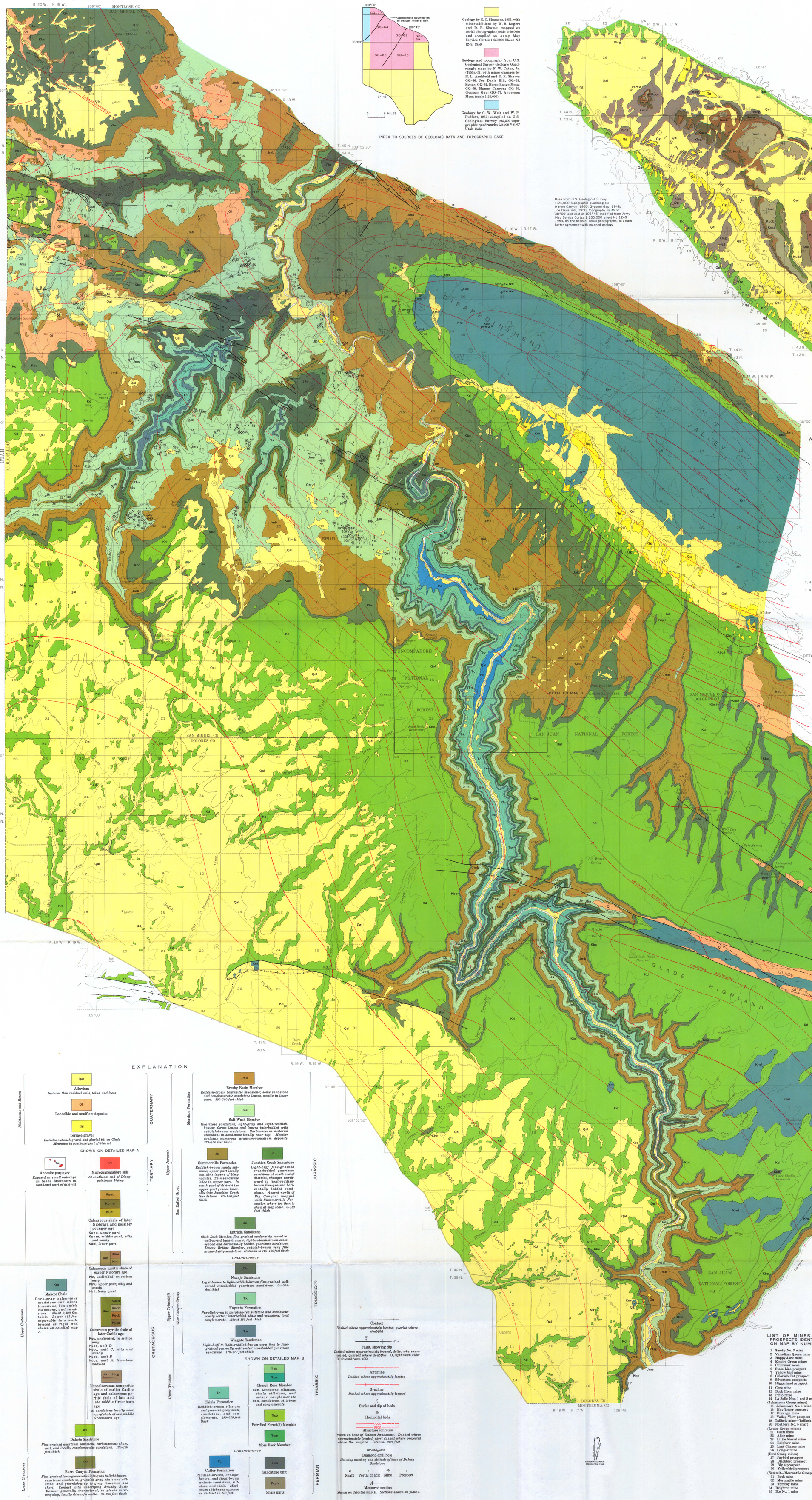
PREPARED ON BEHALF OF THE
U.S. ATOMIC ENERGY COMMISSION



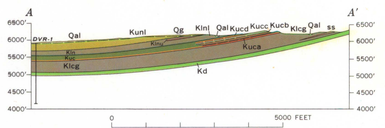
Geology by G. C. Simmons, 1956, with minor additions by W. B. Rogers and D. R. Shawe; mapped on aerial photographs (scale 1:60,000) and compiled on Army Map Service Cortez 1:250,000 Sheet NJ 12-9, 1959

Geology and topography from U.S. Geological Survey Geologic Quadrangle maps by F. W. Cater, Jr. (1955a–f), with minor changes by N. L. Archbold and D. R. Shawe: GQ-66, Joe Davis Hill; GQ-68, Egnar; GQ-64, Horse Range Mesa; GQ-69, Hamm Canyon; GQ-59, Gypsum Gap; GQ-77, Anderson Mesa (scale 1:24,000)

Geology by G. W. Weir and W. P. Puffett, 1959; compiled on U.S. Geological Survey 1:62,500 topographic quadrangle: Lisbon Valley Utah-Colo

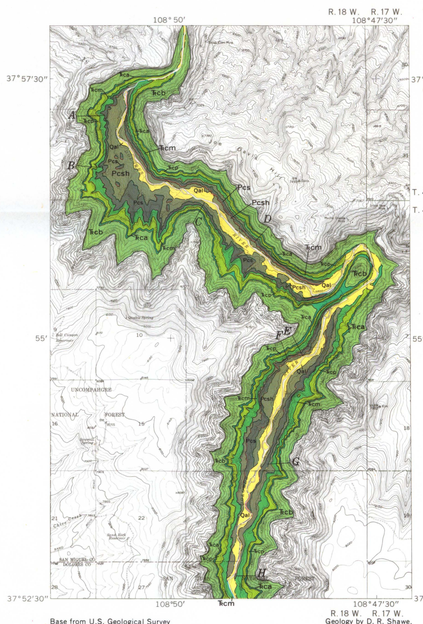
INDEX TO SOURCES OF GEOLOGIC DATA AND TOPOGRAPHIC BASE

Base from U.S. Geological Survey 1:24,000 topographic quadrangles: Hamm Canyon, 1950; Gypsum Gap, 1948; Joe Davis Hill, 1950; topography south of 38°00′ and east of 108°45′ modified from Army Map Service Cortez 1:250,000 sheet NJ 12-9 1959, on the basis of aerial photographs, to attain better agreement with mapped geology



A. DETAILED MAP OF THE MANCOS SHALE IN DISAPPOINTMENT VALLEY

Photogeology by D. R. Shawe, October 1961. Identification of some units in southeast half of map guided by field mapping of G. C. Simmons and J. D. Vogel, and measured sections by O. T. Marsh, and in northwest half by U.S. Geological Survey Geologic Quadrangle maps by F. W. Cater, Jr. (1955a, 1955c, 1955e)



Base from U.S. Geological Survey 1:24,000 topographic quadrangle: Joe Davis Hill, 1950

Geology by D. R. Shawe, photogeologic methods, 1960

B. DETAILED MAP OF THE CHINLE FORMATION AND PART OF THE CUTLER FORMATION DOLORES RIVER CANYON

EXPLANATION

QUATERNARY — Pleistocene and Recent

Qal — Alluvium
Includes thin residual soils, talus, and loess

Ql — Landslide and mudflow deposits

Qg — Terrace gravel
Includes outwash gravel and glacial till on Glade Mountain in southeast part of district

SHOWN ON DETAILED MAP A

TERTIARY

Andesite porphyry
Exposed in small outcrops on Glade Mountain in southeast part of district

Tm — Microgranogabbro sills
At southeast end of Disappointment Valley

CRETACEOUS — Upper Cretaceous

Kunu, Kunm, Kunl — Calcareous shale of later Niobrara and possibly younger age
Kunu, *upper part*
Kunm, *middle part; silty and sandy*
Kunl, *lower part*

Klnu, Klnm, Klnl — Calcareous pyritic shale of earlier Niobrara age
Klnu, *undivided; in section only*
Klnu, *upper part; silty and sandy*
Klnl, *lower part*

Km — Mancos Shale
Dark-gray calcareous mudstone and minor limestone, bentonitic claystone, and sandstone. About 2,300 feet thick. Lower 855 feet separable into units braced at right and shown on detailed map A

Kucd, Kucc, Kucb, Kuca — Calcareous pyritic shale of later Carlile age
Kuc, *undivided; in section only*
Kucd, *unit D*
Kucc, *unit C; silty and sandy*
Kucb, *unit B*
Kuca, *unit A; limestone nodules*

ss, Klcg — Noncalcareous nonpyritic shale of earlier Carlile age and calcareous pyritic shale of late and late middle Greenhorn age
ss, *sandstone locally near top of shale of late middle Greenhorn age*

Kd — Dakota Sandstone
Fine-grained quartzose sandstone, carbonaceous shale, coal, and locally conglomeratic sandstone. 120–180 feet thick

Lower Cretaceous

Kbc — Burro Canyon Formation
Fine-grained to conglomeratic light-gray to light-brown quartzose sandstone, greenish-gray shale and siltstone, and green-to-gray limestone and chert. Contact with underlying Brushy Basin Member generally transitional, in places intertonguing; locally disconformable. 80–300 feet thick

JURASSIC — Upper Jurassic — Morrison Formation

Jmb — Brushy Basin Member
Reddish-brown bentonitic mudstone; some sandstone and conglomeratic sandstone lenses, mostly in lower part. 200–720 feet thick

Jms — Salt Wash Member
Quartzose sandstone, light-gray and light-reddish-brown; forms lenses and layers interbedded with reddish-brown mudstone. Carbonaceous material abundant in sandstone locally near top. Member contains numerous uranium-vanadium deposits. 275–450 feet thick

San Rafael Group

Js — Summerville Formation
Reddish-brown sandy siltstone; upper part locally contains layers of limy nodules. Thin sandstone ledge in upper part. In south part of district the upper part grades laterally into Junction Creek Sandstone. 60–140 feet thick

Jjc — Junction Creek Sandstone
Light-buff fine-grained crossbedded quartzose sandstone at south end of district, changes northward to light-reddish-brown fine-grained horizontally bedded sandstone. Absent north of Big Canyon; mapped with Summerville Formation where too thin to show at map scale. 0–150 feet thick

Je — Entrada Sandstone
Slick Rock Member, fine-grained moderately sorted to well-sorted light-brown to light-reddish-brown crossbedded and horizontally bedded quartzose sandstone. Dewey Bridge Member, reddish-brown very fine grained silty sandstone. Entrada is 120–180 feet thick

UNCONFORMITY

TRIASSIC(?) — Upper Triassic(?) — Glen Canyon Group

J̄Ŧn — Navajo Sandstone
Light-brown to light-reddish-brown fine-grained well-sorted crossbedded quartzose sandstone. 0–400+ feet thick

Ŧk — Kayenta Formation
Purplish-gray to purplish-red siltstone and sandstone; poorly sorted; interbedded shale and mudstone; local conglomerate. About 180 feet thick

Ŧw — Wingate Sandstone
Light-buff to light-reddish-brown very fine to fine-grained generally well-sorted crossbedded quartzose sandstone. 170–270 feet thick

TRIASSIC — Upper Triassic

SHOWN ON DETAILED MAP B

Ŧcb, Ŧca — Church Rock Member
Ŧcb, sandstone, siltstone, shale; siltstone, and minor conglomerate
Ŧca, sandstone, siltstone and conglomerate

Ŧc — Chinle Formation
Reddish-brown siltstone and greenish-gray shale, sandstone, and conglomerate. 490–620 feet thick

Ŧcp — Petrified Forest(?) Member

Ŧcm — Moss Back Member

UNCONFORMITY

PERMIAN

Pc — Cutler Formation
Reddish-brown, orange-brown, and light-brown arkosic sandstone, siltstone, and shale. Maximum thickness exposed in district is 240 feet

Pcs — Sandstone unit

Pcsh — Shale units

Contact
Dashed where approximately located; queried where doubtful

Fault, showing dip
Dashed where approximately located; dotted where concealed; queried where doubtful. U, upthrown side; D, downthrown side

Anticline
Dashed where approximately located

Syncline
Dashed where approximately located

Strike and dip of beds

Horizontal beds

Structure contours
Drawn on base of Dakota Sandstone. Dashed where approximately located; short dashed where projected above the surface. Interval 200 feet

DV-126 5933
Diamond-drill hole
Showing number, and altitude of base of Dakota Sandstone

Shaft — Portal of adit — Mine — Prospect

A
Measured section
Shown on detailed map B. Sections shown on plate 5

APPROXIMATE MEAN DECLINATION, 1968

LIST OF MINES AND PROSPECTS IDENTIFIED ON MAP BY NUMBER

1 Smoky No. 3 mine
2 Vanadium Queen mine
3 Happy Jack mine
4 Empire Group mines
5 Chipmunk mine
6 State Line prospect
7 Yellow Girl mine
8 Colorado Cat prospect
9 Silvertone prospects
10 Niggerhead prospect
11 Cone mine
12 Buck Horn mine
13 Pinto mine
14 La Salle Nos. 1 and 2 mines
(Johnstown Group mines)
15 Johnstown No. 1 mine
16 Mayflower prospect
17 Durango mine
18 Valley View prospect
19 Tailholt mine—Tailholt Group mines
20 Northern No. 5 shaft
(Lower Group mines)
21 Cacti mine
22 Alice mine
23 Little Mariel mine
24 Rainbow mine
25 Last Chance mine
26 Cougar mine
(Bird Group mines)
27 Jaybird prospect
28 Blackbird prospect
29 Big 4 prospect
30 Yellowbird prospect
(Summit—Mercantile Group mines)
31 Beth mine
32 Mercantile mine
33 Tomboy mine
34 Brighton mine
35 Ike No. 1 mine
(Radium Group mines)
36 Radium No. 8 mine
37 Radium No. 7 mine
38 Radium No. 6 mine
39 Radium No. 5 mine
40 Radium No. 4 mine
41 Radium No. 1 mine
42 Radium No. 2 mine
43 Ned mine—Ned Group mines
(Georgetown Group mines)
44 Veta Mad mine
45 Georgeto mine
46 Burro No. 1 shaft
47 Burro No. 5 shaft
48 Burro No. 7 shaft
49 Middle Group mines
50 Ellison—Burro mines
51 Hawkeye mine
52 Deremo shaft
(Bishop Point Group mines)
53 Lucky Strike prospect
54 Victor No. 5 mine
55 Hogback mine
56 France mine
57 Marie mine
58 Governor mine
59 Strawberry Roan mine
(Legin Group mines)
60 Cowgirl mines
61 Frenchy mines
62 King 700 mine
63 Frenchy incline
64 King No. 2 mine
65 May mine
66 King No. 2 incline
67 Eloisa mine
68 King No. 4 mine
69 Uintah mine
70 Black Jack mine
(Ownbey Group mines)
71 Frankie No. 2 mine
72 Nucles mine
73 Frankie No. 1 mine
74 Hawk No. 1 mine
75 Hawk No. 2 mine
(Easton B Group mines)
76 Easton B mine
77 Michael Bray mine
(Charles T Group mines)
78 Charles T Nos. 2 and 4 mine
79 Fraction No. 1 mine
80 Summit mine
81 Sunflower mine
(Golden Rod Group mines)
82 Golden Rod No. 4 mine
83 Golden Rod No. 3 mine
84 Golden Rod No. 1 mine
85 Keystone mine
86 Santa Marie mine
(Upper Group mines)
87 Big Four mine
88 Grant mine
(Moon Group mines)
89 Full Moon mine
90 Full Moon No. 2 mine
91 Full Moon No. 4 mine
92 Full Moon No. 7 prospect
93 Myton mine
94 Duchesne mine
(Snyder Group mines)
95 Effie B mine
96 Bessie No. 1 mine
97 Bessie No. 2 mine
(Spud Patch Group mines)
98 Paystreak mine
99 Frances mine
100 Depression mine
101 Moqui Jug mine
102 Dorothy May mine
103 Sunday mine
104 Mayday mine
105 Norma Jean No. 2 mine
106 Norma Jean mine
107 Rosa L prospect
108 Muleshoe No. 1 prospect
109 Muleshoe No. 6 prospect
110 Muleshoe No. 3 prospect
111 Sarah Ellen mine
112 Parrot No. 2 mine
113 Parrot No. 1 mine
114 Bullsnake mine
(Horseshoe Group mines)
115 Mucho Grande mine
116 Uncle Sam mine
117 Horseshoe Nos. 1 and 2 mine
118 Horseshoe No. 7 mine
119 Pack Rat prospect
120 Arrowhead mine
121 Broken Thumb No. 3 prospect
122 Broken Thumb No. 2 prospect
123 Broken Thumb No. 1 prospect

LIST OF MINES AND PROSPECTS, ALPHABETIZED

22 Alice mine
120 Arrowhead mine
96 Bessie No. 1 mine
97 Bessie No. 2 mine
31 Beth mine
29 Big 4 prospect
87 Big Four mine
70 Black Jack mine
28 Blackbird prospect
34 Brighton mine
123 Broken Thumb No. 1 prospect
122 Broken Thumb No. 2 prospect
121 Broken Thumb No. 3 prospect
12 Buck Horn mine
114 Bullsnake mine
46 Burro No. 1 shaft
47 Burro No. 5 shaft
48 Burro No. 7 shaft
21 Cacti mine
78 Charles T Nos. 2 and 4 mine
5 Chipmunk mine
8 Colorado Cat prospect
11 Cone mine
26 Cougar mine
60 Cowgirl mines
100 Depression mine
52 Deremo shaft
102 Dorothy May mine
94 Duchesne mine
17 Durango mine
76 Easton B mine
95 Effie B mine
50 Ellison Burro mines
67 Eloisa mine
4 Empire Group mines
79 Fraction No. 1 mine
56 France mine
99 Frances mine
73 Frankie No. 1 mine
71 Frankie No. 2 mine
63 Frenchy incline
61 Frenchy mines
89 Full Moon mine
90 Full Moon No. 2 mine
91 Full Moon No. 4 mine
92 Full Moon No. 7 prospect
45 Georgeto mine
84 Golden Rod No. 1 mine
82 Golden Rod No. 3 mine
83 Golden Rod No. 4 mine
58 Governor mine
88 Grant mine
3 Happy Jack mine
74 Hawk No. 1 mine
75 Hawk No. 2 mine
51 Hawkeye mine
55 Hogback mine
117 Horseshoe Nos. 1 and 2 mine
118 Horseshoe No. 7 mine
35 Ike No. 1 mine
27 Jaybird prospect
15 Johnstown No. 1 mine
85 Keystone mine
66 King No. 2 incline
64 King No. 2 mine
68 King No. 4 mine
62 King 700 mine
14 La Salle Nos. 1 and 2 mines
25 Last Chance mine
23 Little Mariel mine
53 Lucky Strike prospect
57 Marie mine
65 May mine
104 Mayday mine
16 Mayflower prospect
32 Mercantile mine
77 Michael Bray mine
49 Middle Group mines
101 Moqui Jug mine
115 Mucho Grande mine
108 Muleshoe No. 1 prospect
110 Muleshoe No. 3 prospect
109 Muleshoe No. 6 prospect
93 Myton mine
43 Ned mine
10 Niggerhead prospect
106 Norma Jean mine
105 Norma Jean No. 2 mine
20 Northern No. 5 shaft
72 Nucles mine
119 Pack Rat prospect
113 Parrot No. 1 mine
112 Parrot No. 2 mine
98 Paystreak mine
13 Pinto mine
41 Radium No. 1 mine
42 Radium No. 2 mine
40 Radium No. 4 mine
39 Radium No. 5 mine
38 Radium No. 6 mine
37 Radium No. 7 mine
36 Radium No. 8 mine
24 Rainbow mine
107 Rosa L prospect
86 Santa Marie mine
111 Sarah Ellen mine
9 Silvertone prospects
1 Smoky No. 3 mine
6 State Line prospect
59 Strawberry Roan mine
80 Summit mine
103 Sunday mine
81 Sunflower mine
19 Tailholt mine
33 Tomboy mine
69 Uintah mine
116 Uncle Sam mine
18 Valley View prospect
2 Vanadium Queen mine
44 Veta Mad mine
54 Victor No. 5 mine
30 Yellowbird prospect
7 Yellow Girl mine

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1968—G67056

GEOLOGIC MAP OF THE SLICK ROCK DISTRICT, SAN MIGUEL AND DOLORES COUNTIES, COLORADO

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 200 FEET
DASHED LINES REPRESENT 100-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL