

Uinta Basin Baseline Water-Quality Study

Janae Wallace
October 2009 update

OBJECTIVES

- Create database of springs, creeks, wells
- Create database of water quality
- Create GIS data- chemistry maps
- Create baseline water quality (spatially and temporally)- 2009, 2010, 2011
- Document changes in water quality

Legend

● Potential wells to sample
-this study

Wells previously sampled
by USGS (1987)

- Alluvial Aquifer
- Birds Nest Aquifer
- Douglas Creek Aquifer
- Surface Water Site
- Spring
- Stream
- Road
- Lake
- Study-area

Approximate Area
of Principal Recharge

- Birds Nest Aquifer
- Douglas Creek Aquifer

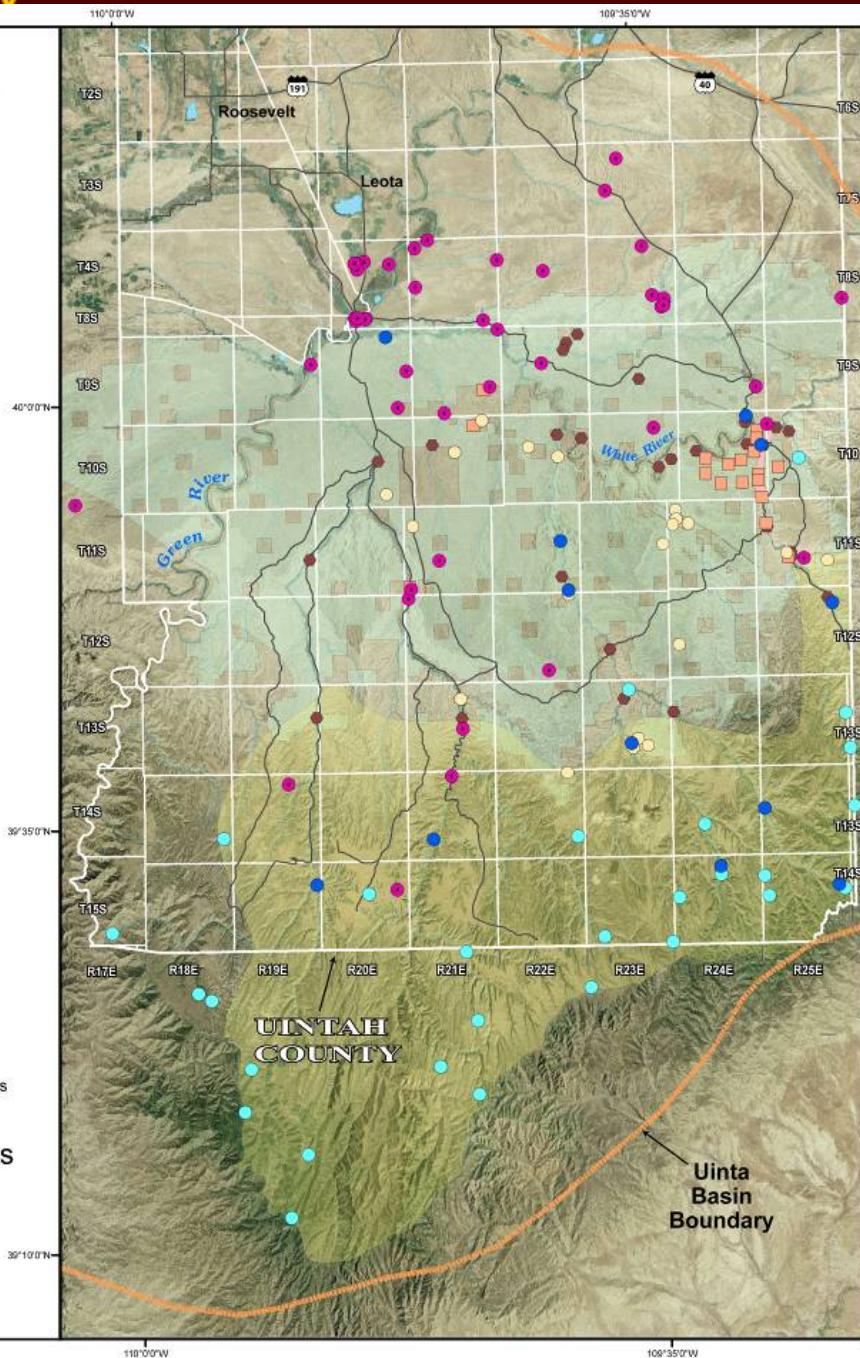


Location Map



Proposed Sample Sites
for Ground-Water
Quality Sampling
in the Uinta Basin

by Janae Wallace



Database Sources (previous reports)

- Wally Gwynn - (UGS) springs and wells (~90 data entries)
- USGS (1987- map only)
- Utah Division of Drinking Water (psw)
- Industry - (Kerr McGee, Anadarko, Westport Resources) ~120 data entries
- Zhang and others (2009) ~57 data entries



Legend

Total Dissolved Solids

- 0 to 3000
- 3001 - 10,000
- 10,001 - 50,000
- 50,001 or greater

— Stream

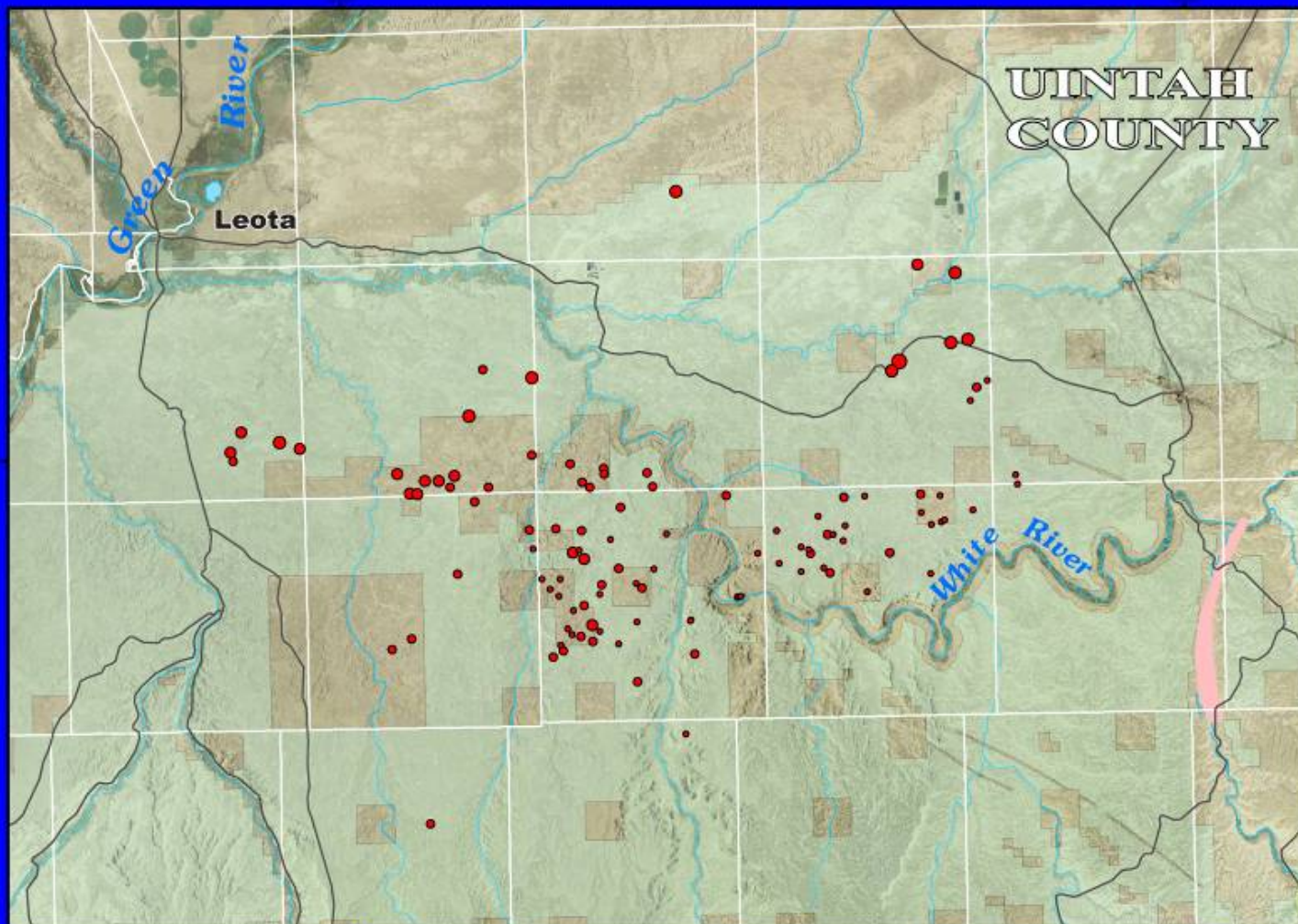
— Road

■ Lake

■ Study-area

Approximate Area
of Principal Recharge

■ Birds Nest Aquifer



0 1.25 2.5 5 7.5 10 Miles

TDS for Uinta Basin Oil/Gas Wells Uintah County, Utah

Legend

Total Dissolved Solids

- 0 - 1000 mg/L
- 1001 - 3000 mg/L
- 3001 - 10,000 mg/L
- 10,001 - 50,000 mg/L
- 50,001 mg/L or greater

Formation Description

- Mesaverde
- Mesaverde + Mancos
- Wasatch
- Mesaverde + Mancos B
- Mesaverde + Wasatch
- Mancos + Dakota
- Mancos
- Dakota

— Uinta Basin Boundary

~ River

~ Roads

Water Body

Douglas Creek Aquifer

Birds Nest Aquifer

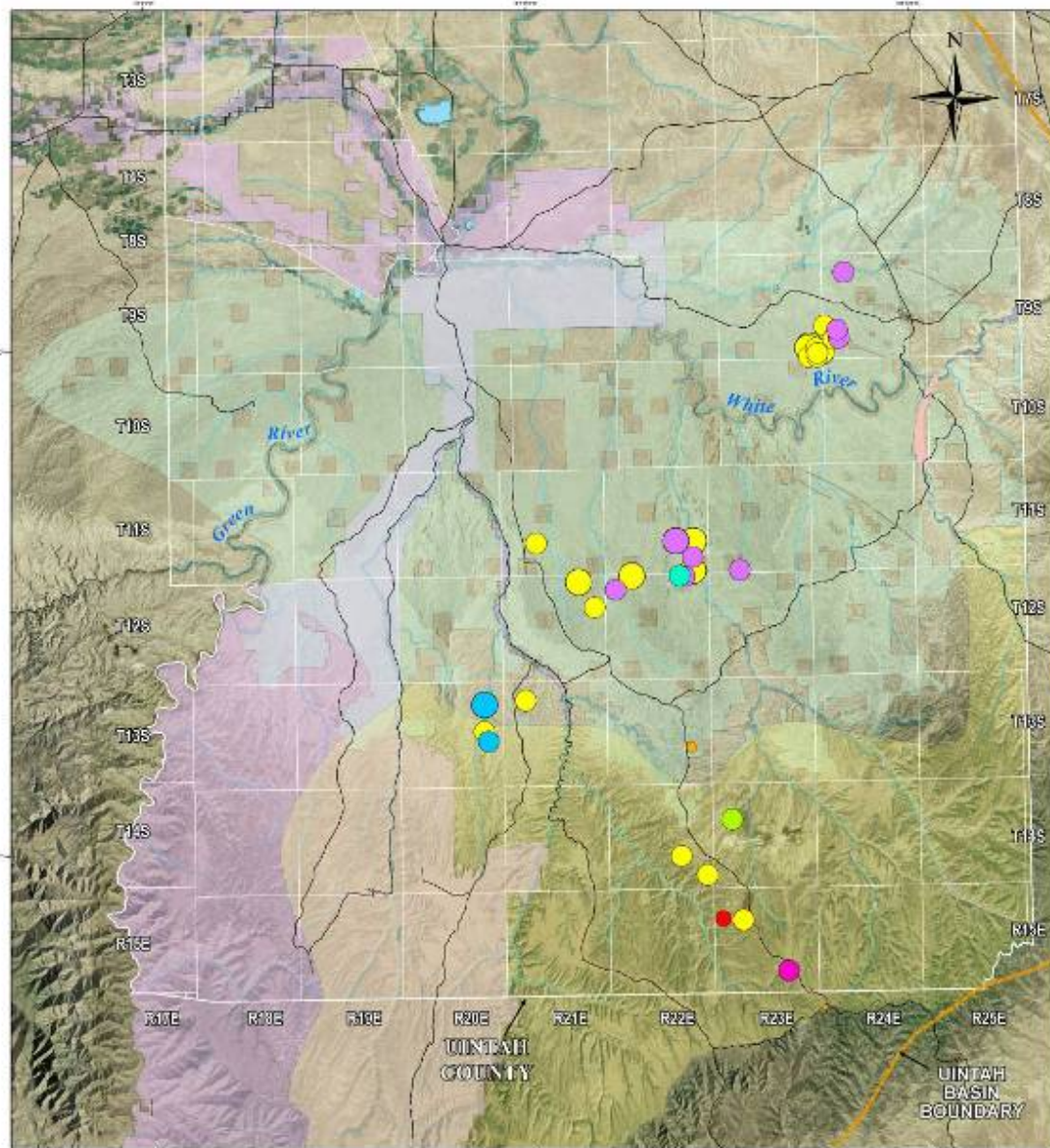
BLM UT
(oil shale lease area)

Tribal Lands



Location Map

Zhang TDS Data



2009 Events

- Recon during March 2009 (BLM, DWQ, and DOGM staff)- 50 wells proposed (most unavailable)
- 4 sampling trips-June, July, August (twice)
- 15 sites- 2 springs, 2 creeks, 11 wells
- Resample October 2009
- Constituents sampled: General Chemistry (Mg, Ca); Nutrients (NO_3); Metals (As, Pb, Se, Ba); TOC; VOCs

Park Canyon (USGS)

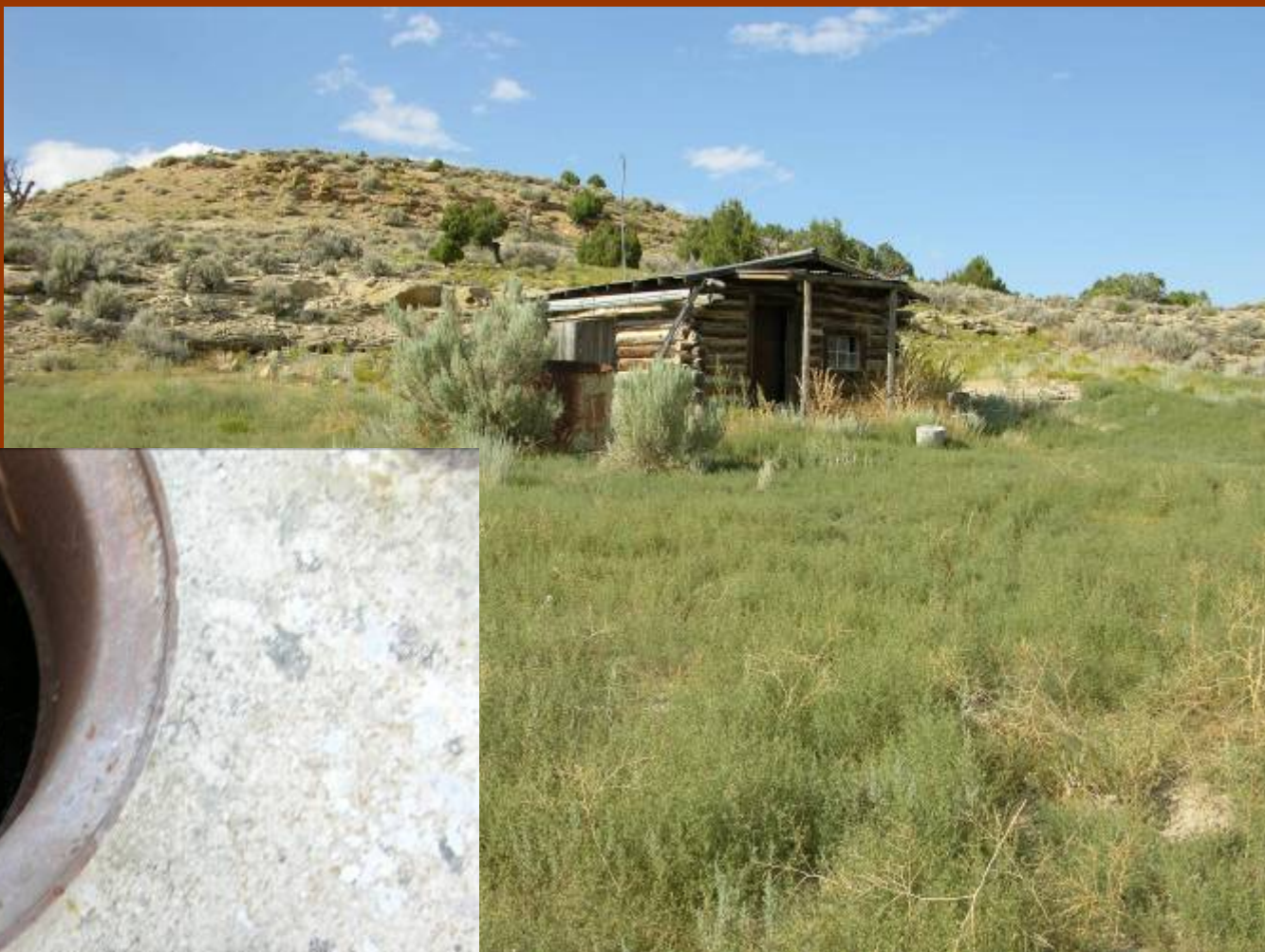
Domestic-Willow Creek



Seep Ridge/ Willow Creek



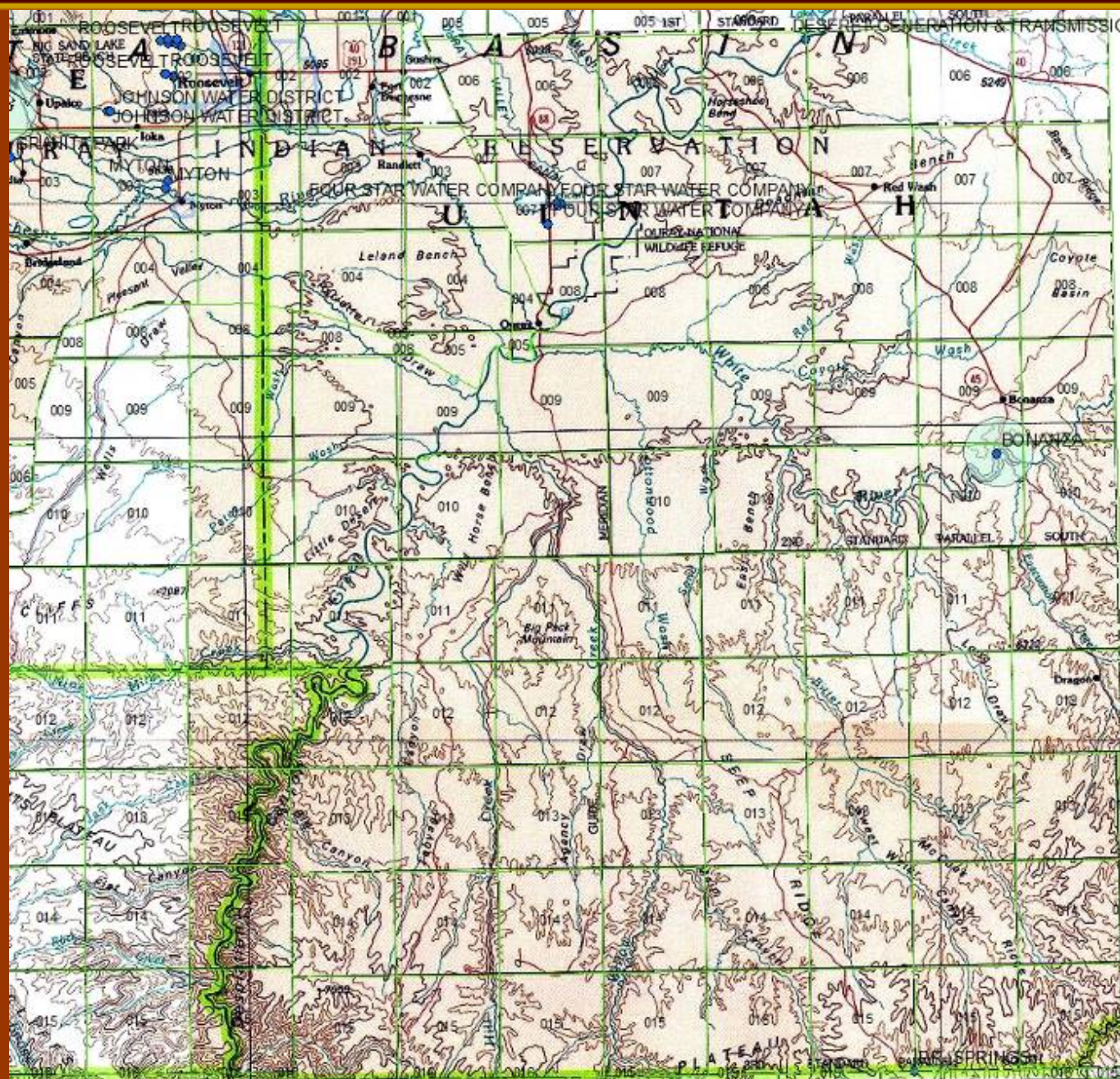
Seep Ridge Domestic Well 1964



Rabbit Mtn
OSEC dry hole



BLM- Seep Ridge



Public-Supply Sources

4-star (2 wells,
same aquifer)

Bonanza (inactive)

Desert Power
(treated Green River)

Roosevelt, Myton,
Duchesne, Gusher
(out of study area)







Domestic
Flowing
Well
Willow Creek
Canyon



Sulfur Spring

Pack Mountain- Willow Creek



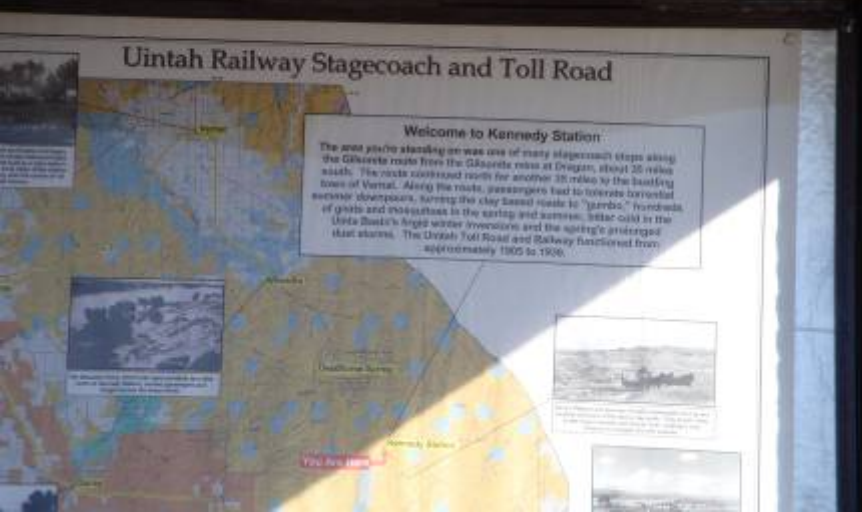


Seep Ridge











USGS
Park Canyon



Kings Well





PR Spring-

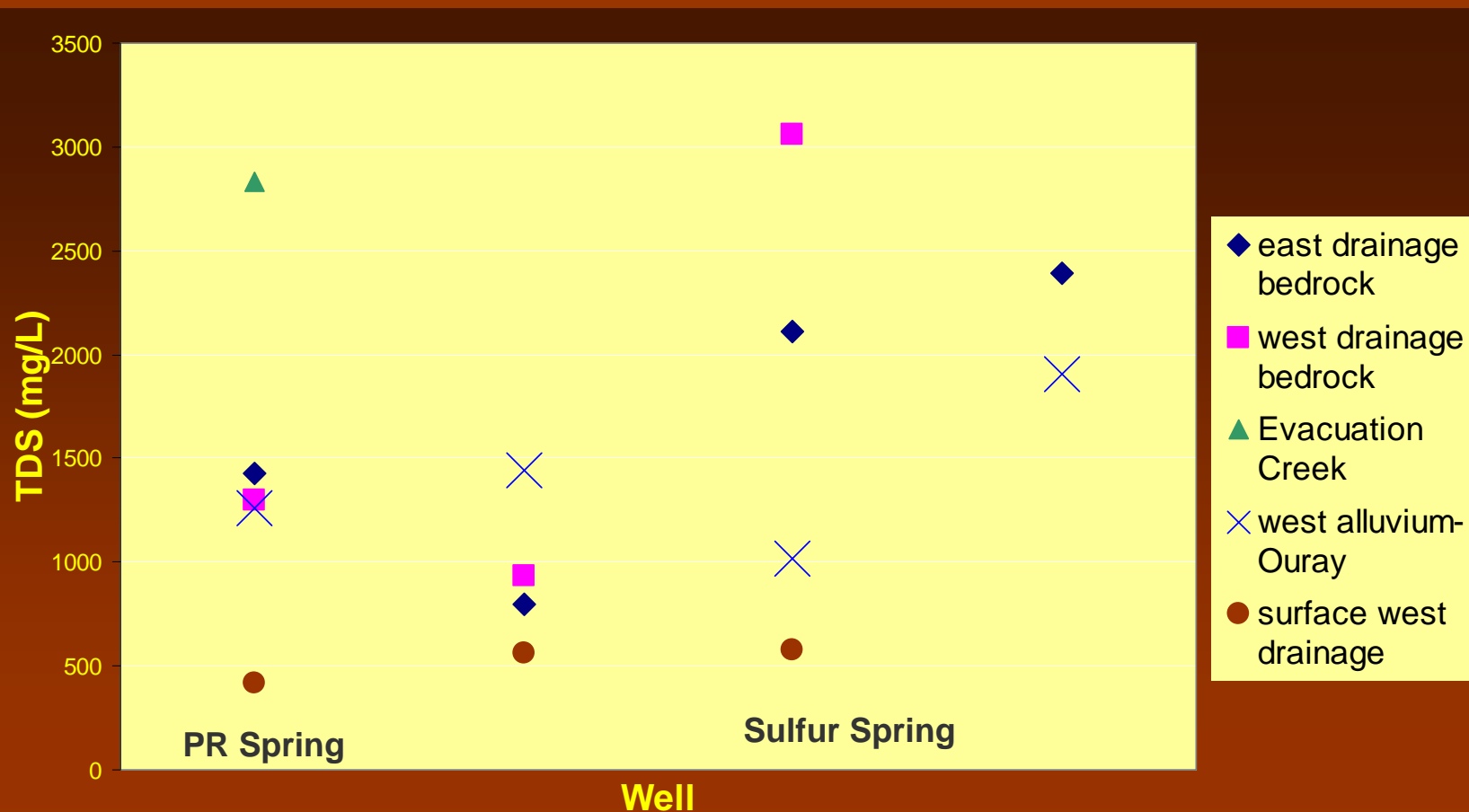




UTAH GEOLOGICAL SURVEY

Water Sampling Sites

Well ID	Depth	Level	Date	NO ₃	TDS	Fm
Park	750	57/350	June	<0.1	1428	Birds N
Park-USGS	193+	Flowing	June	<0.1	796	Green R
Big Pack	6900	Flowing	June	<0.1	1298	Wasatch
Willow-domestic	711	Flowing	June	<0.1	936	Green R?
Willow Creek	Surf	Surface	June	<0.1	562	Alluvial
Sulfur Spring	Spring	Flowing	June	<0.1	578	Green R?
Evacuation	Surf	Surface	July	<0.1	2832	Alluvial
4-star	172	70	July	12.6	1260	Alluvial
Kings	?	67	July	9.5	2114	?
Windmill	?	?	July	<0.1	2394	?
Target	53	23	July	9.95	1442	Alluvial
R&N	80&60	49&23	July	7.65	1016	Alluvial
Batty	83	28	July	18.8	1908	Alluvial
Seep ridge	>2510	Flowing	August	<0.1	3056	Green R
PR Spring	Spring	Flowing	August	0.4	420	Green R?



Legend

Total Dissolved Solids

● well ● spring ● creek

● 0 - 1000 mg/L

● 1001 - 1500 mg/L

● 1501 - 2000 mg/L

● 2001 - 2500 mg/L

● 2501 mg/L or greater

— Uinta Basin Boundary

~ River

~ Roads

■ Water Body

■ Douglas Creek Aquifer

■ Birds Nest Aquifer

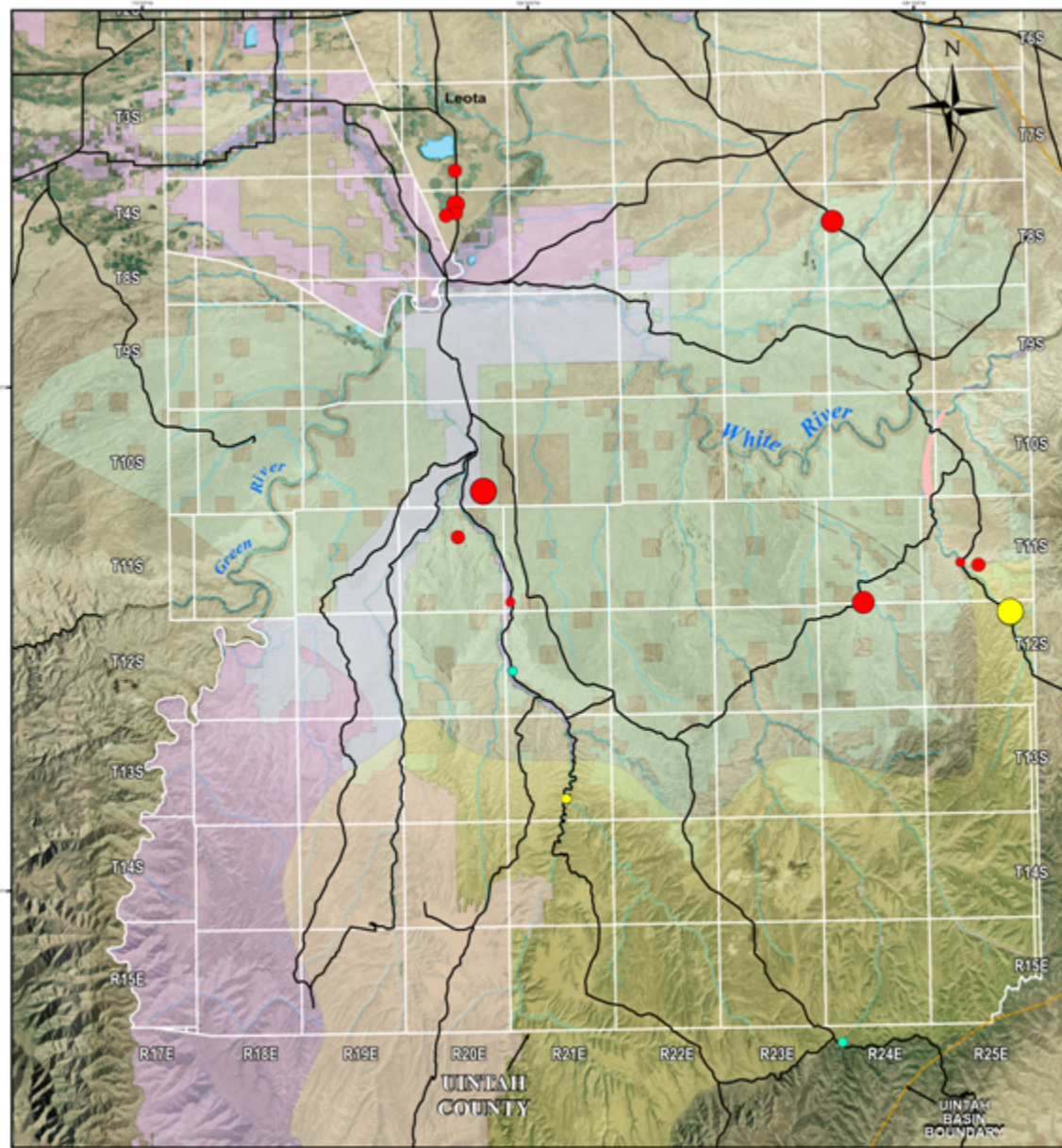
■ BLM UT
(oil shale lease area)

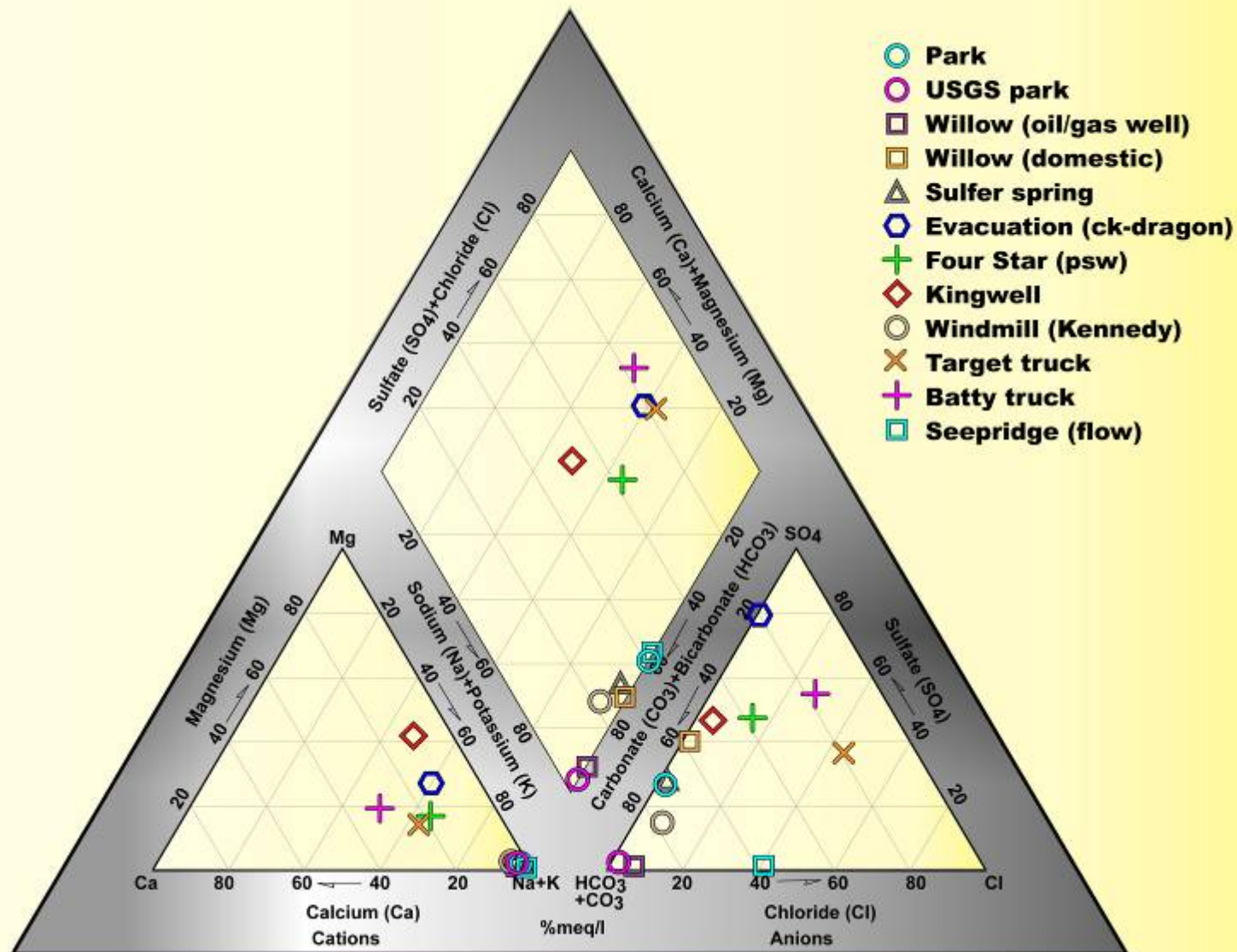
■ Tribal Lands



Location Map

UGS 2009 TDS Data in the Uinta Basin





Legend

Nitrate Concentration

- Well ● Spring ● Creek

- 1 - 3 mg/L
- 3.0 - 5.0 mg/L
- 5.1 - 10.0 mg/L
- 10.1 - 20.0 mg/L

- **Uinta Basin Boundary**

-  **River**

- ## ~ Roads

- **Water Body**

- Douglas Creek Aquifer**

- **Birds Nest Aquifer**

-  **BLM UT**
(oil shale lease area)

- **Tribal Lands**



Location Map

UGS 2009 Nitrate Data in the Uinta Basin

