



Garden Gulch Member,
Green River Formation
Puckett 11D-2

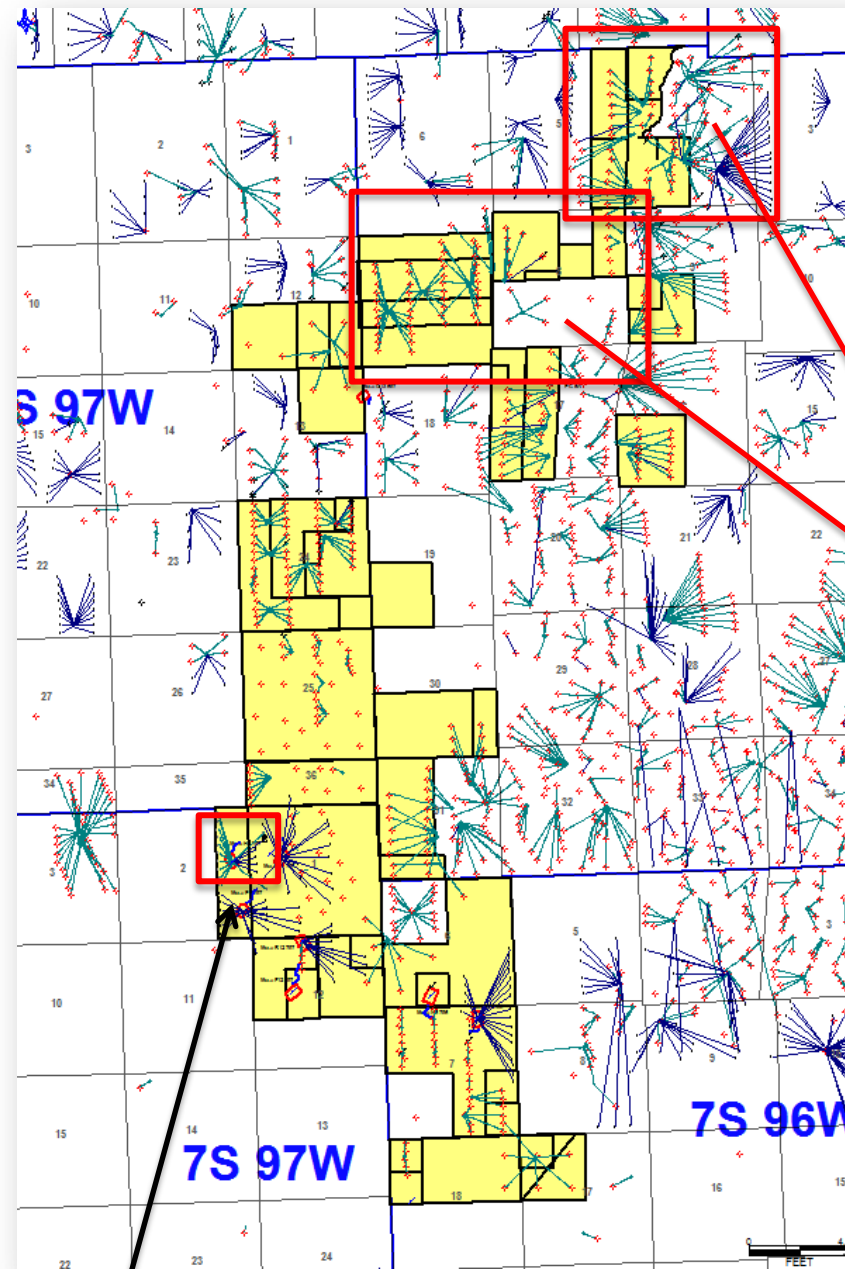
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Conclusions

- ▶ The top of the Garden Gulch member in the Parachute Creek area is ~1300' above the Wasatch formation, & 850' above surface casing of the Puckett 11D-2.

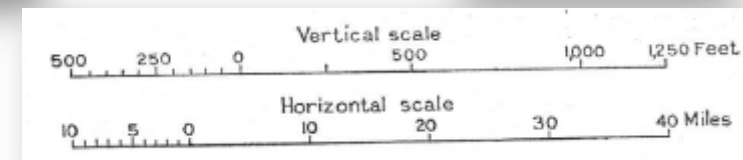
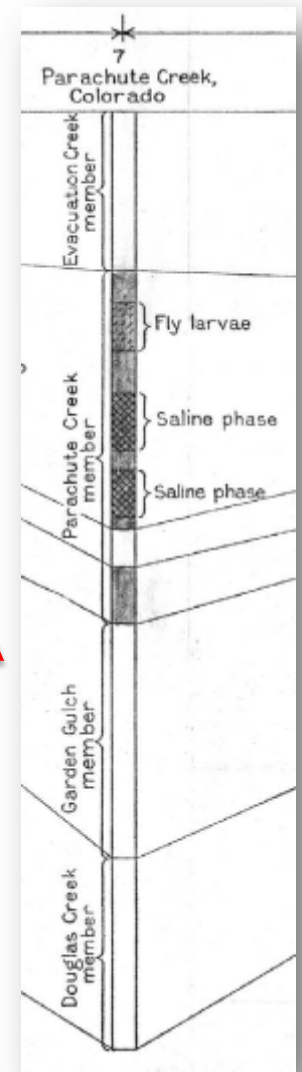
Garden Gulch Member

- ▶ The Garden Gulch member is a finely laminated shale with thickly laminated marlstone.
- ▶ Type location in Sec 7-8 T6S R96W is along Parachute Creek with total thickness 650 ft.
- ▶ The Garden Gulch member overlies the Douglas Creek member, the basal member of the Green River Formation, and underlies the Parachute Creek member.
- ▶ Douglas Creek member is measured at 550' in Sec 4 T6S R96W.



Puckett 11D-2

Measured Section



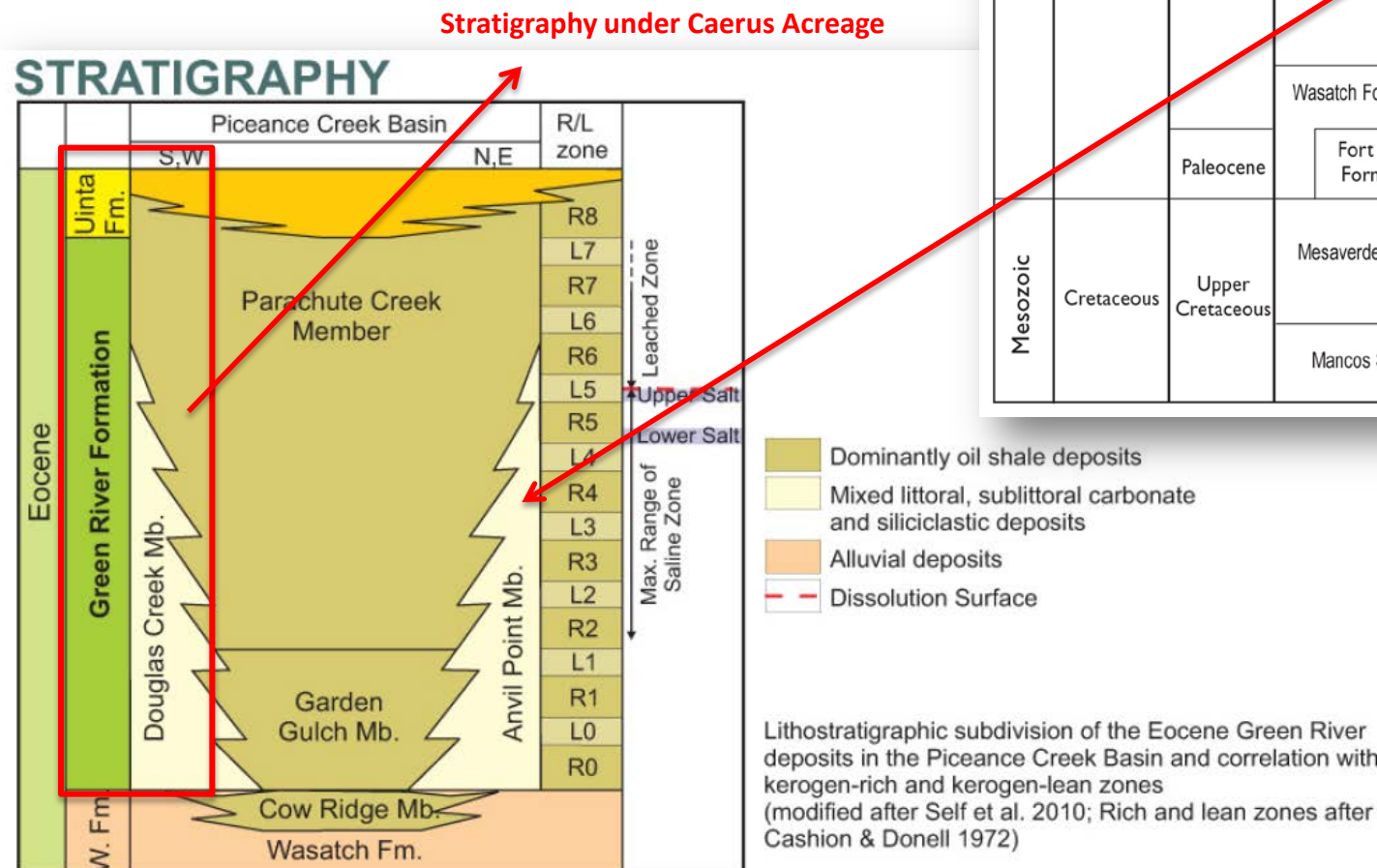
Bradley, 1931

Hydrogeologic Units in Piceance Basin

- ▶ Anvil Points member is not present in our acreage position. It is only present on the Eastern portion of the Basin.
- ▶ Garden Gulch and Douglas Creek members part of the confining unit below the Lower Piceance Basin aquifer.

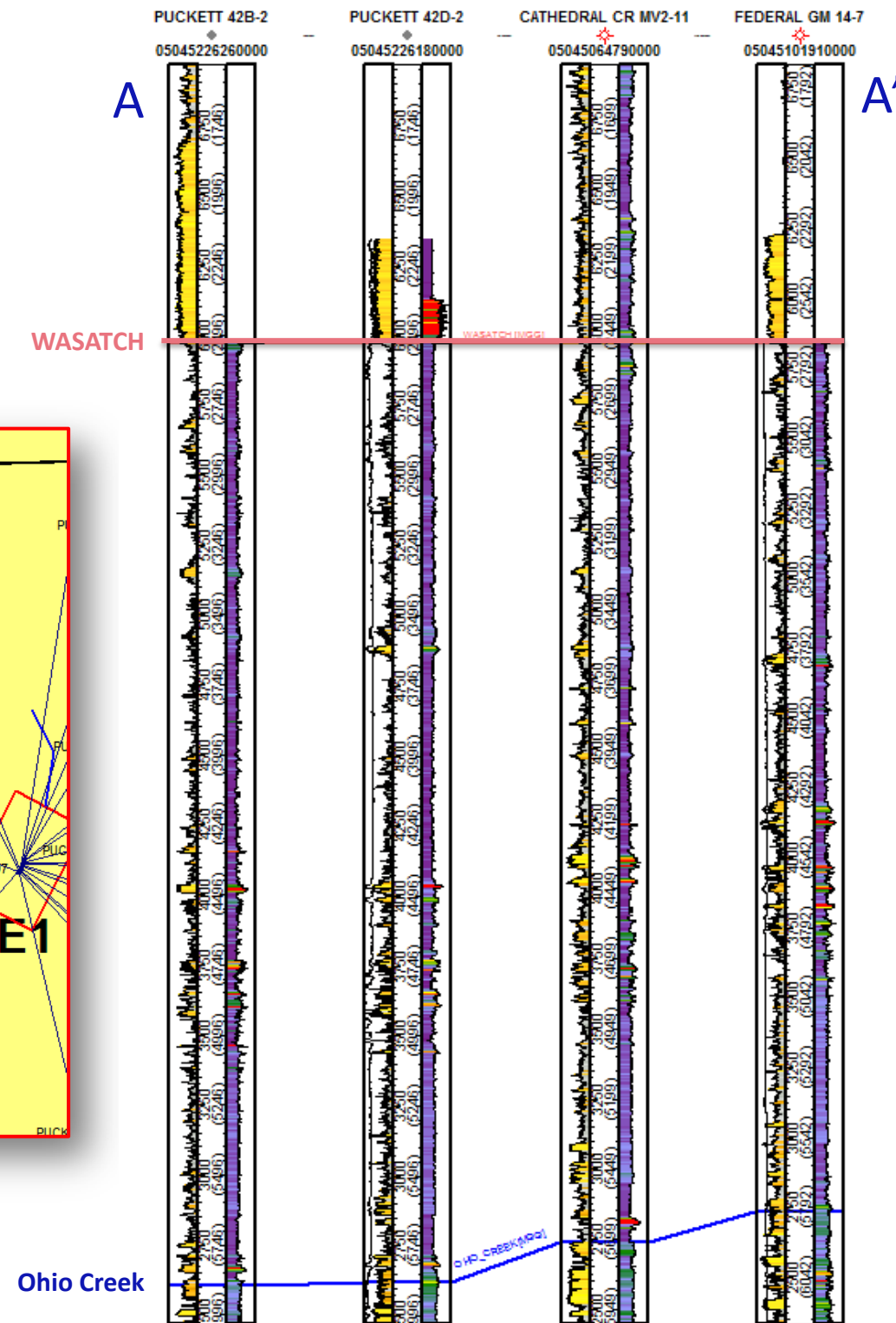
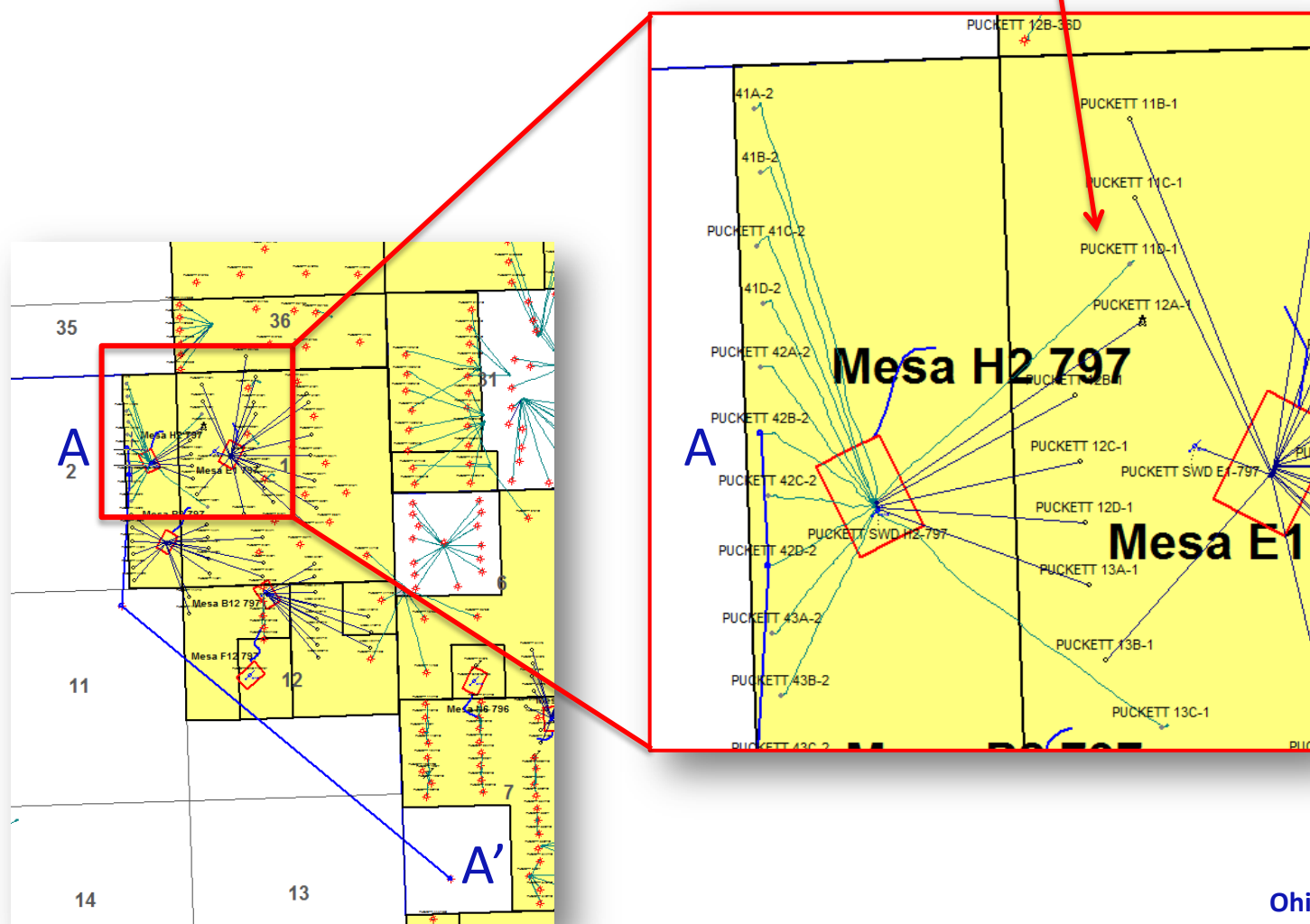
Era	System	Series	Stratigraphic Unit	Unit Thickness (feet)	Physical Description	Hydro-geologic Unit	Saturated Thickness (feet)	Hydrologic Characteristics
Cenozoic	Tertiary	Eocene	Uinta Formation	0–1,400	Silty sandstone, siltstone and marlstone	Upper Piceance Basin aquifer		Conductivity range <0.2 to >1.6 ft/day; yield 1 to 900 gpm; transmissivity 610–770 ft ² /day
			Green River Formation	As much as 5,000	Parachute Creek Member kerogenous, dolomitic marlstone and shale 500–1,800 ft	Mahogany confining unit		Conductivity range <0.1 to >1.2 ft/day; yield 1 to 1,000 gpm; transmissivity 260–380 ft ² /d
					Anvil Points Member shale, fine-grained sandstone and marlstone 0–1,870 ft	Lower Piceance Basin aquifer		
					Garden Gulch Member claystone, siltstone, clay-rich oil shale and marlstone 0–900 ft	Confining unit		
					Douglas Creek Member siltstone, shale and channel sandstone 0–900 ft			
		Paleocene	Wasatch Formation	About 5,000	Shale and lenticular sandstone			
Mesozoic	Cretaceous	Upper Cretaceous	Fort Union Formation	Very thin	Coarse-grained sandstone	Fort Union aquifer		
			Mesaverde Group	Averages 3,000 may be >7,000	Fox-Hills Sandstone, Lewis Shale, Williams Fork Formation, Iles Formation; sandstone interbedded shale and coal	Mesaverde aquifer	<500–2,000	
			Mancos Shale	More than 7,000	Mainly shale but Frontier Sandstone may be local aquifer	Mancos confining unit		

Colorado Geologic Survey



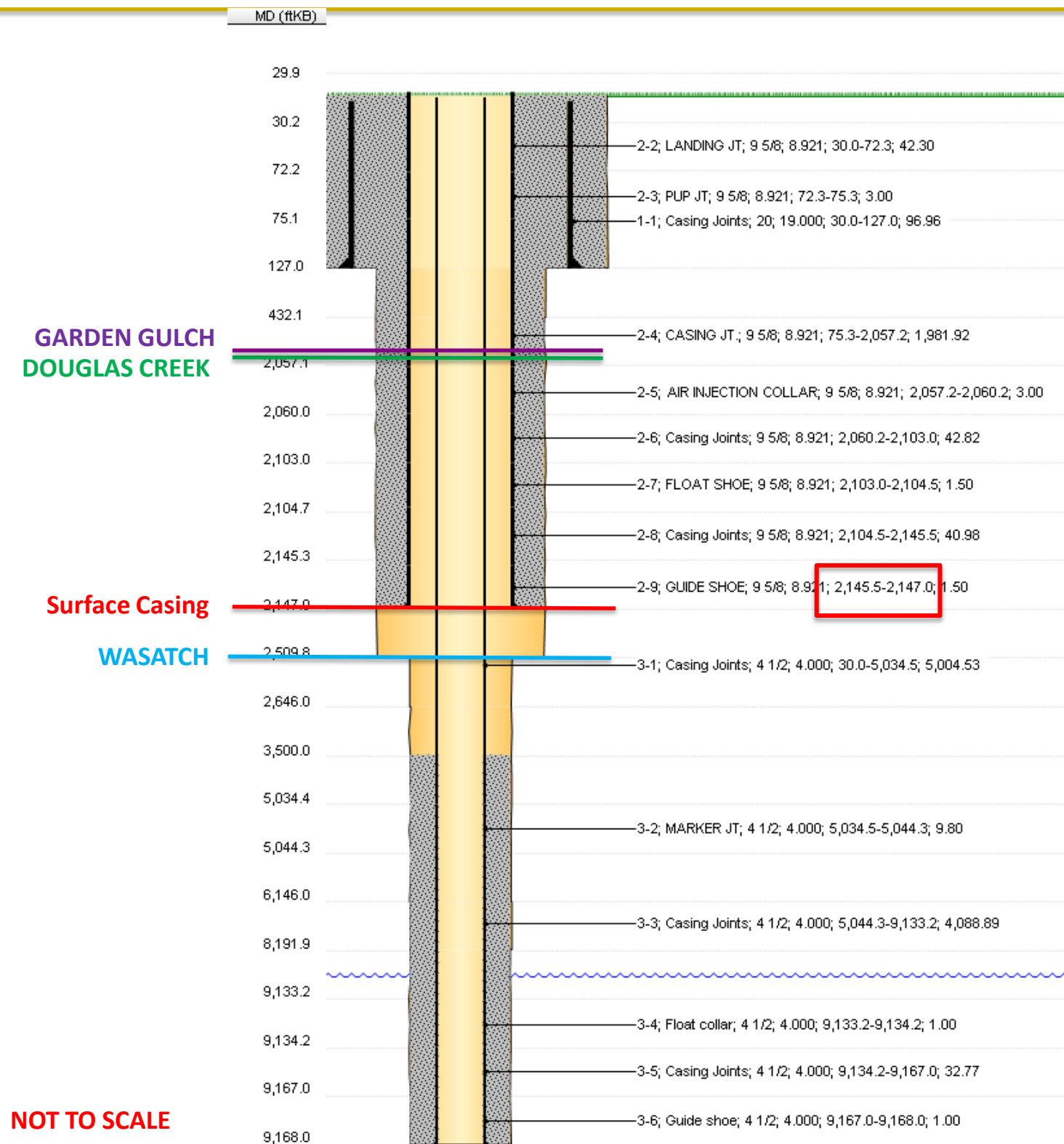
Cross-Section

- Most resistivity logs in the area are not shallow enough to reach the Garden Gulch member.
- Wasatch tops nearest to Puckett 11D-2 are between 2502-2528' MD.
- The Garden Gulch member is roughly 1200' above Wasatch top.



Puckett 11D-2

- ▶ The top of the Garden Gulch member in the Parachute Creek area is ~1300' above the Wasatch, & 850' above surface casing.
- ▶ Puckett 11D-2 surface casing was set to 2,147' MD.
- ▶ The top of the Wasatch for neighboring wells are at ~2500' MD.
- ▶ The surface casing of Puckett 11D-2 is much deeper than the top of the Garden Gulch member and thus poses no threat to the Lower Piceance Basin aquifer.



References

- ▶ W. H. Bradley, 1931, Origin and Microfossils of the Oil Shale of the Green River Formation of Colorado and Utah, p.10