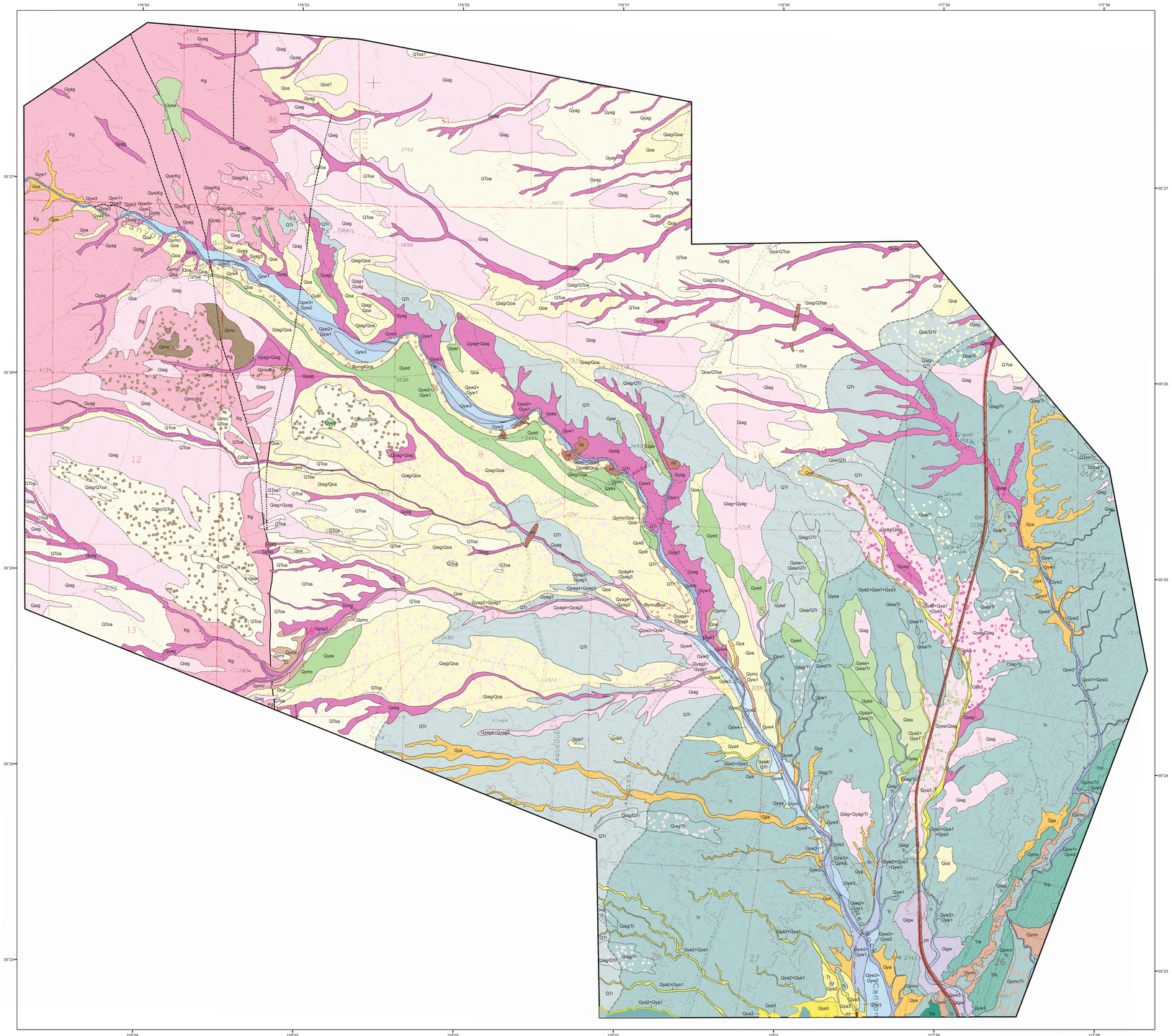
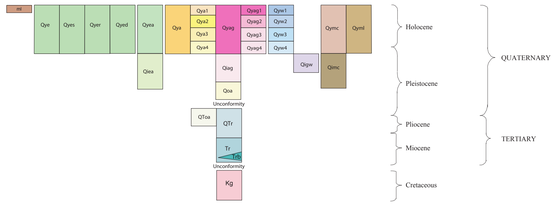
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

In cooperation with
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Open File Report 2006-1265
SHEET 1 OF 1
Pamphlet accompanies map



CORRELATION OF MAP UNITS



LIST OF MAP UNITS

Made land

- ml — **Made land (Anthropogenic)**

Eolian surfaces and underlying deposits

- Qye — **Young eolian sand deposits (Holocene)**
- Qyes — **Young eolian sand sheet deposits (Holocene)**
- Qyer — **Young eolian sand ramp deposits (Holocene)**
- Qyed — **Young eolian sand dune deposits (Holocene)**
- Qyea — **Young eolian sand and alluvial deposits (Holocene)**
- Qiea — **Intermediate eolian sand and alluvial deposits (Pleistocene)**
- Qye/Kg — **Young eolian sand deposits over granite (Holocene and Cretaceous)**
- Qyed/Tr — **Young eolian sand dune deposits over Ricardo Group (Holocene and Miocene)**
- Qyea/Qiea — **Young eolian sand and alluvial deposits over intermediate grussy alluvial fan deposits (Holocene and Pleistocene)**
- Qyea+ Qiea/QTr — **Young eolian sand and alluvial deposits plus intermediate eolian sand and alluvial deposits over Ricardo Group (Holocene, Pleistocene and Miocene)**
- Qyea+ Qiea/Tr — **Young eolian sand and alluvial deposits plus intermediate eolian sand and alluvial deposits over Ricardo Group (Holocene, Pleistocene and Miocene)**
- Qiea/QTr — **Intermediate eolian sand and alluvial deposits over Ricardo Group (Holocene, Pleistocene and Miocene)**
- Qiea/Tr — **Intermediate eolian sand and alluvial deposits over Ricardo Group (Holocene, Pleistocene and Miocene)**

Alluvial fan surfaces and underlying deposits

- Qya — **Young alluvial fan deposits, undifferentiated (Holocene and Latest Pleistocene)**
- Qyag — **Young grussy alluvial fan deposits, undifferentiated (Holocene and Latest Pleistocene)**
- Qya1 — **Youngest alluvial fan deposits (Holocene)**
- Qyag1 — **Youngest grussy alluvial fan deposits (Holocene)**
- Qya2 — **Younger alluvial fan deposits (Holocene)**
- Qyag2 — **Younger grussy alluvial fan deposits (Holocene)**
- Qya3 — **Young alluvial fan deposits (Holocene)**
- Qyag3 — **Young grussy alluvial fan deposits (Holocene)**
- Qya4 — **Young alluvial fan deposits (Holocene and Latest Pleistocene)**
- Qyag4 — **Young grussy alluvial fan deposits (Holocene and Latest Pleistocene)**
- Qiag — **Intermediate age grussy alluvial fan deposits (Pleistocene)**
- Qoa — **Old alluvial fan deposits (Middle to Early Pleistocene), queried where uncertain**
- QToa — **Very old alluvium (Early Pleistocene and Pliocene?), queried where uncertain**
- Qya/Tr — **Young alluvial fan deposits, undifferentiated over Ricardo Group (Holocene and Latest Pleistocene and Miocene)**
- Qyag+ Qiag — **Young grussy alluvial fan deposits, undifferentiated plus intermediate age grussy alluvial fan deposits (Holocene and Pleistocene)**
- Qyag+ Qiag/Tr — **Young grussy alluvial fan deposits, undifferentiated over intermediate age grussy alluvial fan deposits (Holocene and Pleistocene)**
- Qya2+ Qya1 — **Younger alluvial fan deposits plus youngest alluvial fan deposits (Holocene)**
- Qyag2+ Qyag1 — **Younger grussy alluvial fan deposits plus youngest grussy alluvial fan deposits (Holocene)**
- Qya2+Qya1 +Qya3 — **Younger alluvial fan deposits plus youngest alluvial fan deposits plus Young alluvial fan deposits (Holocene and latest Pleistocene)**
- Qya4/QTr — **Young alluvial fan deposits over Ricardo Group (Holocene and Latest Pleistocene and Pleistocene? to Miocene)**
- Qyag4+ Qyag3 — **Young grussy alluvial fan deposits plus young alluvial fan deposits (Holocene and latest Pleistocene)**
- Qiag+Qyag — **Intermediate age grussy alluvial fan deposits plus young grussy alluvial fan deposits, undifferentiated (Holocene and Pleistocene)**
- Qiag+ Qyag/Tr — **Intermediate age grussy alluvial fan deposits plus young grussy alluvial fan deposits, undifferentiated over Ricardo Group (Holocene, Pleistocene and Miocene)**
- Qiag/ Qoa — **Intermediate age grussy alluvial fan deposits over old alluvial fan deposits (Pleistocene)**
- Qiag/ QToa — **Intermediate age grussy alluvial fan deposits over very old alluvium (Pleistocene)**
- Qiag/QTr — **Intermediate alluvial fan deposits, unit 3 over plutonic rocks (Pleistocene)**
- Qiag/ Kg — **Intermediate age grussy alluvial fan deposits over granite (Pleistocene and Cretaceous)**
- Qoa/QToa — **Old alluvial fan deposits over very old alluvium (early to middle Pleistocene and early Pleistocene and Pliocene?)**
- Qoa/QTr — **Old alluvial fan deposits over Ricardo Group (early to middle Pleistocene and Pleistocene? to Miocene)**
- Qoa/Tr — **Old alluvial fan deposits over Ricardo Group (early to middle Pleistocene and Miocene)**
- QToa/Tr — **Old alluvial fan deposits over Ricardo Group (early to middle Pleistocene and Miocene)**

Wash surfaces and underlying deposits

- Qyw1 — **Youngest wash deposits (Holocene)**
- Qyw2 — **Younger wash deposits (Holocene)**
- Qyw3 — **Young wash deposits (Holocene)**
- Qyw4 — **Young wash deposits (Holocene and latest Pleistocene)**
- Qigw — **Intermediate ground-water discharge and wash deposits (late Pleistocene)**
- Qyw1+ Qyw2 — **Youngest wash deposits plus younger wash deposits (Holocene)**
- Qyw2+ Qyw1 — **Younger wash deposits plus youngest wash deposits (Holocene)**
- Qyw2+Qyw1 +Qyw3 — **Younger wash deposits plus youngest wash deposits plus young wash deposits (Holocene)**
- Qyw2+ Qyw3 — **Younger wash deposits plus young wash deposits (Holocene)**
- Qyw3+ Qyw2 — **Young wash deposits plus younger wash deposits (Holocene)**

Mass wasting surfaces and underlying deposits

- Qymc — **Young colluvial deposits (Holocene and Pleistocene)**
- Qyml — **Young landslide deposits (Holocene and Pleistocene)**
- Qimc — **Intermediate colluvial deposits (Pleistocene)**
- Qymc/Qoa — **Young colluvial deposits over old alluvial fan deposits (Holocene and Pleistocene)**
- Qymc/Tr — **Young colluvial deposits over Ricardo Group (Holocene, Pleistocene, and Miocene)**
- Qymc/QToa — **Young colluvial deposits over very old alluvium (Pleistocene and Pliocene?)**
- Qimc/Kg — **Intermediate colluvial deposits over granite (Pleistocene and Cretaceous**

Ricardo Group

- QTr — **Ricardo Group (Pleistocene? to Miocene)**
- Tr — **Ricardo Group (Miocene)**
- Trb — **Ricardo Group, basalt subunit (Miocene)**

Older Rocks

- Kg — **Granite (Cretaceous)**

Note on conventions for unit labels:
Unit nomenclature and conventions follow Yount and others (1994). Surficial geologic units in places exist as thin (<2 m thick) veneers over older units. In areas where this relationship is common the unit designators are shown on the map separated by a slash (/). The younger, or overlying, unit is indicated first. Thus, Qya/Qoa indicates an area where a veneer of young alluvial fan deposits overlies old alluvial deposits. Likewise, the lateral extent of individual deposits in places is so small that each deposit cannot be shown individually at the published map scale or gradations between map units prohibit assigning exact boundaries to areas underlain by single units. In these areas, the designators of deposits present are separated by a plus sign (+), with the most common deposit listed first. Thus, Qya1 + Qya2 indicates an area with both Qya1 and Qya2 deposits and associated surfaces, and that Qya1 is more common than Qya2.

Alluvial, eolian, and wash deposits are the main categories of surface materials in the Dove Spring area; these are classified as young, intermediate, and old primarily based on surface morphology, pattern and degree of channel dissection of alluvial fan surfaces, and degree of soil development. Degree of desert pavement and rock varnish development are important age criteria elsewhere in deserts but less useful in this area because of clast lithology and weak pavement development.

The mixed deposit (Qya3+Qya4) color convention shows the color of the more common deposit. Mixed deposits that exist as a thin veneer (Qya/QToa) have the background color of the underlying unit and a pattern with the color of the overlying unit.

Base from U.S. Geological Survey, 1:24,000-scale Dove Spring, 1994 and Saltdale NW, 1967, CA

Universal Transverse Mercator Projection
1983 North American Datum
Transverse Mercator, Zone 11

TN
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1995

SCALE 1:15 000

1 1/2 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET

CALIF
MAP LOCATION

Geology mapped in 2003-2005 by David M. Miller and Lee Amoroso
Digital database by David M. Miller
Cartography and metadata prepared by Stephanie L. Dudash

EXPLANATION

Contact—Certain; dashed where uncertain; gray dashed line where gradational

Fault—Certain, dashed where uncertain; dotted where concealed

This map was printed on an electronic plotter directly from digital files. Dimensional calibration may vary between electronic plotters and between X and Y directions on the same plotter, and paper may change size due to atmospheric conditions; therefore, scale and proportions may not be true on plots of this map.

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Preliminary Surficial Geology of the Dove Spring Off-Highway Vehicle Open Area, Mojave Desert, California

By
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2006