

RESULTS: SPATIAL EXTENT AND THICKNESS

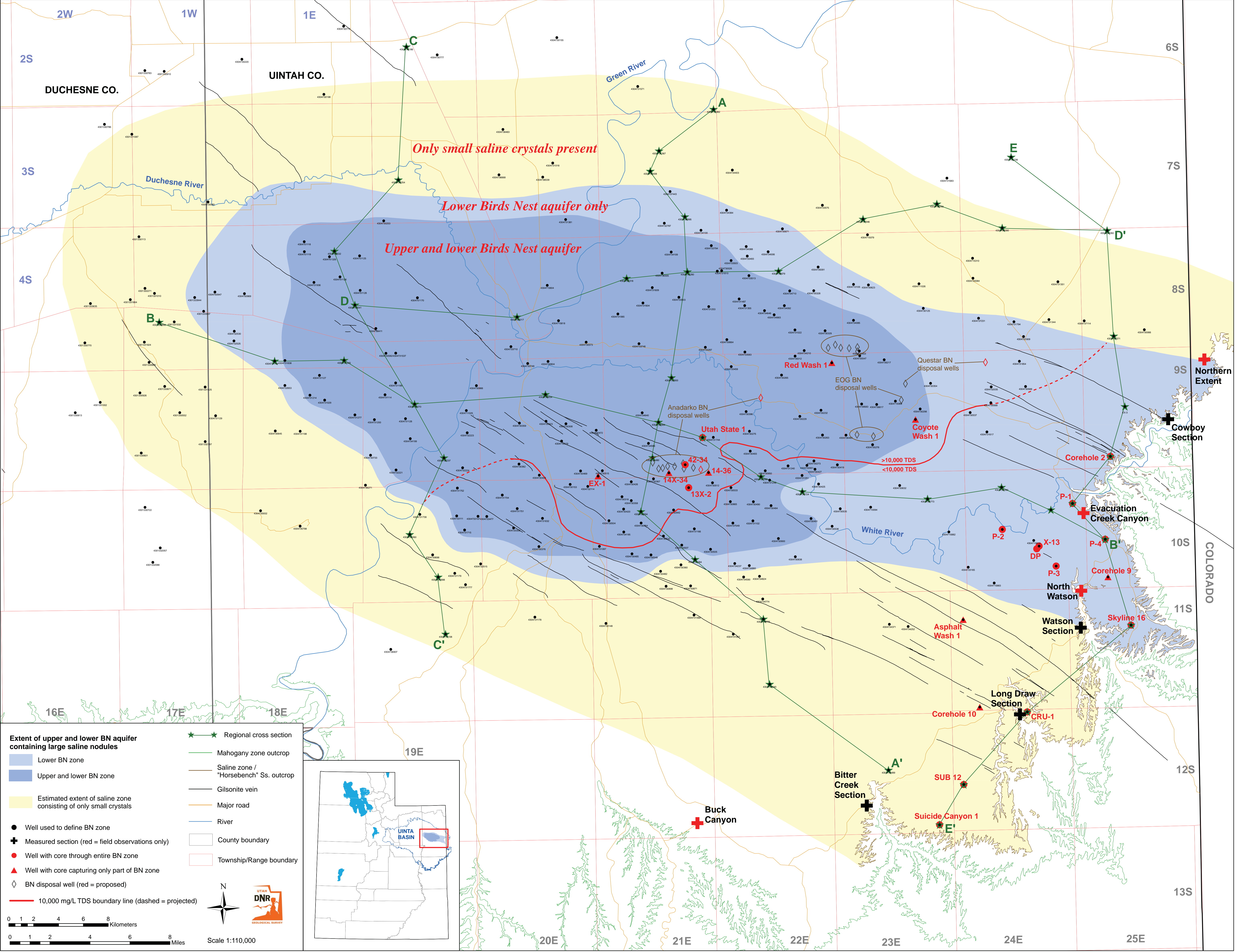
Research methods: Core, outcrop, and geophysical log examinations

The Saline zone is nearly 400 feet thick in the basin’s paleo-depocenter. Within the Saline zone, the Birds Nest aquifer is separated into an upper and lower zone where dissolution of the saline minerals has created significant porosity and permeability for the transmission of water (darker blue shading on map below) (see the 13X-2 core log on panel 3). The large saline mineral nodules and beds in the paleo-depocenter are recorded as spikes to low density on geophysical logs. Further from the depocenter and especially in the east, the upper zone disappears and only the lower zone exists (lighter blue shading on map below) (see the P-4 core log on panel 3). Radiating out from the depocenter, the Saline zone thins to ~130 feet and contains much smaller saline mineral crystals (<1 inch) as compared to the large (up to 1 foot) nodules found near the basin’s center, and the bulk density signature is lost (yellow shading on map below) (there is still a zone of dissolution in the lower portion of the Saline zone which could transport water and is roughly equivalent to the lower Birds Nest zone found in the basin’s center). This transition is confirmed to the south where cores and outcrop exposures are present (see the SUB 12 core log on panel 3). It is presumed that the same transition to small saline crystals exists to the north and west, but no cores exist to confirm this suspicion.

- Highlight:** Using geophysical logs, the authors have mapped the spatial extent and thickness of the Birds Nest aquifer where large nodules exist in both an upper and/or lower zone. This represents the maximum area with potential for saline water disposal, but only where water currently within the zone is greater than 10,000 mg/L TDS and where saline mineral dissolution has already taken place.

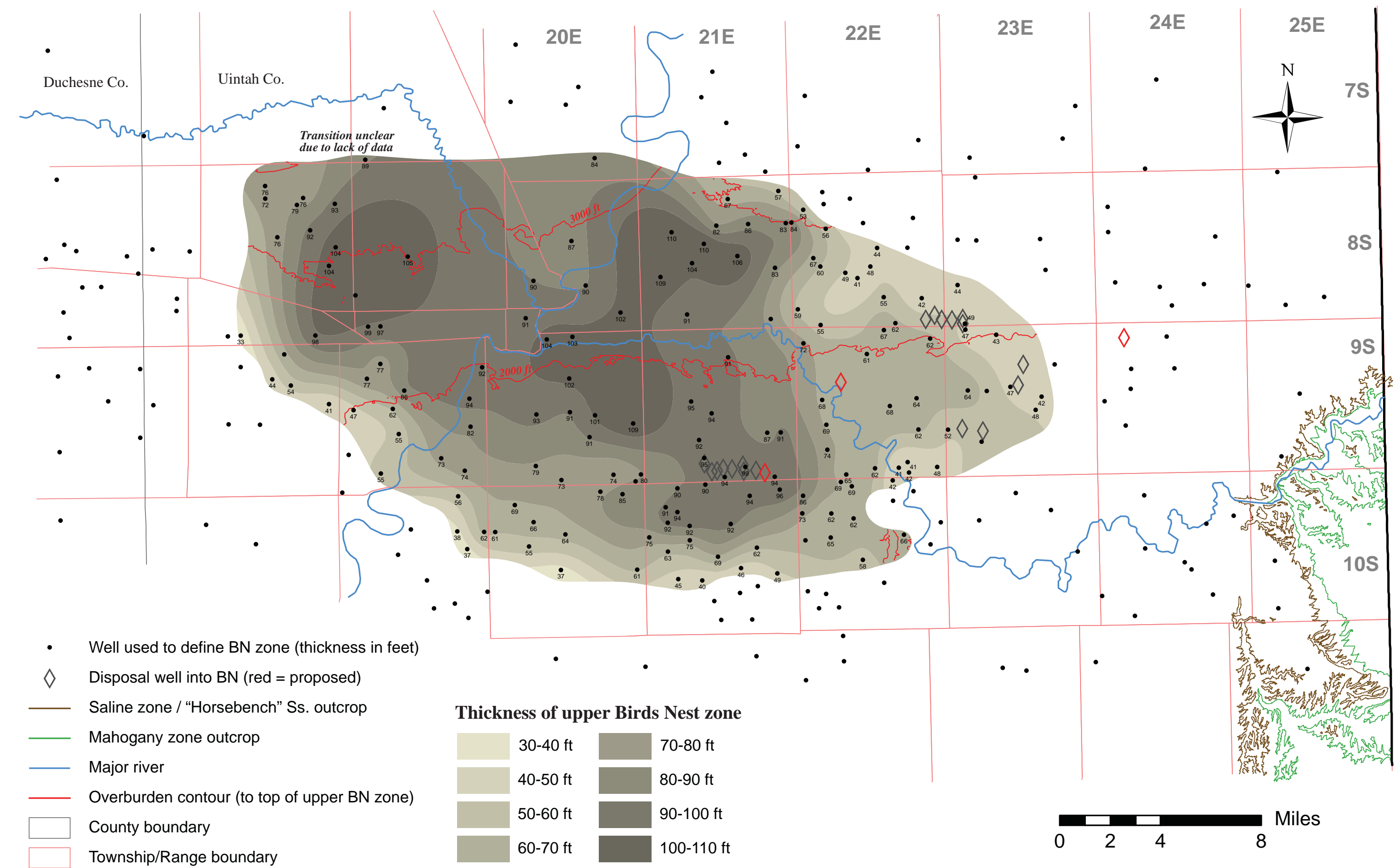
Maximum areal extent for possible saline water disposal into the Birds Nest aquifer

- Areal extent of large saline nodules/beds (blue shading) - in one or two zones (yellow shading = inferred small saline crystal “halo”)
- Chemistry of water currently in aquifer will be a limiting factor - can only dispose into an aquifer with >10,000 mg/L TDS water
- Some areas may be lacking sufficient dissolution of the saline minerals, further limiting extent suitable for disposal



Upper Birds Nest Aquifer Isopach

This map records where large saline mineral nodules/beds are present based on geophysical logs and core descriptions; the dissolution of such nodules creates the space for potential large-scale water disposal.



Lower Birds Nest Aquifer Isopach

This map records where large saline mineral nodules/beds are present based on geophysical logs and core descriptions; the dissolution of such nodules creates the space for potential large-scale water disposal.

