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# Mineral Resources of the Escalante Canyon Instant Study Area, **Garfield County, Utah**

Gordon W. Weir

Michael E. Lane

U.S. Geological Survey

U.S. Bureau of Mines

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# UNITED STATES DEPARTMENT OF THE INTERIOR GEOLOGICAL SURVEY

MINERAL RESOURCES OF THE ESCALANTE CANYON INSTANT STUDY AREA, GARFIELD COUNTY, UTAH

By

Gordon W. Weir, U. S. Geological Survey

and

Michael E. Lane, U.S. Bureau of Mines

Open-File Report 81-559

This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey standards.

## Mineral Surveys

Wilderness Studies Related to Bureau of Land Management

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976), requires the U.S. Geological Survey and the Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Escalante Canyon Instant Study Area, Utah.

## Contents

	Page
Summary	1
Introduction	2
Geology	4
Geochemistry	4
Mining districts and mineralized areas	10
Mineral resource potential	12
References cited	16
Illustrations	
	Page
Figure 1. Index map of Utah showing location of the Escalante	
Canyon Instant Study Area	3
<ol><li>Mineral resource potential and generalized geologic</li></ol>	
map of the Escalante Canyon Study Area	5
3. Index showing the location of exploratory wells in the	
Escalante Canyon Instant Study Area	14
Tables	
	age
Table 1. Generalized stratigraphic section of the Escalante	
Canyon Instant Study Area, Utah	6

# Mineral resource potential of the Escalante Canyon Instant Study Area, Garfield County, Utah SUMMARY

A geologic and geochemical investigation and a survey of the existing mines and prospects have been conducted to determine the mineral resource potential of the Escalante Canyon Instant Study Area, Garfield County, Utah. The study area encompasses about 260 sq mi (670 sq km) of mesas and canyons. Paleozoic rocks known from subsurface tests are overlain by outcropping rocks of Triassic and Jurassic age. The Navajo Sandstone forms the most extensive outcrops. The dominant structures are homoclines associated with broad upwarps and basins. The mineral and energy resource potential of the Escalante Canyon Instant Study Area is low.

Along the eastern edge of the area are uranium-copper deposits in Triassic rocks. The deposits are small and relatively low grade, and no pattern of ore bodies has been recognized that would encourage exploration of the deeply buried Triassic strata. Traces of gold were found in pan concentrates, ut the reported values are too low to encourage prospecting. Twenty-three wildcat wells, including eleven wells from the study area, have been drilled in central Garfield County. Shows of oil and gas were rare, and all of the wells have been abandoned. Gypsum has been mined for local use near Escalante and Boulder; it has little potential for industrial use, because it is clayey and silty, and in thin layers.

Collectors of rocks and minerals have found petrified wood, chart clasts of various colors, limonitic concretions, and large gypsum crystals in the study area.

## INTRODUCTION

During 1979 and 1980 the U.S. Geological Survey and the Bureau of Mines conducted field investigations to evaluate the mineral resource potential of the Escalante Canyon Instant Study Area, Garfield County, Utah. Field studies included geological mapping and reconnaissance (Weir and Beard, 1981), geochemical sampling, and a survey of known mines, prospects, and mineralized areas (Lane, 1981).

The Escalante Canyon Instant Study Area includes about 260 sq mi (670 sq km) of mesas and canyons in Garfield County, Utah (fig. 1). The area is bounded generally on the west by a paved highway; elsewhere most of the periphery is marked approximately by improved and unimproved roads. On the south it is bounded in part by Harris Wash, and the limits of the Glen Canyon National Recreation Area. Several unimproved roads lead to drill sites and to corrals within the study area. All unpaved roads are commonly impassable in wet weather. The principal trails are along the Escalante River, The Gulch, and Harris Wash. Much of the study area is difficult to access even by foot.

No permanent residents are within the area. The nearest towns are Escalante (population 638, 1970) and Boulder (population 93, 1970). Total population of the county in 1970 was 3.157.

The Escalante Canyon Instant Study Area lies within the western part of the Canyon Lands section of the Colorado Plateau physiographic province (Thornbury, 1965, p. 426-434). Steep-walled canyons, mesas, and plateaus are the major landforms in this section. The dominant structures are homoclines associated with broad upwarps and basins in Paleozoic and Mesozoic sedimentary rocks. The study area lies southwest of the Circle Cliffs upwarp and northeast of the Kaiparowits basin. It is southeast of the basalt-capped, flat-lying rocks of the Aquarius Plateau.

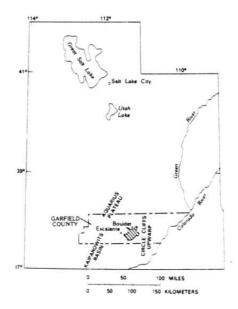


Figure 1.—Index showing location of the Escalante Canyon Instant Study Area,
Garfield County, Utah.

Near the east edge of the area are a few uranium-copper propects in Triassic rocks. The deposits are generally small and low grade. The prospects appeared inactive in 1979 and 1980. None have yielded significant quantities of ore.

Eleven wildcat wells have been drilled within the study area in search for oil and gas. All have been plugged and abandoned.

Collectors of rocks and minerals visit the Escalante Canyon Instant Study Area to look for petrified wood, iron-rich concretions, and gypsum in Mesozoic strata and red, brown, and black chert in Quaternary deposits.

## GEOLOGY

Rocks Triassic and Jurassic age, totalling about 3,000 ft (900 m) crop out in the Esca. te Canyon Listant Study Area (Weir and Beard, 1981).

Underlying Paleozoic rocks known from subsurface tests are more than 4,000 ft (1,200 m) thick. Characteristics of the rock units are listed on table 1.

Grayish-orange, crossbedded sandstone of the Navajo Sandstone forms the most extensive outcrops (fig. 2). Older formations crop out only in the eastern part of the area and along the Escalante River and its major tributaries. The Page Sandstone and Carmel Formation cap a few mesas in the central part of the area and form the major outcrops along the southwestern edge of the area.

In most of the area the rocks dip gently to the southwest. Two major folds interrupt this prevailing dip, the Boulder-Collett Canyon anticline and the Harris Wash syncline. Both folds are relatively narrow and plunge generally southward. Normal faults having a displacement of a few feet to about 150 ft (45 m) locally cut the western flank of the Harris Wash syncline.

## GEOCHEMISTRY

A total of 136 samples from within and near the Escalante Canyon Instant Study Area were collected by the U. S. Geological Survey, (this report).

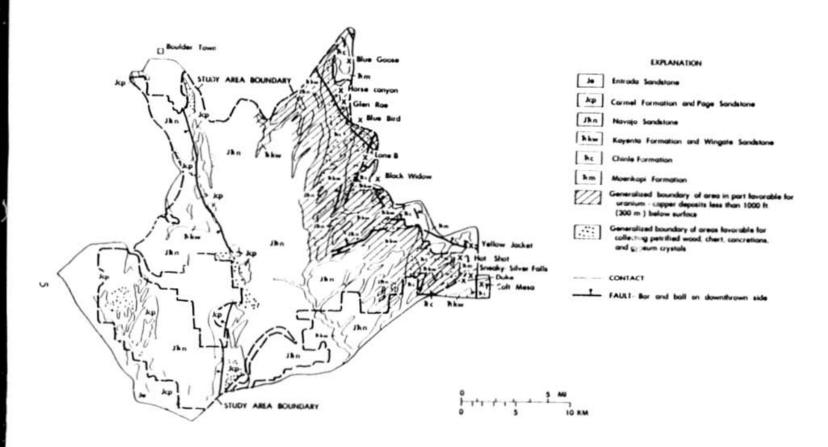


Figure 2.--Mineral resource potential and generalized geologic map of the Escalante Canyon Instant Study Area.

Table 1.—Generalized stratigraphic section of the Escalante Canyon Instant Study Area, Utah

[Data on Chinle Formation from Davidson (1965); data on units below Chinle from Zeller (1973) and Peterson (1973) based on wells in and near the Upper Valley about 12 ml (19 km) west of study area]

System	Series	Format fon	Member	Thic	kness	Descript (a)
				Feet	(Meters)	
Quiternary	Holocene and Pleistocene	Alluvtal and coltan deposits		0-40	(0 <b>-</b> 12)	Clay, silt, sand, and gravel along streams; silt and sand on mesas; pediment gravels, consisting chiefly of pebbles to boulders of hasalt, on mesa tops.
		Unconformity				
	Middle	Entrada Sandstone		150+	(45+)	Reddisir-boson silty sandstone. Only lower part of formution present in aren; as much as 1,000 ft (300 m) thick in adjoining three Canyon quadrangle (Zeller, 1973).
	Middle	Carnel Formation	Upper member	260-300	(80-10)	Mudstone and minor fine-grained sand- stone, chiefly reddish-brown; light-gray gypsum in trogollar lenses; thin-bedded yellowish-gray limestone near base.
Jurassife	Hidle	Page Sundstone	Theorems Pockets Tongue	20-80	(6-24)	Sandstone, chiefly yellowish gray, fine- grained; crossbedded, locally contorted. Contains layer of reddish-brown midstone near middle of unit.
	Mikile	Carnel Formation	Judd Hollow Tongae	0-50	(0-15)	Midstone, reddish brown grades to sand- stone and merges with Thousand Pockets Tongue in southwest corner of area.
	Middle	Page Sandstone	Harris Wash Tongue	10-100	(3-30)	Sandstone, grayIsh-orange, crossbedded; contains chert pebbles at base.

a

Table 1.—Generalized stratigraphic section of the Escalante Canyon Instant Study Area, Utali—Continued

System	Series	Format ton	Henber	Thick	mess	Description
				Feet.	(Meters)	
Jurassic and Triassic		Nava jo Sandstone		1,200-1,500	(364)-464))	Sandstone, grayIsh-orange, crossbedded in part contorted; contains sparse, thin lenses of limistone and reddish-brown siltstone, must be near base.
Triassic(?)	Upper	Kayenta Formitton		200-400	(60-120)	Sandstone Interhedded with slitstone, reddish-brown
Triassic	Upper	Wingste Sandstone		200-260	(60-80)	Sandstone, light-reddish-orange to reddish-brown, fine-grained, cross- bedded.
		Unconformit	у			
Trtassic	Upper	Chinle Formition	Gurch Rock Houber	0-25	(0-8)	Sandstone, brown, fine- to medium- grained.
			Ool Rock Member	150-250	(45-75)	Sandstone and midstone, red, brown, and greenish gray; limestone, greenish- gray, in thin lenses.
			Petrified Forest Member	150-350	(45-105)	Midistone, bentonitie, variegated, and sandstone; contains stilleffled wood.
Triassic			Honitor Butte Honber	100-200	(30 <del>-6</del> 0)	Madstone, bentonitic, green and grayish- red; sandstone, light-brown, micacross, ripple-laminated.
			Shinarup Henher	0-130	(0-40)	Sandstone, congloweratic, yellowisingray, crossbedded; mudstone, greenisingray, in thin lenses. In same general stratigraphic position as mottled unit.
			or			
			Mottled silt- stone unit	0-50	(0-15)	Siltstone and minor sandstone, mottled red and white; generally absent where Shinarump Member present.

Table 1.—Generalized stratigraphic section of the Escalante Canyon Instant Study Area, Utab-Continued

System	Series	Format fon	Member	Thie	kness	Descript ion
				Feet	(Meters)	
		Unconformit	у			
	Middle(?) and Lover	Hoenkopi Formation		600-880	(180-270)	Sandstone, shale, and siltstone, reddish- brown; minor limestone.
			Timpo⊾eap Hember	60-70	(18-21)	Dolomite, light-brown to light-yellowish- red.
		Unconformi				
Peridan	laser	Kaibub Limestone		140-200	(45-60)	Dolomite, light-gray to light-brown; contains abundant chert.
	Lower	Outler Formation	Write Rim Sandstone Monber	140-170	(45-52)	Sandstone, dolomitic light-gray; some interbedded, light-brown dolomite.
	Lawer	Torowsap Format Ion		360-420	(110-130)	Dolomite, light-brown dense; inter- bedded light-gray sandstone and anhydrite
	Loser	Goconfino Sandstone <sup>1</sup>		50	(15)	Sandstone, Hight-gray.
	l/ser	Outler Formation	Organ Rock Member	140-160	(45-50)	Siltstone, light-gray to light-red, some brown sandstone.
	Lower	Outler Forantion	Gedar Mesa Sandstone Monber	1,350-1,400	(410-425)	Sandstone, light-gray to light-yellowish- red, fine-to medium-grafued; lower one- third contains interhedded light-brown to light-yellowish-red limestone and dolonite

Table 1.—Generalized stratigraphic section of the Escalante Canyon Instant Study Area, Utalr—Continued

System	Sertes	Format fon	Member	This	kness	Description
				Feet	(Meters)	
		Unconform	dty			****
Peursylvanfan		Hermosa Formation		340	(105)	Sandstone, light-gray; interbedded ligh yellowish-red dolomite and reddish- and purplish-gray siltstone.
		Molas Formation		40-70	(12-21)	Shale, reddish-gray, some Himestone concretions and sandstone.
		Unconform	lty			
Mississippian	Upper and Lower	Redwill Limestone		900	(270)	Limestone and dolumite, light-gray to light-yellowish-red; extensive karst surface at top; in port cavernous.
Devontan	Upper	Ouray Limestone		160	(50)	Limestone, light-yellowish-red, dense.
Devonfan		Univaried		230	(70)	Dolomite, light-yellowish-red, some interbedded sandstone and greenish-gray shale.
		Unconform	Ity			
Cambritan		Unraned		Im	(30)	Doloaite, light-yellowist-red and interbolied greenish- and reddish-gray shale.

<sup>&</sup>lt;sup>1</sup>Subsurface terminologoy.

These samples include: 71 stream-sediment samples collected along Harris Wash and the Escalante River and their principal tributaries; 19 representative rock samples from the major sedimentary units; 9 mineralized-rock samples from workings and dumps of uranium-copper prospects; pan concentrates of four samples of stream sediments and three of sedimentary rocks; and 26 water samples from streams, springs, and seeps.

The analyses of stream sediments and rocks from in and near the Escalante Canyon Instant Study Area appear characteristic of the country rock, mostly sandstone and shale of Jurassic and Triassic age (this report). A few analytical values appear anomalous because they are high, relative to the whole set of analyses. Most relatively high values in stream-sediment samples are probably caused by the presence of debris derived from volcanic rocks that crop out north of the area (McFall and Peterson, 1971). Most anomalous values detected in the rock samples are less than an order of magnitude higher than the lower limit of spectrographic detection. The mineralized rocks are all slightly uraniferous and most contain detectable amounts of copper and other metallic elements. The detection of uranium in several widely spaced water samples suggests the water has passed through uraniferous rocks—probably the Chinle and Moenkopi Formations (Triassic), which contain uranium—copper prospects near the east edge of the area. Gold values detected in a few pan concentrates are very low.

## MINING DISTRICTS AND MINERALIZED AREAS

Mining activity in or near the Escalante Canyon Instant Study Area consists of numerous workings in the Circle Cliffs area near the east boundary (Lane, in press). Counthouse records indicate that at least 2,000 claims were located in the Circle Cliffs area during the 1950's in the search for uranium. The workings are small, for the most part, and the mineralized rock

is spotty and irregular in grade. The total tonnage of ore produced from all these deposits was probably very small. All the prospects and mines appeared dormant in 1979 and 1980.

The majority of the prospects consists of small- to medium-length adits, mostly less than .00 ft (31 m) metric in length. All are easily accessible by road or a short walk.

The uranium mineralization is limited to the basal part of the Chinle Formation, mostly in the Shinarump Member, and in the upper few feet of the underlying Moenkopi Formation. Oxidized copper minerals are frequently associated with the uraniferous rock, and one deposit, Colt Mesa Mine, was developed primarily for its copper content. All prospects are in stream channels of varying widths. According to Davidson (1967) some attain widths of as much as 1,500 ft (460 m). The paleochannels are usually less than 50 ft (15 m) deep.

The channels vary in composition but are usually conglomeratic with different degrees of sorting. Frequently, large siltstone fragments and carbonaceous material are present.

During the field investigation, a total of 78 samples were taken. Two samples contained above 1.0 percent  $\rm U_3O_3$ . These samples, taken at the Yellow Jacket and Sneaky Prospects (Lane, in press) contained 1.09 percent  $\rm U_3O_8$  and 2.25 percent  $\rm U_3O_8$ , respectively. However, the majority of  $\rm U_3O_8$  values were between 0.01 and 0.2 percent. The highest copper value was 15.5 percent taken at Colt Mesa Mine (Lane, in press). Where copper was analyzed, values range from 36 parts per million to 15.5 percent with the majority of values greater than 0.1 percent but less than 2 percent.

## MINERAL RESOURCE POTENTIAL

The mineral resource potential of the Escalante Canyon Instant Study Area is low. Uranium-copper deposits are in Triassic rocks along the eastern edge of the area (fig. 2). Most of the deposits are in the basal part of the Chinle Formation and in the upper part of the Moenkopi Formation on the edges of channels filled with sandstone of the Shinarump Member of the Chinle. The principal ore minerals are yellow and yellowish-green oxide minerals of uranium and green and blue xide minerals of copper. Analyses of samples from these deposits show that the metallic content waries greatly but indicate that the overall grade of the deposits is low. The profince of uranium in several widely spaced water samples suggests that the weakly mineralized works may underlie much of the area. None of the deposits have been extensively mined, and probably none have yielded a significant amount of ore.

Davidson (1967, p. 70-71) lists five criteria of favorable environments for uranium deposits in the Circle Cliffs area, which includes the Triassic outcrops near the Escalante Canyon Instant Study Area: 1) a channel cut in the Moenkopi filled with sandstone of the Shinarump, 2) carbonaceous material in the sandstone, 3) lenticular mudstone-rich sandstone continuous with the rest of the sandstone unit, 4) an overlying cap of relatively impermeable mudstone, and 5) nearness to the regional pinchout of the Shinarump. These criteria are generally present in ground containing the known deposits. As presently known, however, the deposits are small and relatively low grade, and no pattern of ore bodies has been recognized that would encourage exploration of the deeply buried Triassic strata. Consequently, the uranium and copper potential of the Escalante Canyon Instant Study Area is judged to be low.

Although traces of gold were found in pan concentrates of stream sediments and shale from the Chinle Formation as part of this investigation,

the reported values (less than 1 ppm) are too low to encourage prospecting.

The oil and gas potential of the study area appears low. The oil and gas possibilities of the region including the Escalante Canyon area have been reviewed by deylmun (1958), Kunkel (1965), Blakey (1974), and Doelling (1975, p. 90-102). Oil has been produced since 1964 from the Upper Valley field, about 12 mi (19 km) west of the study area. Production is from the Kaibab Limestone (Permian) and from the Timpoweap Member (Lower Triassic) of the Moenkopi Formation along the crest of an asymmetric anticline (Peterson, 1973; Doelling, 1975, p. 91-96). Oil in non-commercial amounts was discovered in Mississippian strata.

Twenty-three wildcat wells including eleven wells within the study area, have been drilled in central Carfield County (fig. 3). Most of the wells were drilled on anticlines into Permian crata. Shows of oil and gas were rare, and all the wells have been abanuoned. Most of the obvious structural traps have been tested at least in part. Stratigraphic traps within the deeply buried rocks of the region are possible, but none have yet been found.

Gypsum has been mined for local use from the Carmel Formation near Escalante and Boulder (Doelling, 1975, p. 149). It is in wavy layers and podlike lenses irregularly interstratified with red mudstone and siltstone and yellowish-gray sandstone and limestone of the Carmel Formation in the southwestern part of the study area. The gypsum has little potential for industrial use, because it is mostly clayey and silty, is in generally irregular layers only a few feet thick, and is not readily accessible.

Other construction materials within the study area include gravels in Quaternary alluvium and pediment deposits, sand in Quaternary eolian and alluvial deposits, and limestone in the Carmel Formation. Except for borrow pits in red mudstone and siltstone of the Carmel Formation and in gravels of

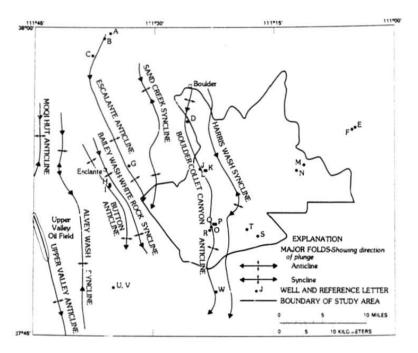


Figure 3.—Index showing the location of exploratory wells in the Escalante Canyon Instant Study Area.

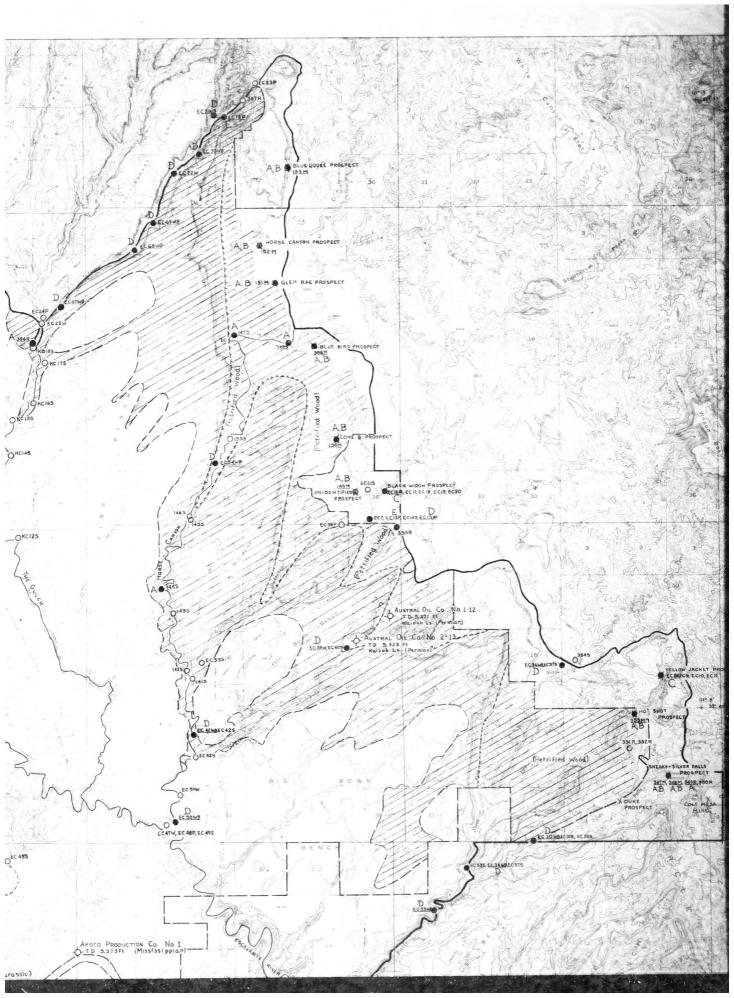
pediment deposits, little of this material has been used, because adequate supplies of these materials are readily available outside the study area.

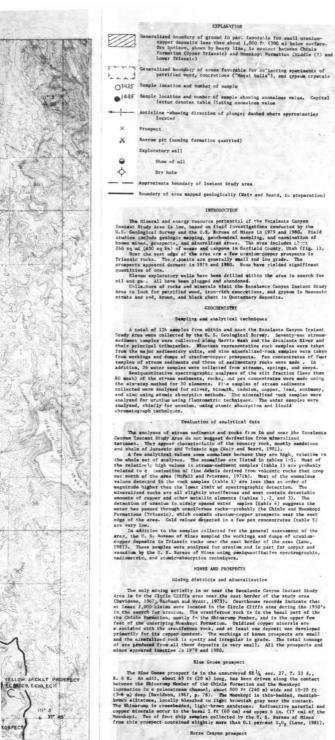
Collectors of rocks and minerals search the Escalante Canyon and surrounding areas for noteworthy specimens. Chief among these are the reddish-brown to black petrified wood common in the lower part of the Chinle Formation and in colluvial and alluvial deposits derived from them. Chert clasts of various colors are locally common in pediment gravels and deposits derived from them. Small, spheroidal, limonitic concretions are common in the Navajo Sandstone on Spencer Flat and near Red Broaks in the southwestern part of the area. The concretions consist of a layer of iron oxides enclosing loosely cemented sand. The spheroids range from a fraction of an inch to a few inches in diameter. They are known to collectors as "Moqui balls" or "Navajo cherries" (Doelling, 1975, p. 156). Large gypsum crystals are common in the Carmel Formation. The value of collected mineral specimens is small, but the presence of these materials is an attraction within the study area.

## References cited

- Blakey, R. C., 1974, Petroliferous lithosomes in the Moenkopi Formation, southern Utah: Utah Geology, v. 4, no. 2, p. 67-84.
- Davidson, E. S., 1967, Geology of the Circle Cliffs area, Garfield and Kane Counties, Utah: U. S. Geological Survey Bulletin 1229, 140 p.
- Doelling, H. H., 1975, Geology and mineral resources of Garfield County, Utah: Utah Geological and Mineral Survey Bulletin 107, 175 p.
- Hackman, R. J., and Wyant, D. G., 1973, Geology structure and uranium deposits of the Escalante quadrangle, Utah and Arizona: U. S. Geological Survey Miscellaneous Geologic Investigations Map I-744, scale 1:250,000.
- Heylmun, E. B., 1958, Paleozoic stratigraphy and oil possibilities of Kaiparowits region, Utah: American Association of Petroleum Geologists Bulletin, v. 42, no. 8, p. 1781-1811.
- Kunkel, R. P., 1965, History of exploration for oil and natural gas in the Kaiparowits region, Utah in Goode, H. D., and Robison, R. A., eds., Geology and resources of south-central Utah - Resources for power: Utah Geological Society Guidebook to Geology of Utah, no. 19, p. 93-111.
- Lane, M. E., in press, Mines and prospects map of the Escalante Canyon Instant Study Area, Utah, by the Bureau of Mines: U. S. Geological Survey Miscellaneous Field Studies Map.
- McFall, C. C., and Peterson, P. R., 1971b, Geology of the Escalante-Boulder area, Garfield County, Utah: Utah Geological and Mineralogical Survey Map 31, scale 1:62,500.
- Peterson, P. R., 1973, Upper Valley Field: Utah Geological and Mineralogical Survey 011 and Gas Field Studies 7.
- Thornbury, W. D., 1965, Regional geomorphology of the United States: New York, John Wiley, 609 p.

Weir, G. W. and Beard, L. S., 1981, Geologic map of the Escalante Canyon Instant Study Area, Garfield County, Utah: U. S. Geological Survey Miscellaneous Field Studies Map MF-A.





The Blow Goose prospect is in the unsurveyed SE  $^{1}_{A}$  sec. 27, T. 33 5, R. 6 E. An addi, about 65 fe (20 m) long, has been driven along the contact between the Bloistoramp Member of the Chila Formation and the Mosskopt between the Bloistoramp Member of the Chila Formation and the Mosskopt 00 fr. (3-6 m) deep (Davidson, 1967, p. 75). The Namehopt is thin-badded, readitablewine slitteness, locally blacked to light brownish gray mear the contact. The Shimarump is crossbedded, light-brown sandstone. Redisactive material and copper storage securi in the basal 2 ft (00 cm) and upper 6 in, (15 cm) of the opper storage accurate the basal 2 ft (00 cm) and upper 6 in, (15 cm) of the from this prospect contained slightly more than 0.1 percent U<sub>3</sub>O<sub>6</sub> (Lane, 1981).

The Herse Cauyon prospect is mear the top of a butte in the SU  $l_k$  sec. ), T. 34 S. 8.6 %. An edit, about 30 ft (9 m) long is in a mandstone constaining carbonacous trans and interbols of siltstone at the base of the Monitor-Butte Hember of the Chicle Formation. The mandstone fills a channel about 300 ft (96 m) wide and 10-15 ft (9-5 m) deep cut into the mottled alliations unit of the Chicle Formation (Savidson, 1967, p. 76-77). The Monadop's Formation crops out blow the sdit and consists of aditations are made to the control of alliations in the action to the control of a distinction and the same of the control of the contro

The Glen Ras prospect is in the unsurveyed NE 1/4 sec. 10, T. 34 S., R. 6 E. An sdit, about 33 ff (10.8) long, is in crossbedded, medium to convergedized senditures of the Shinarup Member of the Chile Formation. The 100-40 ff (9-1) m deep, cut. Into the noticial-dilatons unit of the Chile Chardson, 1957, p. 73). Mive grab samples taken by the U. S. Bureau of Mines Clame, 1931 were low to moderate in 0/0, content. Copper staining was common in the dump material and one sample contained 2.0 percent copper.

## Blue Bird prospect

The like Bird prospect is in the unsurveyed SV M<sub>2</sub> sec. 14, 7, 34 S<sub>1</sub>, 2, 6 E. The workings consist of two addts, 40 ft (12.m) and 4s ft (15 m) prospect (Lawledsen 1947). The state of the consist of the consist of the consist (Lawledsen 1947) and the consist of the consistency of the consist

The Lone B prospect is in unsurveyed NE 1/4 sec. 26, T. 34 s., R. 6 E. The workings commists of two after near the hame of the Shimarumy Number in the sound of the Shimarumy Number in the sound of the Shimarumy Number in the sound of the shimarum of the

The Not Shot propect is in the unsurveyed SW  $^{1}$ /L sec. 23, 7. 35 5., R. 7 E. An addit about 30 ft (15 m) long has been driven in the Shinarump in channal about 400 ft (120 m) wide and (10-1) ft (3-4 m) deep (Davidson, 1967, p. 83). The Shinarump is limentic-extrained, poorly sorted complowers and variance content of five chip semples shann by the U. S. harese of Kines range from 0.244 to 0.409 percent  $W_{\rm Og}$  (Lane, 1981). A sample taken by Davidson (1967, p. 63) of characteristics or se contained 0.079 percent U. a channal sample, 3 ft (1 m) long, of relatively high-grade rock contained 0.20 percent U (Davidson, 1967, p. 83).

## Sneaky-Silver Falls prospect

Sneaky-Silver Falls prospect fs in the unsurveyed SR  $^1h_{\Lambda}$  sec. 26, T. 35 %, R. 7 E. The workings consist of two interconnected addts having about 000 fs (120 m) of drift; and a northern addt about 12 ft (1.7 m) long. The addits are in a Shinaruse phasmol as such as 4,000 ft (1.200 m) wide and been at the north addit and about 70 ft (21 m) deep at the north addt and about 70 ft (21 m) deep at the southern addts. The Shinaruse is well-sorted andstone, in part crossabéded, interlayered with lenses of silettone, shale, and mudstone containing sporadic fragments of carbonaceous naturals. The underlying Monophys silettone is locally blacked from reddish brown to light brownish gray. Urantum-bearing rock is mostly in samples taken by the U. 5. Bureau of Mines ranged from 0.01 to 2.25 percent 0.00 (Lane, 1981).

The Duke prespect is in the unsurveyed Nu  $^{1}$ 0, s.c. 35, T. 35 5, R. 7 E., on the scuth side of the Silver Creek. Two matter, i.e. 1e ft (c.) a) and 9 ft (C.8 a) long, are in the same Sinterumy channel as the Secenty-Silver Palls prospect (Swidson, 1987, p. 84). The Sinterump is composed of poorly sorted, medium-grained sandstone containing fragments of silveton, pertified wod, and carbonaceous material. The urantum content of the rock is relatively low; the highest value shows in samples collected by the U. S. Bureau of Mires was 0.010 percent U\_30g (Lame, 1981).

## Coit Mesa mine

The Golt Mess size is in the Will, sec. 36, T. 35 S., R. 7 K. Copper uninerals were discovered here in 1958 and development of the claims for copper begin in 1971 (Colling, 1975). The mine has three portals and several budged feet of interconnected drift. The mine is at the contact between the Moshogh in a channel shout 2,300 fr (1900 a) wide (Bavidson, 1967, pl. 1, sheet 2) in which the Shinarump is as such as 130 fc (40 s) thick (Doelling, 1975, p. 132). The Shinarump is an iron- and cooper-ratinel, medium-grained sandstone containing s.listone clasts and fragments of charcesly wood and rarely pritte crystals. On 12 samples taken in the mine charcesly wood and rarely pritte crystals. On 12 samples taken in the mine charcesly wood and rarely pritte crystals. On 12 samples taken in the mine charcesly wood and rarely pritte crystals. On 12 samples raken in the mine charcesly wood grown of the containing of processing 30 toms of copper ore per day was completed in the early 1970's, but it is not known if any concentrate was ever shipped.

### MINERAL RESOURCE POTENTIAL

The minoral and energy resource sofemential of the Mscalante Canyon Instant Study Area is low. Uranium-copper deposits are in Triassic rocks sear the enact ofge of the area (fg. 2). Most of the deposits are in the basal part of the Childe Formation and in the upper part of the Moeshopi Tormation on the the control of the Mscalante for the Childe Tormation and in the upper part of the Moeshopi Tormation on the Childe. The principal ore sinerals are yellow and pallowithersem order minerals of uranium and green and blue oxide minerals of copper. Analyses of samples from these deposits show that the metallic content varies greatly and that the overall grade of the deposits is low. The presence of uranium in several videly spaced users samples suggests, bowever, that the weakly make the content of the content

minoralized rocks may underlie such of the area. None of the deposits have been extensively nined, and probably none have yielded a significant amount of one.

Mayddon (1967, p. 70-71) lists five criteria of Evorable environments for urantum deposits in the Circle Cliffs area, which inclides the Triassic outcrops near the Eacalante Canyon Instant Study Area: (1) a channel cut in the Non-holy filled with ansattone of the Bhinarup, (2) carbonaceous ametrial to the sundations; (3) lenticular medicane-rich sandatone continuous with the non-holy filled with ansattone to the Trianguage of the Non-holy filled with ansattone to the regional planchout of the Bhinarup, These criteria are generally present in ground containing the known deposits. As presently known, however, the deposits are assall and relatively low grade, and of depth of the sandation of deeply buried Trianguage to the sandation of the sandati

order dates at issue in part. Settingtophic traps within the deeply border orcks of the region are possible, but none have yet been founds.

Oppose has been sined for local use from the Carmel Formation mear Escalante and Soulder (Dosling, 1975, p. 145). It is in way layers and poditike lenses frregularly interstratified with red modatone and siltence and political setting and the southwastern part of the study area. The gypsum has little potential for irregular layers only a few feet thick, and is not reselfly accessible.

Other construction materials within the study area include gravels in Quaternary allustum and pedienne deposits, and is Quaternary colian and alluvial deposits, and limeatone in the Carmel Formation. Except for borrow pitz in red sudations and siltence of the Carmel Formation. Except for borrow pitz in red sudations and siltence of the Carmel Formation and in gravels of mappiles of these materials are readily available outside the study area. Collectors of rocks and simurals search the Escalante Canyon and surrounding areas for noteworthy specimens. Chief among these ire the readish-brown to black pettified wood comes in the lower part of the Chile Formation and in collowial and alluvial deposits derived from them heer dearlied for the content of the study area for the content of the carmel formation are cannot in the Navajo Sandetone on Spencer Flat and near Red Breaks in the southwestern part of the Area. The concretions consist of a layer of from oxides enclosing lossed comested small. The spheroids limentic concretions are cannot in the Navajo Candetone of these materials is an attraction within the study area.

## REFERENCES CITED

Blakey, R. C., 1974, Petroliferous Lithosomes in the Moencopi Formation, southern Utahi Utah Deology, v. 4, no. 2, p. 67-64. Gollings, 1975, Geology and genchemistry of the Colt Ness copper deposit, Circle Cliffs area, Utahi M. A. thesis, University of Utah, Salt Lake

southern Utahi: Utah Desloy, v. v., no. 2, p. v. v. mo.
Collings, 1975, Geology and geochemistry of the Coll Reas copper deposit,
Collings, 1975, Geology and geochemistry of the Coll Reas copper deposit,
City, Utah.

Davideon, E. v., 1967, Geology of the Citel Cliffs area, Garfield and Kane
Counties, Utahi U. S. Geological Survey Bulletin 1229, 140 p.
Delling, H. M., 1975, Geology and animate resources of Garfield County,
Delling, H. M., 1975, Geology and stream transures of the Collegion of the Escalante questrangle, Utah and Artenon U.S. Geological
Survey Miscellaneous Investigations Saries, May 1-744.

Machama, K. J., and Mysart, D. G., 1973, Geology, attructure, and streams
Geopests of the Escalante questrangle, Utah and Artenon U.S. Geological
Survey Miscellaneous Investigations Saries, May 1-744.

Haylman, E. S., 1987, Paleoratic strat(graphy and oil possibilities of
Kajaravita region, Utah American Association of Ferioleus Geological
Bulletin, v. 42, no. 5, p. 1781-1811.

Hylman, E. S., Obhemour, K. 2, and Keyarr, E. A., 1965, Drilling records for
Kajaravita region, Utah in Goode, H. D., and Mostaon, R. A., eds.,
Geology and resources of seuth-central Bitah. Hessociaes for power Utah
Kafaravita region, Utah in Goode, H. D., and Mostaon, R. A., eds.,
Geology and resources of seuth-central Bitah. Hessociaes for powers Utah
Kefall, C. G., and Peterson, P. R., 1971s, Structure map of the ScalanteBoulder Area, Carticled Gounty, Utah Mich Geo-Escaland Mineralogical
Sariey May 30, acal: 165,300.

Text and Markel and Mineralogical
Sariey of India Cast Field Studies?

Thornbury, V. D., 1965, Ragional geocorphology of the United States: New
Mits, G. W. and Read Read Studies May 16 acal Resources of the Scalante Canyon
Instant Study Area, Carticled County, Utah U. S. Geological Survey
Miscellaneous Field Studies May [in press], scale 1148,000.



Sample	Element	Ag	An	GI	Cr	0
No.	(Lower limit of detection)	(,5)	(200)	(20)	(10)	CS
	Anomaly minimum	5	200	20	100	10
					Stree	m 9
TY7S	-	-		-	100	
DC266		-	-	-	-	-
B1325		-	-	-	100	-
1445		-	-	-	100	-
1475		-	-	-	-	
1488		-	-	-	-	-
B252S		-	-	-	-	*
						Roci
002R		-	700	-	-	-
004R		-	-	-	100	-
OLSN.		-	~	-	-	)[(
E76R		-	-			
253R		-	-	-	-0	*
254R				-		-
258R		-	-	-		-
349R		-	200	-	-	-
355R		0.5	-	-	-	*
356R		-	200	-	-	_
			_	finers	lized	roci
1494		.5	500	-	-	-
150H		1.5	1000	500	-	100
151H		.5	700	~	- 2	0,00
152M		-	-	-	100	5
153M		i	-	~	150 1	0,00
347H		.5	700	-	100 1	0,00
348H					100	10
353M			2000		1.00	- 11
1			2000			
358M		5		-	100	150

Sample No.	U	
149H	5	Non
150H	370	Chila
151H	190	Onto
1524	12	Ohto
153H	160	Shife
		n
347M	380	Shir
		Se
3481	8	Shin
		Se
353M	380	Shin
		at
359H	120	Stin
		799

			Miner	ali
Sample No.		1	Legent	
	Of	Cu	Pb	
ECRES	8.1	11,300	570	
EC16R	24	12,000	-	



Table A. According values since by audignostication spectrographic analysis of stream-entitients, rate, and vincestications, for first in our less or the reachest dispersion from Study Arms, that, [Simples callested by J. C. Armschlief, L. S. Sec. 24, ser. 24, v. W. Welf, antistant by Ellenn Minney, N. K. Wilsons, and C. A. Merralli. Simples analysed by D. E. Detra ed. R. T. Ngikjelm audig stream-packed for 30 determined. As a supercent in parties per million (pps). Of contact thus

Sample	Element	AR	la.	G1	Cr	Oat	La	Ho	N1	Pb	Sr	v	Zn	Rann. Sa
No.	(Lower limit of detection)	(.5)	(200)	(20)	(10)	(5)	(20)	(5)	(5)	(10)	(100)	(10)	(200)	
	Accounty minimum	5	200	20	100	100	100	50	50	100	500	100	200	
					Stre	um sedi	ments							
TY7S	-	-	-	-	100	-	-		-	-	-	-	-	Tributary to Alvey Wash.
00266		-	-	-	-	-	-	-	-	100	-	-	-	Do.
81325		-	-	-	100	-	-	-	-	-	500	230	-	Tributary to Boulder Cr.
1448		7	-	-	100	-	-	-	-	**	-	-	-	Norse Carryon.
1475			-	-	-	1.96	-	-	-	~		100	-	Do-
1485		-	-	-	~	~	-	her .	-	-	*	100	-	Do <sub>*</sub>
#252S		-	-	-	-	-	-	-	-	-	500	-	~	Tributary to Harris Wash.
						Rocks								
XZR		-	700	-	-	-	-	-	-	-	-	150	-	Nevsjo Se.; white ss.
004R		$c_{i,j} = c_{i,j}$	$f_{i} = \frac{1}{2} \left( \frac{1}{2} \right)^{-1} \left( \frac{1}{2} \right)^$	-	100	-	-	$\sim$	70		$\cdot \\$	-	-	Keyenta Pa; red site-sh.
O.SR			$\hat{x}_{i} = \hat{x}_{i}$	~	-	100	-	-	-	-	500	500	-	Colluvium; matrix of basalt boulder
														gravel.
E76R		-	-	-	-	1.7	*	-	-	~	-	-	*	Harris Wash Tongue, Page Se.; cgl.
253R		-	-	-	*		-	-	-	-	-	150	-	Carmel Pau; and sh.
254R		-	300	-		-	-	$(x,y) \in \mathcal{X}_{k}$	~	-	$\gamma = 1$	100	-	Carnel Fo.; yellowish-gray is.
258R		-	~	-		-	-	-	-	-	-	100	-	Carnel Re.: fault breccis.
349R		~	200	-	-	-	500	-	100	-		-	-	Moerikopi Ps., light-brown sh.
355R		0.5	-	~	-	-	*	-	-	-	-	1000	-	Ginle Pm.; petrified wood.
356R		-	200	-	-	-	-	-	-	-	-	7.5	7	Wingste Sn.; red as.
				Minem	lized	rocks								
149M		.5	500	-	-	-	-	~	× :	-	500	100	~	Morekopt Pa.; sn., weakly radio-
														active, unidentified prospect.
150M		1.5	1000	500	-	1000	-	200	3000	15,000	700	100 (	10,000	Oriele Pa.; as., moderately radio-
														active; Lone B prospect.
151M		.5	700	-	~	20,000	*	70	1500	200	-	-	7000	Chinle Ps.; ss., moderately radio-
														active; Glen Rae prospect.
1524			-	-	100	500		-	100	-	700	200	-	Chinle Pm.; sh., weakly radioactive
153H		ī			150	10.000		***	-	****	200	a manage		Horse Canyon prospect.
ioan.		ı	-	-	150	10,000	-	50	70	2000	700	1000	-	Shinarump Hor., Chinle Fm.;
														conglomeratic ss., moderately
347H		.5	700	-	im	10,000		1000	1500	2000	500	100	5000	radioactive; Blue Goome prospect.
34711			ruc		100	10,000		1000	1300	2.00	3.00	tur.	300	Shinarump Mbr., Chinle Pm.; ss., strongly radioactive; Somaky-Silv
														Falls prospect.
348H			-	_	100	100	-	-	20	2		150	-	Some, but weakly reficective.
353M			2000		-	_		1000	500	1000	500	300	7000	Shinarusp Mor., Cinle Pa.;
									,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2000	~~		7100,82	congloweratic as, scrongly
														radioactive; Hot Shot prospect.
		5	-		100	1500	700	43	-	5000	r25000	500		Shinarum Mor., Chinle Pa.;
358M						-								commend court of district cont.
358H														conglomeratic us., moderately

Table 8. Values of unsatus shows by chestcal analyses from starralized rock in and ownr the Rocalest Caspon Instart Study Area, Unit. [Samples collected by G. V. Wetr. Samples analyzed by J. B. Chestay using flasousecric techniques. Values reported in parts per sillion (pu); U. oranica)

Sample No.	U	Sometha
149M	5	Harrisopi Pa.; sh., weakly radioactive; unidentified prospect
150H	370	Chinle Pa.; ss., moderately radioactive; Lone B prospect.
151M	190	Chinle Pa.; ss., moderately radioactive; Glas Rae prospect.
1524	12	Otinle Pa.; sh., weskly radiosetive; Horse Canyon prospect.
153M	160	Shinarump Nor., Chinle Pa.; complomeratic se., moderately radioactive; Elb.: Goom prospect.
347M	380	Shirarump Mor., Chinle Pm.; ss., strongly radioactive; Snesky-Silver Falls prospect.
3481	8	Shinarump Mbr., Chinle Pa.; se., weekly radioactive; Saesky-Silver Falls prospect.
353M	300	Shinsrup Mer., Chinle Pa.; congloweratic ss., strongly strongly radioactive; Hot Shot prospect.
358H	120	Shinarump Mor., Chinle Ha.; congloweratic ss., moderately radioactive; Blue Bird prospect.

Table C. Anomalous values shown by chemical analyses of mineralized rock from in and mear the Socalante Canyon Instact Study Area, Utah. [Samples collected by J. C. Antweller. Samples analyzed by W. L. Campholl using atomic Anomytic techniques. Values reported in parts per million (ppm); (-) no data found.]

			Minen	alfned rock		
Sample No.	Element	Remarks				
Ož .	- Oa	Pb	Sb	2n		
BOSRS	8.1	11,300	570	10	1600	Shinarump Mbr., Chinle Ph.; ss, moderately radioactive; Yellow Jacket prospect.
ECI GR	24	12,000	71	9.70	3700	Shinarump Mor., Chinle Pa.; es., moderatel radioective; Black Widow prospect.

111546		111930	111*16'	111900
38*00	/BA			
	C./	1.0		
	+ E	Boulder	$\Lambda$	
. 3	18	で	/ 1	

Table D. According values shown by chemical analyses of water samples from in and man the Receiveste Compon Instant Study Anna, Cit.
[Samples callecond by J. C. According. Samples analysed by K. L. Compbell and J. S. Meingly unity attention-shources for a contract of the Componing of the Compon

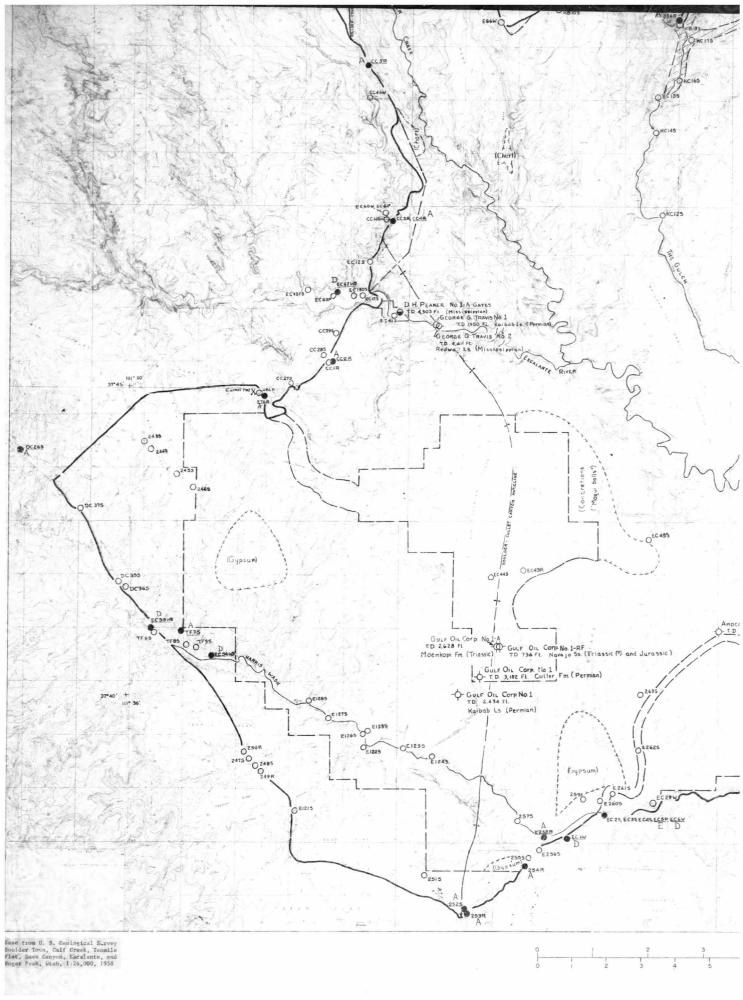
Sample No.			Element aly minim			Dearly
	U	Sh.	Ou	Но	904	
	2	1000	40	10	1000	Control of the Contro
ECIM	3.3	1200		-		Spring course coursel, south of Red Breaks, K.W. of Backaroo Fiat.
ECS4	3.4	1050		12	1500	Harris Wash, intermittent stream flow.
ECI3N	13	10			1900	Spring mear Circle Cliffs Rd, between Der'h Hollow and Wolvering Cr.
EC22W	. 360	-	49	36	1	Seep near fault zone, Long Canyon, 3.8 mg (6.1 km) E. of Stomp Cr.
F/3048	14	-	-	-		Stiver Falls Cr., near boundary of utidences area.
EC344B	16	-	-	-	-	N. Fork Silver Falls Cr. shows confluence with S. Fork.
EC394B	14	-	-		- 1	Silver Falls Cr. about 1 mt (1.6 km) below confluence of forks.
EC364B	7.3	-	-	-	-	Upper reaches, N. Fork Stiver Falls Cr.
8C39AB	13	-		7	200	Death Hollow near Hig Bown Bench, about 2 at (3.2 km) So. of Circle Cliffs Rd.
EC41MB	8,8	-	-			Horse Caryon stream, about 0.9 mi (1.4 km) above Death Hollow.
ECSOMB	6.2	-	-	-		Horse Comyon stream, about 0.2 mt (0.3 km) above Escalante River.
EC544/8	69.	-	-	-	-	niver Coppus street, just above entrance to Marrows.
HC5948	7.3	-	1.00	100	-	Lowey Wash, about 900 ft (30 H) N.W. of Hole-forthe Rock Md.
EC564B	19.	-	-	-	-	Yemile Spring.
E0525/B	5.6	-	-	-	-	Spring, N. side Facalante R., 0.5 mi (0.8 km) W of Otah Highamy
8057WB	24.	-	~	-	+	Seep, So. stde of Long Culch, 0.5 at (0.8 im) E. of Steep Cr.
505/NB	180	-	-	-	-	Seep, So. side of Long Sulch, 2.2 mi (3.6 km) E. Steep Cr.
8059M8	240	-	-	-	-	Seep. So. side of Long Gulch, 2.8 mt (4.5 km) E. of Steep Cr.
EC70M8	65	2 00	-	-	-	Seep. So. side of Long Gulch, 4.4 mi (7 km) E. of Steep Or.
9071MB	430	100	-	-	-	Seep, in Long Gulch, 5.1 mf (8.2 km) E. of Steep Cr.

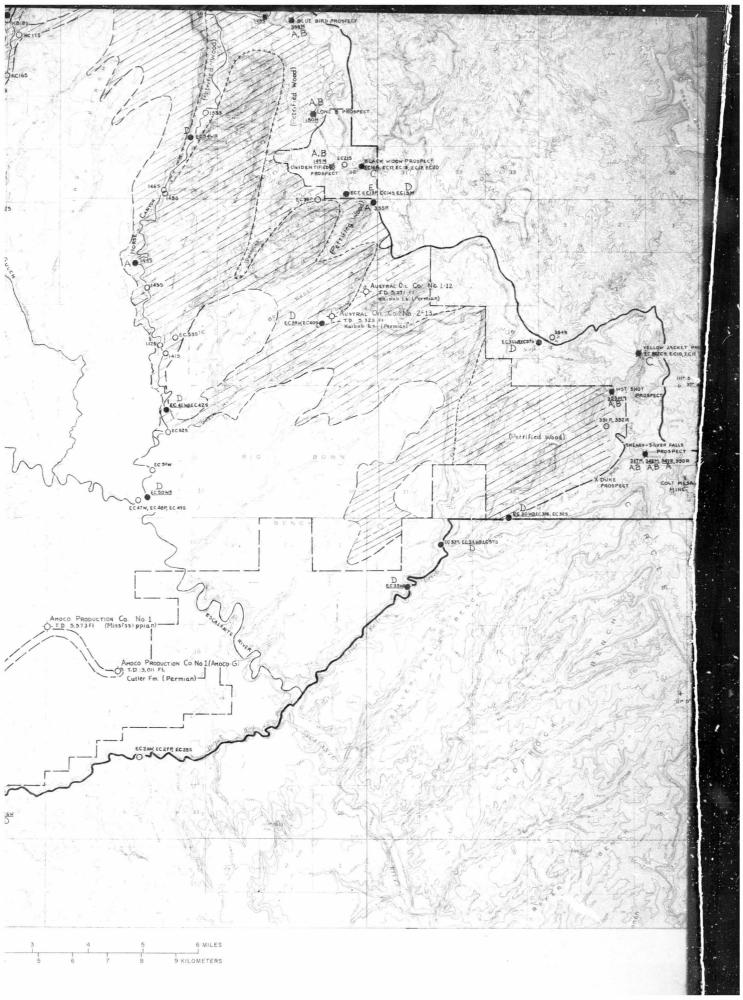
Table E. Ascendors values of gold (bu) shows by destinal analyses of pse concentrates of heavy statemals from stress sediments and actionstanty rocks to sail over the foculation Gerom Instant Study Area, Unda | Samples collected and concentrated by J. G. Katelleric. Supplies analyzed by M. L. Gamphall using assistant-showprifts intentiopses. Values reported to prestry

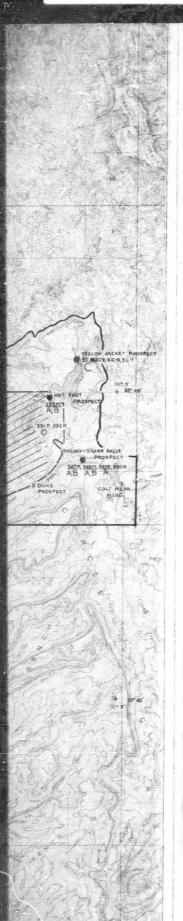
		Pan concentrates of heavy minerals	
Sample No.	Au		Remarks
HISP	.05		Stream mediannt, Harris Wash, south of Red Breeks.
BC12P	.07		Shale, Chinle Pn., near Long Canyon.
8C13P	.04		Streen sediment, unweed dry wash mear Circle Ciffs.
			Rd. between Death Hollow and Molwerine Cr.

Table F. Record of emploratory wills drilled it. ad most the Recolumn Conyon Instant Study Less, Unit. [Balls drilled are or of 1979. All wells on a most Sources of deats Houses and Scottlin (1955), Reylan and others (1965), referring the Processon (1977a), and records of the Generality Brighton of the U. S. Goldgold Marry. [Ball of the Upper Valled (Percents, 1975); Bandling, 1977, as were Listed to an observed leaders

le l'errence	0.5		10160	Total depth	Year	Clifest formitim (or age	The state of the s
letter	Section		Operator		(feet)		of recks) prestrated . De
(fig. 1)	60	100		1	1		
			200	T. 32 S., R. 3 E.			
A	29	Phillips Petroleum Co.	2 Escalante anticline	6,062	1961	Outsy Le. (Devociar-Hissippian)	Yielded nor-inflaments me from Triangle and Fermion moin.
В	32	Phillips Petroleum Co.	1 Escalante anticlin		1961	Kaibab Ls. (Peredan)	
				T. 33 S., R. 2 E.		To Alleria	to Machine
c	12	Skyline Oil Co.	Escalante Federal I	4,168	1969	n.d.	North
				T. 34 S., R. 4 E.			
D	14	Mountain Fuel Supply Co.	1-Collett	3,225	1969		Nose.
						Ortler Pa. (Permiso)	
				T. 34 S., R. 7 E.		The Market	he and the
E	24	Ohio Oil Co.	I Circle Cliffs	3,212	1921	Hermons Pts.	No shows of all or ges.
						(Fermsylvanian)	
F	24	N. B. Hant	1 Circle Cliffs	5,633	1954	(Ombrian)	Oil shows in White Rie Sa
			-				and Goder Hors So. Mirrs. of
97							Catler Fa. (Peradan).
				T. 35 S., T. 3 E.			
G	10	Gulf Ott Corp.	1 (Garfield X)	4,399	1972	lader Hess Ss. Hir. of	Non.
		5 1 k			1	Ortler % (Permiss)	
н	20	Termeco Otl Co.	1 Button	5,483	1963	Occaring Sa. (Perutar)	Oil shows in Kaibab La and
		Interes out ou	1 100.001	2,40	1903	CHOMILIA SAL (PELILLAR)	Torowep Pa.
1	-	Terrasco Off Co.	2 Button	7,223	1963	(Mississippian)	Otl shose in Committee Se.
	29	DESIRECO OLI CON	2 Button	7,223	1903	(Masterippien)	
							and Holan Pa-
				T. 35 S., R. 4 E.	100		
J	13	D. H. Peaker	1-A Gotes	4,303	1956	(Miscinsippinn)	Oil show in Kaibeh La.
							Occurrino Se. zone (Pepulan)
				T. 35 S., R. 5 E.			
K	18	George G. Travis	1	1,950	1966	Kaibeh Lo. (Permian)	Norm.
L	18	George G. Travis	2	4,411	1967	Reducil to.	None.
						(Mississippian)	
				T. 35 S., R. 6 E.			
м	12	Austral Oil Co.	1-12	5,371	1969	Kaibab La. (Permian)	Nore.
N	13	Austral Oil Co.	2-13	5,323	1969	Kedbet Le. (Penelan)	Non.
				T. 36 S., R. 5 E.			
0	17	Galf Oil Corp.	1	3,182	1970	Order Moss St., Mor. of	No.
				D. Line		tler Ma. (Permism).	A STATE OF THE PROPERTY OF THE PARTY OF THE
P	17	Oulf Oil Corp.	18-9	736	1973	News to So. (Triansic(?)	To differ the second second
		can on corp.		/30	19/3	and Jurantic)	** SET 10 10 10 10 10 10 10 10 10 10 10 10 10
		n 15 aut a		-			
Q	17	Gulf Oil Corp	1-A	2,628	1973	Tirpowap Hir. of	
				5.110		Heerkopt Po. (Triane).	THE RESERVE CONTRACTOR
R	20	Gulf Oil Corp.	1	2,434	1973	Kaibab La. (Pensian)	Prog.
				T. 36 S., R. 6 E.			
s	17	Am , Production Co.	1 (Amoco-G)	5,573	1971	(Missfastpplan)	Notes







from the major columnator unitaries of green other two annual state of the columnator units, and fair circumstance-one maples were colored to expect the constitution of the constitution of the constitution of the maples of the constitution of the addition, its varies amples were collected from arrange, springs, and seeps. Seatignathative spectrographic analyzes of the sixt Traction (here than Seating and the color of the color of

## Evaluation of analytical data

The subject of stress software on recise from it and wear the Sacalaste. Caupen lesiant study area of mot engages derivation from atheralized caupen lesiant study area of mot engages derivation from atheralized and shale of Jerzasic and Trisasic, age (Net and Beard, 1781).

A few analytical values mean measures because they are high, relative to the whole sat of analyses. The aboutine stee listed in Irolica 15-5. Most of the study of the state of analyses. The aboutine steel listed in Irolica 15-5. Most of the state of

## HINES AND PROSPECTS

## Mining districts and mineralization

The only siding sactivity in or mear the Reclaims Campon Instant Study Area is in the Cit/De Cliffs area near the east border of the study area (Gavideou, 1997/Sackans and Wyant, 1973). Courtheous records indicate that at least 2,000/claims were located in the Cit/De Cliffs area during the 1950's in the search for urrains. The uraniforous rock is in the beal part of the court of the underlying Newhord Formation. Oxidited copper laterals are sanociated with the uraniforous rock, and at least one deposit was developed primarily for its copper content. The workings of known prospects are small and the unitabilized rock is option, and the winsamilized rock is option, and the winsamilized rock is option, and the unitabilized rock is option, and the unitabilized rock is option, and the court of the court o

## Blue Goose prospect

The Blue Goose prospect is in the unsurveyed SE  $^{1}$ <sub>1</sub> sec. 27, T. 33 S., B. 6 E. As adds, about 65 ft (20 m) long, has been driven along the contact between the Binaruspy sebsor of the China Formation, and the Nocakopi Louise and Control of the Control of t

The Horse Carryon prospect is mear the top of a brite in the 3M  $^{1}_{10}$  sec. ), 7. 34 S., R. 6 E. An adft, about 30 ft. (9 m) long is in a mandatoma constaining carbonaceous trade and 'terbeds of siliations at the base of the Manitor hatte Hember of the Chinie Formation. The sandstone fills a charmed about 300 ft (90 m) wide and 10-15 ft (10-5 m) deep cut fint of the matter about 300 ft (90 m) wide and 10-15 ft (10-5 m) deep cut fint of the matter of the Chinie Formation (Savidson, 1967, p. 78-77). The Weakshyi Formation crops out below the adit and consists of siliations are stated in the adit by the 10-S. Building may near the contact. Of five amplet taken in the adit by the 10-S. Building may near the contact. Of five amplet taken in the adit by the 10-S. Building may near the contact. Of five amplet from mart taken in the adit by the 10-S. Building may near the contact.

## Glen Rae prospect

The Clen Ras prospect is in the unsurveyed NL M<sub>2</sub> sec. 10, T. 34 5., R. 6 E. An addt, about 33 ft (10 m) long, is in crestbeided, medium to course-grained sandstone of the Shnaruny Member of the Chical Street models to so the west Flank of a channel, about 2,000 ft (610 m) wide and 10-40 ft (9-12 m) deep, cut find the mostile-fullstance unit of the Child (Davidson, 1967, p. 78). Five grab samples taken by the U. S. Bureau of M. Clans, 1931) were low to moderate in TU<sub>2</sub>O content. Copper staining was con in the dump material and one sample contained 2.9 percent copper.

The size Mrd prospect is in the unsurveyed  $S^{11}h_{1}^{1}$  sec. 14, T. 34 S., R. 6 2. The workings consist of two addits, 40 ft (12 m) and 46 ft (14 m) long. The sdits are on the east finsh of the same channel as the clien keep consistency of the constraint of

The Long B prespect is in uncurryone MT gesc. 26, T. 34 S. R. 6 E. The workings consist of two affits near the base of the Shinaramy Number in the centure of a Channel that is about 1,400 ft (50 s) wides and less than 20 ft (5 m) deep (Davidson, 1967, p. 78). One addt, eadd by Davidson to be about 100 ft (50 m) long, is now unself to enter. The other adds is 125 ft (58 m) long and has two crosscuts off the wain drift. Baffacettvif is irregular and is highest in ansistone of the Shinaramy containing carbonacous material or the state of the state

## Black Widow prospert

The Black Widow prospect is in the WT \( \)\_2 sec. 35, \( \)\_2 \( \)\_5, \( \)\_4 \( \)\_5, \( \)\_8 \( \) E. The worklings consist of three addits (two of widch are now caved) driven along the contact between the Shinarung simeher of the Chinle Formation and the Newmond Formation in the west side of a broad, shallow channel (Dayddom, 1967, p. 78). The Shinarung is compased of from-realized and spready carbonacous, fine-grained sandatone interhedded with silicatons. Undertween without the simple sandatone interhedded with silicatons. Undertween without the samples of the sample of the silicatons of the

Tallow Jacket prospect
The Yellow Jacket prospect is in a channel filled with Bhimarump exposed
or a cliff in the unsurveyed SE M<sub>2</sub> sec. 14, T. 35 3., R. 7 L., at the head of
or a cliff in the unsurveyed SE M<sub>3</sub> sec. 14, T. 35 3., R. 7 L., at the head of
or C ST sec. 15 sec. 1

ptuny area is now leastum-copper deposits are in Trissate rocks near the seast edge of the area (fig. 2). Note of the deposits are in the basal part the Chile Forsatton and in the upper part of the Neembook Pornation on the diges of channels filled with sandatons of the Shinarump Hember of the segment of the season of the Shinarump Hember of the segment of the season of the Shinarump Hember of the season of the

minoralized rocks may underly much of the area. Home of the depicits lave been extensively since, and probably mose have yielded a significant amount of the sevent probably since and probably mose have yielded a significant amount of the surface of the probable extraction of the surface outcrops agar the facalant Capyan Instant Study Area: (1) a channel cut in the Nonethoy fulled with assistance of the Stantarum, (2) catchanceous marginal in the windstone, (3) inciticals meditone-wich assistance occurrences with the most of the surface of the surface of the surface of the Stantarum, (2) catchanceous marginal in the windstone, (3) inciticals meditone-wich assistance continuous with the most of the surface of the surfa

To can of the region are possible, but nowe here yet been founds.

Organs has been sized for local use from the Carmal Formation near Escalante and Soulder (Destling, 1975, p. 149). It is in wavy layers and pod-like lenses irregularly interattrictical with red model-me and attraces and pod-like lenses irregularly interattrictical with red model-me and attraces and southwestern part of the study area. The gryans has little potential for industrial use because it is southy-clayey and silty, is in generally irregular layers only a few feet thick, and is not reselly accessible.

Gusternery alluvium and pediment deposits, send in Quaternary solian and alluvial deposits, and lineatone in the Carmal Formation. Except for borrow pits in red modetons and siltations of the Carmal Formation and is gravels of pediment deposits, intil of this naturals has been used, because adequate well of the control of the carmal formation and is gravels of pediment deposits, intil of this naturals has been used, because adequate well of the control of the carmal formation. Except for borrow pits in red modetons and siltations of the Carmal Formation send and an analysis of the control of the carmal formation and is gravels of modela-brown to black petrified Soud common in the lower part of the Chinia created with the control of the carmal formation. The calcular control of the carmal formation of the value of collectors as "Poosit balls" or Thomas charmas of these substitutes and the control of these substitutes in the Carmal formation. The value of collectors as "Poosit balls" or Thomas charmas of these substitutes and the carmal formation of the value of collectors as Thought made and the carmal formation of the value of collectors as Thought made and the carmal formation of the value of collectors as Thought made and the carmal formation of the value of collectors as T



Figure 1.--Index showing location of the Escalante Canyon Wilderness Area, Garfield County, Utah

MINERAL RESOURCES OF THE ESCALANTE

MOQI HUT, ANTICLINE

UPPER VALLEY

				1	999	110	20.00		1000	-	1000	910	Similar Pere, Cititle 785;
7h	.5	700		100	10,000		1000	1500	2000	500	100	5000	conglomeratic ss., moderately radioactive; Blue Goose prospe Salasrump Mor., Chinle Pa.; ss.,
													strongly radioactive; Sanaky-S:
M	-	-		100	100	Ŋ,	113						Falls prospect.
M		2000			200				-	-	150	-	Some, but weakly radioactive.
		2000	-	-		7.4	1000	500	1000	500	300	7000	Shinanep Mr., Chinle Ra.;
													congloweratic as., strongly
M													"adioactive; Hot Shot prospect.
	,		-	100	1500	700	-	-	5000	05000	500	-	Shirarump Mor., Chinle Pm.;
													conglomeratic ms., moderately
-													madfanablems Mr. Mr. I

sp Nor., Ontain No.; ss., plandy-diluser prospect.

Semple No. As twenty mellocative, the spirit No. As twenty mellocative, to Nor., Ontain No.;

Mor., Ontain No.;

alone of unentum shown by chemical analyses from effect littled rock for and near the Escalente supon Instant Study Arms, 18th, (Samples collected by G. M. Meirr. Samples scalyand by D. Charley using fluorometric techniques. Values reported in parts per alliion (ppm); unentue!

Sample No.	U	Remarks
1494	5	Morrisopt Ba.; sh., weakly radioscrive; unidentified prospect
150M	370	Offine Ba.; se., moderately radioactive; Lone & prospect.
15IM	190	Chinle Po.; se., moderately radioactive; Glen Rue prospect.
1524	12	Chinle Pa.; sh., weskly radioactive; Horse Canyon prospect.
1534	160	Shinarump Mbr., Chinle Ma.; congloweratic as., moderately
		radioactive; Blue Goose prospect.
347H	380	Shinarump Mr., Chinle Mr.; ss., strongly radioactive;
		Somely-Silver Falls prospect.
Wat.	8	Shinarump Mrr., Chinle Ra.; as., weakly radioactive;
		Someky-Silver Falls prospect.
35311	380	Shinarump Mer., Chinle Pa.; congloweratic ss., strongly
		strongly radioactive; Hot Shot prospect.
358M	120	Shirarump Mor., Chinle Pa.; congloweratic cs., moderately
		radioactive; Blue Bird prospect.

Table C. Anomalous values shown by chemical analyses of mineralized rock from in and near the Escalante Canyon Instant Study Area, Utah. [Samples collected by J. C. Antweller. Samples analyzed by M. L. Campbell using atomic absorption techniques. Values \_ reported in parts per million (ppm); (-) no data found, ]

Sample No.			Hiner			
	1	1	:Ilement			Remarks
	Call	Q <sub>2</sub>	Pb	Sb	Zn	THE REAL PROPERTY.
ECSRS	8.1	11,300	570	10	1600	Shinarusp Mbr., Chinle Pm.; ss, moderately
BC16R	24	12,000	3	-	3700	radiosctive; Yellow Jacket prospect. Shinarump Hor., Chinle Ph.; es., moderatel
			2			radioactive; Black Widow prospect.

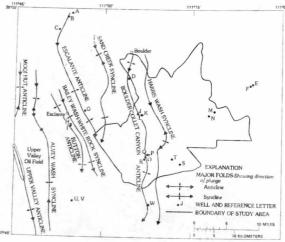


Figure 2. -- Index showing the location of exploratory wells drilled for oil and gas is the Escalante Canyon Instant Study Area and the Upper Valley oil field.

L Accordance subsens of soid (for) stream by cleanting analysis of pain economization of Noory interests from stream entitientary robes to and rose the incord entry Carpon Louison Study Arms, Units—Simples collected and economizated by Jr. C. Antonillor, Sanother analyses by Mr. C. Oppelle Linding control whompatto interludence. Values conversed to prove stilling controllers, and the conversed to prove at Ulino (controllers). To those conversed to prove

		Pan concentrates of	heavy efnerals	Mary Section Control of the Section of		
Sample No.	Au			Nomitio .		
HCSP	-05	- W. 1754	Street and			
BC12P	.07		Shale Outs	inent, Harris shot, south of a	ind Resido	
BCI3P	.04	<b>新工事员</b> 1000		Shale, Chirale Pa., near Long Caspon.		
			Strom sed	most, unwand dry uses mer o	inche Ci	

eference	Gr.	Age of the second of the secon			1000	100 Television		
letter		etion	Operato	oc	Total depth	Year 11 (feet		of moto) practical
(fig. 1)	gelte i	Control of the		8		0	2 - 2 - 2 - 2 - 6	
A		29 Phillips Petroleum Co.	0111		32 S., R. 3 1			
		riactipe recrotem to.	2 Escalante anti	cline	6,062	1961	Denny La.	Yielded nor-inflamable gur
В	- 35	Phillips Petroleum Co.	I Escalente anti	cline	3,384	1961	(Devenian Hisosippi, katheb La. (Permian)	on) Trismic and Product motor
		Te Thereses		T.	B 3. R 2 E	4		
С		2 Skyline Oil Co.	Recalante Federa	11	4,168	1969	n.d.	Rese.
1			Carlotte	<u>T.</u>	34 S., R. 4 E			
D	1	4 Mountain Ruel Supply Co.	1-Collett		3,225	1969	White Rim So. His: of	Nove.
			CONTRACTOR A				Orler Et. (Perster	0
				T.	34 S., R. / E.			
E	3	6 Ohio Oil Co.	1 Circle Cliffs		3,212	1921	Bernona Pas	No shows of oil or gan.
	- 3						(Perceylvenian)	Take July
	3	N. B. Hunt	1 Circle Cliffs		5,633	1954	(Cambrien)	Oil shows in White Rim Se.
1								and Gedar Hote 29. Here. of
								Oxtler Re. (Permiso).
				T. 3	5 S., R. 3 E.			
G	10	Golf Oil Corp.	1 (Garfield X)		4,399	1972	Cedar Hess Se. Mbr. of	None.
							Outler Ha. (Passies)	0.5
H	29	Texaseco Oil Co.	1 Button		5,483	1963	Occordine Se. (Permiss)	Oil shows in Kaitab Le and
								Toroseup H
1	29	Temmeco Oil Co.	2 Button		7,223	1963	(Mississippian)	Oil shows in Commung Se.
								and Holos Pt.
				7. 3	S., R. 4 E.	7		
J	13	D. H. Penker	I-A Gates		4,303	1956	(Mindissippies)	Oil shows in Kaibab La
							B. S. C.	Coconino Se. zone (Permiso)
				7. 35	S., R. 5 E.			
K		George G. Travis	1	14	1,950	1966	Knibab La. (Permian)	A 37 11 10 30
L	18	George G. Travis	2		4,411	1967	Redauli Le.	A-274
							(Missirefppfan)	
				T. 35	S., R. 6 E.			
4	12	Austral Oil Co.	1-12		5,371	1969	Zaibab La. (Permisa)	None.
4	13	Austral Oil Co.	2-13		5,323	1969	Kathab La. (Perutan)	None
				7. 36	S., R. 5 E.			
0	17	Oulf Oil Corp.	1		3,182	1970	Order Mess So. Mor. of	None.
							Outler Rs. (Permian).	
•	17	Galf Oil Corp.	1 R-F		736	1973	Navajo Sa. (Triassic(?)	23-276
							and Jurasarie)	
2	17	Oulf Oil Corp	1-4		2,628	1973	Timpowerp Mur. of	None.
							Hoenkopi Pr. (Trinscho	
1	20	Gulf Oil Corp.	1		2,434	1973	Kaihab La. (Permitan)	None.
					S., R. 6 E.		and the (retifial)	Me - 1 - 1 - 1 - 1 - 1
	17	Asses Production Co.	1 (Amoco-C)		700	1971	(Mississippian)	
No.	18	Amoco Production Co.	1			1972	Order Heen So. Mar. of	
					100	100		The same
				T. 37 :	., R. 3 E.	315	Outler Pa. (Permian)	- 10 P
7 6	30	Houston Oil & Minerals Corp	Skyline A-1		March 19	1977		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -
10		30 2006	Market Comment				Codar Mess Se. Mor. of	Re-opened well V.
	30	Americado Heas Gerp.	l Federal Skyline A		,450	1974	Ostler Pn. (Perulan)	TAN A SHOT
1			A A			19/4	The state of the s	lione,
						40	Ostler Pa. (Perstan)	The state of
	17	Webb Resources, Inc.	17-16		., R. 5 E.		No dian	A CONTRACTOR OF THE PARTY OF TH
		THE RESERVE OF THE PARTY OF THE	THE RESERVE AND ADDRESS OF THE PARTY OF THE	4	.097 1	971	Order Hone Se. Mir. of	Many To.

## Mineral Survey

## Wilderness Studies Related to Bureau of Land Managemen

The Federal Land Folicy and Management Act (Public Law 94-579, October 21, 1974), requires the U. S. Geological Burry and the U. S. Bureau of Minas to conduct mineral surveys on certain areas and the U. S. Bureau interact resource potential. Results was the ande switchale surveys on the surveys of the surveys of the report purchase of the surveys of the Enclaimed compose finance Study Area. Trans-

ESCALANTE CANYON INSTANT STUDY AREA, GARFIELD COUNTY, UTAH

U.S. Geological Survey
OPEN FILE REPORT
This map is preliminary and has not
been edited or reviewed for conformity
with Geological Survey standards.