CRETACEOUS FERRON SANDSTONE FIELD STOPS Aug. '89

STOP 1 Dry Wash
Loc. Sec. 34, T.21 S., R.7E.

Ryer's "3" Shoreface Sandstone unit displays complex geometries, diverse paleocurrent orientations and varied facies relationships at this locality. Cotter (1971) interpreted this unit as a fluvial point bar. An Arco paper (Clair Ossian,1982) interpreted this interval as a "tidal inlet". Others believe a tidal influence is present. The seaward pinchout of Ryer's "5" forms the uppermost minor hogback. This accessible locality best illustrates the seaward facies of progradational units in the Upper Ferron Sandstone.

STOP 2 North Muddy Creek/ Picture Flats
Loc. T22S, R6E, sec. 13, near petroglyph panel (one of Utah's best & least well known!)
Things to see:
1. Landward pinch-out of Ryer's "6" marine Sandstone. Multi-directional trouch cross-stratification, moderate bioturbation, and large seaward-dipping inclined surfaces are observerd in this unit. At the landward pinchout, large roots extend several feet into the upper shoreface facies, interpreted by Ryer as a sandstone.
2. Intertonguing of marine and non-marine rocks.
3. A marine flooding surface marks the contact with the "J" coal that overlies the "6" Sandstone at this locality. The offshore lower shoreface of the "7" sandstone is in contact with the marine Blue Gate Shale (final transgression of the sea and change from transgressive to highstand systems tract).
4. Rapid thickness changes in marine "6" sandstone and channel cuts with non-marine coastal plain sediments filling the cuts.
5. The petroglyphs are 10 min. walk from the cars. This stop is approx. 15 min. drive from the main highway and requires a 10-15 min. walk from the cars.

STOP 3 Miller Canyon-Muddy Creek
Loc. Sec. 25 & 26, T. 22 S., R. 6 E.
This locality is written up as one of Ryer's stops in the AAPG short course.
1. Marine shore facies near mouth of canyon, and landward pinchout of shoreface.
2. The landward pinchout of the "3" shoreface Sandstone unit occurs to the north of Miller Canyon. The C Coal interval that overlies the "3" Sandstone is exposed at this locality and is overlain by an 8' thick intensely bioturbated sandstone interpreted as a transgressive sandstone reworked and deposited landward of the marine sandstone pinchout. A marine flooding surface separates this deposit and the very-thinly interbedded sandstone and shale of the lower shoreface of the "4" sandstone.
3. Within the C-Coal are 4 volcanic ash beds. These beds have been traced landward and form an excellent marker horizon to observe lateral facies changes at the marine-non-marine transistion zone. These volcanic ash beds have been traced seaward into offshore marine shales that overlie the "3" marine sandstone where it forms a condensed section.

(Optional) Side canyon to Muddy Creek; T22S, R6E, NE 1/4
A rather rough road leads into this side canyon. As you drive into the canyon, the No. 5 marine sandstone is well exposed along the cliffs. There is one place along the road where a short stop and walk through this No. 5 unit could be done. The road begins to go to pot at some great outcrops of the No. 2 sandstone. At this location the No. 2 is definitely marine and has been dominated by wave action. From this point, a walk down the remainder of the canyon (and through the remaining deltaic rocks) would put you in Miller Canyon (right at the junction of Miller Creek and Muddy Creek). (walking 1-3/4 to 2 mi would take 1/3 to 1/2 day, or vehicles could be driven around and stop would take about 2.5 hrs.). Section is WELL exposed.

STOP 4 Cowboy Mine/ Bear Gulch
Loc. Sec. 3, T23S, R6E / Sec. 35, T22S, R6E

1. Go from shoreface of Miller Canyon, up-dip to Cowboy Mine and side canyon. This shows transitional marine to non-marine facies. At Bear Gulch, the lower shoreface of the "4" is absent here and the Upper shoreface sits in contact with the bioturbated "transgressive" sandstone that overlies the the C-Coal. The C-Coal has thickened and the volcanic ash bed is now several feet below the sandstone-coal contact. The landward pinchout of the "4" Sandstone occurs to the Souteast along the Coal Cliffs escarpment

2. At the cowboy mine locality, the "4" shoreface facies has pinched out. The transgressive sandstone is present and grades to the south (landward) into a bioturbated oyster lag. The C-Coal is much thicker and the C Coal Bentonite is 10 feet below the bioturbated sandstone suggesting that the peat swamp has expanded in a landward direction. Teh C-Coal is overlain by a bay-fill sequence that is capped by crevasse channels that exhibit soft sediment deformation features. The I Coal is present at road level and in overlain by fluvial point bar facies.

STOP 5 Ivie Creek - I-70 Road Cut (after 5 pm due to road construction)
Loc. Sec. 34, T23S, R5E

This is a classic and continuous exposure showing more fluvial influence in the Ferron system with only minor wave influence. The C-Coal bentonite is well exposed in the road cut. The uppermost channel-belt exposed on the north side of the road can be traced through Ivie Creek to the Browning Mine (Stop 7). A fluvial point bar facies exposed on the South side of the Road was used by Ryer (1980) to determine compaction rates for peat. The Ferron is capped by the M Coal seam at this Locality.

STOP 6 Willow Springs
Loc. T24S, R5E, secs. 13 + 18

1. Drive into the main canyon (good dirt road) to see spectacular channel which cuts into the No. 1 marine unit and is very near or at the landward pinchout of the No. 2 marine unit.

2. Drive to mouth of canyon to observe the landward pinchout of the "2" marine sandstone. Note the offlapping geometry of sandstone lenses at this pinchout.

3. (Optional) Drive to 1st canyon north of Willow Springs. This is in sec. 7. The road is ok if dry and gives vehicle access to the edge of the cliffs (great view!). Can take a short walk (10-15 mins) and see an area of very rapid facies change between shallow marine (just below wave base) to possible ?river mouth bar or ? bar complex. These features are near the landward pinchout of the No. 2 sandstone. There are very good exposures of the sedimentary structures associated with these units. The hiking is short but steep.

STOP 7 Emery (Browning) Mine ,
Loc. Sec. 33, T. 22 S. R. 6 E., S of Emery - Quitchupah Creek

1. Multistorey channelbelt geometries in the "6 or 7" channelbelt are well exposed on the south-facing cliff face. At this stop, we can contrast fluvial geometries within the multi-lateral channelbelt geometries of the "1" fluvial sandstone unit exposed in Willow Springs Wash with the multi-storey channelbelt exposed here. This change in geometry from multi-lateral to multi-storey channel-belts reflects a change in the rate of baselevel rise. This change is associated with the forward-stepping to backstepping units that comprises the transgressive systems tract of the Upper Ferron.

2. The I and J Coal seams are mined here.

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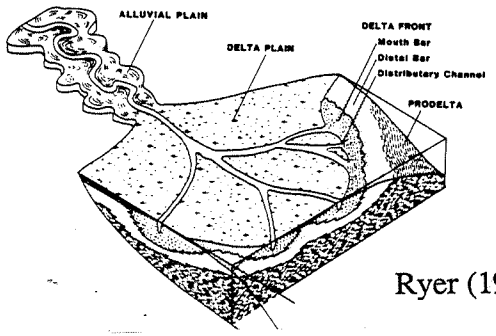
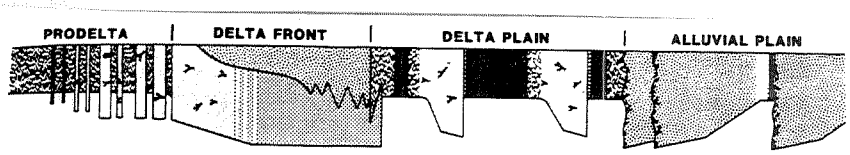


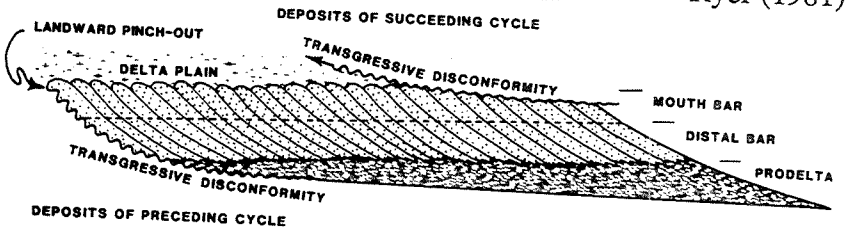
Ryer (1981)

—Facies of lobate, river-dominated delta. (Modified from Fisher et al, 1969.)

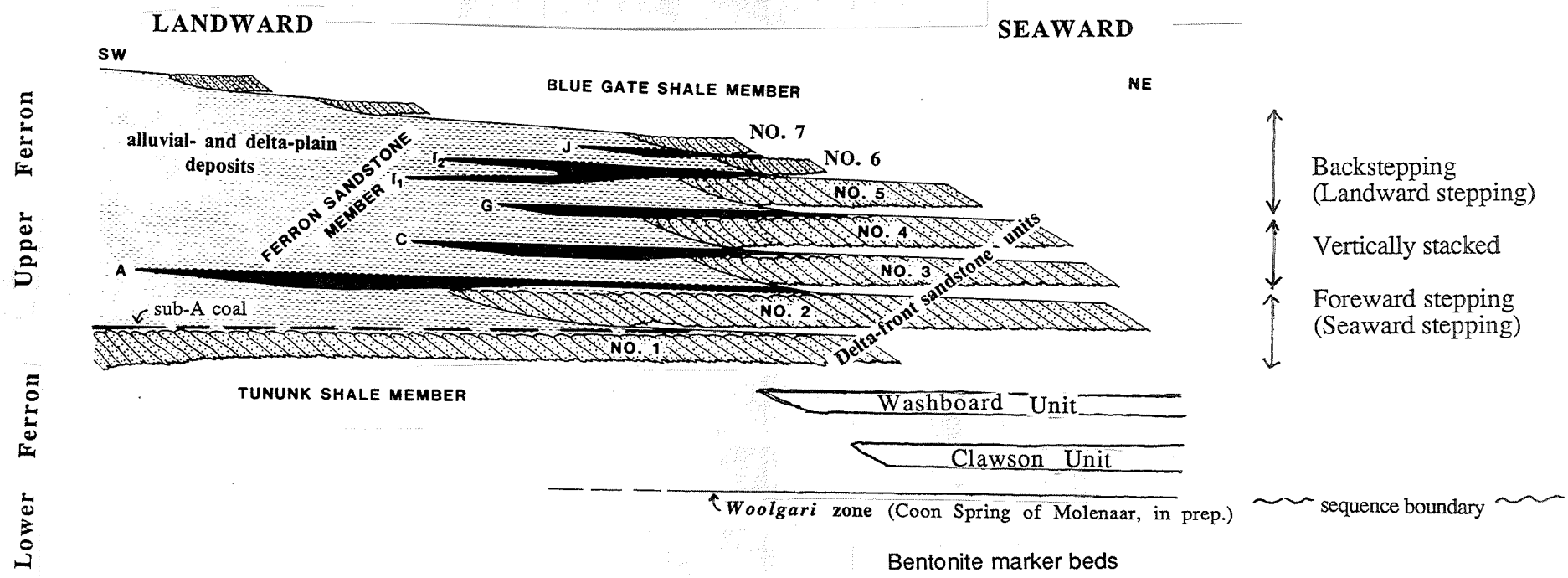


—Idealized progradational sequence for Ferron Sandstone Member.

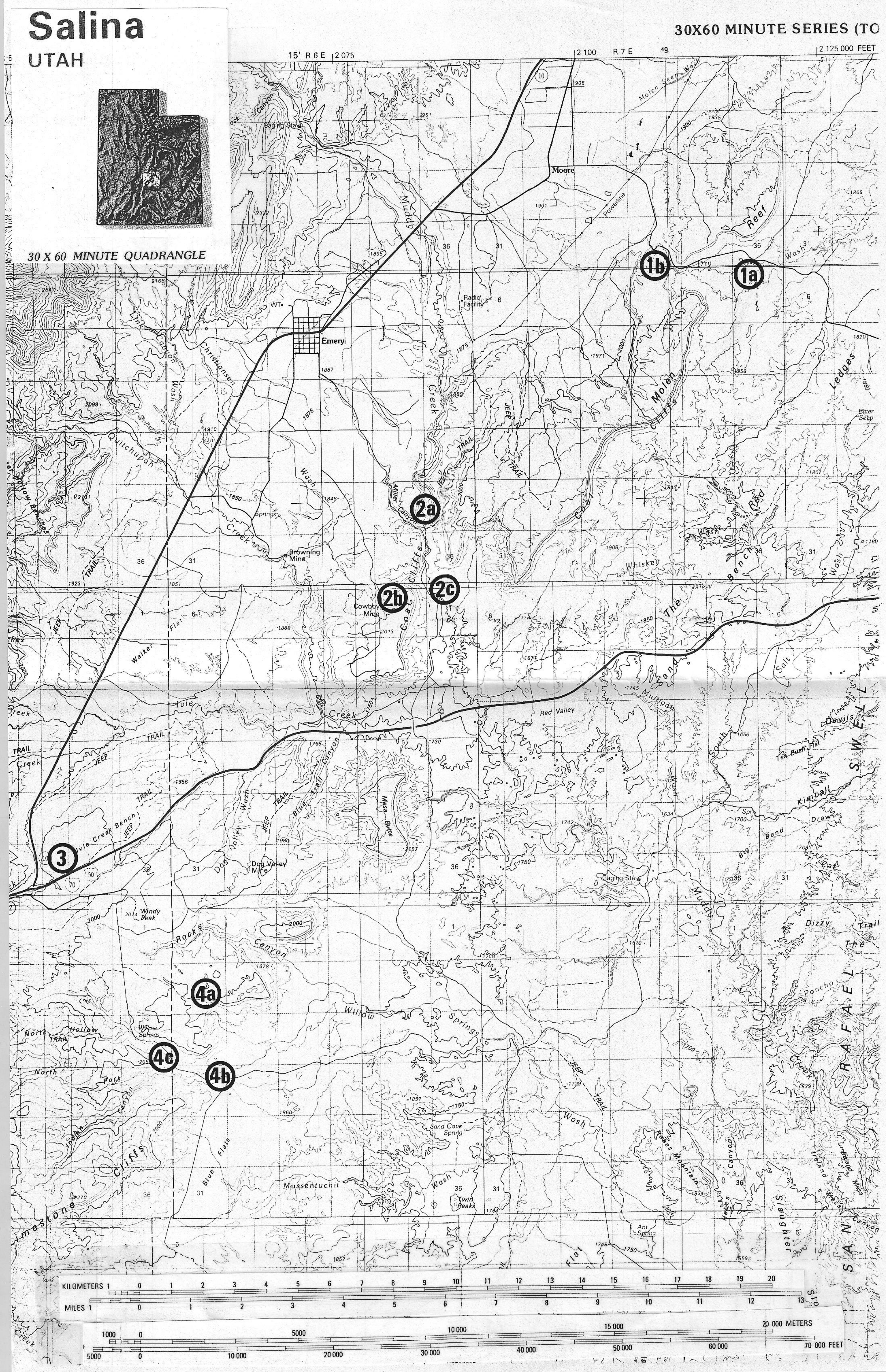
Ryer (1981)



—Diagrammatic section, parallel with depositional dip, through deposits of deltaic cycle showing bounding transgressive disconformities and landward pinch-out of delta-front sandstone unit.



Diagramattic cross section of the Ferron Sandstone Member, Castle Valley area, UT. Delta -front sandstone units are labeled numerically, major coal beds alphabetically. Undivided alluvial- and delta-plain deposits are indicated by horizontal dashed pattern. Modified after Ryer (1981), with sequence stratigraphy context at right after Gardner (in prep.).



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Hollow Benches
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Bitter Seep
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Browning Mine
Cowboy Mine
Springs
Walker Flat
Ivie Creek
Ivie Creek Bench
Red Valley
The Sand
Mulligan
Salt Wash
Devils
South Wash
Tea Bush Flat
Kimball Draw
Big Bend
Cat
Mesa Butte
Blue Trail Canyon
Dog Valley Wash
Dog Valley Mine
Windy Peak
Rock Canyon
Willow Springs Wash
North Hollow
North Fork
Indian Canyon
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