .7 | .7 | .3 | | | | |
| Ca | 3. | .07 | .15 | .7 | .15 | 1.5 | | | | |
| Na | 1.5 | .7 | .7 | .3 | .7 | .7 | | | | |
| K | 3. | 1.5 | 1.5 | 0 | 1.5 | 1.5 | | | | |
| Ti | .07 | .07 | .15 | .07 | .07 | .07 | | | | |
| Mn | .03 | .007 | .015 | .07 | .03 | .03 | | | | |

Suite No. 20458--Continued

| Serial no. / Field no. | 248, 933 a | 934 b | 935 c | 936 d | 937 e | 938 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | .003 | .003 | 0 | | | | |
| Ba | .07 | .03 | .03 | .03 | .03 | .03 | | | | |
| Be | .00015 | 0 | .0003 | .0007 | .0003 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | 0 | 0 | 0 | <.005 | <.005 | 0 | | | | |
| Cr | .0003 | .0003 | .0007 | .0015 | .0007 | .0003 | | | | |
| Cu | .0003 | .0007 | .0007 | .0015 | .0007 | .0003 | | | | |
| Ga | .0003 | .00015 | .0007 | .0003 | .0003 | .00015 | | | | |
| Ge | 0 | 0 | 0 | <.005 | <.005 | 0 | | | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Mo | .007 | .3 | .07 | .03 | .15 | .03 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | .0015 | .003 | .007 | .15 | .03 | .003 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .007 | .015 | .015 | .007 | .007 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .07 | .03 | .03 | .3 | .15 | .03 | | | | |
| Y | 0 | 0 | .0015 | 0 | .0015 | 0 | | | | |
| Yb | 0 | 0 | 0 | 0 | — | .00015 | | | | |
| Zr | .007 | .003 | .015 | .015 | .007 | .03 | | | | |

Suite No.-- 26G61 ( a through t )

Serial No's.-- 294,142 through 294,161

Mine-- Cliffside

Level--

Sec. 36 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 311,490 N. x 553,760 E.

Mine location-- 40-60 ft N of 4-433 raise (level above track haulage #4).

Sample elevation-- 5,680 ft

Premining water table elevation--~6,475 ft

Sampled to test element distribution in-- a prefault ore layer that is partly destroy by oxidation.

Sample descriptions:

Completely oxidized suite (a-c):

a.--Moderate-red, fine-grained, oxidized sandstone. Quartz overgrowths common. Most sand grains coated with hematite and hematite-stained clay. Kaolinite nests, 1-2 mm across, are sparse and are generally unstained by hematite.

b.--Pale-grayish-red, fine-grained sandstone. Quartz overgrowths are common. Kaolinite aggregates are sparsely scattered and 1-2 mm across. Sand grains largely coated with specks of hematite and hematite-stained clay.

c.--Pale-red to light-olive-gray, medium-grained sandstone. Quartz overgrowths are sparse. Kaolinite aggregates, 1-3 mm across, are common and generally unstained. Hematite specks sparsely scattered throughout.

Largely oxidized suite:

--Pale-red, fine-grained sandstone. Quartz overgrowths are sparse to missing.

Suite No. 26G61 . Sample descriptions (Continued)

Kaolinite nests, 1-2 mm across, are sparse and not stained by hematite although the sand grains enclosed by kaolinite are locally stained. Hematite is more evenly distributed than in "c."

e.--Pale-red, light-brownish-gray, and dark-reddish-brown, fine-grained sandstone. Kaolinite aggregates, 1-3 mm across, are common and hematite stain coats many sand grains under the clay. Sand grains are abundantly coated with hematite and hematite-stained clay.

f.--Mottled medium-light-gray, medium-gray, and moderate-red, fine-grained sandstone. Kaolinite nests are very sparse. Calcite cement is abundant as small poikiloblastic crystals. Specks of limonite (after pyrite) are sparse. A greenish-gray clay-like mineral coats most sand grains and seems to have been converted to red in the reddish areas. Anatase was noted but is sparse.

g.--Mottled and somewhat layered medium-gray and moderate-red, fine-grained sandstone. Authigenic carbonaceous material forms widely scattered blebs, <5 mm across, in which most of the interstices are filled and sand grains are coated. These are commonly surrounded by a border of gray sandstone where they occur within the reddish zones. Calcite poikiloblasts are abundant. All sand grains are coated with a clay-like mineral that is greenish in the gray areas and hematite-stained in the red areas.

h.--Medium-dark-gray, fine-grained sandstone. Small sooty-appearing specks of authigenic carbonaceous material, less than 2 mm across, are scattered throughout. Sand grains between these specks are almost all coated with a grayish clay-like mineral. Kaolinite nests, 1-5 mm across, are common. Very sparse, extremely fine-grained pyrite is present in some of the carbonaceous specks.

i.--Dark-gray, fine-grained ore sandstone. Dull authigenic carbonaceous material fills most interstices. Sparse kaolinite nests are generally less than 2 mm across.

Suite No. 26G61 . Sample descriptions (Continued)

Small limonite specks, probably representing oxidized pyrite are sparsely disseminated.

j.--Variegated moderate-red and grayish-orange oxidized areas and mottled light-gray and medium-dark-gray areas, in fine-grained sandstone. Authigenic carbonaceous material is largely restricted to blebs that fill the interstices in the darker mottled areas. Kaolinite nests are sparse but some other white clay-like mineral is present. The oxidized zones locally contain a black mineral cement that is probably cryptomelane or psilomelane.

k.--Pale-red to grayish-red, fine-grained oxidized sandstone. Kaolinite nests are common but generally less than 1 mm across. Hematite is common as a clay stain but much of the clay coating sand grains is light gray and unstained.

l.--Pale-red to moderate-reddish-brown, medium-grained oxidized sandstone. Quartz overgrowths are common. Kaolinite nests, 1-7 mm across, are also common. Hematite is abundant as films on many of the sand grains.

Partly oxidized suite:

m.--Moderate-red, fine-grained sandstone. Kaolinite aggregates are sparse and less than 2mm across. Calcite cement is sparse to common. Nearly all sand grains have a thick coating of hematite. This coat is generally much thinner under kaolinite.

n.--Grayish-orange-pink, fine-grained sandstone. Quartz overgrowths are common. Kaolinite aggregates are sparse and rarely exceed 1 mm across. Hematite or limonite specks and stained clay locally coat sand grains.

o.--Yellowish-gray, medium-grained sandstone. Kaolinite nests, 1-3 mm across, are abundant. A little sulfide mineral, probably marcasite, is present. The sandstone is locally thoroughly cemented by clear pale-amber barite.

p.--Dark-gray, medium-grained sandstone with scattered coarse sand grains and mudstone

granules. Authigenic carbonaceous material fills most interstices. Extremely fine-grained pyrite is common in the carbonaceous material and abundant in the mudstone. Kaolinite nests are sparse and very small. A few hematite-stained sand grains are scattered throughout.

q.--Grayish-brown, fine-grained sandstone with a few mudstone granules. Authigenic carbonaceous material coats sand grains and fills the interstices in patches throughout the samples. The intervening areas contain sand grains coated with an extremely thin film of a brownish material that may be carbon-stained clay. Sparse, extremely fine-grained pyrite occurs largely in mudstone granules. Kaolinite nests are common and range from 1 to 3 mm across.

r.--Largely medium-gray, fine-grained sandstone. Authigenic carbonaceous material fills interstices in widely spaced blebs less than 2 mm in diameter and commonly bordered by a moderate-red halo. The red halo seems to be caused by a red-stained clay that coats most sand grains. In the gray areas this clay is medium gray. Kaolinite nests are less than 1 mm in diameter and sparse. A few anatase aggregates were noted.

s.--Mottled moderate-red and medium-gray, fine-grained sandstone. In the medium-gray areas many sand grains are coated with a greenish-gray clay-like mineral which is hematite stained in the red areas. Calcite cement is common in the gray areas and sparse in the red areas. Kaolinite aggregates are sparse.

t.--Pale-orange, medium- to coarse-grained sandstone. Quartz overgrowths are common. Kaolinite nests of various sizes and shapes as much as several millimeters across are common.

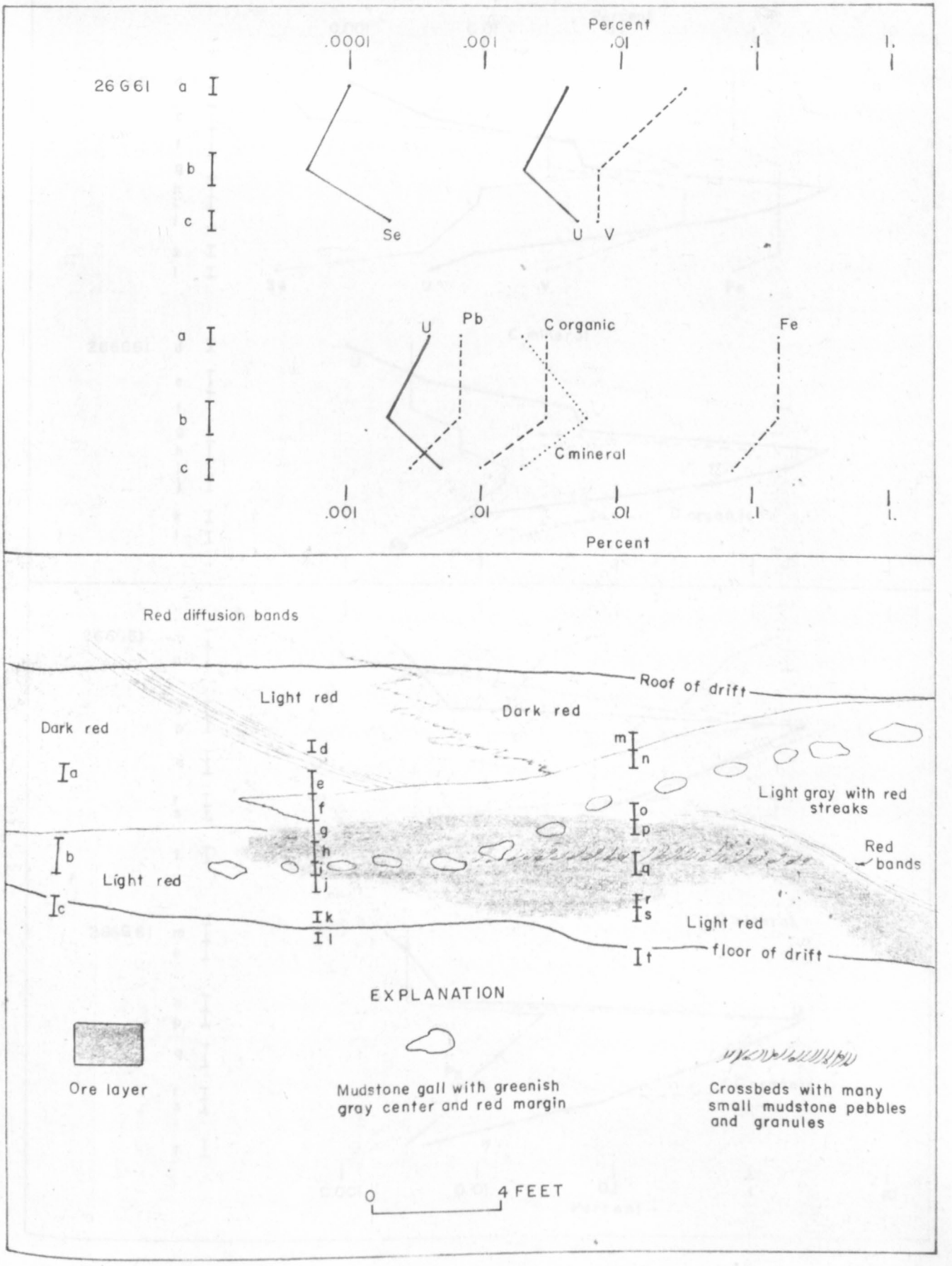



Figure 57a.--Sample suite 26G61a-26G61t, Cliffside mine.

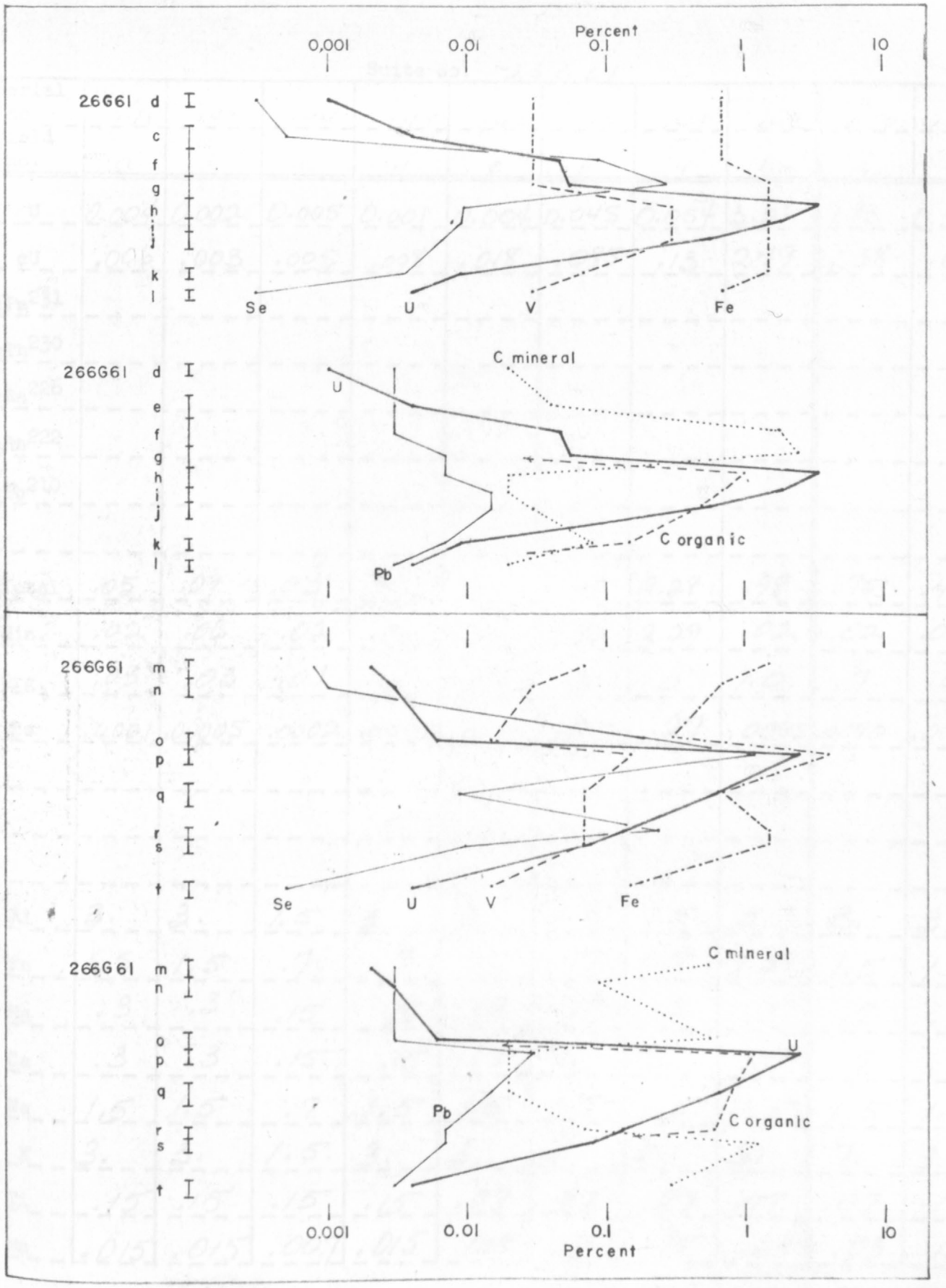



Figure 57b.--Sample suite 26G61d-26G61t, Cliffside mine.

Suite No. 26661

| Serial no. / Field no. | 142 a | 143 b | 144 c | 145 d | 146 e | 147 f | 148 g | 149 h | 150 i | 151 j |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.004 | 0.002 | 0.005 | 0.001 | 0.004 | 0.045 | 0.054 | 3.21 | 1.83 | 0.56 |
| eU | .006 | .003 | .005 | .008 | .018 | .085 | .13 | 2.49 | 1.38 | .64 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .05 | .09 | .03 | — | — | 1.69 | 2.28 | .98 | .75 | .49 |
| $C_{Min.}$ | .02 | .06 | .02 | .02 | .04 | 1.72 | 2.29 | .02 | .02 | .03 |
| $C_{Org.}$ | .03 | .03 | .01 | — | — | 0 | 0 | 1.0 | .7 | .5 |
| Se | .0001 | .00005 | .0002 | .0003 | .0005 | .09 | .27 | .0095 | .0090 | .0065 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 1.5 | 3. | 3. | 1.5 | 1.5 | 2. | 3. | 3. |
| Fe | 1.5 | 1.5 | .7 | .7 | .7 | .7 | 1.5 | 1.5 | 1.5 | 1.5 |
| Mg | .3 | .3 | .15 | .15 | .3 | .3 | .3 | .3 | .7 | .7 |
| Ca | .3 | .3 | .15 | .15 | .7 | 7. | 7. | .7 | .7 | .7 |
| Na | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | 3. | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 7. | 3. |
| Ti | .15 | .15 | .15 | .15 | .07 | .07 | .07 | .07 | .07 | .15 |
| Mn | .015 | .015 | .007 | .015 | .015 | .15 | .15 | .03 | .03 | .15 |

Suite No. 26661 --Continued

| Serial no. | 294, 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 107 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | j |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 |
| Ba | .07 | .07 | .07 | .07 | .07 | .03 | .03 | .07 | .07 | .15 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0003 | .0007 | .0007 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.005 | <.005 | <.005 |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 |
| Cu | .0007 | .0007 | .0015 | .0007 | .0007 | .0015 | .0015 | .0007 | .0007 | .0007 |
| Ga | .0015 | .0015 | .0003 | .0007 | .0015 | .0007 | .0007 | .0007 | .0007 | .0015 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.005 | <.005 | <.005 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .007 | .003 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 |
| Pb | .007 | .007 | .003 | .003 | .003 | .003 | .007 | .007 | .015 | .015 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .015 | .007 | .015 | .015 | .03 | .03 | .03 | .03 | .03 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .03 | .007 | .007 | .03 | .03 | .03 | .03 | .3 | .3 | .3 |
| Y | .007 | 0 | .003 | 0 | .0015 | .003 | .003 | .0015 | .0015 | .003 |
| Yb | .0007 | 0 | .0003 | .00015 | .0003 | .0003 | .0003 | — | — | — |
| Zr | .015 | .007 | .015 | .015 | .015 | .007 | .007 | .007 | .015 | .015 |

Suite No. 26461 (cont'd)

| Serial no. / Field no. | 294, 452 k | 453 l | 454 m | 455 n | 456 o | 457 p | 458 q | 459 r | 460 s | 461 t |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.009 | 0.004 | 0.002 | 0.003 | 0.006 | 2.31 | 0.63 | 0.13 | 0.078 | 0.004 |
| eU | .017 | .009 | .004 | .008 | .11 | 1.86 | .53 | .16 | .096 | .005 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .23 | — | — | — | .51 | 1.09 | .82 | .68 | 1.17 | — |
| $C_{Min.}$ | .08 | .02 | .53 | .09 | .55 | .02 | .02 | .07 | 1.19 | .29 |
| $C_{Org.}$ | .15 | — | — | — | 0 | 1.1 | .8 | .6 | 0 | — |
| Se | .0035 | .0003 | .0008 | .0010 | .19 | 1.1 | .0087 | .23 | .0097 | .0005 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 1.5 | 3. | 3. | 3. | 3. | 1.5 |
| Fe | 1.5 | .7 | 1.5 | .7 | .3 | 3. | .7 | 1.5 | 1.5 | .15 |
| Mg | .3 | .15 | .3 | .3 | .15 | .7 | .3 | .3 | .3 | .07 |
| Ca | .7 | .15 | 3. | .7 | 1.5 | .3 | .15 | .3 | 3. | .7 |
| Na | .7 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | .7 |
| K | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 1.5 |
| Ti | .3 | .07 | .3 | .3 | .15 | .07 | .15 | .03 | .03 | .15 |
| Mn | .015 | .007 | .03 | .015 | .03 | .03 | .015 | .015 | .07 | .03 |

Suite No. 26461 --Continued

| Serial no. / Field no. | 294, 152 k | 153 l | 154 m | 155 n | 156 o | 157 p | 158 q | 159 r | 160 s | 161 t |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 |
| Ba | .03 | .07 | .07 | .07 | .7 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | .0003 | .0003 | .00015 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | <.005 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | 0 | 0 | 0 | <.005 | <.0005 | 0 | 0 | 0 |
| Cr | .0007 | .0003 | .003 | .0007 | .0003 | .0007 | .0007 | .00015 | .0003 | .0007 |
| Cu | .0007 | .0007 | .0007 | .0015 | .0007 | .003 | .0015 | .0015 | .0015 | .0007 |
| Ga | .0007 | .0007 | .00015 | .0015 | .0007 | .0015 | .0007 | .0015 | .0015 | .0007 |
| Ge | 0 | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | .007 | 0 | 0 | .003 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | .0015 | .0015 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .007 | .003 | .003 | .003 | .003 | .03 | .015 | .007 | .007 | .003 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .007 | .007 | .03 | .015 | .015 | .015 | .015 | .007 | .03 | .007 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .03 | .07 | .03 | .015 | .15 | .07 | .07 | .07 | .015 |
| Y | 0 | .003 | .0015 | 0 | .0015 | .003 | .0015 | .003 | .0015 | .0015 |
| Yb | — | .0003 | .0003 | .00015 | .0003 | — | — | — | .0003 | .0003 |
| Zr | .015 | .003 | .07 | .015 | .003 | .007 | .007 | .007 | .007 | .007 |

Suite No.-- 27G61 ( a through i )

Serial No's.-- 294,662 through 294,670

Mine-- Cliffside

Level-- $D_2$ ore zone

Sec. 36 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 311,140 N. x 553,550 E.

Mine location-- 2-212 W drift

Sample elevation-- ~5,670 ft

Premining water table elevation-- ~6,475 ft

Sampled to test element distribution in-- a prefault ore layer directly overlying a mudstone layer. Also to test effect of mudstone on radium migration (see eU).

Sample descriptions:

a.--Light-olive-gray, fine- to coarse-grained, poorly sorted sandstone. Very sparse quartz overgrowths. Kaolinite nests common and less than 3 mm across.

b.--Light-gray to medium-light-gray, fine- to medium-grained sandstone with scattered coarse sand grains. Very sparse, extremely fine-grained disseminated pyrite. Very sparse quartz overgrowths. Kaolinite nests less than 2 mm across are common. Very sparse anatase clusters.

c.--Medium-gray to medium-light-gray, fine- to medium-grained sandstone. Sparse kaolinite nests less than 1 mm in diameter. A medium-light-gray clay(?) forms a thin film on all sand grains.

d.--Dark-greenish-gray, fine- to medium-grained poorly sorted sandstone with scattered coarse grains and with local zones stained dark reddish brown. Sparse extremely fine-grained pyrite. A dark-greenish-gray clay(?) coats all the sand grains and fills the interstices. In the red areas it seems to be hematite stained.

Suite No. 27G61 . Sample descriptions (Continued)

e.--Dark-gray, fine- to medium-grained ore sandstone with scattered coarse to very coarse grains and granules. Black authigenic carbonaceous material and stained clay fills most interstices. Pyrite is sparse; fine-grained calcite cement is common.

f.--Dark-gray to grayish-black, fine- to medium-grained ore sandstone. Black to grayish-black authigenic carbonaceous material fills most interstices. Kaolinite nests are extremely small.

g.--Yellowish-gray and light-olive-gray, fine-grained sandstone with mudstone granules; streaks and patches of medium-dark-gray ore sandstone were unavoidably included in sample. Calcite cement is common to abundant.

h.--Mottled moderate-red and greenish-gray mudstone. Composed largely of clay with scattered sand grains.

i.--Greenish-gray mudstone composed largely of clay with scattered sand grains.

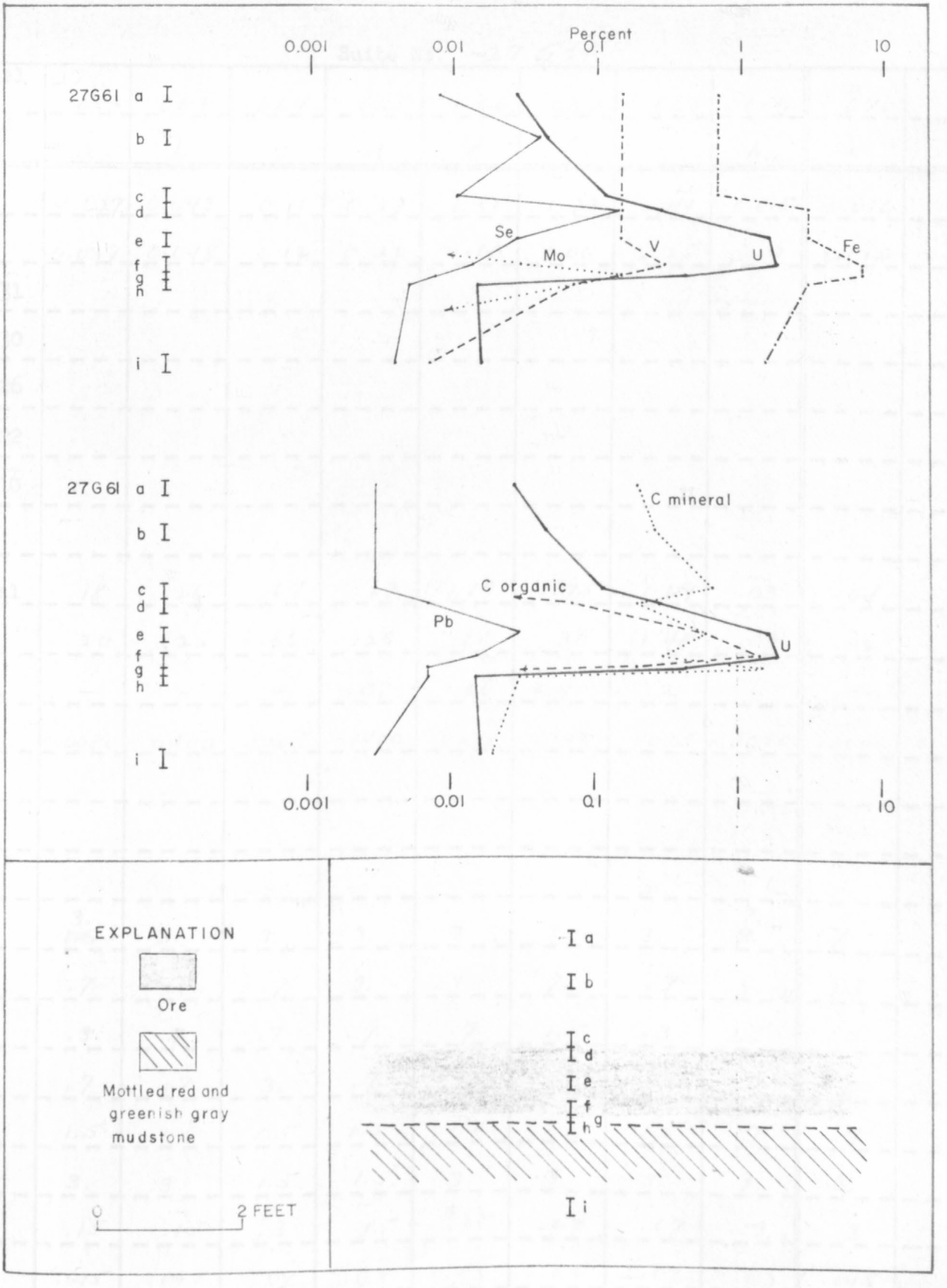



Figure 58.--Sample suite 27G61, Cliffside mine.

Suite No. 27661

| Serial no. | 294, 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| U | 0.027 | 0.043 | 0.11 | 0.27 | 1.57 | 1.23 | 0.41 | 0.015 | 0.016 | |
| eU | 0.037 | 0.048 | 0.12 | 0.20 | 1.10 | 1.06 | 2.25 | 0.19 | 0.016 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .18 | .26 | .67 | .27 | 1.19 | 1.75 | 1.69 | .03 | .04 | |
| $C_{Min.}$ | .20 | .25 | .66 | .20 | .60 | .30 | 1.48 | .03 | .02 | |
| $C_{Org.}$ | — | — | — | .07 | .60 | 1.4 | .2 | — | — | |
| Se | .0080 | .0400 | .0105 | .1400 | .0275 | .0140 | .0075 | .0050 | .0040 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 2. | 2. | |
| Fe | .7 | .7 | .7 | 3. | 3. | 2. | .7 | 3. | 1.5 | |
| Mg | .3 | .7 | .7 | .7 | .7 | 1.5 | .3 | 1.5 | 1.5 | |
| Ca | .7 | .7 | 3. | .7 | 3. | .7 | 3. | .7 | .7 | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | .7 | .7 | |
| K | 3. | 3. | 1.5 | 1.5 | 3. | 3. | 3. | 3. | 3. | |
| Ti | .15 | .15 | .3 | .15 | .15 | .07 | .07 | .3 | .3 | |
| Mn | .015 | .015 | .02 | .03 | .03 | .03 | .07 | .03 | .015 | |

Suite No. 27661 --Continued

| Serial no. | 294, 662 | 663 | 664 | 665 | 666 | 667 | 668 | 669 | 670 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 | .003 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .03 | 1.5 | .07 | .03 | |
| Be | 0 | 0 | 0 | 0 | .0001⁵ | 0 | 0 | .0003 | .0001⁵ | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | <.005 | <.005 | <.005 | <.005 | <.005 | 0 | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | .0003 | .0015 | .0007 | |
| Cu | .0007 | .0015 | .0007 | .0007 | .003 | .003 | .003 | .003 | .0015 | |
| Ga | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .003 | .003 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | .007 | .007 | 0 | 0 | .003 | |
| Mo | .007 | 0 | 0 | 0 | 0 | .03 | .15 | .02 | 0 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | .015 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | 0 | |
| Pb | .003 | .003 | .003 | .002 | .03 | .015 | .007 | .002 | .003 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | .0007 | |
| Sr | .015 | .015 | .015 | .015 | .03 | .015 | .03 | .03 | .03 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .15 | .15 | .15 | .15 | .15 | .3 | .15 | .02 | .007 | |
| Y | .0015 | .0015 | .003 | .0015 | .003 | .007 | .015 | .003 | .003 | |
| Yb | — | — | — | — | — | — | — | — | — | |
| Zr | .007 | .003 | .007 | .03 | .03 | .007 | .007 | .03 | .03 | |

Suite No.-- 28G61 ( a through d )

Serial No's.-- 293,968 through 293,971

Mine-- Cliffside

Level-- haulage level

Sec. 36 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 310,710 N. x 553,850 E.

Mine location-- near track #2

Sample elevation-- 5,655 ft

Premining water table elevation--~6,475 ft

Sampled to test element distribution in--oxidized rock within a "sandstone pipe."

Sample descriptions:

a.--Moderate-orange-pink siltstone and mudstone. This could be a fault gouge or fine-grained material moved in plastically during faulting. Biotite flakes are common. Narrow veinlets, some filled with calcite and others with cryptomelane or psilomelane are common.

b.--Same as "a," but abundant calcite cement.

c.--Highly varicolored in moderate-pink, grayish-red, and grayish-green, medium- to coarse-grained sandstone. This material seems to grade into sample "b" without obvious structural or stratigraphic break. Local blebs of cryptomelane cement. A grayish-green clay-like mineral is abundant in the grayish-green areas and seems to be hematite stained in some of the red areas. Calcite, some of which is hematite stained, forms abundant poikiloblastic cement with crystals as much as 1 cm across.

d.--Mottled greenish-gray and pale-brown, fine- to medium-grained sandstone. Calcite

poikiloblasts up to 1 cm across form abundant cement. A greenish-gray clay-like mineral coats all grains in the gray areas and seems to be brownish in the other areas. An X-ray diffractometer pattern of the clay separate indicates principally montmorillonite and kaolinite.

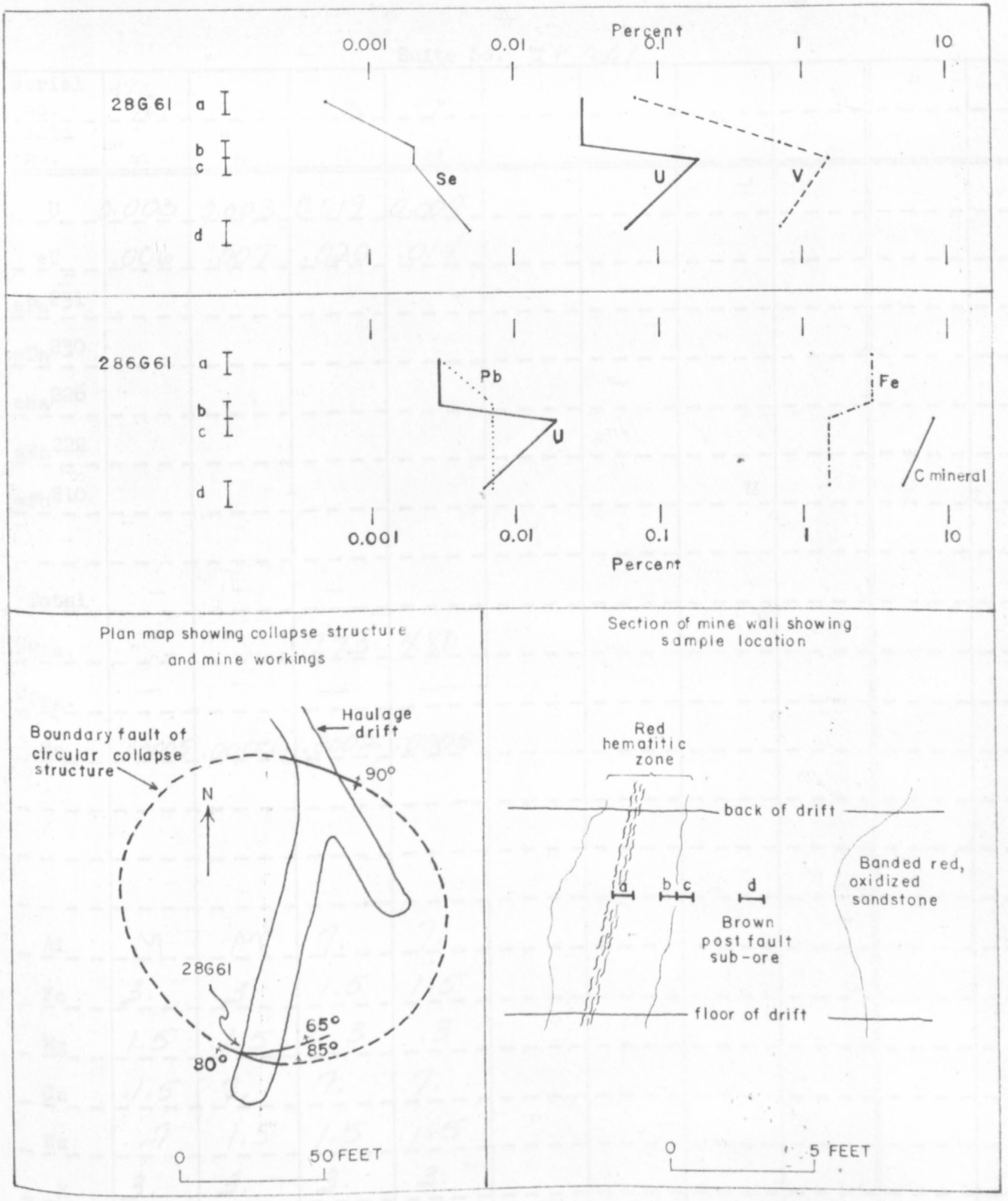



Figure 59.--Sample suite 28G61, Cliffside mine.

Suite No. 28661

| Serial no. / Field no. | 293,268 a | 969 b | 970 c | 971 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.003 | 0.003 | 0.019 | 0.006 | | | | | | |
| eU | .006 | .007 | .020 | .014 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | — | | | | | | |
| $C_{Min.}$ | — | — | 7.73 | 4.80 | | | | | | |
| $C_{Org.}$ | — | — | — | — | | | | | | |
| Se | .00005 | .0002 | .0002 | .0005 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | M | M | 7. | 7. | | | | | | |
| Fe | 3. | 3. | 1.5 | 1.5 | | | | | | |
| Mg | 1.5 | 1.5 | .3 | .3 | | | | | | |
| Ca | 1.5 | 7. | 7. | 7. | | | | | | |
| Na | .7 | 1.5 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 3. | 3. | | | | | | |
| Ti | .3 | .3 | .07 | .15 | | | | | | |
| Mn | .03 | .15 | .15 | .03 | | | | | | |

Suite No. 28661 --Continued

| Serial no. / Field no. | 293, 968 a | 969 b | 970 c | 971 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .03 | .07 | .07 | .07 | | | | | | |
| Be | .0003 | .00015 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | .0007 | .0003 | 0 | 0 | | | | | | |
| Cr | .0015 | .0015 | .0007 | .0007 | | | | | | |
| Cu | .0015 | .0015 | .007 | .0007 | | | | | | |
| Ga | .003 | .003 | .0015 | .0007 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | .0015 | .0007 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | .0015 | .0007 | .0007 | 0 | | | | | | |
| Pb | .003 | .007 | .007 | .007 | | | | | | |
| Sc | .0015 | .0015 | 0 | 0 | | | | | | |
| Sr | .07 | .07 | .03 | .015 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .007 | .07 | .15 | .07 | | | | | | |
| Y | .003 | .003 | .003 | 0 | | | | | | |
| Yb | .0003 | <.001 | <.001 | <.001 | | | | | | |
| Zr | .015 | .015 | .001 | .003 | | | | | | |

Suite No.-- 50G61 ( a through i )

Serial No's.-- 294,462 through 294,470

Mine-- Dog No. 1

Level--

Sec. 20 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- 1,579,710 N. x 506,265 E.

Mine location-- 25 ft W. from bottom of inclined shaft.

Sample elevation-- 6,875 ft

Premining water table elevation-- (well below 6,800 ft; probably near 6,550 ft).

Sampled to test element distribution in-- prefault ore layer

Sample descriptions:

a.--Yellowish-gray, medium- and coarse-grained sandstone with widely scattered mudstone pebbles. Quartz overgrowths are common. Kaolinite nests, 1 to 8 mm across are abundant. Calcite cement is sparse.

b.--Very light gray, very coarse to medium grained, poorly sorted sandstone. Disseminated minute pyrite grains are sparse. A few anatase aggregates were noted. Quartz overgrowths and kaolinite nests are common. Calcite cement is sparse.

c.--Light-olive-gray, very coarse and coarse grained sandstone. Minute disseminated pyrite grains are common. Kaolinite aggregates are common. Quartz overgrowths and calcite cement are sparse.

d.--Medium-dark-gray to dark-gray, coarse and very coarse grained ore sandstone. Dull dark-gray, authigenic carbonaceous material fills a few interstices and coats sand grains. Disseminated grains and masses of pyrite are common to abundant. Kaolinite nests, 2 to 5 mm across, and calcite cement are common.

Suite No. 50G61 . Sample descriptions (Continued)

e.--Medium-dark-gray, coarse-grained ore sandstone. Dark-gray authigenic carbonaceous material coats sand grains and fills a few interstices. Very small disseminated pyrite grains and kaolinite nests, 2 to 8 mm across, are common. Calcite cement is common.

f.--Dark-gray, coarse-grained ore sandstone with scattered quartz and feldspar granules. Dull-dark-gray authigenic carbonaceous material coats most sand grains and forms sparse black blebs in the interstices. Disseminated grains and masses of pyrite, kaolinite nests 3 to several millimeters across, and calcite cement are common.

g.--Olive-gray, coarse- to medium-grained ore sandstone. Sand grains are coated with a gray to brownish film of authigenic carbonaceous material. Quartz overgrowths, disseminated pyrite and calcite cement are sparse. Kaolinite nests, 1 to 8 mm across, are common. This didn't appear to be part of the ore layer when sampled, but the analyses indicate that it is.

h.--Light-olive-gray, medium-grained sandstone. Minute disseminated pyrite grains are abundant. Kaolinite nests 1 to 3 mm across are common.

i.--Yellowish-gray, medium-grained sandstone. Disseminated pyrite and quartz overgrowths are sparse. Kaolinite nests 1 to 4 mm across are common.

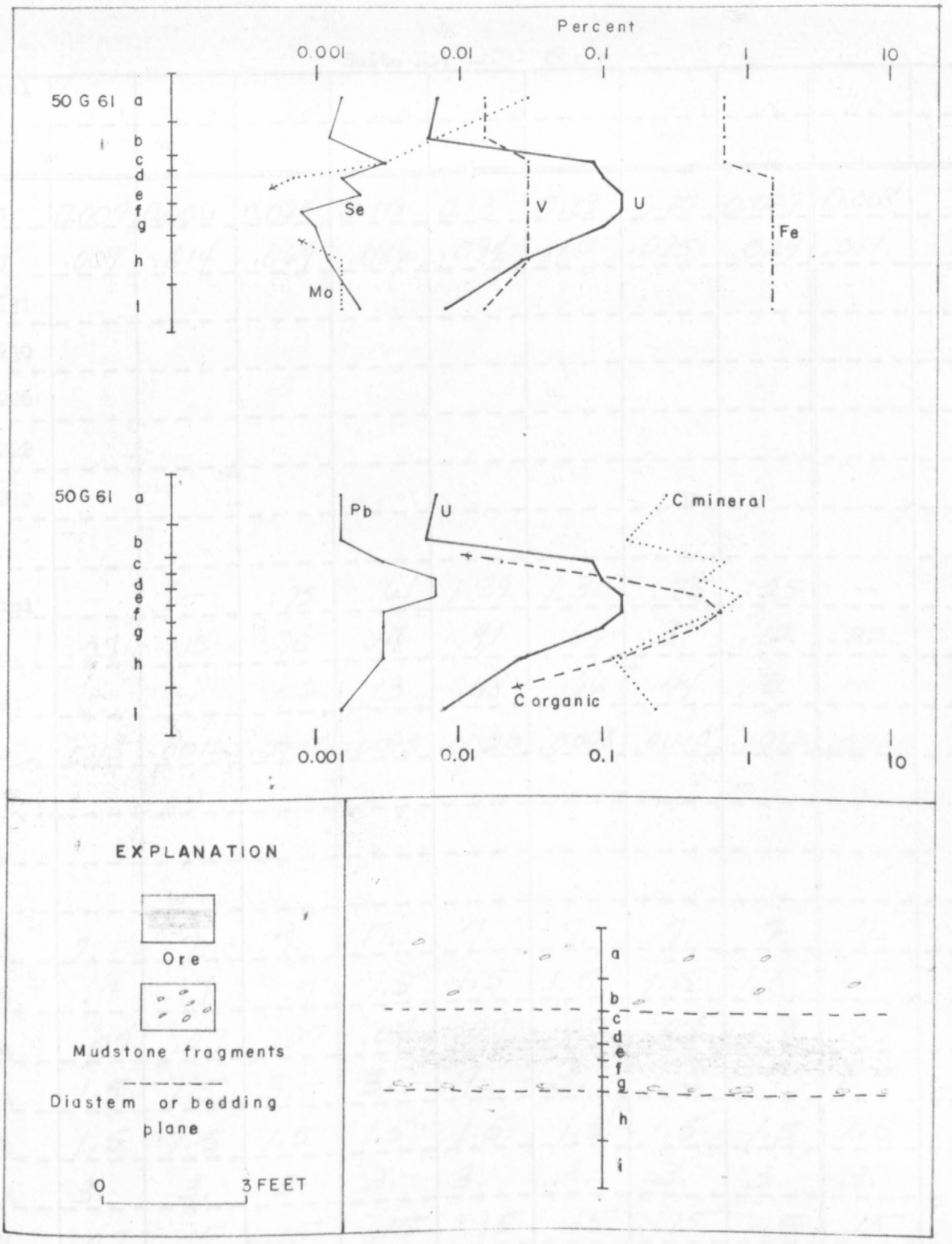



Figure 60.--Sample suite 50G61, Dog No. 1 mine.

Suite No. 50 G 61

| Serial no. | 294, 462 | 463 | 464 | 465 | 466 | 467 | 468 | 469 | 470 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | i | |
| U | 0.007 | 0.006 | 0.084 | 0.10 | 0.13 | 0.13 | 0.10 | 0.027 | 0.008 | |
| eU | .009 | .014 | .069 | .086 | .094 | .10 | .095 | .029 | .011 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | .72 | .61 | 1.39 | 1.30 | .75 | .25 | — | |
| $C_{Min.}$ | .27 | .15 | .70 | .48 | .91 | .64 | .31 | .12 | .22 | |
| $C_{Org.}$ | — | — | .02 | .13 | .48 | .66 | .44 | .13 | — | |
| Se | .0015 | .0012 | .0030 | .0015 | .0020 | .0008 | .0010 | .0012 | .0020 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 7. | 7. | 7. | 7. | 7. | 7. | |
| Fe | .7 | .7 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| Mg | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Ca | 1.5 | 1.5 | 3. | 3. | 7. | 3. | 1.5 | .7 | 1.5 | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | |
| Ti | .07 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | .15 | |
| Mn | .015 | .015 | .03 | .03 | .07 | .03 | .015 | .007 | .015 | |

Suite No. 50 G 61 --Continued

| Serial no. / Field no. | 294, 462 a | 463 b | 464 c | 465 d | 466 e | 467 f | 468 g | 469 h | 470 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .15 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | .0007 | .0007 | .0007 | .0007 | .0007 | 0 | 0 | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | .0003 | |
| Cu | .0007 | .0007 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Ga | .0015 | .0015 | .0015 | .003 | .0015 | .0015 | .0015 | .0015 | .0015 | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mo | .03 | .007 | .003 | .0007 | 0 | 0 | 0 | .0015 | .0015 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | .0003 | 0 | .0003 | 0 | 0 | 0 | 0 | |
| Pb | .0015 | .0015 | .003 | .007 | .007 | .003 | .003 | .003 | .0015 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .015 | .015 | .03 | .03 | .03 | .03 | .03 | .03 | .015 | |
| Y | 0 | .0015 | .007 | .015 | .003 | .007 | .007 | .0015 | .0015 | |
| Yb | 0 | .00015 | .0007 | .0015 | .0003 | .0003 | .0007 | .0003 | .00015 | |
| Zr | .007 | .007 | .007 | .007 | .007 | .015 | .007 | .007 | .007 | |

Suite No.-- 30G62 ( a through i )

Serial No's.-- 302,937 through 302,945

Mine-- Doris No. 1 (Little Doris)

Level--

Sec. 21 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- N. x E.

Mine location-- 2,355 ft N x 2,410 ft E of SW cor. sec. 21.

Sample elevation-- 6,710 ft

Premining water table elevation-- ~6,625 ft

Sampled to test element distribution in--partly oxidized prefault S-type ore roll.

Sample descriptions:

a.--Yellowish-gray, medium-grained sandstone. Kaolinite nests, 1-1.5 mm across, are common. Limonite occurs as disseminated specks, clay stain, and thin films on sand grains. Quartz overgrowths are scarce. Calcite is extremely sparse.

b.--Very pale orange to grayish to grayish-orange, fine-grained sandstone. Kaolinite nests are common. Specks and films of limonite on sand grains are common. A thin film of light-colored clay coats most sand grains. Sparse needles of gray native selenium are present, locally.

c.--Yellowish-gray, fine-grained sandstone with local pale-reddish-brown specks and stain. A loose clay-like mineral fills many interstices. Very sparse, minute disseminated flakes of a greenish-yellow uranium mineral.

d.--Dark-gray, fine to very fine grained ore sandstone. Well cemented by authigenic carbonaceous material. Pyrite sparse and largely oxidized to limonitic stain. Kaolinite aggregates are sparse and very small.

Suite No. 30G62 . Sample descriptions (Continued)

e.--Same as "d."

f.--Grayish-black, very fine grained ore sandstone. Authigenic carbonaceous material fills nearly all interstices. The remainder are filled with kaolinite. A few scattered flakes of a greenish uranium(?) mineral are present.

g.--Yellowish-gray, fine-grained sandstone with local yellowish-brown limonite specks and stain. Sand grains all coated with a thin film of nearly white clay.

h.--Yellowish-gray, fine-grained sandstone with local grayish-orange limonite stain. Clay disseminated throughout rock.

i.--Yellowish-gray, fine- to medium-grained sandstone with local grayish-orange specks and stains of limonite. Each sand grain is coated with a thin film of nearly white clay and a few scattered kaolinite nests are present.

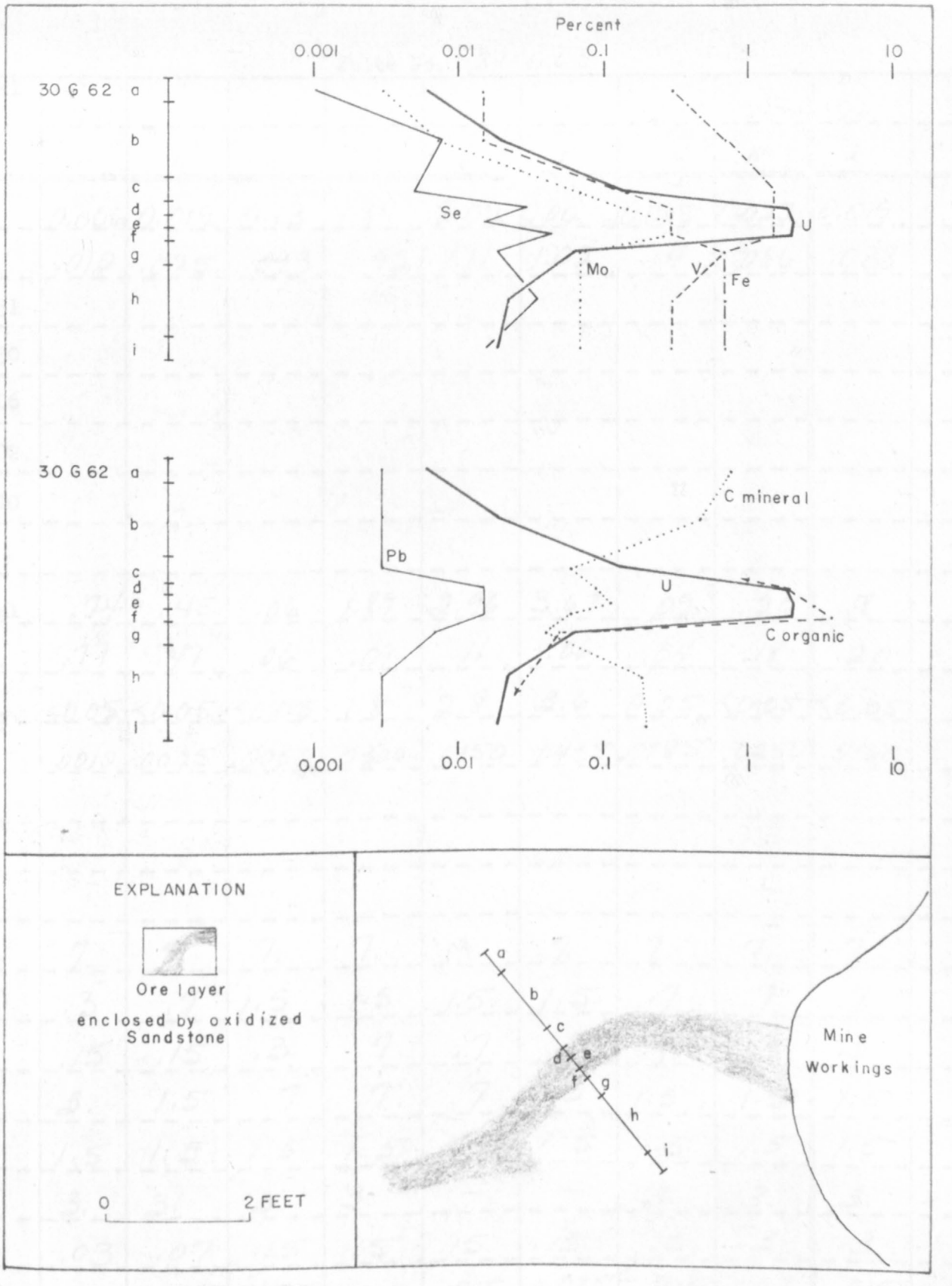



Figure 61.--Sample suite 30G62, Doris No. 1 mine.

Suite No. 30662

| Serial no. / Field no. | 302, 237 a | 238 b | 239 c | 240 d | 241 e | 242 f | 243 g | 244 h | 245 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.006 | 0.019 | 0.13 | 1.84 | 2.02 | 2.00 | 0.065 | 0.022 | 0.019 | |
| eU | .010 | .025 | .093 | .92 | 1.11 | 1.02 | .14 | .066 | .038 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .74 | .45 | .06 | 1.89 | 2.96 | 3.67 | .09 | .20 | .18 | |
| $C_{Min.}$ | .77 | .47 | .06 | .09 | .11 | .06 | .04 | .18 | .20 | |
| $C_{org.}$ | <0.05 | <0.05 | <0.05 | 1.8 | 2.8 | 3.6 | 0.05 | <0.05 | <0.05 | |
| Se | .0010 | .0075 | .0050 | .0300 | .0150 | .0435 | .0185 | .0250 | .0160 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 7. | M | 7. | 7. | 7. | 7. | |
| Fe | .3 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | .7 | .7 | .7 | |
| Mg | .15 | .15 | .3 | .7 | .7 | .7 | .7 | .3 | .3 | |
| Ca | 3. | 1.5 | .7 | .7 | .7 | .3 | 1.5 | 1.5 | 1.5 | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | |
| K | 3. | 3. | 3. | 3. | — | — | 3. | 3. | 3. | |
| Ti | .03 | .07 | .15 | .15 | .15 | .15 | .3 | .3 | .3 | |
| Mn | .03 | .03 | .015 | .015 | .015 | .015 | .015 | .03 | .015 | |

Suite No. 30662 --Continued

| Serial no. / Field no. | 301, 937 a | 238 b | 239 c | 240 d | 241 e | 242 f | 243 g | 244 h | 245 i | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | |
| Be | 0 | .00015 | .00015 | .0003 | .0003 | .0003 | .0003 | .0003 | .0003 | |
| Bi | 0 | 0 | 0 | <0.005 | <0.005 | <0.005 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Co | 0 | .0007 | 0 | <0.005 | <0.005 | <0.005 | 0 | 0 | 0 | |
| Cr | .0003 | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | |
| Cu | .003 | .0015 | .007 | .0015 | .0015 | .003 | .003 | .0015 | .0015 | |
| Ga | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | |
| Ge | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | 0 | |
| La | 0 | 0 | 0 | .003 | .007 | .007 | 0 | 0 | 0 | |
| Mo | .003 | .007 | .07 | .15 | .3 | .3 | .07 | .07 | .07 | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nd | 0 | 0 | 0 | 0 | .015 | 0 | 0 | 0 | 0 | |
| Ni | 0 | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .003 | .003 | .003 | .015 | .015 | .015 | .007 | .003 | .003 | |
| Sc | 0 | 0 | 0 | .0007 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .015 | .015 | .15 | .3 | .3 | .3 | .7 | .3 | .3 | |
| Y | 0 | .0015 | .0015 | .003 | .0015 | .003 | .003 | .003 | .003 | |
| Yb | 0 | .00015 | — | — | — | — | — | — | — | |
| Zr | .003 | .007 | .015 | .015 | .015 | .015 | .015 | .015 | .03 | |

Suite No.-- 1G58 ( a through d )

Serial No's.-- 294,653 through 294,656

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 333,985 N. x 517,005 E.

Mine location-- face of a stub extending S from 102-drift.

Sample elevation-- 6,785 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- a mineralized mudstone cobble.

Sample descriptions:

a.--Black authigenic carbonaceous material and stained clay. Forms rounded blebs that coalesce along fractures. Within the blebs replacement seems to be nearly complete and the surrounding mudstone is partly replaced.

b.--Light-gray, yellowish-gray, and light bluish-gray mudstone. Some joint surfaces are coated with sparse pyrite grains and a film of authigenic carbonaceous material.

c.--Dark-gray to dusky-blue, medium-grained sandstone. Sand grains are coated by a submetallic bluish material that seems to be earlier than sparse disseminated pyrite and kaolinite nests. Metatyuyamunite is disseminated in the rock at the outer edge of the dusky-blue stained zone.

Suite No. 1058 . Sample descriptions (Continued)

d.--Dark-gray, medium-grained ore sandstone. Black authigenic carbonaceous material coats most sand grains and forms scattered small blebs in the interstices. Disseminated pyrite is sparse. Kaolinite nests are common. A little disseminated metatyuyamunite is present.

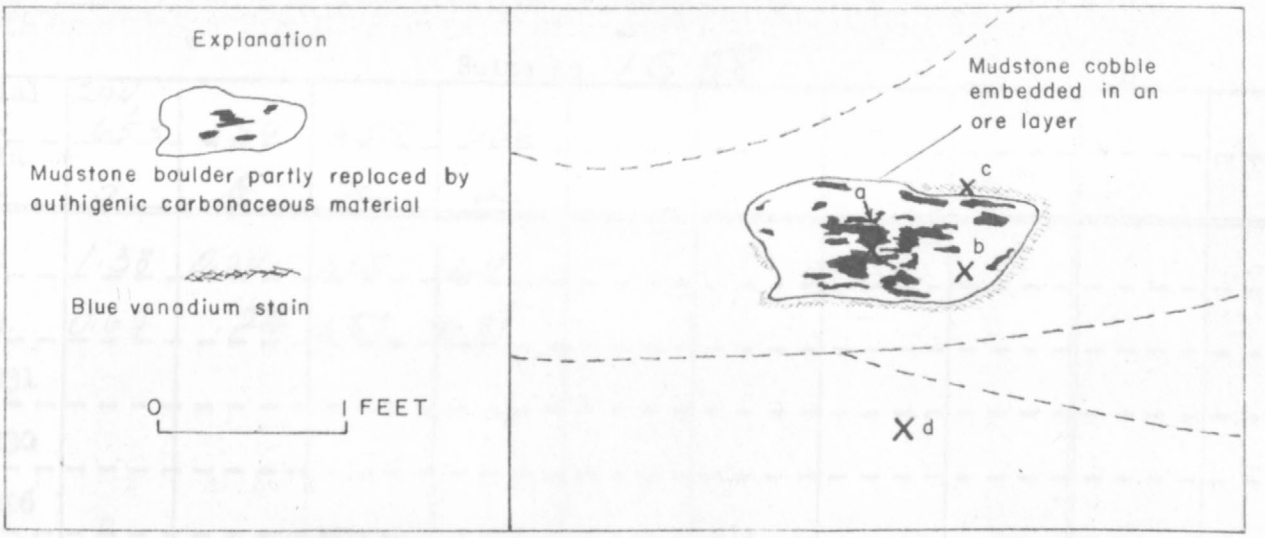



Figure 62.--Sample suite 1G58a, Dysart No. 1 mine.

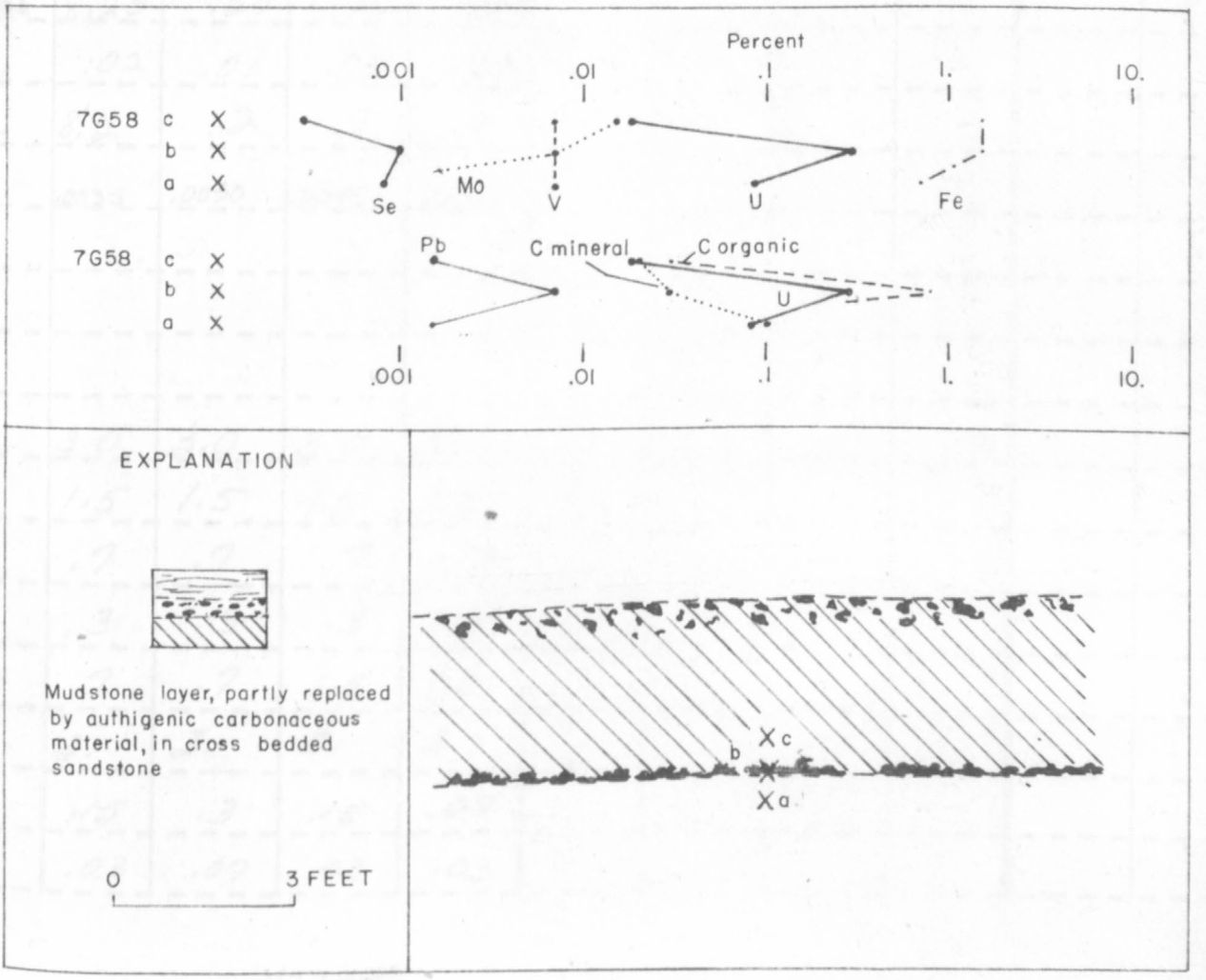



Figure 63.--Sample suite 7G58, Dysart No. 1 mine.

Suite No. IG 58

| Serial no. / Field no. | 294 653 a | 654 b | 655 c | 656 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 1.38 | 0.24 | 1.55 | 1.11 | | | | | | |
| eU | 0.67 | .22 | 1.63 | 0.81 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 8.20 | .20 | .78 | .65 | | | | | | |
| $C_{Min.}$ | .02 | .01 | .05 | .29 | | | | | | |
| $C_{Org.}$ | 8.2 | .2 | .7 | .4 | | | | | | |
| Se | .0035 | .0030 | .0045 | .0040 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | | | | | | |
| Fe | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| Mg | .7 | .7 | .7 | .15 | | | | | | |
| Ca | .3 | .3 | .3 | 1.5 | | | | | | |
| Na | .7 | .7 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 3. | 3. | | | | | | |
| Ti | .15 | .3 | .15 | .07 | | | | | | |
| Mn | .03 | .07 | .03 | .03 | | | | | | |

Suite No. / G58 --Continued

| Serial no. / Field no. | 294 653 a | 654 b | 655 c | 656 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0.003 | 0.003 | 0 | 0 | | | | | | |
| Ba | .03 | .03 | .07 | .07 | | | | | | |
| Be | .0007 | .0007 | .0003 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | <.005 | <.005 | <.005 | <.005 | | | | | | |
| Cr | .0015 | .0015 | .0015 | 0 | | | | | | |
| Cu | .003 | .0015 | .0015 | .0015 | | | | | | |
| Ga | .003 | .003 | .0015 | .0007 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | .007 | 0 | .003 | 0 | | | | | | |
| Mo | .07 | .15 | .015 | 0 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | .0007 | 0 | 0 | | | | | | |
| Pb | .015 | .015 | .015 | .007 | | | | | | |
| Sc | .0007 | .0007 | 0 | 0 | | | | | | |
| Sr | .03 | .03 | .03 | .03 | | | | | | |
| Tl | — | — | — | — | | | | | | |
| V | .15 | .3 | 1.5 | .3 | | | | | | |
| Y | 0 | 0 | 0 | 0 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .015 | .015 | .015 | .007 | | | | | | |

Suite No.-- 2G58 ( a through h )

Serial No's.-- 268,905 through 268,912

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 333,960 N. x 516,945 E.

Mine location-- Stub drift on S side of 102 drift

Sample elevation-- 6,785 ft.

Premining water table elevation-- ~6,525 ft.

Sampled to test element distribution in--a partly leached(?), partly oxidized prefault ore layer.

Sample descriptions:

a.--Dark-gray to medium-dark gray, fine-grained ore sandstone. Blebs of interstitial authigenic carbonaceous material are common but it does not seem generally to coat the sand grains. Kaolinite nests are 2-3 mm across and common. Some are stained yellowish by oxidized vanadium(?) minerals. Post mining oxidation is common and may mask some premining oxidation.

b.--Somewhat mottled medium-dark gray and grayish-black, fine-grained ore sandstone. Sand grains are coated with authigenic carbonaceous material, especially in the grayish-black areas. Yellow-stained kaolinite nests are common. Post mining oxidates similar to sample "a."

c.--Medium-light gray, fine-grained ore sandstone, mottled with dark-gray and brownish-black areas. Authigenic carbonaceous material thoroughly cements the darker areas and forms scattered blebs in the interstices of the lighter areas.

Suite No. 2G58. Sample descriptions (Continued)

Kaolinite nests, 2-3 mm across, are abundant and commonly are stained yellowish. Disseminated pyrite is common. Post mining oxidation seems to be common and produces yellow minerals and limonite stain.

d.--Grayish-orange, medium- to fine-grained sandstone. Each sand grain is coated with a film of limonite. Kaolinite nests less than 4 mm across are common. A few dark-gray streaks along bedding planes and scattered dark-gray interstitial blebs seem to be authigenic carbonaceous material that has survived oxidation.

e.--Grayish-black, medium-grained ore sandstone with varicolored surficial stains. Authigenic carbonaceous material coats many sand grains. Kaolinite nests are stained grayish yellow. Disseminated pyrite is common. On the side toward sample "d" is a reddish stain probably caused by selenium. Other yellowish and bluish stains are probably caused by vanadium.

f.--Medium-light gray, medium-grained sandstone. Scattered blebs of authigenic carbonaceous material and blebs of poikiloblastic calcite are present but sparse. Disseminated pyrite is common even adjacent to scattered flakes of tyuyamunite. A yellow-orange mineral, probably pascoite, locally stains the rock.

g.--Similar to sample "e." Staining between "g" and "h" is similar to the staining between "e" and "d."

h.--Almost identical to sample "d." This may have been part of the ore layer at one time and is now leached.

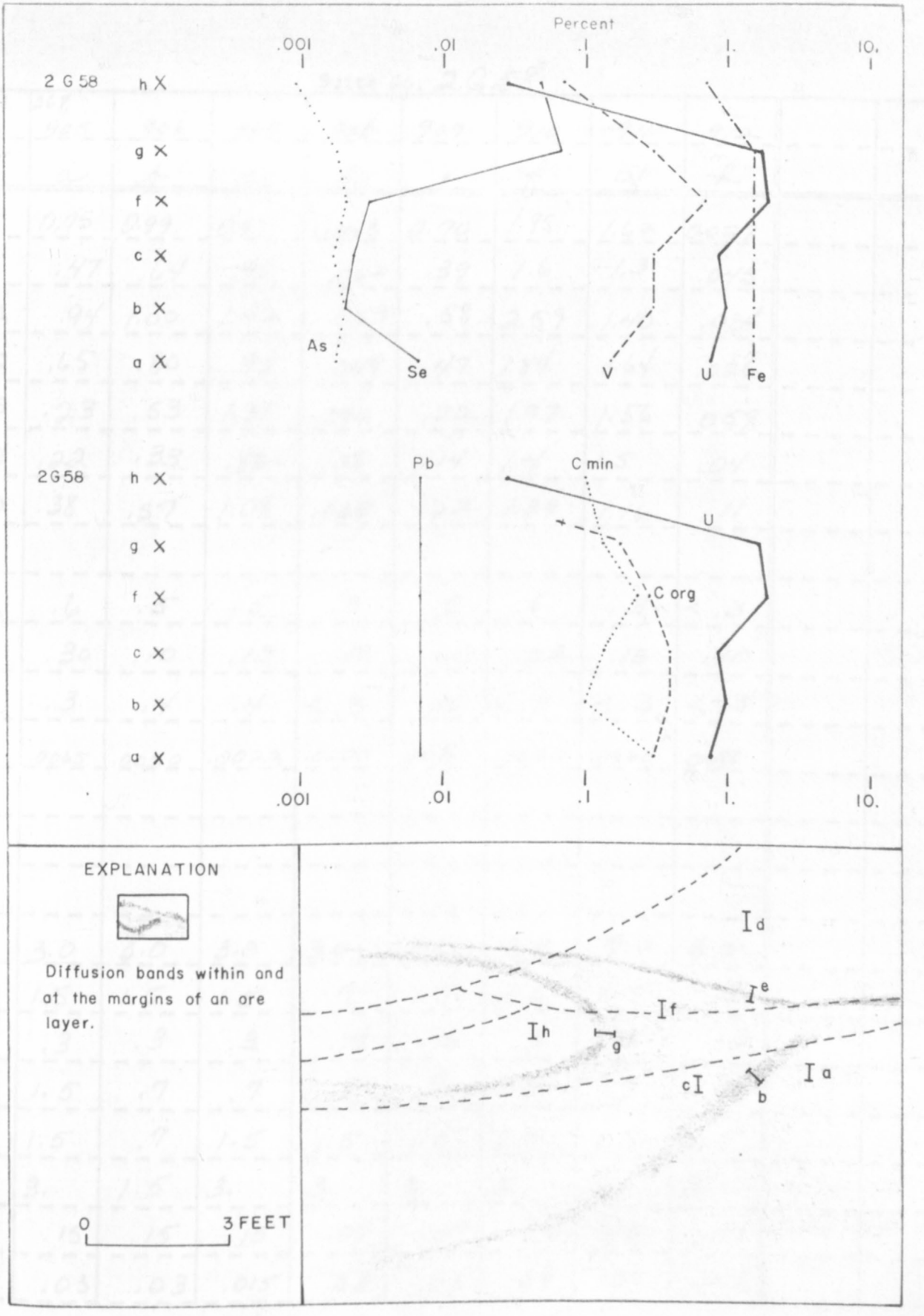



Figure 64.--Sample suite 2G58, Dysart No. 1 mine.

Suite No. 2658

| Serial no. / Field no. | 368, 905 a | 906 b | 907 c | 908 d | 909 e | 910 f | 911 g | 912 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.75 | 0.99 | 0.87 | 0.043 | 0.70 | 1.85 | 1.62 | 0.027 | | |
| eU | .47 | .64 | .95 | .062 | .39 | 1.6 | 1.3 | .043 | | |
| $ePa^{231}$ | .94 | 1.00 | 1.42 | .059 | .58 | 2.59 | 1.40 | .034 | | |
| $eTh^{230}$ | .65 | .80 | .95 | .049 | .47 | 1.84 | 1.64 | .026 | | |
| $eRa^{226}$ | .23 | .53 | 1.31 | .090 | .22 | 1.97 | 1.56 | .059 | | |
| $eRn^{222}$ | .22 | .33 | .82 | .08 | .14 | 1.4 | 1.5 | .04 | | |
| $ePb^{210}$ | .38 | .57 | 1.08 | .065 | .22 | 1.39 | 1.16 | .11 | | |
| | | | | | | | | | | |
| $C_{Total}$ | .6 | .5 | .5 | .3 | .5 | .5 | .3 | < .3 | | |
| $C_{Min.}$ | .30 | .10 | .13 | .19 | .10 | .22 | .13 | .10 | | |
| $C_{Org.}$ | .3 | .4 | .4 | < .3 | .4 | < .3 | < .3 | < .3 | | |
| Se | .0065 | .0020 | .0022 | .0200 | .1050 | .0030 | .0660 | .0480 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 7.0 | 3.0 | | |
| Fe | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | .7 | | |
| Mg | .3 | .3 | .3 | .15 | .15 | .3 | .3 | .15 | | |
| Ca | 1.5 | .7 | .7 | .7 | .7 | 1.5 | .7 | .7 | | |
| Na | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| K | 3. | 1.5 | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Ti | .15 | .15 | .15 | .07 | .07 | .07 | .15 | .07 | | |
| Mn | .03 | .03 | .015 | .03 | .03 | .03 | .03 | .015 | | |

Suite No. 2658 --Continued

| Serial no. / Field no. | 205 a | 206 b | 207 c | 208 d | 209 e | 210 f | 211 g | 212 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .15 | .07 | .07 | | |
| Be | .0003 | .0003 | .0003 | .0003 | .0003 | .00015 | .0003 | .0003 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | <.005 | <.005 | <.005 | 0 | <.005 | <.005 | <.005 | 0 | | |
| Cr | .0007 | .0015 | .0007 | .0003 | .0007 | .0015 | .0007 | .0007 | | |
| Cu | .0007 | .0007 | .0007 | .0003 | .0007 | .0007 | .0007 | .0007 | | |
| Ga | .0007 | .0007 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | | |
| Ge | <.005 | <.005 | <.005 | 0 | <.005 | <.005 | <.005 | 0 | | |
| La | .007 | .003 | .003 | .003 | .003 | .003 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nb | 0 | .0015 | .0015 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | <.05 | <.05 | 0 | <.05 | <.05 | <.05 | 0 | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sr | .015 | .015 | .03 | .03 | .03 | .07 | .07 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .15 | .3 | .3 | .07 | .3 | .7 | .3 | .07 | | |
| Y | .0015 | .0015 | .0015 | .0015 | .003 | 0 | .0015 | 0 | | |
| Yb | — | — | — | — | — | — | — | — | | |
| Zr | .03 | .015 | .015 | .007 | .015 | .015 | .015 | .007 | | |

Suite No.-- 4G58 ( a through e )

Serial No's.-- 268,913 through 268,917

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 333,900 N. x 516,230 E.

Mine location-- 62 drift

Sample elevation-- 6,805

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- prefault molybdenum-rich ore.

Sample descriptions:

a.--Pinkish-gray, coarse-grained, poorly sorted sandstone. Sand grains are coated with a film of light-gray clay. Disseminated pyrite is sparse. Kaolinite nests are common.

b.--Grayish-black, medium-grained ore sandstone. Sand grains are coated with authigenic carbonaceous material. Kaolinite nests are fewer and smaller than in "a." Pyrite seems to be less prevalent than in "a" but is probably largely concealed by carbonaceous material.

c.--Light-gray medium- to fine-grained sandstone. Seems to be the equivalent of sample "b" but without any authigenic carbonaceous material. The interstices contain large amounts of a light-gray clay.

d.--Dark-gray, medium- to coarse-grained ore sandstone. Each sand grain is coated with a thin film of authigenic carbonaceous material. Some interstitial

carbonaceous blebs are also present. Kaolinite nests are several millimeters across and common. Disseminated pyrite is common, particularly in a few scattered mudstone granules.

e.--Brownish-gray, medium- to coarse-grained ore sandstone. Authigenic carbonaceous material coats sand grains with a thin brownish film but doesn't fill interstices. Otherwise similar to sample "d."

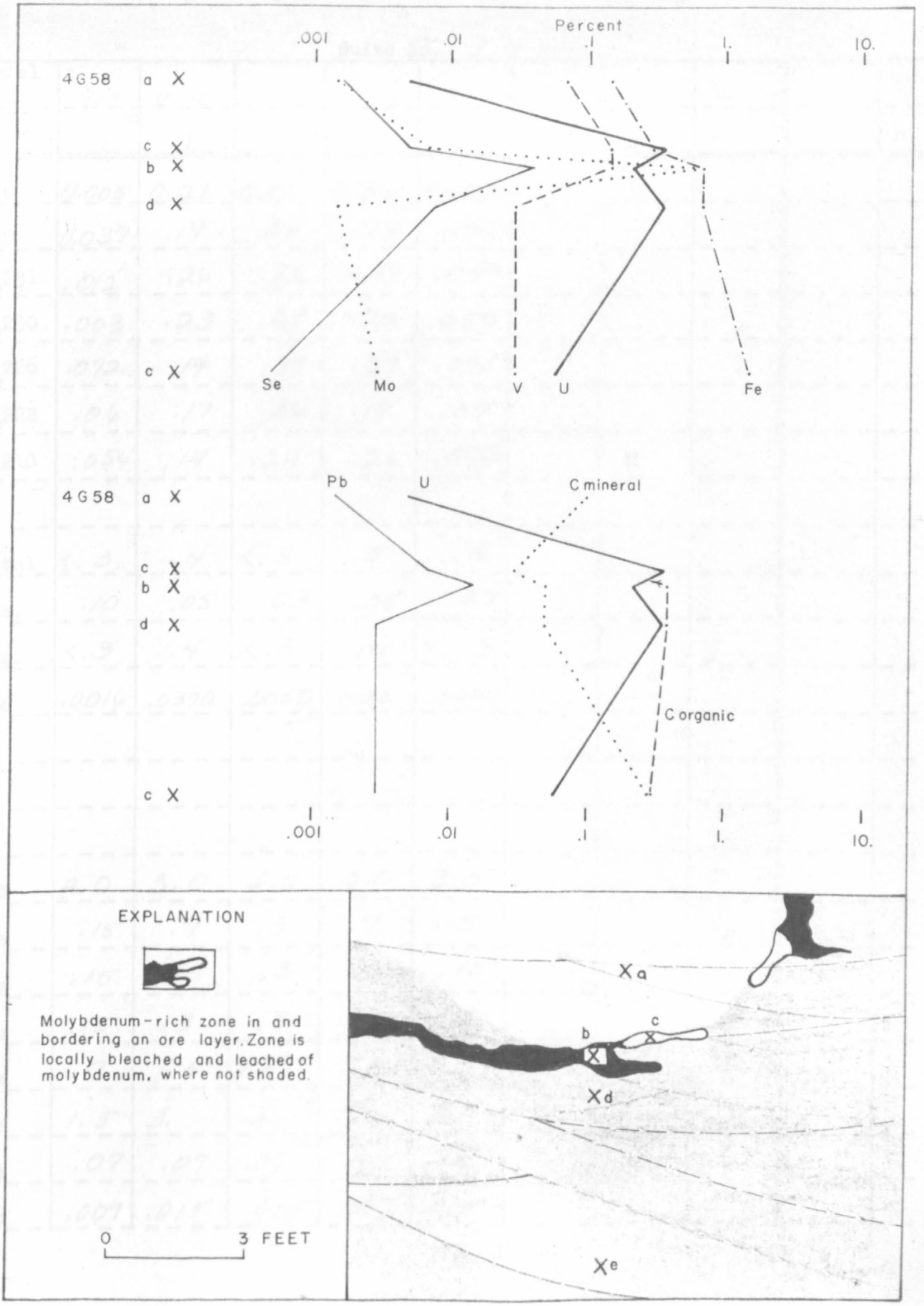



Figure 65.--Sample suite 4G58, Dysart No. 1 mine.

Suite No. 4658

| Serial no. | 268, 913 | 914 | 915 | 916 | 917 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | | | | | |
| U | 0.005 | 0.21 | 0.37 | 0.36 | 0.059 | | | | | |
| eU | 0.037 | .19 | .34 | .26 | .070 | | | | | |
| $ePa^{231}$ | .012 | .26 | .32 | .33 | .059 | | | | | |
| $eTh^{230}$ | .003 | .23 | .27 | .20 | .050 | | | | | |
| $eRa^{226}$ | .072 | .19 | .39 | .27 | .091 | | | | | |
| $eRn^{222}$ | .06 | .17 | .36 | .19 | .07 | | | | | |
| $ePb^{210}$ | .054 | .17 | .23 | .26 | .072 | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | <.3 | .4 | <.3 | .5 | .6 | | | | | |
| $C_{Min.}$ | .10 | .05 | .03 | .05 | .27 | | | | | |
| $C_{Org.}$ | <.3 | .4 | <.3 | .4 | .3 | | | | | |
| Se | .0016 | .0390 | .0050 | .0080 | .0005 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | | | | | |
| Fe | .15 | .7 | .3 | .7 | 1.5 | | | | | |
| Mg | .15 | .15 | .3 | .15 | .15 | | | | | |
| Ca | .15 | .3 | .3 | .15 | 1.5 | | | | | |
| Na | .7 | 1.5 | 1.5 | 1.5 | 1.5 | | | | | |
| K | 1.5 | 3. | 3. | 3. | 3. | | | | | |
| Ti | .07 | .07 | .07 | .03 | .15 | | | | | |
| Mn | .007 | .015 | .015 | .007 | .015 | | | | | |

Suite No. 4G 58 --Continued

| Serial no. | 228 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 23 a | 24 b | 25 c | 26 d | 27 e | | | | | |
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | | | | | |
| Be | .00015 | .00015 | .0003 | .00015 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | 0 | .0007 | <.005 | <.005 | 0 | | | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | .0007 | | | | | |
| Cu | .0003 | .0007 | .00015 | .0007 | .0007 | | | | | |
| Ga | .0003 | .0003 | .0007 | .0003 | .0003 | | | | | |
| Ge | 0 | 0 | <.005 | <.005 | 0 | | | | | |
| La | 0 | 0 | 0 | 0 | 0 | | | | | |
| Mo | .0015 | .7 | .007 | .0015 | .003 | | | | | |
| Nb | 0 | 0 | 0 | 0 | .0015 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .0015 | .015 | .007 | .003 | .003 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .015 | .015 | .015 | .015 | | | | | |
| Tl | 0 | .03 | 0 | 0 | 0 | | | | | |
| V | .07 | .15 | .15 | .03 | .03 | | | | | |
| Y | 0 | .007 | .015 | .0015 | .0015 | | | | | |
| Yb | — | — | .0015 | .00015 | .00015 | | | | | |
| Zr | .007 | .003 | .007 | .003 | .007 | | | | | |

Suite No.-- 7058 ( a through g ) See fig 63.

Serial No's.-- 294,657 through 294,659

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 131,815 N. x 516,360 E.

Mine location-- Incline 76

Sample elevation-- 6,780 ft

Premining water table elevation-- ~6,585 ft

Sampled to test element distribution in-- carbon-impregnated margin of mudstone layer.

Sample descriptions:

a.--Light-gray, fine-grained sandstone. Small kaolinite nests common.

b.--Light-gray, sandy mudstone mottled with dark-gray zones that are impregnated with authigenic carbonaceous material. Disseminated pyrite common in the carbonaceous material.

c.--Light-greenish gray mudstone containing as much as 50 percent sand grains. Biotite flakes are common.

Suite No. 7658

| Serial no. / Field no. | 294, 657 a | 658 b | 659 c | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.083 | 0.27 | 0.018 | | | | | | | |
| eU | I.S.* | .16 | .034 | | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .12 | .83 | .05 | | | | | | | |
| $C_{Min.}$ | I.S.* | .03 | .02 | | | | | | | |
| $C_{Org.}$ | I.S.* | .8 | — | | | | | | | |
| Se | .008 | .0010 | .003 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | | | | | | | |
| Fe | 0.7 | 1.5 | 1.5 | | | | | | | |
| Mg | .7 | .7 | .7 | | | | | | | |
| Ca | .3 | .3 | .3 | | | | | | | |
| Na | 1.5 | 1.5 | 1.5 | | | | | | | |
| K | 3. | 3. | 3. | | | | | | | |
| Ti | .15 | .3 | .3 | | | | | | | |
| Mn | .015 | .015 | .015 | | | | | | | |

* Insufficient sample

Suite No. 7658 --Continued

| Serial no. / Field no. | 294, 657 a | 658 b | 659 c | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | | | | | | | |
| Ba | .07 | .03 | .03 | | | | | | | |
| Be | .00015 | .00015 | .00015 | | | | | | | |
| Bi | 0 | 0 | 0 | | | | | | | |
| Ce | 0 | 0 | 0 | | | | | | | |
| Co | 0 | 0 | 0 | | | | | | | |
| Cr | .0003 | .0003 | .0015 | | | | | | | |
| Cu | .0007 | .0015 | .0015 | | | | | | | |
| Ga | .003 | .003 | .003 | | | | | | | |
| Ge | 0 | 0 | 0 | | | | | | | |
| La | 0 | 0 | 0 | | | | | | | |
| Mo | 0 | .007 | .015 | | | | | | | |
| Nb | 0 | 0 | 0 | | | | | | | |
| Nd | 0 | 0 | 0 | | | | | | | |
| Ni | 0 | 0 | 0 | | | | | | | |
| Pb | .0015 | .007 | .0015 | | | | | | | |
| Sc | 0 | .0007 | .0007 | | | | | | | |
| Sr | .03 | .03 | .03 | | | | | | | |
| Tl | — | — | — | | | | | | | |
| V | .007 | .007 | .007 | | | | | | | |
| Y | .003 | .007 | .003 | | | | | | | |
| Yb | .0003 | .0007 | .0003 | | | | | | | |
| Zr | .03 | .015 | .03 | | | | | | | |

Suite No.-- 22ES59 ( A through E ) See fig. 68.

Serial No's.-- 272,731 through 272,735

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S.A.E.C. Coordinates-- 333,290 N. x 517,450 E.

Mine location-- N. rib of 28-haulageway, 80 ft E. of sta. 121.

Sample elevation-- 6,730 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- A roll-like ore boundary and nearby oxidized sandstone. The bedding plane between samples A and B corresponds to the bedding plane above sample E in suite 23ES59.

Sample descriptions:

A.--Dark-gray to black, very fine grained sandstone. Authigenic carbonaceous material is sparse. Disseminated pyrite is common to abundant.

B.--Interface between dark-gray and light-brown, medium- to coarse-grained sandstone. Light-brown sandstone contains abundant white kaolinite nests; sparse unidentified black crystals perched on sand grains, sparse carbonaceous blebs and some calcite. Dark-gray sandstone has gray and black coating on sand grains with sparse limonite crusts over the black coating. Pyrite is sparse. Kaolinite nests are common.

C.--Grayish-orange-pink, medium- to coarse-grained sandstone. Kaolinite nests are abundant. Calcite cement is common. A thin black coating is present on some grains. Sparse unidentified black crystals are perched on sand grains. Very fine grained disseminated pyrite is sparse.

Suite No. 22ES59. Sample descriptions (Continued)

D.--Light-brown, very coarse grained to conglomeratic, poorly sorted sandstone. Yellow and orange limonite(?) stains and coatings on sand grains are abundant. Red hematite(?) specks are sparse. Kaolinite nests are common.

E.--Grayish-orange-pink, coarse-grained sandstone. Very finely disseminated pyrite is common. Kaolinite nests are common. Small unidentified black crystals and blotches on sand grains are common to sparse.

Suite No. 22 F 5 59

| Serial no. / Field no. | 272, 731 A | 732 B | 733 C | 734 D | 735 E | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | .18 | .009 | .004 | .001 | .007 | | | | | |
| eU | .16 | .049 | .024 | .004 | .016 | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .2 | .7 | — | — | — | | | | | |
| $C_{Min.}$ | .08 | .57 | .09 | .36 | .08 | | | | | |
| $C_{Org.}$ | ≤.2 | ≤.2 | — | — | — | | | | | |
| Se | .0237 | .030 | .010 | .0003 | .0105 | | | | | |
| Mo | ≤.001 | ≤.001 | ≤.001 | ≤.001 | ≤.001 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 1.5 | 3. | 3. | 1.5 | | | | | |
| Fe | .7 | .3 | .15 | .3 | .3 | | | | | |
| Mg | .3 | .15 | .15 | .07 | .07 | | | | | |
| Ca | .7 | 1.5 | .2 | 1.5 | .3 | | | | | |
| Na | .7 | .7 | 1.5 | 1.5 | .7 | | | | | |
| K | 1.5 | 1.5 | 3. | 3. | 1.5 | | | | | |
| Ti | .15 | .02 | .02 | .07 | .03 | | | | | |
| Mn | .015 | .03 | .015 | .015 | .015 | | | | | |

Suite No. 22ES59 --Continued

| Serial no. | 232, 731 | 732 | 733 | 734 | 735 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | | | | | |
| B | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .07 | .07 | .07 | .03 | | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | <.005 | 0 | 0 | 0 | 0 | | | | | |
| Cr | .007 | .007 | .007 | .003 | .003 | | | | | |
| Cu | .007 | .003 | .003 | .007 | .007 | | | | | |
| Ga | .003 | .0015 | .007 | .003 | .0015 | | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | | | | | |
| La | 0 | 0 | 0 | 0 | 0 | | | | | |
| Mo | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .015 | .003 | .015 | .015 | .015 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .015 | .015 | .015 | .007 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .03 | .03 | .03 | .02 | .015 | | | | | |
| Y | .003 | 0 | 0 | 0 | 0 | | | | | |
| Yb | .0003 | .0015 | 0 | 0 | 0 | | | | | |
| Zr | .007 | .007 | .007 | .007 | .007 | | | | | |

Suite No.-- 59ES59 ( 1 through 9B )

Serial No's.-- 277,673 through 277,682

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 333,633 N. x 518,130 E.

Mine location-- South rib 40' west of Δ314

Sample elevation-- 6,706 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- a complex prefault ore zone rich in molybdenum and displaying some diffusion banding.

Sample descriptions:

1.--Dark-gray, fine-grained ore sandstone. Almost all interstices are filled with authigenic carbonaceous material. Disseminated pyrite is probably abundant but largely masked by carbonaceous material. Kaolinite nests are very small and sparse.

2.--Moderate-yellowish-brown, medium-grained sandstone. Authigenic carbonaceous material forms scattered small black interstitial blebs and may form the brown films that stains most sand grains. Disseminated pyrite and kaolinite nests are common.

3.--Streaked, moderate-yellowish-brown and grayish-brown, coarse-grained ore sandstone. Authigenic carbonaceous material forms dark films on sand grains and scattered blebs in the interstices in the grayish streaks and may provide the pale-brown stain in the yellowish areas. Kaolinite nests are common to abundant. Disseminated pyrite is common. Quartz overgrowths and calcite cement are sparse to common.

4.--Black, fine-grained sandstone. Molybdenum-rich authigenic carbonaceous material

Suite No. 59ES59 . Sample descriptions (Continued)

forms a thin film on each sand grain. Calcite cement is common. Kaolinite nests, disseminated pyrite, and quartz overgrowths are sparse to common.

5.--Pale-yellowish, medium- to coarse-grained sandstone. Authigenic carbonaceous material occurs as very sparse interstitial blebs and, perhaps, as a pale-brown stain on sand grains. Calcite cement is common. Disseminated pyrite and quartz overgrowths are sparse. Kaolinite nests are common.

6.--Pinkish-gray, medium-grained sandstone. Disseminated pyrite and quartz overgrowths are sparse. Interstitial clay is common.

7.--Light-olive-gray, coarse-grained sandstone. Authigenic carbonaceous material forms scattered sparse interstitial blebs. Pyrite, kaolinite nests, and calcite cement are common.

8.--Brownish-gray, coarse-grained ore sandstone. Authigenic carbonaceous material forms interstitial blebs in certain laminae and bedding planes. Kaolinite nests are abundant. Pyrite and quartz overgrowths are sparse. Calcite cement is common.

9A.--Black, fine-grained, silty sandstone. Molybdenum-rich material coats most sand grains. Calcite cement is sparse.

9B.--Medium-gray, fine-grained sandstone. Authigenic carbonaceous material forms a few scattered interstitial blebs. Pyrite is abundant bordering sample "9A." Calcite cement is abundant.

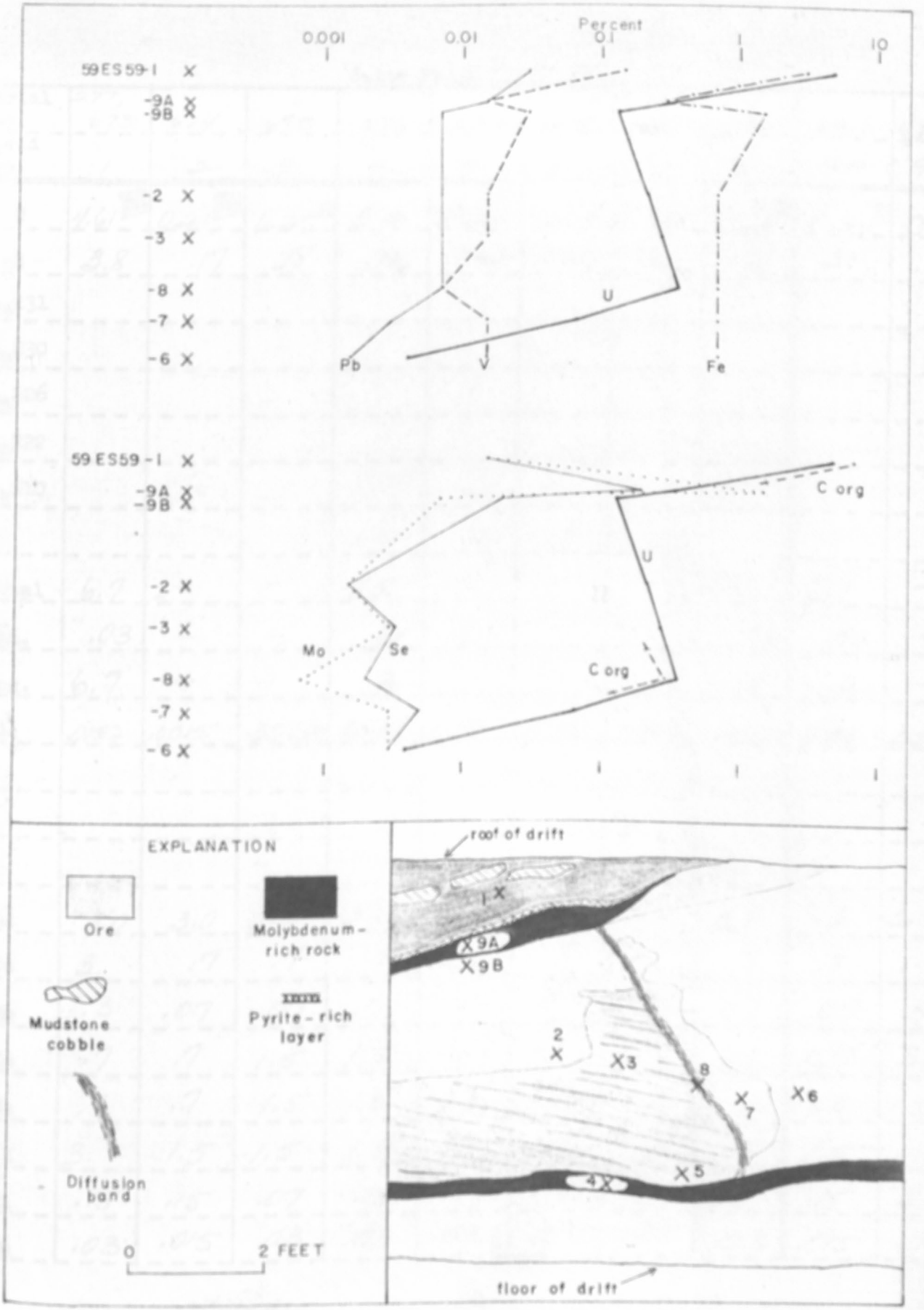



Figure 66.--Sample suite 59ES59, Dysart No. 1 mine.

Suite No. 59ES59

| Serial no. / Field no. | 277, 673 / 1 | 674 / 2 | 675 / 3 | 676 / 4 | 677 / 5 | 678 / 6 | 679 / 7 | 680 / 8 | 681 / 9A | 682 / 9B |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 4.61 | 0.21 | 0.27 | 0.10 | 0.020 | 0.004 | 0.064 | 0.36 | 0.34 | 0.13 |
| eU | 3.8 | .17 | .18 | .096 | .042 | .020 | .064 | .21 | .31 | .19 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 6.7 | — | — | 0.5 | — | — | — | 0.6 | 0.1 | — |
| $C_{Min.}$ | .03 | — | — | .31 | — | — | — | .29 | .02 | — |
| $C_{Org.}$ | 6.7 | — | — | .2 | — | — | — | .3 | <.2 | — |
| Se | .0152 | .0015 | .0032 | .0570 | .0150 | .0030 | .0050 | .0020 | .2100 | .0200 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 1.5 | 3.0 | 3.0 | 1.5 | 3.0 |
| Fe | 3. | .7 | .7 | .3 | .7 | .7 | .7 | .7 | .3 | 1.5 |
| Mg | .3 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .15 |
| Ca | .7 | .7 | 1.5 | 1.5 | 3.0 | .7 | 1.5 | 1.5 | 0.7 | 3. |
| Na | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | 3. | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Ti | .15 | .15 | .07 | .15 | .07 | .15 | .15 | .07 | .15 | .15 |
| Mn | .03 | .015 | .03 | .03 | .03 | .015 | .03 | .03 | .015 | .03 |

Suite No. 59ES59--Continued

| Serial no. | 673 | 674 | 675 | 676 | 677 | 678 | 679 | 680 | 681 | 682 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9A | 9B |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .15 |
| Be | .0007 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 | .00015 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | .03 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.005 | <.005 | <.005 | <.005 | 0 | 0 | <.005 | <.005 | <.005 | <.005 |
| Cr | .0015 | .0015 | .0003 | .0007 | .0003 | .0007 | .0003 | .0003 | .0003 | .0007 |
| Cu | .007 | .0007 | .0007 | .0015 | .0007 | .0015 | .0007 | .0015 | .003 | .0007 |
| Ga | — | d | d | d | d | d | d | d | d | .0003 |
| Ge | <.005 | 0 | 0 | 0 | 0 | 0 | 0 | <.005 | <.005 | 0 |
| La | .015 | 0 | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 |
| Mo | .015 | .0015 | .003 | .3 | .003 | .003 | .003 | .0007 | 1.5 | .007 |
| Nb | 0 | .0015 | .0015 | .0015 | 0 | .0015 | .0015 | .0015 | .0015 | .0015 |
| Nd | .015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .03 | .007 | .007 | .007 | .007 | .0015 | .003 | .007 | .015 | .007 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |
| Tl | 0 | 0 | 0 | d | 0 | 0 | 0 | 0 | .03 | 0 |
| V | .15 | .015 | .015 | .015 | .015 | .015 | .015 | .007 | .015 | .03 |
| Y | .003 | .0015 | .0015 | .0015 | 0 | 0 | .003 | 0 | 0 | 0 |
| Yb | — | .0003 | .0003 | .0003 | 0 | .00015 | .0003 | .00015 | .00015 | .00015 |
| Zr | .007 | .03 | .007 | .03 | .007 | .015 | .003 | .007 | .007 | .015 |

Suite No.-- 89ES59 ( 1 through 4 )

Serial No's.-- 277,075 through 277,078

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 333,520 N. x 517,620 E.

Mine location-- NE corner at 236 haulage and Rm 12 off 236 haulage

Sample elevation-- 6,800 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- a highly jointed postfault ore body.

Sample descriptions:

1.--Medium-light-gray, coarse-grained sandstone. Disseminated pyrite and calcite cement are sparse. Kaolinite nests are common and locally lightly colored by green and yellow uranium and vanadium stains. Fine black perched needles of montroseite are common.

2.--Medium-gray, coarse- to medium-grained sandstone with a faint purplish caste. Calcite cement is common. Otherwise similar to sample "1."

3.--Light-olive-gray, very coarse grained sandstone. Similar to sample "2."

4.--Medium-gray, medium- to coarse-grained sandstone. Similar to sample "2" except that quartz overgrowths are common and calcite cement is sparse.

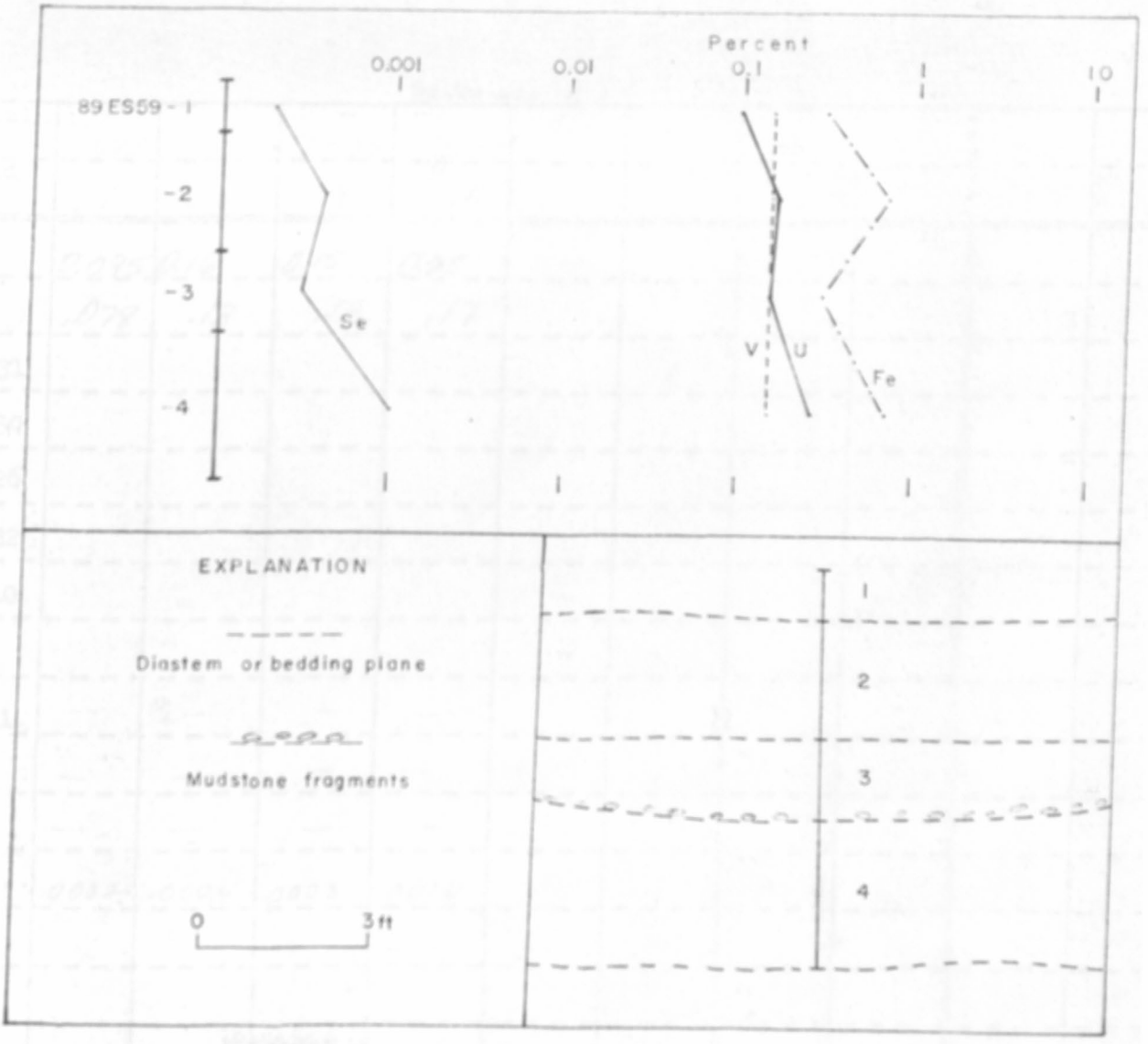



Figure 67.--Sample suite 89ES59, Dysart No. 1 mine.

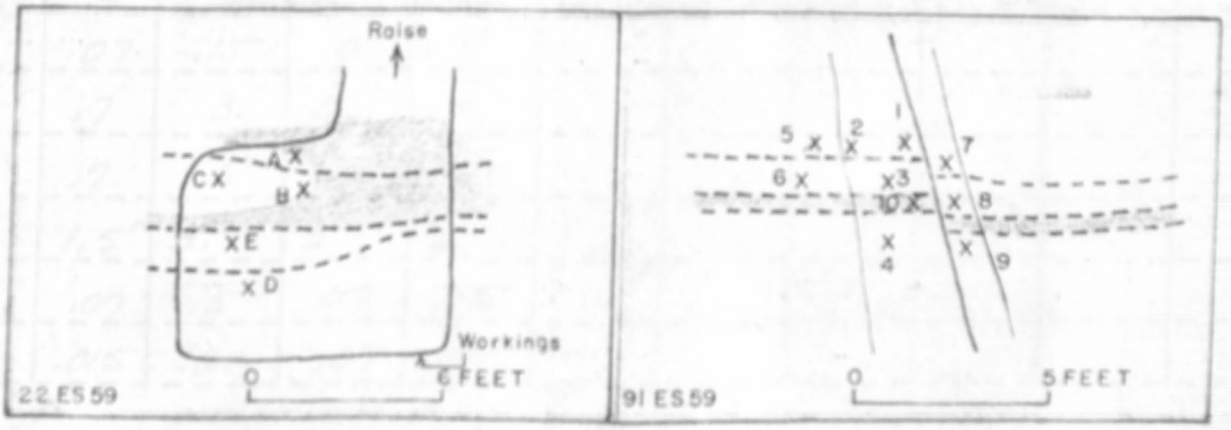



Figure 68.--Sample suites 22ES59 and 91ES59, Dysart No. 1 mine.

Suite No. 89ES59

| Serial no. | 277, 075 | 076 | 077 | 078 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | | | | | | |
| U | 0.095 | 0.16 | 0.15 | 0.25 | | | | | | |
| eU | .078 | .13 | .13 | .17 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | — | | | | | | |
| $C_{Min.}$ | — | — | — | — | | | | | | |
| $C_{Org.}$ | — | — | — | — | | | | | | |
| Se | .0002 | .0004 | .0003 | .0010 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 7.0 | 7.0 | 7.0 | | | | | | |
| Fe | .3 | .7 | .3 | .7 | | | | | | |
| Mg | .07 | .15 | .07 | .15 | | | | | | |
| Ca | .7 | 3. | 3. | .3 | | | | | | |
| Na | .7 | 1.5 | 1.5 | 1.5 | | | | | | |
| K | 1.5 | 3. | 3. | 3. | | | | | | |
| Ti | .07 | .15 | .07 | .15 | | | | | | |
| Mn | .015 | .03 | .07 | .03 | | | | | | |

Suite No. 89ES59 --Continued

| Serial no. | 277, 025 | 026 | 027 | 028 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | | | | | | |
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .15 | .15 | .7 | .07 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | 0 | <.002 | <.002 | <.002 | | | | | | |
| Cr | .0003 | .0007 | .0003 | .0003 | | | | | | |
| Cu | .0003 | .0003 | .0007 | .0003 | | | | | | |
| Ga | d | d | d | d | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | .003 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | 0 | d | d | d | | | | | | |
| Sc | 0 | 0 | 0 | 0 | | | | | | |
| Sr | .015 | .03 | .03 | .03 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .15 | .15 | .15 | .15 | | | | | | |
| Y | d | .0015 | 0.0015 | .0015 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .007 | .015 | .015 | .015 | | | | | | |

Suite No.-- 91ES59 ( 1 through 10 ) See fig. 68.

Serial No's.-- 277,079 through 277,088

Mine-- Dysart No. 1

Level--

Sec. 11 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 333,900 N. x 515,970 E.

Mine location-- east rib of drift along Kermac 10 line 10 feet south of △437.

Sample elevation-- 6,735 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- postfault ore related to minor fault.

Sample descriptions:

1.--Pale-yellowish-brown, very coarse grained sandstone. Calcite cement and kaolinite nests are common to abundant. An extremely fine-grained, black mineral perched on sand grains may be häggite. Note that sample is relatively high in U and low in V compared to sample "2."

2.--Mottled dark-gray and light-olive-gray, very coarse grained sandstone. Kaolinite nests are common and locally stained yellow. Yellow secondary U and V minerals are sparse (post mining?). Calcite cement and disseminated pyrite are common. Perched black minerals (häggite?) are sparse. Note that sample is low in U and high in V relative to sample "1."

3.--Mottled olive-gray and yellowish-brown, coarse-grained sandstone. Small black vanadium(?) mineral grains perched on the sand grains are common. Kaolinite nests are common and stained yellow by post mining oxidation of vanadium minerals.

Suite No. 91ES59 . Sample descriptions (Continued)

4.--Light-olive-gray, coarse- to very coarse grained sandstone. Calcite cement and kaolinite aggregates are abundant. Disseminated pyrite is sparse.

5.--Light-olive-gray, very coarse grained sandstone. Calcite cement is common to abundant. Kaolinite aggregates are common and disseminated pyrite is sparse.

6.--Light-olive-gray, coarse-grained sandstone. Kaolinite nests are sparse.

7.--Light-olive-gray, very coarse grained sandstone. Considerable interstitial white clay is present but may not be kaolinite. Quartz overgrowths are sparse. Sparse black vanadium minerals are perched on sand grains.

8.--Similar to sample "6" but with sparse black vanadium(?) minerals perched on the sand grains.

9.--Pale-brown, coarse- to very coarse grained sandstone. Calcite cement is common. Quartz overgrowths, disseminated black vanadium(?) minerals, and pyrite are sparse. Kaolinite aggregates are abundant.

10.--Pale-yellowish-brown, coarse-grained sandstone. Mottled gray and yellowish-gray by post mining oxidation. The darker zones contain sparse to common black vanadium(?) minerals perched on sand grains. Kaolinite aggregates are sparse.

Suite No. 91ES 59

| Serial no. / Field no. | 277, 079 / 1 | 080 / 2 | 082 / 3 | 082 / 4 | 083 / 5 | 084 / 6 | 085 / 7 | 086 / 8 | 087 / 9 | 088 / 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.21 | 0.087 | 0.078 | 0.054 | 0.051 | 0.033 | 0.062 | 0.064 | 0.094 | 0.24 |
| eU | .14 | .078 | .066 | .053 | .050 | .035 | .062 | .066 | .083 | .13 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | — | — | — | — | — | .4 | — | — | — |
| $C_{Min.}$ | — | — | — | — | — | — | .37 | — | — | — |
| $C_{Org.}$ | — | — | — | — | — | — | <.2 | — | — | — |
| Se | .0020 | .0062 | .0270 | .0100 | .0235 | .0150 | .0010 | .0003 | .0038 | .0250 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 3.0 | 7.0 | 3.0 | 7.0 | 7.0 |
| Fe | .3 | 1.5 | .3 | .7 | .7 | .3 | .3 | .3 | .7 | .3 |
| Mg | .15 | .15 | .15 | .15 | .07 | .07 | .07 | .15 | .15 | .15 |
| Ca | 1.5 | 1.5 | .7 | 1. | 3. | .7 | 1.5 | .3 | 1.5 | .7 |
| Na | 1.5 | 1.5 | 1.5 | 3. | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. |
| Ti | .07 | .15 | .15 | .15 | .07 | .07 | .07 | .07 | .07 | .07 |
| Mn | .015 | .03 | .007 | .15 | .03 | .007 | .015 | .007 | .015 | .015 |

Suite No. 91E559 --Continued

| Serial no. | 277, 579 | 580 | 581 | 582 | 583 | 584 | 585 | 586 | 587 | 588 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .15 | .15 | .07 | .15 | .15 | .07 | .15 | .07 | .15 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.002 | .0007 | 0 | 0 | .0007 | 0 | d | 0 | .0007 | <.002 |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 | .00015 |
| Cu | .0003 | .0007 | .0003 | .0003 | .0007 | .0003 | .0003 | .0003 | .0003 | .0003 |
| Ga | d | d | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 | 0 | 0 |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | .0003 | 0 | 0 | .0003 | 0 | 0 | 0 | 0 | 0 |
| Pb | .0015 | .0015 | d | d | .0015 | d | d | d | .0015 | d |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .03 | .015 | .03 | .03 | .015 | .03 | .03 | .03 | .03 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .15 | .3 | .3 | .07 | .03 | .07 | .07 | .07 | .15 | .15 |
| Y | d | d | d | .0015 | .0015 | d | .0015 | .0015 | .0015 | d |
| Yb | — | — | — | — | .00015 | — | — | — | — | — |
| Zr | .007 | .003 | .007 | .007 | .015 | .003 | .03 | .015 | .007 | .003 |

Suite No.-- 12d60 ( A through D )

Serial No's.-- 304,744 through 304,747

Mine-- Isabella

Level--

Sec. 7 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- 304,245 N. x 530,415 E.

Mine location-- NW end of 1NW

Sample elevation-- 6,725 ft

Premining water table elevation-- ~6,575 ft

Sampled to test element distribution in--a postfault ore body adjacent to a fault.

Sample descriptions:

A.--Light-olive-gray, coarse-grained sandstone. Quartz overgrowths and kaolinite nests are common. Calcite cement is spotty but common to abundant. Disseminated pyrite is sparse to common. Many sand grains are partly coated with a dull-black film.

B.--Olive-gray, coarse-grained sandstone. Very similar to "A."

C.--Same as "B."

D.--Streaked yellowish-gray and medium-light-gray fault gouge. Sand grains in a white clay to gray matrix. Pyrite is disseminated in the gray clay.

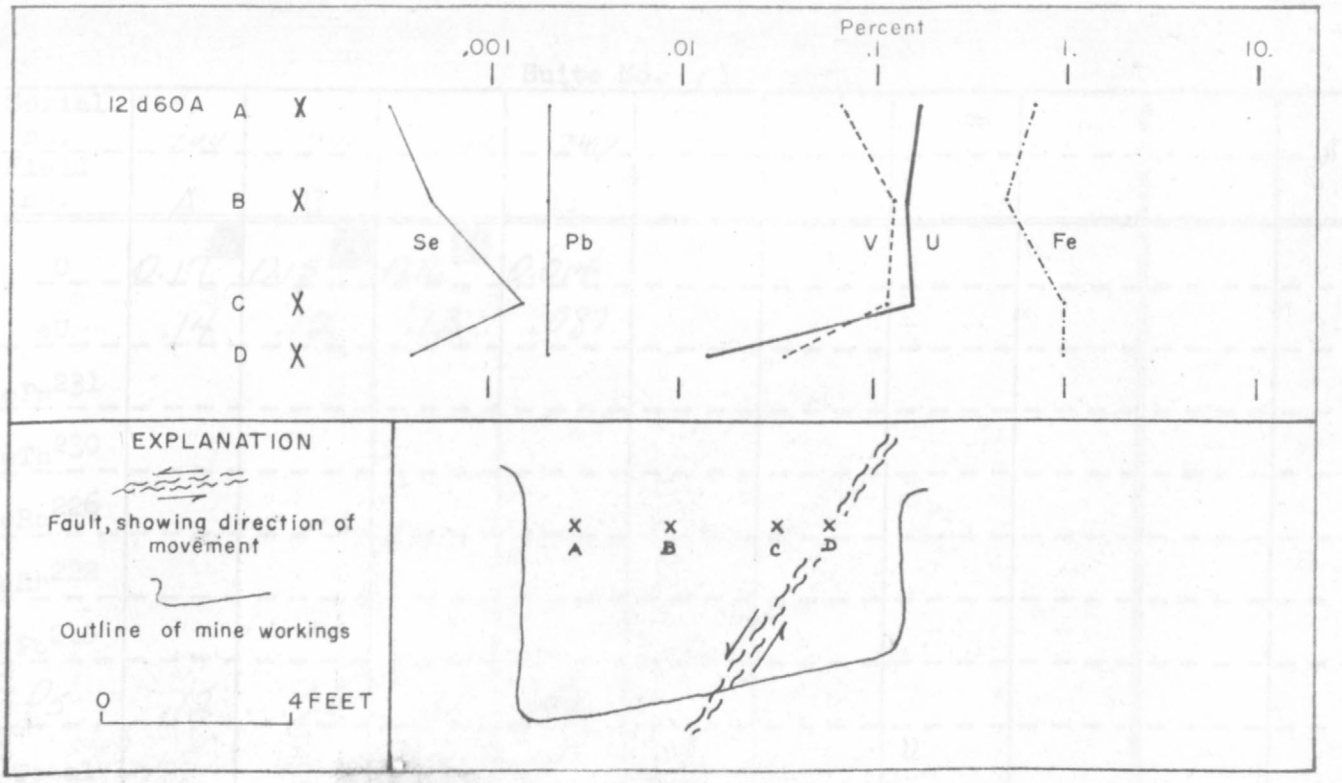



Figure 69.--Sample suite 12d60, Isabella mine.

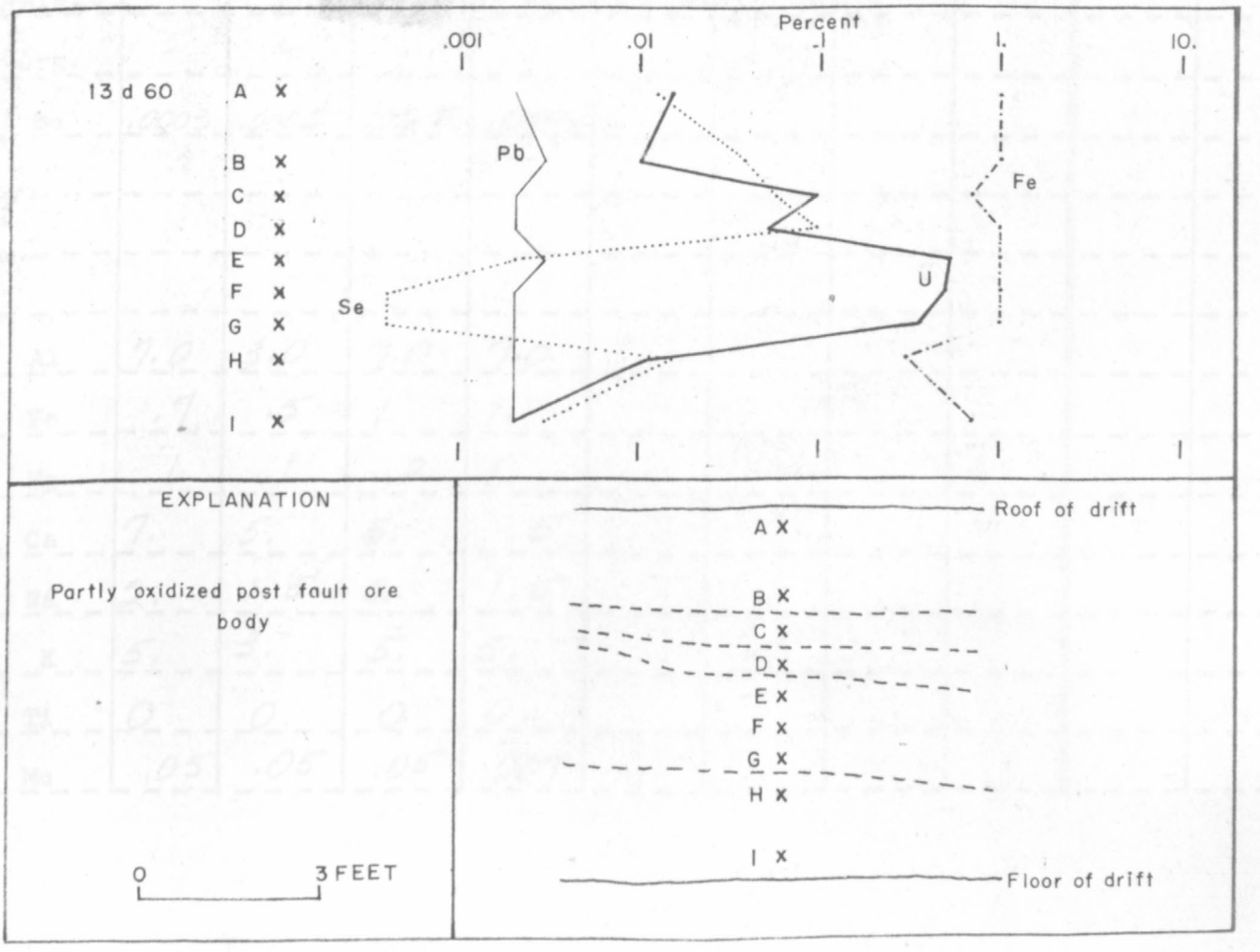



Figure 70.--Sample suite 13d60, Isabella mine.

Suite No. 12d 60

| Serial no. / Field no. | 304, 244 A | 245 B | 246 C | 247 D | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.17 | 0.15 | 0.16 | 0.014 | | | | | | |
| eU | .14 | .12 | .13 | .087 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | .12 | .23 | .21 | .06 | | | | | | |
| $C_{Total}$ | – | – | – | – | | | | | | |
| $C_{Min.}$ | – | – | – | – | | | | | | |
| $C_{Org.}$ | – | – | – | – | | | | | | |
| Se | .0003 | .0005 | .0015 | .0004 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 3.0 | 7.0 | 7.0 | | | | | | |
| Fe | .7 | .5 | 1. | 1. | | | | | | |
| Mg | .1 | .1 | .2 | 1. | | | | | | |
| Ca | 7. | 5. | 5. | .5 | | | | | | |
| Na | 2. | 1.5 | 2. | 1.5 | | | | | | |
| K | 5. | 3. | 5. | 5. | | | | | | |
| Ti | 0 | 0 | 0 | 0 | | | | | | |
| Mn | .05 | .05 | .05 | .007 | | | | | | |

Suite No. 12 & 60 --Continued

| Serial no. / Field no. | 304, 744 A | 745 B | 746 C | 747 D | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .1 | .07 | .15 | .15 | | | | | | |
| Be | 0 | 0 | 0 | .00015 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | <.005 | <.005 | <.005 | 0 | | | | | | |
| Cr | .0005 | .0005 | .0007 | .0007 | | | | | | |
| Cu | .001 | .002 | .0015 | .003 | | | | | | |
| Ga | .0015 | .001 | .0015 | .001 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | .003 | .003 | .003 | .003 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | .002 | .002 | .002 | .002 | | | | | | |
| Sc | 0 | 0 | 0 | .0005 | | | | | | |
| Sr | .02 | .015 | .015 | .015 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .15 | .2 | .2 | .05 | | | | | | |
| Y | .0015 | .0015 | .002 | .001 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .005 | .02 | .005 | .007 | | | | | | |

Suite No.-- 13d60 ( A through I ) See fig. 70.

Serial No's.-- 304,748 through 304,756

Mine-- Isabella

Level--

Sec. 7 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- 304,070 N. x 530,825 E.

Mine location-- 16 ft W. of sta. 37.

Sample elevation-- ~6,725 ft

Premining water table elevation-- ~6,575 ft

Sampled to test element distribution in-- a partly oxidized postfault ore layer.

Sample descriptions:

A.--Yellowish-brown, medium-grained sandstone. Quartz overgrowths and kaolinite nests are sparse. Calcite cement is common to abundant. All but the kaolinite and calcite are stained by limonite.

B.--Similar to "A."

C.--Dusky-yellow, coarse-grained sandstone. Quartz overgrowths are common; kaolinite nests are sparse. Poikiloblastic calcite cement is common but seems to have been partly removed during oxidation. Limonite stain is abundant.

D.--Light-olive-gray, fine- to medium-grained sandstone. Disseminated pyrite, quartz overgrowths, and kaolinite nests are common. Calcite cement is sparse.

E.--Olive-gray, medium-grained ore sandstone. Very similar to "D" except for a dark-gray film that coats many sand grains.

--Grayish-olive, medium-grained ore sandstone similar to "E."

Suite No. 13d60 . Sample descriptions (Continued)

G.--Same as "F."

H.--Grayish-yellow, medium- to coarse-grained oxidized sandstone. Quartz overgrowths and kaolinite nests are common. Limonite stain is common on the sand grains and in some of the interstitial clay.

I.--Grayish-orange, medium- to coarse-grained oxidized sandstone very similar to "H."

Suite No. 13d 60

| Serial no. | 304, 248 | 249 | 250 | 251 | 252 | 253 | 254 | 255 | 256 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | H | I | |
| U | 0.015 | 0.010 | 0.095 | 0.051 | 0.52 | 0.50 | 0.36 | 0.011 | 0.002 | |
| eU | .007 | .019 | .090 | .064 | .33 | .34 | .26 | .029 | .007 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $2\ O_5$ | .01 | .06 | .02 | .03 | .11 | .21 | .14 | .02 | .02 | |
| $C_{Total}$ | — | — | — | — | .53 | — | — | — | — | |
| $C_{Min.}$ | — | — | — | — | .46 | — | — | — | — | |
| $C_{Org.}$ | — | — | — | — | <.1 | — | — | — | — | |
| Se | .0125 | .0375 | .0575 | .0950 | .0020 | .0004 | .0004 | .0150 | .0030 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | 3.0 | 3.0 | 3.0 | 7.0 | 3.0 | 3.0 | 3.0 | 3.0 | |
| Fe | 1. | 1. | .7 | 1. | 1. | 1. | 1. | .3 | .7 | |
| Mg | .2 | .2 | .15 | .15 | .2 | .2 | .2 | .1 | .1 | |
| Ca | 5. | 3. | 7. | 2. | 2. | 2. | 3. | 2. | 2. | |
| Na | 2. | 1.5 | 2. | 1.5 | 2. | 1.5 | 1.5 | 2. | 1. | |
| K | 5. | 2. | 3. | 3. | 3. | 3. | 2. | 3. | 2. | |
| Ti | .1 | .15 | .15 | .2 | .1 | .15 | .2 | .03 | .3 | |
| Mn | .03 | .03 | .05 | .05 | .02 | .02 | .02 | .015 | .03 | |

Suite No. 13d 60 --Continued

| Serial no. / Field no. | 304 748 A | 749 B | 750 C | 751 D | 752 E | 753 F | 754 G | 755 H | 756 I | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ba | .7 | .07 | .1 | .1 | .1 | .15 | .07 | .1 | .07 | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ce | 0 | 0 | 0 | 0 | <.02 | 0 | 0 | 0 | 0 | |
| Co | 0 | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | .0007 | |
| Cu | .0015 | .003 | .003 | .003 | .003 | .0015 | .0015 | .001 | .002 | |
| Ga | .001 | .001 | .0015 | .001 | .001 | .001 | .001 | .001 | .001 | |
| Ge | 0 | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 | 0 | |
| La | .003 | 0 | .003 | .003 | .005 | .003 | .005 | .003 | 0 | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nb | 0 | .001 | .001 | .001 | .0015 | .0015 | .0015 | 0 | .0015 | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pb | .002 | .003 | .002 | .002 | .003 | .002 | .002 | .002 | .002 | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sr | .015 | .015 | .02 | .01 | .02 | .015 | .015 | .015 | .01 | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| V | .01 | .03 | .01 | .015 | .15 | .2 | .15 | .02 | .007 | |
| Y | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 | .001 | .0015 | |
| Yb | .0002 | .0003 | .0003 | .0005 | — | — | — | .0002 | .0003 | |
| Zr | .007 | .007 | .01 | .01 | .01 | .005 | .015 | .005 | .02 | |

**Suite No.--** 26G58 ( a **through** f )

**Serial No's.--** 268,939 **through** 268,944

**Mine--** Marquez

**Level--** Main

**Sec.** 23 , **Twp.** 13 , **Rge.** 9 --

**U.S.A.E.C. Coordinates--** -------- **N. x** ---------- **E.**

**Mine location--** South 1 drift; S-2605 x W-2175

**Sample elevation--** 6,705 ft

**Premining water table elevation--** about 6,650 feet(?)

**Sampled to test element distribution in--** A thin, high-grade prefault ore layer overlain by molybdenum-rich zones.

**Sample descriptions:** Locality characterized by abundant ilsemannite on mine wall above ore layer. Ore layer was at floor of drift, prohibiting collection of samples below.

a.--Light-gray, fine- to medium-grained sandstone. Scattered kaolinite nests 2-3 mm across. Very fine-grained disseminated pyrite is common. Very sparse clusters of anatase perched on sand grains.

b.--Light- to medium-dark gray, fine- to medium-grained sandstone. Rock is quite porous but each sand grain is coated with "jordisite." Scattered kaolinite nests 3-5 mm across. Rock partly cemented by finely disseminated calcite.

c.--Grayish-black, fine- to medium-grained sandstone and very-light gray, medium- to coarse-grained sandstone with scattered mudstone granules. The dark rock is "jordisite"-rich; the light rock is barren. Scattered, 2-4 mm kaolinite nests throughout. Pyrite is sparse except as minute grains disseminated in mudstone granules.

Suite No. 26G58 . Sample descriptions (Continued)

d.--Dark-gray to grayish-black, fine-grained sandstone. All sand grains are coated with "jordisite."

e.--Dark-gray, fine- to very fine-grained sandstone with some medium- to coarse-grained laminae. The pores are largely filled with authigenic carbonaceous material. Pyrite is very sparse. Kaolinite is present but the aggregates are not much larger than sand-grain size.

f.--Similar to "e" except that the upper half of the sample contains granule- and pebble-sized mudstone plates.

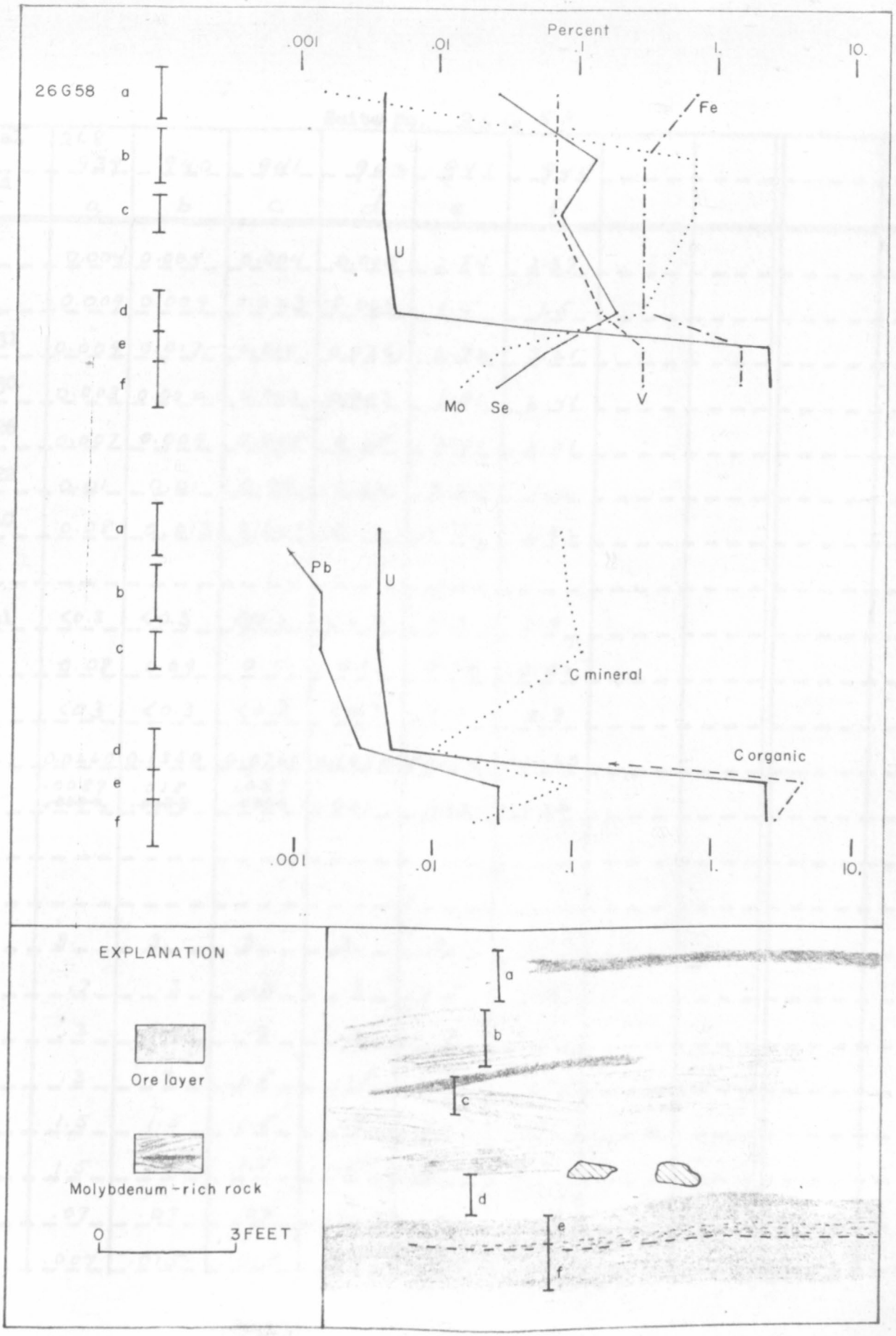



Figure 71.--Sample suite 26G58a, Marquez mine.

Suite No. 26G58

| Serial no. / Field no. | 268, 939 a | 940 b | 941 c | 942 d | 943 e | 944 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.004 | 0.004 | 0.004 | 0.005 | 2.34 | 2.37 | | | | |
| eU | 0.009 | 0.009 | 0.023 | 0.069 | 1.5 | 1.5 | | | | |
| $ePa^{231}$ | 0.009 | 0.017 | 0.010 | 0.036 | 2.72 | 3.21 | | | | |
| $eTh^{230}$ | 0.003 | 0.002 | 0.003 | 0.003 | 1.91 | 2.41 | | | | |
| $eRa^{226}$ | 0.007 | 0.009 | 0.048 | 0.15 | 2.01 | 2.21 | | | | |
| $eRn^{222}$ | 0.01 | 0.01 | 0.04 | 0.12 | 0.85 | 1.0 | | | | |
| $ePb^{210}$ | 0.08 | 0.013 | 0.029 | 0.12 | 1.73 | 1.92 | | | | |
| | | | | | -1/ | | | | | |
| $C_{Total}$ | <0.3 | <0.3 | <0.3 | <0.3 | 4.3 | 2.9 | | | | |
| $C_{Min.}$ | 0.08 | 0.09 | 0.11 | 0.01 | 0.09 | 0.02 | | | | |
| $C_{Org.}$ | <0.3 | <0.3 | <0.3 | <0.3 | 4.2 | 2.9 | | | | |
| Se | 0.0260 | 0.1350 | 0.0760 | 0.1950 | 0.0470 | 0.0260 | | | | |
| As | .0087 ~~.0004~~ | .018 ~~.0033~~ | .037 ~~.0006~~ | .031 | .033 | .022 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Fe | .7 | .3 | .3 | .3 | 1.5 | 1.5 | | | | |
| Mg | .3 | .15 | .3 | .3 | .7 | .7 | | | | |
| Ca | .3 | .7 | 1.5 | .15 | .7 | .7 | | | | |
| Na | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | | | | |
| K | 1.5 | 1.5 | 1.5 | 1.5 | 3. | 3. | | | | |
| Ti | .07 | .07 | .07 | .15 | .07 | .07 | | | | |
| Mn | .007 | .015 | .015 | .015 | .03 | .03 | | | | |

Suite No. 2465F-Continued

| Serial no. / Field no. | 2468, 939 a | 940 b | 941 c | 942 d | 943 e | 944 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | .003 | .003 | | | | |
| Ba | .03 | .03 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | 0 | .00015 | .0007 | .0007 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | d | 0 | | | | |
| Co | 0 | .0015 | .0007 | .0015 | <.005 | <.005 | | | | |
| Cr | .0003 | .0003 | .0003 | .003 | .0007 | .0007 | | | | |
| Cu | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | | | | |
| Ga | .0003 | .0003 | .0003 | .0003 | .0015 | .0015 | | | | |
| Ge | 0 | 0 | 0 | 0 | <.005 | <.005 | | | | |
| La | 0 | 0 | 0 | 0 | .007 | .003 | | | | |
| Mo | .0015 | .7 | .7 | .3 | .03 | .015 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | .015 | 0 | | | | |
| Ni | 0 | .0007 | .0003 | .0007 | 0 | 0 | | | | |
| Pb | 0 | .0015 | .0015 | .003 | .03 | .03 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .007 | .007 | .015 | .015 | .015 | .015 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .07 | .07 | .07 | .15 ~~.07~~ | .3 | .3 | | | | |
| Y | 0 | 0 | 0 | 0 | .003 | .0015 | | | | |
| Yb | — | — | — | — | — | — | | | | |
| Zr | .015 | .007 | .003 | .015 | .015 | .015 | | | | |

Suite No.-- 113G61 ( a through h )

Serial No's.-- 294,471 through 294,478

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- N. x E.

Mine location-- 1st cross cut left off N-1

Sample elevation-- 6,675 ft

Premining water table elevation-- ~ 6,625 ft

Sampled to test element distribution in--a very thin ore layer enclosed by dark, but reportedly (by the mine officials) barren rock.

Sample descriptions:

a.--Pale-yellowish-brown, fine-grained sandstone. Minute disseminated pyrite grains are sparse. Kaolinite aggregates less than 0.5 mm across are common but inconspicuous.

b.--Medium-dark-gray, medium-grained, poorly sorted sandstone. Each sand grain is coated with a very thin film of light-brownish-gray material. Pyrite is extremely fine grained and sparse. Kaolinite nests, 2-3 mm across, are abundant and conspicuous.

c.--Medium-dark-gray, coarse-grained sandstone. Sparse blebs of authigenic carbonaceous material fill some interstices. Many sand grains are coated with a gray material which may not be organic. Pyrite is sparse. Kaolinite nests are common and several millimeters across.

d.--Mottled dusky-yellow and light-olive-gray, coarse-grained sandstone with scattered mudstone granules and pebbles. Pyrite and quartz overgrowths are sparse. Kaolinite

nests are abundant and several millimeters across. Calcite cement is sparse. A little stain, possibly limonite, was noted locally.

e.--Light-olive-gray, medium-grained sandstone. Kaolinite nests and quartz overgrowths are sparse.

f.--Dark-gray, medium-grained sandstone with scattered greenish-gray mudstone fragments. Black authigenic carbonaceous material fills nearly all the interstices. Disseminated pyrite is abundant, particularly in the mudstone fragments. Kaolinite nests are small and sparse.

g.--Olive-gray to light-olive-gray, fine-grained sandstone. Some of the sand grains seem to be stained with a dark-brown stain and a few interstices are filled with black authigenic carbonaceous material. Kaolinite nests are small and sparse.

h.--Medium-light-gray, fine-grained sandstone with scattered coarse sand grains. Disseminated pyrite is common. Kaolinite nests and a greenish interstitial clay are common.

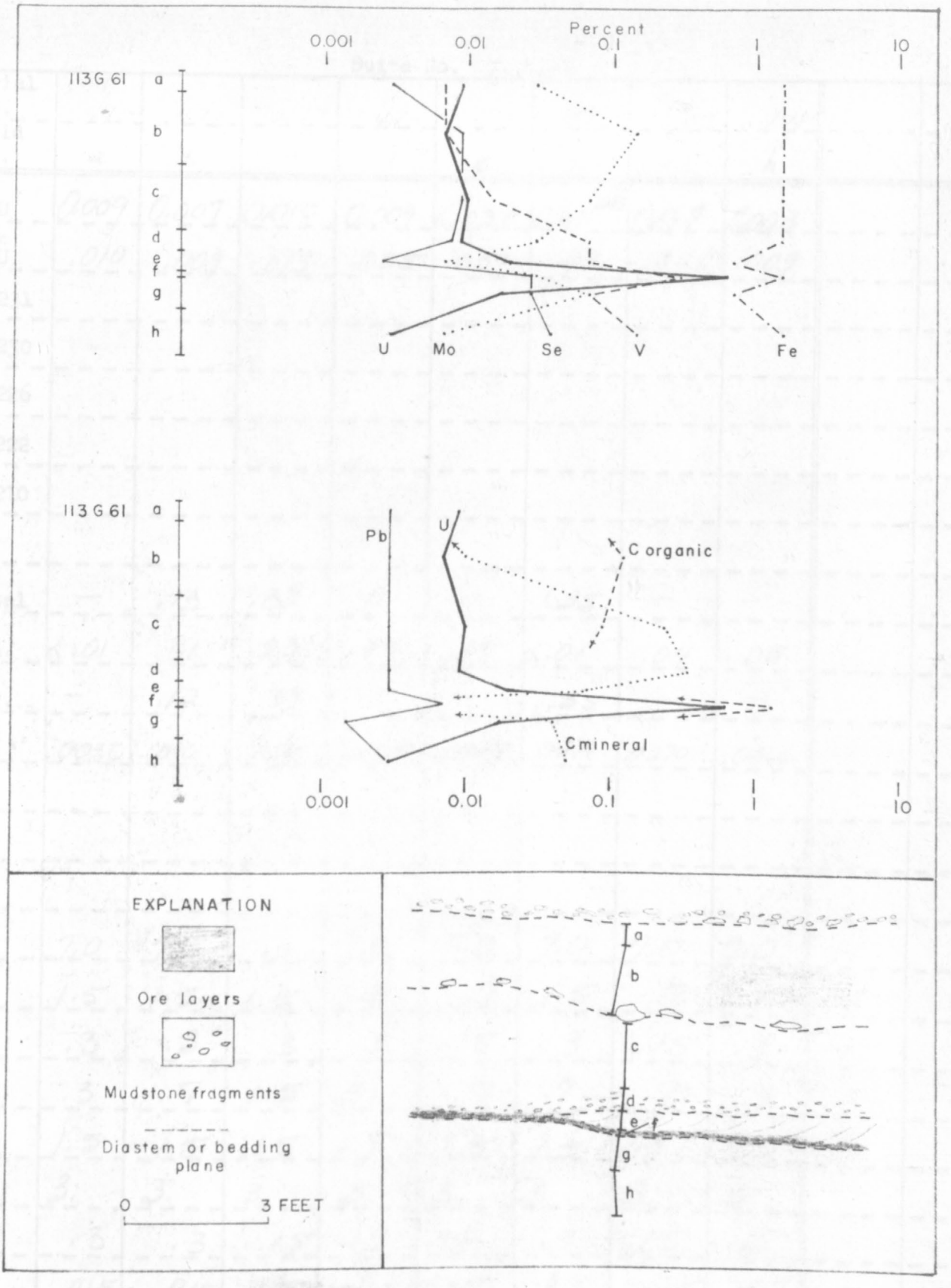



Figure 72.--Sample suite 113G61, Marquez mine.

Suite No. 113661

| Serial no. | 294, 471 | 472 | 473 | 474 | 475 | 476 | 477 | 478 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | h | | |
| U | 0.009 | 0.007 | 0.010 | 0.009 | 0.020 | 0.61 | 0.017 | 0.003 | | |
| eU | .010 | .009 | .013 | .025 | .057 | .43 | .041 | .009 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | .13 | .32 | — | — | 1.35 | — | — | | |
| $C_{Min.}$ | <.01 | .01 | .23 | .34 | .07 | <.01 | .04 | .05 | | |
| $C_{org.}$ | — | .12 | .09 | — | — | 1.35 | — | — | | |
| Se | .0020 | .0090 | .0090 | .0075 | .0025 | .0270 | .0270 | .0360 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | |
| Fe | 1.5 | 1.5 | 1.5 | 1.5 | .7 | 1.5 | .7 | 1.5 | | |
| Mg | .3 | .3 | .3 | .3 | .15 | .3 | .15 | .3 | | |
| Ca | .3 | .7 | 1.5 | 3. | .7 | .7 | .7 | .7 | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | 3. | 3. | | |
| Ti | .3 | .3 | .15 | .15 | .15 | .3 | .15 | .15 | | |
| Mn | .015 | .015 | .015 | .03 | .007 | .015 | .015 | .007 | | |

Suite No. 113661 --Continued

| Serial no. / Field no. | 294, 471 a | 472 b | 473 c | 474 d | 475 e | 476 f | 477 g | 478 h | ~~479~~ x | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | .003 | 0 | 0 | 0 | 0 | .0015 | 0 | 0 | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Be | 0 | 0 | 0 | 0 | 0 | .0003 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | .0015 | .0003 | .0003 | .0007 | .0015 | <.003 | .003 | .0015 | | |
| Cr | .0007 | .0007 | .0007 | .0007 | .0007 | .0015 | .0003 | .0003 | | |
| Cu | .0007 | .0007 | .0007 | .0015 | .0007 | .0007 | .0007 | .0007 | | |
| Ga | .0015 | .0015 | .0015 | .0015 | .0015 | .003 | .0015 | .0015 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | .03 | .15 | .07 | .03 | .007 | .03 | .07 | .007 | | |
| Nb | 0 | .0015 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | .0007 | 0 | .0003 | .0007 | .0007 | .0015 | .0015 | .0007 | | |
| Pb | .003 | .003 | .003 | .003 | .003 | .007 | .0015 | .003 | | |
| Sc | .0007 | .0007 | 0 | 0 | 0 | .0015 | 0 | 0 | | |
| Sr | .007 | .015 | .015 | .015 | .007 | .015 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .007 | .007 | .015 | .07 | .07 | .3 | .07 | .15 | | |
| Y | .0015 | .0015 | .0015 | 0 | 0 | .03 | .0015 | 0 | | |
| Yb | .00015 | .00015 | .00015 | <.003 | <.003 | .003 | <.003 | <.003 | | |
| Zr | .03 | .03 | .015 | .007 | .015 | .07 | .015 | .007 | | |

Suite No.-- 10d59 ( A through G ) See Fig. 74.

Serial No's.-- 272,328 through 272,334

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

Mine
~~XXSXXXXXX~~ Coordinates-- S-2745 ~~XX~~ x W-3150 ~~XX~~

Mine location--W-13, 8 ft from West Air drift

Sample elevation-- 6,740 ft

Premining water table elevation--

Sampled to test element distribution in-- a prefault ore layer

Sample descriptions:

A.--Dark-gray, medium-grained ore sandstone. Black authigenic carbonaceous material coats sand grains and fills many interstices. Disseminated pyrite is sparse. Kaolinite nests are common.

B.--Olive-gray, coarse-grained ore sandstone. Black and brownish authigenic carbonaceous material coats sand grains, fills many interstices, and seems to stain interstitial clay. Disseminated pyrite and kaolinite nests are common.

C.--Light-olive-gray, coarse-grained sandstone with abundant clay cement. Scattered blebs of authigenic carbonaceous material are sparse. Disseminated pyrite and kaolinite nests are sparse. Fine-grained calcite cement is abundant.

D.--Olive-gray, coarse- and medium-grained ore sandstone. Blebs of authigenic carbonaceous material commonly fill interstices. Most sand grains are coated with a brownish to black film. Disseminated pyrite and kaolinite nests are common.

Suite No. 10d59 . Sample descriptions (Continued)

E.--Medium-dark-gray, coarse-grained ore sandstone. Very similar to sample "D."

F.--Similar to "D" except for abundant poikiloblastic calcite cement.

G.--Dark-gray to olive-gray, medium-grained ore sandstone. Authigenic carbonaceous material fills all interstices in the dark-gray areas and forms scattered blebs in the lighter areas. Kaolinite nests are sparse. Poikiloblastic calcite cement is abundant.

Suite No. 10 d 59

| Serial no. | 328 | 329 | 330 | 331 | 332 | 333 | 334 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | | | |
| U | 0.83 | 0.70 | 0.094 | 0.40 | 0.64 | 0.38 | 0.58 | | | |
| eU | .62 | .50 | .12 | .32 | .49 | .28 | .35 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | .51 | .57 | .24 | .52 | .42 | .32 | .33 | | | |
| $C_{Total}$ | .5 | 1.4 | 2.1 | 1.3 | 1.3 | 2.6 | 3.3 | | | |
| $C_{Min.}$ | .01 | .01 | 1.89 | .25 | .29 | 2.24 | 2.60 | | | |
| $C_{org.}$ | .5 | 1.4 | .2 | 1.0 | 1.0 | .4 | .7 | | | |
| Se | .0050 | .0062 | .0015 | .0030 | .0060 | .0045 | .0040 | | | |
| Al | | | 3.0 | | | | | | | |
| Fe | | | .15 | | | | | | | |
| Mg | | | .3 | | | | | | | |
| Ca | | | M | | | | | | | |
| Na | | | 1.5 | | | | | | | |
| K | | | 3. | | | | | | | |
| Ti | | | .15 | | | | | | | |
| Mn | | | .07 | | | | | | | |

Suite No. 10d59 --Continued

| Serial no. | 328 | 329 | 330 | 331 | 332 | 333 | 334 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | | | |
| B | | | 0 | | | | | | | |
| Ba | | | .07 | | | | | | | |
| Be | | | 0 | | | | | | | |
| Bi | | | 0 | | | | | | | |
| Ce | | | 0 | | | | | | | |
| Co | | | 0 | | | | | | | |
| Cr | | | .0015 | | | | | | | |
| Cu | | | .0003 | | | | | | | |
| Ga | | | .0003 | | | | | | | |
| Ge | | | 0 | | | | | | | |
| La | | | .007 | | | | | | | |
| Mo | | | .007 | | | | | | | |
| Nb | | | 0 | | | | | | | |
| Nd | | | 0 | | | | | | | |
| Ni | | | 0 | | | | | | | |
| Pb | | | .007 | | | | | | | |
| Sc | | | 0 | | | | | | | |
| Sr | | | .03 | | | | | | | |
| Tl | | | 0 | | | | | | | |
| V | | | .15 | | | | | | | |
| Y | | | .003 | | | | | | | |
| Yb | | | — | | | | | | | |
| Zr | | | .007 | | | | | | | |

Suite No.-- 11d59 ( A through H )

Serial No's.-- 272,335 through 272342

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

Mine Coordinates-- S-2725 E x W-3170 E

Mine location--West Air drift between W-15 and W-12

Sample elevation-- 6,745 ft

Premining water table elevation--

Sampled to test element distribution in-- a prefault ore layer.

Sample descriptions:

A.--Dark-gray, medium-grained ore sandstone. Authigenic carbonaceous material forms a local interstitial filling and commonly coats sand grains. Quartz overgrowths and kaolinite nests are common.

B.--Light-olive-gray, coarse-grained, poorly sorted sandstone. Sparse blebs of authigenic carbonaceous material were noted. Disseminated pyrite and quartz overgrowths are sparse. Kaolinite nests are common.

C.--Dark-olive-gray, medium-grained ore sandstone. Authigenic carbonaceous material forms a dull-dark-brown film on sand grains and locally fills interstices. Disseminated pyrite and kaolinite nests are sparse.

D.--Medium-gray, coarse-grained ore sandstone. Authigenic carbonaceous material forms a dull-dark-brown to dark-gray coating on sand grains and fills a few interstices. Disseminated pyrite is common. Kaolinite nests are abundant.

Suite No. 11d59 . Sample descriptions (Continued)

E.--Dark-gray mudstone conglomerate with a coarse-grained sandstone matrix. A few kaolinite nests are present but nearly all interstices are filled by authigenic carbonaceous material.

F.--Olive-gray, coarse-grained ore sandstone. Authigenic carbonaceous material forms a thin film (perhaps staining clay) on sand grains and a few scattered interstitial blebs. Disseminated pyrite and kaolinite nests are sparse. Poikiloblastic calcite cement is abundant.

G.--Brownish-gray, very coarse-grained sandstone. A dull-dark film on some of the sand grains doesn't look like carbonaceous material. It could be stained clay or molybdenum-rich material. A very little limonite stain seems to be present. The rock is thoroughly cemented by poikiloblastic calcite.

H.--Light-olive-gray mudstone.

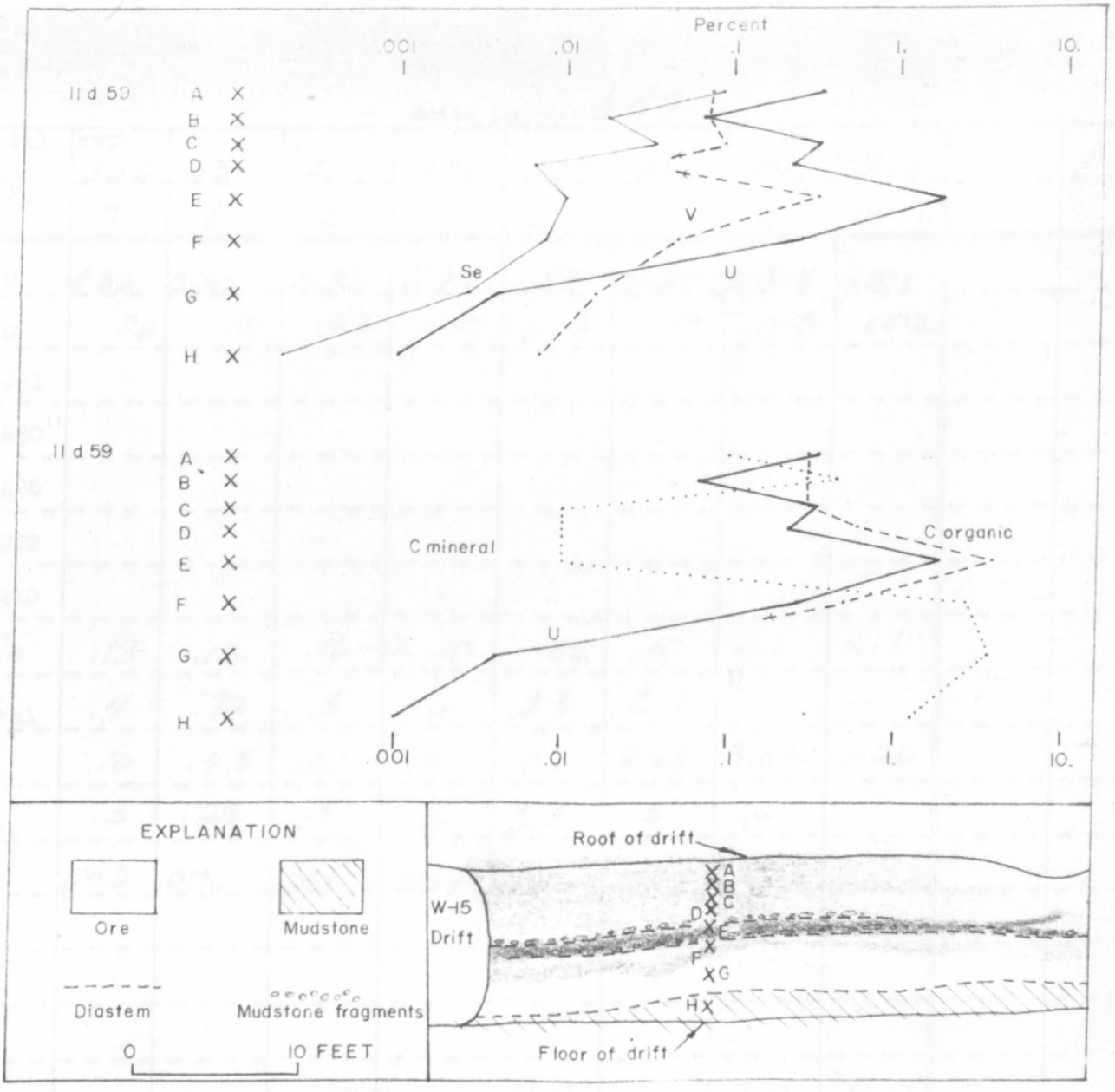



Figure 73.--Sample suite 11d59, Marquez mine.

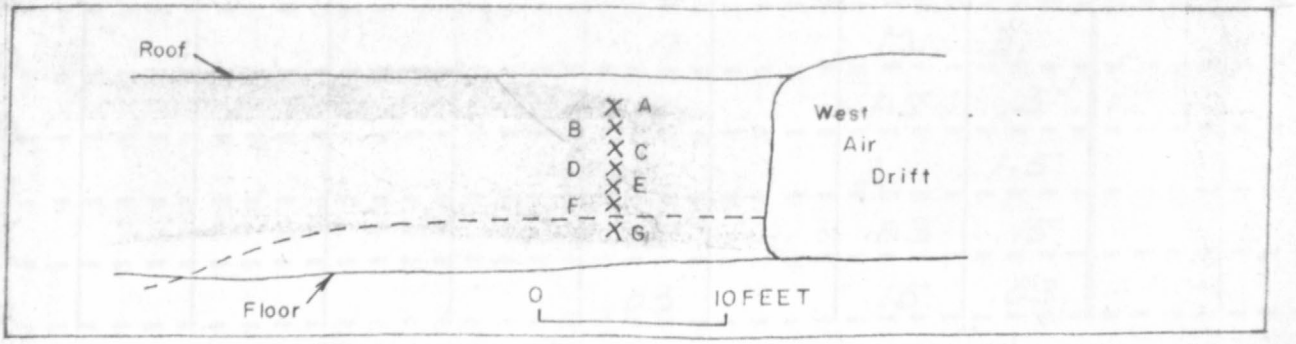



Figure 74.--Sample suite 10d59, Marquez mine.

Suite No. 11d 59

| Serial no. / Field no. | 272, 335 A | 336 B | 337 C | 338 D | 339 E | 340 F | 341 G | 342 H | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.32 | 0.065 | 0.32 | 0.22 | 1.83 | 0.25 | 0.004 | 0.001 | | |
| eU | .26 | .10 | .23 | .17 | 1.13 | .19 | .013 | .002 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | .13 | .12 | .16 | <.10 | .55 | .10 | <.1 | <.1 | | |
| C Total | .4 | .72 | .3 | .6 | 3.8 | 3.1 | — | — | | |
| C Min. | .10 | .43 | .01 | .01 | .01 | 2.63 | 3.52 | 1.24 | | |
| C Org. | .3 | .29 | .3 | .6 | 3.8 | .5 | — | — | | |
| Se | .0850 | .0170 | .0316 | .0062 | .0100 | .0075 | .0025 | .0002 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | | 7.0 | | 3.0 | 2.0 | | |
| Fe | | | | | 1.5 | | 1.5 | 1.5 | | |
| Mg | | | | | 1.5 | | .3 | 1.5 | | |
| Ca | | | | | .7 | | M | 3. | | |
| Na | | | | | 1.5 | | 1.5 | .3 | | |
| K | | | | | 3. | | 3. | 1.5 | | |
| Ti | | | | | .15 | | .03 | .15 | | |
| Mn | | | | | .03 | | .15 | .03 | | |

Suite No. 11d 59 --Continued

| Serial no. | 271, 335 | 336 | 332 | 338 | 339 | 340 | 341 | 342 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | H | | |
| B | | | | | 0.003 | | 0 | 0 | | |
| Ba | | | | | .07 | | .07 | .015 | | |
| Be | | | | | .0007 | | 0 | 0 | | |
| Bi | | | | | <.005 | | 0 | 0 | | |
| Ce | | | | | .03 | | 0 | 0 | | |
| Co | | | | | <.005 | | 0 | 0 | | |
| Cr | | | | | .003 | | .0003 | .0007 | | |
| Cu | | | | | .0015 | | .0015 | .0015 | | |
| Ga | | | | | .0015 | | .0003 | .0015 | | |
| Ge | | | | | <.005 | | 0 | 0 | | |
| La | | | | | .015 | | 0 | .003 | | |
| Mo | | | | | .015 | | .003 | 0 | | |
| Nb | | | | | 0 | | 0 | 0 | | |
| Nd | | | | | .015 | | 0 | 0 | | |
| Ni | | | | | 0 | | 0 | 0 | | |
| Pb | | | | | .03 | | .003 | 0 | | |
| Sc | | | | | .0015 | | 0 | .0007 | | |
| Sr | | | | | .03 | | .03 | .03 | | |
| Tl | | | | | 0 | | 0 | 0 | | |
| V | | | | | .15 | | .015 | .007 | | |
| Y | | | | | .0015 | | .0015 | .0015 | | |
| Yb | | | | | — | | .00015 | .00015 | | |
| Zr | | | | | .015 | | .003 | .015 | | |

Suite No.-- 13d59 ( a through g )

Serial No's.-- 272,343 through 272,349

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- N. x E.

Mine location-- Main W. drift, between W-14 and W-16

Sample elevation-- 6,740 ft

Premining water table elevation-- ~6,650 ft(?)

Sampled to test element distribution in--a prefault ore layer

Sample descriptions:

a.--Olive-gray, medium- to coarse-grained sandstone. Many sand grains are coated with a thin dull film of grayish and brownish material that is probably molybdenum-rich. Quartz overgrowths are abundant. Kaolinite nests several millimeters across are common.

b.--Similar to "a."

c.--Similar to "a" except that disseminated pyrite is common and the rock contains abundant greenish-gray interstitial clay.

d.--Dark-gray, medium-grained ore sandstone with scattered mudstone pebbles. Kaolinite nests are common but small, nearly black authigenic carbonaceous material fills most of the interstices.

e.--Medium-dark-gray and fine-grained ore sandstone. Nearly black earthy-appearing authigenic carbonaceous material coats the sand grains and fills most of the

Suite No. 13d59 . Sample descriptions (Continued)

interstices. Disseminated pyrite is sparse. Kaolinite nests and scattered poikiloblastic calcite crystals are common.

f.--Brownish-black, medium- to coarse-grained ore sandstone. Nearly black dull authigenic carbonaceous material fills many interstices and coats sand grains. Poikiloblastic calcite cement is abundant.

g.--Light-olive-gray mudstone. Highly calcareous.

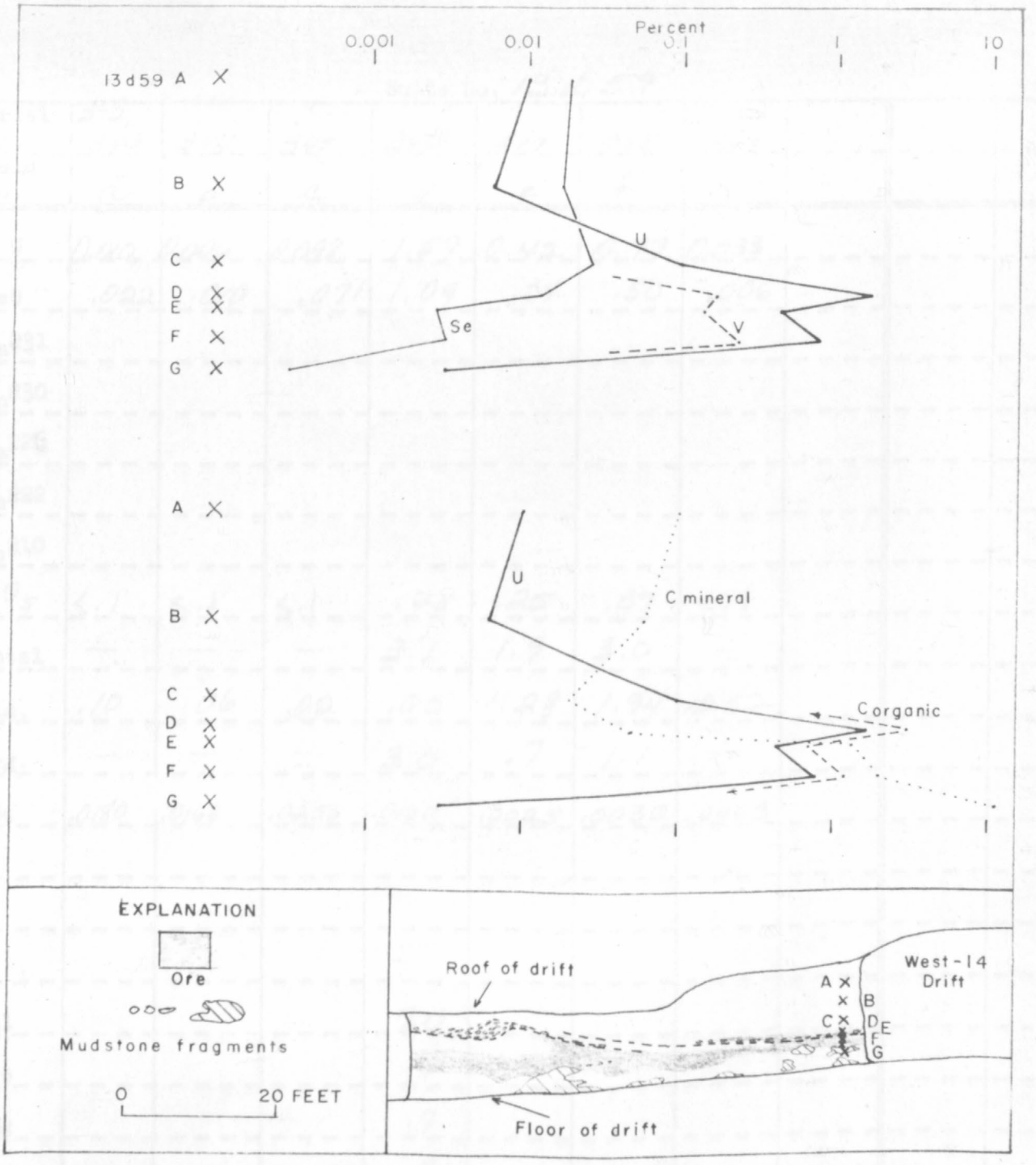



Figure 75.--Sample suite 13d59, Marquez mine.

Suite No. 13259

| Serial no. / Field no. | 272, 343 a | 344 b | 345 c | 346 d | 347 e | 348 f | 349 g | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.010 | 0.006 | 0.098 | 1.57 | 0.42 | 0.77 | 0.033 | | | |
| eU | .022 | .010 | .071 | 1.09 | .34 | .50 | .006 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | <.1 | <.1 | <.1 | .28 | .25 | .39 | <.1 | | | |
| $C_{Total}$ | — | — | — | 3.1 | 1.9 | 3.0 | — | | | |
| $C_{Min.}$ | .10 | .06 | .02 | .05 | 1.28 | 1.94 | 10.52 | | | |
| $C_{Org.}$ | — | — | — | 3.0 | .7 | 1.1 | — | | | |
| Se | .0180 | .0163 | .0253 | .0120 | .0025 | .0030 | .0003 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | 7.0 | | | | | | |
| Fe | | | | .7 | | | | | | |
| Mg | | | | .7 | | | | | | |
| Ca | | | | .7 | | | | | | |
| Na | | | | 1.5 | | | | | | |
| K | | | | 3. | | | | | | |
| Ti | | | | .15 | | | | | | |
| Mn | | | | .03 | | | | | | |

Suite No. 13d 59 --Continued

| Serial no. / Field no. | 272, 343 a | 344 b | 345 c | 346 d | 347 e | 348 f | 349 g | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | | | | 0 | | | | | | |
| Ba | | | | .07 | | | | | | |
| Be | | | | .0007 | | | | | | |
| Bi | | | | <.005 | | | | | | |
| Ce | | | | 0 | | | | | | |
| Co | | | | <.005 | | | | | | |
| Cr | | | | .0015 | | | | | | |
| Cu | | | | .0007 | | | | | | |
| Ga | | | | .0015 | | | | | | |
| Ge | | | | <.005 | | | | | | |
| La | | | | .007 | | | | | | |
| Mo | | | | .015 | | | | | | |
| Nb | | | | 0 | | | | | | |
| Nd | | | | 0 | | | | | | |
| Ni | | | | 0 | | | | | | |
| Pb | | | | .03 | | | | | | |
| Sc | | | | 0 | | | | | | |
| Sr | | | | .015 | | | | | | |
| Tl | | | | 0 | | | | | | |
| V | | | | .15 | | | | | | |
| Y | | | | .0015 | | | | | | |
| Yb | | | | — | | | | | | |
| Zr | | | | .007 | | | | | | |

Suite No.-- 14d59 ( a through g )

Serial No's.-- 272,350 through 272,356

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- N. x E.

Mine location-- Main W-drift, between W-12 and W-14

Sample elevation-- 6,745 ft

Premining water table elevation-- ~6,650 ft(?)

Sampled to test element distribution in--a prefault ore layer

Sample descriptions:

a.--Pale-yellowish-brown, medium-grained sandstone. Kaolinite nests and disseminated pyrite are common.

b.--Similar to "a" except that a few scattered blebs of authigenic carbonaceous material locally fill interstices.

c.--Dark-gray, medium-grained ore sandstone with scattered mudstone fragments. Authigenic carbonaceous material coats sand grains and fills most interstices. Disseminated pyrite is sparse to common and kaolinite nests are small but common.

d.--Similar to "c" except that the grain size is coarse with a few scattered very coarse grains.

e.--Same as "d."

f.--Olive-gray, medium- to coarse-grained ore sandstone. Authigenic carbonaceous material coats most sand grains and fills some of the interstices. Disseminated

Suite No. 14d59 . Sample descriptions (Continued)

pyrite, kaolinite nests, and calcite cement are all common.

g.--Light-olive-gray, medium-grained sandstone. Scattered blebs of authigenic carbonaceous material fill some of the interstices and a brownish film on many sand grains may be a stained clay. Disseminated pyrite is sparse and extremely fine grained. Poikiloblastic calcite cement is abundant. Kaolinite nests are common.

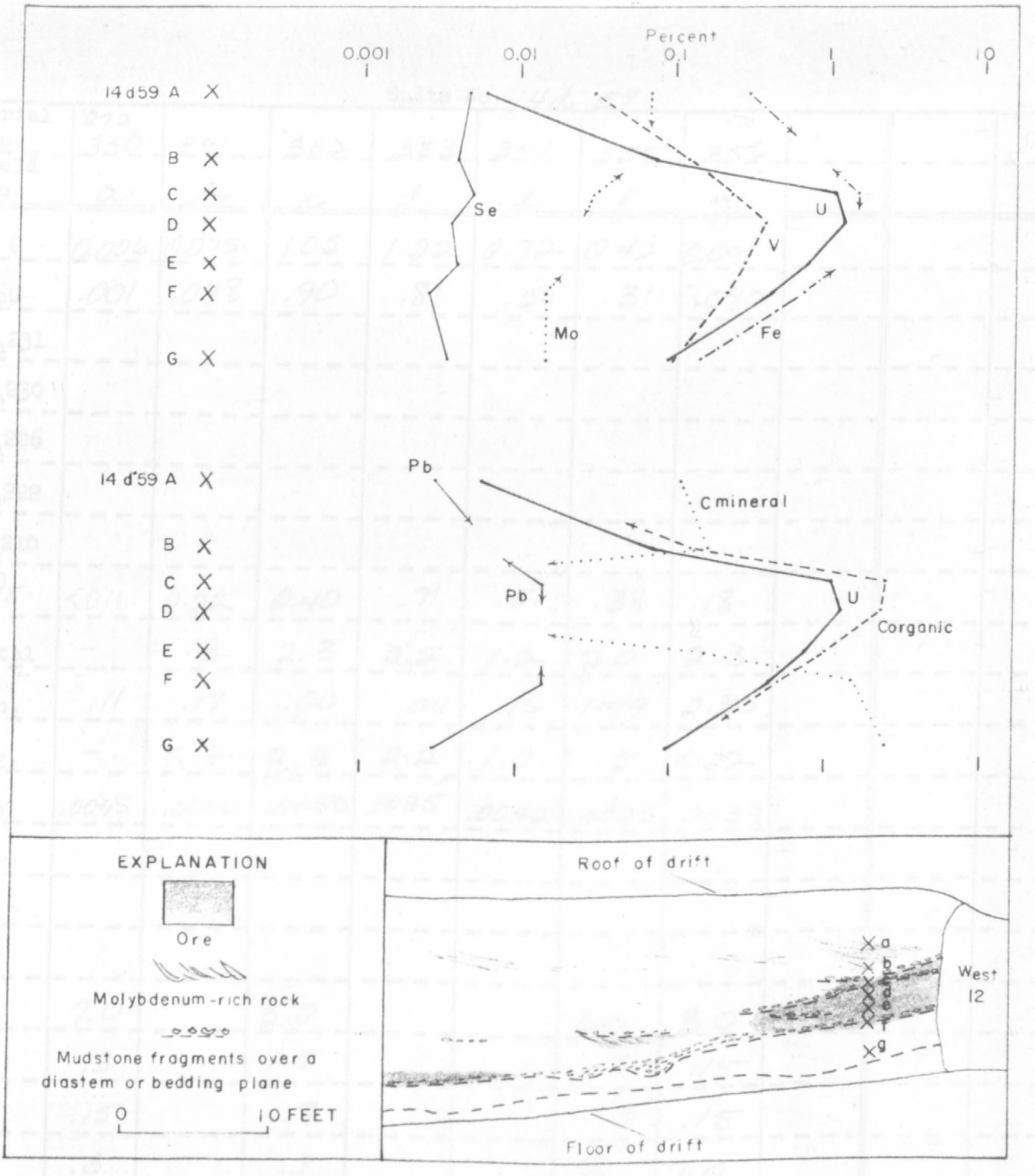



**Figure 76.--Sample suite 14d59, Marquez mine.**

Suite No. 14d 59

| Serial no. / Field no. | 272, 350 a | 351 b | 352 c | 353 d | 354 e | 355 f | 356 g | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.006 | 0.075 | 1.05 | 1.22 | 0.72 | 0.42 | 0.091 | | | |
| eU | .001 | .078 | .90 | .81 | .55 | .31 | .080 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | <0.1 | 0.22 | 0.40 | .71 | .51 | .38 | .18 | | | |
| $C_{Total}$ | – | .3 | 2.3 | 2.2 | 1.2 | 2.0 | 2.3 | | | |
| $C_{Min.}$ | .11 | .17 | .00 | .00 | .16 | 1.49 | 2.30 | | | |
| $C_{Org.}$ | – | <.2 | 2.3 | 2.2 | 1.0 | .5 | <.2 | | | |
| Se | .0045 | .0040 | .0050 | .0035 | .0040 | .0025 | .0033 | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7.0 | | 3.0 | | | 3.0 | 3.0 | | | |
| Fe | .3 | | 1.5 | | | .7 | .15 | | | |
| Mg | .15 | | .7 | | | .3 | .15 | | | |
| Ca | .3 | | .3 | | | 7. | 7.0 | | | |
| Na | 1.5 | | 1.5 | | | 1.5 | 1.5 | | | |
| K | 3. | | 3. | | | 3. | 3.0 | | | |
| Ti | .07 | | .07 | | | .03 | .07 | | | |
| Mn | .007 | | .015 | | | .07 | .07 | | | |

Suite No. 14d59 --Continued

| Serial no. | 272, 350 | 351 | 352 | 353 | 354 | 355 | 356 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | g | | | |
| B | 0 | | 0 | | | 0 | 0 | | | |
| Ba | .07 | | .07 | | | .07 | .07 | | | |
| Be | 0 | | .0003 | | | 0 | 0 | | | |
| Bi | 0 | | <.005 | | | 0 | 0 | | | |
| Ce | 0 | | 0 | | | 0 | 0 | | | |
| Co | 0 | | <.005 | | | <.005 | <.005 | | | |
| Cr | .0007 | | .0003 | | | .0003 | .0003 | | | |
| Cu | .0003 | | .0003 | | | .0003 | .0003 | | | |
| Ga | .0003 | | .0007 | | | .0003 | .0003 | | | |
| Ge | 0 | | <.005 | | | <.005 | 0 | | | |
| La | 0 | | .003 | | | 0 | 0 | | | |
| Mo | .07 | | .03 | | | .015 | .015 | | | |
| Nb | 0 | | 0 | | | 0 | 0 | | | |
| Nd | 0 | | 0 | | | 0 | 0 | | | |
| Ni | 0 | | 0 | | | 0 | 0 | | | |
| Pb | .003 | | .015 | | | .015 | .003 | | | |
| Sc | 0 | | 0 | | | 0 | 0 | | | |
| Sr | .015 | | .015 | | | .03 | .03 | | | |
| Tl | 0 | | 0 | | | 0 | 0 | | | |
| V | .03 | | .15 | | | .15 | .15 | | | |
| Y | 0 | | 0 | | | 0 | 0 | | | |
| Yb | 0 | | — | | | — | — | | | |
| Zr | .003 | | .015 | | | .007 | .003 | | | |

Suite No.-- 15d59 ( A through I )

Serial No's.-- 272,357 through 272,365

Mine-- Marquez

Level--

Sec. 23 , Twp. 13 , Rge. 9 --

Mine Coordinates-- S-2675 x W-2995

Mine location-- W-10, 15 ft from Main West drift

Sample elevation-- 6,745 ft

Premining water table elevation--

Sampled to test element distribution in-- a prefault ore layer in sandstone and mudstone conglomerate.

Sample descriptions:

A.--Medium-light-gray, medium- to coarse-grained sandstone with scattered mudstone fragments. Authigenic carbonaceous material coats all sand grains and fills most interstices. Disseminated pyrite is sparse. Kaolinite nests fill some interstices not completely occupied by carbonaceous material.

B.--Banded dark-gray and light-olive-gray mudstone conglomerate with a very coarse to medium-grained matrix. Authigenic carbonaceous material fills some of the interstices and coats many sand grains. Disseminated pyrite is common. Kaolinite nests are sparse. Poikiloblastic calcite cement is abundant.

C.--Yellowish-gray, very fine-grained sandstone. Calcite cement is abundant. This seems to be a clean quartz sandstone with much less feldspar than is usual.

D.--Dark-gray, medium-grained sandstone. Sand grains are coated with authigenic carbonaceous material that may be molybdenum-rich. Quartz overgrowths are

Suite No. 15d59 . Sample descriptions (Continued)

abundant. Disseminated pyrite is common. Kaolinite nests are sparse.

E.--Brownish-gray, medium-grained sandstone. Authigenic carbonaceous material forms a brownish film on sand grains and fills some of the interstices. Disseminated pyrite is common and kaolinite nests are sparse.

F.--Grayish-black, medium-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills many interstices. Disseminated pyrite and kaolinite nests are common.

G.--Olive-gray, coarse-grained ore sandstone. Authigenic carbonaceous material incompletely coats many sand grains and fills some of the interstices. Quartz overgrowths are common. Kaolinite nests are abundant and pyrite is sparse.

H.--Olive-gray, coarse-grained sandstone. Similar to sample "G" except for abundant calcite cement.

I.--Dark-gray, medium-grained to coarse-grained ore sandstone. Authigenic carbonaceous material coats sand grains and fills most interstices. Pyrite is sparse. Kaolinite nests are common.

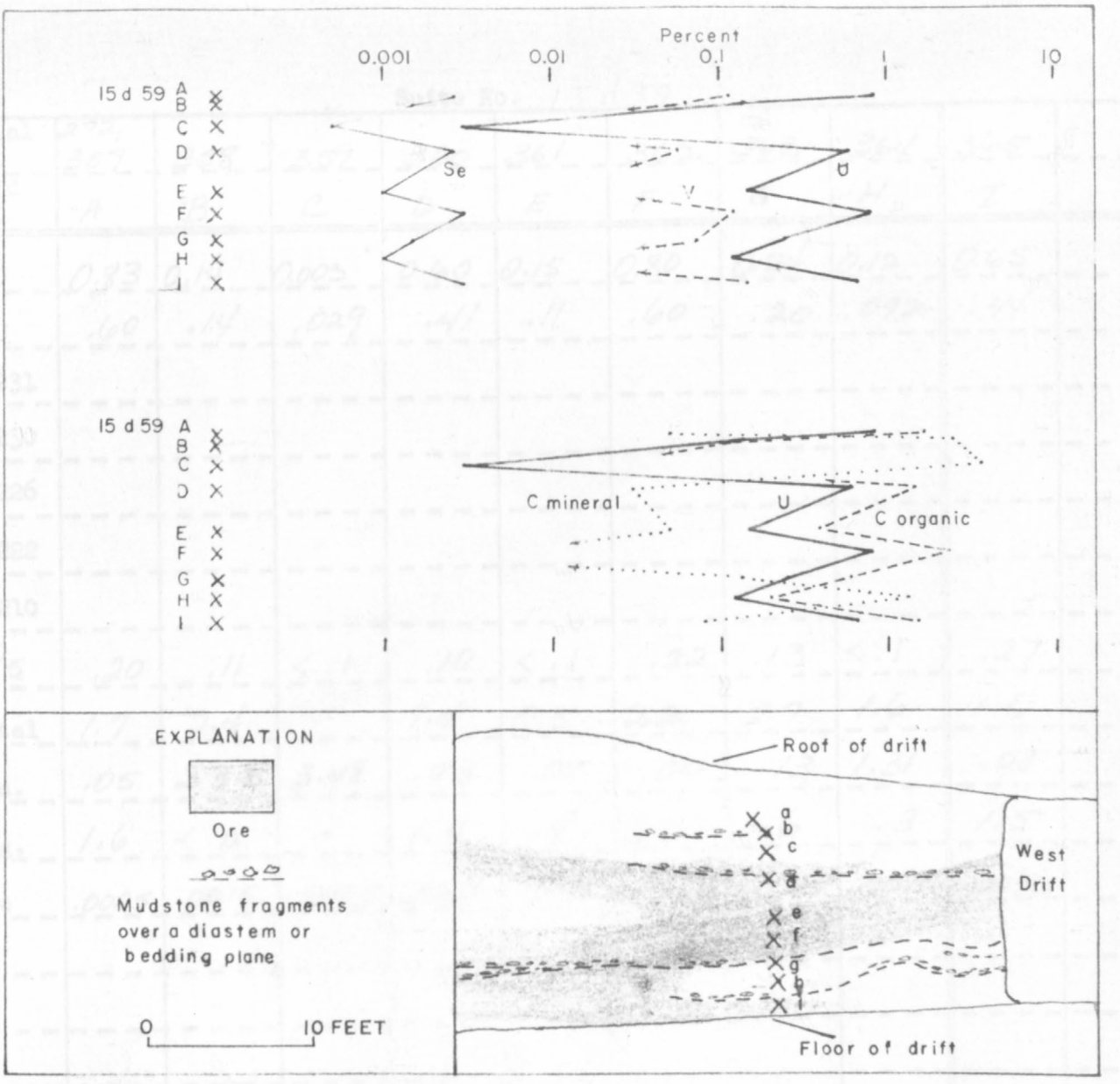



Figure 77.--Sample suite 15d59, Marquez mine.

Suite No. 15d59

| Serial no. | 272, 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | H | I | |
| U | 0.83 | 0.14 | 0.003 | 0.60 | 0.15 | 0.80 | 0.24 | 0.12 | 0.65 | |
| eU | .60 | .14 | .029 | .41 | .11 | .60 | .20 | .092 | .44 | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $V_2O_5$ | .20 | .11 | < .1 | .10 | < .1 | .22 | .13 | < .1 | .27 | |
| $C_{Total}$ | 1.7 | 2.4 | - | 1.4 | 0.5 | 2.2 | 0.7 | 1.6 | 1.6 | |
| $C_{Min.}$ | .05 | 2.30 | 3.48 | .03 | .05 | .00 | .13 | 1.31 | .08 | |
| $C_{org.}$ | 1.6 | < .2 | - | 1.4 | .4 | 2.2 | .6 | .3 | 1.5 | |
| Se | .0025 | .0015 | .0005 | .0025 | .0010 | .0030 | .0015 | .0010 | .0030 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | | | | | | | | | 7.0 | |
| Fe | | | | | | | | | .3 | |
| Mg | | | | | | | | | .3 | |
| Ca | | | | | | | | | 7. | |
| Na | | | | | | | | | 1.5 | |
| K | | | | | | | | | 3. | |
| Ti | | | | | | | | | .07 | |
| Mn | | | | | | | | | .015 | |

Suite No. 15d59 --Continued

| Serial no. | 272 357 | 358 | 359 | 360 | 361 | 362 | 363 | 364 | 365 | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | A | B | C | D | E | F | G | H | I | |
| B | | | | | | | | | 0 | |
| Ba | | | | | | | | | .07 | |
| Be | | | | | | | | | .00015 | |
| Bi | | | | | | | | | 0 | |
| Ce | | | | | | | | | 0 | |
| Co | | | | | | | | | <.005 | |
| Cr | | | | | | | | | .0003 | |
| Cu | | | | | | | | | .0007 | |
| Ga | | | | | | | | | .0007 | |
| Ge | | | | | | | | | <.005 | |
| La | | | | | | | | | .003 | |
| Mo | | | | | | | | | .007 | |
| Nb | | | | | | | | | 0 | |
| Nd | | | | | | | | | 0 | |
| Ni | | | | | | | | | 0 | |
| Pb | | | | | | | | | .015 | |
| Sc | | | | | | | | | 0 | |
| Sr | | | | | | | | | .015 | |
| Tl | | | | | | | | | 0 | |
| V | | | | | | | | | .15 | |
| Y | | | | | | | | | 0 | |
| Yb | | | | | | | | | 0 | |
| Zr | | | | | | | | | .007 | |

Suite No.-- 33G61 ( a through c )

Serial No's.-- 294,671 through 294,674

Mine-- Mary No. 1

Level-- 560 level

Sec. 11 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- _____ N. x _____ E.

Mine location--near shaft (exact location not recorded)

Sample elevation-- ~6,555 ft

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- contact between mudstone layer and enclosing barren sandstone.

Sample descriptions:

a.--Light-greenish-gray mudstone with abundant disseminated sand grains. Fine-grained calcite cement is common.

b.--Light-greenish-gray mudstone with abundant disseminated sand grains. Calcite cement is common, particularly along thin dark-colored veinlets.

$b_1$.--The 2 cm nearest the mudstone contact is yellowish gray. The remainder is light-greenish-gray, fine and very fine-grained sandstone. Fine-grained calcite cement is common. Pyrite is very sparse but locally completely fills interstices rather than occurring as perched crystals. Kaolinite forms minute nests not much larger than sand-grain size.

c.--Light-gray coarse-grained sandstone with scattered mudstone fragments up to granule size. Sparse pyrite grains perched on sand grains. Poikiloblastic calcite and kaolinite nests several millimeters across are abundant.

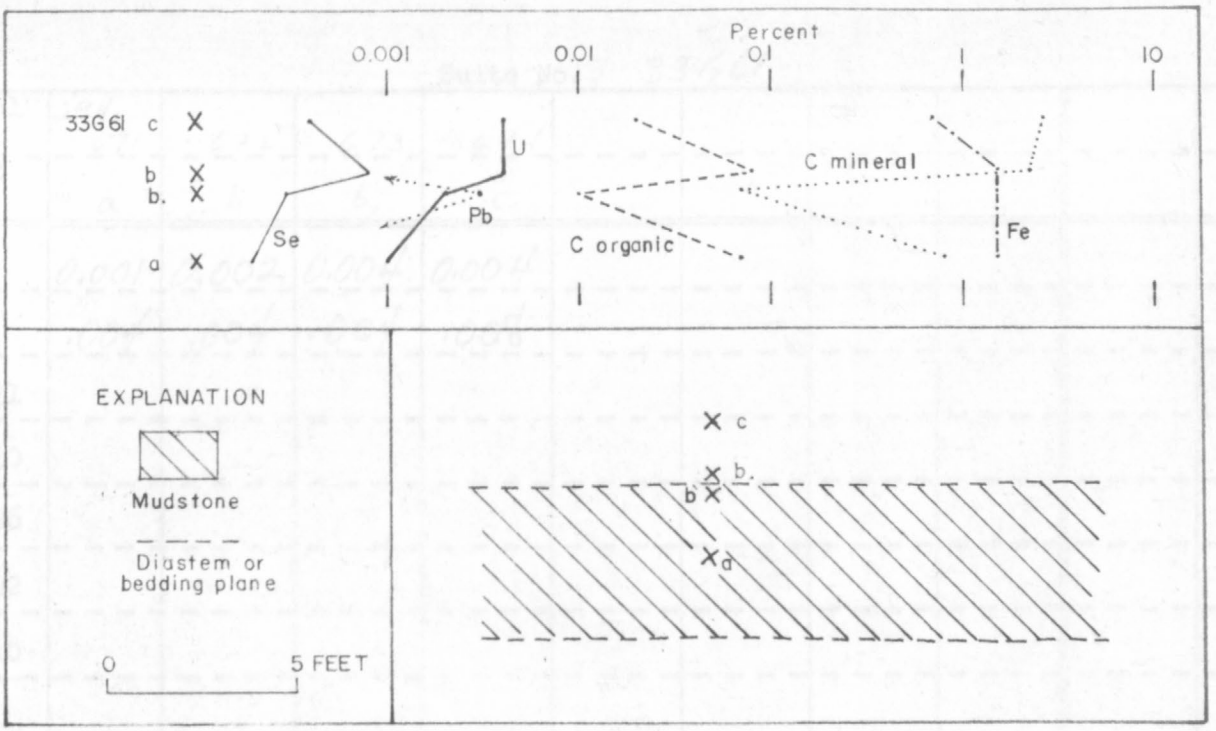



**Figure 78.--Sample suite 33G61, Mary No. 1 mine.**

Suite No. 33661

| Serial no. / Field no. | 294, 671 a | 672 b | 673 b, | 674 c | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.001 | 0.002 | 0.004 | 0.004 | | | | | | |
| eU | .004 | .004 | .004 | .008 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .87 | .08 | 2.23 | 2.64 | | | | | | |
| $C_{Min.}$ | .81 | .07 | 2.16 | 2.62 | | | | | | |
| $C_{Org.}$ | .1 | .01 | .07 | .02 | | | | | | |
| Se | .0002 | .0003 | .0008 | .0004 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 3. | 3. | | | | | | |
| Fe | 1.5 | 1.5 | 1.5 | .7 | | | | | | |
| Mg | .7 | .7 | .3 | .15 | | | | | | |
| Ca | 3. | .7 | 7. | 7. | | | | | | |
| Na | .7 | .7 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 3. | 3. | | | | | | |
| Ti | .15 | .3 | .15 | .03 | | | | | | |
| Mn | .03 | .007 | .07 | .015 | | | | | | |

Suite No. 33661 --Continued

| Serial no. / Field no. | 2941 621 a | 622 b | 623 b, | 624 c | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .15 | .03 | .15 | .15 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | 0 | 0 | 0 | 0 | | | | | | |
| Cr | .0015 | .0015 | .0007 | .0003 | | | | | | |
| Cu | .0015 | .0015 | .0015 | .0007 | | | | | | |
| Ga | .0015 | .0015 | .0015 | .0007 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | 0 | 0 | 0 | 0 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | 0 | .003 | 0 | 0 | | | | | | |
| Sc | 0 | .0007 | 0 | 0 | | | | | | |
| Sr | .03 | .015 | .03 | .07 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .007 | .007 | .003 | .007 | | | | | | |
| Y | .003 | .003 | .0015 | 0 | | | | | | |
| Yb | .0003 | .0003 | .00015 | 0 | | | | | | |
| Zr | .015 | .015 | .007 | .003 | | | | | | |

Suite No.-- 28G62 ( a through f )

Serial No's.-- 302,927 through 302,932

Mine-- Mary No. 1

Level-- 460 level

Sec. 11 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 336,305 N. x 516,815 E.

Mine location--

Sample elevation-- ~ 6,660 ft

Premining water table elevation-- ~ 6,525 ft

Sampled to test element distribution in--a postfault ore body.

Sample descriptions:

a.--Light-gray to medium-light-gray, very fine grained sandstone with a dusky-yellow surface stain. Quartz overgrowths and small kaolinite nests are common. Calcite cement is very sparse. A few small greenish clay aggregates associated with a dark vanadium(?) mineral may be vanadium-stained kaolinite.

b.--Light-gray fine-grained sandstone with yellowish and orange specks and stain. A few sparse grains of pyrite. Kaolinite nests and quartz overgrowths are common. Sparse needles of paramontroseite and specks and stains probably caused by pascoite indicate the significant vanadium content.

c.--Greenish-gray, poorly sorted, coarse-grained sandstone with local yellowish-gray stains. Grain sizes range largely between medium-grained and granule sizes. Kaolinite nests, calcite cement, and disseminated paramontroseite needles are common.

Suite No. 28G62, Sample descriptions (Continued)

d.--Light-gray to medium-light-gray, very coarse grained sandstone with yellowish- and brownish-stained surface. Grain sizes range up to small pebbles. Quartz overgrowths, kaolinite nests, and calcite cement are common. Disseminated pyrite is sparse. Paramontroseite(?) is abundant in the interstices, but the grain size is small.

e.--Light-gray to medium-light-gray, coarse-grained sandstone with pale-olive surface stains. Pyrite is common and locally associated with paramontroseite. Quartz overgrowths are abundant. Kaolinite nests are common. Disseminated paramontroseite is abundant and seems to be partly altered to pascoite.

f.--Medium-light-gray, medium- to coarse-grained sandstone with dusky-yellow stains. Disseminated pyrite is common but extremely fine grained. Quartz overgrowths and small kaolinite nests are common. Disseminated paramontroseite is abundant.

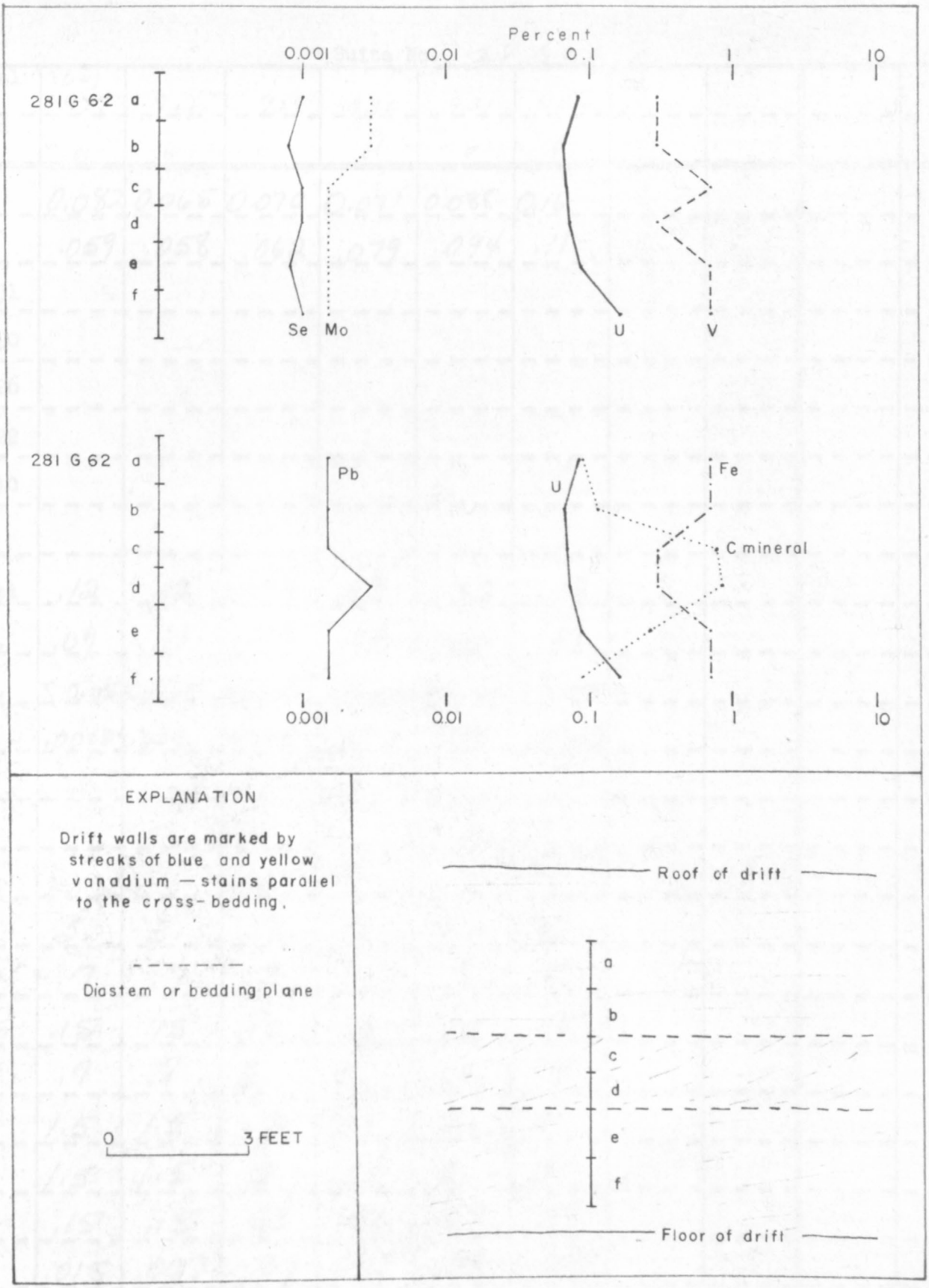



Figure 79.--Sample suite 28G62, Mary No. 1 mine.

Suite No. 28662

| Serial no. / Field no. | 302, 927 a | 928 b | 929 c | 930 d | 931 e | 932 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.082 | 0.065 | 0.070 | 0.071 | 0.088 | 0.16 | | | | |
| eU | .059 | .058 | .062 | .079 | .094 | .11 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .12 | .12 | .79 | .83 | .23 | .12 | | | | |
| $C_{Min.}$ | .09 | .11 | .79 | .83 | .25 | .09 | | | | |
| $C_{org.}$ | $\leq 0.05$ | $<0.05$ | $\leq 0.05$ | $\leq 0.05$ | $\leq 0.05$ | $\leq 0.05$ | | | | |
| Se | .0010 | .008 | .0010 | .0010 | .008 | .0010 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 3. | 7. | 7. | 7. | 7. | | | | |
| Fe | .7 | .7 | .3 | .3 | .7 | .7 | | | | |
| Mg | .15 | .15 | .15 | .15 | .15 | .15 | | | | |
| Ca | .7 | .7 | 3. | 3. | 1.5 | .7 | | | | |
| Na | 1.5 | 1.5 | 3. | 3. | 3. | 3. | | | | |
| K | 1.5 | 1.5 | 3. | 3. | 3. | 3. | | | | |
| Ti | .15 | .15 | .03 | .03 | .07 | .07 | | | | |
| Mn | .015 | .007 | .07 | .03 | .03 | .015 | | | | |

Suite No. 28662--Continued

| Serial no. | 302, 927 | 928 | 929 | 930 | 931 | 932 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | .00015 | .00015 | .00015 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Cr | .0007 | .0007 | .0003 | .0003 | .0007 | .0003 | | | | |
| Cu | .015 | .003 | .0015 | .0015 | .0015 | .0015 | | | | |
| Ga | .0007 | .0007 | .0015 | .0015 | .0015 | .0015 | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| La | 0 | 0 | .003 | .003 | 0 | .003 | | | | |
| Mo | .003 | .003 | .0015 | .0015 | .0015 | .0015 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | .0015 | .0015 | .0015 | .003 | .0015 | .0015 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .015 | .03 | .03 | .03 | .03 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .3 | .3 | .7 | .3 | .7 | .7 | | | | |
| Y | .003 | .0015 | .0015 | .0015 | .0015 | .0015 | | | | |
| Yb | — | — | — | — | — | — | | | | |
| Zr | .015 | .015 | .003 | .003 | .003 | .003 | | | | |

Suite No.-- 29G62 ( a through d )

Serial No's.-- 302,933 through 302,936

Mine-- Mary No. 1

Level-- 560 level

Sec. 11 , Twp. 14 , Rge. 10 --

U.S. AEC Coordinates-- 336,115 N. x 516,970 E.

Mine location-- 170 S of shaft at sta. 93.

Sample elevation-- not recorded.

Premining water table elevation-- ~6,525 ft

Sampled to test element distribution in-- concretion-like vanadium concentrations in a postfault ore body.

Sample descriptions:

a.--Greenish-gray, fine- and medium-grained sandstone. Pyrite is sparse to common and seems to be associated with abundant calcite cement. Fine hairs of thenardite are scattered among the interstices. A little hematite stain is present locally.

b.--Bleached-appearing coarse- and medium-grained sandstone with local greenish and yellowish stains. Surface is stained gray. Disseminated pyrite is abundant to common. Kaolinite nests are common. Calcite cement sparse. Vanadium must be in the yellowish stain that permeates much of the rock.

c.--Medium-light-bluish-gray, medium-grained sandstone. Extremely fine-grained disseminated pyrite and fine-grained calcite cement are abundant. Kaolinite nests, 2 mm across, are common. Paramontroseite(?) needles are abundant in the interstices

d.--Very light-olive-gray, medium-grained sandstone with scattered coarse and very coarse grains. Extremely fine-grained pyrite is abundant. Quartz overgrowths are common.

Suite No. 29062 . Sample descriptions (Continued)

Kaolinite nests, 1-3 mm across, are abundant. Calcite cement is abundant.

Paramontroseite(?) rosettes are common in the interstices.

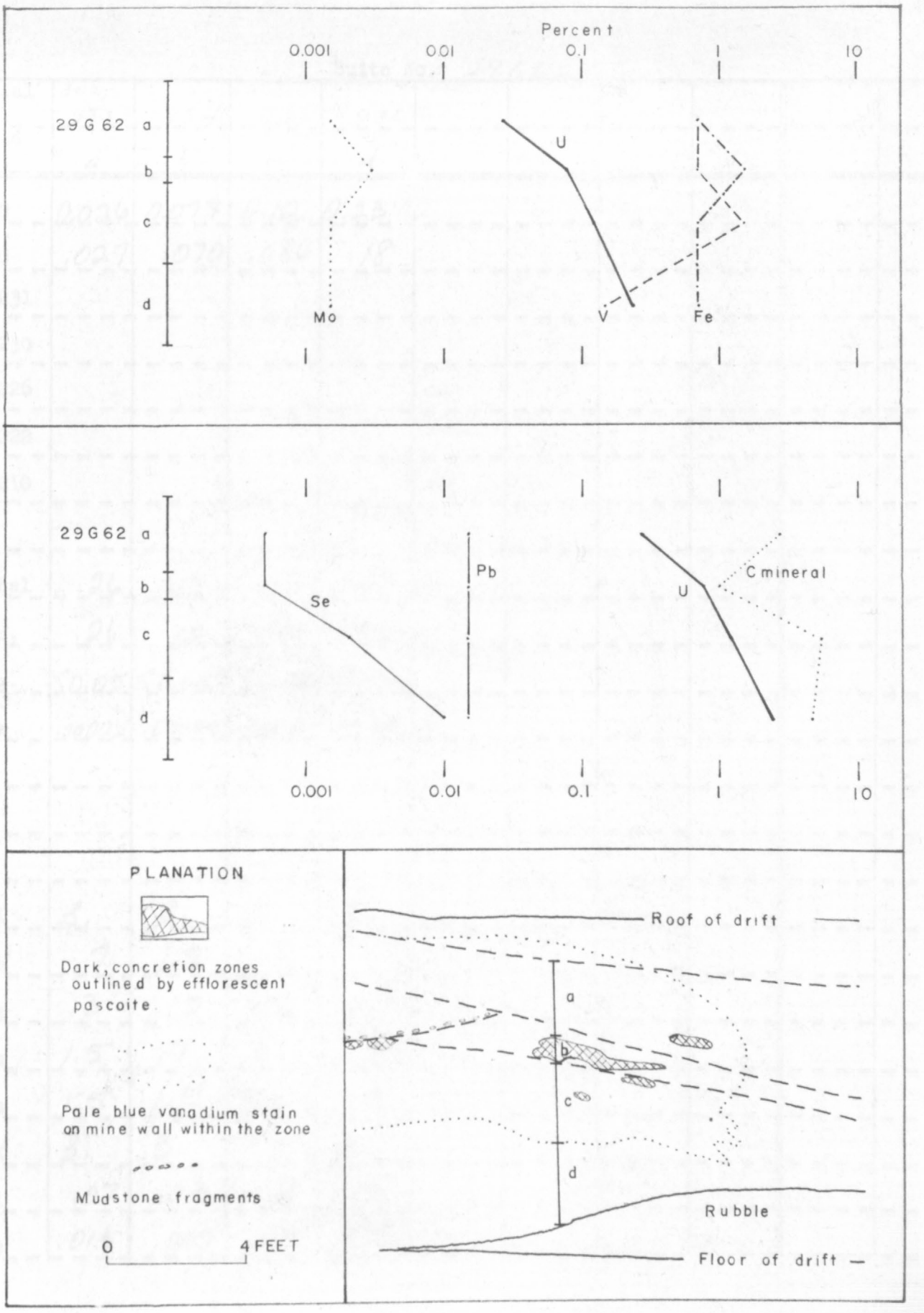



Figure 80.--Sample suite 29G62, Mary No. 1 mine.

Suite No. 29662

| Serial no. / Field no. | 302, 933 a | 934 b | 935 c | 936 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.026 | 0.077 | 0.12 | 0.23 | | | | | | |
| eU | .027 | .070 | .086 | .18 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .26 | .12 | .47 | .43 | | | | | | |
| $C_{Min.}$ | .26 | .10 | .52 | .45 | | | | | | |
| $C_{org.}$ | <0.05 | <0.05 | <0.05 | <0.05 | | | | | | |
| Se | .00005 | .00005 | .0002 | .0010 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 2. | 2. | 2. | 3. | | | | | | |
| Fe | .7 | 1.5 | .7 | .7 | | | | | | |
| Mg | .3 | .15 | .15 | .15 | | | | | | |
| Ca | 1.5 | .7 | 3. | 1.5 | | | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 1.5 | 3. | | | | | | |
| Ti | .07 | .03 | .07 | .15 | | | | | | |
| Mn | .015 | .007 | .015 | .015 | | | | | | |

Suite No. 29662 --Continued

| Serial no. | 3025 933 | 934 | 235 | 236 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | | | | | | |
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .07 | .07 | .07 | .07 | | | | | | |
| Be | 0 | 0 | 0 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | 0 | 0 | 0 | .0007 | | | | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | | | | | | |
| Cu | .0015 | .003 | .0015 | .0015 | | | | | | |
| Ga | .0015 | .0015 | .0015 | .0007 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | .003 | | | | | | |
| Mo | .0015 | .003 | .0015 | .0015 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | 0 | 0 | | | | | | |
| Pb | .0015 | .0015 | .0015 | .0015 | | | | | | |
| Sc | 0 | 0 | 0 | 0 | | | | | | |
| Sr | .03 | .03 | .03 | .015 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .7 | .7 | 1.5 | .15 | | | | | | |
| Y | .0015 | .0015 | 0 | 0 | | | | | | |
| Yb | — | — | — | — | | | | | | |
| Zr | .015 | .007 | .003 | .007 | | | | | | |

Suite No.-- 57061 ( a through h )

Serial No's.-- 294,432 through 294,439

Mine-- M-5 mine

Level--

Sec. 32 , Twp. 15 , Rge. 11 --

U.S. AEC Coordinates-- N. x E.

Mine location-- 50 ft S. of foot of inclined shaft

Sample elevation--

Premining water table elevation--

Sampled to test element distribution in-- prefault ore layer.

Sample descriptions:

a.--Yellowish-gray, fine-grained sandstone with sparse, very small kaolinite nests.

b.--Same as "a."

c.--Yellowish-gray and very light gray, fine-grained to silty sandstone with streaks of grayish-red hematite stain. Scattered granules of mudstone are present. Pyrite is missing in the red areas but is sparsely present in the gray areas. Small kaolinite nests are common.

d.--Pale-yellowish-brown, medium-grained ore sandstone. Small blebs of black authigenic carbonaceous material are disseminated in the interstices. Finely disseminated pyrite is sparse.

e.--Medium-gray, medium-grained ore sandstone. Authigenic carbonaceous material occurs both as sparsely disseminated black blebs in the interstices and as a gray coat on sand grains. Finely disseminated pyrite, small kaolinite nests, and calcite cement are common.

Suite No. 57G61 . Sample descriptions (Continued)

f.--Mottled dark-gray and brownish-gray, medium-grained ore sandstone with scattered mudstone granules. A thin gray film of authigenic carbonaceous material coats sand grains and stains clay. Calcite cement is abundant.

g.--Light-olive-gray, fine-grained sandstone. Widely scattered blebs of authigenic carbonaceous material are present in the interstices. Pyrite, quartz overgrowths, and calcite cement are sparse.

h.--Light-olive-gray, fine-grained sandstone. Some sand grains are stained with a hematite film.

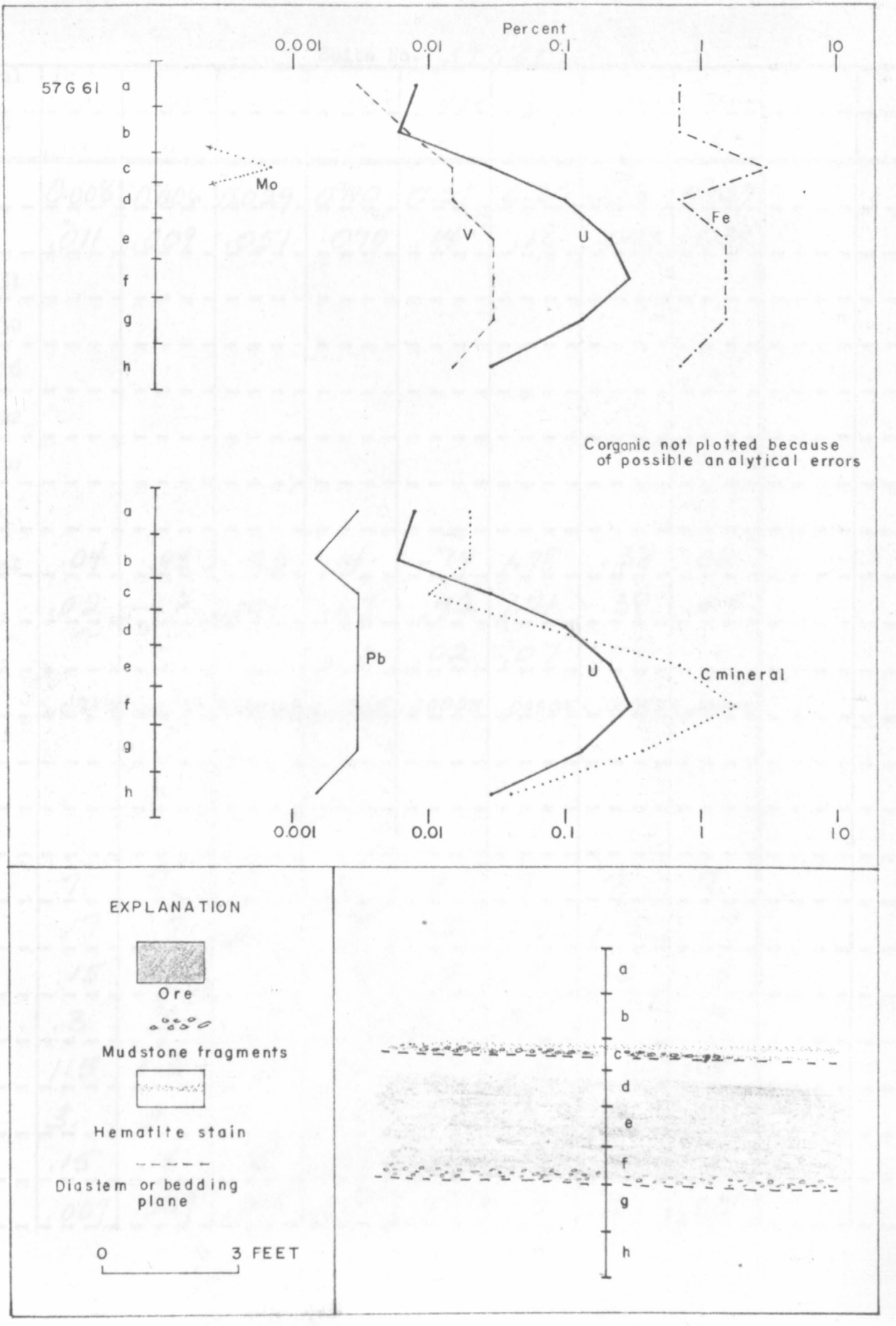



Figure 81.--Sample suite 57G61, M-5 mine.

Suite No. 57661

| Serial no. / Field no. | 294, 432 a | 433 b | 434 c | 435 d | 436 e | 437 f | 438 g | 439 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.008 | 0.006 | 0.029 | 0.10 | 0.21 | 0.30 | 0.13 | 0.029 | | |
| eU | .011 | .009 | .051 | .070 | .14 | .18 | .079 | .034 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .04 | .04 | .03 | .14 | .74 | 1.78 | .38 | .06 | | |
| $C_{Min.}$ | .02 | .02 | .01 | .07 | .72 | 1.71 | .38 | .04 | | |
| $C_{Org.}$ | — | — | — | .07 | .02 | .07 | — | — | | |
| Se | <.00005 | .00005 | <.00005 | <.00005 | .00005 | .00005 | <.00005 | <.00005 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 3. | 7. | 7. | 7. | 7. | | |
| Fe | .7 | .7 | 3. | .7 | 1.5 | 1.5 | 1.5 | .7 | | |
| Mg | .15 | .3 | .7 | .15 | .3 | .3 | .3 | .3 | | |
| Ca | .3 | .3 | .7 | .7 | 3. | 7. | 1.5 | .7 | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| K | 3. | 3. | 3. | 1.5 | 3. | 3. | 3. | 3. | | |
| Ti | .15 | .15 | .15 | .07 | .07 | .07 | .15 | .3 | | |
| Mn | .007 | .007 | .015 | .015 | .15 | .3 | .07 | .015 | | |

Suite No. 57661 --Continued

| Serial no. / Field no. | 294, 432 a | 433 b | 434 c | 435 d | 436 e | 437 f | 438 g | 439 h | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | 0 | 0 | .0007 | <.002 | <.002 | .0007 | .0003 | | |
| Cr | .0007 | .0007 | .0007 | .0003 | .0003 | .0007 | .0015 | .0015 | | |
| Cu | .03 | .003 | .003 | .0015 | .0015 | .0007 | .0003 | .0007 | | |
| Ga | .0007 | .0007 | .0015 | .0007 | .0015 | .0015 | .0015 | .0015 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | 0 | 0 | .0007 | 0 | 0 | 0 | 0 | 0 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0015 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | .0003 | .0003 | .0003 | 0 | 0 | 0 | | |
| Pb | .003 | .0015 | .003 | .003 | .003 | .003 | .003 | .0015 | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | .0007 | | |
| Sr | .007 | .015 | .015 | .007 | .015 | .03 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .0003 | .007 | .015 | .015 | .03 | .03 | .03 | .015 | | |
| Y | 0 | .0015 | .0015 | .0015 | .0015 | .0015 | .007 | .003 | | |
| Yb | 0 | .00015 | .00015 | .0003 | .0003 | .0003 | .0007 | .0003 | | |
| Zr | .03 | .03 | .015 | .03 | .007 | .007 | .015 | .15 | | |

Suite No.-- 91G61 ( a through d )

Serial No's.-- 294,682 through 294,685

Mine-- Poison Canyon

Level-- North incline

Sec. 19 , Twp. 13 , Rge. 9 --

U.S. AEC Coordinates-- _____ N. x _____ E.

Mine location--

Sample elevation-- ~7,020 ft

Premining water table elevation-- Morrison Formation is dry

Sampled to test element distribution in-- the contact between a mudstone layer and the enclosing sandstone.

Sample descriptions:

a.--Very light gray, medium- to fine-grained sandstone. Disseminated pyrite and kaolinite nests are abundant.

b.--Very light gray, fine-grained sandstone. Disseminated pyrite, kaolinite nests and poikiloblastic calcite cement are abundant.

c.--Grayish-yellow mudstone. Disseminated cubes and masses of pyrite are abundant.

d.--Grayish-green mudstone with scattered small rounded blebs of medium-gray mudstone. Anhedral pyrite masses are common.

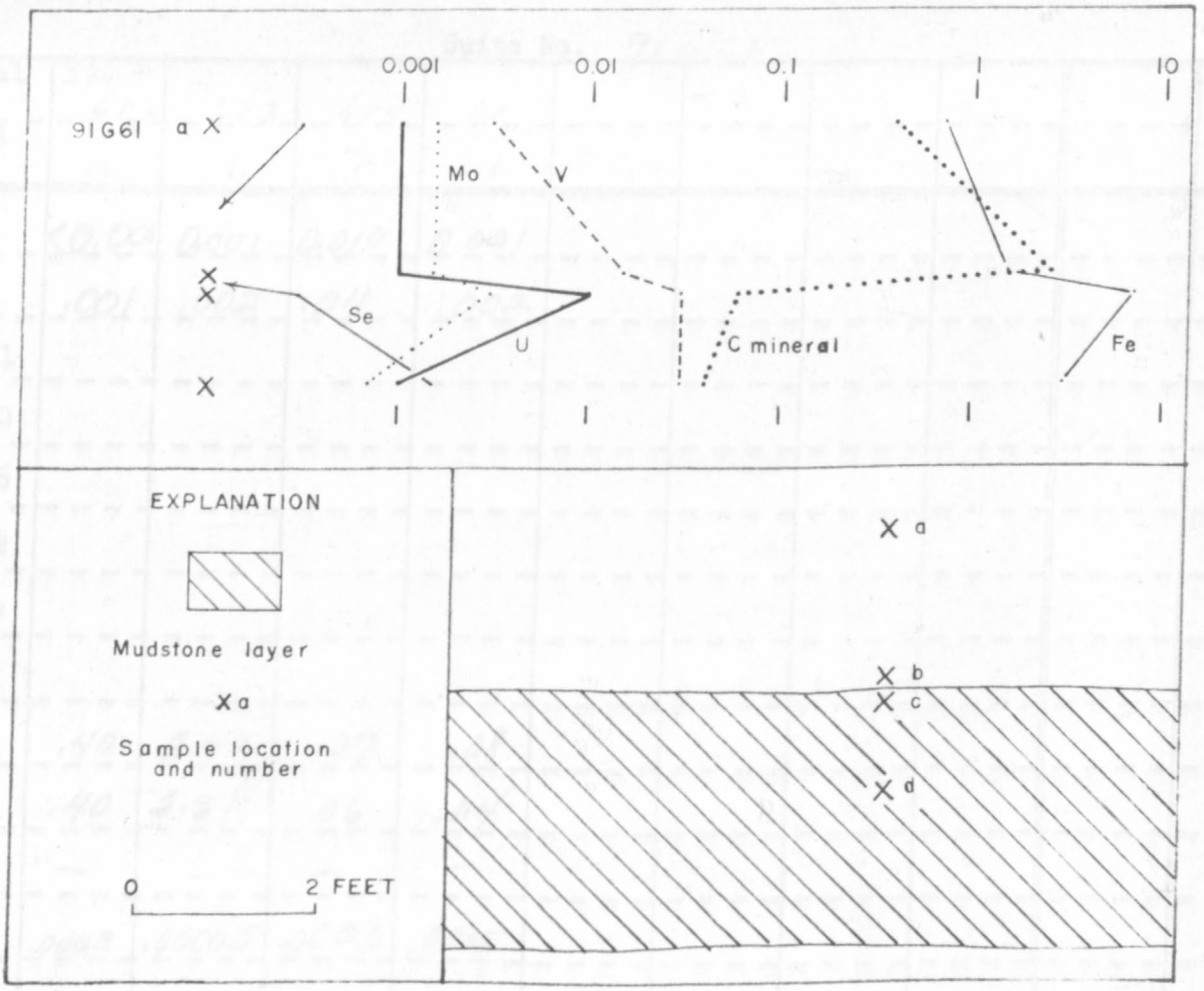



Figure 82.--Sample suite 91G61, Poison Canyon mine.

Suite No. 91661

| Serial no. / Field no. | 294, 682 a | 683 b | 684 c | 685 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | <0.001 | 0.001 | 0.010 | 0.001 | | | | | | |
| eU | .001 | .002 | .011 | .002 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .40 | 2.47 | .07 | .08 | | | | | | |
| $C_{Min.}$ | .40 | 2.51 | .06 | .04 | | | | | | |
| $C_{Org.}$ | — | — | — | — | | | | | | |
| Se | .0003 | .00005 | .0003 | .0015 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3.0 | 3.0 | 7.0 | 7.0 | | | | | | |
| Fe | .7 | 1.5 | 7. | 3. | | | | | | |
| Mg | .15 | .3 | 1.5 | 1.5 | | | | | | |
| Ca | 1.5 | 7. | .7 | .7 | | | | | | |
| Na | 1.5 | 1.5 | .7 | .7 | | | | | | |
| K | 1.5 | 2. | 3. | 3. | | | | | | |
| Ti | .03 | .03 | .3 | .3 | | | | | | |
| Mn | .007 | .007 | .007 | .007 | | | | | | |

Suite No. 91661 --Continued

| Serial no. / Field no. | 294, 682 a | 683 b | 684 c | 685 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .07 | .07 | .03 | .03 | | | | | | |
| Be | 0 | 0 | .0003 | .0003 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | 0 | 0 | .0007 | .0007 | | | | | | |
| Cr | .0003 | .003 | .015 | .003 | | | | | | |
| Cu | .0015 | .0007 | .003 | .003 | | | | | | |
| Ga | .0007 | .0007 | .003 | .003 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | .0015 | .0015 | .003 | .0007 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | 0 | 0 | .0015 | .0007 | | | | | | |
| Pb | 0 | 0 | 0 | .003 | | | | | | |
| Sc | 0 | 0 | .0007 | .0007 | | | | | | |
| Sr | .015 | .03 | .03 | .03 | | | | | | |
| Tl | 0 | 0 | 0 | 0 | | | | | | |
| V | .003 | .015 | .03 | .03 | | | | | | |
| Y | 0 | .0015 | .007 | .003 | | | | | | |
| Yb | 0 | .00015 | .0007 | .0007 | | | | | | |
| Zr | .003 | .0015 | .015 | .015 | | | | | | |

Suite No.-- 34G61 ( a through e )

Serial No's.-- 293,973 through 293,977

Mine-- Sandstone mine

Level--

Sec. 34 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 314,040 N. x 547,500 E.

Mine location-- Track 3 area

Sample elevation-- 6,140 ft

Premining water table elevation--~6,500 ft

Sampled to test element distribution in-- molybdenum-rich body

Sample descriptions:

a.--Pale-yellowish-brown, medium-grained sandstone. Contains scattered blebs of interstitial authigenic carbonaceous material. Sparse very fine pyrite perched on sand grains. Kaolinite nests are common and are about 2 to 4 mm across.

b.--Light-olive-gray, fine-grained sandstone. Disseminated pyrite is common. Kaolinite nests, less than 2 mm across, are sparse. The rock is generally clean looking and porous, without much clay. Sparse quartz overgrowths.

c.--Grayish-orange-pink to pale-yellowish-brown, medium- to fine-grained sandstone with scattered coarse grains. Abundant disseminated pyrite. Quartz overgrowths are common. Kaolinite nests are common but mostly quite small.

d.--Dark-gray, fine-grained sandstone. Authigenic molybdenum-rich material coats most sand grains. Disseminated pyrite, quartz overgrowths, and very small kaolinite nests are common. Most of the molybdenum-rich material overlies the quartz overgrowths but some of it seems to be under and intergrown with the overgrowths.

Suite No. 34G61 . Sample descriptions (Continued)

e.--Medium-dark-gray, fine-grained to medium-grained sandstone. Authigenic molybdenum-bearing material sporadically coats many sand grains. Quartz overgrowths and very small kaolinite nests are common.

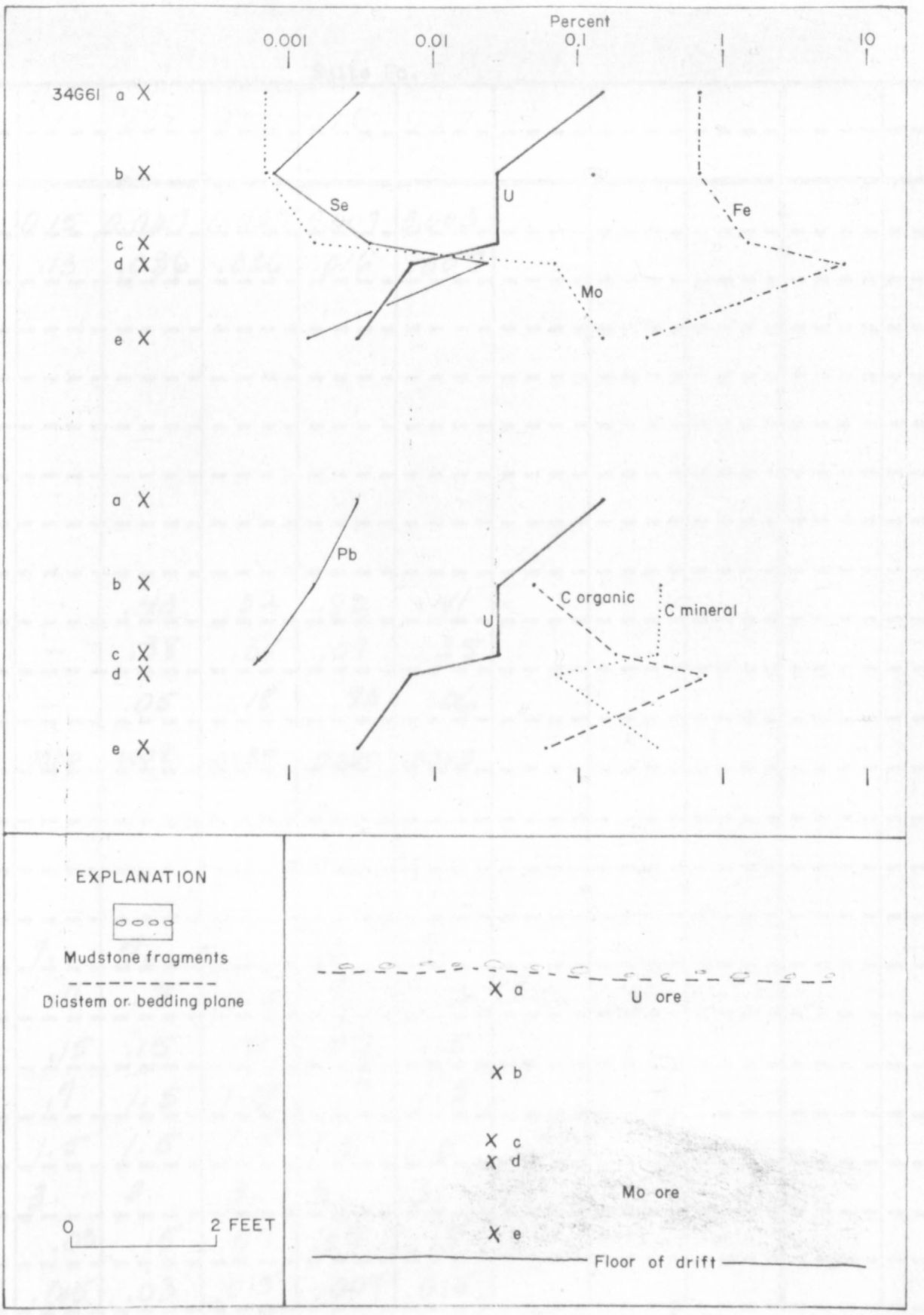



Figure 83.--Sample suite 34G61, Sandstone mine.

Suite No. 34G61

| Serial no. / Field no. | 273 273 a | 274 b | 275 c | 276 d | 277 e | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.15 | 0.027 | 0.027 | 0.001 | 0.003 | | | | | |
| eU | .13 | .036 | .036 | .016 | .007 | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | — | .43 | .52 | .82 | .41 | | | | | |
| $C_{Min.}$ | — | .38 | .34 | .07 | .35 | | | | | |
| $C_{Org.}$ | — | .05 | .18 | .75 | .06 | | | | | |
| Se | .0030 | .0008 | .0035 | .0220 | .0013 | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 3. | 7. | | | | | |
| Fe | .7 | .7 | 1.5 | 7. | .3 | | | | | |
| Mg | .15 | .15 | .15 | .07 | .15 | | | | | |
| Ca | .7 | 1.5 | 1.5 | .7 | 1.5 | | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | | | |
| K | 3. | 2. | 3. | 3. | 3. | | | | | |
| Ti | .03 | .15 | .07 | .07 | .15 | | | | | |
| Mn | .015 | .03 | .015 | .007 | .015 | | | | | |

Suite No. 34661 --Continued

| Serial no. / Field no. | 293, 973 a | 974 b | 975 c | 976 d | 977 e | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | .0015 | 0 | 0 | 0 | | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | | | | | |
| Be | 0 | 0 | 0 | 0 | 0 | | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | | | | | |
| Co | <.001 | 0 | 0 | 0 | 0 | | | | | |
| Cr | .00015 | .0007 | .0007 | .0015 | .0003 | | | | | |
| Cu | .00015 | .0003 | .0003 | .0003 | .0003 | | | | | |
| Ga | .0015 | .0015 | .0007 | .0007 | .0007 | | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | | | | | |
| La | 0 | 0 | 0 | 0 | 0 | | | | | |
| Mo | .0007 | .0007 | .0015 | .07 | .15 | | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | | | | | |
| Pb | .003 | .0015 | .0007 | 0 | 0 | | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | | | | | |
| Sr | .015 | .015 | .007 | .007 | .015 | | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | | | | | |
| V | .07 | .07 | .015 | .007 | .007 | | | | | |
| Y | 0 | 0 | 0 | 0 | 0 | | | | | |
| Yb | <.001 | <.001 | 0 | 0 | 0 | | | | | |
| Zr | .007 | .007 | .003 | .015 | .015 | | | | | |

Suite No.-- 37G61 ( a through d )

Serial No's.-- 294,458 through 294,461

Mine-- Sandstone

Level--

Sec. 34 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 313,700 N. x 545,440 E.

Mine location-- Track 2 area

Sample elevation-- 6,165 ft

Premining water table elevation-- ~6,500 ft

Sampled to test element distribution in-- leached-appearing prefault ore layer (analysis proved this to be a molybdenum-rich layer).

Sample descriptions:

a.--Dark-gray, medium-grained molybdenum-rich ore sandstone. Black authigenic molybdenum-rich carbonaceous material coats nearly all sand grains. Quartz overgrowths are sparse.

b.--Dark-gray, medium-grained molybdenum-rich ore sandstone grading into a 2-cm-wide, very light gray border adjacent to "c." In the dark areas all the sand grains are coated with authigenic molybdenum-rich carbonaceous(?) material. In the light areas all grains are coated with a film of very light gray clay. Kaolinite nests are very small and sparse.

c.--Brownish-gray, medium-grained sandstone grading into very light gray at the border zone in "b." Kaolinite nests are abundant and as much as 4 mm across. Finely disseminated pyrite is common. Blebs of authigenic carbonaceous material about the size of the sand grains are scattered about and occupy the interstices. An

Suite No. 37G61 . Sample descriptions (Continued)

extremely thin film of very light gray clay seems to coat all sand grains.

d.--Same as "c."

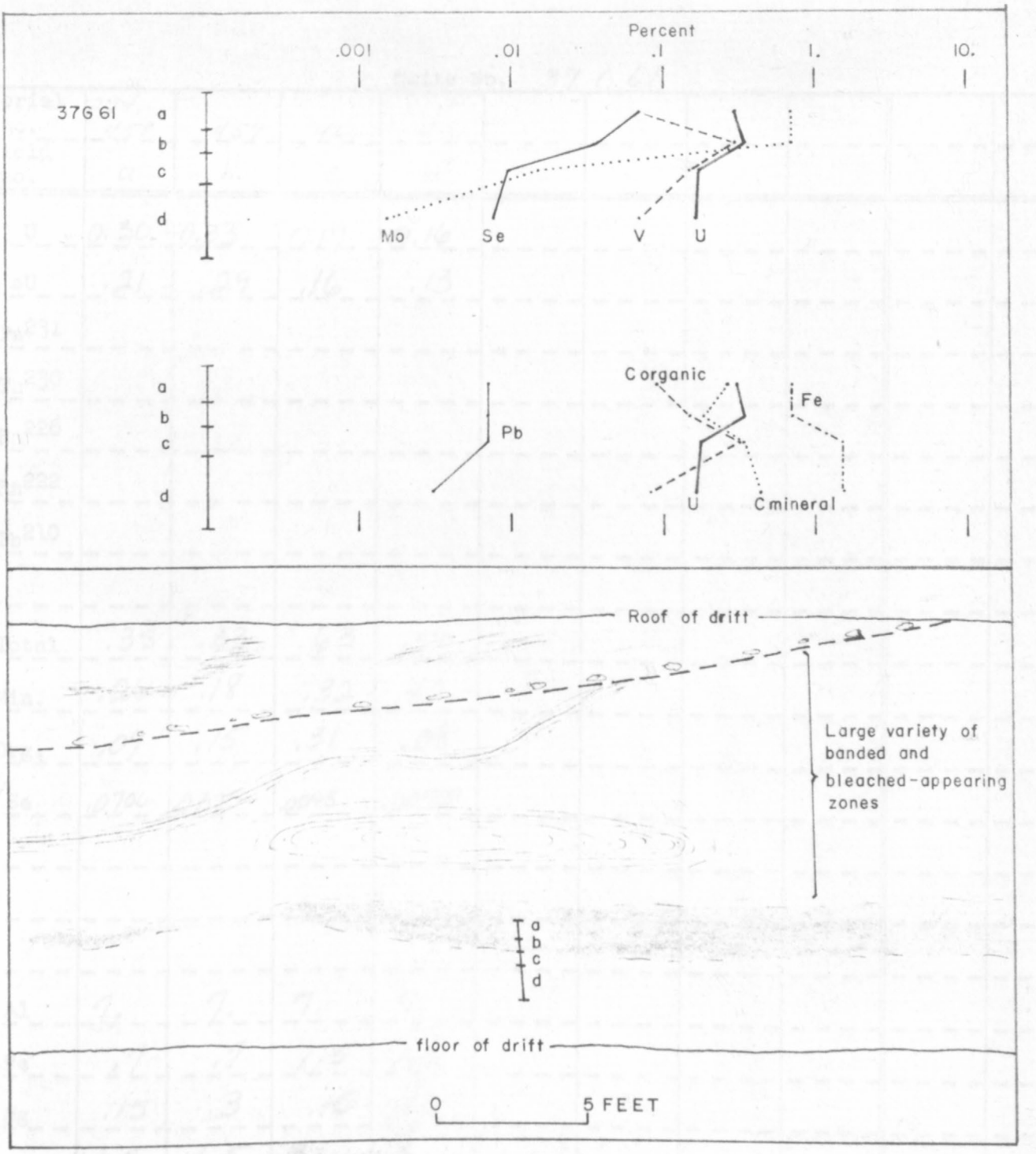



Figure 84.--Sample suite 37G61, Sandstone mine.

Suite No. 37661

| Serial no. / Field no. | 294, 458 a | 459 b | 460 c | 461 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.30 | 0.33 | 0.17 | 0.16 | | | | | | |
| eU | .21 | .29 | .16 | .13 | | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .35 | .33 | .63 | .50 | | | | | | |
| $C_{Min.}$ | .24 | .18 | .32 | .42 | | | | | | |
| $C_{Org.}$ | .09 | .15 | .31 | .08 | | | | | | |
| Se | .0700 | .0375 | .0095 | .0075 | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 7. | 7. | | | | | | |
| Fe | .7 | .7 | 1.5 | 1.5 | | | | | | |
| Mg | .15 | .3 | .15 | .15 | | | | | | |
| Ca | 1.5 | 1.5 | 3. | 3. | | | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | | | | | | |
| K | 3. | 3. | 3. | 3. | | | | | | |
| Ti | .07 | .07 | .07 | .07 | | | | | | |
| Mn | .03 | .03 | .03 | .03 | | | | | | |

Suite No. 37661 --Continued

| Serial no. / Field no. | 294, 458 a | 459 b | 460 c | 461 d | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | | | | | | |
| Ba | .07 | .07 | .07 | .07 | | | | | | |
| Be | .0003 | .0007 | .0003 | 0 | | | | | | |
| Bi | 0 | 0 | 0 | 0 | | | | | | |
| Ce | 0 | 0 | 0 | 0 | | | | | | |
| Co | <.003 | <.003 | <.003 | <.003 | | | | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | | | | | | |
| Cu | .0015 | .0015 | .0007 | .0003 | | | | | | |
| Ga | .0015 | .003 | .0015 | .0015 | | | | | | |
| Ge | 0 | 0 | 0 | 0 | | | | | | |
| La | 0 | 0 | 0 | 0 | | | | | | |
| Mo | .7 | .7 | .015 | .0015 | | | | | | |
| Nb | 0 | 0 | 0 | 0 | | | | | | |
| Nd | 0 | 0 | 0 | 0 | | | | | | |
| Ni | .0003 | .0003 | 0 | 0 | | | | | | |
| Pb | .007 | .007 | .007 | .003 | | | | | | |
| Sc | 0 | 0 | 0 | 0 | | | | | | |
| Sr | .015 | .015 | .015 | .015 | | | | | | |
| Tl | .015 | .007 | 0 | 0 | | | | | | |
| V | .07 | .3 | .15 | .07 | | | | | | |
| Y | .003 | .003 | .0015 | .0015 | | | | | | |
| Yb | <.003 | <.003 | <.003 | <.003 | | | | | | |
| Zr | .007 | .015 | .015 | .007 | | | | | | |

Suite No.-- 40061 ( a through f )

Serial No's.-- 294,186 through 294,191

Mine-- San Mateo

Level--

Sec. 30 , Twp. 13 , Rge. 8 --

U.S. AEC Coordinates-- -- N. x -- E.

Mine location-- 17,410 N. x 23,920 E. (mine coordinates)

Sample elevation-- not recorded

Premining water table elevation--~6,625 ft

Sampled to test element distribution in--a prefault ore layer that abruptly changes grade and appears leached where it crosses a zone of joints.

Sample descriptions:

a.--Light-gray, fine-grained sandstone with streaks of dark gray. The dark-gray streaks are impregnated with black authigenic carbonaceous material. Fine-grained calcite cement is abundant. Sparse kaolinite nests less than 2 mm across occur in the light-gray areas.

b.--Brownish-gray coarse- and very coarse grained ore-bearing strata alternating with some dark-greenish-gray fine-grained strata. Authigenic organic material partly coats some sand grains and forms scattered blebs in the interstices. Quartz overgrowths and kaolinite nests as much as 2 cm across are abundant in the coarser grained facies. A greenish-gray clay occurs in the finer grained facies. Calcite cement is common.

c.--Medium-light-gray, medium- to coarse-grained sandstone with scattered very coarse grains and granules. Quartz overgrowths are abundant and kaolinite nests 2-4 mm across are common. Calcite is sparse.

Suite No. 40G61, Sample descriptions (Continued)

d.--Very-pale-orange, fine- to medium-grained sandstone. A few scattered blebs of authigenic carbonaceous material are present. Quartz overgrowths and kaolinite nests, 1 to 2 mm across, are common.

e.--Yellowish-brown, coarse-grained, leached ore sandstone. A few scattered blebs of authigenic carbonaceous material were noted. Pyrite is very sparse. Quartz overgrowths enclosing some of the carbonaceous material and kaolinite nests as much as 3 to 10 mm across are abundant. Calcite cement is sparse.

f.--Pale-yellowish-brown, medium- to coarse-grained sandstone with scattered mudstone pebbles. Quartz overgrowths are common. Kaolinite nests asemuch as several millimeters across are common. Calcite cement is sparse to common.

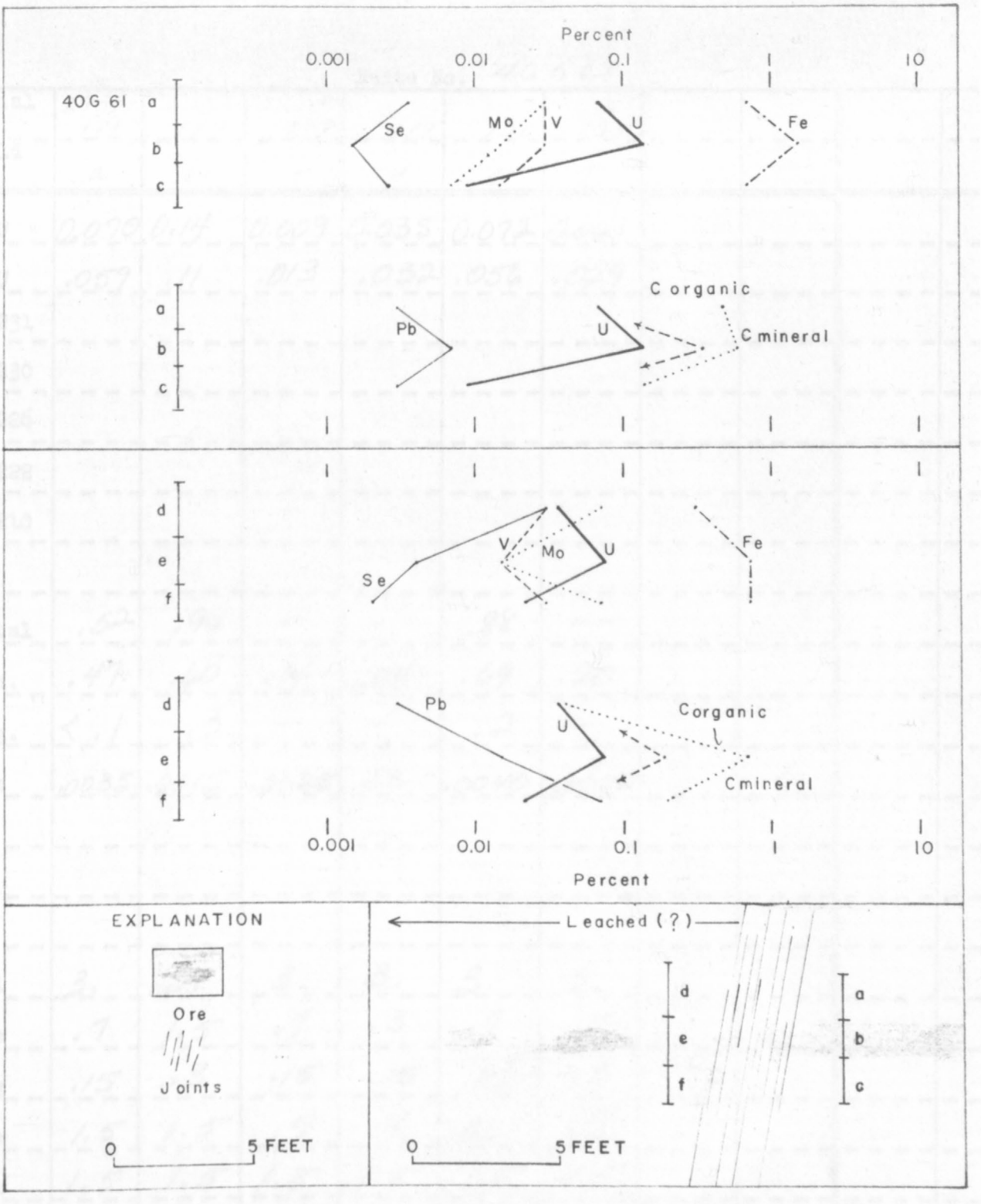



Figure 85.--Sample suite 40G61, San Mateo mine.

Suite No. 40661

| Serial no. / Field no. | 294, 186 a | 182 b | 188 c | 189 d | 190 e | 191 f | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.070 | 0.14 | 0.009 | 0.035 | 0.072 | 0.021 | | | | |
| eU | .059 | .11 | .013 | .032 | .056 | .029 | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .52 | .94 | — | — | .88 | — | | | | |
| $C_{Min.}$ | .47 | .60 | .14 | .04 | .69 | .20 | | | | |
| $C_{Org.}$ | <.1 | .3 | — | — | .2 | — | | | | |
| Se | .0035 | .0015 | .0025 | .03 | .0040 | .0020 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | 2. | 3. | 3. | 3. | 3. | | | | |
| Fe | .7 | 1.5 | .7 | .3 | .7 | .7 | | | | |
| Mg | .15 | .3 | .15 | .15 | .15 | .3 | | | | |
| Ca | 1.5 | 1.5 | .7 | .7 | 3. | .7 | | | | |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | | | |
| K | 3. | 3. | 3. | 3. | 3. | 3. | | | | |
| Ti | .07 | .07 | .03 | .07 | .03 | .15 | | | | |
| Mn | .03 | .03 | .015 | .007 | .07 | .015 | | | | |

Suite No. 40661 --Continued

| Serial no. | 294, 186 | 187 | 188 | 189 | 190 | 191 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | a | b | c | d | e | f | | | | |
| B | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | | | | |
| Be | 0 | 0 | .003 | 0 | .0007 | 0 | | | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Co | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Cr | .0003 | .0003 | .0003 | .0003 | .0003 | .0007 | | | | |
| Cu | .0007 | .0007 | .0015 | .0015 | .0015 | .0015 | | | | |
| Ga | .0015 | .0015 | .0015 | .0007 | .0007 | .0015 | | | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| La | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Mo | .03 | .015 | .007 | .07 | .015 | .07 | | | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Pb | .003 | .007 | .003 | .003 | .015 | .07 | | | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| Sr | .015 | .03 | .015 | .015 | .03 | .03 | | | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| V | .03 | .03 | .015 | .03 | .015 | .03 | | | | |
| Y | 0 | .0015 | 0 | .0015 | .0015 | .0015 | | | | |
| Yb | .0003 | .0003 | .0003 | .0003 | .00015 | .00015 | | | | |
| Zr | .007 | .007 | .003 | .003 | .003 | .007 | | | | |

Suite No.-- 66G62 ( a through e )

Serial No's.-- 301,269 through 301,273

Mine-- Drill core 221-C

Level--

Sec. 20 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 326,120 N. x 534,920 E.

Mine location--

Sample elevation-- ~ 6,100 ft

Premining water table elevation-- ~ 6,500 ft

Sampled to test element distribution in--an unmineralized mudstone layer. (Analyses suggest that it is weakly mineralized, however.)

Sample descriptions:

a.--Medium-light-gray, coarse and very coarse grained sandstone. Kaolinite aggregates are common and calcite cement is abundant. Pyrite is sparse and generally occurs within altered sand grains. A few anatase aggregates were noted.

b.--Light-greenish-gray mudstone with scattered sand grains. Minute scattered pyrite grains are sparse.

c.--Similar to "b" with a smaller percentage of sand-size grains.

d.--Greenish-gray to light-greenish-gray mudstone with scattered, very fine sand grains. Pyrite is common in the centimeter of mudstone adjacent to "e."

e.--Light-brownish-gray, very coarse grained sandstone. Kaolinite aggregates, 10 mm across are common to abundant. Calcite poikiloblasts 10 mm across form abundant cement. Pyrite is common in and near altered sand grains.

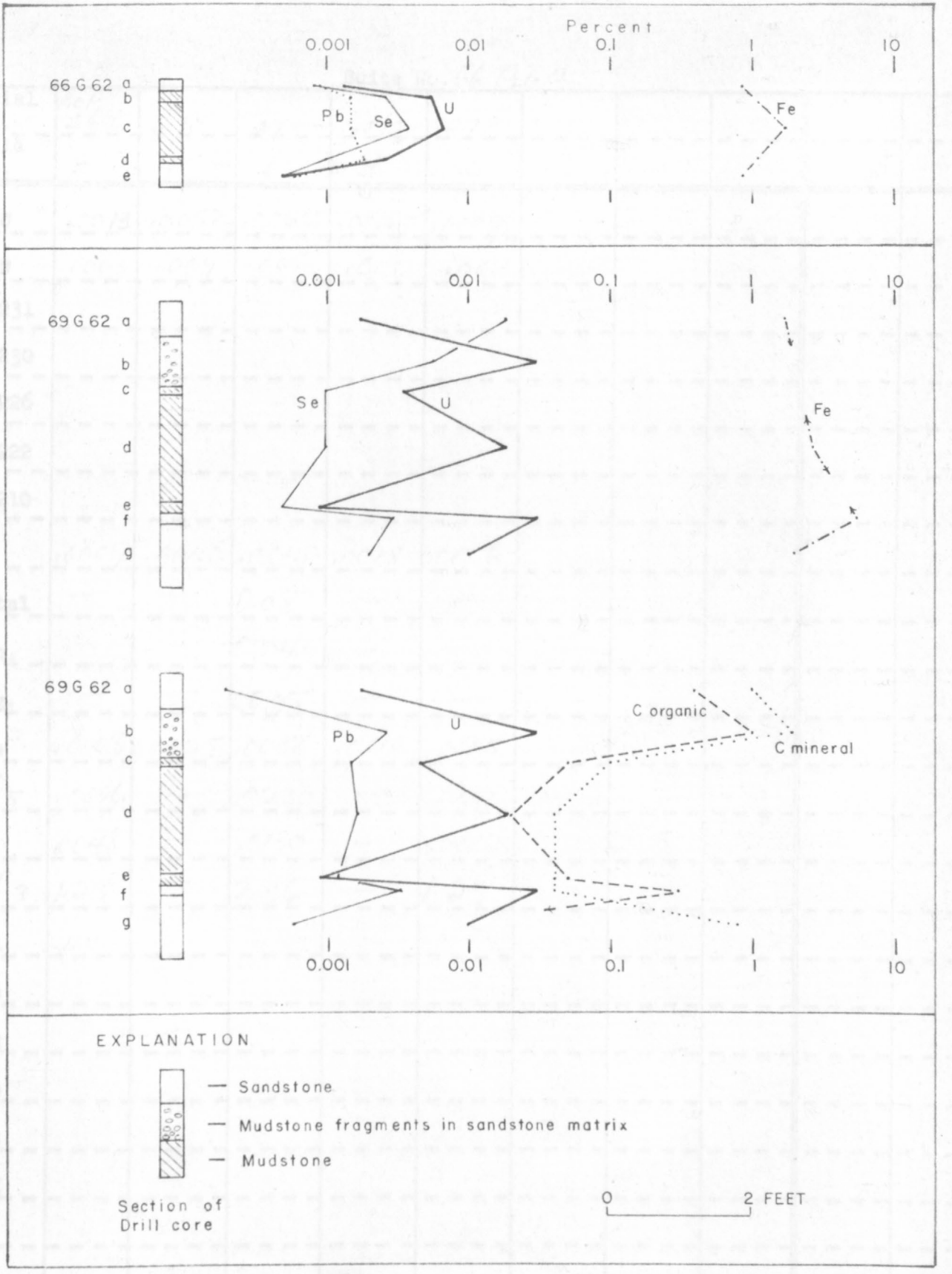



Figure 86.--Sample suites 66G62 and 69G62 from drill cores.

Suite No. 66 G62

| Serial no. / Field no. | 301, 269 a | 270 b | 271 c | 272 d | 273 e | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | .0013 | .0052 | .0065 | .0025 | .0005 | | | | | |
| eU | .003 | .009 | .009 | .013 | .003 | | | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Pb | .0009 | .0015 | .0015 | .0018 | .0006 | | | | | |
| $C_{Total}$ | — | — | 0.08 | — | — | | | | | |
| $C_{Min.}$ | — | — | 0.04 | — | — | | | | | |
| $C_{Org.}$ | — | — | <0.05 | — | — | | | | | |
| Se | .0008 | .0025 | .0038 | .0010 | .0005 | | | | | |
| $V_2O_5$ | .0096 | — | .0230 | — | .0150 | | | | | |
| Mo | .0048 | — | .0130 | — | .0012 | | | | | |
| $Fe_2O_3$ | 1.25 | — | 2.36 | — | 1.23 | | | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

Suite No.-- 69G62 ( a through g ) See fig. 86.

Serial No's.-- 301,276 through 301,282

Mine-- Drill core

Level--

Sec. 35 , Twp. 14 , Rge. 9 --

U.S. AEC Coordinates-- 312,510 N. x 550,980 E.

Mine location--

Sample elevation-- ~ 5,865 ft

Premining water table elevation-- ~ 6,500 ft

Sampled to test element distribution in--a mudstone layer in a presumably unmineralized part of the core. Careful inspection and subsequent analysis proved it to be mineralized, however.

Sample descriptions:

a.--Medium-gray to very light gray, largely medium-light-gray, medium-grained sandstone, with many mudstone fragments of granule size and smaller. Disseminated pyrite and and kaolinite nests are very sparse. Calcite cement is abundant.

b.--Mostly greenish-gray, small mudstone pebble conglomerate in a coarse-grained sandstone matrix. Streaked with grayish-black zones of clay impregnated with authigenic carbonaceous material. Calcite cemented.

c.--Greenish-gray to dark-greenish-gray mudstone with scattered very coarse and finer sand grains. Very sparse pyrite and calcite cement.

d.--Medium-gray to greenish-gray mudstone with scattered fine to coarse sand grains.

e.--Medium-greenish-gray mudstone with scattered sand grains.

f.--Medium-gray, fine-grained sandstone grading to grayish-black adjacent to "e." Authigenic carbonaceous material fills the interstices for about 1 cm adjacent to

Suite No. 69G62 . Sample descriptions (Continued)

the mudstone but grades downward into a clay stain. Pyrite is associated with carbonaceous material.

g.--Medium-light-gray, fine-grained sandstone. Very small kaolinite nestssare common. A thin layer of a grayish clay coats all the sand grains.

Suite No. 69 G 62

| Serial no. / Field no. | 276 a | 277 b | 278 c | 279 d | 280 e | 281 f | 282 g | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.0017 | 0.030 | 0.0033 | 0.018 | 0.0009 | 0.030 | 0.010 | | | |
| eU | .017 | .072 | .009 | .020 | .012 | .075 | .014 | | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| Pb | .0002 | .0025 | .0015 | .0016 | .0012 | .0032 | .0006 | | | |
| $C_{Total}$ | 1.45 | 2.95 | 0.15 | 0.06 | 0.09 | 0.32 | 0.78 | | | |
| $C_{Min.}$ | 1.00 | 1.90 | 0.10 | .04 | .04 | .04 | 0.78 | | | |
| $C_{org.}$ | 0.4 | 1.0 | .05 | <.05 | 0.05 | 0.3 | <.05 | | | |
| Se | .0180 | .0055 | .0010 | .0010 | .0005 | .0030 | .0020 | | | |
| Mo | .0047 | — | — | .0007 | — | .0007 | — | | | |
| $V_2O_5$ | .0400 | — | — | .0570 | — | .1200 | .0300 | | | |
| $Fe_2O_3$ | 2.35 | — | — | 3.66 | — | 7.46 | 2.82 | | | |
| Al | | | | | | | | | | |
| Fe | | | | | | | | | | |
| Mg | | | | | | | | | | |
| Ca | | | | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

SPECTROGRAPHIC ANALYSES

No

Miscellaneous Samples

| Field No. | 5ES59B | 5ES59C | 15ES59A | 15ES59C | 31G59 |
|---|---|---|---|---|---|
| Serial No. | 272,712 | 272,713 | 272,726 | 272,727 | D-112,468 |
| Mine | Sec 10 | Sec 10 | Sec 10 | Sec 10 | Sec. 15 |
| Sec.-Twp.-Rge | 10-14-10 | 10-14-10 | 10-14-10 | 10-14-10 | 15-14-10 |
| AEC coord.: N | 333,850 | 333,850 | 333,380 | 333,380 | 326,415 |
| do : E | 515,850 | 515,850 | 515,595 | 515,595 | 515,810 |
| Elevation (ft) | 6741 | 6741 | 6735 | 6735 | 6595 |
| Sandstone | ✓ | | ✓ | ✓ | |
| Mudstone | | | | | |
| Mudstone cglt. | | ✓ | | | |
| Color | Gray | Gray | Gray | Light Brown | |
| Grain size | fine | coarse | medium | coarse | |
| Prefault ore | | | | | |
| Prefault sub ore | ✓ | ✓ | ✓ | ✓ | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | | | ✓ | ✓ | |
| Near oxidation | ✓ | ✓ | | | |
| Oxidized | | | | | |
| Remarks | | | | | Pyrite from a joint. |

Miscellaneous Samples

| Field No. | 32G59 | 33G59 | 38G59 | 42G59a | 7G60 |
|---|---|---|---|---|---|
| Serial No. | D-112,469 | 277,964 | 277,965 | D-112,470 | D-112,472 |
| Mine | Sec. 15 | Sec. 15 | Sec. 15 | Sec. 15 | Sec 15 |
| Sec.-Twp.-Rge | 15-14-10 | 15-14-10 | 15-14-10 | 15-14-10 | 15-14-10 |
| AEC coord.: N | 326,610 | 326,610 | 326,535 | 326,420 | 327,300 |
| do : E | 515,305 | 515,305 | 514,515 | 514,870 | 514,640 |
| Elevation (ft) | 6585 | 6610 | 6500 | 6515 | 6590 |
| Sandstone | | ✓ | ✓ | | |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | | med.-gray | Brownish-gray | | |
| Grain size | | fine | medium | | |
| Prefault ore | | | | | |
| Prefault sub ore | | ? | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | ✓ | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | | ✓ | ✓ | | |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | Pyrite from a mudstone layer. | | | Pyrite from a joint. | Pyrite from sandstone. |

| Serial no. | 272, 212 | 272, 213 | 272, 224 | 272, 222 | D-112, 468 | D-112, 469 | 277, 964 | 277, 965 | D-112, 420 | D-112, 422 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 5ES59B | 5ES59C | 15ES59A | 15ES59C | 31G59 | 32G59 | 33G59 | 38G59 | 42G59 | 7G60 |
| U | 0.006 | 0.002 | 0.025 | 0.045 | 0 (spect.) | 0 (spect.) | 0.048 | 1.03 | 3 (spect.) | — |
| eU | .008 | .006 | .021 | .012 | — | — | .042 | .78 | — | — |
| $ePa^{231}$ | — | — | — | — | — | — | — | .81 | — | — |
| $eTh^{230}$ | — | — | — | — | — | — | — | .74 | — | — |
| $eRa^{226}$ | — | — | — | — | — | — | — | .79 | — | — |
| $eRn^{222}$ | — | — | — | — | — | — | — | .67 | — | — |
| $ePb^{210}$ | — | — | — | — | — | — | — | .72 | — | — |
| | — | — | — | — | — | — | — | — | — | — |
| CTotal | — | — | — | — | — | — | — | — | — | — |
| CMin. | .02 | .90 | 3.41 | .17 | — | — | — | — | — | — |
| $C_{org.}$ | — | — | — | — | — | — | — | — | — | — |
| Be | .0003 | .0015 | .0004 | .0008 | .230 | .0230 | .010 | .0004 | .0520 | .0085 |
| | — | — | — | — | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |
| | — | — | — | — | — | — | — | — | — | — |
| Al | 3 | 3 | 1.5 | 3 | 1.5 | 1.5 | 7 | 3 | 3 | 1.5 |
| Fe | .3 | .7 | 3 | .3 | .7 | .7 | 3 | .7 | .7 | .7 |
| Mg | .3 | .7 | .15 | .15 | .015 | .03 | .3 | .07 | .03 | .05 |
| Ca | .15 | 3 | 3 | .2 | .02 | .1 | .2 | .15 | .02 | .2 |
| Na | .7 | .7 | 1.5 | 1.5 | .02 | .05 | .7 | .7 | .3 | .05 |
| K | 3 | 3 | 3 | 3 | 0 | 0 | 1.5 | 1.5 | 0 | 0 |
| Ti | .15 | .07 | .015 | .02 | .05 | .005 | .15 | .03 | .07 | .1 |
| Mn | .007 | .03 | .3 | .007 | .03 | .001 | .15 | .015 | .015 | .02 |

| Serial no. | 272, 712 | 272, 713 | 272, 726 | 272, 727 | D-112, 448 | D-112, 449 | 272, 944 | 272, 945 | D-112, 420 | D-112, 473 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 5ES59B | 5ES59C | 15ES59A | 15ES59C | 31659 | 32659 | 33659 | 38659 | 43659a | 7660 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .01 | .002 | .07 | .07 | .01 | .003 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .03 |
| Co | 0 | 0 | 0 | 0 | .002 | .0015 | .0007 | <.002 | <.005 | .005 |
| Cr | .0015 | .0007 | .0003 | .0003 | .003 | .0002 | .0015 | .0003 | .0015 | .01 |
| Cu | .0007 | .0015 | .0003 | .0003 | .01 | .002 | .0003 | .0007 | .03 | .015 |
| Ga | .0003 | .0003 | .0003 | .0007 | <.005 | <.005 | d | <.001 | <.005 | <.005 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .005 | .01 |
| Mo | 0 | 0 | .003 | 0 | 0 | 0 | .003 | 0 | .03 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 |
| Nd | 0 | 0 | 0 | 0 | — | — | 0 | 0 | 0 | .007 |
| Ni | 0 | 0 | 0 | 0 | .002 | .001 | d | 0 | .002 | .003 |
| Pb | .0015 | .0015 | 0 | .0015 | .01 | 0 | d | d | .05 | .007 |
| Sc | 0 | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .03 | .03 | .015 | 0 | 0 | .03 | .015 | .0015 | .0015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .003 | .007 | .03 | .02 | .002 | 0 | .015 | .3 | .01 | .015 |
| Y | .0015 | .0015 | .0015 | 0 | .0015 | 0 | .003 | 0 | 0 | .005 |
| Yb | .00015 | .0003 | .00015 | — | — | — | .0003 | — | — | — |
| Zr | .015 | .007 | .003 | .007 | .007 | .001 | .015 | .007 | .015 | .3 |

Miscellaneous Samples

| Field No. | 19660 | 77661a | 77661b | 43G59 | 58G59 |
|---|---|---|---|---|---|
| Serial No. | 287,473 | 294,679 | 294,680 | 158,011 | 277,979 |
| Mine | Sec 17 | Sec 17 | Sec 17 | Sec. 22 | Sec. 22 |
| Sec.-Twp.-Rge | 17-14-9 | 17-14-9 | 17-14-9 | 22-14-10 | 22-14-10 |
| AEC coord.: N | 327,650 | 326,500 | 326,500 | 324,650 | 324,650 |
| do : E | 533,040 | 533,800 | 533,800 | 514,485 | 514,250 |
| Elevation (ft) | 6255 | — | — | 6410 | 6410 |
| Sandstone | ✓ | ✓ | | Jointed | ✓ |
| Mudstone | | | ✓ | | |
| Mudstone cglt. | | light olive gray | greenish gray | | |
| Color | Dark gray | silt | clay | Black | Grayish-red |
| Grain size | fine | | | | medium |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | ? | | | ✓ | |
| Postfault sub ore | | | | | ✓ |
| Barren rock | | ✓ | ✓ | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | |
| Near oxidation | | | | ✓ | |
| Oxidized | | | | | ✓ |
| Remarks | | | | Uraninite from joint. | Calcitic concretion. |

Miscellaneous Samples

| Field No. | 66G59 | 2G60 | 11G60 | 126G61 | 127G61 |
|---|---|---|---|---|---|
| Serial No. | 287, 468 | D-112, 471 | D-112, 473 | 294, 652 | 293, 985 |
| Mine | Sec 22 | Sec 22 | Sec 23 | Sec. 23 | Sec 23 |
| Sec.-Twp.-Rge | 22-14-10 | 22-14-10 | 23-14-10 | 23-14-10 | 23-14-10 |
| AEC coord.: N | 325, 860 | 326, 100 | — | 324, 870 | 325, 016 |
| do : E | 514, 325 | 514, 470 | — | 519, 080 | 519, 140 |
| Elevation (ft) | ~ 6450 | 6560 | — | 6510 | 6520 |
| Sandstone | faulted | | | | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | replacement | |
| Color | White | | | black | medium gray |
| Grain size | coarse | | | minute | medium |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | near | | | | ✓ |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | | | | | ✓ |
| Near oxidation | | | | ✓ | ✓ |
| Oxidized | | | | | |
| Remarks | Barite from fault. | Pyrite from a mudstone layer. 4/28 | Pyrite from ore layer | Psilomelane separate | |

| Serial no. | 287, -473 | 294, -679 | 294, -680 | 158, -014 | 277, -929 | 287, -466 | D-112, -471 | D-112, -423 | 294, -652 | 293, -925 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 19660 | 77661a | 77661b | 43659 | 58659 | 66659 | 2640 | 11640 | 126661 | 127661 |
| U | 0.16 | 0.003 | 0.001 | 7/11 | 0.030 | — | — | — | 0(spec.) | 0.70 |
| eU | .13 | .007 | .004 | — | .034 | .007 | — | — | ≈.13 | .43 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .24 | .52 | .24 | | | | | | — | — |
| $C_{Min.}$ | .02 | .62 | .04 | | | | | | — | .62 |
| $C_{Org.}$ | .4 | — | — | | | | | | — | — |
| Be | | .0015 | .0005 | — | .0250 | — | .0145 | 1.52 | — | .0005 |
| | | | | .10 | — | — | — | — | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3 | 3 | 7 | .07 | 3 | .0015 | .3 | .3 | .3 | .7 |
| Fe | .7 | 1.5 | 3 | .15 | .7 | .003 | .1 | .1 | .5 | 1.5 |
| Mg | .3 | .7 | 1.5 | .0015 | .15 | 0 | .03 | .03 | .5 | .15 |
| Ca | .15 | .3 | .3 | 1.5 | .1 | .03 | .05 | .1 | .3 | .7 |
| Na | .7 | 1.5 | 1.5 | 0 | .7 | 0 | .1 | .05 | .5 | 1.5 |
| K | 3 | 3 | 3 | — | 1.5 | 0 | 0 | 0 | 2 | 3 |
| Ti | .15 | .3 | .15 | .0002 | .7 | 0 | .05 | 0 | .15 | .15 |
| Mn | .007 | .015 | .007 | .3 | .15 | 0 | .001 | .015 | .1 | .015 |

| Serial no. | 187, | 294, | 294, | 158, | 277, | 287, | D-112, | D-112, | 294, | 293, |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 473 | 629 | 680 | 944 | 979 | 468 | 471 | 473 | 652 | 985 |
| | 19660 | 77661a | 77661b | 43659 | 58659 | 66659 | 2660 | 11660 | 126661 | 127661 |
| B | 0 | 0 | 0 | .007 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .03 | .03 | .03 | .07 | .003 | .003 | .7 | .02 |
| Be | .0015 | .0003 | .0003 | .0003 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | .015 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.003 | 0 | 0 | .003 | 0 | 0 | .002 | .005 | 0 | <.001 |
| Cr | .0007 | .0015 | .0015 | .0003 | .0015 | 0 | .0005 | .003 | .007 | .0003 |
| Cu | .0015 | .015 | .0015 | .0007 | .0015 | 0 | .003 | .007 | .005 | .0003 |
| Ga | .0001 | .0015 | .0015 | 0 | d | 0 | <.005 | <.005 | — | .0007 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | .015 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mo | 0 | .0015 | .0007 | 0 | 0 | 0 | 0 | .003 | 0 | 0 |
| Nb | 0 | 0 | 0 | .0003 | .0015 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | — | — | — | 0 |
| Ni | 0 | 0 | .0007 | .007 | 0 | 0 | .003 | .003 | 0 | 0 |
| Pb | .0015 | .015 | 0 | .15 | d | 0 | 0 | .1 | .02 | 0 |
| Sc | 0 | .0007 | .0007 | .003 | d | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .03 | .07 | .03 | .03 | .15 | .001 | 0 | .15 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .02 | .003 | .003 | 1.5 | .07 | 0 | 0 | .02 | .02 | .02 |
| Y | .0007 | .003 | .003 | .015 | .003 | 0 | 0 | .007 | .0015 | .0015 |
| Yb | <.0005 | .0001 | .0001 | — | .003 | 0 | — | — | <.0005 | <.0007 |
| Zr | .007 | .015 | .015 | 0 | .015 | 0 | .0015 | .1 | .03 | .015 |

Miscellaneous Samples

| Field No. | 14G60 | 4G61 | 5G61 | 6G60 | 8-20-59 c |
|---|---|---|---|---|---|
| Serial No. | 287,470 | 291,354 | 291,355 | 287,469 | 278,059 |
| Mine | Sec 24 | Sec 24 | Sec 24 | Sec 25 | Sec 30 |
| Sec.-Twp.-Rge | 24-14-10 | 24-14-10 | 24-14-10 | 25-14-10 | 30-14-9 |
| AEC coord.: N | 322,650 | 323,338 | 323,338 | — | 318,850 |
| do : E | 522,090 | 522,055 | 522,097 | — | 531,210 |
| Elevation (ft) | 6283 | ? | ? | ~6240 | 6500 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | granules | | | |
| Color | Dark gray | Medium Dark gray | Medium Dark gray | Light gray | Brownish gray |
| Grain size | medium | coarse | fine | fine | medium |
| Prefault ore | | ? | | ✓ | ? |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | ✓ | ? | ✓ | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | ✓ | ? | | | |
| Oxidized | | | | | |
| Remarks | | From a fault zone | | | |

Miscellaneous Samples

| Field No. | 8-20-59 D | 8-20-59 E | 8-20-59 F | 8-20-59 G | 8-20-59 H |
|---|---|---|---|---|---|
| Serial No. | 278,060 | 278,061 | 278,062 | 278,063 | 278,064 |
| Mine | Sec 30 | Sec 30 | Sec 30 | Sec 30 | Sec 30 |
| Sec.-Twp.-Rge | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 |
| AEC coord.: N | 318,850 | 318,850 | 318,850 | 318,850 | 318,850 |
| do : E | 531,210 | 531,210 | 531,210 | 531,290 | 531,290 |
| Elevation (ft) | 6500 | 6500 | 6500 | 6500 | 6500 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Black | Dark gray | Gray | Dark gray | Gray |
| Grain size | medium | medium | medium | medium | medium |
| Prefault ore | ✓ | ✓ | ✓ | ✓ | |
| Prefault sub ore | | | | | ✓ |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

| Serial no. | 287, | 291, | 291, | 292, | 278, | 278, | 278, | 278, | 278, | 278, |
|---|---|---|---|---|---|---|---|---|---|---|
| | 470 | 354 | 355 | 469 | 059 | 060 | 061 | 062 | 063 | 064 |
| Field no. | 14660 | 4661 | 5661 | 6660 | 8-20-59 C | 8-20-59 D | 8-20-59 E | 8-20-59 F | 8-20-59 G | 8-20-59 H |
| U | 0.94 | 0.21 | 1.15 | 0.30 | 0.31 | 1.28 | 0.75 | 0.56 | 0.74 | 0.013 |
| eU | .81 | .18 | .99 | .32 | .23 | .79 | .61 | .53 | .60 | .081 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| CTotal | .2 | 2.7 | .3 | ≤.2 | — | 1.7 | .4 | .33 | .4 | ≤.2 |
| CMin. | .20 | 2.39 | .26 | .05 | — | .06 | .03 | .03 | .01 | .01 |
| COrg. | ≤.2 | .3 | ≤.2 | ≤.2 | — | 1.6 | .4 | .3 | .4 | ≤.2 |
| Se | — | | | — | .0020 | .0086 | .0084 | .0080 | .0120 | .0082 |
| | — | .05 | .22 | — | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 3. | | | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| Fe | 1.5 | | | 1.5 | 3 | 1.5 | 1.5 | 1.5 | 1.5 | 3 |
| Mg | .3 | | | .3 | .2 | .3 | .3 | .3 | .3 | .2 |
| Ca | .2 | | | .15 | 1.5 | .2 | .3 | .3 | .2 | .3 |
| Na | .2 | | | .2 | 1.5 | 1.5 | .2 | 1.5 | 1.5 | .2 |
| K | 3 | | | 3 | 3 | 3 | 3 | 3 | 3 | 1.5 |
| Ti | .15 | | | .15 | .02 | .02 | .02 | .02 | .15 | .02 |
| Mn | .015 | | | .007 | .03 | .015 | .015 | .03 | .015 | .015 |

No Spectrographic Analyses

| Serial no. | 287, 470 | 291, 354 | 291, 355 | 287, 449 | 278, 059 | 278, 060 | 278, 061 | 278, 062 | 278, 063 | 278, 064 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 14660 | 4661 | 5661 | 6660 | 8-20-59C | 8-20-59D | 8-20-59E | 8-20-59F | 8-20-59G | 8-20-59H |
| B | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | | | .07 | .07 | .07 | .07 | .07 | .07 | .03 |
| Be | 0 | | | 0 | 0 | .0003 | .00015 | .0003 | .0003 | 0 |
| Bi | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.003 | | | <.003 | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 |
| Cr | .0007 | | | .0015 | .003 | .0003 | .0003 | .0003 | .0003 | .0003 |
| Cu | .0007 | | | .0007 | .015 | .007 | .007 | .007 | .003 | .003 |
| Ga | 0 | | | .00015 | d | d | d | d | d | d |
| Ge | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | | | 0 | 0 | 0 | 0 | 0 | .003 | 0 |
| Mo | 0 | | | 0 | 0 | .0015 | .003 | .003 | .015 | .003 |
| Nb | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | | | .0003 | 0 | 0 | 0 | .0007 | 0 | 0 |
| Pb | d | | | d | .007 | .015 | .007 | .007 | .007 | .0015 |
| Sc | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | | | .007 | .03 | .03 | .015 | .03 | .03 | .015 |
| Tl | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .15 | | | .07 | .3 | 1.5 | .7 | .7 | .3 | .15 |
| Y | .0015 | | | 0 | .0015 | .0015 | d | .0015 | .0015 | 0 |
| Yb | <.0005 | | | <.0005 | — | — | — | — | — | — |
| Zr | .015 | | | .007 | .015 | .007 | .003 | .003 | .007 | .015 |

Miscellaneous Samples

| Field No. | 8-20-59 I | 8-20-59 J | 8-20-59 K | 8-20-59 L | 8-20-59 M |
|---|---|---|---|---|---|
| Serial No. | 278,065 | 278,066 | 278,067 | 278,068 | 278,069 |
| Mine | Sec 30 | Sec 30 | Sec 30 | Sec 30 | Sec 30 |
| Sec.-Twp.-Rge | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 |
| AEC coord.: N | 318,850 | 318,850 | 318,850 | 318,850 | 318,850 |
| do : E | 531,290 | 531,290 | 531,290 | 531,290 | 531,290 |
| Elevation (ft) | 6500 | 6500 | 6500 | 6500 | 6500 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Streaked light gray & black | Brownish gray | Dark gray | Dark gray | Gray |
| Grain size | medium | medium | medium | medium | medium |
| Prefault ore | ✓ | ✓ | ✓ | ✓ | ✓ |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

Miscellaneous Samples

| Field No. | 8-25-59 M | 8-25-59 N | 8-25-59 O | 9-9-59 C | 1 F 60 |
|---|---|---|---|---|---|
| Serial No. | 279,314 | 279,315 | 279,316 | 279,340 | D-112,476 |
| Mine | Sec 30 | Sec 30 | Sec 30 | Sec 30 | Sec 30 |
| Sec.-Twp.-Rge | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 |
| AEC coord.: N | 318,795 | 318,795 | 318,795 | 319,430 | 318,420 |
| do : E | 531,355 | 531,355 | 531,355 | 531,130 | 530,940 |
| Elevation (ft) | 6500 | 6500 | 6500 | 6500 | 6515 |
| Sandstone | ✓ | ✓ | ✓ | | |
| Mudstone | | | | ✓ | |
| Mudstone cglt. | | | | | |
| Color | Black | Light brown | Dark gray | Greenish gray | Gray |
| Grain size | coarse | v. coarse | fine | clay | fine |
| Prefault ore | ✓ | | ✓ | | |
| Prefault sub ore | | ✓ | | ✓ | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | Pyrite disseminated in prefault ore. |

| Serial no. | 278, 065 | 278, 066 | 278, 067 | 278, 068 | 278, 069 | 279, 314 | 279, 315 | 279, 316 | 279, 340 | D-112, 426 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 8-20-59 I | 8-20-59 J | 8-20-59 K | 8-20-59 L | 8-20-59 M | 8-25-59 M | 8-25-59 N | 8-25-59 O | 9-9-59 C | 1F60 |
| U | 0.33 | 0.31 | 0.46 | 0.31 | 0.27 | 1.08 | 0.11 | 0.54 | 0.04 | — |
| eU | .26 | .33 | .39 | .27 | .28 | .91 | .092 | .39 | .83 | — |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .15 | .28 | .28 | .5 | .4 | 1.1 | — | .7 | .3 | — |
| $C_{Min.}$ | <.02 | <.02 | .02 | .02 | .05 | .24 | — | .06 | .00 | — |
| $C_{Org.}$ | .15 | .28 | .26 | .5 | .3 | .9 | — | .6 | .3 | — |
| Se | .0040 | .0038 | .0027 | .0073 | .0050 | .0025 | .0135 | .0390 | .0280 | 1.45 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 7. | 7. | 3. | 7. | 3. | 2. | 2. | 2. | 2. | .3 |
| Fe | .3 | .3 | .3 | .7 | .7 | 1.5 | .7 | 3. | 7. | M |
| Mg | .15 | .3 | .3 | .15 | .15 | .3 | .15 | .7 | 1.5 | .02 |
| Ca | .3 | .3 | .3 | .3 | .3 | 1.5 | 1.5 | .7 | .7 | .05 |
| Na | 1.5 | .7 | 1.5 | 1.5 | .7 | 1.5 | 3. | 1.5 | 1.5 | .05 |
| K | 3. | 3. | 3. | 3. | 1.5 | 3. | 3. | 3. | 3. | 0 |
| Ti | .15 | .15 | .15 | .15 | .07 | .3 | .07 | .07 | .3 | .7 |
| Mn | .015 | .015 | .015 | .015 | .015 | .03 | .03 | .03 | .07 | .03 |

| Serial no. | 278, 065 | 278, 066 | 278, 067 | 278, 068 | 278, 069 | 279, 314 | 279, 315 | 279, 316 | 279, 340 | D-112, 476 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 8-20-59 I | 8-20-59 J | 8-20-59 K | 8-20-59 L | 8-20-59 M | 8-25-59 M | 8-25-59 N | 8-25-59 O | 9-9-59 C | 1F60 |
| B | 0 | 0 | 0 | 0 | 0 | d | 0 | 0 | .007 | 0 |
| Ba | .07 | .07 | .07 | .7 | .07 | .15 | .15 | .07 | .03 | .03 |
| Be | .00015 | .0003 | .0003 | .00015 | .00015 | .0003 | .00015 | .00015 | .0007 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | <.002 | 0 | <.002 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.002 | <.002 | <.002 | <.002 | <.002 | <.002 | .0007 | <.002 | <.002 | 0 |
| Cr | .0003 | .0007 | .0007 | .0007 | .0007 | .0007 | .0003 | .0003 | .003 | .0007 |
| Cu | .003 | .0015 | .003 | .0015 | 0 | .0007 | .0007 | .0015 | .003 | .015 |
| Ga | d | d | d | d | d | .0007 | .0003 | d | .003 | <.005 |
| Ge | 0 | 0 | 0 | 0 | 0 | <.005 | 0 | <.005 | 0 | 0 |
| La | 0 | 0 | .003 | 0 | 0 | .007 | 0 | 0 | 0 | 0 |
| Mo | .007 | .015 | .015 | .015 | .003 | .03 | .07 | .0015 | .07 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 |
| Nd | 0 | 0 | 0 | 0 | 0 | — | 0 | — | 0 | — |
| Ni | .0007 | d | .0007 | 0 | 0 | 0 | .0007 | 0 | .0015 | .007 |
| Pb | .007 | .003 | .007 | .007 | .003 | .015 | .003 | .015 | .015 | .02 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | .0015 | 0 |
| Sr | .03 | .03 | .03 | .03 | .015 | .03 | .03 | .03 | .03 | .002 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .15 | .15 | .07 | .07 | .07 | .7 | .15 | .3 | .15 | .01 |
| Y | .003 | .0015 | .003 | .0015 | d | .003 | .0015 | .015 | 0 | .005 |
| Yb | — | — | — | — | — | <.005 | .0003 | <.005 | <.001 | — |
| Zr | .015 | .015 | .007 | .003 | .007 | .007 | .003 | .003 | .015 | .3 |

Miscellaneous Samples

| Field No. | 11 F 60 | 12 F 60 | 13 F 60 | 18 F 60 | 19 F 60 |
|---|---|---|---|---|---|
| Serial No. | 280,521 | 280,522 | 280,523 | 280,524 | 280,525 |
| Mine | Sec 30 | Sec 30 | Sec 30 | Sec 30 | Sec 30 |
| Sec.-Twp.-Rge | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 | 30-14-9 |
| AEC coord.: N | 319,095 | 319,095 | 319,095 | 319,625 | 319,515 |
| do : E | 530,750 | 530,750 | 530,750 | 531,010 | 531,010 |
| Elevation (ft) | ~6500 | ~6500 | ~6500 | 6495 | 6495 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Light gray | Very light gray | Light gray | Light gray | Light gray |
| Grain size | fine | fine | fine | fine | fine |
| Prefault ore | | | | | |
| Prefault sub ore | ✓ | ✓ | ✓ | ✓ | ✓ |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

Miscellaneous Samples

| Field No. | 100G61 | 15G60 | 16G60 | 17G60 | 18G60 |
|---|---|---|---|---|---|
| Serial No. | 294,686 | D-112,474 | 287,471 | 287,472 | 287,467 |
| Mine | Sec 30 | Sec 33 | Sec 33 | Sec 33 | Sec 33 |
| Sec.-Twp.-Rge | 30-14-9 | 33-14-9 | 33-14-9 | 33-14-9 | 33-14-9 |
| AEC coord.: N | 319,160 | 314,065 | 313,955 | 314,025 | 314,080 |
| do : E | 531,170 | 540,130 | 540,271 | 540,270 | 540,120 |
| Elevation (ft) | ~6500 | 6322 | 6337 | 6335 | 6355 |
| Sandstone | | | ✓ | ✓ | |
| Mudstone | | | | | Enclosed by |
| Mudstone cglt. | cobble | | | | |
| Color | medium gray | | Dark gray | Brownish gray | Amber |
| Grain size | clay | | medium | coarse | |
| Prefault ore | | | | ✓ | |
| Prefault sub ore | | | | | |
| Molybdenum ore | ✓ | | ✓ | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | | ✓ | ✓ | |
| Near oxidation | ? | | | | |
| Oxidized | | | | | |
| Remarks | | Pyrite from a joint. | 440. | | Barite pod in mudstone |

| Serial no. | 280, 521 | 280, 522 | 280, 523 | 280, 524 | 280, 525 | 294, 486 | D-112, 473 | 287, 471 | 287, 472 | 287, 462 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 11F60 | 12F60 | 13F60 | 18F60 | 19F60 | 100G61 | 15G60 | 16G60 | 17G60 | 18G60 |
| U | 0.038 | 0.012 | 0.005 | 0.003 | 0.027 | 0.016 | — | 0.006 | 0.37 | — |
| eU | .034 | .013 | .008 | .11 | .11 | .053 | — | .007 | .26 | <.001 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| $C_{Total}$ | .4 | .2 | | | <.2 | .06 | | .23 | 1.3 | — |
| $C_{Min.}$ | .36 | .16 | | | .01 | .02 | | .20 | .83 | — |
| $C_{Org.}$ | .04 | <.2 | | | <.2 | — | | .03 | .5 | — |
| Se | | | | | | .1575 | .0840 | — | | |
| | | | | | | | | | | |
| Al | | | | | | 12 | .3 | 3. | 3. | .03 |
| Fe | | | | | | 3. | 12 | .3 | .7 | .15 |
| Mg | | | | | | 1.5 | .02 | .07 | .07 | d |
| Ca | | | | | | .3 | .1 | .7 | 3. | .003 |
| Na | No | | | | | 1.5 | .07 | .7 | 1.5 | 0 |
| K | | | | | | 3. | 0 | 3 | 3. | 0 |
| Ti | | | | | | .3 | 0 | .07 | .03 | 0 |
| Mn | | | | | | .015 | .01 | .015 | .03 | 0 |

spectrographic analyses

No spectrographic analyses

| Serial no. | 280, 521 | 280, 522 | 280, 523 | 280, 524 | | 294, 686 | D-112, 474 | 282 472 | 287, 472 | 287, 467 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 11 F60 | 12 F60 | 13 F60 | 18 F60 | | 100 G61 | 15 G60 | 16 G60 | 17 G60 | 18 G60 |
| B | | | | | | 0 | 0 | 0 | 0 | 0 |
| Ba | | | | | | .03 | .15 | .07 | .07 | .1 |
| Be | | | | | | .0003 | 0 | 0 | .00015 | 0 |
| Bi | | | | | | 0 | 0 | .0015 | 0 | 0 |
| Ce | | | | | | .03 | 0 | 0 | 0 | 0 |
| Co | | | | | | .0015 | .001 | 0 | <.003 | 0 |
| Cr | | | | | | .003 | .0015 | .0003 | .00015 | 0 |
| Cu | | | | | | .003 | .1 | .007 | .0003 | .0003 |
| Ga | | | | | | .007 | <.005 | 0 | .00015 | 0 |
| Ge | | | | | | 0 | 0 | 0 | 0 | 0 |
| La | | | | | | .015 | 0 | 0 | 0 | 0 |
| Mo | | | | | | .7 | .007 | .15 | .003 | 0 |
| Nb | | | | | | 0 | 0 | 0 | 0 | 0 |
| Nd | | | | | | .015 | — | 0 | 0 | 0 |
| Ni | | | | | | .0015 | .001 | 0 | .0003 | 0 |
| Pb | | | | | | .003 | .05 | d | .003 | 0 |
| Sc | | | | | | .0007 | 0 | 0 | 0 | 0 |
| Sr | | | | | | .03 | .005 | .007 | .015 | .15 |
| Tl | | | | | | 0 | 0 | 0 | 0 | 0 |
| V | | | | | | .15 | .002 | .07 | .03 | 0 |
| Y | | | | | | .0015 | 0 | 0 | .0007 | 0 |
| Yb | | | | | | — | — | d | <.0005 | 0 |
| Zr | | | | | | .015 | .03 | .007 | .007 | 0 |

Miscellaneous Samples

| Field No. | 68G61 | 62ES59A | 62ES59B | 72ES59C | 72ES59D |
|---|---|---|---|---|---|
| Serial No. | 294,678 | 294,689 | 294,690 | 278,049 | 278,050 |
| Mine | Alta | Ann Lee | Ann Lee | Ann Lee | Ann Lee |
| Sec.-Twp.-Rge | 32-15-11 | 28-14-9 | 28-14-9 | 28-14-9 | 28-14-9 |
| AEC coord.: N | — | 319,240 | 319,240 | 319,305 | 319,305 |
| do : E | — | 538,240 | 538,240 | 538,440 | 538,440 |
| Elevation (ft) | — | 6365 | 6365 | 6400 | 6400 |
| Sandstone | | | | ✓ | ✓ |
| Mudstone | ✓ | | | | |
| Mudstone cglt. | dusky yellow | ✓ | ✓ | | |
| Color | clay | Very light gray | Medium light gray | Dark gray | dark gray |
| Grain size | | | | medium | medium |
| Prefault ore | | | | | |
| Prefault sub ore | | ✓ | ✓ | | |
| Molybdenum ore | | | ✓ | ✓ | ✓ |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | ✓ | | | | |
| Unoxidized | | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | ✓ | | | | |
| Remarks | | Interior of a cobble | Border of a cobble | | |

Miscellaneous Samples

| Field No. | 82ES59 | 83ES59 | 1ES60 A | 16G61 | 56G62 |
|---|---|---|---|---|---|
| Serial No. | 277,058 | 277,059 | D-112,475 | 294,661 | 302,972 |
| Mine | Ann Lee | Ann Lee | Ann Lee | Black Jack #1 | Black Jack #1 |
| Sec.-Twp.-Rge | 28-14-9 | 28-14-9 | 28-14-9 | 12-15-13 | 12-15-13 |
| AEC coord.: N | 318,790 | 318,790 | 319,145 | — | 1,654,170 |
| do : E | 540,215 | 540,215 | 538,310 | — | 401,200 |
| Elevation (ft) | 6335 | 6335 | 6395 | — | — |
| Sandstone | | ✓ | | | ✓ |
| Mudstone | ✓ | | | ✓ | |
| Mudstone cglt. | | | | cobble | |
| Color | Mottled gray-green & dark gray | Dark gray | | Med. gray | Dark gray |
| Grain size | clay | fine | | silt | fine |
| Prefault ore | | ✓ | | ✓ | |
| Prefault sub ore | | | | | |
| Molybdenum ore | ✓ | | | | ✓ |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | | ✓ | ✓ |
| Near oxidation: | | | | | |
| Oxidized | | | | | |
| Remarks | | Just above 82ES59 | Pyrite from a joint in prefault ore | | |

4/4/4

| Serial no. | 294, -678 | 294, -679 | 294, -690 | 278, -042 | 278, -050 | 277, -058 | 277, -053 | D-113, -425 | 294, -641 | 302, -972 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 68G61 | 42ES59A | 42ES59B | 72ES59C | 72ES59D | 82ES59 | 83ES59 | 1ES60A | 16G61 | 56G62 |
| U | 0.004 | 0.006 | 0.022 | — | — | 0.07 | 1.17 | 0 (sp?) | 0.57 | 0.005 |
| eU | .005 | .013 | .042 | — | — | .24 | .82 | | .51 | .012 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| C Total | .03 | .47 | .11 | | | < .2 | .9 | | < .39 | .17 |
| C Min. | .02 | .40 | < .01 | | | .01 | < .01 | | < .12 | .15 |
| $C_{Org.}$ | — | .1 | .1 | | | < .2 | .9 | | .3 | < .06 |
| Se | .0100 | .0050 | .0105 | | | .0595 | .0054 | .0195 | .350 | .0150 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 2 | 2 | 2 | 3 | 3 | M | 2 | .3 | 1.5 | 3 |
| Fe | 3 | 1.5 | 3 | .7 | .15 | 3 | 1.5 | M | .7 | 2 |
| Mg | 1.5 | 1.5 | 1.5 | .15 | .15 | 3 | .3 | .03 | .7 | .07 |
| Ca | .7 | 1.5 | .7 | 1.5 | 3 | .2 | .7 | .7 | M | .3 |
| Na | .7 | 1.5 | 1.5 | .7 | .7 | 1.5 | 1.5 | .15 | .3 | .45 |
| K | 3 | 3 | 3 | 1.5 | 3 | 2 | 3 | .0 | 3 | 3 |
| Ti | .3 | .3 | .3 | .02 | .07 | .7 | .3 | .01 | .02 | .02 |
| Mn | .015 | .03 | .015 | .015 | .03 | .07 | .03 | .015 | .15 | .003 |

| Serial no. | 294, 628 | 294, 682 | 294, 690 | 278, 049 | 278, 050 | 277, 058 | 277, 059 | D-113, 475 | 294, 641 | 903, 22 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 68GG1 | 62ES59A | 62ES59B | 72ES59C | 72ES59D | 82ES59 | 83ES59 | 1ES60A | 16GG1 | 56GG2 |
| B | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 | 0 |
| Ba | .03 | .03 | .03 | .07 | .07 | .07 | .07 | 3 | .015 | .07 |
| Be | .0007 | .0003 | .0003 | 0 | 0 | .0002 | .0003 | 0 | .0003 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | <.002 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.05 | 0 |
| Co | .0015 | 0 | .0015 | 0 | 0 | .0015 | <.002 | .002 | <.005 | .002 |
| Cr | .007 | .0015 | .0015 | .0007 | .0007 | .003 | .0015 | .003 | .0015 | .0003 |
| Cu | .007 | .003 | .007 | .0003 | .0003 | .003 | .0007 | .001 | .0015 | .0007 |
| Ga | .003 | .007 | .007 | .00015 | .00015 | .007 | d | <.005 | .003 | .0007 |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | 0 | 0 |
| Mo | 0 | .03 | .15 | .15 | .15 | .15 | .003 | .0015 | .15 | .2 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | .0015 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | .0007 | 0 | 0 | .0015 | 0 | .003 | 0 | 0 |
| Pb | .007 | .003 | .007 | .0015 | .0015 | .007 | .015 | .02 | .015 | .003 |
| Sc | .0015 | .0007 | .0007 | 0 | 0 | .0015 | 0 | 0 | 0 | 0 |
| Sr | .03 | .03 | .03 | .015 | .015 | .03 | .015 | .02 | .03 | .03 |
| Tl | 0 | 0 | 0 | 0 | 0 | d | 0 | 0 | 0 | .015 |
| V | .07 | .15 | .3 | .007 | .007 | .15 | .15 | .0015 | .15 | .03 |
| Y | .003 | .003 | .003 | 0 | 0 | .0015 | .003 | 0 | .003 | 0 |
| Yb | — | — | — | 0 | 0 | — | — | — | — | .0005 |
| Zr | .07 | .015 | .03 | .015 | .007 | .015 | .07 | .0015 | .003 | .007 |

Miscellaneous Samples

| Field No. | 57 G 62 | 59 G 62 | 61 G 62 | 56 d 59 | 57 d 59 |
|---|---|---|---|---|---|
| Serial No. | 302,973 | 302,974 | 302,975 | 278,918 | 278,930 |
| Mine | Black Jack #1 | Black Jack #1 | Black Jack #1 | Centennial | Centennial |
| Sec.-Twp.-Rge | 12-15-13 | 12-15-13 | 12-15-13 | 8-13-9 | 8-13-9 |
| AEC coord.: N | 1,654,290 | — | 1,652,640 | — | — |
| do : E | 402,030 | — | 402,130 | — | — |
| Elevation (ft) | — | — | — | — | — |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Medium gray | yellow | Medium light gray | Light greenish gray | Light olive gray |
| Grain size | fine | coarse | fine | coarse | medium |
| Prefault ore | | | | | |
| Prefault sub ore | ? | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | ✓ | ✓ | | |
| Postfault sub ore | ? | | | ✓ | ✓ |
| Barren rock | | | | | |
| Unoxidized | ✓ | | ✓ | ✓ | ✓ |
| Near oxidation | ? | | | | |
| Oxidized | | ✓ | | | |
| Remarks | | Tyuyamunite ore. | | | |

Miscellaneous Samples

| Field No. | 58 d 59 | 52 G 62 a | 52 G 62 b | 53 G 62 | 54 G 62 |
|---|---|---|---|---|---|
| Serial No. | 278,931 | 302,968 | 302,969 | 302,970 | 302,971 |
| Mine | Centennial | Cliffside | Cliffside | Cliffside | Cliffside |
| Sec.-Twp.-Rge | 8-13-9 | 36-14-9 | 36-14-9 | 36-14-9 | 36-14-9 |
| AEC coord.: N | — | — | — | — | — |
| do : E | — | — | — | — | — |
| Elevation (ft) | — | — | — | — | — |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Greenish gray | Brownish gray | Dark gray | Dark gray | Medium dark gray |
| Grain size | V. coarse | medium | very fine | fine | medium |
| Prefault ore | | ✓ | ✓ | ✓ | ✓ |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | ✓ | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ? | ? | | ✓ |
| Near oxidation | | ✓ | ✓ | ✓ | |
| Oxidized | | | | | |
| Remarks | | | | | |

| Serial no. | 302, 273 | 302, 274 | 302, 275 | 278, 218 | 278, 230 | 278, 231 | 302, 268 | 302, 269 | 302, 270 | 302, 271 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 57G63 | 59G62 | 61G62 | 56d59 | 57d59 | 58d59 | 53G63a | 53G63b | 53G62 | 54G62 |
| U | 0.010 | 2.88 | 0.31 | 0.015 | 0.065 | 0.19 | 0.76 | 0.45 | 0.88 | 0.36 |
| eU | .084 | 2.74 | .24 | .018 | .046 | .15 | .52 | .34 | .69 | .26 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | .12 | .02 | .03 | — | — | — | 1.09 | .46 | .80 | 1.82 |
| $C_{Min.}$ | .16 | .02 | .10 | — | — | — | .41 | .25 | .04 | 1.55 |
| $C_{Org.}$ | <.05 | <.05 | <.05 | — | — | — | .7 | .2 | .7 | .3 |
| Se | .040 | .0045 | .0003 | .0025 | — | — | .0075 | .0150 | .0050 | .018 |
| | | | | — | — | | | | | |
| | | | | <.001 | — | — | | | | |
| | | | | | | | | | | |
| Al | 3 | 3 | 3 | 7 | 3 | 3 | 7 | 3 | 3 | 3 |
| Fe | .7 | 3 | 3 | .2 | .2 | 1.5 | 1.5 | 3 | 1.5 | 1.5 |
| Mg | .3 | .3 | .3 | .15 | .15 | .07 | .3 | .7 | .3 | .3 |
| Ca | .7 | .7 | .15 | 1.5 | .7 | 3 | 3 | .3 | .3 | 3 |
| Na | 1.5 | 3 | 3 | 1.5 | 1.5 | 1.5 | 3 | 1.5 | 1.5 | 3 |
| K | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Ti | .15 | .3 | .03 | .02 | .02 | .02 | .07 | .7 | .02 | .03 |
| Mn | .015 | .03 | .007 | .015 | .015 | .02 | .03 | .03 | .015 | .02 |

| Serial no. / Field no. | 302. - 923 - 57662 | 302. - 924 - 59662 | 302. - 925 - 61662 | 278 - 918 - 56d59 | 278 - 920 - 57d59 | 278. - 931 - 58d59 | 302. - 968 - 52662a | 302. - 969 - 52662b | 302. - 970 - 53662 | 302. - 971. - 54662 |
|---|---|---|---|---|---|---|---|---|---|---|
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | ? | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .15 |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | .00015 | 0 | .00015 | .00015 |
| Bi | 0 | <.005 | 0 | 0 | 0 | 0 | <.005 | 0 | <.005 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | 0 | <.005 | <.005 | 0 | 0 | <.005 | <.005 | <.005 | <.005 | <.005 |
| Cr | .0003 | .0015 | .0003 | .0003 | .0003 | .0003 | .0003 | .0015 | .0007 | .00015 |
| Cu | .0015 | .003 | .0015 | .0003 | .0003 | .0003 | .0015 | .0007 | .0007 | .0007 |
| Ga | .0007 | = | .0007 | .00015 | .00015 | .00015 | .0015 | .0015 | .0007 | .0007 |
| Ge | 0 | <.005 | 0 | 0 | 0 | 0 | <.005 | <.005 | <.005 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | .003 | .003 | 0 | 0 |
| Mo | .003 | 0 | 0 | 0 | 0 | 0 | .03 | .0007 | .03 | .003 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | 0 | 0 | .0003 | .0003 | 0 | 0 | 0 | 0 |
| Pb | .0015 | .007 | .0015 | .0007 | .0007 | .0007 | .015 | .007 | .015 | .007 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .015 | .3 | .015 | .015 | .015 | .015 | .03 | .03 | .03 | .02 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .015 | .15 | .007 | .015 | .02 | .07 | .3 | .15 | .15 | .15 |
| Y | 0 | 0 | .0015 | .0007 | .0007 | .0007 | 0 | .0015 | 0 | 0 |
| Yb | — | — | .00015 | 0 | <.002 | <.002 | 0 | 0 | — | — |
| Zr | .015 | .015 | .003 | .007 | .003 | .003 | .015 | .15 | .003 | .003 |

Miscellaneous Samples

| Field No. | 31G62 | 18ES59A | 18ES59B | 18ES59C | 23ES57 |
|---|---|---|---|---|---|
| Serial No. | 302,946 | 272,728 | 272,729 | 272,730 | 272,736 |
| Mine | Doris #1 | Dysart #1 | Dysart #1 | Dysart #1 | Dysart #1 |
| Sec.-Twp.-Rge | 2-13-9 | 11-14-10 | 11-14-10 | 11-14-10 | 11-14-10 |
| AEC coord.: N | — | 333,240 | 333,240 | 333,240 | 333,285 |
| do : E | — | 517,780 | 517,780 | 517,780 | 517,470 |
| Elevation (ft) | 6715 | 6725 | 6725 | 6725 | 6730 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Dark gray | Yellowish brown | Dark yellowish gray | gray | Grayish orange |
| Grain size | coarse | medium | medium | medium | coarse |
| Prefault ore | ✓ | | ✓ (?) | | |
| Prefault sub ore | | ✓ | | ✓ | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | ✓ |
| Unoxidized | | | | | |
| Near oxidation | ✓ | | | ✓ | |
| Oxidized | minor | ✓ | ✓ | | ✓ |
| Remarks | From circular collapse boundary fault zone | | | | |

Miscellaneous Samples

| Field No. | 57ES59 | 5G58a | 5G58b | 19 d 59 | 20 d 59 |
|---|---|---|---|---|---|
| Serial No. | 277,672 | 268,918 | 268,919 | 278,919 | 278,920 |
| Mine | Dysart #1 | Dysart #1 | Dysart #1 | Hogan | Hogan |
| Sec.-Twp.-Rge | 11-14-10 | 11-14-10 | 11-14-10 | 14-13-9 | 14-13-9 |
| AEC coord.: N | 333,633 | 333,865 | 333,865 | 17.35 N | 17.15 N |
| do : E | 518,130 | 516,440 | 516,440 | 31.95 E | 31.85 E |
| Elevation (ft) | 6706 | 6800 | 6800 | 6615 | 6615 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Black | Grayish-black | Brownish gray | Yellowish gray olive black | Dark gray |
| Grain size | fine | medium | medium | coarse | medium |
| Prefault ore | ✓ | ✓ | ✓ | | ✓ |
| Prefault sub ore | | | | ✓ | |
| Molybdenum ore | ✓ | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | Same as 59ES59-9A | | | | Coal fragments in sandstone |

| Serial no. | 302, | 272, | 272, | 272, | 272, | 272, | 268, | 268, | 278, | 278, |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 31G62 | 18ES59A | 18ES59B | 18ES59C | 23ES59E | 57ES59 | 5G58a | 5G58b | 19d59 | 20d59 |
| U | 0.90 | 0.016 | 0.005 | 0.022 | 0.003 | 0.29 | 0.64 | 0.11 | 0.003 | 1.44 |
| eU | .48 | 0.030 | .038 | .045 | .006 | .29 | .45 | .10 | .006 | 2.6 |
| $ePa^{231}$ | | | | | | | .52 | .11 | | |
| $eTh^{230}$ | | | | | | | .46 | .10 | | |
| $eRa^{226}$ | | | | | | | .45 | .10 | | |
| $eRn^{222}$ | | | | | | | .34 | .08 | | |
| $ePb^{210}$ | | | | | | | .43 | .12 | | |
| | | | | | | | | | | |
| C Total | 1.95 | — | .7 | — | — | 0.2 | .8 | .3 | — | — |
| C Min. | 2.77 | .47 | .58 | .13 | .24 | 0.05 | .10 | .13 | — | — |
| C org. | .40 | — | <.2 | — | — | <.2 | .7 | <0.3 | — | — |
| Be | .0040 | .0185 | .150 | .0335 | .0015 | .1675 | .0020 | .0008 | — | — |
| | | | | | | | | | — | — |
| | | | | | | | | | — | — |
| | | | | | | | | | | |
| Al | 7 | 3 | 3 | 1.5 | 3 | 1.5 | 7 | 3 | 7 | 3 |
| Fe | 2 | .3 | .2 | .3 | .1 | .2 | 1.5 | .7 | 1.5 | 1.5 |
| Mg | .3 | .15 | .15 | .15 | .15 | .15 | .15 | .02 | .15 | .2 |
| Ca | 3 | 3 | 3 | .3 | .3 | .2 | .2 | .7 | 3 | .8 |
| Na | 1.5 | .2 | .2 | .2 | .7 | .7 | 1.5 | .7 | 1.5 | .7 |
| K | 3 | 1.5 | 1.5 | 1.5 | 2 | 1.5 | 3 | 2 | 3 | 2 |
| Ti | .02 | .15 | .15 | .07 | .07 | .15 | .07 | .07 | .02 | .15 |
| Mn | .02 | .03 | .03 | .007 | .007 | .015 | .015 | .015 | .015 | .02 |

| Serial no. | 302, | 272, | 272, | 272, | 272, | 277 | 268, | 268, | 278, | 278, |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 946 | 228 | 229 | 230 | 234 | 273 | 918 | 913 | 919 | 920 |
| | 31G62 | 18ES59A | 18ES59B | 18ES59C | 23ES59E | 57ES59 | 56S58a | 56S58b | 19d59 | 20d59 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | d | 0 | .005 |
| Ba | .07 | .07 | .07 | .03 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | 0 | 0 | 0 | .0015 | .0003 | .0003 | 0 | .0015 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.03 |
| Co | <.005 | 0 | 0 | 0 | 0 | .0015 | <.005 | 0 | 0 | <.005 |
| Cr | .0007 | .0007 | .0007 | .0003 | .0003 | .0007 | .0003 | .0003 | .0003 | .0007 |
| Cu | .003 | .0003 | .0007 | .0007 | .0007 | .003 | .0003 | .003 | .0003 | .003 |
| Ga | .003 | .0003 | .0003 | .0015 | .0003 | d | .0007 | .0003 | .0015 | .0007 |
| Ge | <.005 | 0 | 0 | 0 | 0 | 0 | <.005 | 0 | 0 | 0 |
| La | .007 | 0 | 0 | 0 | 0 | 0 | .003 | 0 | 0 | .015 |
| Mo | .007 | 0 | 0 | 0 | 0 | .15 | .003 | .0007 | .015 | .07 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0015 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <.03 |
| Ni | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0003 | <.002 |
| Pb | .007 | .0015 | .003 | .0015 | .0015 | .015 | .007 | .007 | .0015 | .03 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | .015 | 0 | 0 | 0 | 0 |
| V | .3 | .03 | .07 | .03 | .015 | .07 | .15 | .03 | .07 | .15 |
| Y | .003 | 0 | 0 | .0015 | 0 | .0015 | .0015 | .003 | .0007 | .007 |
| Yb | — | .0015 | — | .0015 | 0 | .0015 | — | .0003 | <.002 | <.002 |
| Zr | .015 | .007 | .007 | .003 | .007 | .007 | .007 | .007 | .003 | .015 |

Miscellaneous Samples

| Field No. | 21 d 59 | 22d 59 | 23 d 59 A | 23 d 59 B | 24 d 59 |
|---|---|---|---|---|---|
| Serial No. | 278, 921 | 278, 922 | 278, 923 | 278, 932 | 278, 93[illegible] |
| Mine | Hogan | Hogan | Hogan | Hogan | Hogan |
| Sec.-Twp.-Rge | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 |
| AEC coord.: N | 16.95 N | 17.0 | 17.0 | 17.0 | 16.7 |
| do : E | 30.75 E. | 30.8 | 30.8 | 30.8 | 31.9 |
| Elevation (ft) | 6615 | 6615 | 6615 | 6615 | 6615 |
| Sandstone | ✓ | muddy | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Yellowish gray | Medium Light gray | Light gray | Medium dark gray | Lt. green gray Pk. olive gra |
| Grain size | medium | medium | coarse | medium | medium |
| Prefault ore | | | ✓ | ✓ | |
| Prefault sub ore | | ? | | | ✓ |
| Molybdenum ore | | | ✓ | | |
| Postfault ore | | | | | |
| Postfault sub ore | ✓ | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

Miscellaneous Samp'es

| Field No. | 25d59 | 26d59 | 27d59 A | 27d59 B | 28d59 |
|---|---|---|---|---|---|
| Serial No. | 278,939 | 278,940 | 278,910 | 278,911 | 278,912 |
| Mine | Hogan | Hogan | Hogan | Hogan | Hogan |
| Sec.-Twp.-Rge | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 |
| AEC coord.: N | 16.8 | 16.9 | 15.7 | 15.7 | 15.8 |
| do ; E | 32.0 | 32.1 | 30.85 | 30.85 | 31.10 |
| Elevation (ft) | 6615 | 6615 | 6625 | 6625 | 6620 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Dark gray | Olive gray yellowish gray | Grayish red | Greenish gray | Reddish brown |
| Grain size | medium | fine | fine | fine | coarse |
| Prefault ore | ✓ | ✓ | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | ✓ | ✓ | ✓ |
| Unoxidized | ✓ | ✓ | | | |
| Near oxidation | | | | ✓ | |
| Oxidized | | | ✓ | | ✓ |
| Remarks | | | | | |

| Serial no. | 278, 921 | 278, 922 | 278, 923 | 278, 932 | 278 938 | 278 939 | 278, 940 | 278, 910 | 278, 911 | 278, 912 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 21 d 59 | 22 d 59 | 23 d 59 A | 23 d 59 B | 24 d 59 | 25 d 59 | 26 d 59 | 27 d 59 A | 27 d 59 B | 28 d 59 |
| U | 0.005 | 0.003 | 0.19 | 1.03 | 0.085 | 3.43 | 0.52 | 0.001 | <0.001 | 0.001 |
| eU | .013 | .013 | .19 | .62 | .052 | 2.05 | .33 | .011 | .005 | .003 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| C Total | — | — | — | .8 | — | 2.5 | 1.0 | — | — | — |
| C Min. | — | — | — | .07 | — | .03 | .03 | — | — | — |
| C Org. | — | — | — | .7 | — | 2.5 | 1.0 | — | — | — |
| Be | — | — | — | — | .010 | .230 | .0820 | .0001 | .0008 | .0003 |
| | — | — | — | .7 | .13 | .44 | .001 | <.001 | <.001 | <.001 |
| | — | — | — | — | .023 | .005 | .82 | — | — | — |
| | | | | | | | | | | |
| Al | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| Fe | 1.5 | 1 | 3 | 1.5 | 1.5 | .7 | 1.5 | 1 | 1.5 | 1.5 |
| Mg | .3 | .7 | .3 | .15 | .3 | .15 | .3 | .1 | .7 | .07 |
| Ca | .3 | .3 | .3 | .2 | .7 | .2 | .3 | .1 | .3 | .1 |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| Ti | .07 | .15 | .07 | .07 | .07 | .15 | .15 | .15 | .15 | .07 |
| Mn | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |

| Serial no. | 278, 921 | 278, 922 | 278, 923 | 278, 923 | 278, 928 | 278, 929 | 278, 940 | 278, 910 | 278, 911 | 278, 912 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 21d59 | 22d59 | 23d59A | 23d59B | 24d59 | 25d59 | 26d59 | 27d59A | 27d59B | 28d59 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | 0 | .0003 | .0003 | 0 | .0003 | .0003 | 0 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | .015 | 0 | .03 | 0 | 0 | 0 | 0 |
| Co | 0 | 0 | <.002 | <.005 | <.005 | <.005 | <.005 | 0 | d | 0 |
| Cr | .0003 | .0003 | .0003 | .0007 | .0003 | .0007 | .0007 | .0007 | .0007 | .0003 |
| Cu | .0007 | .0003 | .0003 | .0003 | .0007 | .0007 | .0007 | .0003 | .0003 | .0003 |
| Ga | .0015 | .0003 | .0003 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 | .0015 |
| Ge | 0 | 0 | 0 | <.01 | 0 | <.01 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | .007 | 0 | .015 | 0 | 0 | 0 | 0 |
| Mo | .015 | .0007 | .15 | .07 | .03 | .003 | .0015 | .0003 | 0 | .0003 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | .015 | .015 | 0 | 0 | 0 |
| Ni | 0 | .0003 | .0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .0007 | .0015 | .003 | .007 | .0007 | .03 | .007 | .0007 | .0015 | .0007 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | .0003 | .0003 | 0 |
| Sr | .015 | .015 | .015 | .015 | .015 | .015 | .03 | .015 | .015 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .07 | .3 | .15 | .07 | .15 | .3 | .007 | .007 | .007 |
| Y | .0007 | .0007 | .003 | .0015 | .0007 | .007 | .003 | .0015 | .0007 | .0015 |
| Yb | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | .00015 | .00015 | .00015 |
| Zr | .007 | .015 | .007 | .003 | .007 | .015 | .015 | .03 | .015 | .03 |

Miscellaneous Samples

| Field No. | 29d59A | 29d59B | 30d59A | 31d59 | 32d59A |
|---|---|---|---|---|---|
| Serial No. | 278,941 | 278,924 | 278,913 | 278,914 | 278,933 |
| Mine | Hogan | Hogan | Hogan | Hogan | Hogan |
| Sec.-Twp.-Rge | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 | 14-13-9 |
| AEC coord.: N | 16.4 | 16.4 | 16.95 | 16.85 | — |
| do : E | 30.5 | 30.5 | 28.35 | 28.80 | — |
| Elevation (ft) | 6595 | 6595 | 6605 | 6605 | — |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Dark gray | Pale yellow brown | Grayish orange pink | Greenish gray / Grayish red | Olive gray |
| Grain size | medium | medium | medium | medium | medium |
| Prefault ore | ✓ | | | | |
| Prefault sub ore | | ✓ | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | ? |
| Postfault sub ore | | | | | |
| Barren rock | | | ✓ | ✓ | |
| Unoxidized | ✓ | ✓ | | | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | ✓ | ✓ | |
| Remarks | | | | | |

4/59

Miscellaneous Samples

| | | | | | |
|---|---|---|---|---|---|
| Field No. | 32d59B | 47G61 | 88ES59 | 21d60c | 22d60c |
| Serial No. | 278,934 | 294,675 | 277,074 | 304,757 | 304,758 |
| Mine | Hogan | Hogan | Isabella | Isabella | Isabella |
| Sec.-Twp.-Rge | 14-13-9 | 14-13-9 | 7-13-9 | 7-13-9 | 7-13-9 |
| AEC coord.: N | — | Near shaft | — | 304,435 | 304,435 |
| do : E | — | — | — | 530,305 | 530,300 |
| Elevation (ft) | — | ~ 6595 | — | 6745 | 6745 |
| Sandstone | muddy | | ✓ | ✓ | ✓ |
| Mudstone | | ✓ | | | |
| Mudstone cglt. | | | | | |
| Color | Medium light gray | dark gray | Black | light gray | Light grayish brown |
| Grain size | medium | clay | gouge | V. coarse | V. coarse |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | ✓ | | | |
| Postfault ore | | | ✓ | | |
| Postfault sub ore | ? | | | ✓ | ✓ |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | | | |
| Near oxidation | | ✓ | ✓ | | |
| Oxidized | | | | | |
| Remarks | | | Fault gouge | | |

460

| Serial no. | 278, 941 | 278, 924 | 278, 913 | 278, 914 | 278, 923 | 278, 924 | 294, 675 | 277, 074 | 304, 252 | 304, 258 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 29d59A | 29d59B | 30d59A | 31d59 | 32d59A | 32d59B | 42641 | 88559 | 21d60C | 22d60C |
| U | 5.95 | 0.003 | <0.001 | 0.003 | 0.28 | 0.004 | 0.032 | 4.86 | 0.070 | 0.058 |
| eU | 4.33 | .036 | .001 | .018 | .21 | .025 | .13 | 3.71 | 0.052 | .046 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| $C_{Total}$ | 2.0 | — | — | — | — | — | .05 | .9 | — | .96 |
| $C_{Min.}$ | .03 | — | — | — | — | — | .04 | .48 | — | .95 |
| $C_{org.}$ | 2.0 | — | — | — | — | — | — | .2 | — | ≤.1 |
| Se | .0220 | — | .0004 | .0008 | — | — | .0250 | .0010 | .0001 | .0001 |
| | .006 | — | ≤.001 | ≤.001 | — | — | | | .27 | .23 |
| | 1.10 | — | — | — | .50 | .15 | | | — | — |
| | | | | | | | | | | |
| Al | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Fe | 1.5 | .2 | 1.5 | 3 | 3 | 1.5 | 1.5 | 1.5 | .7 | .5 |
| Mg | .3 | .3 | .3 | .15 | .3 | .15 | .2 | .2 | .15 | .15 |
| Ca | .7 | .3 | .7 | .3 | .3 | .15 | .3 | .2 | .3 | .5 |
| Na | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 2 | 2 |
| K | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 5 | 5 |
| Ti | .15 | .02 | .02 | .15 | .03 | .02 | .15 | .02 | .05 | .05 |
| Mn | .03 | .015 | .015 | .015 | .015 | .002 | .03 | .02 | .03 | .05 |

| Serial no. | 278, 941 | 278, 942 | 278, 943 | 278, 944 | 278, 933 | 278, 934 | 294 675 | 277 074 | 304, 757 | 304, 758 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 28d59A | 29d59B | 30d59A | 31d59 | 32d59A | 32d59B | 47G61 | 88ES59 | 31d60C | 32d60 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .15 | .1 | .1 |
| Be | .0007 | 0 | 0 | 0 | 0 | 0 | .00015 | .00015 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Co | <.005 | 0 | 0 | 0 | <.005 | 0 | 0 | <.01 | 0 | 0 |
| Cr | .0007 | .0003 | .0003 | .0007 | .00015 | .00015 | .0007 | .0015 | .003 | .0003 |
| Cu | .0007 | .0003 | .0007 | .0003 | .0003 | .00015 | .0015 | 0 | .0015 | .001 |
| Ga | .00015 | .0003 | .00015 | .00015 | .00015 | .00015 | .003 | 0 | .0015 | .001 |
| Ge | <.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mo | .003 | .015 | 0 | 0 | .0007 | .0007 | .7 | 0 | 0 | 0 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .001 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ni | 0 | 0 | .0003 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pb | .03 | .003 | .0007 | .003 | .003 | .0007 | .007 | 0 | .003 | .003 |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sr | .03 | .015 | .015 | .015 | .015 | .015 | .015 | .07 | .015 | .03 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .7 | .15 | .02 | .07 | .1 | .07 | .15 | .3 | .2 | .2 |
| Y | .003 | 0 | .0007 | .0007 | .007 | 0 | 0 | .03 | .003 | .003 |
| Yb | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 | — | — | — | — |
| Zr | .003 | .007 | .003 | .03 | .003 | .003 | .007 | 0 | .005 | .01 |

Miscellaneous Samples

| Field No. | 23d60c | 24d60c | 25d60c | 26d60c | 20G61 |
|---|---|---|---|---|---|
| Serial No. | 304,759 | 304,760 | 304,761 | 304,762 | 293,966 |
| Mine | Isabella | Isabella | Isabella | Isabella | Isabella |
| Sec.-Twp.-Rge | 7-13-9 | 7-13-9 | 7-13-9 | 7-13-9 | 7-13-9 |
| AEC coord.: N | 304,435 | 304,435 | 304,435 | 304,435 | — |
| do : E | 530,295 | 304,290 | 530,285 | 530,280 | — |
| Elevation (ft) | 6745 | 6745 | 6745 | 6745 | ~6740 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Light grayish brown | Light grayish brown | Light grayish brown | brown | Greenish gray |
| Grain size | V. coarse | V. coarse | V. coarse | coarse | COARSE |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | ✓ | ✓ | ✓ | ✓ | ✓ |
| Barren rock | | | | | |
| Unoxidized | | | | | ✓ |
| Near oxidation | | | | | ✓ |
| Oxidized | | | | | |
| Remarks | | | | | |

Miscellaneous Samples

| Field No. | 21G61 | 28G58 | 40658 | 16d59A | 16d59B |
|---|---|---|---|---|---|
| Serial No. | 293,967 | 278,052 | 294,660 | 272,366 | 272,367 |
| Mine | Isabella | Marquez | Marquez | Marquez | Marquez |
| Sec.-Twp.-Rge | 7-13-9 | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 |
| AEC coord.: N | — | Mine Coord W-2190 | Mine Coord. W-2185 | Mine coord. S-2460 | S-2460 |
| do : E | — | Mine Coord. S-2615 | Mine Coord. S-2085 | W-2480 | W-2480 |
| Elevation (ft) | ~6740 | 6705 | 6705 | ~6735 | ~6735 |
| Sandstone | ✓ | ✓ | | ✓ | |
| Mudstone | | | cobble | | |
| Mudstone cglt. | | | | | |
| Color | Greenish gray | Dark gray | Grayish black | Medium dark gray | Dark brown |
| Grain size | coarse | medium | clay | medium | |
| Prefault ore | | | ✓ | | |
| Prefault sub ore | | | | ✓ | |
| Molybdenum ore | | ✓ | | ? | |
| Postfault ore | ✓ | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | |
| Near oxidation | ✓ | | | | |
| Oxidized | | | | | |
| Remarks | | | | Marginal To 16d59B | Coal fragments |

464

| Serial no. | 304, 259 | 304, 260 | 304, 261 | 304, 262 | 293, 266 | 293, 267 | 278, 057 | 294, 660 | 272, 366 | 272, 367 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 23d60C | 24d60C | 25d60C | 26d60C | 20661 | 21661 | 28658 | 40658 | 16d59A | 16d59B |
| U | 0.049 | 0.044 | 0.052 | 0.001 | 0.047 | 0.19 | 0.(Incert) | 40.67 | 0.003 | 0.007 |
| eU | .053 | .050 | .052 | .006 | .047 | .19 | | 4.87 | .006 | .001 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| CTotal | — | — | .67 | — | .28 | .70 | | 21.6 | .8 | 2.3 |
| CMin. | — | — | .64 | — | .27 | .66 | | .07 | .04 | .41 |
| COrg. | — | — | <.1 | — | .04 | .04 | | 21.6 | .8 | 2.9 |
| Se | .0001 | .0001 | .0001 | .0150 | .0002 | .0002 | | .0835 | .0030 | .0029 |
| | .25 | .20 | .21 | .03 | | | | | — | <.1 |
| | — | — | | | | | | | <.1 | — |
| | | | | | | | | | — | |
| Al | 7 | 2 | 7 | 3 | 2 | 2 | .45 | .45 | | |
| Fe | .7 | .5 | .7 | .3 | 1.5 | 1.5 | .15 | 1.5 | | |
| Mg | .2 | .1 | .15 | .1 | .15 | .15 | .15 | .7 | | |
| Ca | 3 | 7 | 5 | 3 | 1.5 | 3 | .07 | .7 | | |
| Na | 2 | 2 | 2 | 1.5 | 1.5 | 1.5 | .7 | 0 | | |
| K | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 0 | | |
| Ti | .05 | .03 | .03 | .02 | .02 | .15 | .02 | .15 | | |
| Mn | .03 | .05 | .02 | .03 | .015 | .03 | .007 | .07 | | |

Not Spect Analyses

| Serial no. | 304, 259 | 304, 260 | 304, 261 | 304, 262 | 293, 266 | 293, 267 | 278, 053 | 284, 660 | 272, 346 | 272, 347 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 23d60c | 24d60c | 25d60c | 26d60c | 20G61 | 21G61 | 38d58 | 40d58 | 16d59A | 16d59B |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .003 | | |
| Ba | .1 | .1 | .15 | .07 | .07 | .07 | .07 | .03 | | |
| Be | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .0007 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Co | 0 | 0 | 0 | 0 | .0003 | <.001 | 0 | 0 | | |
| Cr | .0025 | .0025 | .0007 | .0003 | .0007 | .0003 | .0007 | .003 | | |
| Cu | .005 | .002 | .001 | .005 | .0003 | .0007 | .0007 | .007 | | |
| Ga | .0025 | .0025 | .002 | .001 | .0007 | .0007 | .0015 | 0 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | .003 | 0 | .003 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | 0 | 0 | 0 | 0 | 0 | 0 | .15 | 0 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | .003 | .003 | .003 | .002 | .003 | .0015 | .0015 | .02 | | |
| Sc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Sr | .02 | .02 | .02 | .015 | .015 | .015 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | — | | |
| V | .2 | .2 | .2 | .015 | .3 | .3 | .007 | .3 | | |
| Y | .002 | .0015 | .0015 | .001 | .0007 | .0015 | 0 | 0 | | |
| Yb | — | — | — | .0002 | <.001 | <.001 | 0 | — | | |
| Zr | .007 | .003 | .003 | .007 | .007 | .015 | .03 | 0 | | |

Miscellaneous Samples

| Field No. | 17 d 59 | 34 d 59 | 35 d 59 | 36 d 59 | 38 d 59 A |
|---|---|---|---|---|---|
| Serial No. | 272,368 | 278,915 | 278,942 | 278,943 | 278,944 |
| Mine | Marquez | Marquez | Marquez | Marquez | Marquez |
| Sec.-Twp.-Rge | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 |
| AEC coord.: N | S-2465 | S-2715 | S-2860 | S-2855 | S-2860 |
| do : E | W-2500 | W-1560 | W-1685 | W-1755 | W-2050 |
| Elevation (ft) | ~6735 | 6665 | 6665 | 6670 | 6685 |
| Sandstone | | ✓ | ✓ | | |
| Mudstone | | | | | |
| Mudstone cglt. | | | | ✓ | cobble |
| Color | Dark brown | Yellowish gray | Medium gray | Olive gray yellowish gray (matrix) | Greenish gray |
| Grain size | | fine | V. coarse | coarse | clay |
| Prefault ore | | | ✓ (?) | | ✓ |
| Prefault sub ore | | ✓ | | ✓ | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | Coal fragments | | | | |

Miscellaneous Samples

| Field No. | 38d 59 B | 39 d 59 | 40 d 59 | 41 d 59 | 42 d 59 |
|---|---|---|---|---|---|
| Serial No. | 278,945 | 278,946 | 278,947 | 278,925 | 278,935 |
| Mine | Marquez | Marquez | Marquez | Marquez | Marquez |
| Sec.-Twp.-Rge | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 |
| AEC coord.: N | S-2860 | S-2855 | S-2750 | S-2680 | S-2650 |
| do : E | W-2050 | W-2060 | W-2150 | W-2215 | W-2240 |
| Elevation (ft) | 6685 | 6670 | 6695 | 6710 | 6715 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | ✓ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Dark gray | Medium dark gray | Dark gray | Light olive gray | Dark gray |
| Grain size | medium | coarse | coarse | fine | coarse |
| Prefault ore | ✓ | ✓ | ✓ | | ✓ |
| Prefault sub ore | | | | ✓ | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

| Serial no. | 272, 368 | 278, 915 | 278, 942 | 278, 943 | 278, 944 | 276, 945 | 278, 946 | 278, 947 | 278, 925 | 278 935 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 17d 59 | 34d 59 | 35d 59 | 36d 59 | 38d 59A | 38d 59B | 39d 59 | 40d 59 | 41d 59 | 42d 59 |
| U | 0.001 | 0.005 | 0.17 | 0.005 | 0.17 | 1.34 | 0.20 | 0.40 | 0.005 | 1.83 |
| eU | .001 | .005 | .13 | .008 | .22 | .78 | .16 | .34 | .005 | 1.31 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| C Total | 5.4 | — | — | | 2.00 | 6.6 | — | 4.3 | — | 3.8 |
| C Min. | 0.0 | — | — | | <.01 | .09 | | .14 | — | .83 |
| C org. | 5.4 | — | — | | 2.00 | 6.5 | | 4.1 | — | 3.8 |
| Se | .0010 | .0030 | .0015 | .0075 | .0020 | .001 | .0015 | .0040 | — | — |
| | <.1 | — | .04 | <.05 | .70 | .32 | .11 | .16 | — | .62 |
| | — | .004 | <.001 | .044 | .049 | .002 | <.001 | .009 | — | — |
| | | | | | | | | | | |
| Al | No | 7. | 7. | 7. | 7 | 3. | 3. | 3 | 3. | 7. |
| Fe | | 1.5 | 1.5 | .3 | 1.5 | .7 | .7 | .7 | .7 | .7 |
| Mg | 0 | .3 | .15 | .07 | 1.5 | .15 | .15 | .15 | .15 | .3 |
| Ca | analyses | 1.5 | .7 | 1.5 | .7 | .7 | 1.5 | .7 | .15 | .3 |
| Na | | 1.5 | 1.5 | 1.5 | .3 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| K | | 3. | 3. | 3. | 3. | 3. | 3 | 3 | 1.5 | 3. |
| Ti | | .15 | .07 | .15 | .3 | .07 | .07 | .07 | .15 | .15 |
| Mn | | .03 | .015 | .03 | .045 | .015 | .03 | .045 | .007 | .015 |

| Serial no. | 272, 368 | 278, 925 | 278, 942 | 278, 943 | 278, 944 | 278, 945 | 278, 946 | 278, 947 | 278, 948 | 278, 934 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 17d 59 | 34d 59 | 35d 59 | 36d 59 | 38d 59A | 38d 59B | 39d 59 | 40d 59 | 41d 59 | 42d 59 |
| B | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | | .07 | .07 | .02 | .03 | .02 | .07 | .07 | .07 | .07 |
| Be | | 0 | 0 | 0 | .0007 | .0003 | .00015 | .0003 | 0 | .0003 |
| Bi | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | | 0 | 0 | 0 | 0 | .03 | 0 | 0 | 0 | 0 |
| Co | | d | <.005 | 0 | <.005 | <.005 | <.005 | <.005 | .0007 | <.005 |
| Cr | | .0007 | .0003 | .0007 | .0015 | .0007 | .0003 | .0003 | .0003 | .0003 |
| Cu | | .0007 | .0007 | .0003 | .0015 | .0015 | .0003 | .0007 | .0007 | .0003 |
| Ga | | .00015 | .00015 | d | .0007 | .00015 | .00015 | .00015 | .00015 | .00015 |
| Ge | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ≤.01 |
| La | | 0 | 0 | 0 | .003 | .007 | 0 | 0 | 0 | .003 |
| Mo | | .003 | 0 | .02 | .02 | .0015 | 0 | .007 | .15 | 0 |
| Nb | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | | 0 | 0 | 0 | 0 | .015 | 0 | 0 | 0 | 0 |
| Ni | | 0 | 0 | 0 | .0003 | 0 | 0 | 0 | .0007 | 0 |
| Pb | | .0007 | .0015 | .0007 | .003 | .007 | .003 | .007 | .0007 | .015 |
| Sc | | .0003 | 0 | 0 | .0007 | d | 0 | 0 | 0 | 0 |
| Sr | | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .007 | .03 |
| Tl | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | | .007 | .07 | .007 | .2 | .15 | .02 | .02 | .03 | .3 |
| Y | | .0015 | .0007 | 0 | .003 | .0015 | .0007 | .0007 | .0007 | .0007 |
| Yb | | .0001 | <.001 | 0 | <.001 | <.001 | <.001 | <.001 | <.001 | <.001 |
| Zr | | .03 | .007 | .003 | .015 | .003 | .007 | .003 | .03 | .007 |

Miscellaneous Samples

| Field No. | 43 d 59 | 44 d 59 A | 44 d 59 B | 44 d 59 C | 45 d 59 |
|---|---|---|---|---|---|
| Serial No. | 278,926 | 278,936 | 278,927 | 278,937 | 278,916 |
| Mine | Marquez | Marquez | Marquez | Marquez | Marquez |
| Sec.-Twp.-Rge | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 |
| AEC coord.: N | S-2650 | S-2460 | S-2460 | S-2460 | S-2460 |
| do : E | W-2240 | W-2365 | W-2365 | W-2365 | W-2375 |
| Elevation (ft) | 6710 | 6720 | 6720 | 6720 | 6725 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | ✓ |
| Color | Yellowish brown | Dark gray | Olive gray | Dark gray | Greenish gray |
| Grain size | medium | fine | fine | fine | Coarse (matrix) |
| Prefault ore | | ✓ | | ✓ | |
| Prefault sub ore | ✓ | | ✓ | | ✓ |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

Miscellaneous Samples

| Field No. | 46 d 59 | 47 d 59 A | 47 d 59 B | 48 d 59 | 50 d 59 |
|---|---|---|---|---|---|
| Serial No. | 278,928 | 278,948 | 278,929 | 278,949 | 278,048 |
| Mine | Marquez | Marquez | Marquez | Marquez | Marquez |
| Sec.-Twp.-Rge | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 | 23-13-9 |
| AEC coord.: N | S-2560 | S-2680 | S-2680 | S-2720 | S-2660 |
| do : E | W-2150 | W-2820 | W-2820 | W-3205 | W-2265 |
| Elevation (ft) | 6710 | 6750 | 6745 | 6735 | 6715 |
| Sandstone | muddy | ↙ | ↙ | ↙ | ↙ |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Greenish gray | Dark gray | Light olive gray | Medium dark gray | Dark gray |
| Grain size | very fine | coarse | medium | coarse | medium |
| Prefault ore | | ↙ | | ↙ | |
| Prefault sub ore | ↙ | | ↙ | | |
| Molybdenum ore | | ↙ | | | ↙ |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ↙ | ↙ | ↙ | ↙ | ↙ |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | | | | | |

| Serial no. | 278, 226 | 278, 236 | 278, 237 | 278, 237 | 278, 216 | 278, 228 | 278, 248 | 278, 229 | 278, 242 | 278, 042 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 43d59 | 44d59A | 44d59B | 44d59C | 45d59 | 46d59 | 47d59A | 47d59B | 48d59 | 50d59 |
| U | 0.004 | 3.64 | <.05 | 6.41 | .008 | .006 | 1.61 | 0.005 | 0.59 | (a) spect. |
| eU | .012 | 2.69 | .67 | 4.4 | .002 | .028 | 1.22 | .10 | .30 | — |
| ePa$^{231}$ | | | | | | | | | | |
| eTh$^{230}$ | | | | | | | | | | |
| eRa$^{226}$ | | | | | | | | | | |
| eRh$^{222}$ | | | | | | | | | | |
| ePb$^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| CTotal | — | 3.6 | — | 4.1 | — | — | 5.1 | — | 3.08 | — |
| CMin. | — | .02 | — | .04 | — | — | .02 | — | 2.28 | — |
| COrg. | — | 3.6 | — | 4.1 | — | — | 5.1 | — | .80 | — |
| Se | — | — | — | — | .0075 | — | .010 | — | .050 | — |
| | — | .92 | — | 1.02 | — | — | .28 | — | .32 | — |
| | — | — | — | — | .003 | — | .19 | — | .002 | — |
| | | | | | | | | | | |
| Al | 3 | 3 | 7 | 3 | 2 | 2 | 3 | 3 | 3 | 1.5 |
| Fe | .2 | 1.5 | 1.5 | 1.5 | 3 | 1.5 | .2 | 1 | 1.5 | 1.5 |
| Mg | .15 | .3 | .7 | .3 | .3 | .3 | .15 | .3 | .15 | .02 |
| Ca | .3 | .3 | .7 | .3 | 3 | .3 | .3 | 3 | 2 | .15 |
| Na | 1.5 | 1.5 | 1.5 | .7 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | .7 |
| K | 1.5 | 3 | 3 | 1.5 | 3 | 3 | 3 | 3 | 3 | 3 |
| Ti | .15 | .15 | .15 | .3 | .3 | .15 | .02 | .3 | .02 | .03 |
| Mn | .015 | .03 | .03 | .03 | .02 | .015 | .015 | .015 | .15 | .002 |

| Serial no. | 278, 216 | 278, 236 | 278, 227 | 278, 232 | 278, 216 | 278, 228 | 278, 248 | 278, 219 | 278, 249 | 278, 242 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 43d59 | 44d59A | 44d59B | 44d59C | 45d59 | 46d59 | 47d59A | 47d59B | 48d59 | 50d59 |
| B | 0 | 0 | .0015 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 | .07 |
| Be | 0 | .0007 | .0007 | .0007 | 0 | 0 | .0003 | .0003 | 0 | 0 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | .015 | 0 | 0 | .015 | 0 | 0 | 0 | 0 | 0 |
| Co | .0003 | <.005 | .0007 | <.005 | .0007 | 0 | <.005 | .0003 | <.005 | 0 |
| Cr | .0003 | .0007 | .0007 | .003 | .003 | .0007 | .0003 | .0015 | .0003 | .0003 |
| Cu | .0003 | .0007 | .0007 | .0007 | .0015 | .0007 | .0003 | .0007 | .00015 | .0015 |
| Ga | .00015 | .00015 | .0007 | .00015 | .0003 | .0003 | .00015 | .0003 | .00015 | .0003 |
| Ge | 0 | <.01 | 0 | <.01 | 0 | 0 | <.01 | 0 | 0 | 0 |
| La | 0 | .015 | 0 | .007 | .007 | 0 | .007 | 0 | 0 | 0 |
| Mo | .07 | .003 | .015 | <.002 | .003 | .015 | .15 | .015 | .0015 | .3 |
| Nb | 0 | 0 | 0 | 0 | .0015 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | .015 | 0 | 0 | .007 | 0 | 0 | 0 | 0 | 0 |
| Ni | .0007 | 0 | .0007 | 0 | .0007 | 0 | 0 | 0 | 0 | 0 |
| Pb | .0015 | .03 | .007 | .03 | .0015 | .0015 | .015 | .003 | .003 | .003 |
| Sc | 0 | 0 | 0 | 0 | .0007 | .0003 | 0 | .0003 | 0 | 0 |
| Sr | .015 | .015 | .03 | .015 | .03 | .015 | .015 | .015 | .03 | .015 |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .07 | .3 | .7 | .7 | .015 | .015 | .15 | .07 | .15 | .03 |
| Y | .0015 | .007 | 0 | .0015 | .003 | .0007 | .0007 | .0007 | 0 | 0 |
| Yb | <.001 | <.001 | <.001 | <.001 | .0007 | .00015 | <.001 | <.001 | <.001 | 0 |
| Zr | .007 | .015 | .015 | .03 | .03 | .007 | .007 | .03 | .003 | .0015 |

Miscellaneous Samples

| Field No. | 52 d 59 | 32661 | 80661 | 33658 | 53 d 59 |
|---|---|---|---|---|---|
| Serial No. | 278,917 | 293,972 | 294,681 | 278,051 | 278,950 |
| Mine | Marquez | Mary #1 | Mary #1 | Mesa Top | Mesa Top |
| Sec.-Twp.-Rge | 23-13-9 | 11-14-10 | 11-14-10 | 20-13-9 | 20-13-9 |
| AEC coord.: N | S-2950 | 336,250 | near shaft | – | – |
| do ; E | W-2480 | 517,020 | – | – | – |
| Elevation (ft) | 6730 | ~5650 | ~6545 | ~7050 | – |
| Sandstone | | ✓ | | ✓ | ✓ |
| Mudstone | | | ✓ | | |
| Mudstone cglt. | ✓ | | greenish gray | | |
| Color | Greenish gray | Dusky yellow-green | clay | Grayish black | Grayish black |
| Grain size | medium (matrix) | medium | | coarse | fine |
| Prefault ore | | | | | |
| Prefault sub ore | ✓ | | | | |
| Molybdenum ore | | | | ✓ | ✓ |
| Postfault ore | | ✓ | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | ✓ | | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | ✓ |
| Near oxidation | | ✓ | ✓ | | |
| Oxidized | | | | | |
| Remarks | | | 475. | | |

Miscellaneous Samples

| Field No. | 54 d 59 | 55 d 59 | 59 G 61 | 60 G 61 | 93 G 61 |
|---|---|---|---|---|---|
| Serial No. | 278, 951 | 278, 952 | 294, 676 | 294, 677 | 293, 984 |
| Mine | Mesa Top | Mesa Top | M-5 | M-5 | Poison Canyon |
| Sec.-Twp.-Rge | 20-13-9 | 20-13-9 | 32-15-11 | 32-15-11 | 19-13-9 |
| AEC coord.: N | – | – | In shaft | In shaft | – |
| do : E | – | – | – | – | – |
| Elevation (ft) | – | – | ? | – | ~7060 |
| Sandstone | | ✓ | | | ✓ |
| Mudstone | | | ✓ | ✓ | |
| Mudstone cglt. | ✓ | | | greenish gray | |
| Color | Dark gray & Greenish gray | Dark gray | greenish gray | Clay | Dark gray |
| Grain size | Very coarse (matrix) | medium | clay | | – |
| Prefault ore | ✓ | ✓ | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | ✓ |
| Postfault sub ore | | | | | |
| Barren rock | | | ✓ | ✓ | |
| Unoxidized | ✓ | ✓ | ✓ | ✓ | |
| Near oxidation | | | | | ✓ |
| Oxidized | | | | | ✓ |
| Remarks | | | 476. | | Fault gouge |

| Serial no. | 278, -812 | 293, -971 | 294, -651 | 278, -051 | 278, -950 | 278, -954 | 278, -952 | 294, -626 | 294, -627 | 293, -984 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 52458 | 32661 | 80661 | 33658 | 53d59 | 54d59 | 55d59 | 59661 | 60661 | 93664 |
| U | <.05 | 0.16 | <0.001 | 0(spoil) | 0.008 | 1.11 | 1.62 | 0.001 | 0.001 | 0.23 |
| eU | .26 | .14 | .003 | | .023 | .55 | 1.02 | .004 | .003 | .13 |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| CTotal | — | .12 | .05 | | <.2 | 5.7 | 2.4 | .04 | .02 | <.05 |
| CMin. | — | .05 | .05 | | .04 | .02 | .72 | .03 | .02 | .02 |
| COrg. | — | .07 | — | | <.2 | 5.7 | 1.7 | — | — | <.05 |
| Se | .910 | .0002 | .0001 | | .0425 | .0075 | .0046 | .0015 | .0015 | .0390 |
| | — | | | | .13 | .12 | .83 | | | |
| | .031 | | | | .61 | .004 | .027 | | | |
| | | | | | | | | | | |
| Al | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 |
| Fe | 1.5 | .7 | 3 | .3 | .7 | .7 | .7 | 3 | 3 | 3 |
| Mg | .7 | .07 | 3 | .02 | .15 | .02 | .3 | 1.5 | 1.5 | .3 |
| Ca | .2 | .7 | .2 | .02 | .3 | .15 | 1.5 | .3 | .7 | .7 |
| Na | 1.5 | 1.5 | .7 | .7 | 1.5 | 1.5 | 1.5 | .7 | .7 | 1.5 |
| K | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Ti | .3 | .15 | .3 | .02 | .02 | .03 | .02 | .3 | .15 | .15 |
| Mn | .015 | .007 | .002 | .003 | .007 | .007 | .02 | .015 | .002 | .002 |

| Serial no. | 278, 947 | 293, 977 | 294, 621 | 278, 951 | 278, 950 | 278, 951 | 278, 952 | 294, 626 | 294, 627 | 293, 984 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 52d59 | 32G61 | 80G61 | 33G52 | 53d59 | 54d59 | 55d59 | 59G61 | 60G61 | 93G61 |
| B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ba | .15 | .07 | .15 | .07 | .07 | .07 | .07 | .03 | .03 | .07 |
| Be | .0003 | 0 | .0003 | 0 | .00015 | .00015 | .00015 | .0003 | .0003 | .0003 |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ce | 0 | 0 | 0 | 0 | 0 | .015 | 0 | 0 | .015 | 0 |
| Co | .0007 | <.001 | .0007 | 0 | .0007 | <.005 | <.005 | 0 | 0 | <.001 |
| Cr | .015 | .007 | .03 | .0007 | .003 | .003 | .0015 | .015 | .015 | .0007 |
| Cu | .0007 | .0003 | .003 | .0003 | .003 | .0003 | .0003 | .0015 | .003 | .003 |
| Ga | .0007 | .0007 | .003 | .00015 | .0003 | .00015 | .00015 | .0015 | .0015 | .0015 |
| Ge | 0 | 0 | 0 | 0 | 0 | <.01 | <.01 | 0 | 0 | 0 |
| La | 0 | 0 | 0 | 0 | 0 | .015 | 0 | 0 | .015 | 0 |
| Mo | .07 | 0 | 0 | .15 | .7 | .007 | .03 | .0015 | .0015 | .07 |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | .015 | 0 |
| Ni | .0015 | 0 | .0007 | 0 | .0007 | 0 | 0 | 0 | 0 | .0007 |
| Pb | .003 | .0015 | .003 | .0015 | .0015 | .007 | .015 | .007 | 0 | .007 |
| Sc | .0007 | 0 | .0015 | 0 | 0 | 0 | 0 | .0007 | .0015 | 0 |
| Sr | .015 | .015 | .07 | .015 | .03 | .015 | .03 | .03 | .07 | .015 |
| Ti | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| V | .15 | .7 | .007 | .003 | .07 | .07 | .3 | .015 | .003 | .03 |
| Y | .003 | 0 | .003 | 0 | 0 | .0015 | .0007 | .003 | .007 | .007 |
| Yb | <.001 | <.001 | .0003 | 0 | <.001 | <.001 | <.001 | .003 | .0007 | .0007 |
| Zr | .015 | .007 | .015 | .007 | .003 | .003 | .007 | .03 | .015 | .015 |

Miscellaneous Samples

| Field No. | 36G62 | 38G62 | 39G62 | 34G61 | 43G61a |
|---|---|---|---|---|---|
| Serial No. | 302,947 | 302,948 | 302,949 | 293,978 | 293,979 |
| Mine | Poison Canyon | Poison Canyon | Poison Canyon | Sandstone | San Mateo |
| Sec.-Twp.-Rge | 19-13-9 | 19-13-9 | 19-13-9 | 34-14-9 | 30-13-8 |
| AEC coord.: N | — | — | — | 313,740 | Mine coord. 18,030 |
| do : E | — | — | — | 545,710 | Mine coord. 23,090 |
| Elevation (ft) | 7060 | ~7040 | 7080 | 6120 | ? |
| Sandstone | ✓ | | ✓ | ✓ | ✓ |
| Mudstone | | ✓ | | | |
| Mudstone cglt. | | | | | |
| Color | Dark gray | Medium light gray | Medium gray | Pale yellow brown | Pale yellow-brown |
| Grain size | fine | clay | fine | coarse | medium |
| Prefault ore | | | ✓ | ✓ | |
| Prefault sub ore | | | | | ✓ |
| Molybdenum ore | ✓ | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | | |
| Unoxidized | ✓ | ✓ | | ✓ | ✓ |
| Near oxidation | ✓ | | | | |
| Oxidized | | | | | |
| Remarks | Near-surface sample | Underground sample | Outcrop sample | | |

Miscellaneous Samples

| Field No. | 43G61b | 44G61 | 89G61 | 62G62a | 62G62b |
|---|---|---|---|---|---|
| Serial No. | 293,980 | 293,981 | 293,980 | 301,261 | 301,262 |
| Mine | San Mateo | San Mateo | United Western | Core AM-23-46 | Core AM-23-46 |
| Sec.-Twp.-Rge | 30-13-8 | 30-13-8 | 36-14-10 | 23-14-10 | 23-14-10 |
| AEC coord.; N | Mine coord. 18,030 | Mine coord. 17,840 | — | 325,050 | 325,050 |
| do ; E | Mine coord. 23,000 | Mine coord. 23,250 | — | 517,428 | 517,428 |
| Elevation (ft) | ? | ? | ~6560 | 6376 | 6376 |
| Sandstone | ✓ | ✓ | ✓ | ✓ | |
| Mudstone | | | | | ✓ |
| Mudstone cglt. | | | | | |
| Color | Light brown | grayish brown | Dark gray Medium gray | Light olive gray | Light greenish gray |
| Grain size | coarse | V. coarse | fine | medium | silt |
| Prefault ore | | | ✓ | | |
| Prefault sub ore | ✓ | ✓ | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | ? | | |
| Postfault sub ore | | | | | |
| Barren rock | | | | ✓ | ✓ |
| Unoxidized | ✓ | ✓ | ✓ | | |
| Near oxidation | | | | | |
| Oxidized | | | | ? | ? |
| Remarks | | | In a fault zone<br><br>480. | Westwater sandstone at 672 ft. depth. | Scattered limonite (?) Specks. Recapture siltstone at 672 ft. depth. |

| Serial no. / Field no. | 302, 947 / 36662 | 302, 948 / 38662 | 302, 949 / 39662 | 293, 922 / 36661 | 293, 972 / 43661a | 293, 980 / 43661b | 293, 981 / 44661 | 293, 980 / 89661 | 301, 341 / 62662a | 301, 342 / 63662a |
|---|---|---|---|---|---|---|---|---|---|---|
| U | 0.005 | 0.008 | 0.26 | 0.15 | 0.015 | 0.002 | 0.057 | 0.63 | 0.0004 | 0.0004 |
| eU | .007 | .013 | .21 | .12 | .012 | .005 | .035 | .55 | .002 | .001 |
| $eRa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRn^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | | | | | | | | | |
| C Total | .85 | 1.1 | 3.49 | .74 | .74 | — | — | .91 | — | — |
| C Min. | 2.81 | ≤.05 | 3.47 | .35 | .34 | — | — | .02 | — | — |
| C Org. | .27 | .1 | ≤.05 | .4 | .4 | — | — | .89 | — | — |
| Se | .0165 | .0010 | .0003 | .0015 | .0015 | .0015 | .0005 | .0620 | — | — |
| | | | | | | | | | .0015 | .0021 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Al | 2 | M | 3 | 2 | 2 | 2 | 2 | 2 | | |
| Fe | .2 | 3 | .7 | 1.5 | .7 | .3 | .3 | 2 | | |
| Mg | .15 | 1.5 | .15 | .15 | .15 | .07 | .07 | .2 | | |
| Ca | M | .7 | M | 1.5 | .15 | .3 | .3 | .3 | | |
| Na | 3 | .3 | 3 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | | |
| K | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | |
| Ti | .03 | .3 | .03 | .07 | .07 | .03 | .03 | .15 | | |
| Mn | .3 | .015 | .3 | .03 | .003 | .003 | .07 | .03 | | |

No spectrographic Analysis

| Serial no. | 302, 247 | 302, 248 | 302, 249 | 293, 228 | 293, 279 | 293, 280 | 293, 281 | 293, 282 | 301, 241 | 301, 24 |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 36G62 | 38G62 | 39G62 | 36G61 | 43G61a | 43G61a | 44G61 | 89G61 | 42G62a | 42G62 |
| B | 0 | .003 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ba | .07 | .03 | .07 | .07 | .07 | .07 | .07 | .07 | | |
| Be | .00015 | .00015 | 0 | 0 | 0 | 0 | 0 | .00015 | | |
| Bi | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ce | <.05 | 0 | <.05 | 0 | 0 | 0 | 0 | 0 | | |
| Co | .0015 | .0007 | .0007 | <.001 | 0 | 0 | <.001 | <.001 | | |
| Cr | .0003 | .003 | .0003 | .0003 | .0003 | .00015 | .00015 | .00015 | | |
| Cu | .003 | .0015 | .0015 | .0007 | .0003 | .0003 | .0007 | .0007 | | |
| Ga | .0015 | .003 | .0007 | .0007 | .0007 | .0015 | .0015 | .0015 | | |
| Ge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| La | 0 | .007 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Mo | .3 | .003 | .003 | .0015 | 0 | .003 | .003 | .03 | | |
| Nb | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Ni | .0007 | .0007 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| Pb | .0015 | .0015 | .007 | .007 | .003 | .0015 | .003 | .015 | | |
| Sc | 0 | .0015 | 0 | 0 | 0 | 0 | 0 | .0007 | | |
| Sr | .07 | .03 | .07 | .015 | .007 | .007 | .015 | .015 | | |
| Tl | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| V | .015 | .03 | .015 | .07 | .007 | .007 | .015 | .03 | | |
| Y | 0 | .003 | .007 | 0 | .0015 | 0 | .003 | .03 | | |
| Yb | 0 | .0003 | .0007 | <.001 | .0015 | 0 | .0015 | .003 | | |
| Zr | .015 | .015 | .007 | .003 | .03 | .007 | .003 | .015 | | |

Miscellaneous Samples

| Field No. | 63 G62 | 65 G62 a | 65 G 62 b | 65 G62 c | 65 G62 d |
|---|---|---|---|---|---|
| Serial No. | 301, 263 | 301, 265 | 301, 266 | 301, 267 | 301, 268 |
| Mine | Core AM-23-46 | Core 15-A-2 | Core 15-A-2 | Core 15-A-2 | Core 15-A-2 |
| Sec.-Twp.-Rge | 23-14-10 | 15-14-10 | 15-14-10 | 15-14-10 | 15-14-10 |
| AEC coord.: N | 325,050 | — | — | — | — |
| do : E | 517,428 | — | — | — | — |
| Elevation (ft) | 6375 | — | — | — | — |
| Sandstone | | ✓ | ✓ | ✓ | ✓ |
| Mudstone | ✓ | | | | |
| Mudstone cglt. | | | | | |
| Color | Lt. olive gray Grayish red | Light olive gray | Light olive gray | Light olive gray | Yellowish gray |
| Grain size | silt | medium | fine | fine | fine |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | ✓ | ✓ | ✓ | ✓ | ✓ |
| Unoxidized | | | ✓ | ✓ | ✓ |
| Near oxidation | | | | | |
| Oxidized | ✓ | | | | |
| Remarks | Recapture siltstone at 673 ft. depth. | Westwater sandstone at 990 ft. depth. | Westwater sandstone at 1015 ft. depth. | Westwater sandstone at 1030 ft. depth. | Westwater sandstone at 1085 ft. depth. |

Miscellaneous Samples

| | | | | | |
|---|---|---|---|---|---|
| Field No. | 67G62 | 68G62 | 70G62 | | |
| Serial No. | 301, 274 | 301, 275 | 301, 283 | | |
| Mine | Core 221-C | Core 221-C | Core 930-C | | |
| Sec.-Twp.-Rge | 20-14-9 | 20-14-9 | 30-14-9 | | |
| AEC coord.: N | 326, 110 | 326, 110 | — | | |
| do : E | 534, 910 | 534, 910 | — | | |
| Elevation (ft) | 6365 | 6290 | — | | |
| Sandstone | ✓ | ✓ | ✓ | | |
| Mudstone | | | | | |
| Mudstone cglt. | | | | | |
| Color | Very light gray | Very light gray | Light gray | | |
| Grain size | medium | coarse | medium | | |
| Prefault ore | | | | | |
| Prefault sub ore | | | | | |
| Molybdenum ore | | | | | |
| Postfault ore | | | | | |
| Postfault sub ore | | | | | |
| Barren rock | ✓ | ✓ | ✓ | | |
| Unoxidized | ✓ | ✓ | ✓ | | |
| Near oxidation | | | | | |
| Oxidized | | | | | |
| Remarks | Westwater sandstone at 852 ft. depth. | Westwater sandstone at 852 ft. depth. | Westwater sandstone at 600 ft. depth. | | |

| Serial no. | 301, -263 | 301, -265 | 301, -266 | 301, -267 | 301, -268 | 301, -274 | 301, -275 | 301, -283 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Field no. | 63662 | 65662a | 66662b | 65662c | 65662d | 67662 | 68662 | 70662 | | |
| U | <0.0001 | 0.0001 | 0.0001 | 0.0001 | <0.0001 | 0.0007 | 0.0005 | 0.0005 | | |
| eU | .002 | <.001 | .003 | .001 | .002 | .001 | .003 | .001 | | |
| $ePa^{231}$ | | | | | | | | | | |
| $eTh^{230}$ | | | | | | | | | | |
| $eRa^{226}$ | | | | | | | | | | |
| $eRh^{222}$ | | | | | | | | | | |
| $ePb^{210}$ | | | | | | | | | | |
| | | <.0001 | <.0001 | .0002 | .0002 | .0009 | .0003 | .0005 | | |
| C Total | — | — | | | | | | | | |
| C Min. | — | — | | | | | | | | |
| C Org. | — | — | | | | | | | | |
| Se | — | <.00005 | <.00005 | <.00005 | <.00005 | .0002 | <.00005 | .0003 | | |
| | .0025 | .0009 | .0021 | .0029 | .0036 | .0069 | .0021 | .0350 | | |
| | | .0057 | .52 | .59 | .41 | .78 | .61 | .77 | | |
| | | .57 | .0008 | .0010 | .0006 | .0006 | .0013 | .0009 | | |
| Al | Kaolinite | | | | | | | | | |
| Fe | | | | | Hydrographite | | Anatase | | | |
| Mg | Chlorite | | | | | | | | | |
| Ca | | No | Specks | | | | | | | |
| Na | | | | | | | | | | |
| K | | | | | | | | | | |
| Ti | | | | | | | | | | |
| Mn | | | | | | | | | | |

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1. Analytical data on samples collected at Ambrosia Lake, New Mexico--1958 through 1962, by Harry C. Granger. 485 p., 86 figs., 4 tables.

2. Lunar Orbiter--Image Analysis Studies Report, May 1, 1965, to January 31, 1966, by the U. S. Geological Survey. 148 p., 42 figs., 10 tables, and 1 pl. (Albedo map of the Lunar Equatorial Belt, scale 1:5,000,000). Copy from which reproduction can be made at private expense is available from the U. S. Geological Survey, 601 E. Cedar Ave., Flagstaff, Ariz. 86001.

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