

EXPLANATION

Qsl	Qal	Qlds
Qtr	Qao	

Surficial deposits

Qsl, salines and fine-grained clastic sediments on floor of Death Valley
 Qal, alluvium; fresh gravel and finer grained stream sediments along latest channels; older parts have desert varnish but retain rough surface of deposit
 Qao, older alluvium; weathered gravel at surface; dark desert varnish; supports surface smoothed by disintegration and desert pavement; much dissected, in series of terraces; includes some stable talus material
 Qtr, travertine of former springs
 Qlds, landslide constituents undifferentiated

Unconformity

QTfu		QTfb	QTfa
QTfl	QTfx		

Funeral Formation

QTfu, upper member, conglomerate containing sandy and silty matrix; locally conspicuous calcite veins; forms cliffs
 QTfl, lower member, gravelly mudstone and sandstone; local travertine
 QTfx, breccia and landslide blocks of Paleozoic rocks, interlayered in lower member
 QTfb, olivine basalt in flows, at some places intertonguing with the conglomerate
 QTfa, agglomerate at volcanic vents of olivine basalt

Unconformity, except locally

Tfu	Tfcu	Tfa	Tfb	Tfp
Tf				
Tfg				
Tf				
Tfc				

Furnace Creek Formation

Tfu, upper, light-colored fine-grained lacustrine mudstone marked at base by pumiceous beds; locally grades into sandy and gravelly rocks
 Tfcu, upper conglomerates, pebble to boulder, small to moderate amount of muddy to sandy matrix; intertongues across formation; forms prominent ridges and cliffs
 Tf, main part of formation, dominantly lacustrine mudstone and sandstone, light-greenish- or yellowish-gray to light-brown (some at depth much darker), only dispersed salines; divided by gypsiferous member (Tfg) about 2,500 feet above base of formation; abundantly tuffaceous; locally conglomeratic westward; minor limestone and marlstone but conspicuous at main colemanite deposits. Contains major borate deposits in lowest part
 Tfg, gypsiferous member, thin beds of granular gypsum and minor anhydrite interlayered with little or much mudstone; abundant veins of fibrous gypsum; member commonly 100 to 200 feet thick. Contains widely distributed, small quantities of borates
 Tfc, conglomerate at base of formation, pebble to boulder, abundant sandy and muddy matrix and interbeds; locally thick lenses of calcareous chipstone. Contains some major borate deposits

Basaltic and more siliceous volcanic rocks intrude and intertongue with sedimentary rocks of the Furnace Creek Formation and each other south of Furnace Creek Wash, thickening abruptly southward throughout the formation in the Black Mountains
 Tfa, altered pyroclastic basalt, fragments commonly sand to pebble size, unsorted, or poorly sorted where obscurely stratified; interlayered with mudstone and in large transgressive masses. Contains a few coarse selenite veins and some borate veins
 Tfb, basaltic flows and intrusions; some fragmented, including peperite. Contain a few thick veins of granular gypsum and some borate veins
 Tfp, pale volcanic rocks, undifferentiated; tuff-breccia, felsitic and pumiceous fragments, greenish-gray or pale-orange; minor vitrophyre and vitrophyre breccia, some altered

Unconformity in eastern part
 Major unconformity in northern part

Tau	Taf	Tab
Tapu		
Tam		
Tapl		
Tal		

Artist Drive Formation

Two colorful pyroclastic members divide yellowish-gray to light-brown sedimentary rocks into three members, dominantly lacustrine mudstone and sandstone, containing minor but widespread conglomerate. Volcanic flows and intrusions are spaced through the formation
 Tau, upper sedimentary member
 Tapu, upper pyroclastic member, massive tuff-breccia, conspicuously pink, pale-green, and nearly white
 Tam, middle sedimentary member
 Tapl, lower pyroclastic member, massive well-lithified tuff-breccia, generally light-blue-green to pale-green and pale-greenish-yellow, streaked brown along felsite dikes and silicified zones
 Tal, lower sedimentary member
 Taf, felsite, brownish, shown in larger sills, dikes, and plugs
 Tab, basaltic flows, intrusions; some coarsely porphyritic

Major unconformity, concealed



Paleozoic rocks, undivided

Marine limestone and dolomite dominant over shale, siltstone, and quartzite; upper Precambrian to Upper Ordovician formations



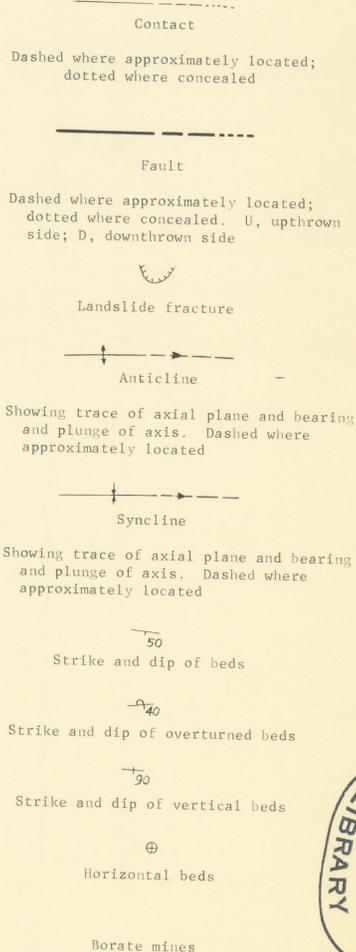
Borate deposits

B, borate minerals, undifferentiated, in Furnace Creek Formation (surficial accumulations on Death Valley floor and terraces are not shown); main deposits of colemanite, ulexite, and probertite interlayered with sedimentary rocks (Tf, Tfc) in elongate lenses as much as 200 feet thick, widely distributed within a favorable zone about 500 feet thick starting in the lowest conglomerate (Tfc); generally minor lenses and veins of colemanite widely distributed in the gypsiferous member (Tfg) and closely associated rocks; minor veins (generalized) of colemanite, priceite, howlite, and bakerite mostly in basaltic rocks (Tfa, Tfb)

QUATERNARY

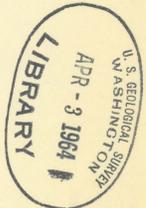
TERTIARY AND QUATERNARY

TERTIARY



Major production (1915-1927) from mines 4 to 10; recent production from mines 1, 2, 3

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|------------------------|------------------------|
| ① East Coleman pit | ⑥ Lower Biddy McCarthy |
| ② Corkscrew | ⑦ Grand View |
| ③ Kern Borate | ⑧ Lizzie V. Oakley |
| ④ Played Out | ⑨ Widow No. 7 |
| ⑤ Upper Biddy McCarthy | ⑩ Widow No. 3 |



California (Furnace Creek area). Geol. 1:24,000. 1964.

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