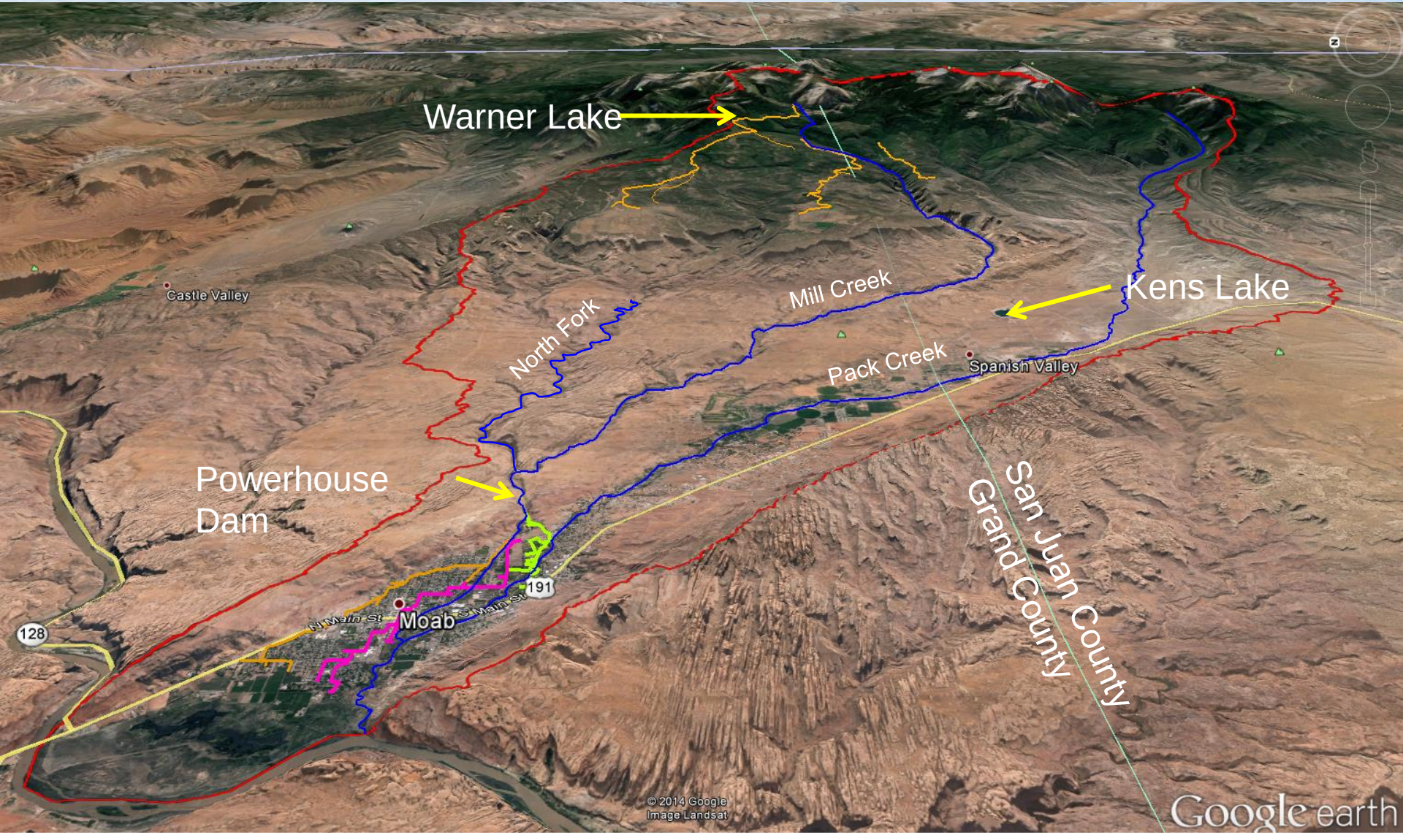
Utah Division of Water Rights

REVIEW OF GROUNDWATER MONITORING
MOAB / SPANISH VALLEY

Moab / Spanish Valley Watershed



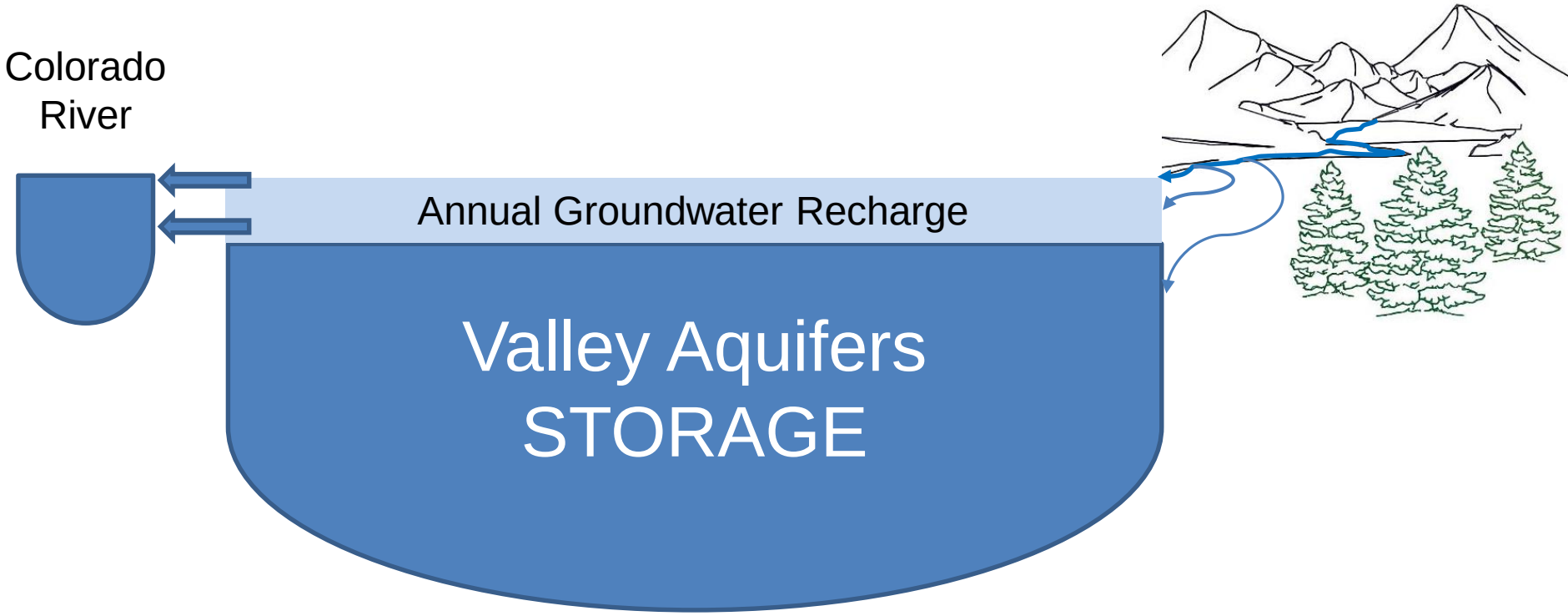
Groundwater Management Plans

- Est. in Section 73-5-15 Utah Code

Objectives:

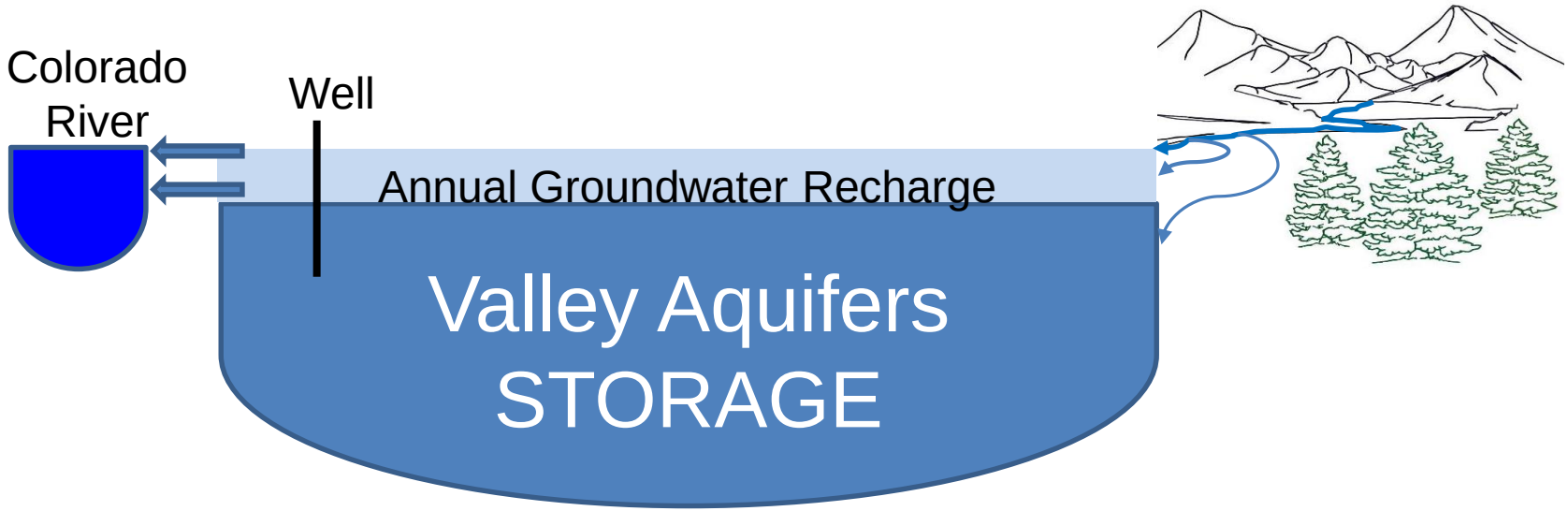
- Limit groundwater withdrawals to safe yield.
- Protect physical integrity of the aquifer.
- Protect water quality.

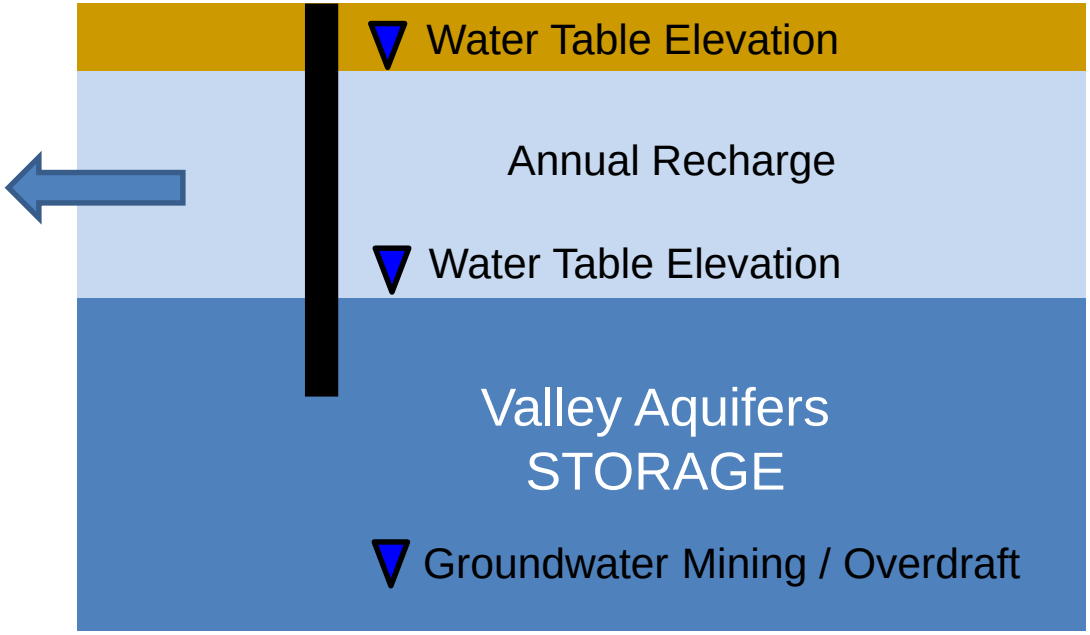
"Safe Yield" means the amount of groundwater that can be withdrawn from a groundwater basin over a period of time without exceeding the long-term recharge of the basin or unreasonably affecting the basin's physical and chemical integrity.



USGS "Evaluation of Groundwater Resources in the Spanish Valley Watershed, Grand and San Juan Counties, Utah"
Scientific Investigations Report 2019-5062, pg. 55

- Recharge: 9,550 – 30,000 acre-feet
- Discharge: 14,000 – 16,000 acre-feet



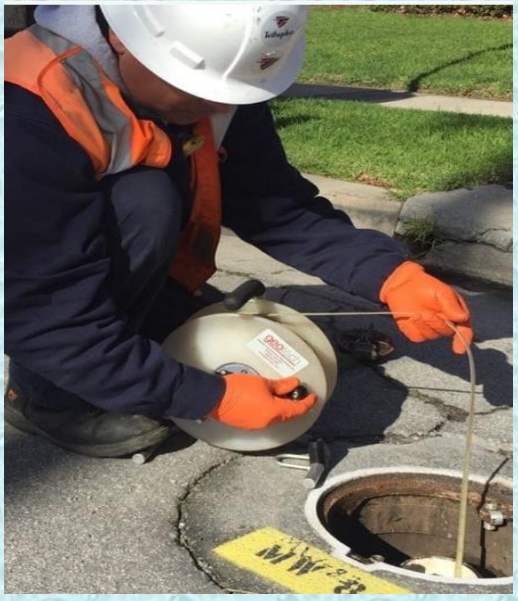


Zero Development

Maximum Development Allowed Under Utah Law

What Should Be Measured?

- Spring Flows
- Stream Flows
- Water Quality
- Water Table Elevations



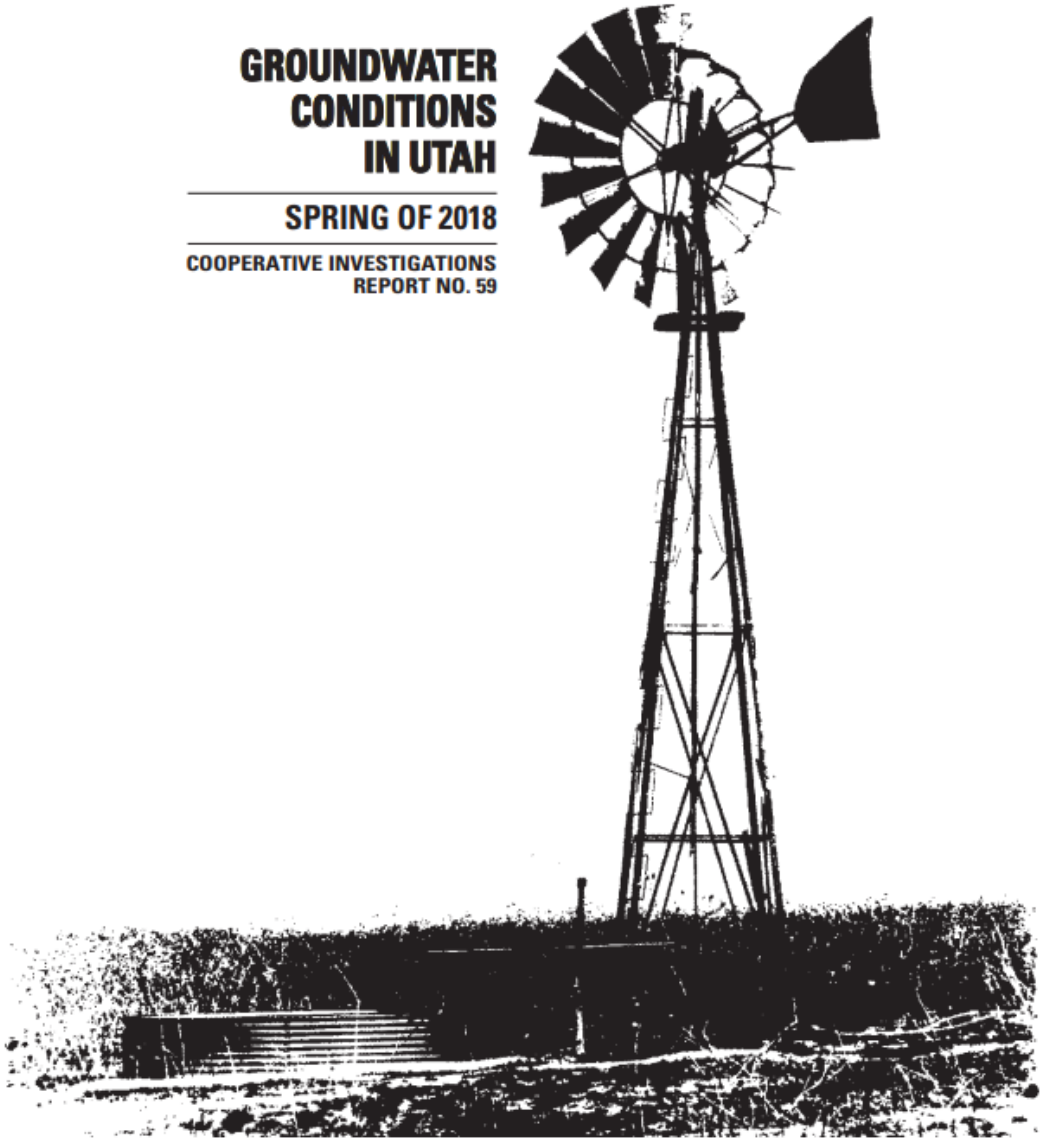
Who's collecting the Data?

- USGS
- Moab City
- Moab Irrigation Company
- Grand Water & Sewer SA
- San Juan Spanish Valley SSD
- Division of Water Quality
- Division of Water Rights

GROUNDWATER CONDITIONS IN UTAH

SPRING OF 2018

COOPERATIVE INVESTIGATIONS
REPORT NO. 59



UTAH DEPARTMENT OF NATURAL RESOURCES and
UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

U.S. GEOLOGICAL SURVEY

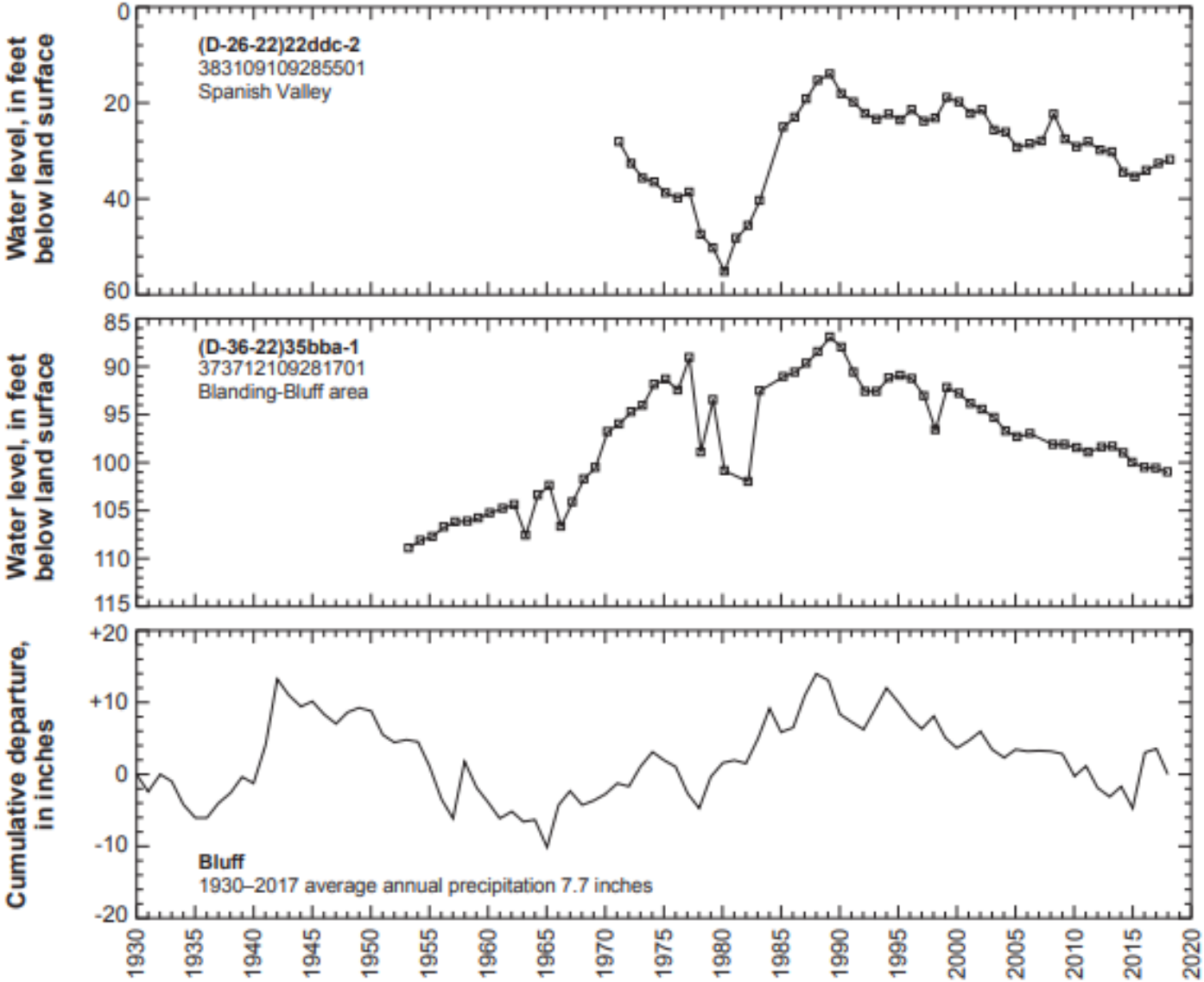
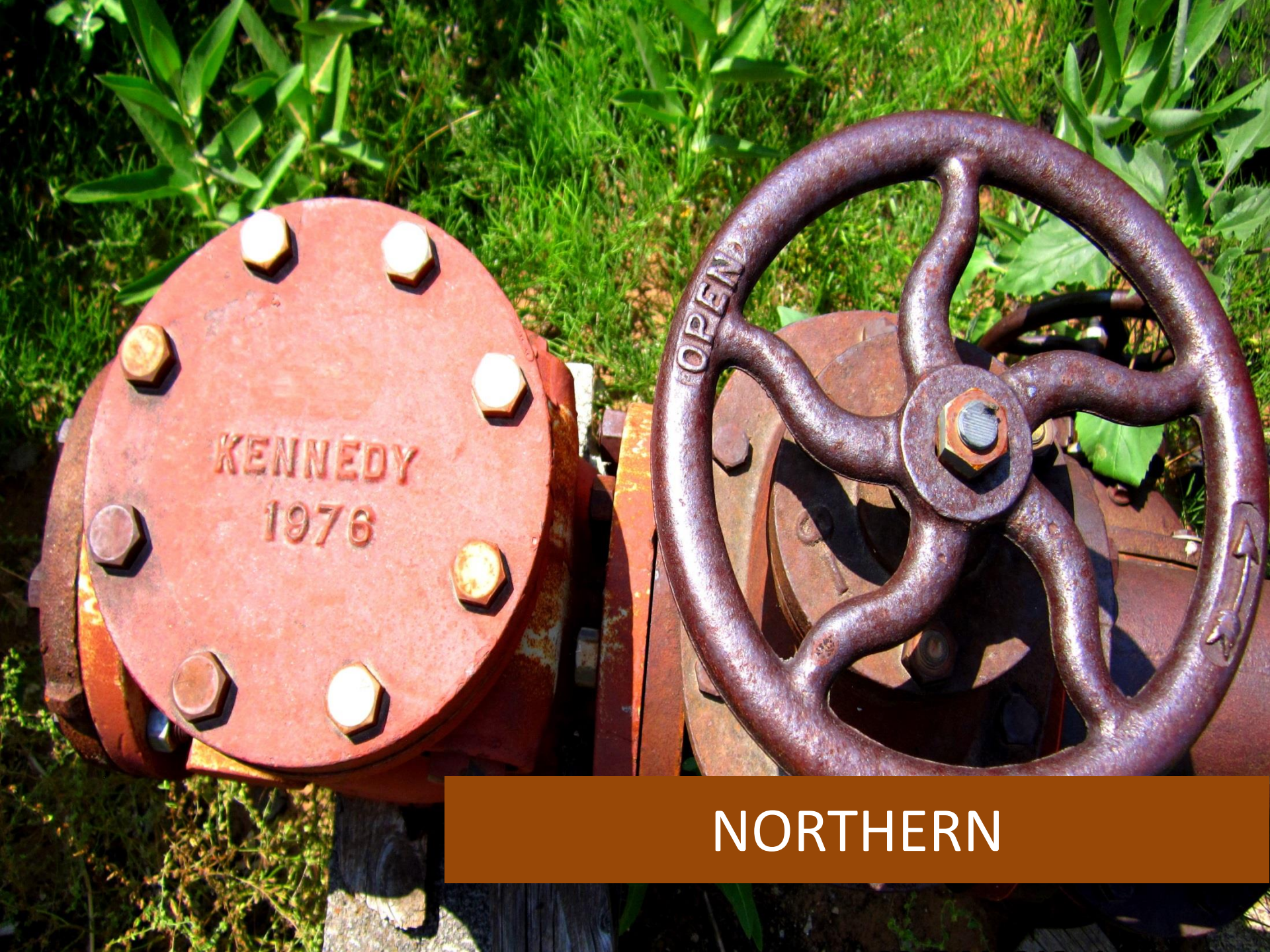


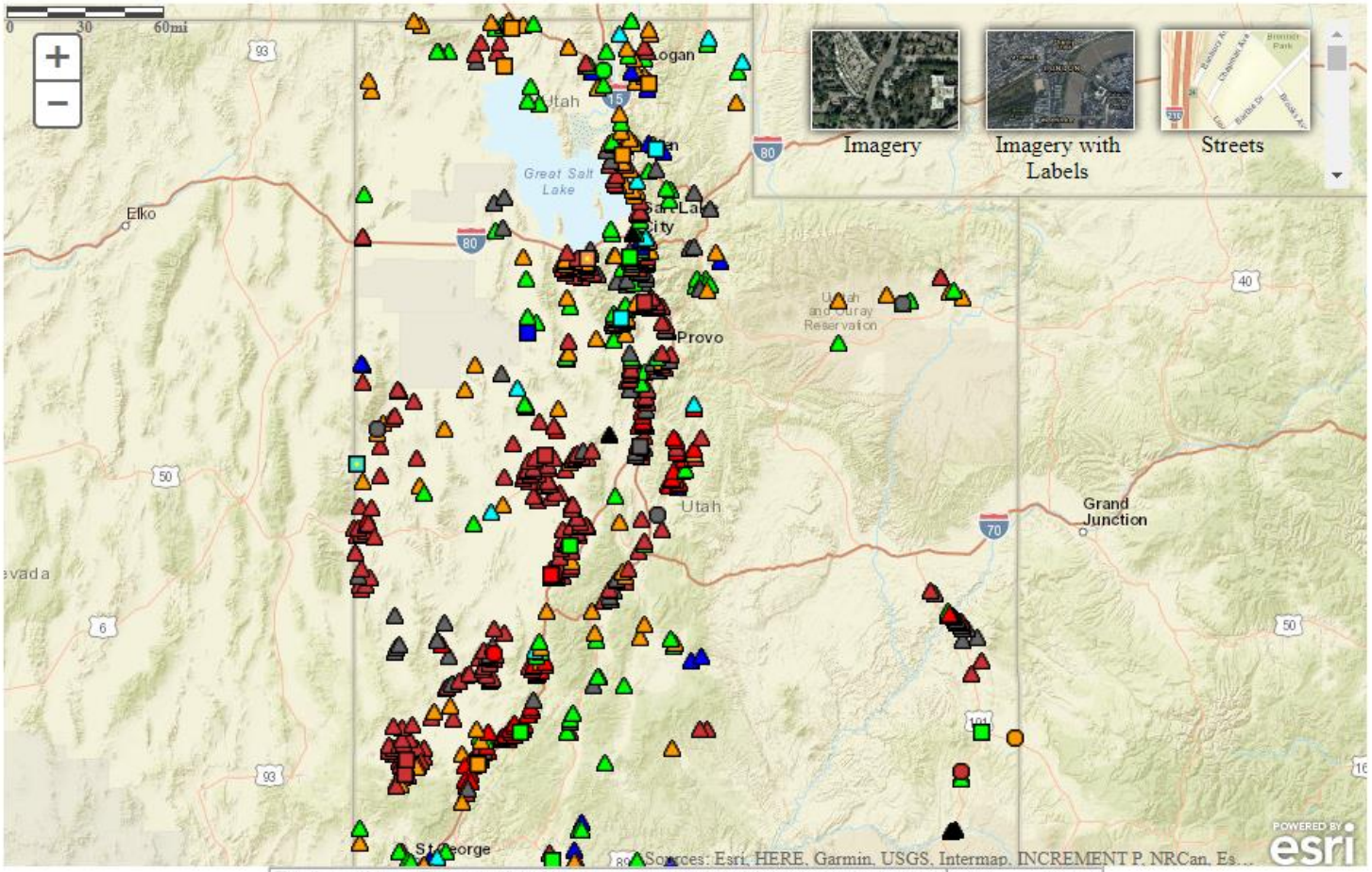
Figure 40. Relation of water level in wells in selected areas of Utah to cumulative departure from average annual precipitation at sites in or near those areas.—Continued



NORTHERN

Utah Active Water Level Network

Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
Map loading slowly? Try a different browser. Web browser performance varies significantly.



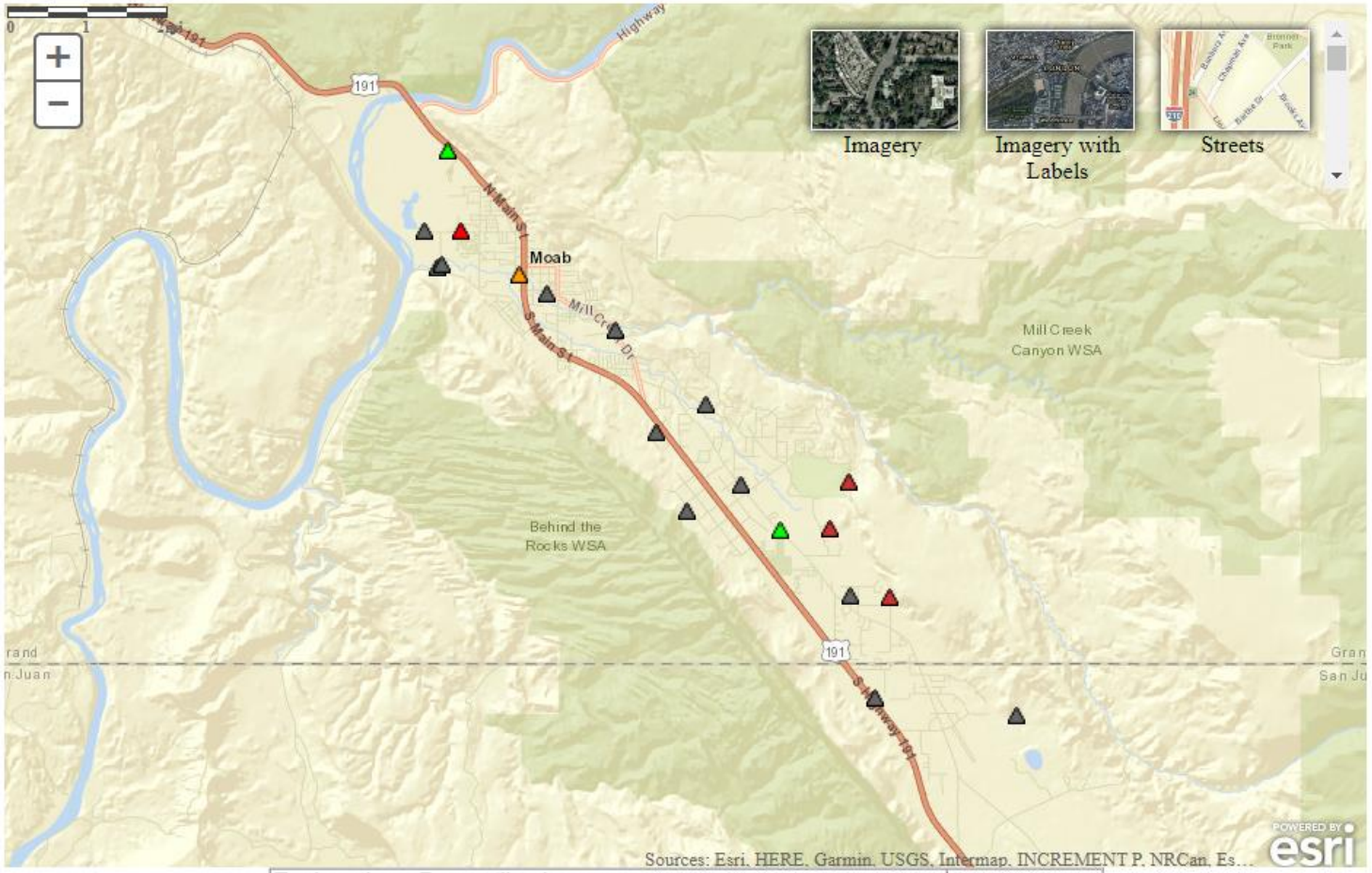
Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

Wells: Real-Time, Continuous, Periodic Measurements
Springs

Map generated 11/7/2019 2:29:19 PM

Utah Active Water Level Network

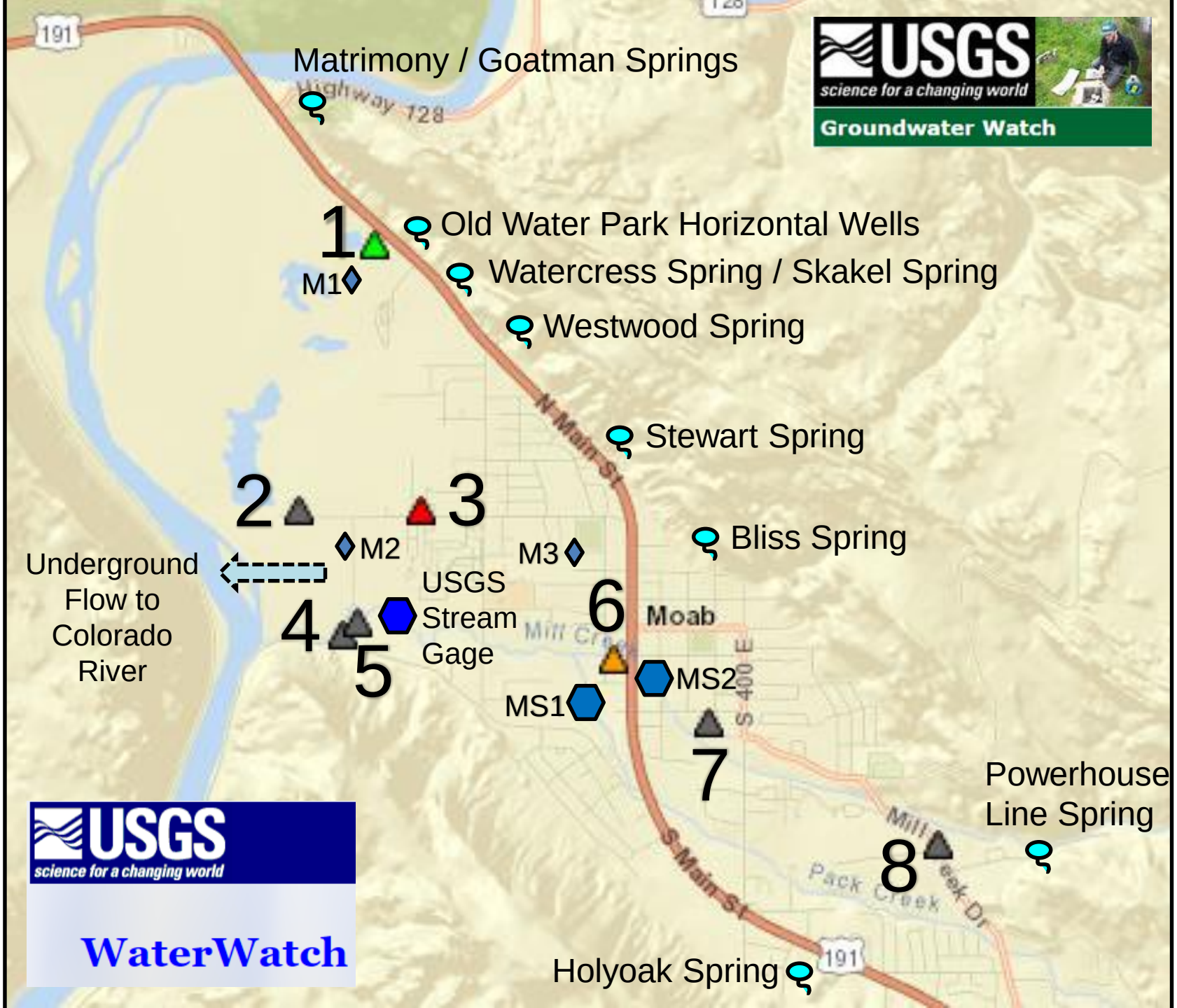
Click site symbol to open information pop-up. Click Station ID in pop-up for county information and site selection.
Map loading slowly? Try a different browser. Web browser performance varies significantly.



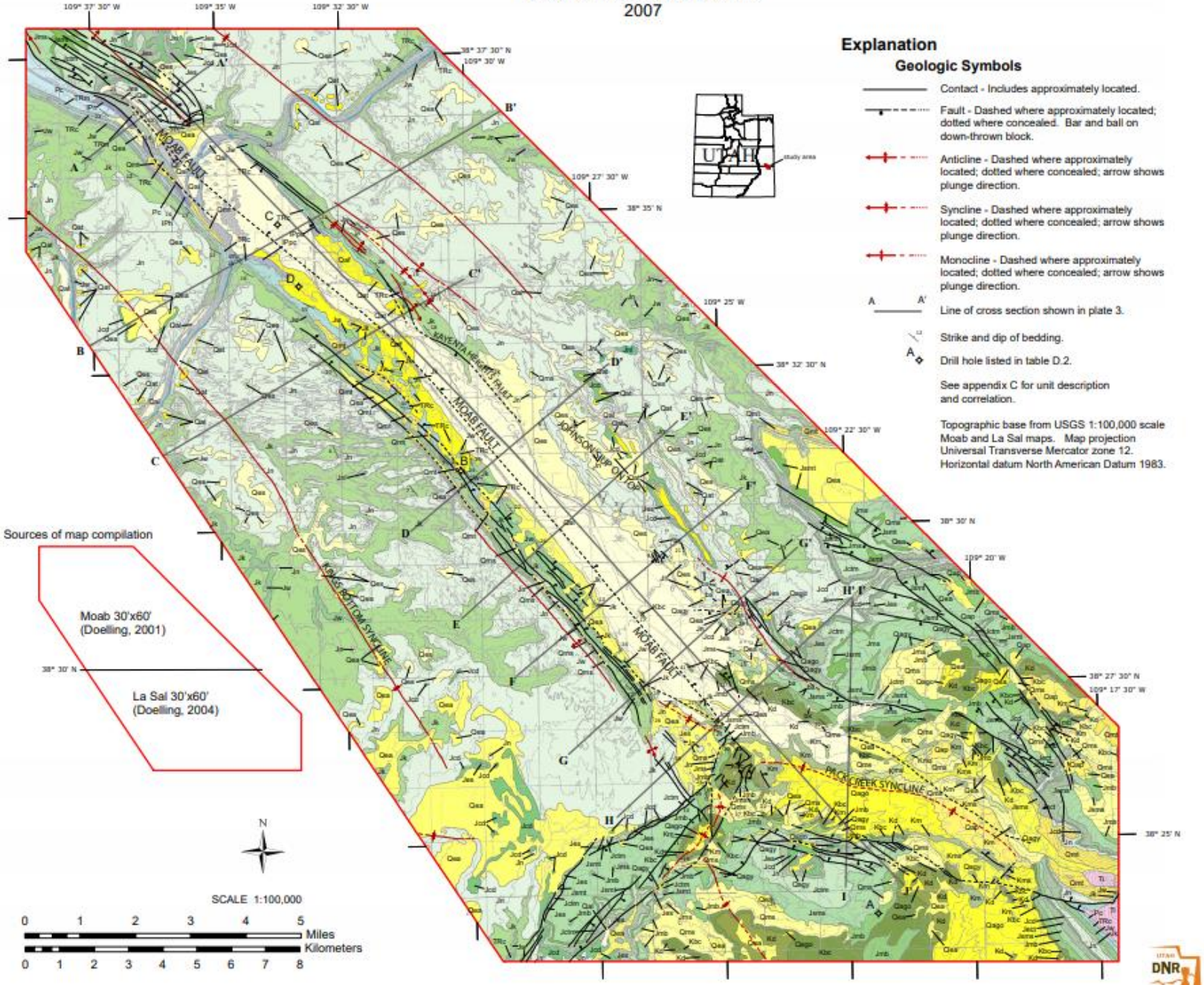
Explanation - Percentile classes (symbol color based on most recent measurement)							
Low	<10 Much Below Normal	10-24 Below Normal	25-75 Normal	76-90 Above Normal	>90 Much Above Normal	High	Not Ranked

Wells	Springs
Real-Time	
Continuous	
Periodic Measurements	

Map generated 11/7/2019 2:29:19 PM


USGS
science for a changing world
Groundwater Watch
Matrimony / Goatman Springs
Highway 128
191
1
Old Water Park Horizontal Wells
M1
Watercress Spring / Skakel Spring
Westwood Spring
N Main St
Stewart Spring
2
3
M2
M3
Bliss Spring
Underground Flow to Colorado River
USGS Stream Gage
4
5
6
Moab
Mill Creek
MS2
MS1
S 400 E
7
Powerhouse Line Spring
8
Mill Creek Dr
Pack Creek
S Main St
191
Holyoak Spring
USGS
science for a changing world
WaterWatch

Special Study 120
UTAH GEOLOGICAL SURVEY
2007



Explanation

Geologic Symbols

- Contact - Includes approximately located.
- Fault - Dashed where approximately located; dotted where concealed. Bar and ball on down-thrown block.
- Anticline - Dashed where approximately located; dotted where concealed; arrow shows plunge direction.
- Syncline - Dashed where approximately located; dotted where concealed; arrow shows plunge direction.
- Monocline - Dashed where approximately located; dotted where concealed; arrow shows plunge direction.
- A — A' Line of cross section shown in plate 3.
- Strike and dip of bedding.
- A Drill hole listed in table D.2.

See appendix C for unit description and correlation.

Topographic base from USGS 1:100,000 scale Moab and La Sal maps. Map projection Universal Transverse Mercator zone 12. Horizontal datum North American Datum 1983.

Sources of map compilation

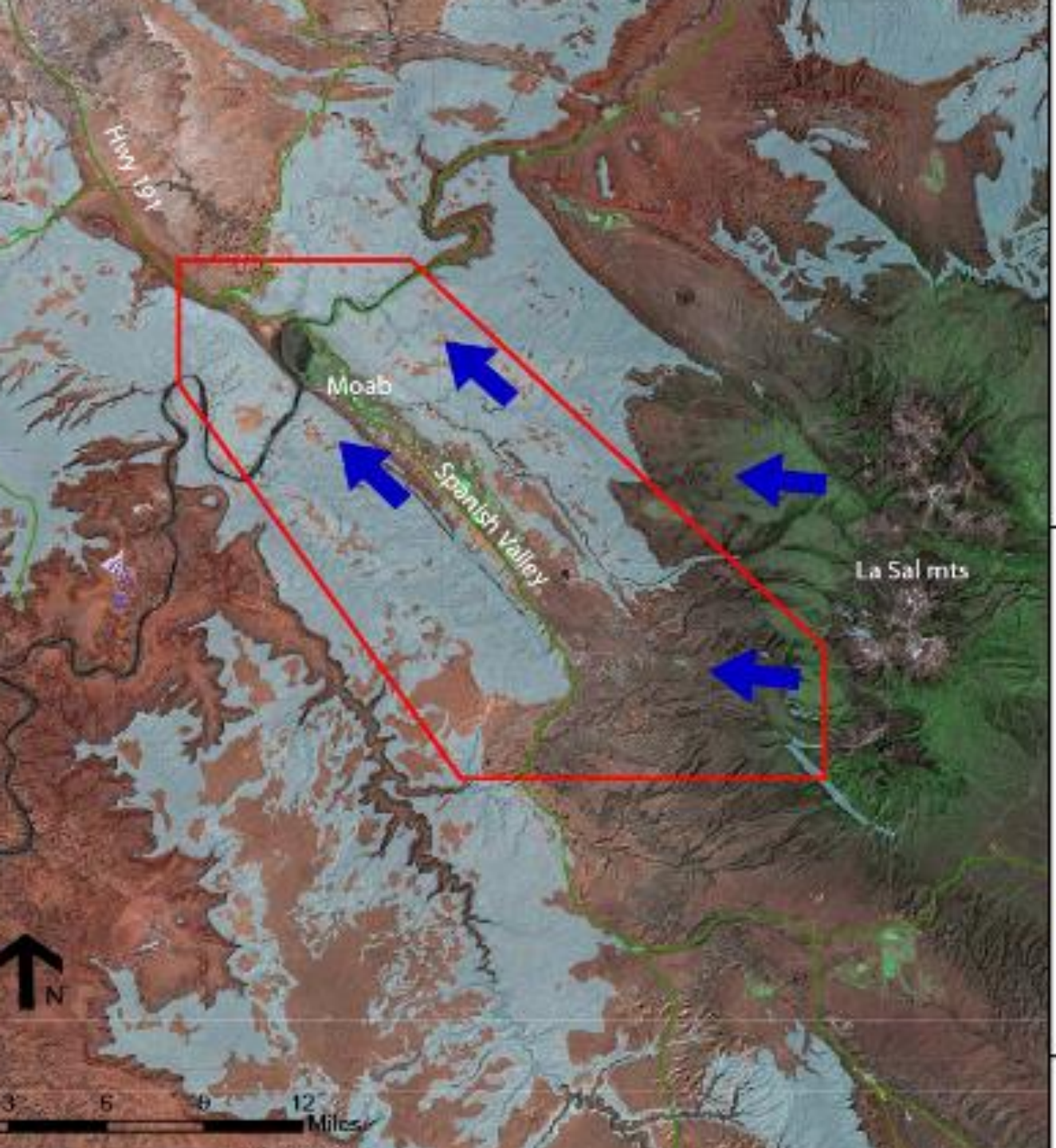
Moab 30'x60'
(Doelling, 2001)

La Sal 30'x60'
(Doelling, 2004)

N

SCALE 1:100,000

0 1 2 3 4 5 Miles
0 1 2 3 4 5 6 7 8 Kilometers



THE HYDROGEOLOGY OF MOAB-SPANISH VALLEY, GRAND AND SAN JUAN COUNTIES, UTAH, WITH EMPHASISON ON MAPS FOR WATER-RESOURCEMANAGEMENT AND LAND-USE PLANNING

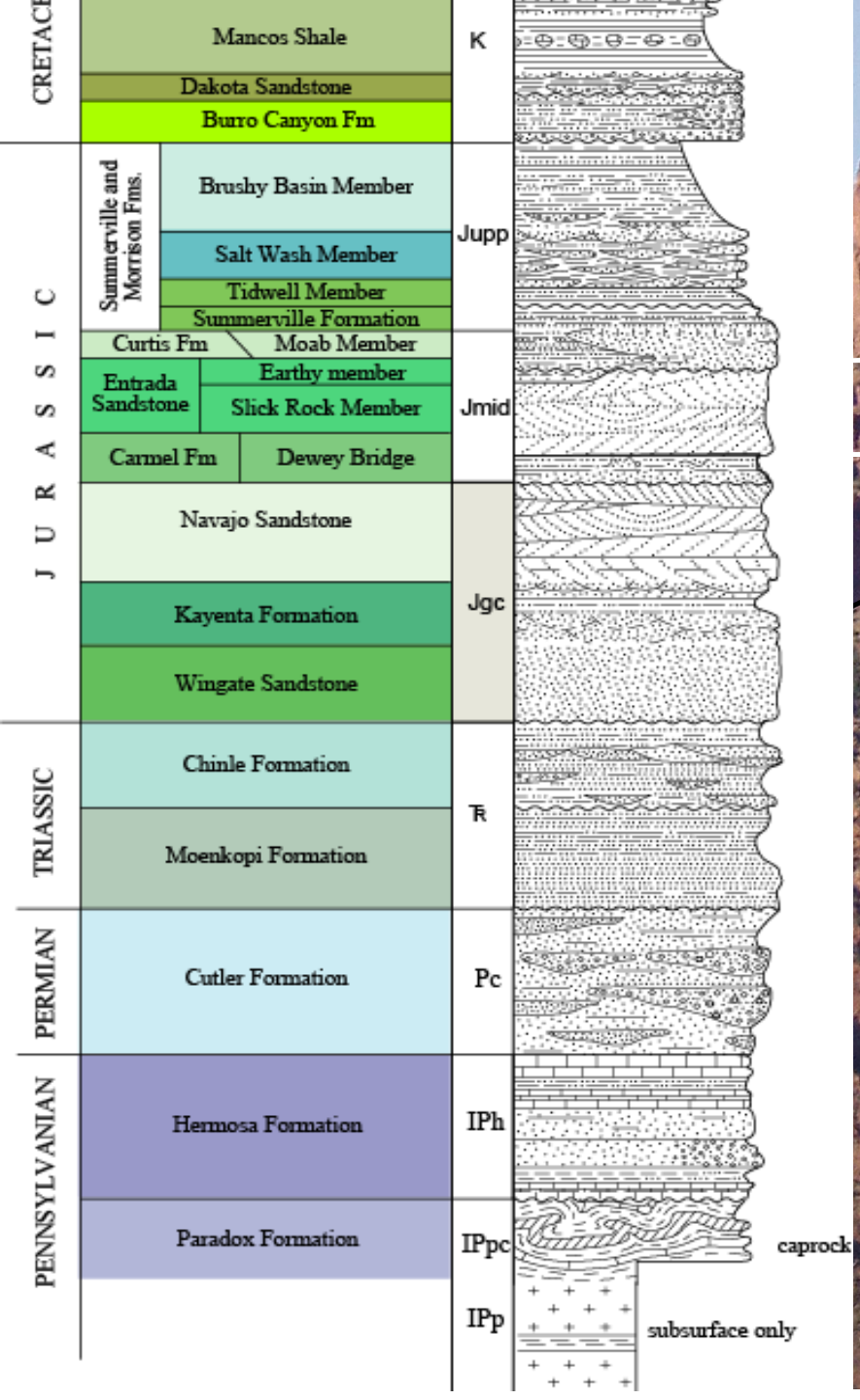
by Mike Lowe, Janae Wallace,Stefan M. Kirby, and Charles E. Bishop

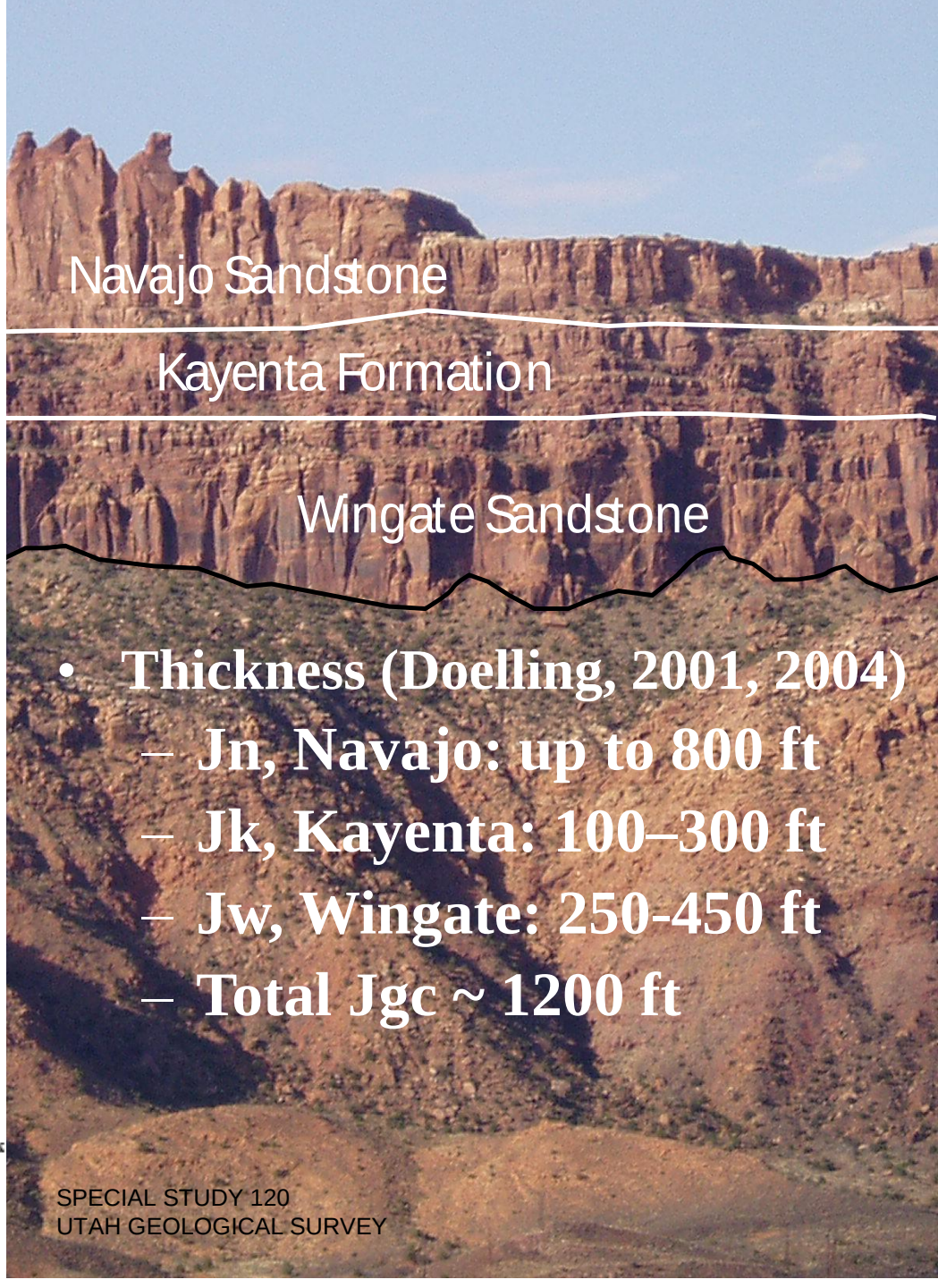
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

Study area

Glen Canyon Group

General direction of ground-water movemennt

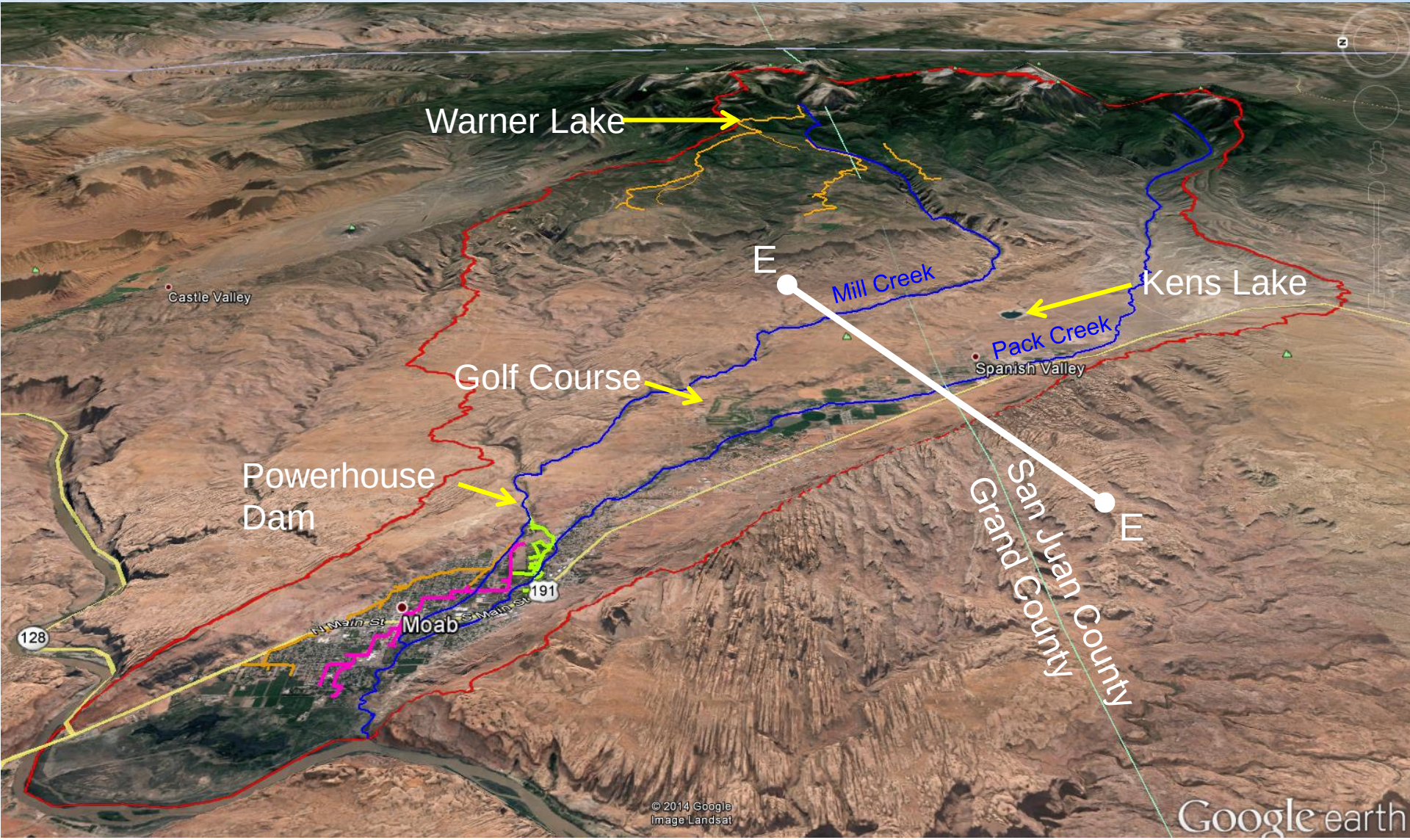


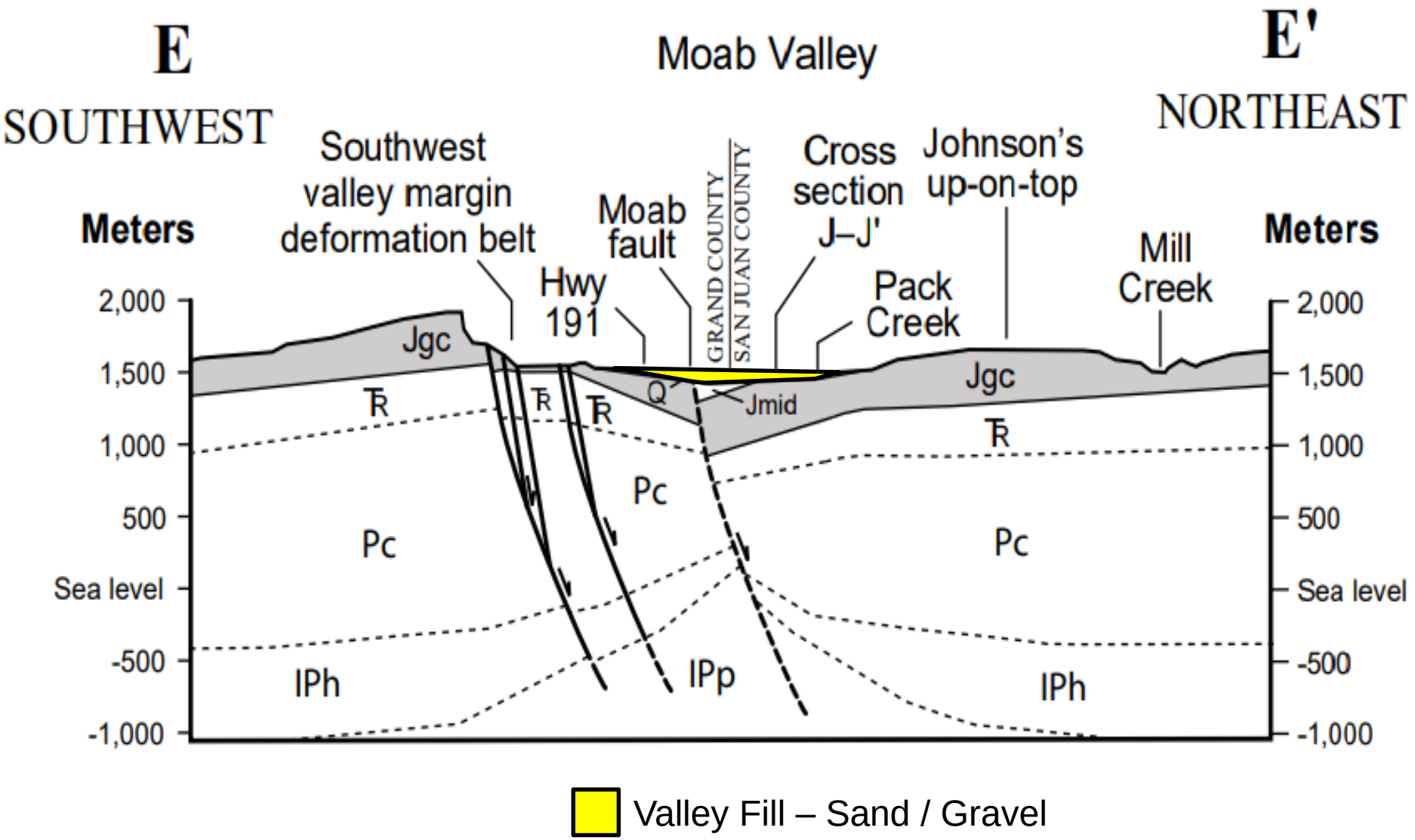


- **Thickness (Doelling, 2001, 2004)**
  - **Jn, Navajo: up to 800 ft**
  - **Jk, Kayenta: 100–300 ft**
  - **Jw, Wingate: 250-450 ft**
  - **Total Jgc ~ 1200 ft**

SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

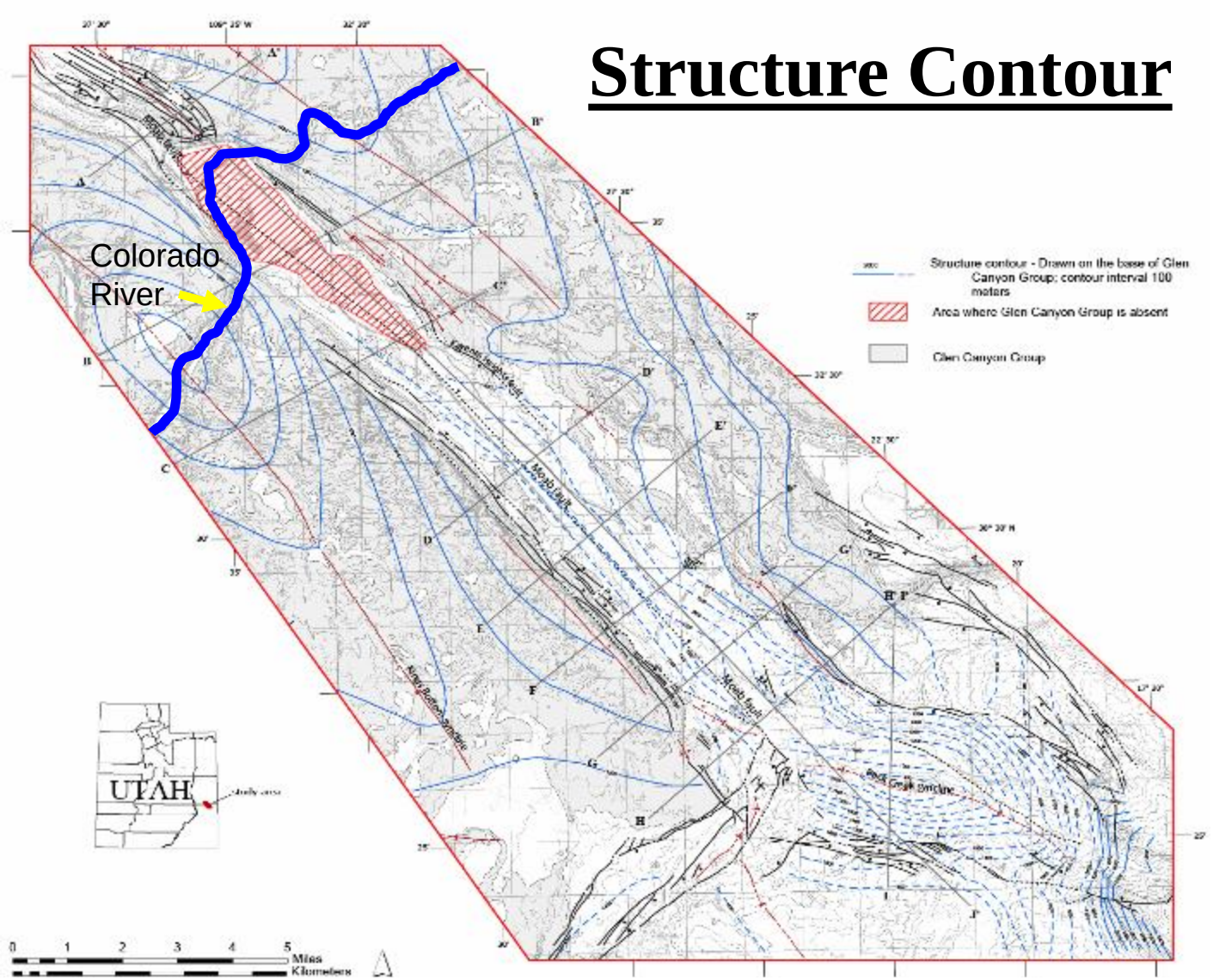
Moab / Spanish Valley Watershed





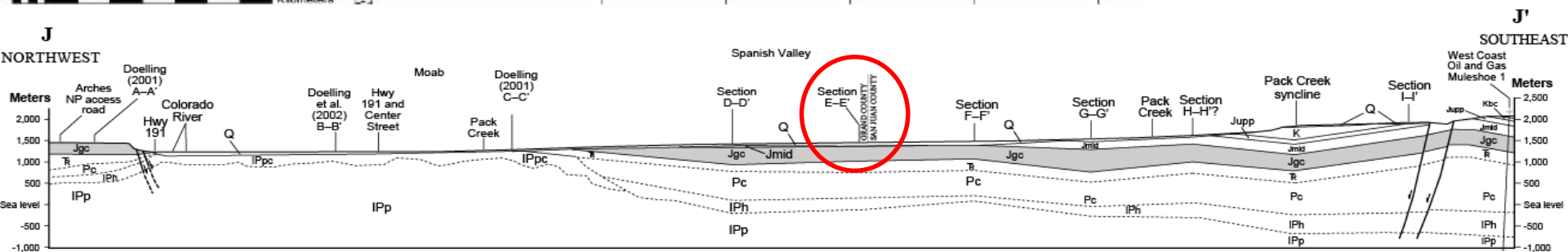
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

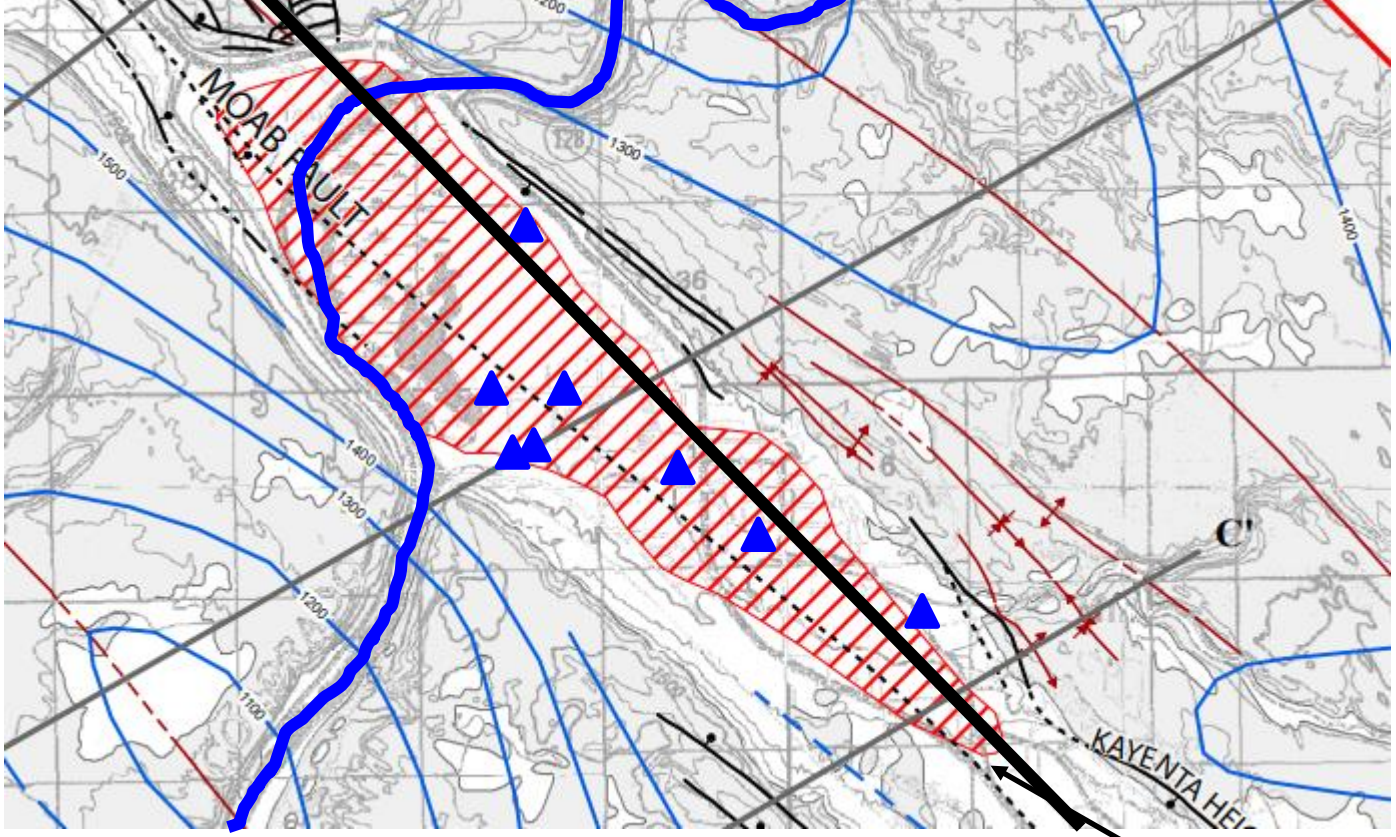
Structure Contour



- **The Glen Canyon Group ranges in thickness from about 330 feet south and southeast of Moab to about 1300 feet beneath southeastern Moab-Spanish Valley**
- **Glen Canyon Group is absent in the subsurface near Moab**

SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

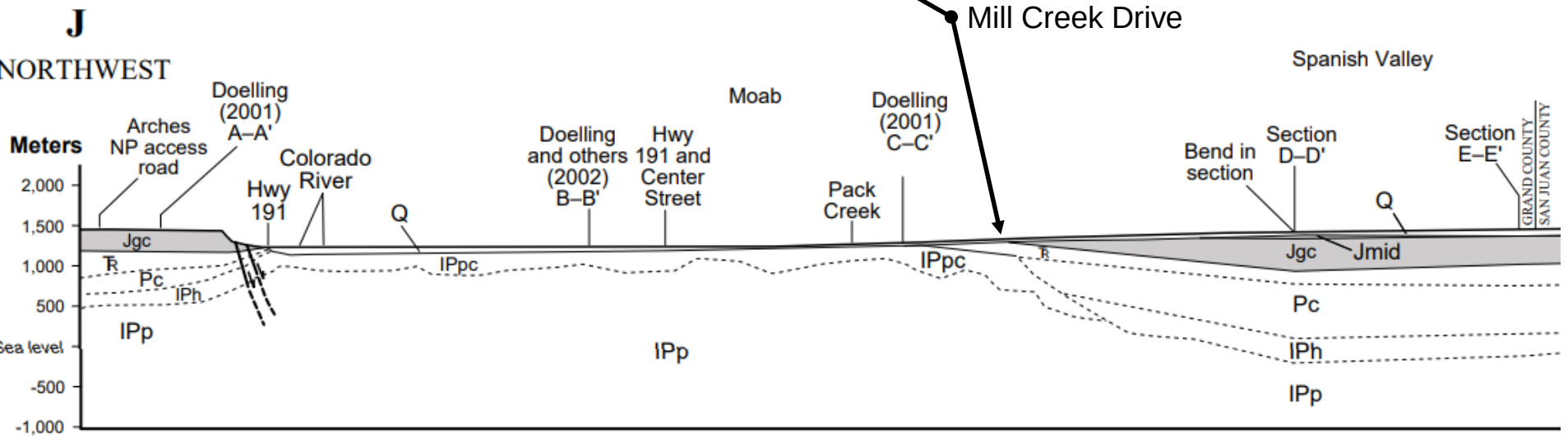




Glen Canyon Group is absent in the subsurface near Moab

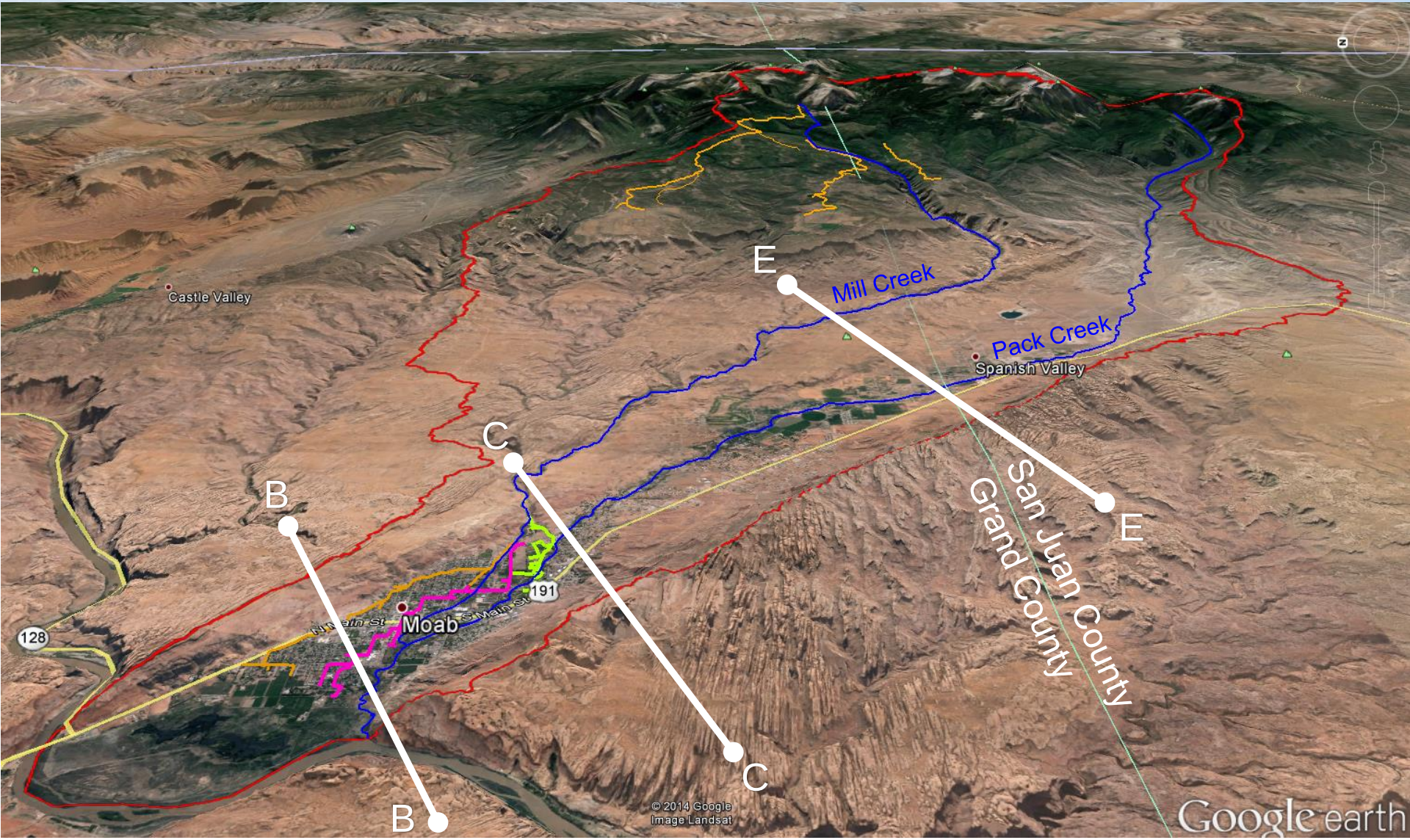
▲ USGS Monitoring Well

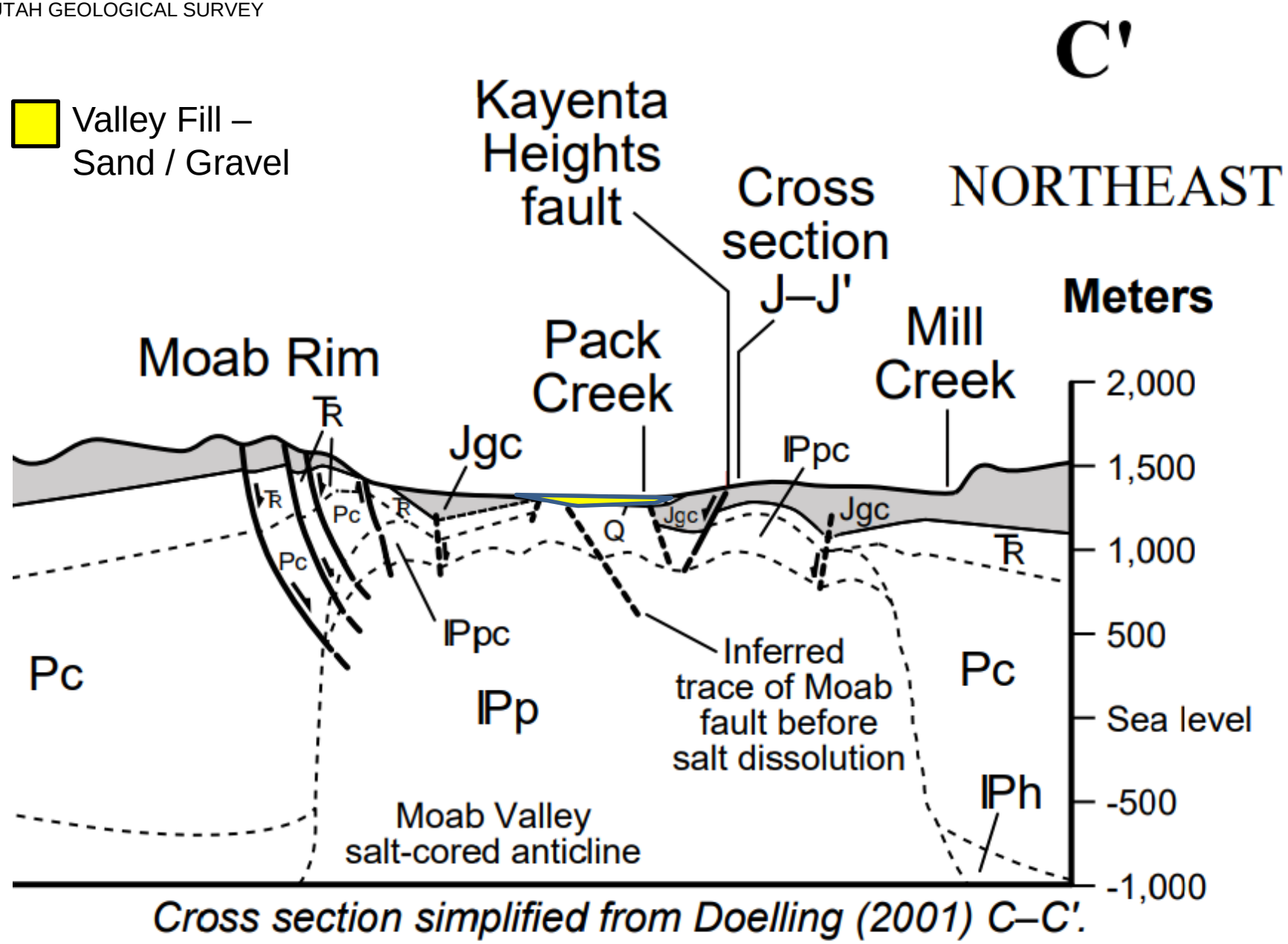
Mill Creek Drive



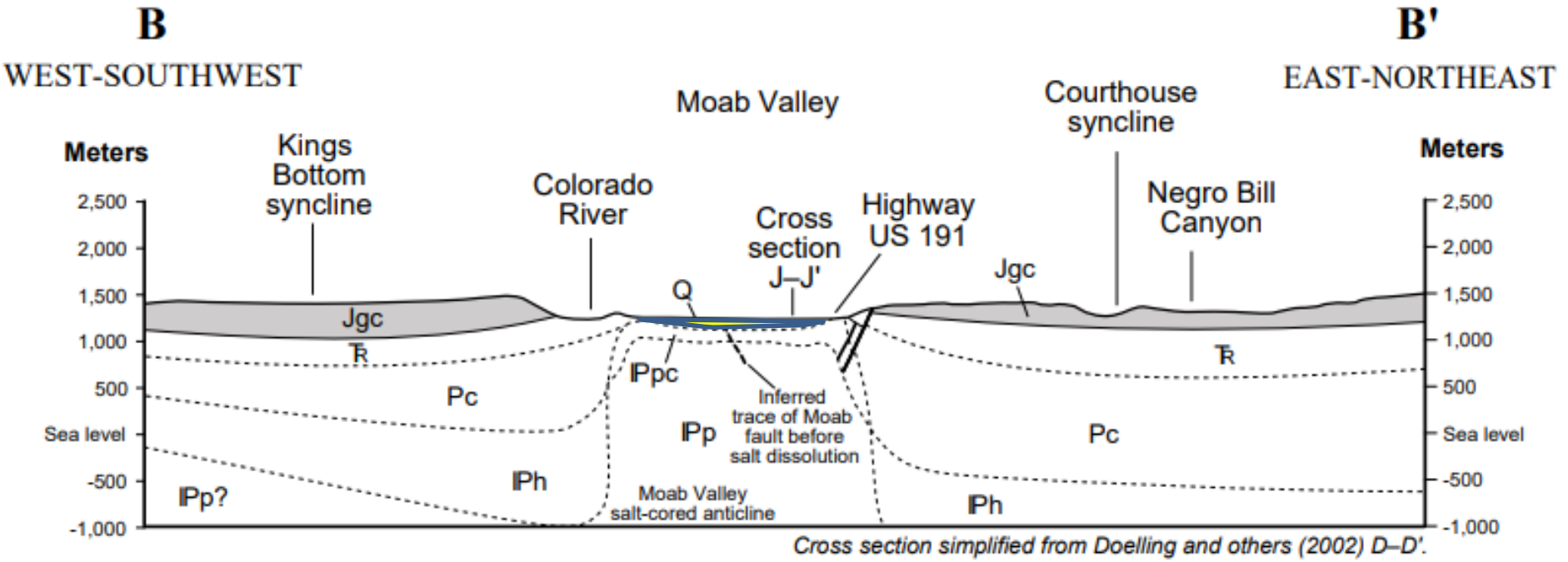
SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY

Moab / Spanish Valley Watershed

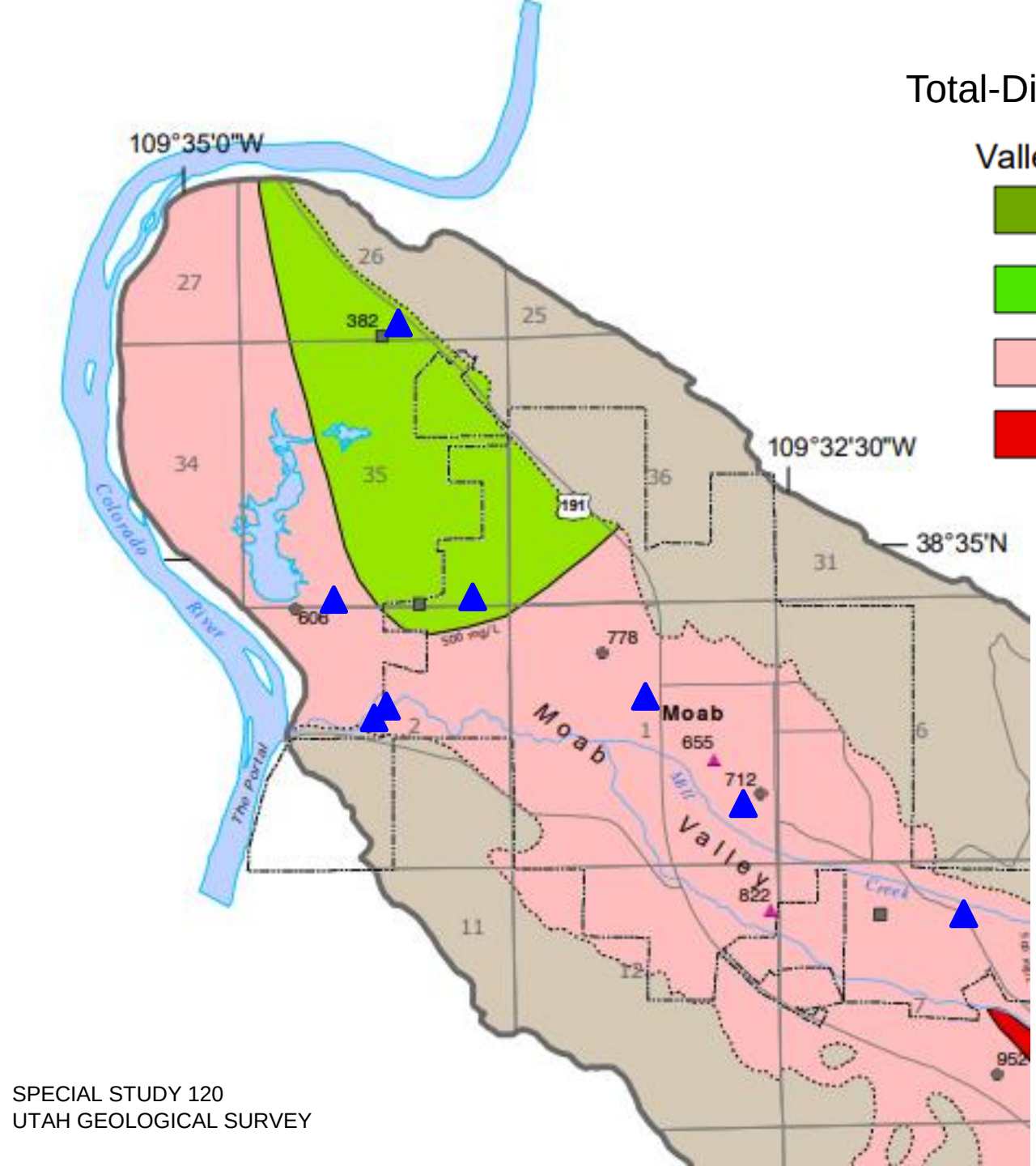




Cross section simplified from Doelling (2001) C–C'.



Valley Fill –
Sand / Gravel



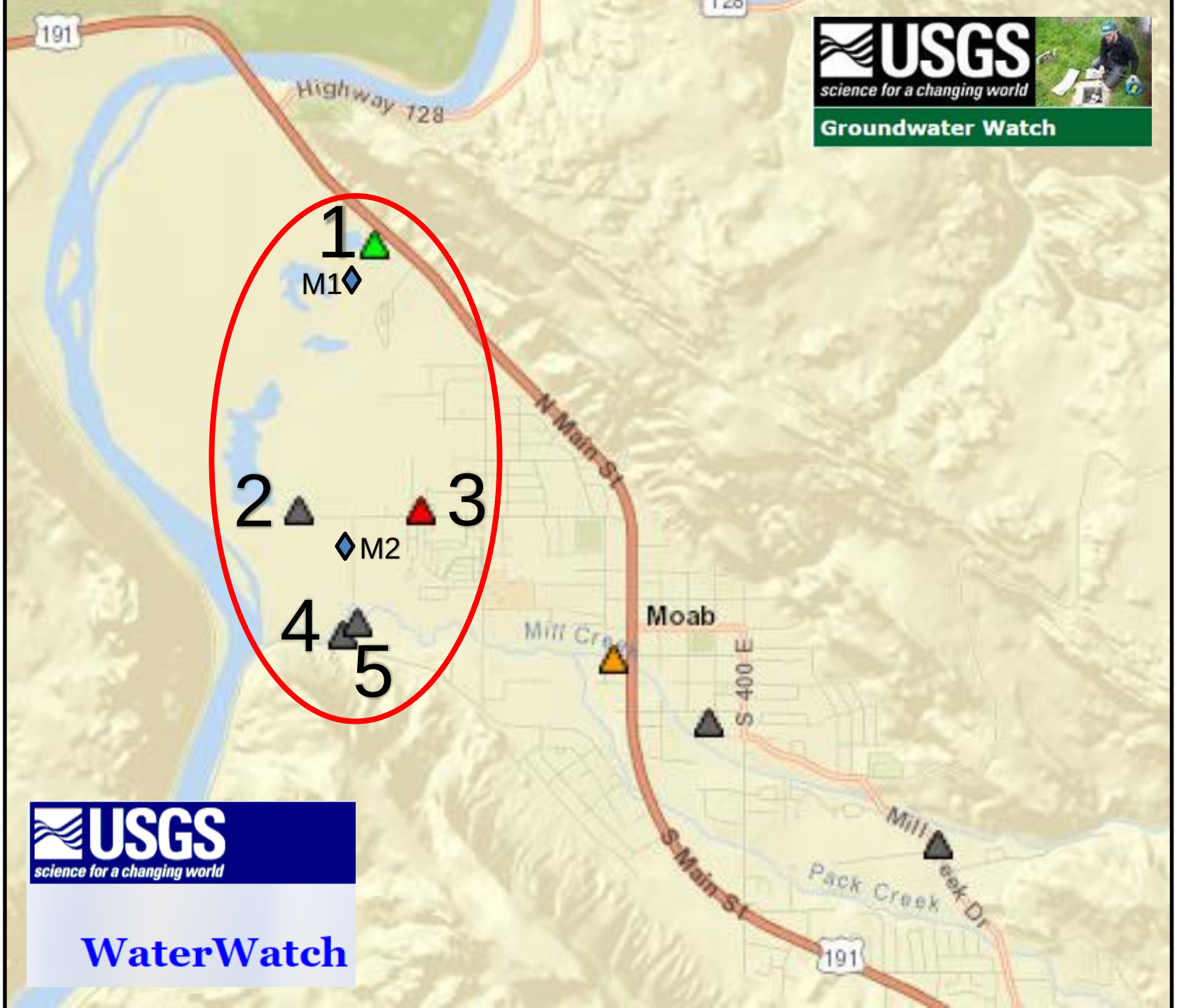
Total-Dissolved-Solids (TDS)

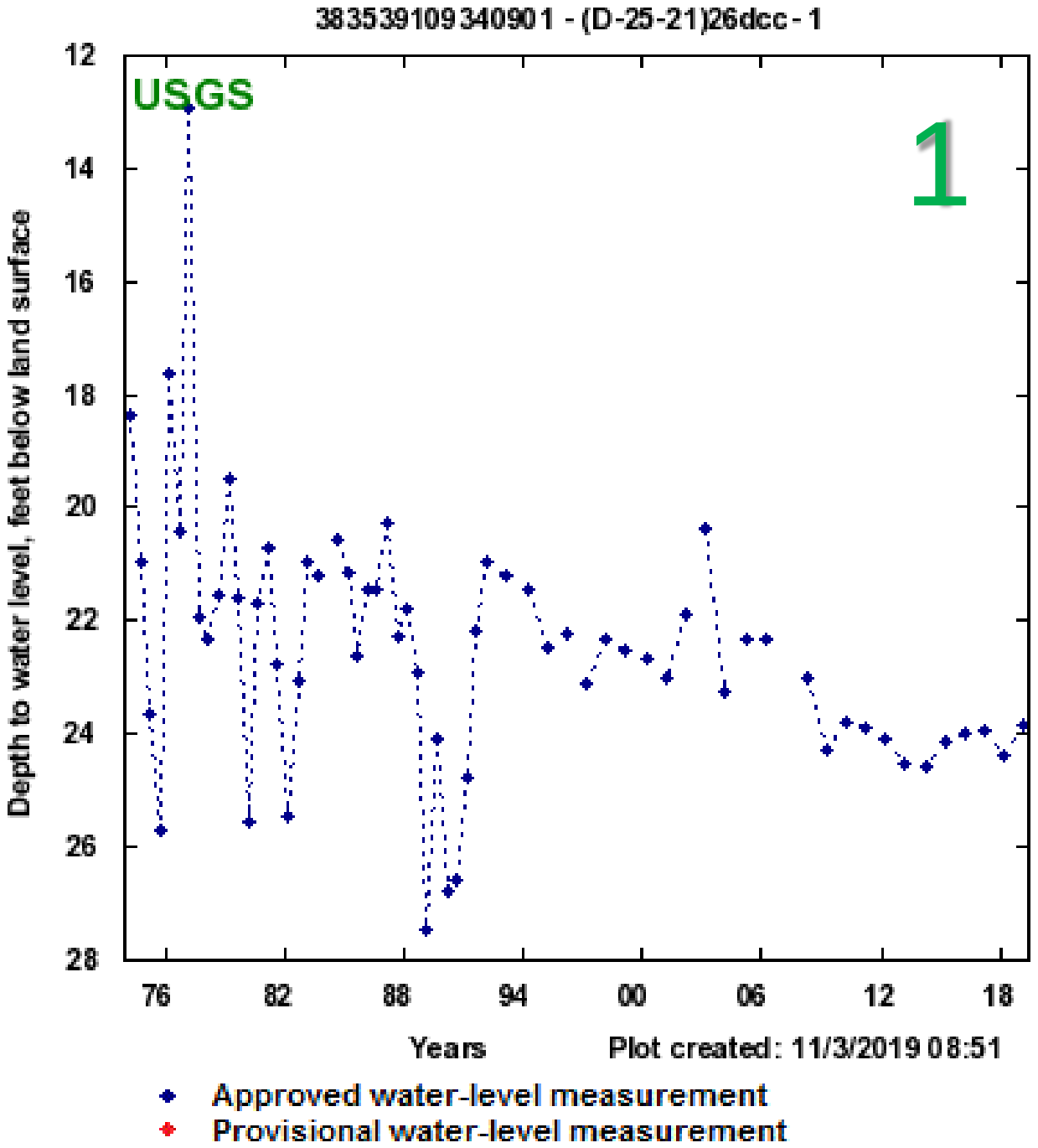
Valley fill

- 0 - 250 mg/L
- 251 - 500 mg/L
- 501 - 1000 mg/L
- 1001 - 2000 mg/L

▲ USGS Monitoring Well

SPECIAL STUDY 120
UTAH GEOLOGICAL SURVEY


USGS
science for a changing world
Groundwater Watch
191
Highway 128
1
M1
2
3
M2
4
5
N Main St
Moab
Mill Creek
S 400 E
S Main St
Pack Creek
Mill Creek Dr
191
USGS
science for a changing world
WaterWatch



Williams Gas Plant / New Condo Dev.

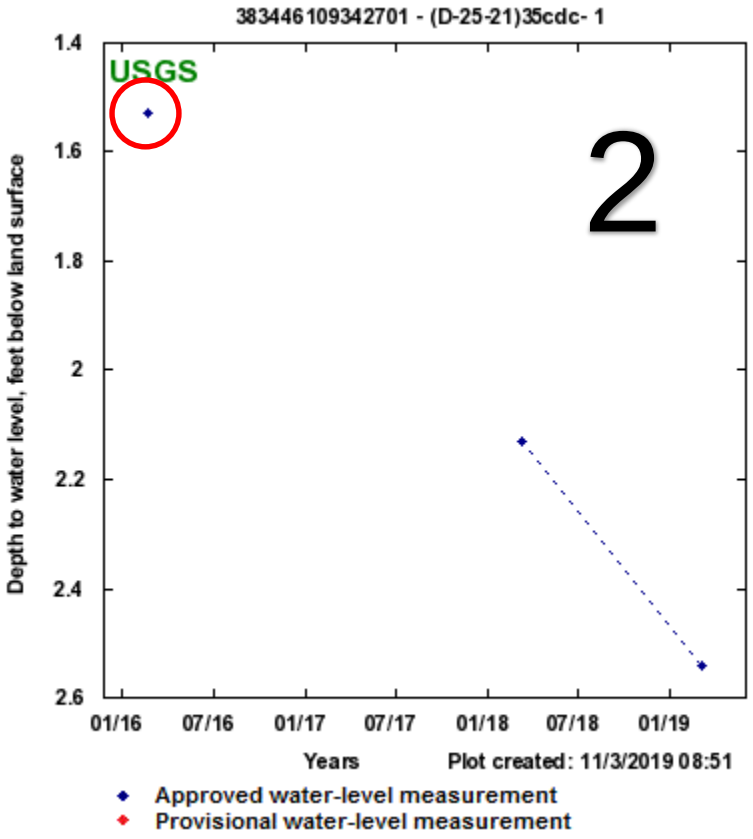
Valley Fill

0-38’ Sand

38-55’ Gravel

M1 – Continuous Read Well Probe installed in October 2019

Matheson Wetlands – Treatment Plant

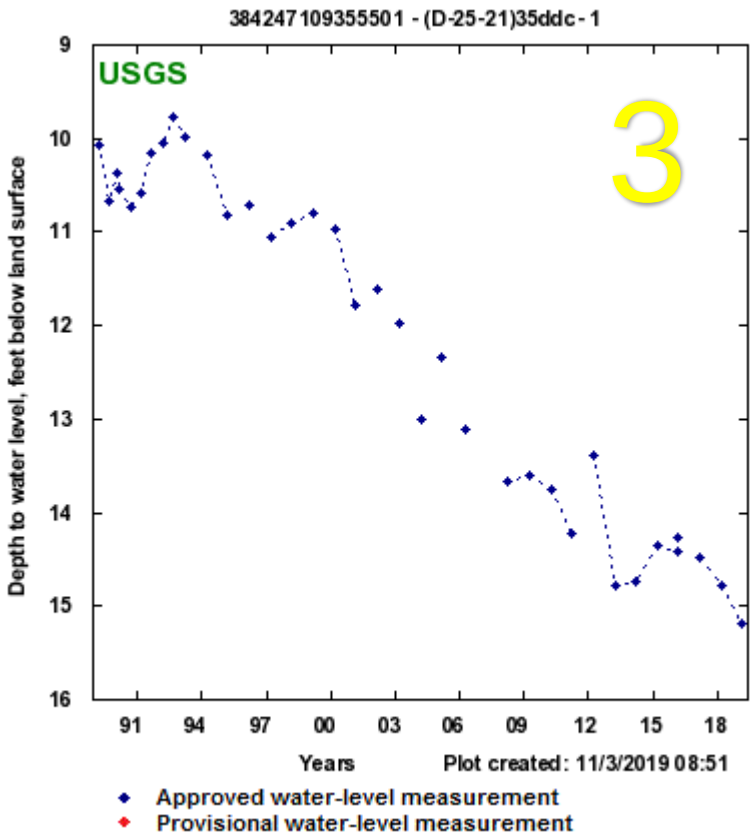


Valley Fill

0-32’ Sand

32-40’ Gravel

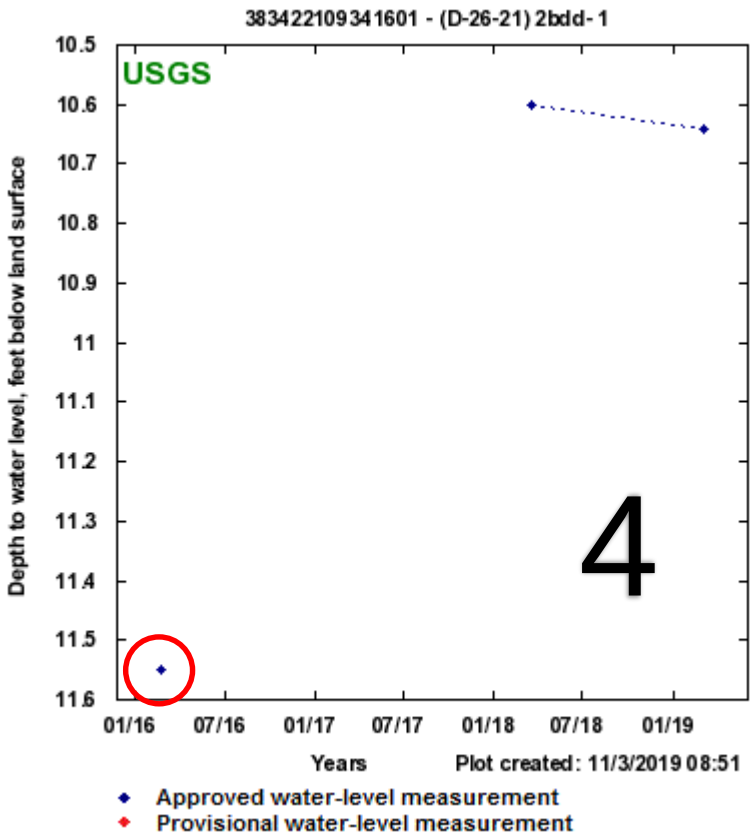
Riversands & 400 N Well



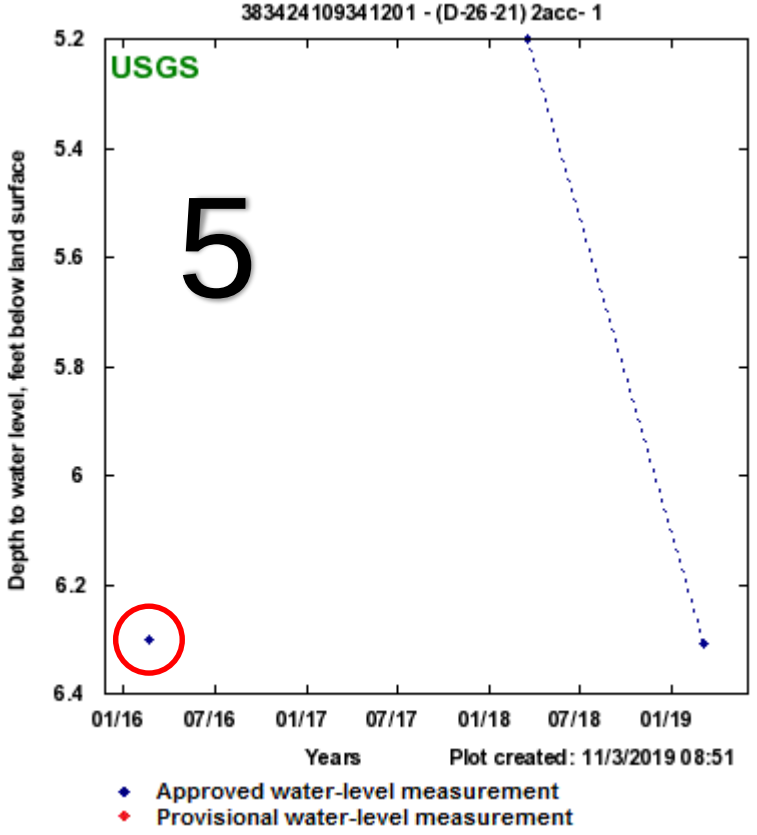
No Well Log

M2 – Continuous Read Well Probe installed in October 2019

Matheson Wetlands – South Parking Lot (S)



Matheson Wetlands – South Parking Lot (N)



Valley Fill

0-62’ Sand / Gravel

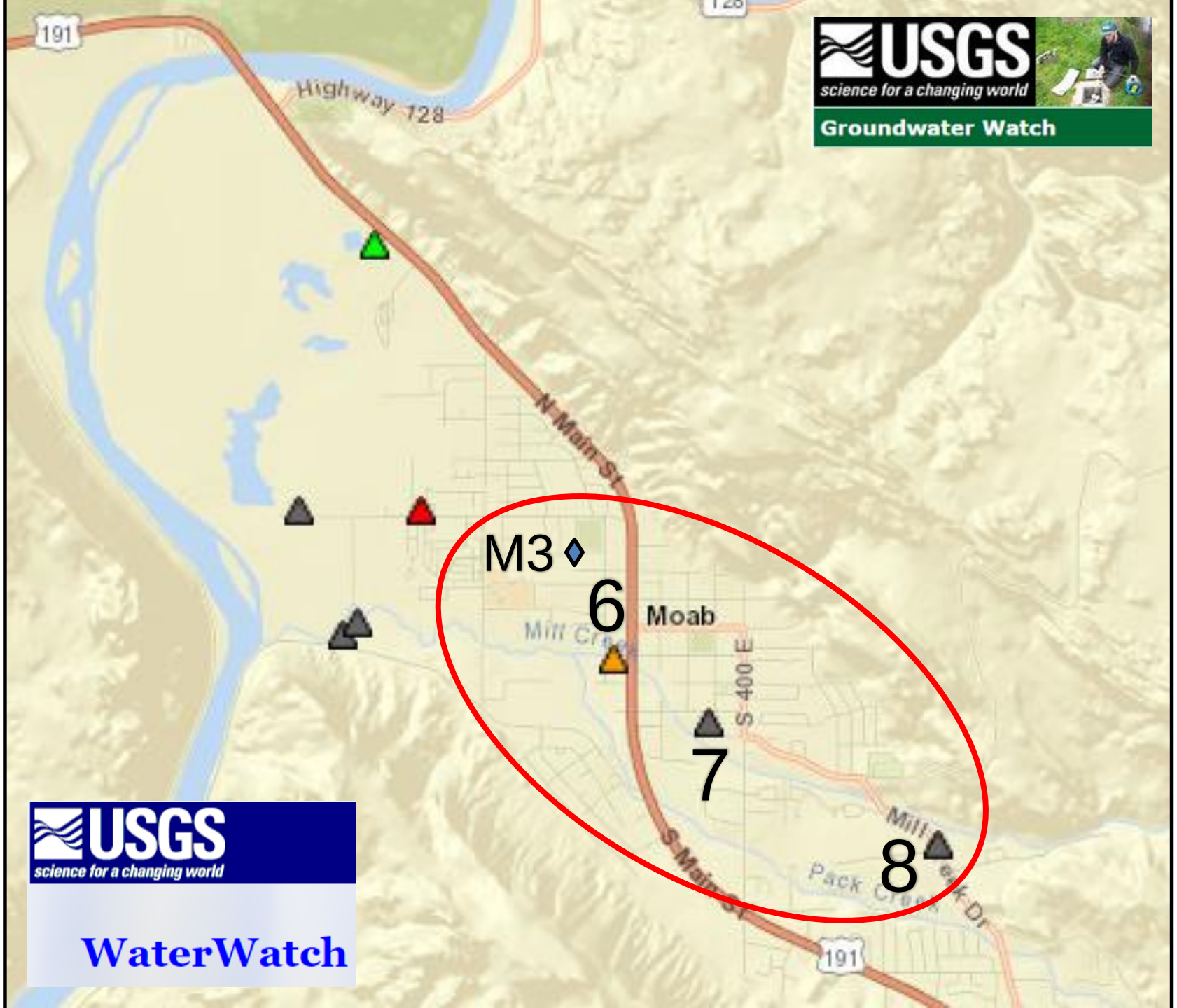
Bedrock

62-65’ Gypsum / Paradox / Caprock

Valley Fill

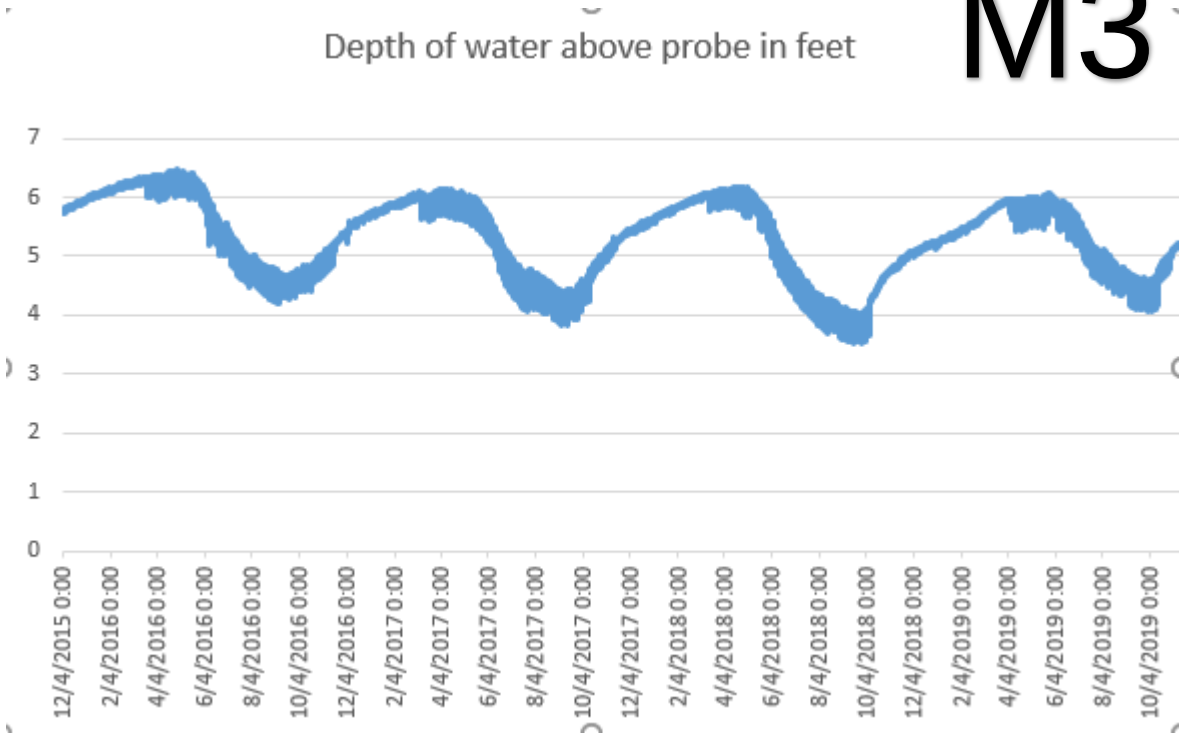
0-25’ Sand

25-51’ Gravel

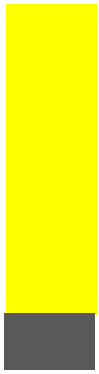

USGS
science for a changing world
Groundwater Watch
191
Highway 128
N Main St
M3
6
Moab
Mill Creek
S 400 E
7
S Main St
8
Mill Creek Dr
Pack Creek
191
USGS
science for a changing world
WaterWatch

Swanny Park

M3



Depth to Water 1979: 18’

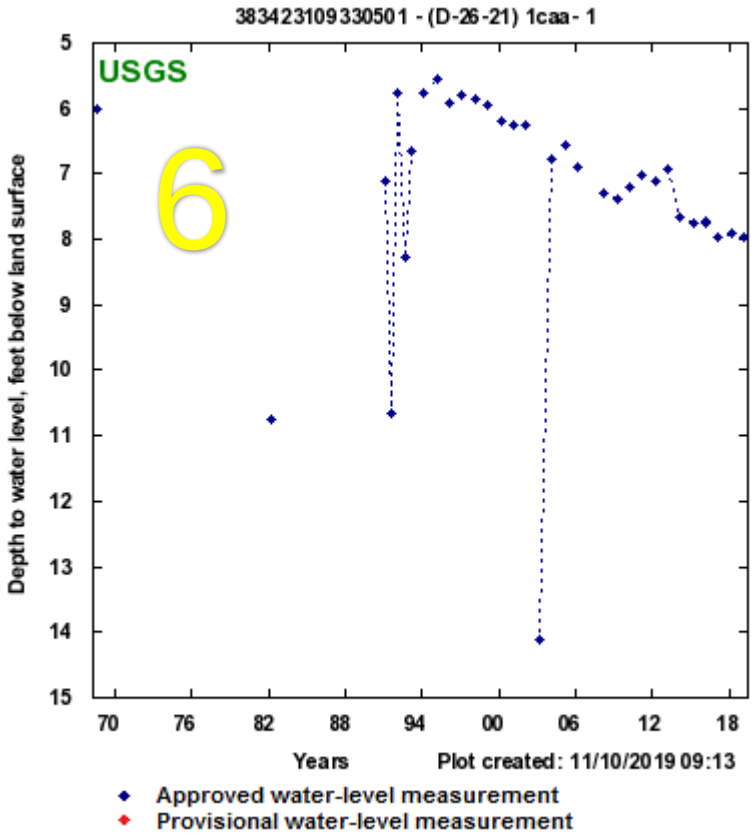


Valley Fill

0-122’ Sand / Gravel

122’ – 128’ “Paradox Formation”

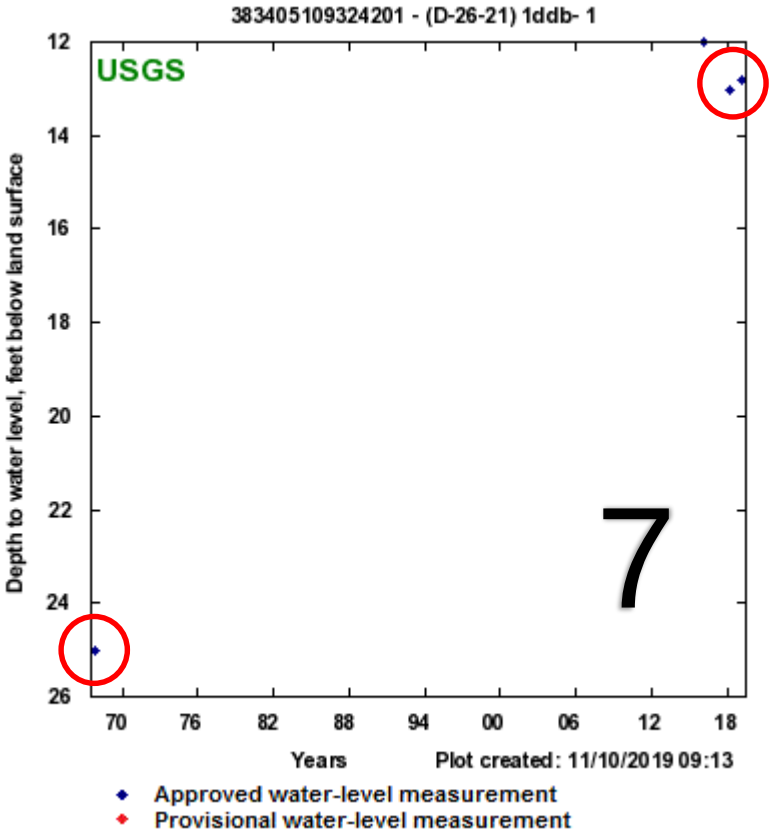
Hotel Moab – North Parking Lot



Valley Fill

0-85’ Sand / Gravel

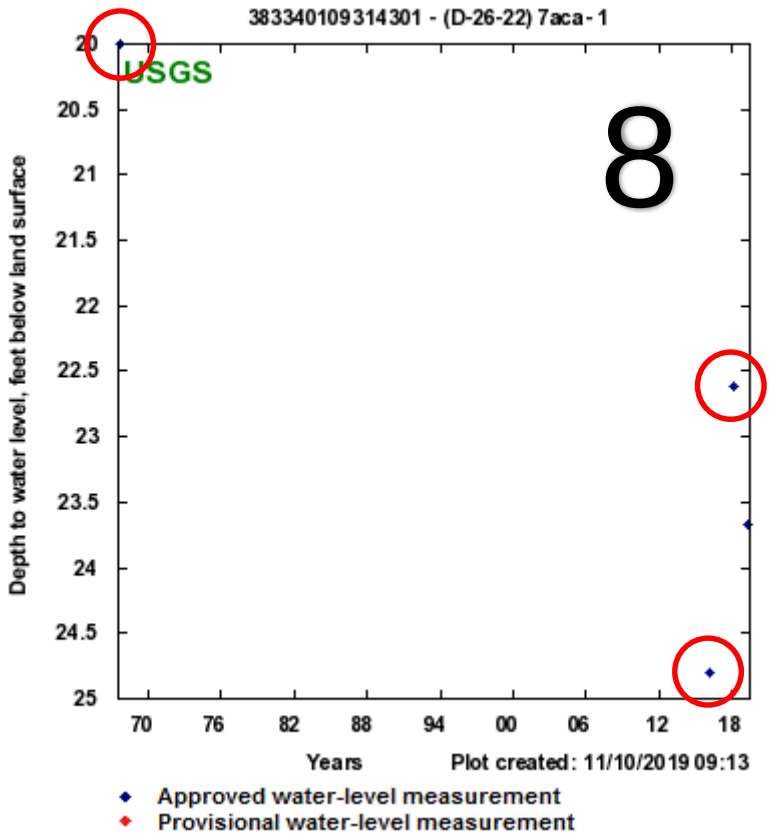
300 South



Valley Fill

0-30’ Sand / Gravel

Powerhouse Lane

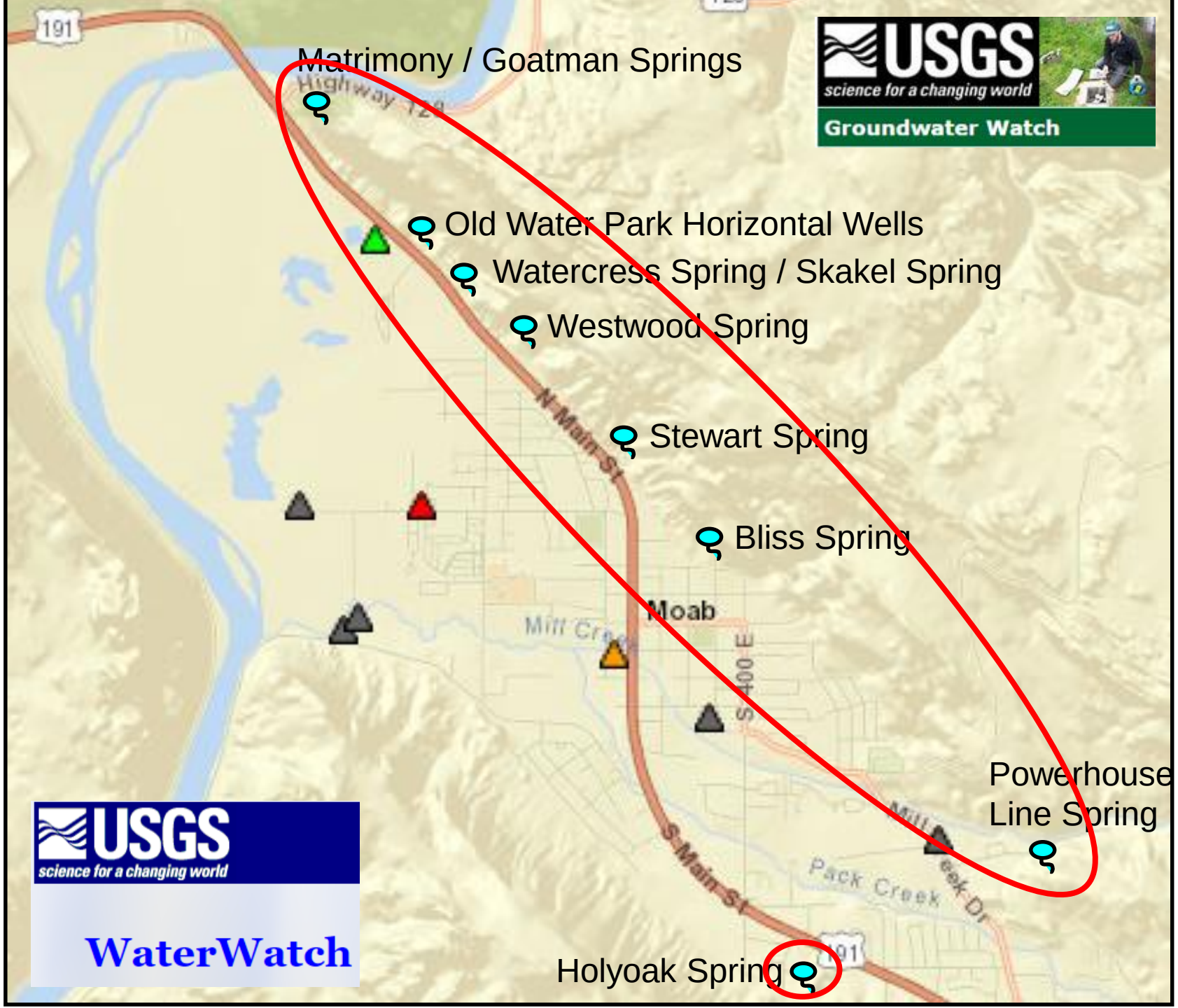


1956 Water Level: 23

Valley Fill

0-123’ Sand / Gravel / Boulders

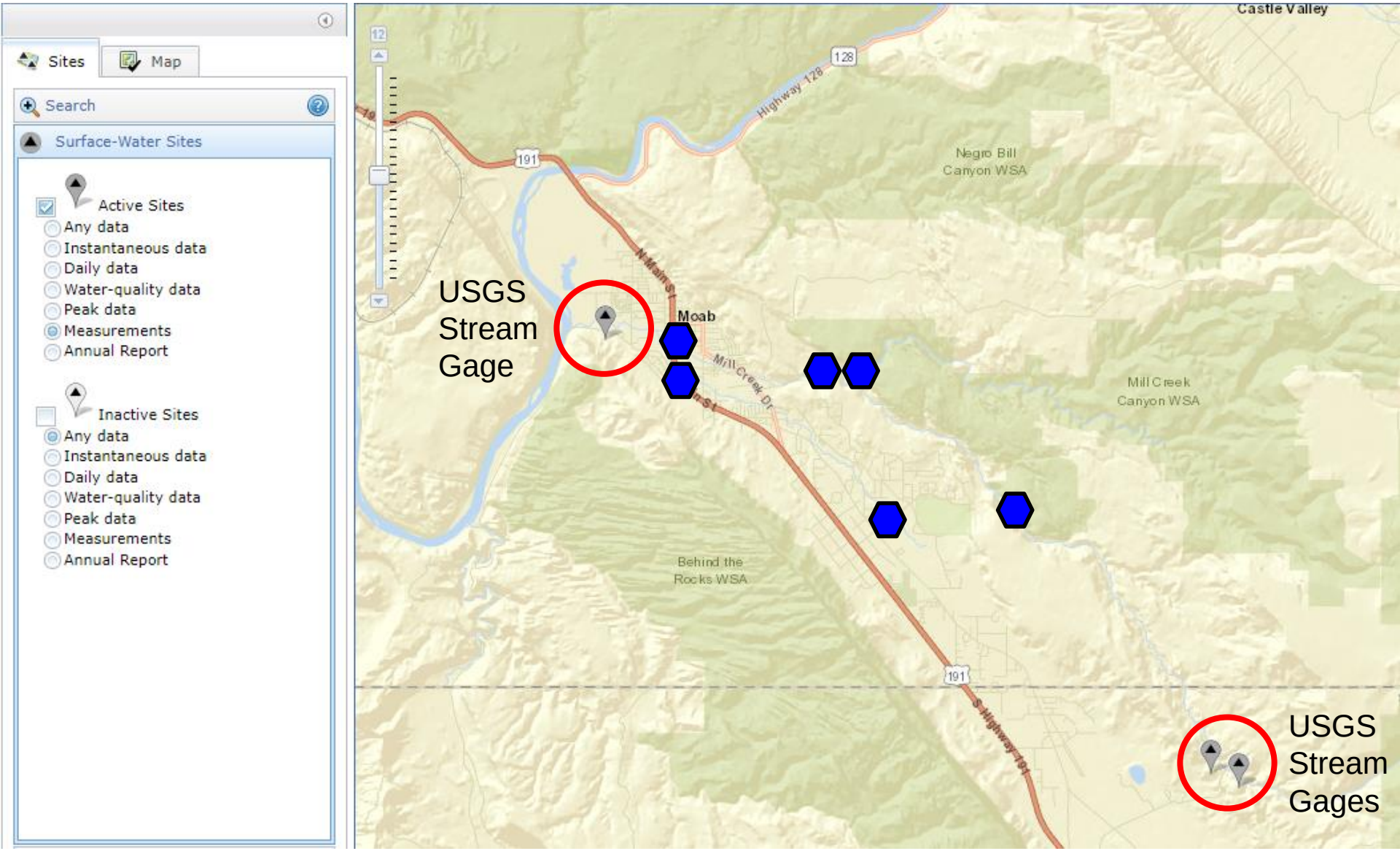
123’ – 245’ “Blue Shale”

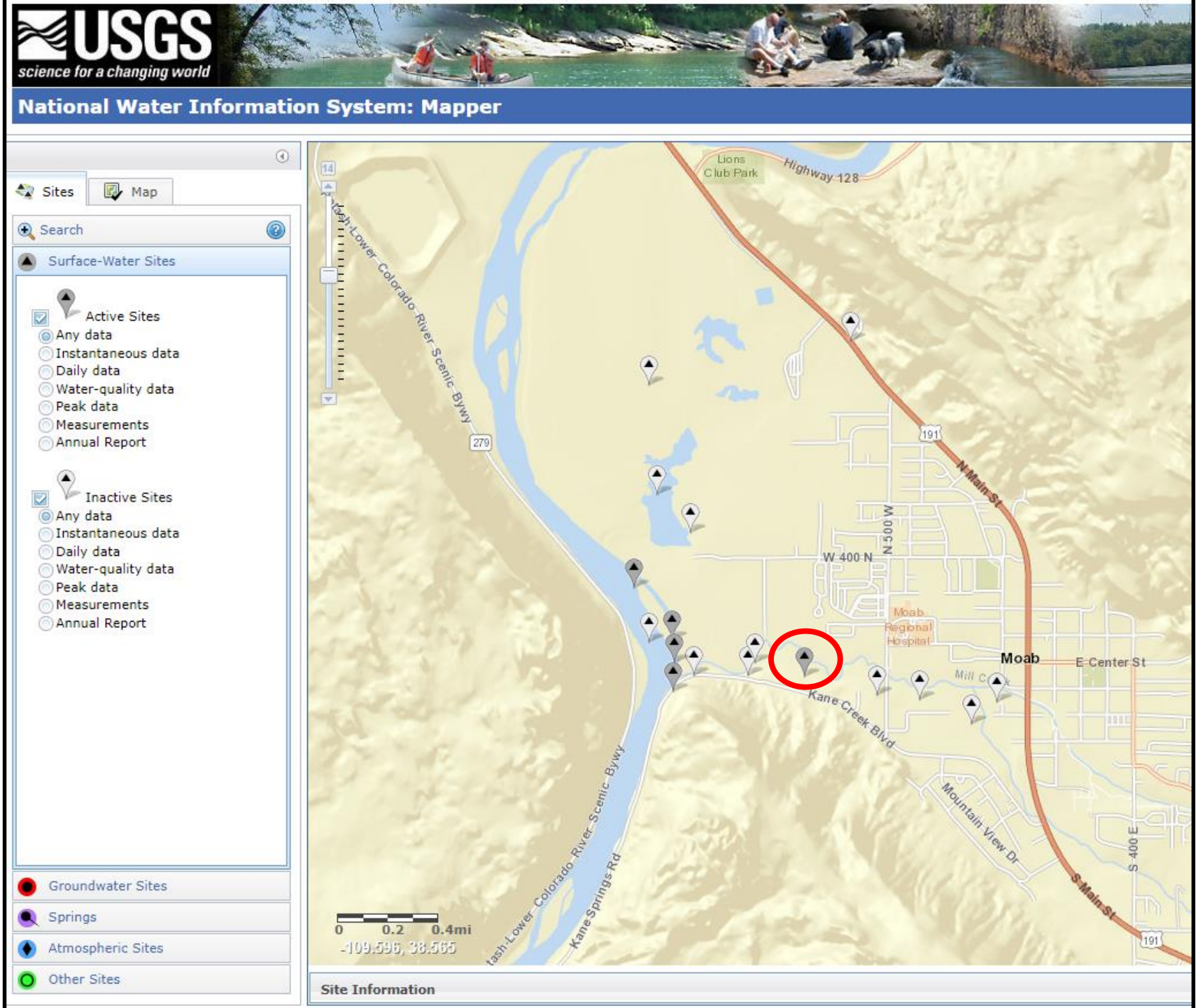

USGS
science for a changing world
Groundwater Watch
Matrimony / Goatman Springs
Old Water Park Horizontal Wells
Watercress Spring / Skakel Spring
Westwood Spring
Stewart Spring
Bliss Spring
Moab
Powerhouse
Line Spring
Holyoak Spring
N Main St
S Main St
S 400 E
Mill Creek
Pack Creek
191
USGS
science for a changing world
WaterWatch

Natural Spring Flows

- Matrimony/Goatman, Old Water Park, Watercress, Westwood, Stewart, Bliss, Powerline & Holyoak — No Monitoring / Measurements

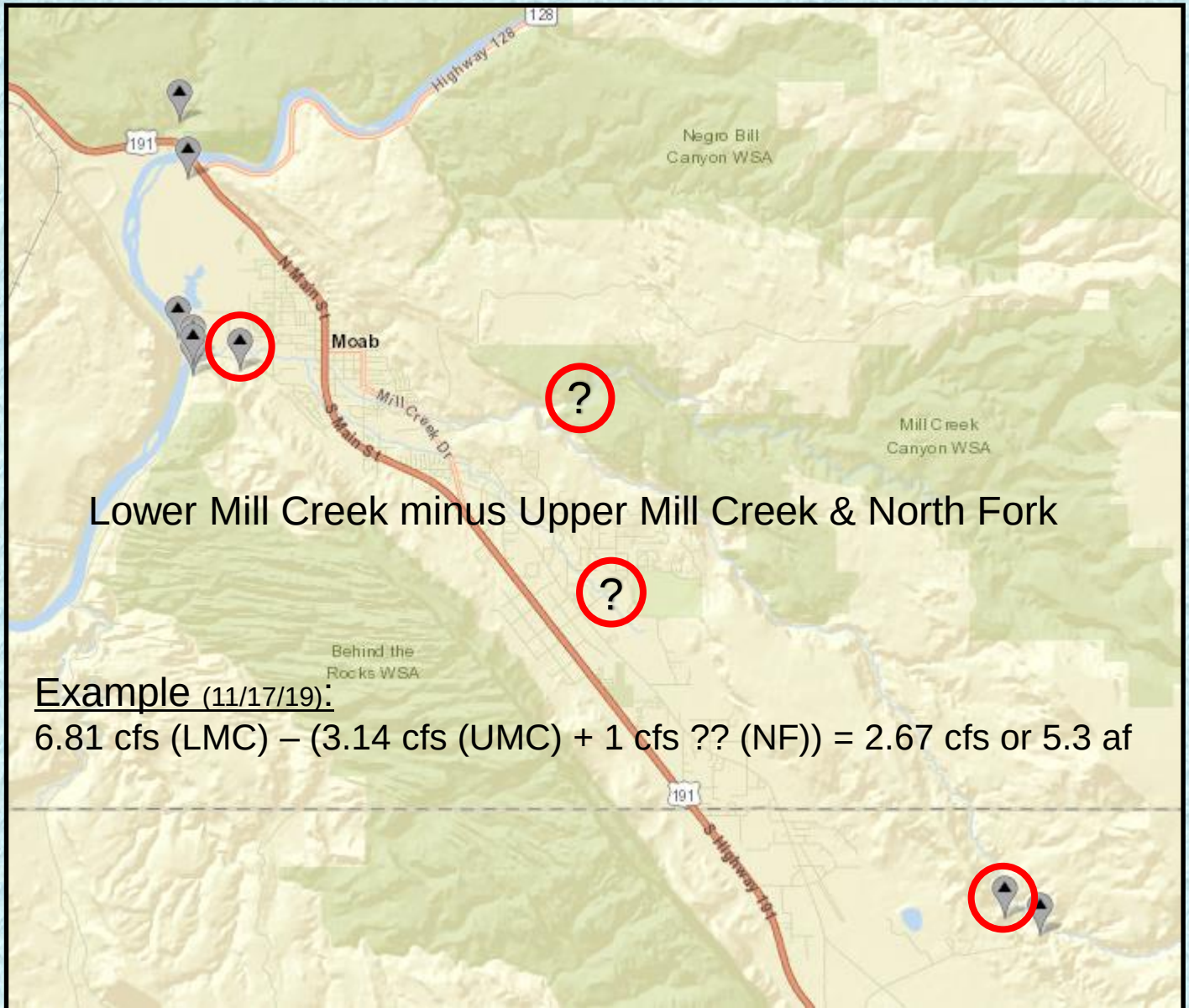
- Skakel - Flow to Tanks: Metered
  Overflow: Not Metered

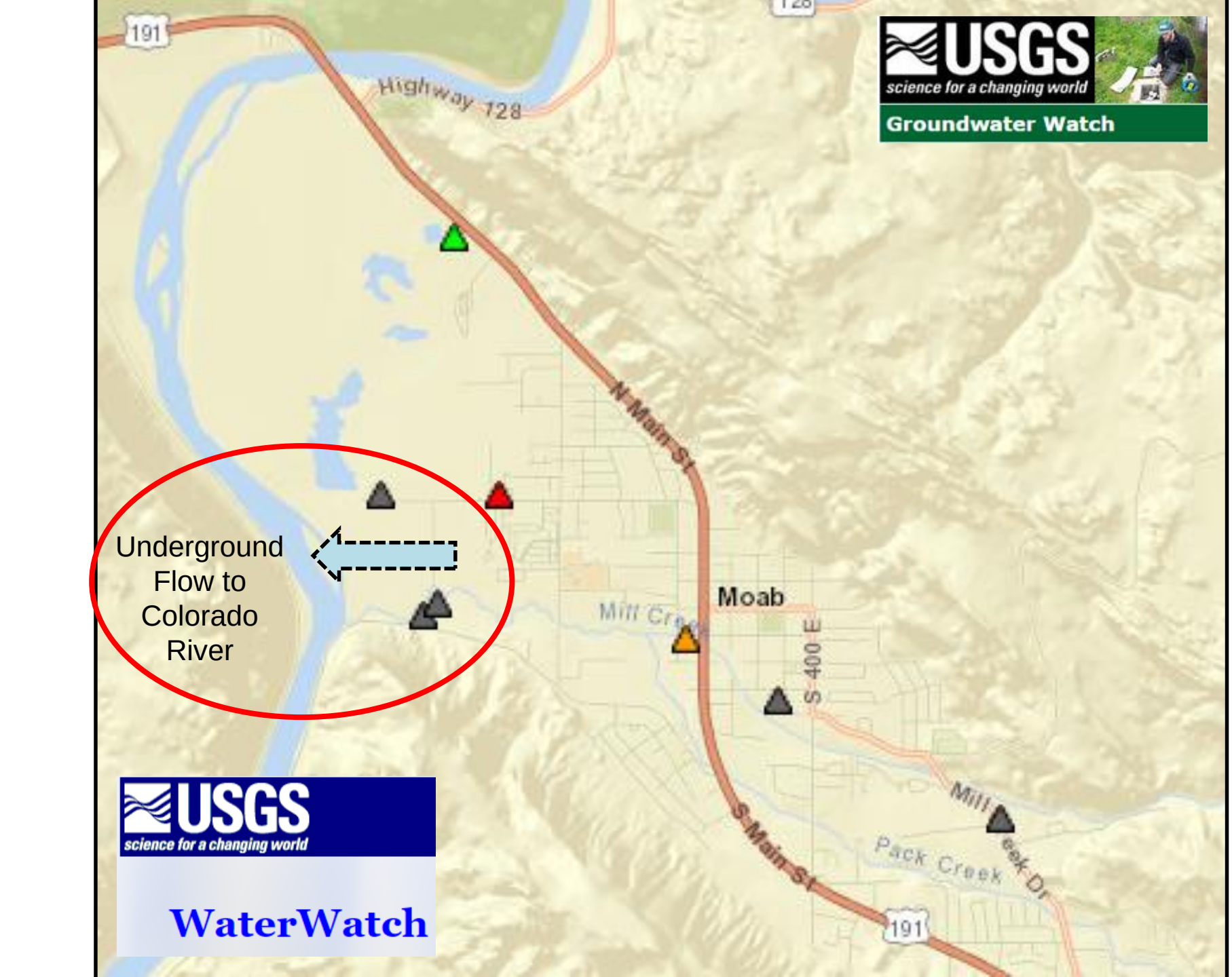

Sites
Map
Search
Surface-Water Sites
Active Sites
Any data
Instantaneous data
Daily data
Water-quality data
Peak data
Measurements
Annual Report
Inactive Sites
Any data
Instantaneous data
Daily data
Water-quality data
Peak data
Measurements
Annual Report
USGS Stream Gage
Moab
Castle Valley
Highway 128
191
Negro Bill Canyon WSA
Mill Creek Canyon WSA
Behind the Rocks WSA
USGS Stream Gages


USGS
science for a changing world
National Water Information System: Mapper
Sites
Map
Search
Surface-Water Sites
Active Sites
Any data
Instantaneous data
Daily data
Water-quality data
Peak data
Measurements
Annual Report
Inactive Sites
Any data
Instantaneous data
Daily data
Water-quality data
Peak data
Measurements
Annual Report
Groundwater Sites
Springs
Atmospheric Sites
Other Sites
Lions Club Park
Highway 128
Utah-Lower Colorado River Scenic Bywy
279
191
N Main St
N 500 W
W 400 N
Moab Regional Hospital
Moab
E Center St
Mill Creek
Kane Creek Blvd
Mountain View Dr
S 400 E
S Main St
Kane Springs Rd
0 0.2 0.4mi
-109.596, 38.565
Site Information

Return / Base Flows

- Groundwater (valley aquifers) returning to the stream channel

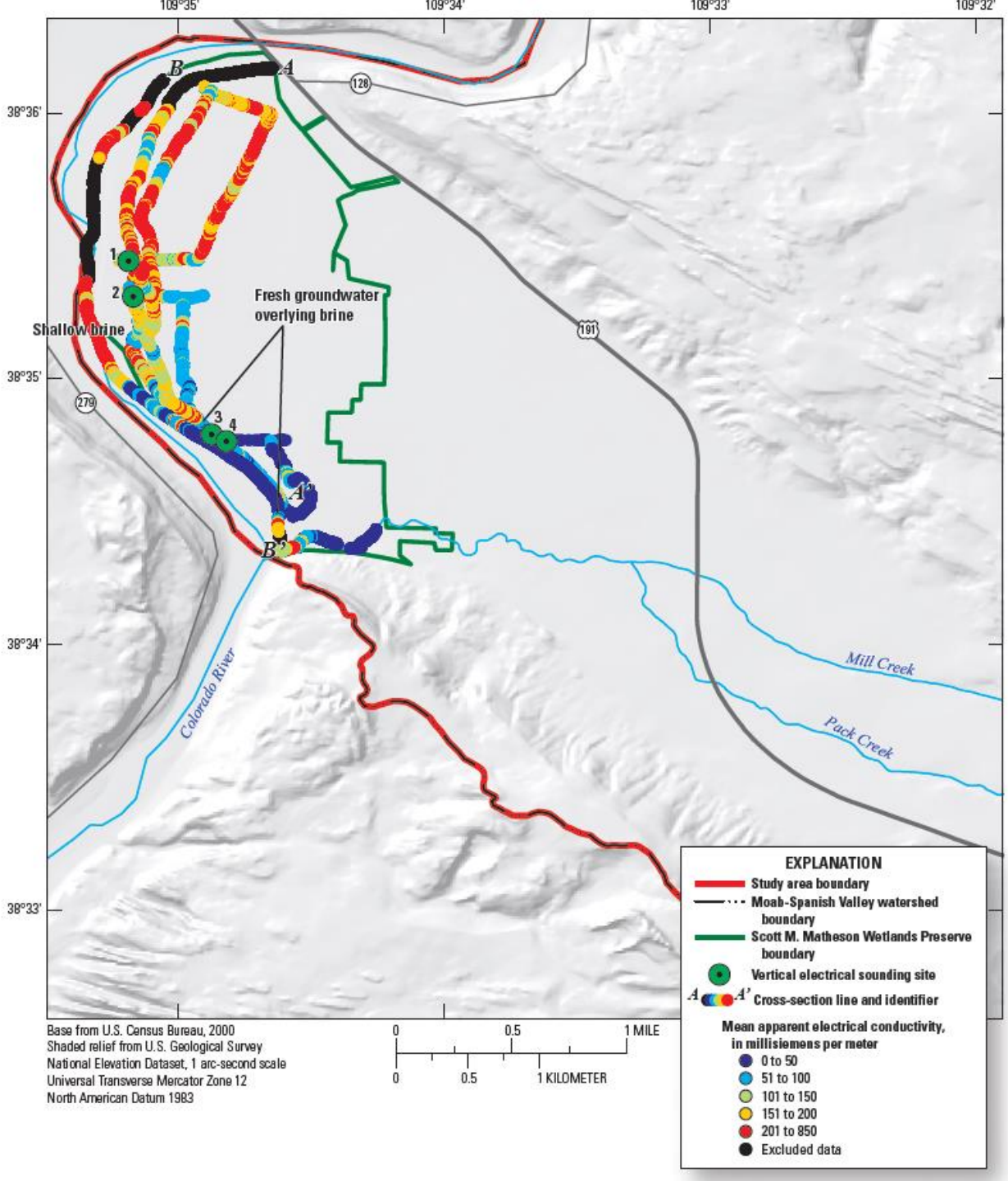



USGS
science for a changing world
Groundwater Watch
191
Highway 128
N Main St
Underground Flow to Colorado River
Moab
Mill Creek
S 400 E
Mill Creek Dr
Pack Creek
S Main St
191
USGS
science for a changing world
WaterWatch

Groundwater Discharge to Colorado River

Matheson Wetland Geophysics (April 2015)

- Surface Electromagnetic Resistivity (EMR)



USGS "**Evaluation of Groundwater Resources in the Spanish Valley Watershed, Grand and San Juan Counties, Utah"**

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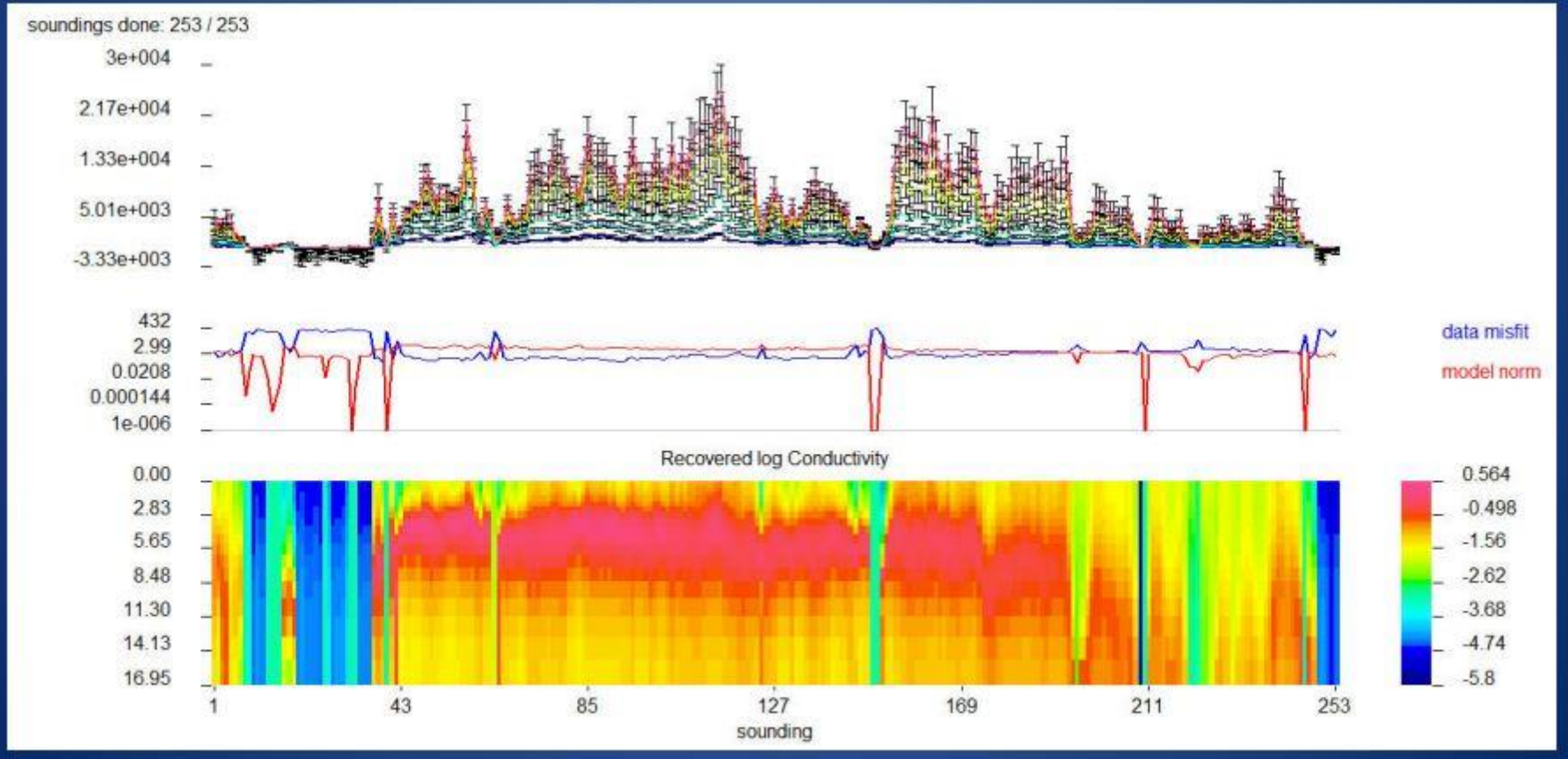
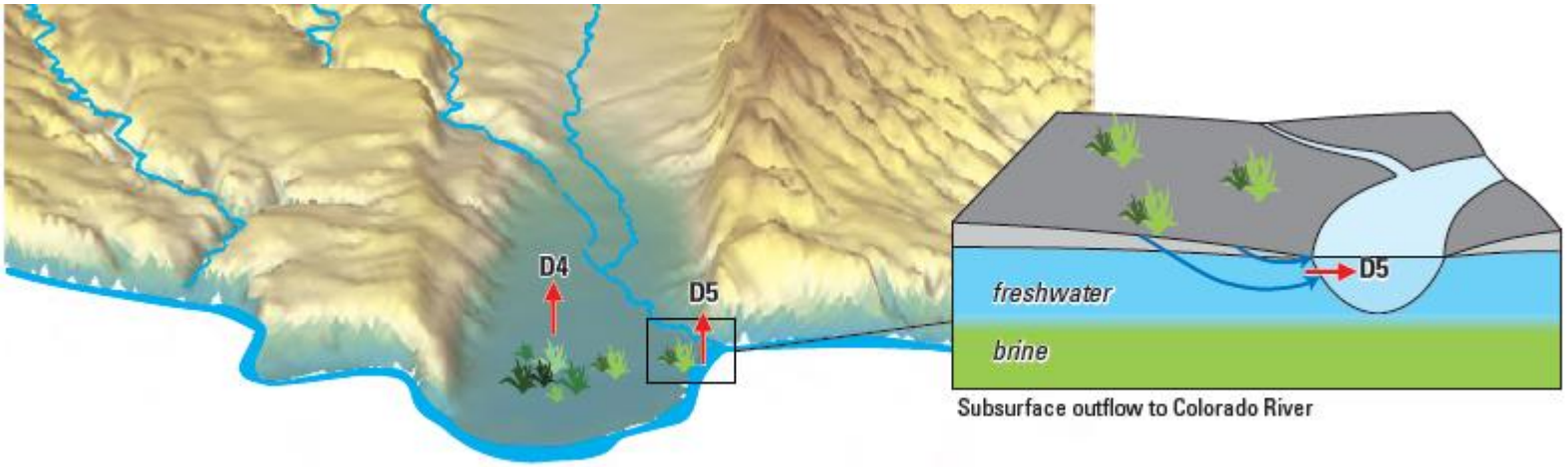
Surface EM Resistivity geophysics

- Low resistivity (blue) = freshwater
- High resistivity (red) = brine saturated sediments
- EM survey will guide drilling locations & together they will define cross section for Darcy estimate





Sumsion (1971): 8,000 acre-feet / year

USGS (2019): 300 – 1,000 acre-feet / year

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Thank You… Any Questions?

Utah Division of Water Rights