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INTERIM REPORT ON  
 EXPLORATION ON CLUB MESA,  
 MONTROSE COUNTY, COLORADO

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Trace Elements Memorandum Report 296

UNITED STATES DEPARTMENT OF THE INTERIOR  
 GEOLOGICAL SURVEY

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AEC-724/2

Dr. Phillip L. Merritt, Assistant Director  
Division of Raw Materials  
U. S. Atomic Energy Commission  
P. O. Box 30, Ansonia Station  
New York 23, New York

Dear Phil:

Transmitted herewith for your information and distribution are copies 13 - 18 of Trace Elements Memorandum Report 296, "Interim report on exploration on Club Mesa, Montrose County, Colorado," by Leonid Bryner and R. F. Douglas, March 1952.

The Geological Survey exploration of the Club Mesa area, from March 1948 through January 1952, has resulted in the discovery of about 198,000 short tons of carnotite ore classed as indicated and inferred reserves. The average grade of this material is estimated to be about 0.35 percent  $U_3O_8$  and 1.8 percent  $V_2O_5$ .

This interim report also presents, somewhat in more detail, the results of the exploration done in the area from February 1951 through January 1952. A total of about 60,000 short tons of indicated and inferred reserves is attributable to the last period of exploration. The average grade of these reserves is about 0.30 percent  $U_3O_8$  and 1.7 percent  $V_2O_5$ . Most of these reserves are in two deposits in the deep ground in the south-central part of Club Mesa.

No additional drilling is planned by the Geological Survey in the Club Mesa area.

Sincerely yours,

*W. H. Bradley*

W. H. Bradley  
Chief Geologist

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Geology - Mineralogy

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UNITED STATES DEPARTMENT OF THE INTERIOR

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~~Classification changed to *10-11-10*  
by authority of *Kentz* *2/29/50*  
by *N. Gas. ell* date *3/19/51*~~

INTERIM REPORT ON EXPLORATION ON CLUB MESA,  
MONTROSE COUNTY, COLORADO\*

By

Leonid Bryner and R. F. Douglas

March 1952

Trace Elements Memorandum Report 296

This preliminary report is distributed without editorial and technical review for conformity with official standards and nomenclature. It is not for public inspection or quotation.

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\*This report concerns work done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

## USGS - TEM Report 296

## GEOLOGY - MINERALOGY

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INTERIM REPORT ON EXPLORATION ON CLUB MESA,  
MONTROSE COUNTY, COLORADO

By Leonid Bryner and R. F. Douglas

INTRODUCTION

This report summarizes the results of diamond-drill exploration on Club Mesa by the U. S. Geological Survey.

Club Mesa is in secs. 31 and 32, and parts of secs. 28, 29, 30, and 33, T. 48 N., R. 17 W., and sec. 5 and parts of secs. 4, 6, 7, 8, and 9, T. 47 N., R. 17 W., New Mexico principal meridian (fig. 1). The mesa is 1 mile west of Uravan, Montrose County, Colo. Uravan is 93 miles south of Grand Junction by U. S. Highway 50 and Colorado Highway 141. The mesa is public land except for 57 mining claims belonging to the U. S. Vanadium Co. The altitude of the mesa ranges from 5,500 to 6,500 feet.

Total production of carnotite ore from Club Mesa from 1911 through 1950 amounted to about 180,000 short tons averaging 0.39 percent  $U_3O_8$  and 2.1 percent  $V_2O_5$  (Bryner and Withington, 1951, p. 5). During 1951 about 16,000 short tons averaging about 0.35 percent  $U_3O_8$  and about 1.85 percent  $V_2O_5$  was mined from Club Mesa. Of this 16,000 short tons, about 10,000 came from deposits discovered as a result of Geological Survey drilling on public land. This land is leased for mining to private operators.

GEOLOGY

The exposed rocks on Club Mesa are part of a series of Mesozoic sedimentary beds. These beds strike N.  $50^\circ$  W. and dip  $3^\circ$  NE. The mesa

is capped by the Cretaceous Burro Canyon formation which is underlain by the Jurassic Morrison formation. The Morrison formation is divided into an upper member, called the Brushy Basin shale, and a lower member, called the Salt Wash sandstone. On Club Mesa all the known carnotite deposits that individually contain more than several hundred tons of ore are in a part of the uppermost sandstone stratum of the Salt Wash member. This stratum is called the main ore-bearing sandstone. Other parts of this stratum as well as sandstones lower in the Salt Wash contain small deposits.

#### GEOLOGICAL SURVEY EXPLORATION

Diamond-drill exploration on Club Mesa by the Geological Survey was planned to find most of the carnotite deposits of commercial size and grade, to outline these deposits sufficiently to provide private enterprise with incentive to develop and mine them, and also to determine the total carnotite reserves of the mesa. Between March 6, 1948, and January 22, 1952, 650 holes, totaling 164,025 feet, were drilled. About 94 percent of this footage was drilled on public land. Mineralized rock was cut in 181 holes, of which 62 are in material rich enough and thick enough to be included in the ore reserves given below.

Of the total footage drilled, 91,610 feet, in 298 holes, was drilled on the last contract between February 20, 1951, and January 22, 1952. About 97 percent of this footage was drilled on public land. Mineralized rock was cut in 70 holes, and 19 of these are in material of ore grade and thickness.



## RESERVES

The indicated and inferred ore reserves found by Geological Survey exploration on Club Mesa total about 198,000 short tons, averaging about 0.35 percent  $U_3O_8$  and 1.8 percent  $V_2O_5$ . These reserves include only material in layers 1 foot or more thick that contain 0.10 percent or more  $U_3O_8$  or 1.0 percent or more  $V_2O_5$ . About 85 percent of the total reserves is on public land, some of which is already leased. About 90 percent of the total reserves is in five deposits, which range in size from 15,000 to 65,000 short tons, within the belt of favorable ground that extends westerly from the Club mine through the center of the mesa.

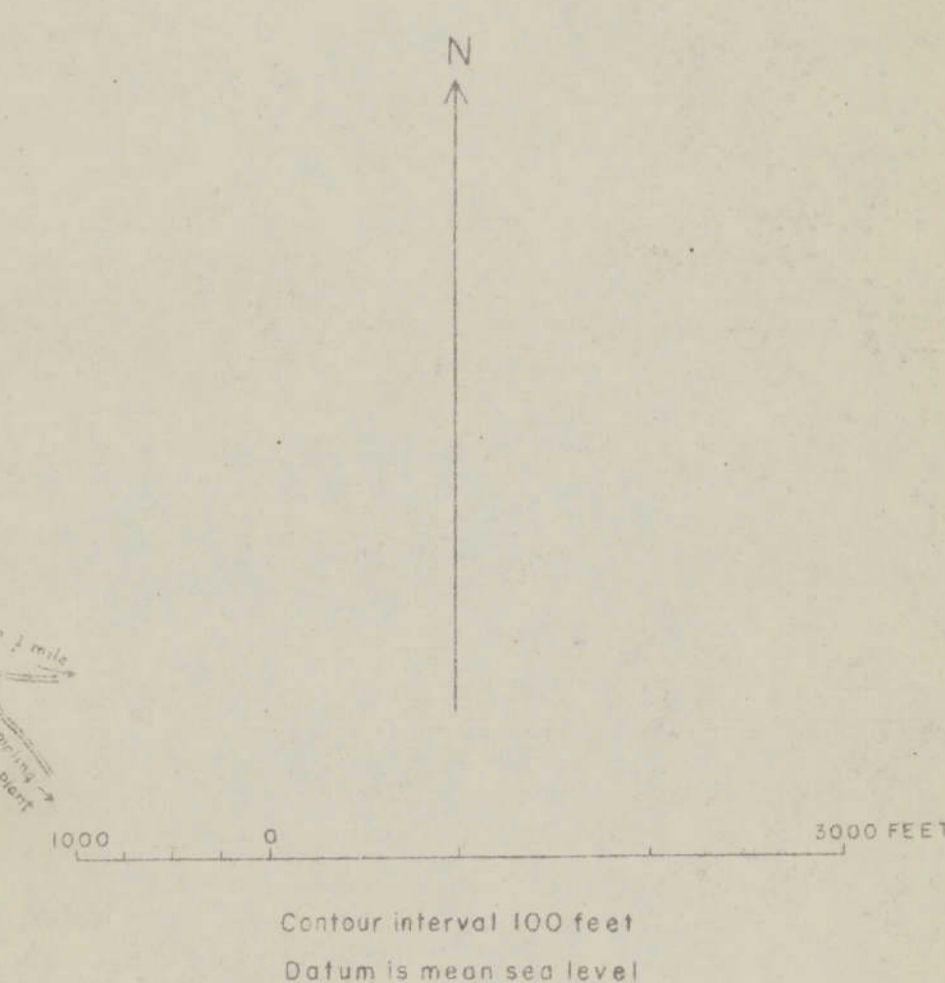
Of the total, about 25,000 short tons of indicated and 35,000 short tons of inferred reserves, averaging about 0.30 percent  $U_3O_8$  and 1.7 percent  $V_2O_5$ , were found during the last drilling contract. Almost all of these newly discovered reserves are in blocks 6 and 8 (fig. 1). Preliminary reserve statements for blocks 1, 3, 4, and 5 (Trace, Sept. 1950), block 2 (Trace, Oct. 1950), block 6 (Bryner and Cramer, 1951), and block 7 (Bryner and Cramer, 1952) have been transmitted and a statement for block 8 is in preparation.

## PLANS

No further drilling is planned on Club Mesa by the Geological Survey. Recommendations for further exploration by private enterprise, however, will be included in the final report, which is in preparation.

## REFERENCES

- Bryner, Leonid, June 1950, Preliminary appraisal of the results of diamond-drill exploration, Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Rept. 111, 12 pp.
- Bryner, Leonid, and Withington, C. F., May 1951, Interim report of diamond-drill exploration, Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Rept. 204, 9 pp.
- Bryner, Leonid, and Cramer, M. A., October 1951, Preliminary Reserve Statement 18, Reserve block 6, Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Rept. 256, 3 pp.
- Bryner, Leonid, and Cramer, M. A., January 1952, Preliminary Reserve Statement 22, Reserve block 7, Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Rept. 260, 3 pp.
- Trace, R. D., September 1950, Preliminary Reserve Statements 1, 2, 3, and 4, Reserve blocks 1, 3, 4, and 5 (east part), and 5 (west part), Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Repts. 176, 177, 178, and 179.
- Trace, R. D., October 1950, Preliminary Reserve Statement 8, Reserve block 2, Club Mesa, Montrose County, Colo.: U. S. Geol. Survey Trace Elements Memorandum Rept. 184, 1 p.



- EXPLANATION**
- Approximate base of the main ore-bearing sandstone
  - Boundary of favorable, semifavorable, or unfavorable ground underlain by ore-bearing sandstone
  - Ground underlain by carnotite-bearing rock found by Geological Survey drilling, projected to inferred outer edges of mineralized layers, some of which overlap and are not connected between adjacent drill holes (includes reserve block where number is shown)
  - Mine workings, underground
  - Area drilled by U. S. Vanadium Co. (individual drill holes not shown)
  - Claim boundary and index number (claim boundaries located approximately)
  - U. S. Vanadium Co. coordinates
  - Land section number (section lines projected from adjoining townships)
  - Leased Government land
  - Diamond-drill holes, Geological Survey. Classification by grade (based on chemical assay or gamma-ray data) and thickness. Drill holes located by plane-table or pace and compass survey methods. (Numbers on drill-hole standpipes in field have prefix CM or XCM)
  - Barren
  - Weakly mineralized (contains less than 0.10% U<sub>3</sub>O<sub>8</sub> or 1.0% V<sub>2</sub>O<sub>5</sub> but 0.020% or more U<sub>3</sub>O<sub>8</sub> or 0.10% or more V<sub>2</sub>O<sub>5</sub> by chemical assay or registers gamma-ray values within the range from 0.02% to 0.099% eU<sub>3</sub>O<sub>8</sub>, or less than 1 foot thick if higher grade)
  - Ore bearing (contains 0.10% or more U<sub>3</sub>O<sub>8</sub> or 1.0% or more V<sub>2</sub>O<sub>5</sub> by chemical assay or registers gamma-ray values of 0.10% or more eU<sub>3</sub>O<sub>8</sub> and 1 foot or more thick)

Geology by Leonid Bryner  
Engineering by M. M. Gilkey,  
M. L. Emerick, and others

**CLAIM INDEX**

1 LUCKY STRIKE	16 RAINY DAY	31 R. A. W.	46 BIG SHOT
2 MARY	17 D. B. M.	32 BETA WONDER	47 (abandoned)
3 VIRGINIA	18 COMMODORE	33 BETA	48 TRAMP NO. 1
4 HUNTER	19 YELLOW JACKET	34 SURPRISE	49 TRAMP NO. 2
5 IRENE	20 KAISER	35 SURPRISE NO. 1	50 TRAMP NO. 3
6 SHAMROCK	21 J. M.	36 TELLURIDE	51 TRAMP NO. 4
7 OLD SALT LICK	22 RAMBLER	37 CHEMIST	52 OLD TAYLOR
8 LOST HORSE	23 BEAVER	38 CHEMIST NO. 2	53 OLD HICKORY
9 TRUSCOTT	24 ELK	39 LOLA	54 U. S. GRANT
10 RANCH VIEW	25 MILL NO. 1	40 RAVEN-20472	55 WILLIAM
11 RAYMOND	26 MILL NO. 2	41 CRACK SHOT	MCKINLEY
12 LITTLE JOHNNY	27 MILL NO. 3	42 BIRD SHOT	56 JOHN ADAMS
13 SALT LAKE EXT.	28 MILL NO. 4	43 BUCK SHOT	57 JACK RABBIT
14 ANIELOPE	29 MILL NO. 5	44 HALF SHOT	58 PEARL WALKER
15 RAVEN-20271	30 JOE JUNIOR	45 SURE SHOT	

UNITED STATES DEPARTMENT OF THE INTERIOR  
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TRACE ELEMENTS MEMORANDUM REPORT 296

INTERIM REPORT ON  
EXPLORATION ON CLUB MESA  
MONTROSE COUNTY, COLORADO  
February, 1952

Figure 1.--Geologic map  
of Club Mesa,  
Montrose County, Colorado





