The geology of, and known mineral occurrences within, Wilderness Study Area 4-48 Whitlock Mountains

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contents:

Brief summary of geological features and known mineral occurrences

Wilderness Study Area 4-48
Whitlock Mountains

1) The entire WSA is underlain by either middle Tertiary volcanics or late Tertiary-Quaternary basin-fill (sand , gravels, etc.);

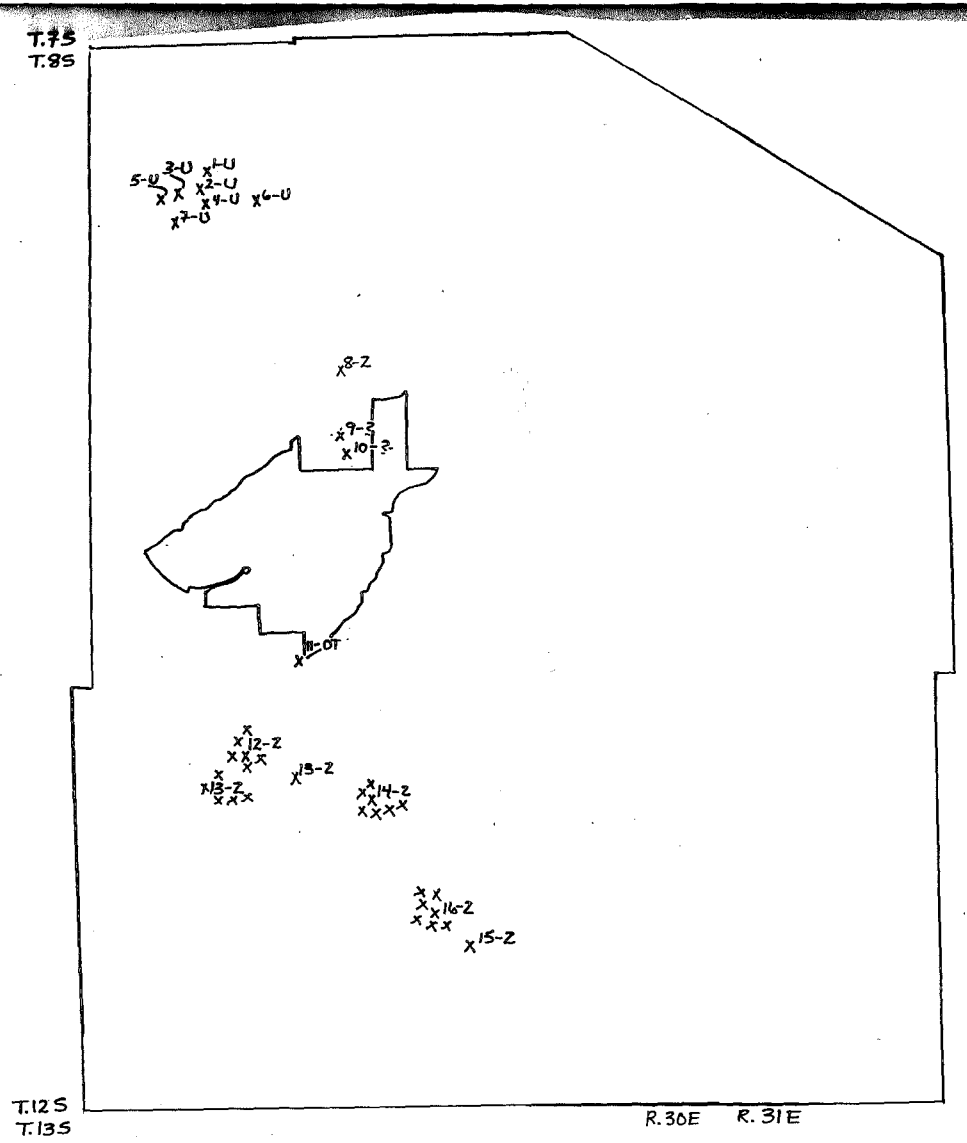
2) The WSA does not contain any known base or precious metal occurrences. Middle Tertiary volcanic rocks around the WSA do not contain any known base and precious metal mineralization;

3) There are several zeolite occurrences in volcanic rocks near the northern boundary of the WSA. The significance of these is unknown;

4) There are zeolite and uranium occurrences in basin-fill deposits of the San Simon Valley outside of the WSA. Basin-fill underlies the western part of the WSA, but no zeolite or uranium occurrences have been reported; and

5) Newspaper articles of 1927 report that oil was encountered in a water well south of the WSA. These reports have not been confirmed.

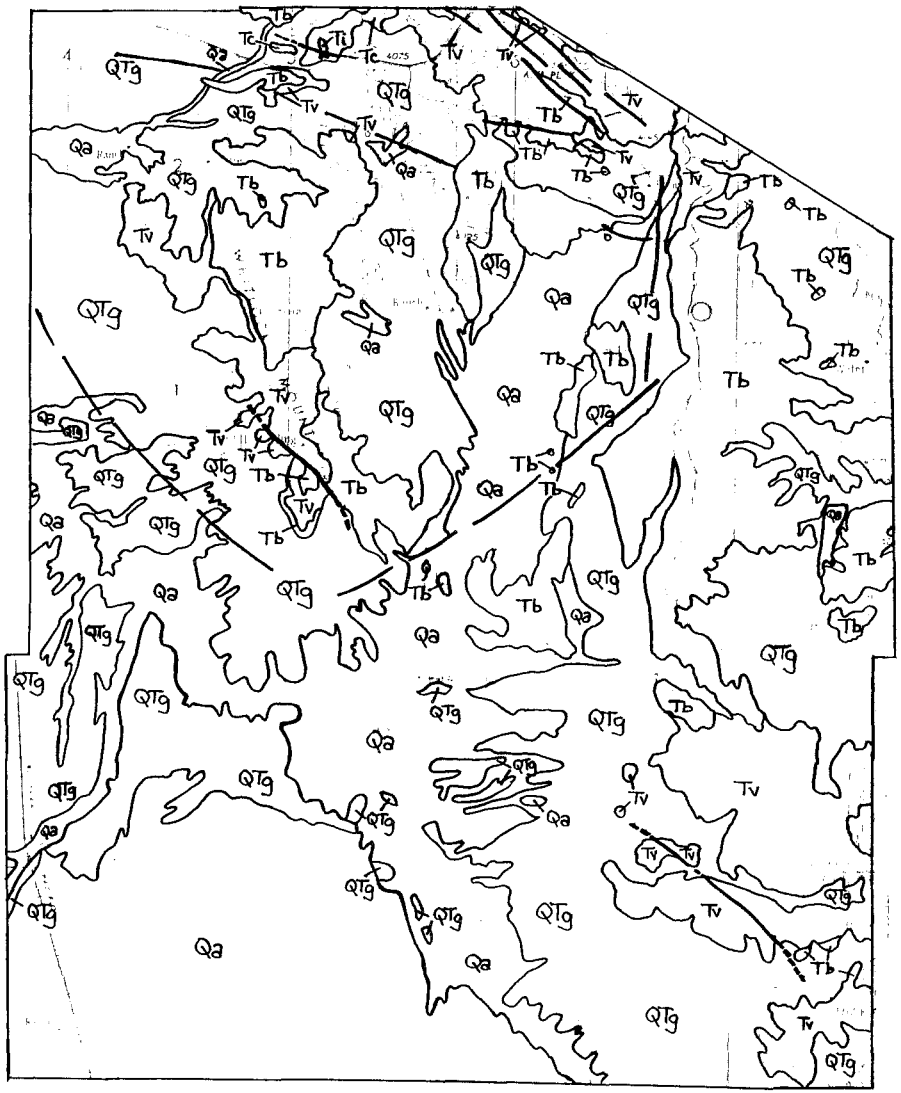
For additional discussions of the mineral potential of the WSA see Richter and others (1981).



EXPLANATION

Known mineral occurrences are located by map number, followed by type of mineral deposit. See accompanying table of mineral occurrences.

- x^{U} uranium, chiefly uranophane and carnotite-type deposits
- x^{Z} zeolites, chiefly clinoptilolite
- x^{OT} oil test
- $x^{?}$ unknown; clinoptilolite occurs in vicinity



EXPLANATION

QUATERNARY-LATE TERTIARY

- Qa — Younger alluvium; unconsolidated silt, sand, and gravel.
- QTg — Sedimentary deposits; mostly alluvium on stream terraces, fan aprons, and pediments; colluvium on hill slopes; and eolian and lacustrine deposits in intermontane regions. Includes Gila Conglomerate, local clay, gypsum, marl, limestone, diatomite, and some intercalated basalt flows and felsic tuff beds.

MIDDLE TERTIARY

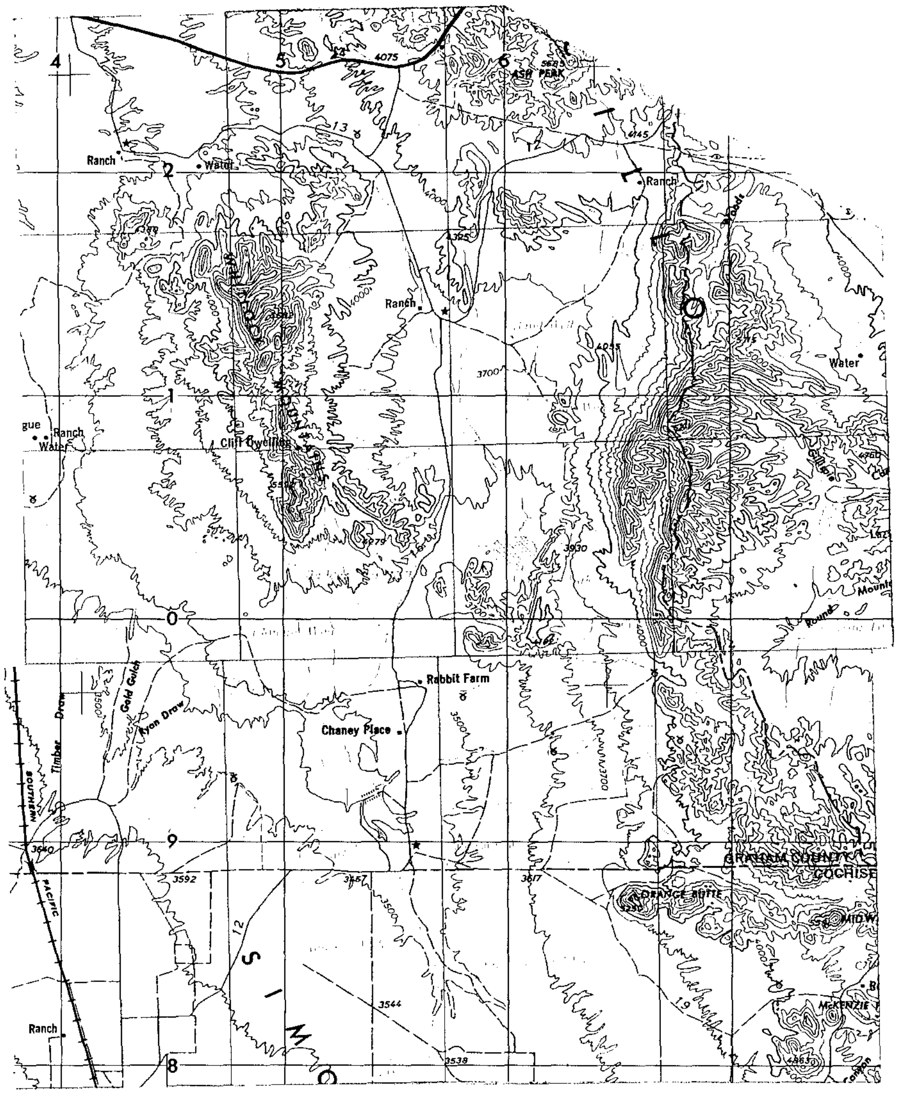
- Tc — Conglomerates, with intercalated mafic to intermediate flows and felsic tuffs.
- Tb — Basalt and basaltic andesite flows and pyroclastic deposits; locally includes felsic volcanic rocks and volcaniclastic rocks.
- Tv — Rhyolite and dacite flows, domes and pyroclastic deposits; locally includes sedimentary rocks and mafic volcanic rocks.
- Ti — Intrusive rocks, including granitic plutons and aphanitic to porphyritic plugs and dikes.

——— Contact

——— -- Fault dashed where inferred or covered.

Sources of information include:
Wynn, J.C., 1981
Wilson et al., 1969
Richter et al., 1981

GEOLOGY OF THE WHITLOCK MOUNTAINS (4-48)



Scale 1:250,000

5 0 5 10 15 20 Statute Miles

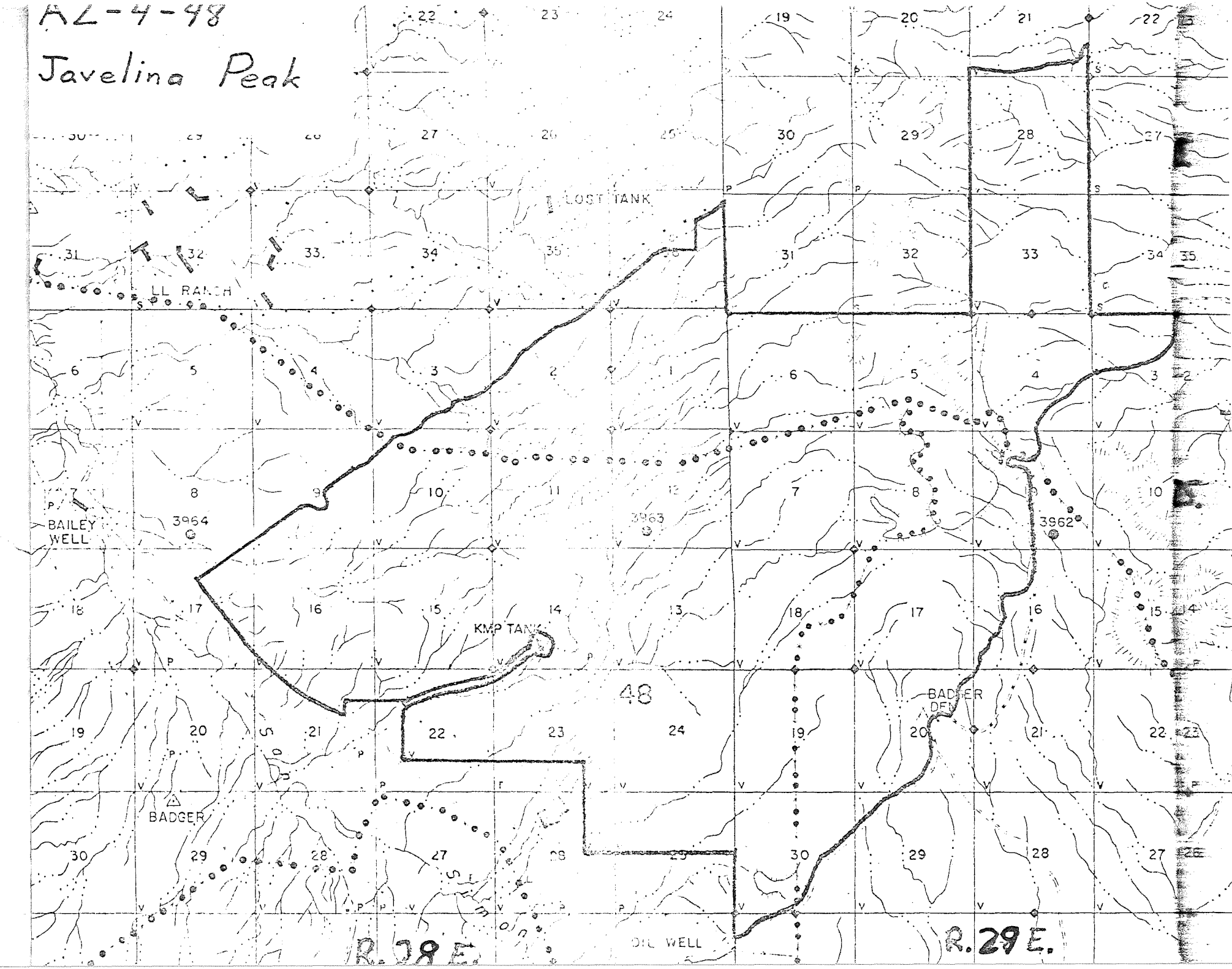
5 0 5 10 15 20 25 30 Kilometers

5 0 5 10 Nautical Miles

CONTOUR INTERVAL 200 FEET

AZ-4-48

Javelina Peak



KNOWN MINERAL OCCURRENCES

WHITLOCK MOUNTAINS AREA (4-48)

Zeolite and Uranium Deposits

The Whitlock Mountains are primarily composed of basaltic to rhyolitic volcanic rocks of Cenozoic age (16 to 30 million years). Two dome flow complexes, with eruptive centers at Powerline Pass and Dry Mountain, probably formed around 22 to 26 million years ago.

Map numbers 8-10 to 12-16 represent zeolite deposits. Zeolite minerals, principally clinoptilolite, are common secondary minerals in many of the pyroclastic flow and air-fall breccias throughout the region. Map numbers 8-10 are contained in a pyroclastic breccia zone resulting from voluminous explosive activity associated with the eruptive center at Powerline Pass; formation of breccia zones in the area followed the main period of dome-flow emplacement and was contemporaneous with the beginning of basaltic andesite volcanism. Map numbers 12-16 comprise water-laid deposits of vitric tuff that have been altered to zeolite minerals; sedimentary beds containing zeolites are intercalated with Pliocene-Pleistocene age San Simon basin-fill and lacustrine strata.

Map numbers 1-7 contain secondary uranium minerals, primarily uranophane and carnotite-type deposits. Uranium minerals coat fracture and bedding planes in late Pliocene-early Pleistocene lacustrine strata on the north flank of Dry Mountain.

An oil sand deposit (map number 11), associated with a large artesian well in lacustrine sediments south of the Whitlock Mountains, was reported in 1927. No records of further development are available.

MAP NO. 4-48-1

Mine: Royal John Group

Location: T.8S R.28E Sec. 22 Cen., S½ Lat. 32-42-04N Long. 109-28-03W Elev. 3400 ft.

Geology: Carnotite-type mineralization in interbedded clays and tuffs in lake bed sediments of late Pliocene-early Pleistocene age.

Mineral Products: Uranium (U_3O_8): carnotite

Development and Production: Prospect pit and bulldozer cuts. Claims located by George and John Lee (Gila, New Mexico).

References

USGS Dry Mountain Quad (1:24000)
USBM Files, Royal John Group
Scarborough, Robert B., 1981
USAEC, 1954, A-P-376
Richter, et al., 1981

MAP NO. 4-48-2

Mine Pluto Group

Location T.8S Sec. 21
R.28E SW¼

Geology Uranium minerals in late Pliocene-Early Pleistocene lacustrine bedded clay and tuffs.

Mineral Products Uranium (U_3O_8)

Development and Production One bulldozer cut 3 ft deep. Claims located by Alf Claridge.

References

Scarborough, Robert B., 1981, p 193
USAEC, 1954, A-P-378
USGS Dry Mountain Quad (1:24000)
Richter, et al., 1981

MAP NO. 4-48-3

Mine Last Chance Group

Locaation T.8S Sec. 21 Lat. 32-42-59N Elev. 3340 Ft.
Long. 109-27-45W

Geology Thin coating of carnotite on fractures in a thin opalized bed within bedded clays and tuffs in late Pliocene to early Pleistocene lacustrine strata. Sedimentary beds are capped by rhyolite flow.

Mineral Products Uranium (U_3O_8): carnotite

Development and Production One location pit; 43 claims owned and located by Lewis Olson, Sam Jensen and Assoc. (1955). Operated by U.S. Lime and Mining Corp.

References

Scarborough, Robert B., 1981, p. 192
USAEC, 1954, A-P-376
Richter et al., 1981
USBM Files, Last Chance Group
USGS Dry Mountain Quad (1:24000)

MAP NO. 4-48-4

Mine Flat Tire Group
(A.H. Haralson Property)

Location T.8S Sec. 27 Lat. 32-42-38N
R.28E SW¼ NW¼ Long. 109-28-30W
On old 111 ranch

Geology Carnotite coating fractures and disseminated in a 12-15 ft. bed of hard greenish-brown clay of Pliocene lacustrine and paludal sedimentary sequence. Strata near the claims are anomalous over a considerable area. Uranium minerals occur in small and scattered masses within 3 separate layers (each 12-18 inches thick) in the clay. Ore body dimensions: 40 ft. wide, 400 ft. long, 4 ft. deep.

Mineral Products Uranium (U_3O_8): uranophane; diatomite; zeolites: chabazite

Development and Production Developed by a 30 ft shaft and 3 trenches; produced 4 tons of 0.02% U_3O_8 in 1955 and 9 tons of 0.11% U_3O_8 in 1958. Flat Tire Shaft shows no uranium deposits below a depth of 15 ft. 52 unpatented claims located by A. H. Haralson and Sons (1955). Operated by U.S. Lime And Mining Corp., Yates Petroleum Co. of Artesia, Metals Corp. of America. Claims total 2540 acres.

References

Scarborough, Robert B. 1981, p. 192
USGS Dry Mountain Quad (1:24000)
Richiter et.al., 1981
USBM Files, Flat Tire Mine
ADMR Flat Tire Mine File
ADMR U.S. Lime and Mining Corp. File
USAEC, 1954, A-P-378

MAP NO. 4-48-5

Mine Mermaid Mining Co. Property
unpatented claims (moon mist, saturn, moon beam)

Location T8S Sec. 28 Lat. 32-42-30N Elev. 3290 Ft.
R.28E W½ Long. 109-29-37W

Geology Secondary uranium minerals coating fractures and bedding planes in Pliocene lake beds of the nw flank of Dry Mountain.

Mineral Products Clay, diatomite; uranium (U_3O_8)

Development and Production Unknown; unpatented claims extend into sections 26, 27, 33, 34, and 35 (T.8S, R.28E). Owned by U.S. Lime and Mining Corp. as of 1965.

References

ADMR card file-Mermaid Mining Co File
BLM Mining Claims - Lead File, July 1980
USBM Files, Mermaid Mining Co Property
USGS Dry Mountain Quad (1:24000)
Richter, et a., 1981

MAP NO. 4-48-6

Mine Canuk Group

Location T.8S Sec. 26; 35 Lat. 32-42-08N Elev. 3500 Ft.
R.28E SW¼, NW¼ Long. 109-27-39W

Geology Carnotite-type mineral coatings on fractures in opalized beds in lake sediments, tuffs and gravels of Pliocene age. Secondary uranium minerals locally occur coating bedding planes and fractures in Pliocene lacustrine strata on the north flank of Dry Mountain.

Mineral Products Uranium (U_3O_8)

Development and Production Prospect pits.

References

Scarborough, Robert B, 1981, p. 191
Richter et al., 1981
USGS Dry Mountain Quad (1:24000)
USAEC, 1954, A-P-375
USBM Files, Prospect

MAP NO. 7

Mine White Bluffs Uranium Area
(Crunk Group;Whitlock Mines, Inc.)

Location T.8S Sec. 33 Lat. 32-41-54N
R.28E NW¼, NE¼, NE¼ Long. 109-28-49W

Geology Uranophane coatings along bedding planes and on fractures in siliceous lake beds interbedded with diatomaceous earth, bentonitic clay mudstones, and thin vitric ash-fall tuffs of Pliocene paludal sediments. Yellow stained opal lenses in diatomite and disseminated radioactivity in light-colored calcic paludal beds. Located on or near contact between lacustrine strata, and high-silica rhyolite dome-flow comples or Dry Mountain (Oligocene).

Mineral Products Uranium (U_3O_8); diatomite;clay; bentonite

Development and Production Surface prospects, bulldozer cuts. Whitlock Mines Inc. prospected for diatomite, and leased claims in section 28, 26, 33, 34, and 35 (T.8S, R. 28E) from L. Grogg (owner) in 1976, Whitlock Mines Inc. subleased uranium deposits to Anaconda Corp.

References

Scarborough, Robert B, 1981, p. 194
USAEC, 1954, A-P-330
USBM Files, White Bluff Uranium
USBM Files, Crunk Group
ADMR Whittlock Mines, Inc. File
USGS Dry Mountain Quad (1:24000)

MAP NO. 4-48-8

Mine Highline claims

Location T.9S Sec. 20 Lat: 32-37-55N Elev. 4680 ft.
R.29E 5½ Long: 109-23-55W

Geology Claims located within rhyodacite, dacite, andesite dome-flow-cone complex of powerline pass (late Oligocene). Fibrous zeolite minerals locally fill interclast cavities and vesicles within silicic clasts near the outer edges of a remnant of structureless pyroclastic

Geology (continuned)

breccia cone. Breccia cone is overlain by thin (less than 5 m.) glassy flows, flow breccias and agglutinates, probably of rhyodacite composition.

Mineral Products Clinoptilolite occurrence

Development and Production Prospect; extent of development is unknown.

References

BLM Mining Claims - lead file 22949 July 1980
USBM Files, Highline Claims
Richter, et.al, 1981

MAP NO. 4-48-9

Mine Cave

Location				
T9S	sec. 32	Lat. 32-36-32N	Elev. 4620 ft.	
R29E	NW¼	Long. 109-24-14W		

Geology Cave is located in massive nonbedded vent breccia, between a contact zone to the west of vent breccia and massive hornblende-biotite rhyodacite dome, and a contact zone to the east of vent breccia and massive pyroclastic breccia (Oligocene) composed almost entirely of secondary zeolite minerals. Pyroclastic (rhyolitic to rhyodacitic) breccia zone to the east contains occasional blocks almost wholly replaced by clinoptilolite (secondary zeolite mineral)

Mineral Products Unknown; clinoptilolite occurs in vicinity.

Development and Production Exploration prospect, underground. Extent of development ins unknown.

References

USBM Files, Cave
Richter, et al, 1981
USGS Javeline Peak Quad (1:24,000)

MAP NO.4-48-10

Mine Cave

Location				
T95	Sec. 32	Lat. 32-36-08N	Elev. 4730 ft.	
R.29E	SW¼	Long. 109-24-07W		

Geology Cave located on contact zone between massive rhyolite flow associated with Javelina Peak (Oligocene) and porphyritic quartz latite flow of the Whitlock Mountain Range (Oligocene). Situated on or near NW-SE trending basaltic andesite dike (Miocene - Oligocene (20-30 my); Richter, et al, 1981). Maximum flow thickness about 210 m. with 0-60m basal vitrophyre and flow breccias; source unknown. Rare inclusions of fluorite (less than 2%) in quartz flow groundmass, ore minerals unknown.

Mineral Products Unknown; clinoptilolite occurs in vicinity.

Development and Production Exploration prospect, underground. Extent of development is unknown.

References

USBM Files, Cave
Richter, et. al, 1981
USGS Javelina Pead Quad (1:24000)

MAP NO. 4-48-11

Mine Whitlock Oil Company Drillings

Location T. 10S Sec. 36 Lat. 32-31-26N Elev. 3440 ft.
R. 28E SE¼NE¼ Long. 109-25-20W

Geology Newspaper articles of 1927 report the following information: 22.5 ft. thick oil sand deposit below 1400 vertical ft. of alternating layers of sand, shales, and clays (Pliocene-Pleistocene). Sands containing oil capped by a conglomerate consisting of gravel cemented by lime. Oil drilling at the 1200 ft. level encountered a large artesian well which brought a heavy proportion of oil to the surface.

Mineral Products crude oil potential

Development and Production Oil drilling conducted by Pinal Oil Co., under lease from Whitlock Oil Co., in 1927. Oil encountered in main drill hole at a depth of about 1427 ft. No records of production or continuation of operations after initial drilling. Whitlock Oil Co. claimed 70,000 acres of land 15 - 17 miles north of Bowie.

References

ABGMT Clippings, Whitlock Oil Company
USGS Javelina Peak Quad (1:24000)

MAP NO. 4-48-12

Mine San Simon Zeolite Deposits - Union Carbide Non-metallic Exploration Corp. (EZ Claims, Cab Claims, Bowie Chabazite Deposit)

Location T. 11S, R. 28E, Sec. 01,12,13,18,20,28,30,33 (EZ Claims)
T. 11S, R. 29E, Sec. 13,17,18,19,20,28,29,33
T. 12S, R. 29E, Sec. 01,02,03,04,10,11,12
Ore Body: Lat. 32-26-49N, Long. 109-21-04W Elev. 3420 ft.

Geology Zeolites, consisting primarily of the minerals chabazite, erionite, and clinoptilolite, occur in bedded alterred silicic tuff deposits (Miocene) in an unnamed Tertiary lacustrine formation. Extensive and highly pure (more than 90% zeolite) beds form thin flat layers 0-15 inches thick; beds are underlain by a thick deposit of conglomerates, quartz-feldspar silt, and fine-grained plastic clay material containing some montmorillonite and bentonite, and overlain by 3-4 ft. of partially alterred volcanic ash. Some bed layers are nearly monomineralic. Minor amounts of halite, thenardite, and iron oxides associated with sodic-rich zeolites.

Mineral Products Zeolites: chabazite, erionite, clinoptilolite, analcime, hershelite, gmelinite

Development and Production Union Carbide Corp. property consists of over 200 claims totalling about 4000 acres; Claims are single placer claims of 20 acres (660 ft by 1320 ft.). Development included exploration rotary drilling on each claim to depths of 70 feet open cuts to expose zeolotized volcanic ash bed (maximum of 60 feet overburden), strip mining of flat zeolotized layers. Area has been commercially exploited since 1968. Individual placer claims were located in 1961.

References

ADMR EZ Mine File
ADMR Union Carbide Non-Metallic Exploration File
ADMR (Eyde), 1978
USBM Files, Cab Claims
USBM Files, EZ Mine Claims
USBM Files, Bowie Chabazite Deposit
Regis and Sand, 1967
Sand and Regis, 1966
BLM Mining Claims Lead File 39883, July 1980
Sheppard, Ricard A., 1969
USGS Bowie Quad (1:62500)
USGS Javelina Peak Quad (1:24000)

MAP NO. 4-48-13

Mine San Simon Zeolite Deposits - BMS Associates Property
(Genie Claims, Courthouse Claims, Norton Abrasives Property)

Location				Ore Body:
	T.11S	R.29E	Sec. 21 (center), 28	Lat. 32-27-51N
	T.11S	R 28E	Sec. 13, 14, 18	Long. 109-23-20W

Geology See San Simon Zeolite Deposits - Union Carbide Non-Metallic Exploration Corp. and NRB Mining Co. Inc. claims for regional geological description.

Mineral Products Zeolites

Development and Production Prospect; extent of development unknown. Anaconda Corp. owns a portion of the Genie Claims in section 28 (T.11S, R.29E). Property overlaps with Union Carbide Corp. claims.

References

USBM Files, Genie Claims
ADMR Card File - BMS Associates Card
BLM Mining Claims Lead File 56580, July 1980
ADMR Ez Mine File (map)
USGS Bowie Quad (1:62500)

MAP NO. 4-48-14

Mine San Simon Zeolite Deposits - NRG Mining Co., Inc. Claims (Cholla Unpatented Claims, Ruth unpatented Claims)

Location T.11S R.29E Sec. 27,24, 35 Ore Body: Lat 32-2600N Elevation 3460 Long. 109-22-20W

Geology See: San Simon Zeolite Deposits - Union Carbide Non-Metallic Exploration Corp.
Herschelite occurs as thin layers interbedded with layers of other secondary zeolite minerals.
Center of San Simon Basin contains richest deposits; beds of chabazite, analcime, and bentonite pinch out to the north and are nearly absent in the NW part of the basin. Tertiary andesites and Quaternary basalt rim the basin.

Mineral Products Zeolites: Chabazite, erionite, clinoptilolite, herschelite

Development and Production Property consists of 54 claims; claims are single placer claims of 20 acres (660 ft by 1320 ft). Development similar to that on Union Carbide Corp. property. NRG Mining Co. was incorporated in 1973 (formerly Systems Capital Corp.)

References

ADMR NRG Inc. File
BLM Mining Claims Lead File, July 1980
USBM Files, NRG Mining Co Claims
ADMR (EYDE),1978
Regis and Sand, 1967
Sand and Regis, 1966
USGS Bowie Quad (1:62500)

MAP NO. 4-48-15

Mine Tuffa-Tex Group (Clark Claims)

Location T.11S R.29E Sec. 34 Lat. (estimated) 32-26-00N Elev. 3470 ft. Long. (estimated) 109-22-22W

Geology See: San Simon Zeilite Deposits for regional geological description.
6 inch bed of zeolitized volcanic ash in alterred silicic tuff deposits underlain by an unknown depth of plastic clay and quartz-feldspar silt. Deposits are Miocene-Pliocene in age.

Mineral Products Zeolites; "Tuffa-Tex" (zeolotized volcanic ash)

Development and Production Prospecting on 2 unpatented claims. Property owned by Frank W. Clark, Bowie. Small tonnage amounts of "Tuffa-Tex" have been quarried for use in interior decorating. Claims located in 1958-1959. Property leased in 1961 for oil drilling exploration.

References

USBM Files, Tuffa Tex 1-2-3-4
ADMR Tuffa-Tex Group File
ADMR Ez Mine File
ADMR (Eyde), 1978
USGS Bowie Quad (1:62500)

MAP. NO. 4-48-16

Mine W.R. Grace Co. Claims

Location T.12S Sec. 0Z Lat. 32-25-12N Elev. 3440 ft.
R. 29E Long. 109-21-25W

Geology See: San Simon Zeolite Deposits for regional geological description.
Zeolotized beds in alterred silicic tuff deposits (Miocene).

Mineral Products Zeolites

Development and Production Unknown.

References

ADMR E Mine File
USBM Files, Grace 1-4
USGS Bowie Quad (1:62500)
ADMR (Eyde), 1978

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