

USAEC RME 89(PH)

Zanucki

1954

✓  
3. ALT. 44/RME 69/Pt. 1  
✓

UNITED STATES ATOMIC ENERGY COMMISSION

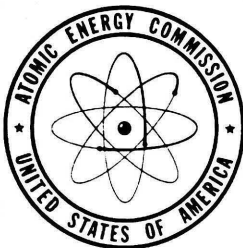
RME-69(Pt. 1)

RECONNAISSANCE OF URANIUM OCCURRENCES  
AT WRAY MESA, SAN JUAN COUNTY, UTAH  
AND MONTROSE COUNTY, COLORADO

By  
Gordon K. Zareski

October 5, 1954

Exploration Division  
Grand Junction Operations Office  
Grand Junction, Colorado



Technical Information Service, Oak Ridge, Tennessee

## RECONNAISSANCE OF URANIUM OCCURRENCES

AT WRAY MESA, SAN JUAN COUNTY, UTAH

AND MONTROSE COUNTY, COLORADO

( Part I )

## CONTENTS

	<u>Page</u>
Abstract. . . . .	5
Introduction. . . . .	5
Location . . . . .	5
Accessibility. . . . .	5
History of Operations. . . . .	7
Topography and Vegetation. . . . .	7
Water. . . . .	7
Geology . . . . .	8
Stratigraphy . . . . .	8
Structure. . . . .	8
Geology of the Ore Deposits. . . . .	12
Brushy Basin Ore Deposits . . . . .	12
Brushy Basin No. 3 . . . . .	12
Sego Lilly Lou . . . . .	12
Brushy Basin No. 1 . . . . .	12
Too High No. 1 . . . . .	12
Salt Wash Deposits. . . . .	12
Yip Yip Group. . . . .	12
Howling Coyote . . . . .	12
Big Casino . . . . .	13
Long John. . . . .	13
Broken Shoe. . . . .	13
Deposits Outside of the Investigated Area. . . . .	13
Sedimentary Trends . . . . .	14
Sedimentary Petrography. . . . .	14
Target Size. . . . .	14
References. . . . .	15

# RECONNAISSANCE OF URANIUM OCCURRENCES

AT WRAY MESA, SAN JUAN COUNTY, UTAH

AND MONTROSE COUNTY, COLORADO

( Part I )

## ABSTRACT

Uranium deposits are found in sandstone in the Brushy Basin and Salt Wash members of the Morrison formation on Wray Mesa. In all but two deposits, ore minerals are carnotite and black vanadium minerals. In one deposit in the Brushy Basin member, uranium is contained in an unidentified black mineral; in another deposit, the ore minerals are tyuyamunite and beta-uranotil. The orebodies are small in size.

## INTRODUCTION

A reconnaissance study was carried on at Wray Mesa from June to September 1953 to determine the advisability of an investigational drilling program. Geologic field data were accumulated on aerial photographs and subsequently transferred to a single base map (fig. 2). Rims considered favorable, due to proximity to known areas of mineralization, were tested for radioactivity with a Geiger counter and, toward the end of the study, with a scintillation counter.

### Location

Wray Mesa is located in San Juan County, Utah, and Montrose County, Colorado, 18 miles southeast of La Sal, Utah. It is bounded on the north by La Sal Creek, on the east by the Dolores River, and on the south by Coyote Wash (fig. 1):

### Accessibility

State Highway 46, which joins U. S. Highway 160 approximately 24 miles south of Moab, Utah, provides access to within eight miles of Wray Mesa. From here, a road, which is in part a county project but is seldom repaired, crosses the northeastern portion of the mesa. This road might require attention in wet weather to enable a heavy volume of traffic to pass over it.

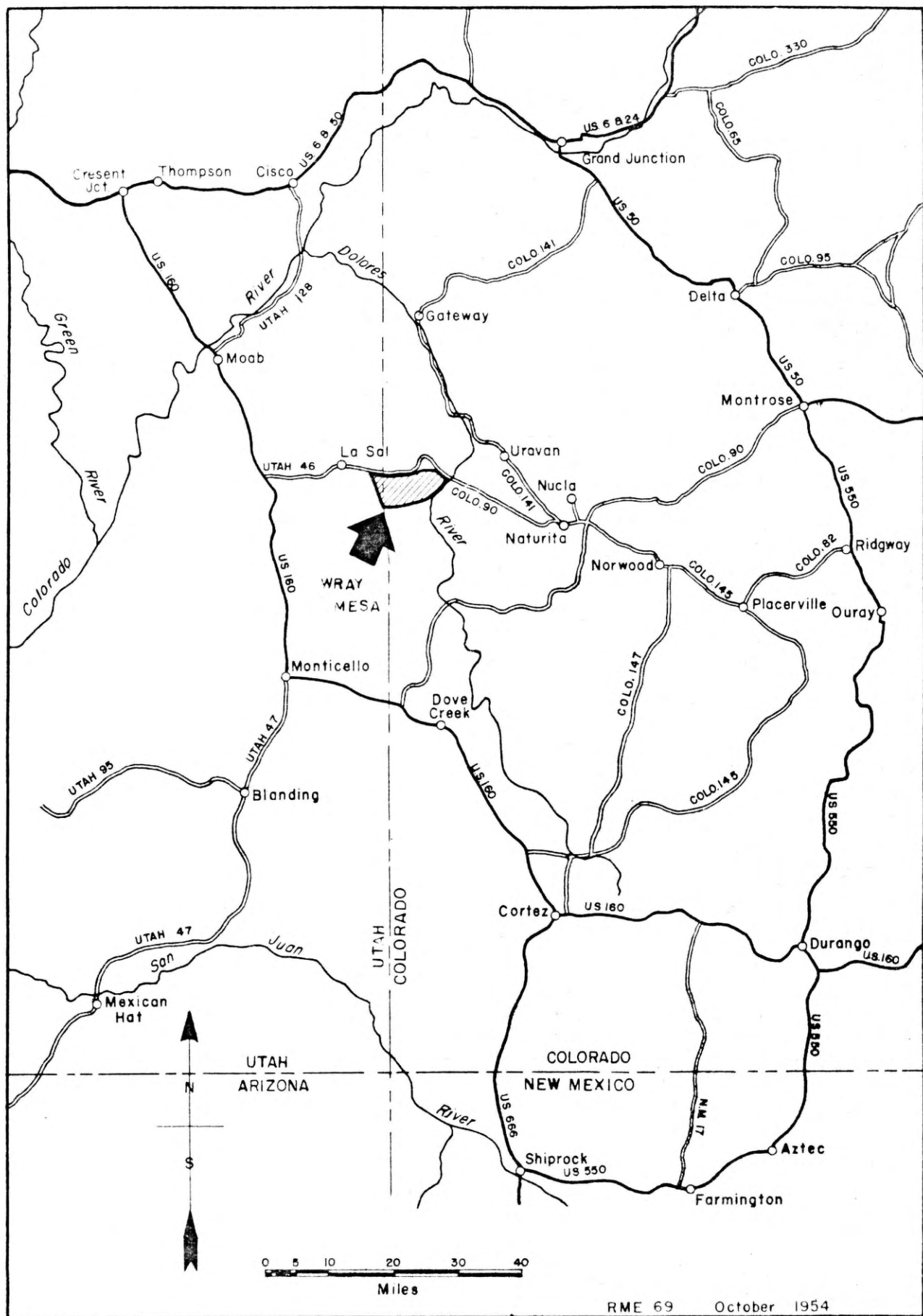


Figure I. Location of Wray Mesa  
San Juan County, Utah, and Montrose County, Colorado

### History of Operations

All the claims in the area under consideration are owned by the Great Western Uranium Company of Moab, Utah. Uranium mining in this area began in November 1952.

Wagon drilling has not proved successful in the southeastern portion of Wray Mesa. Almost 75 percent of attempted drilling operations had to be abandoned because of difficulties encountered in trying to penetrate the several layers of mudstone in the area.

### Topography and Vegetation

The top of Wray Mesa is comparatively flat with low swells, covered by grass, pinon trees and sagebrush, providing the only relief.

The north, east, and south sides have been cut by streams and deep canyons, causing a difference in elevation of as much as 2,000 feet.

From the top of the mesa to the edge of the bordering canyons, the succession of topographic features is: a steep cliff from 40 feet to 100 feet high; a slope; a series of terraces and rims. Minor canyons have been cut through these features in places and join the major canyons at the extremities of the area.

Sagebrush, pinon trees and scrub oak cover the slopes and terraces, while the canyons sometimes have a growth of pines.

### Water

There is no running water on Wray Mesa. Twenty-four reservoirs, which are under the control of the Bureau of Land Management, should provide an adequate amount of water for drilling. If rainfall is insufficient to fill the reservoirs, La Sal Creek, which is eight to ten miles away, could be used as a source of water. La Sal, Utah, has an abundant supply of water but the distance from the subject area might eliminate this location as a source of water.

Permission to use the reservoirs would have to be obtained from the Bureau of Land Management office in Monticello, Utah.

## GEOLOGY

The most prominent geologic feature in the area is the La Sal Mountains. The Tertiary activity which formed these mountains intruded the sediments, causing them to dip gently to the northwest. Some buckling is found close to the mountains.

Salt, flowing plastically, has caused the major folds in the area. Three of the most prominent of these are the Lisbon Valley anticline, which has been faulted along the axis, the Gypsum Valley anticline, and the Paradox Valley anticline.

Wray Mesa is located between the Gypsum Valley and Paradox Valley anticlines.

### Stratigraphy

The rocks exposed in the Wray Mesa district range in age from the Jurassic Entrada sandstone to the Cretaceous Dakota sandstone (fig. 3). The Salt Wash member of the Morrison formation was measured and the results are shown in figure 4.

### Structure

Wray Mesa is composed of gently dipping beds. South of the Dakota-Burro Canyon sandstone cap, the beds dip  $2^{\circ}$  to  $3^{\circ}$  northwest with local variations to the northeast and southwest. On the northern side of the Dakota-Burro Canyon sandstone, the few dips measured were found to be to the southeast. This suggests a shallow syncline with an approximate east-west axis.

Only one fault could be located in the examined area, and this was found with the aid of aerial photographs. This fault (fig. 2), striking N.  $14^{\circ}$  W., can be traced for approximately one mile. The heavy soil cover in the area makes it difficult to locate faults, but it is suspected that more are present.

Joints are conspicuous in the sandstone of the Too High claim and also on the rims; particularly the lower rims. The major joint pattern was found to strike in a northwest direction with a somewhat lesser system striking northeast.

The joints are continuous through the rolls and streaks of ore in the Too High claim, evidence that jointing took place after the emplacement of ore.



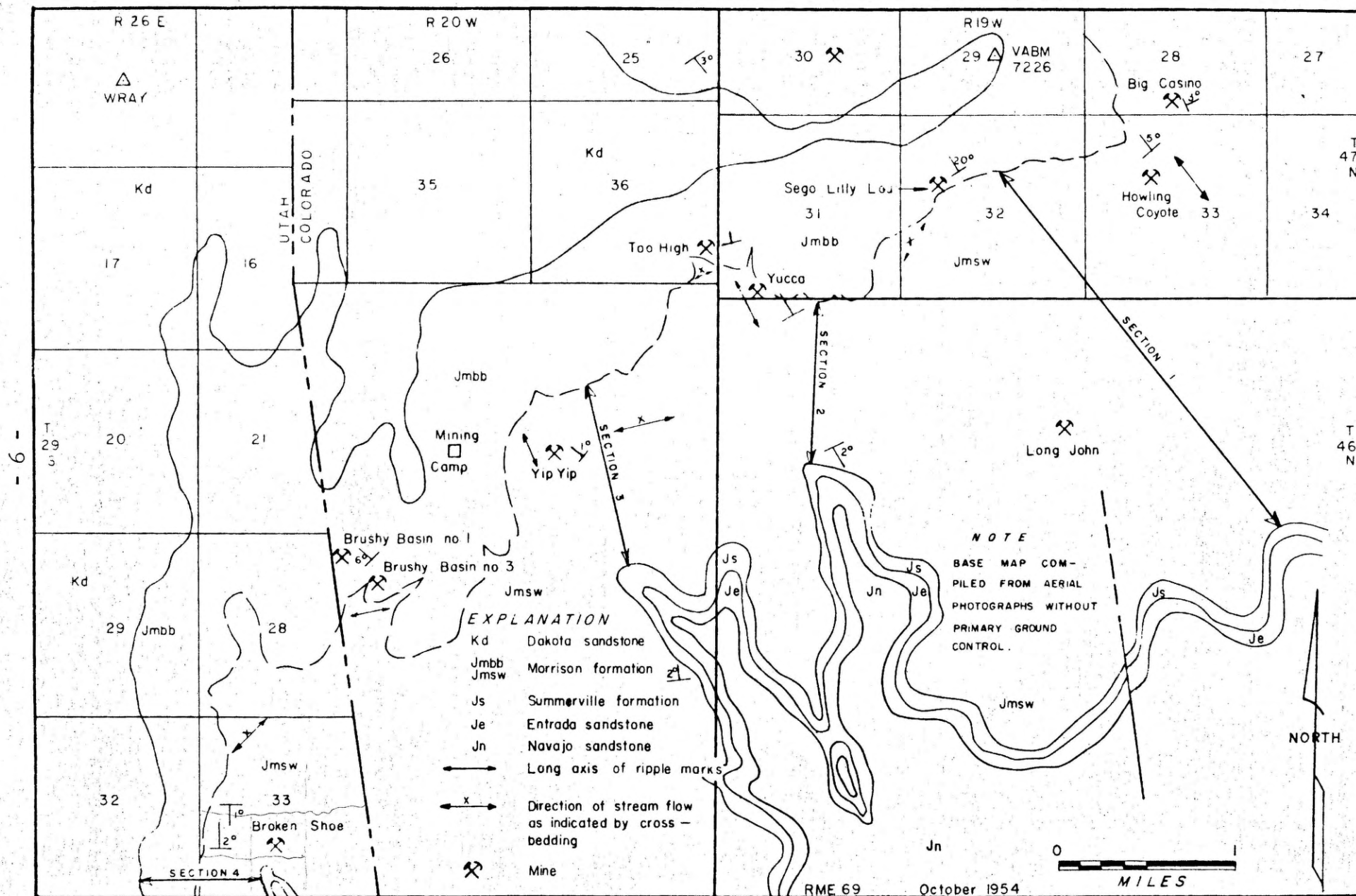


Figure 2 Geologic map of Wray Mesa  
San Juan County, Utah, and Montrose County, Colorado



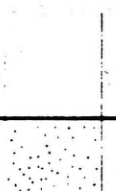

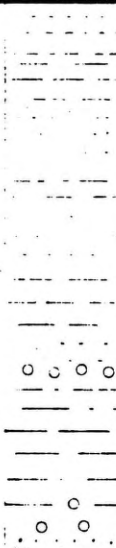


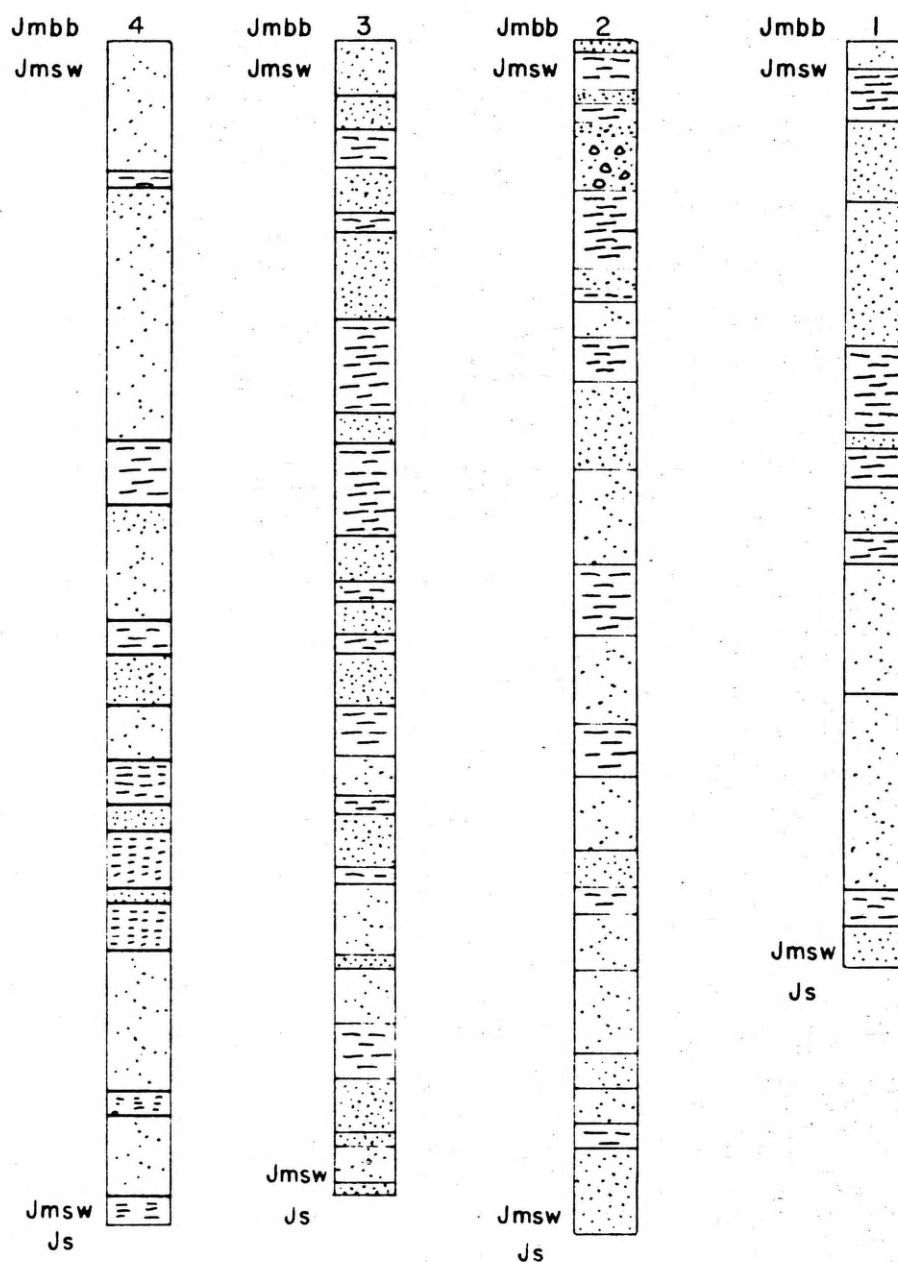
SYSTEM	FORMATION		THICKNESS	DESCRIPTION
UPPER CRETACEOUS				
	Dakota sandstone		40 - 100	Gray and brown sandstone; conglomeratic in places; cliff forming
JURASSIC  UPPER	MORRISON FORMATION	Brushy Basin member		145 - 225 Variegated shale and thin beds of sandstone; conglomeratic lenses of sandstone at base and near upper contact; forms steep slopes
		Salt Wash member		296 - 374 Gray and brown sandstone interbedded with red and gray shale; sandstone forms cliffs and benches.
		Summerville Formation		10 - 20 Red sandstone and shale; forms steep slopes.
		Entrada sandstone		200 - 400 Pink, buff and light gray sandstone with white bands; forms rounded cliffs and steep slopes.
RME 69      October 1954				

Figure 3. Generalized stratigraphic section of the Wray Mesa area  
San Juan County, Utah, and Montrose County, Colorado



### EXPLANATION

- Jmbsw Brushy Basin member of the Morrison formation  
 Jmbsw Salt Wash member of the Morrison formation  
 Js Summerville formation



Sandstone



Shale



Conglomerate



Cross-bedded sandstone

( Vertical Scale 1" = 60' )

RME 69

Figure 4 Measured sections of the Salt Wash member of the Morrison formation in the Wray Mesa area  
 Locations shown on figure 2

## Geology of the Ore Deposits

Ore is found in both the Brushy Basin and Salt Wash members of the Morrison formation.

### Brushy Basin Ore Deposits

Brushy Basin No. 3: In the Brushy Basin No. 3 open pit (fig. 2), the ore is in a thin, dense, sandstone unit in the extreme lower portion of the Brushy Basin member. The sandstone layer is both covered and underlain by a thick deposit of tan mudstone. Schroeckingerite is present in small amounts in the tan mudstone and in the sandstone. Uranium is contained in an unidentified black uranium mineral.

Sego Lilly Lou: The Sego Lilly Lou open pit (fig. 2) is at the same stratigraphic level as the Brushy Basin No. 1, and the geology is similar.

Brushy Basin No. 1: The ore in the Brushy Basin No. 1 claim (fig. 2) is carnotite with associated black vanadium minerals.

Too High No. 1: The ore from the Too High open pit (fig. 2) is in a medium- to coarse-grained, cross-bedded sandstone unit over- and underlain by gray mudstone. The surrounding sandstone has been fractured to a great extent, while the orebody shows a lesser degree of fracturing.

Diamond drilling above the Too High has extended the orebody approximately 50 feet to the southwest. Two of the identifiable ore minerals are tyuyamunite and beta-uranotil. 1/

### Salt Wash Deposits

Yip Yip Group: The Yip Yip mine (fig. 2) is on one of the upper heavy rims of the Salt Wash member. It is at the pinch-out of a sandstone lens in contact with lenses of gray and tan mudstone.

Ore minerals are carnotite and black vanadium minerals.

Howling Coyote: The Howling Coyote claim (fig. 2) is in the upper part of the Salt Wash member within 50 feet of the Brushy Basin member. The ore is in a hard, dense sandstone unit covered by talus. Ore minerals are carnotite and associated black uranium minerals.

1/ Mineralogy Laboratory, Technical Services Branch

Big Casino: The Big Casino claim (fig. 2) is in the upper portion of the Salt Wash member. Ore minerals are carnotite and associated black uranium minerals.

Long John: The Long John claim (fig. 2) is in the middle portion of the Salt Wash member. It has not yet been developed, so little information is obtainable. The mineralization apparently follows a northeast trend and consists of carnotite with black vanadium minerals.

Broken Shoe: The Broken Shoe (fig. 2) is an undeveloped deposit in a sandstone unit of the lower portion of the Salt Wash member. Carnotite, associated with black vanadium minerals, occurs on the eastern and western slopes of an eroded bench. If mineralization is continuous between these two occurrences, it trends northeast for a distance of 250-300 feet.

#### Deposits Outside of the Investigated Area

On the northern slope of Wray Mesa, three miles north of the investigated area, the Yellow Bird mine has been in operation since 1950.

Approximately two miles northeast of the Too High pit, a uranium deposit was discovered in August 1953. The ore is in a medium-grained sandstone unit with cross-bedding and abundant limonite staining. It is overlain and underlain by gray mudstone.

Shallow wagon drilling at a lower stratigraphic level than the above deposit has indicated mineralization at a depth of 27 feet.

Table I -- Results of Radiometric and Chemical Analysis of Samples Collected at Wray Mesa

<u>Claim</u>	<u>Radiometric</u>	<u>Chemical</u>	
	<u>U<sub>3</sub>O<sub>8</sub></u> (percent)	<u>U<sub>3</sub>O<sub>8</sub></u> (percent)	<u>V<sub>2</sub>O<sub>5</sub></u> (percent)
Too High	1.90	2.26	8.89
Too High	2.86	3.41	9.33
Brushy Basin No. 3	0.89	0.83	1.89
Yucca	0.87	0.90	2.14
Long John	0.14	0.14	0.77
Long John	Trace	—	2.12
Broken Shoe	0.24	0.28	1.62
Broken Shoe	0.27	0.28	1.40
Big Casino	0.34	0.46	2.25
Howling Coyote	0.48	0.50	3.03
Sego Lilly Lou	0.24	0.24	2.07
Yip Yip	0.68	0.88	3.92

### Sedimentary Trends

Ripple marks have a northwest strike, and cross-bedding indicates a flow of water to the northeast. The sandstone units generally dip to the northwest. From these facts it might be concluded that there is a northeast-southwest channel with its axis under the Dakota-Burro Canyon cap. It was impossible, however, to accumulate sufficient evidence to warrant a positive conclusion along these lines.

The orebodies follow a rough northeast trend (fig. 2). This could be due to their position on the southeastern flank of a channel with a northeast strike, or perhaps this trend is followed because most of the orebodies lie close to the Brushy Basin-Salt Wash contact which has been eroded in such a manner that it trends in a northeast direction.

The most favorable areas, on the basis of past mining activities and rim-walking, include the Yip Yip, Too High, Brushy Basin, and Long John groups.

### Sedimentary Petrography

A channel sample from the face of the Too High pit was submitted to the Mineralogical Laboratory for examination. The following is a summary of the report written by E. B. Gross:

Quartz, chert, jasper: 66 percent; feldspar: 1 percent; biotite: 2 percent; cement: 31 percent. The cementing material included kaolinite, montmorillonite, limonite, hematite, prochlorite, hydromica, siderite, and sericite. The uranium minerals identified were tyuyamunite and B-uranotil. ... the ore minerals were introduced from a source outside of the orebody. The ore minerals are confined to solution or shrinkage cracks rather than to pore openings. There are no temperature effects which require hydrothermal action'.

### Target Size

The largest body of ore in the area, excluding the Yellow Bird mine, is the Yip Yip mine. This orebody has been blocked out by drilling to an approximate size of 125 feet by 95 feet.

The other developed deposits vary in size from the Too High, approximately 80 feet by 40 feet, to the Big Casino, which is a narrow streak of ore of extremely small size.

## REFERENCES

Craig, L. C., et al., Preliminary report of the stratigraphy of the Morrison and related formations of the Colorado Plateau region: U. S. Geological Survey TEI-180, 1951.

McKee, E. D., Some types of bedding in the Colorado River Delta: Jour. Geology, Vol. 47, 1939.

Stokes, W. L., Morrison and related deposits in and adjacent to the Colorado Plateau: Geol. Soc. America Bull., Vol. 55, 1944.