Aquifer Exemptions their Purpose, our Past and those Proposed

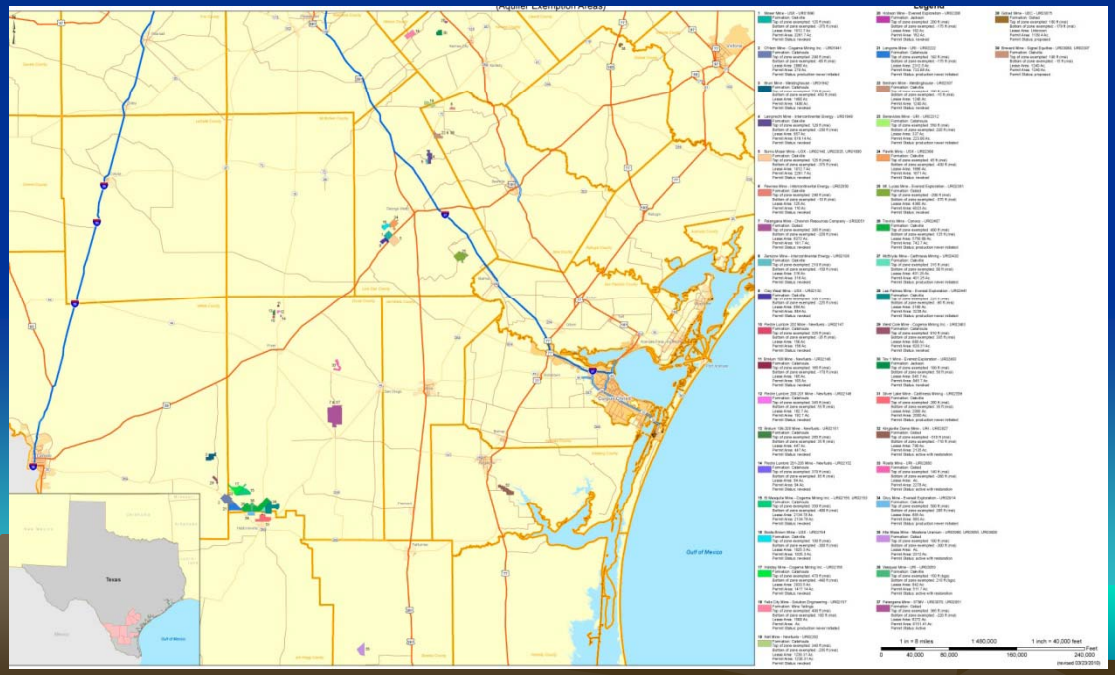
November 4, 2011

Purpose of Exemptions

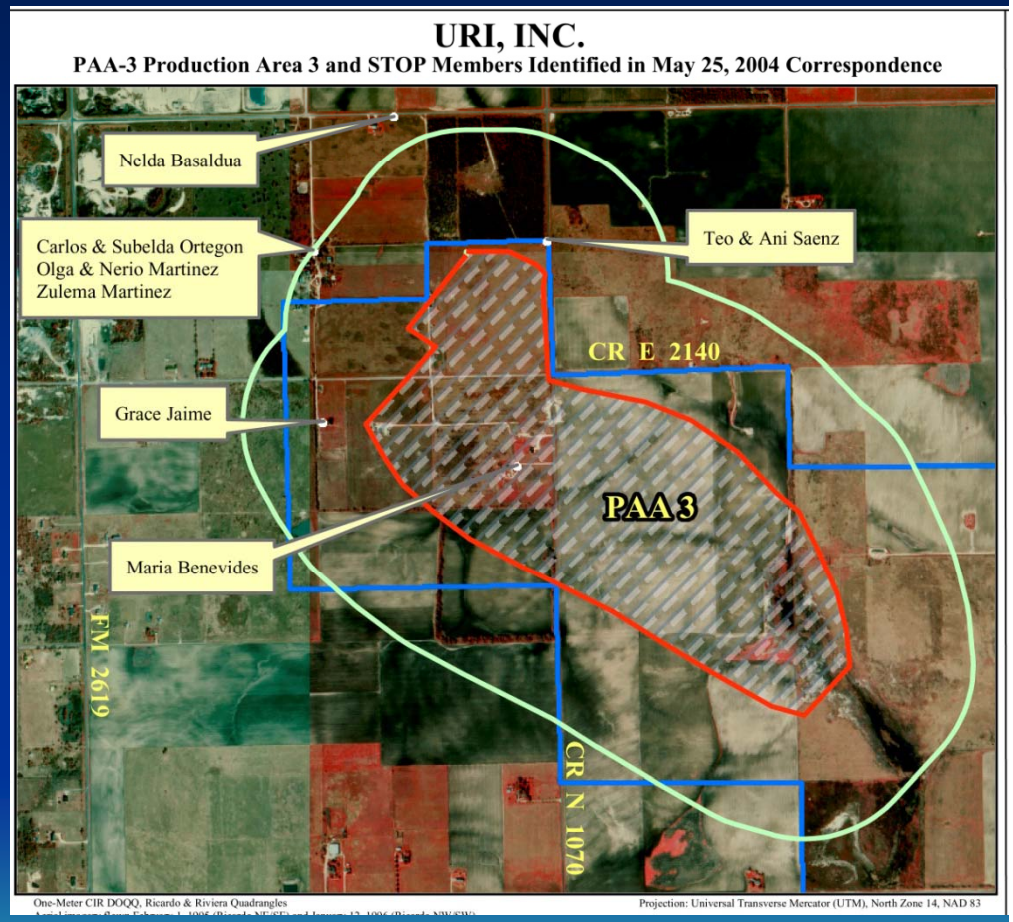
- Exemptions allow injection into aquifers that would otherwise be protected as USDWs.
- Criteria for exempting USDWs are found at 40 CFR 146.4.
  1. It does not currently serve as a USDW ***and***,
  2. It cannot be used as a USDW in the future due to it's contamination or Class III or HC production capacity ***or***,
  3. It's TDS is >3000, <10,000 and not reasonably expected to be a public water supply.

Past Exemptions

- This Region has issued close to 40 exemptions since primacy (early 1980s), all but one for insitu leach mining.
- Mining exemptions have almost always been in rural settings, covering small parcels of land owned by the applicant and with mineral interests rights.
- Since primacy the Region has learned two things.
  1. Restoration of the plume to baseline has not yet been achievable.
  2. Population growth is encroaching on these mining sites



- Uranium mining projects like Kingsville Dome (KVD) have raised awareness that ground water usage is becoming more prevalent in the countryside and thus in potential proximity to uranium mining activities.
- More scrutiny is needed to ensure health and safety of the population and compliance with the exemption criteria.
- The GW/UIC Section has come up with a conceptual GW modeling requirement to increase scrutiny and provide a scientific basis to support decisions made on proposed exemptions.



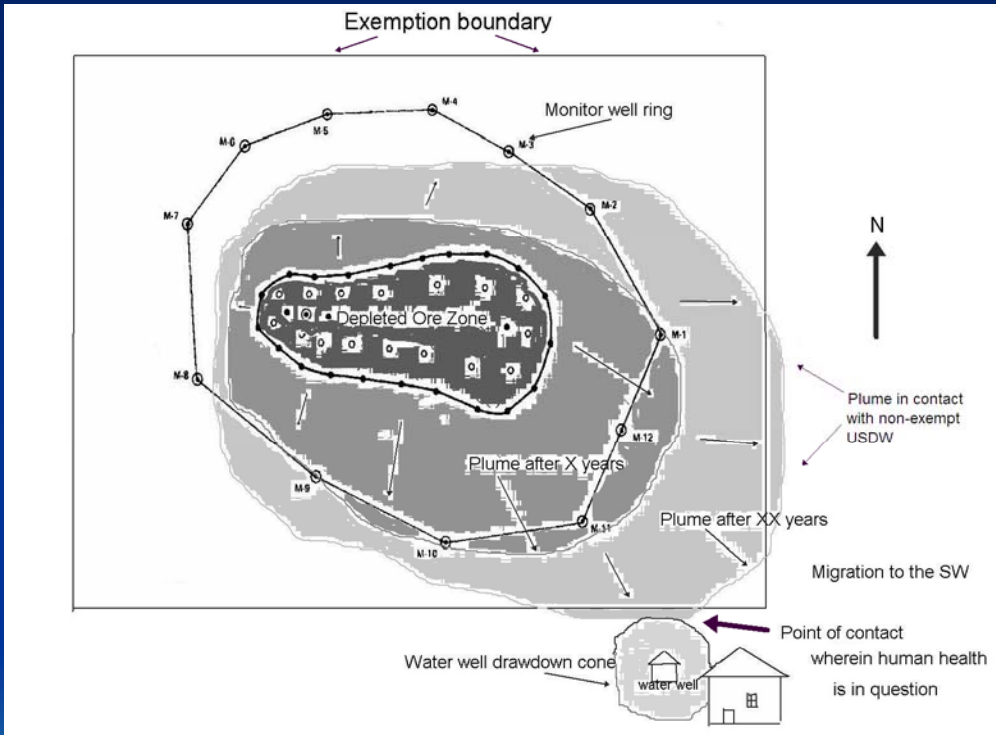
- The golden rule (144.12) is to ensure the injection will not harm human health.

- The model will seek to determine the distances necessary for plume migration to occur in order to ensure that, when the plume contacts a non-exempt USDW, no harm to human health will occur.

- The model predicts the plume's migration and the affect that migration will have upon contaminant concentrations.

- In addition to the influences incurred in migration (i.e. dilution, dispersion, and chem fate), the model may examine the potential influence of hypothetical GW withdrawals beyond the exemption boundary.

Conceptual Model



Proposed Exemptions

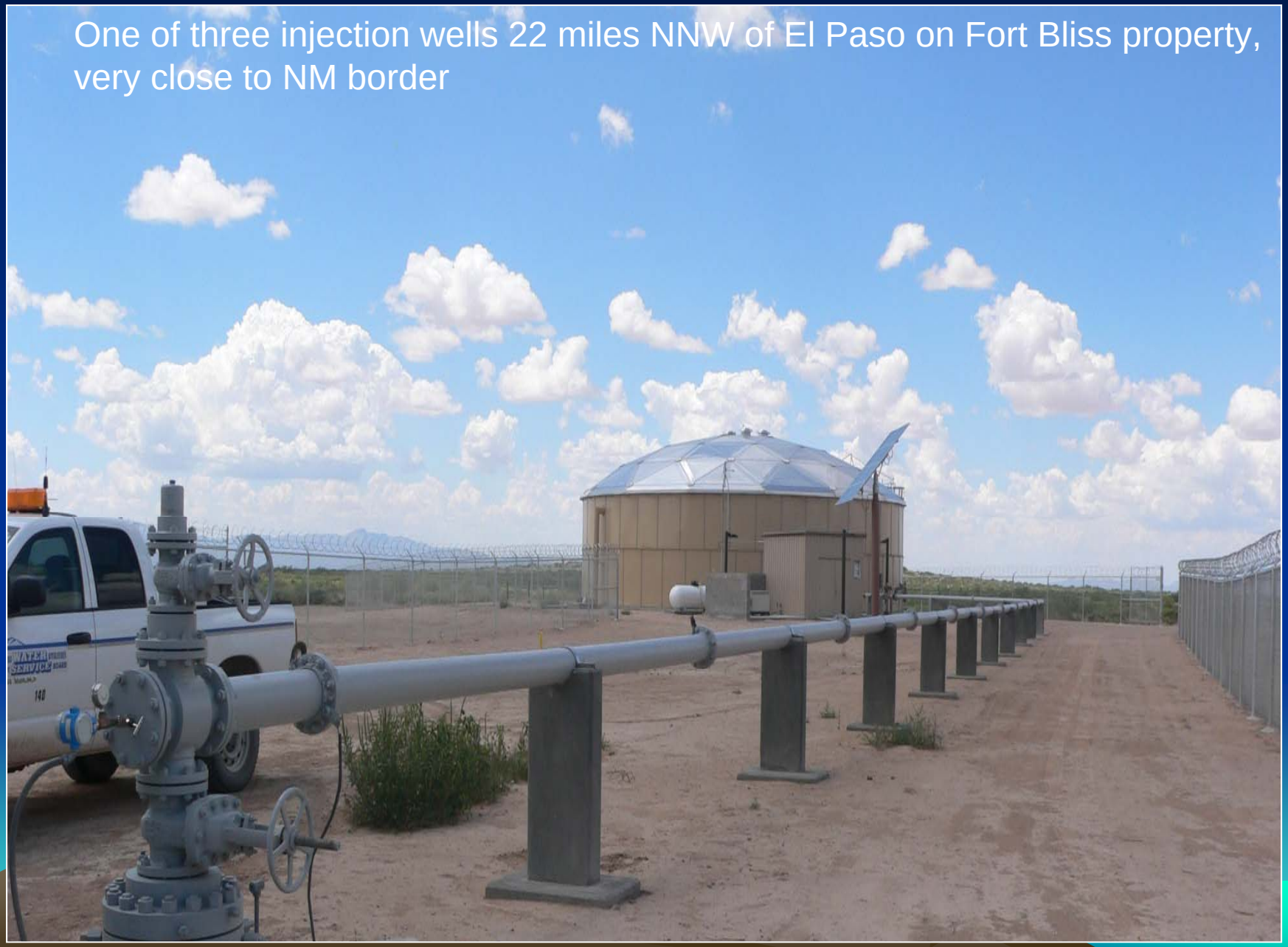
El Paso, Texas - Class V
Goliad, Texas - Class III

Tentative Exemptions

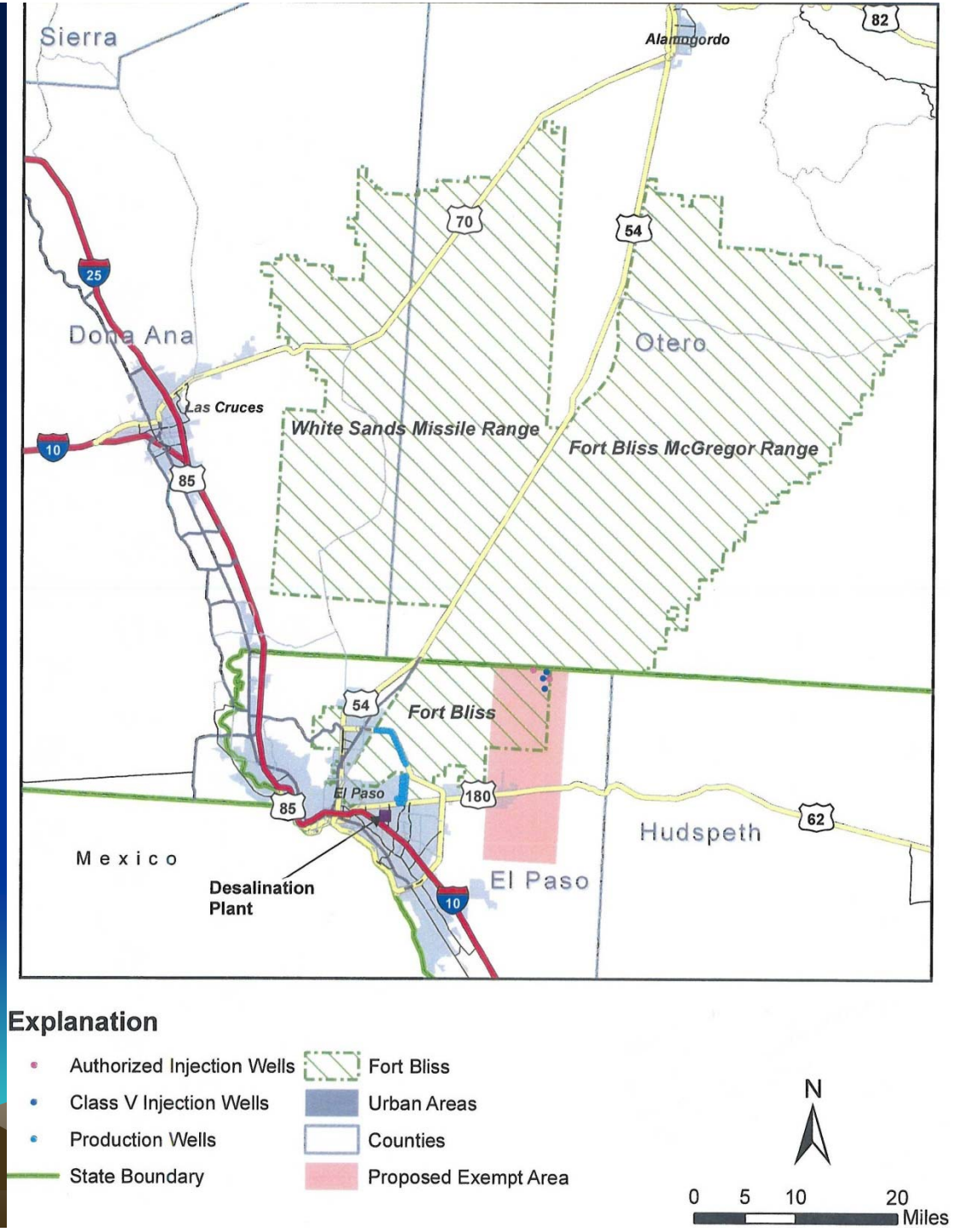
Church Rock, New Mexico - Class III
Ambrosia Lake, New Mexico - Class III

El Paso Water Utilities

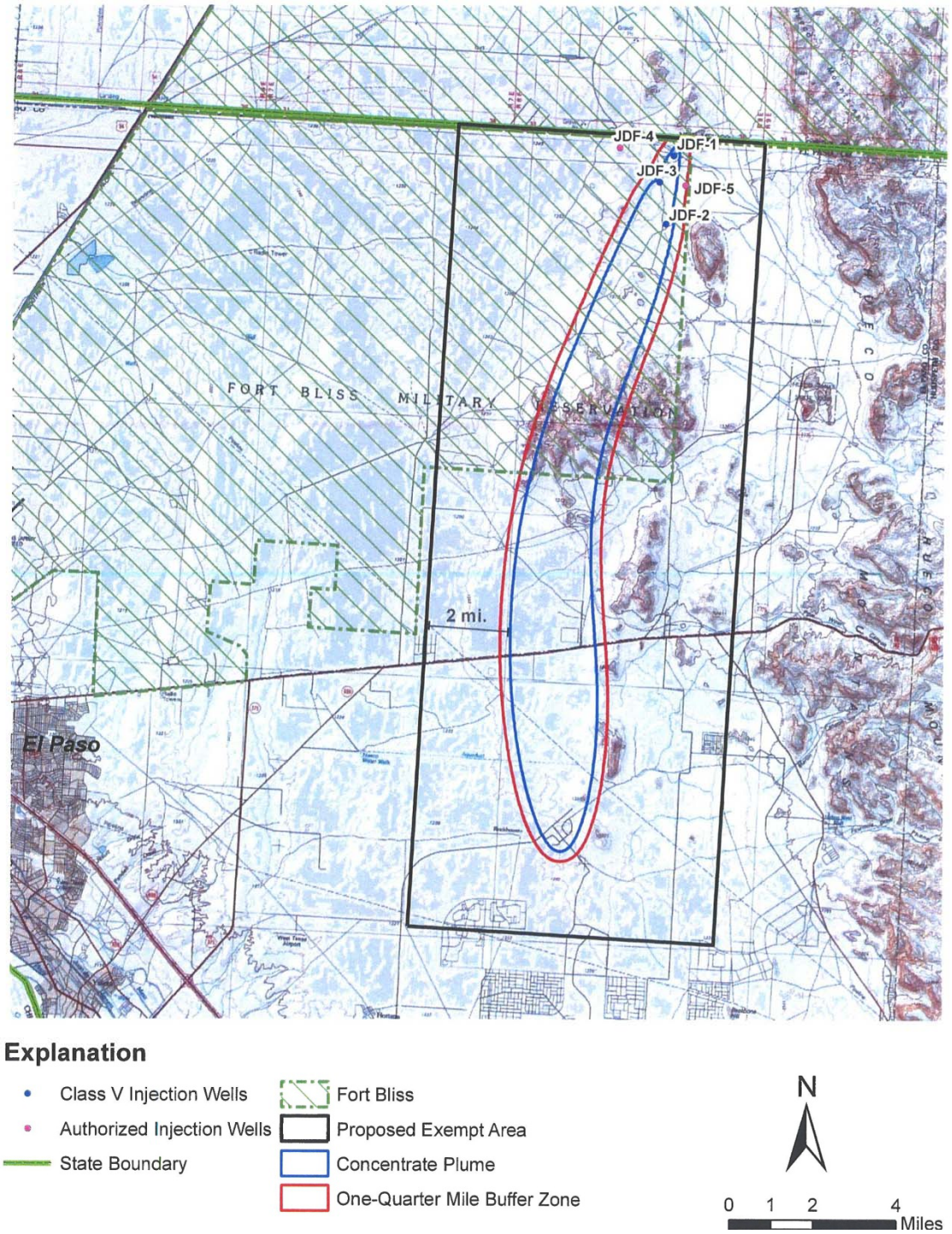
- El Paso Water Utilities (EPWU) uses Class V injection wells to dispose of desalination concentrate.
- State UIC permit requires concentrate to meet MCLs at the point of injection.
- EPWU needs an exemption to operate their desalination plant more efficiently.


One of three injection wells 22 miles NNW of El Paso on Fort Bliss property, very close to NM border

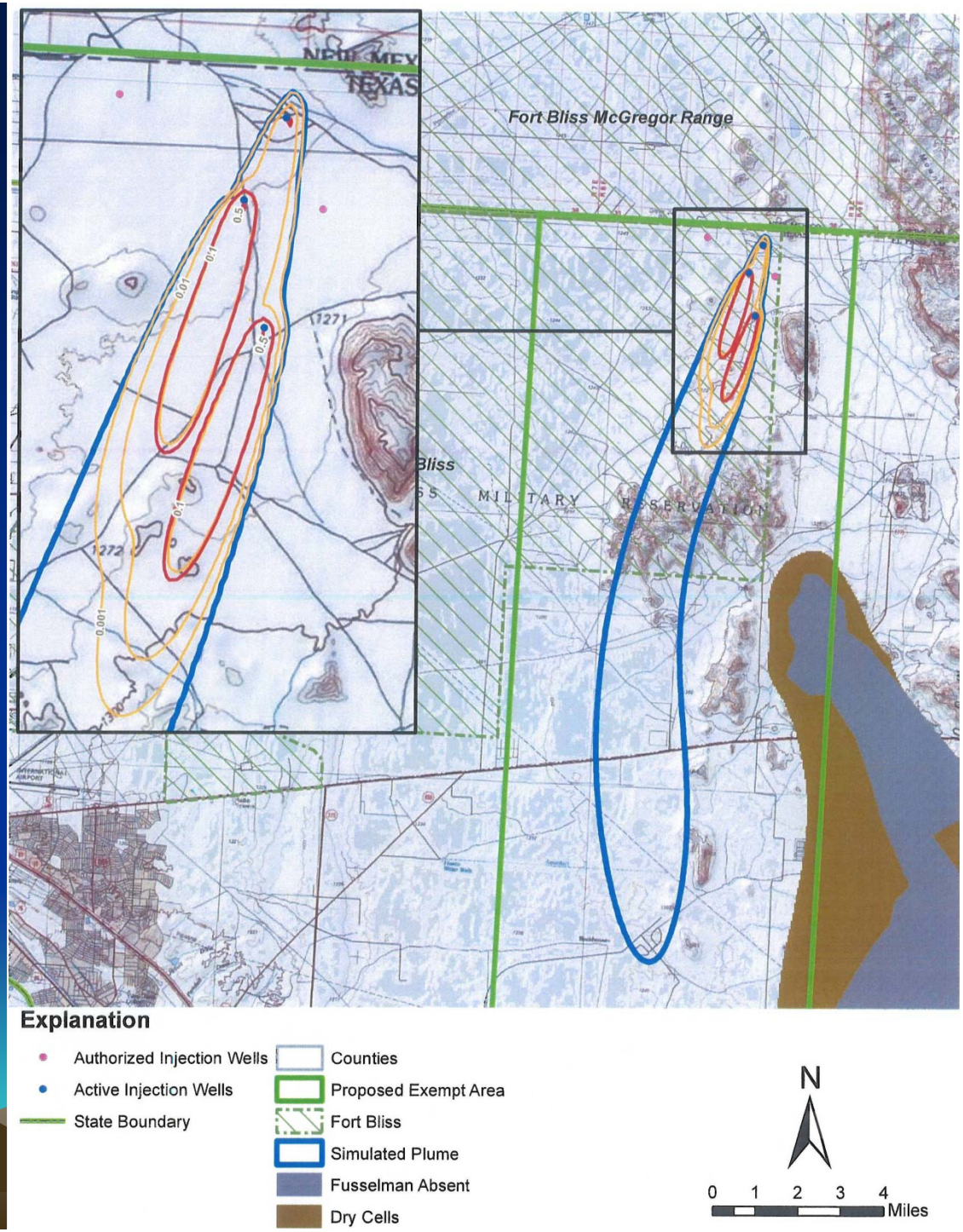
- This map shows the land area currently proposed for exemption.
- The proposed exemption area is 141 sq. miles extending inside and outside of Fort Bliss.
- The exemption area includes an estimated 38,000 residents.
- These factors make public participation and institutional controls problematic.



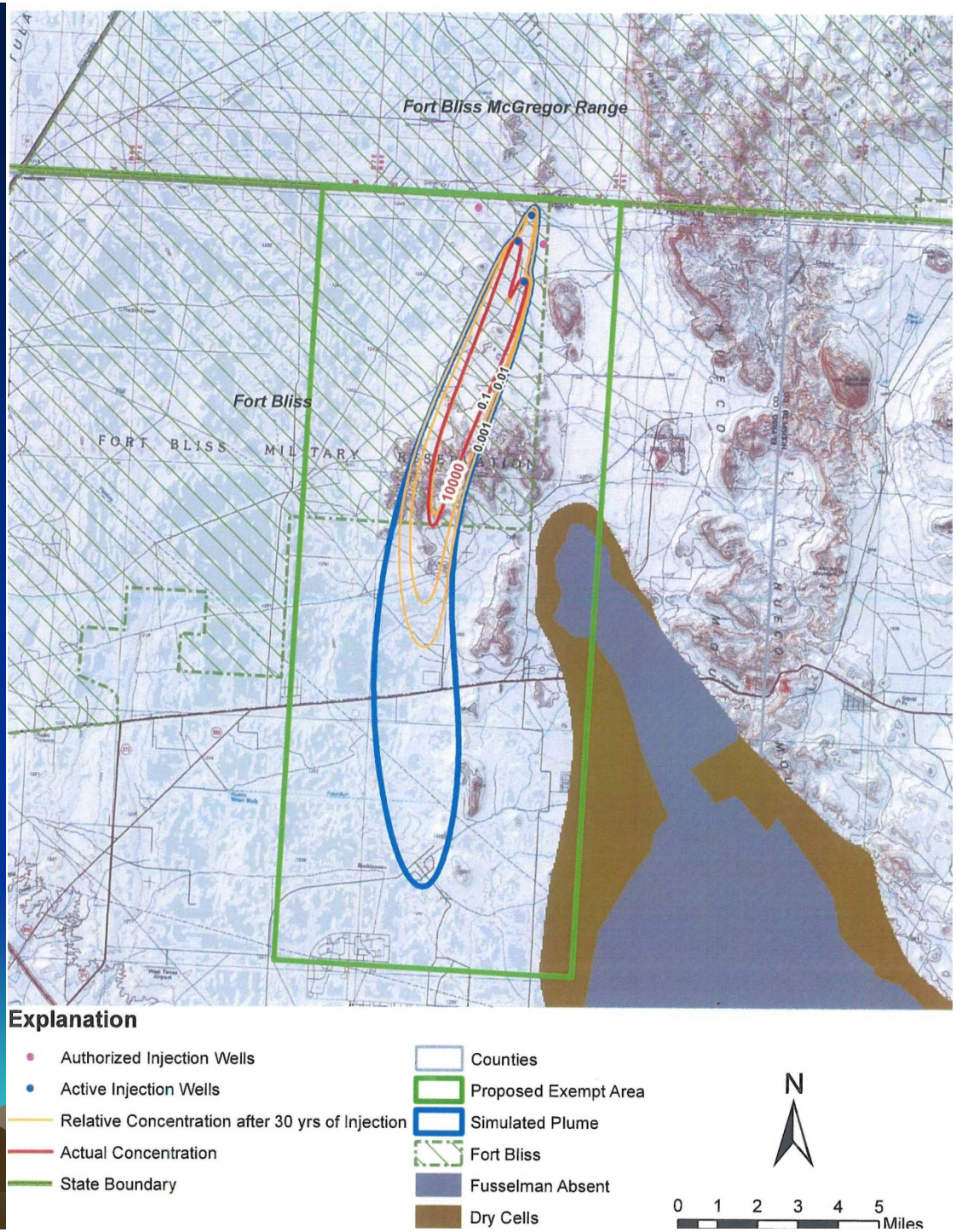
- This map shows full extent of plume using the 3 existing wells after 50 years of injection.
- After 50 years the plume is predicted to be 17 miles long and 2 miles wide.
- The plume extends beyond Fort Bliss.
- The plume model does not include 2 additional approved Class V wells (JDF 4 and 5).
- The model does not predict migration into New Mexico despite approximate ¼ mile distance from closest well to the state boundary.



- This map close up depicts the stepped concentration fronts of a generic contaminant, injected at maximum rate and 100% concentration, and reduced by dispersion and dilution after 10 years of injection.
- The maximum injection rate is projected to be 3 million gallons/day over 50 years.



- This map depicts the expected growth of the concentration fronts after 30 years.



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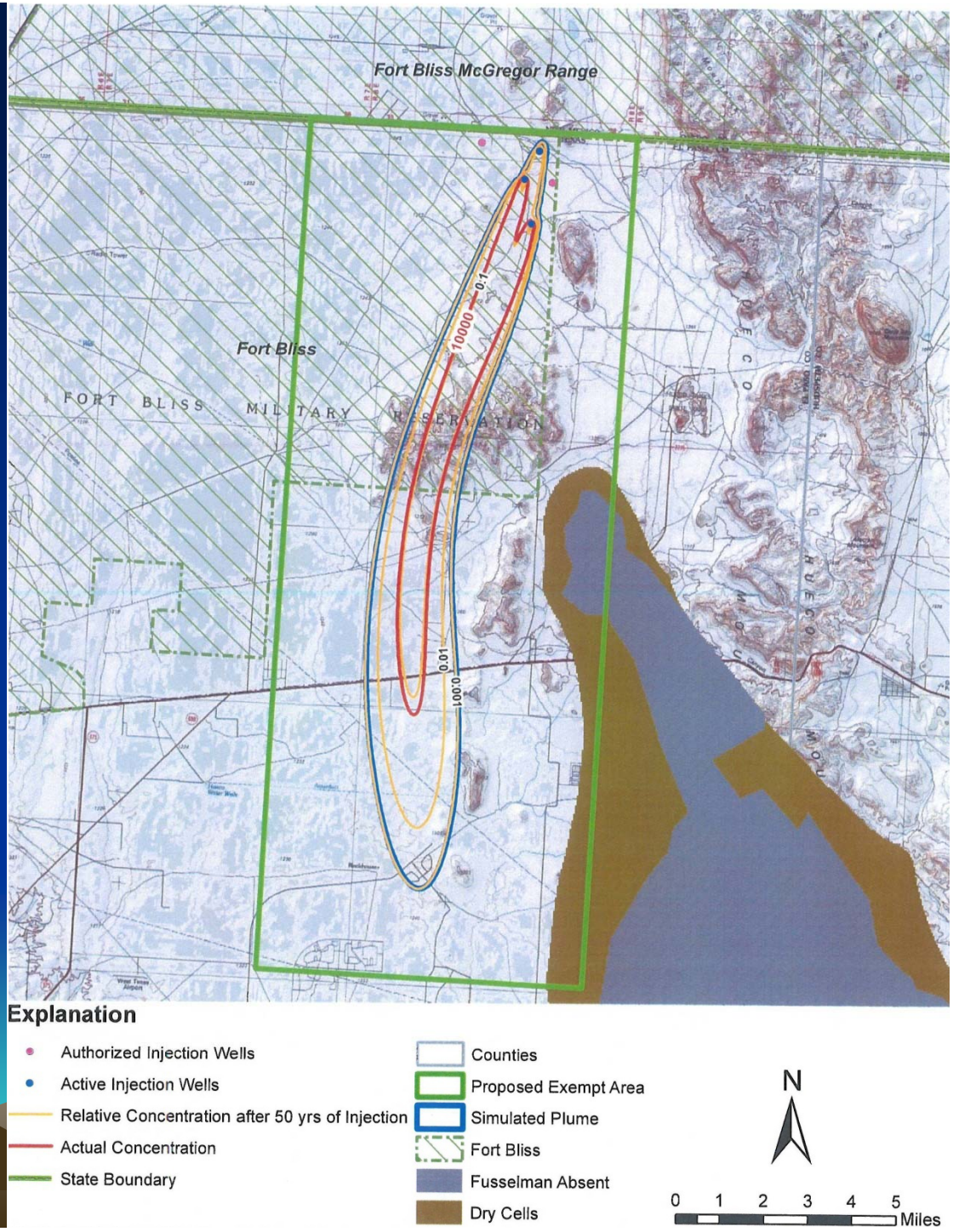
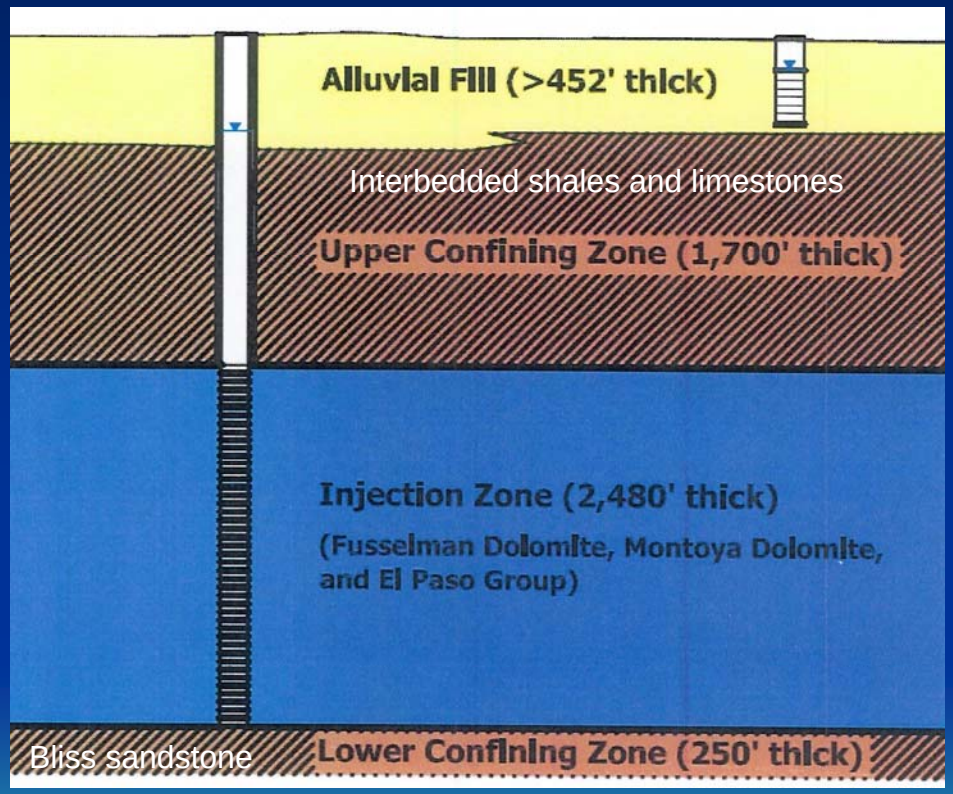
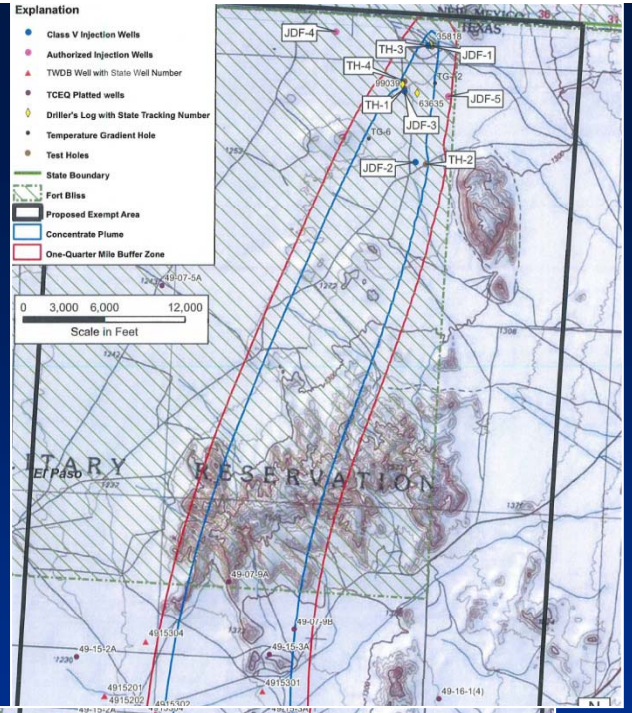


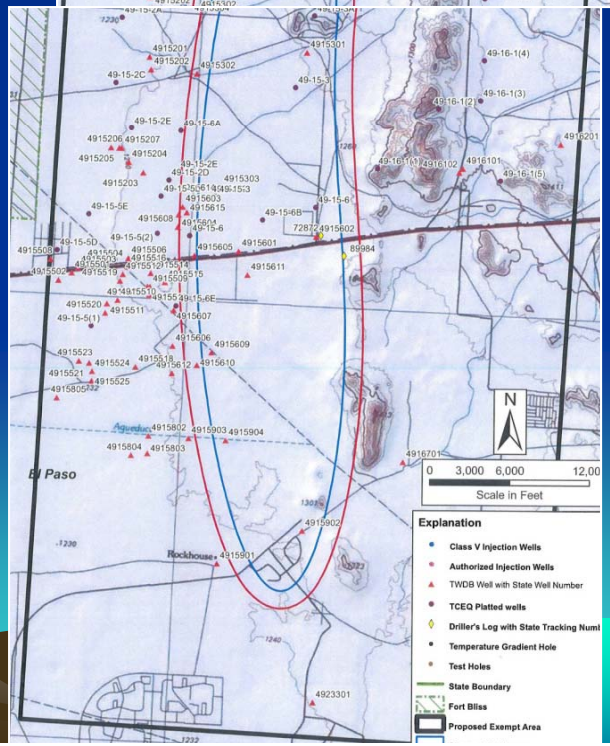
Main Issue with the Modeling Provided

- The application asserts an simplified cross section from well logs in the Franklin Mt. Range, the APs that partially penetrate the zone, and gravity surveys indicating wide variation in depth to basement rock across the area.
- There are not enough wells penetrating the formations to provide evidence corroborating the proposal that the cross section remains consistent across the areal extent of the proposed exemption.
- The model is too basic in design and quality control for its intended purpose.



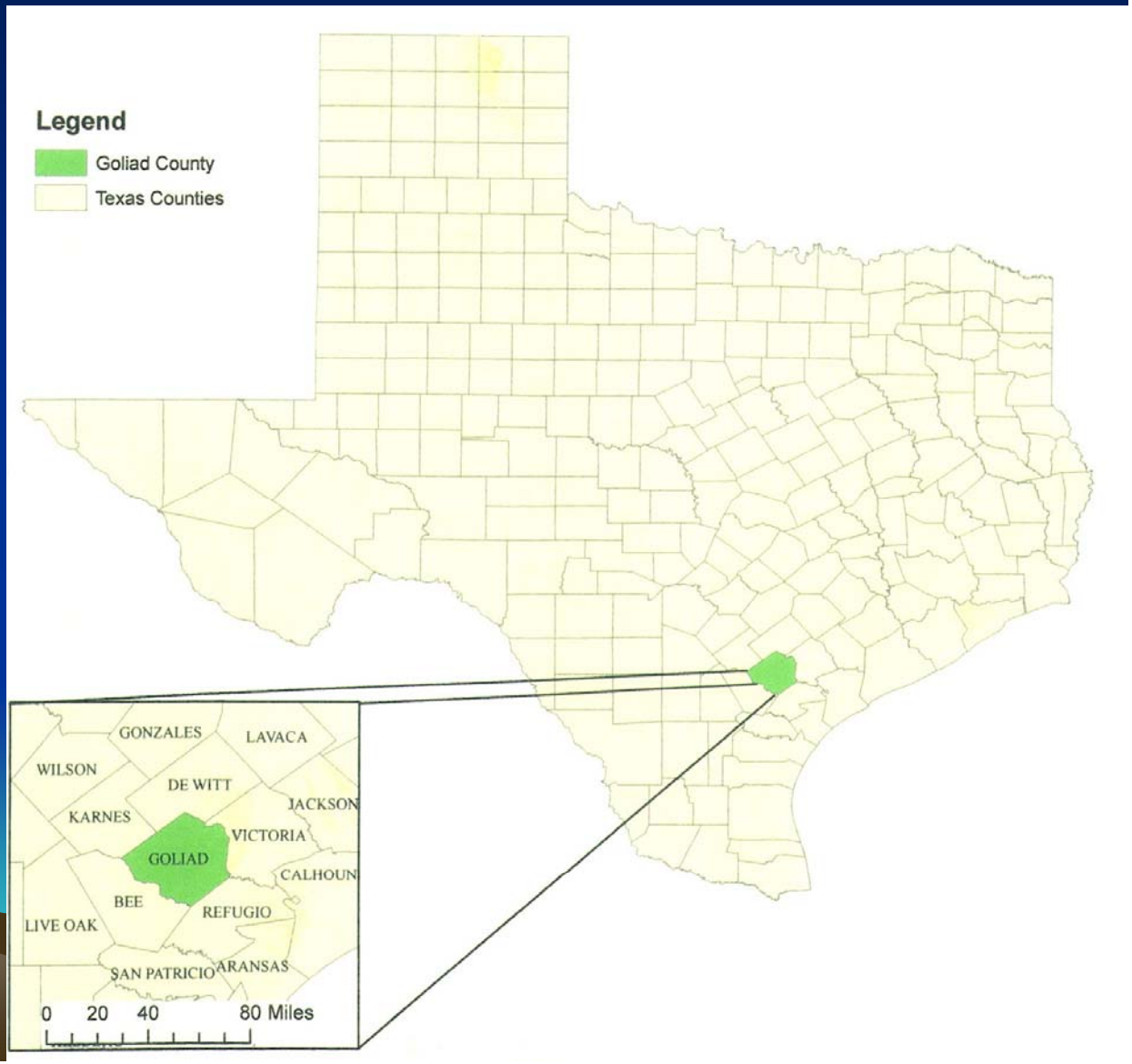
- This map shows the artificial penetrations in the proposed exempted area.
- All but one of these 89 penetrations are or were private wells ranging from 400’ – 1100’.
- Only 6 wells penetrate the top of the proposed exempted zone which ranges between 2222’ – 2890’ BGL. These include the 3 injection wells and 3 test wells drilled in the northern reaches of the proposed exempted area.



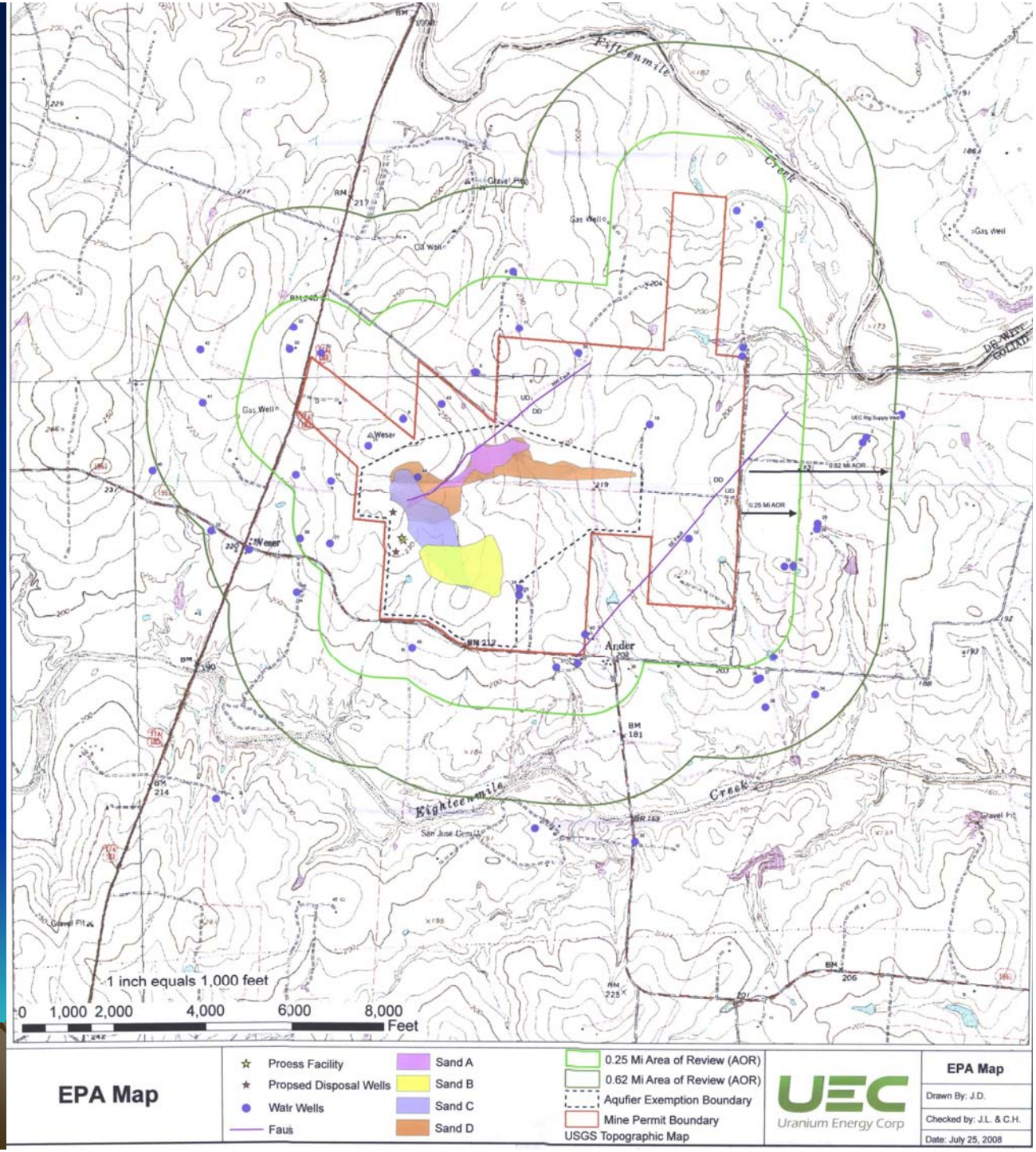


Goliad

- Uranium Energy Corp. is proposing an ISL uranium mining site 13 miles north of Goliad in Goliad County, Texas.
- This proposal predates EPWU's proposed exemption but has been delayed due to a very contentious public participation phase. It is currently in its second round of contested case hearings.

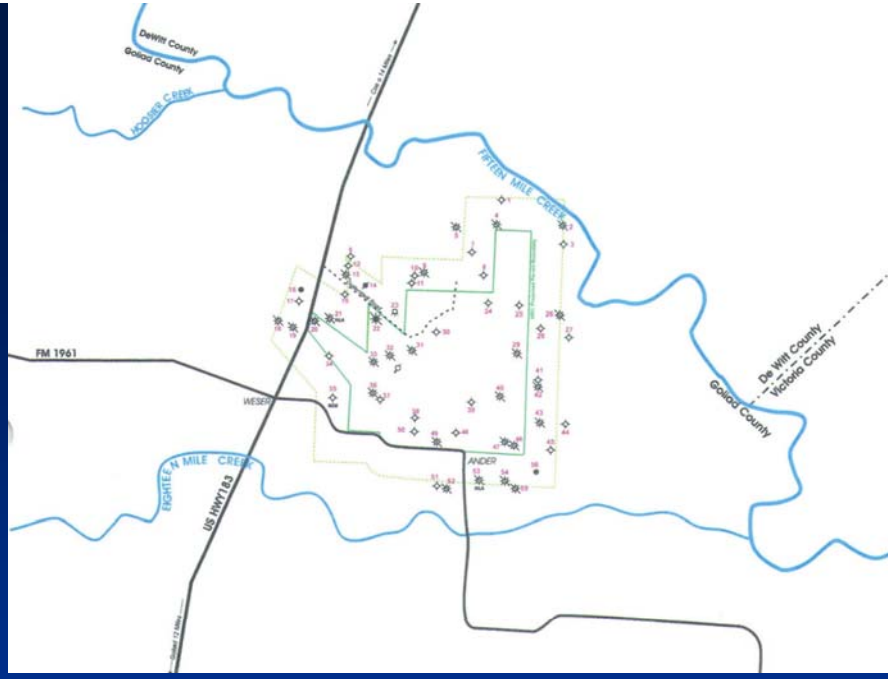


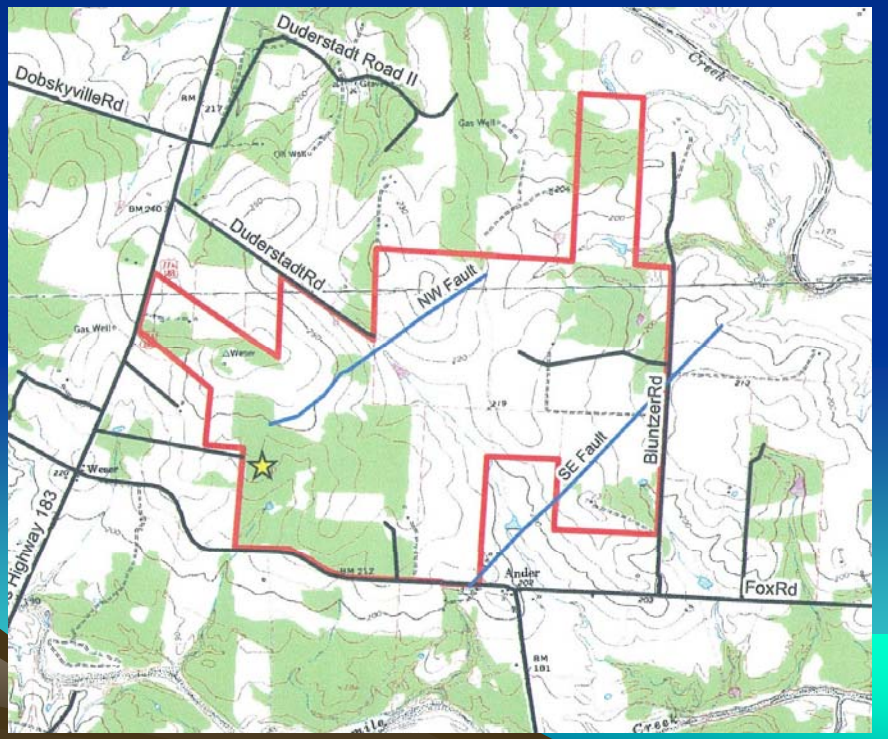
- The proposed mining site has numerous homesteads within 1 km of the site.
- 40 water wells are located in the area, all in the Goliad aquifer (80' – 460'). The proposed mining zone is (45' – 304').
- One church community exists in Ander (pop. 35) that although not listed as a PWS, may qualify as one.
- Surface owners within the 1140 acre permit boundary own the minerals.
- The modeling requirement was discussed with the State after the informal submission. Deeply involved with the public participation process, the state was not receptive to the new additional scrutiny.



- The surface is in general agricultural use with some oil and gas activity. 56 APs were located within ¼ mile of the permit boundary, most are plugged.

- The State Office of Administrative Hearings ALJ has recently proposed more testing to determine if the NW fault is transmissive. In lieu of that proposal, the ALJ proposes to deny the permit.

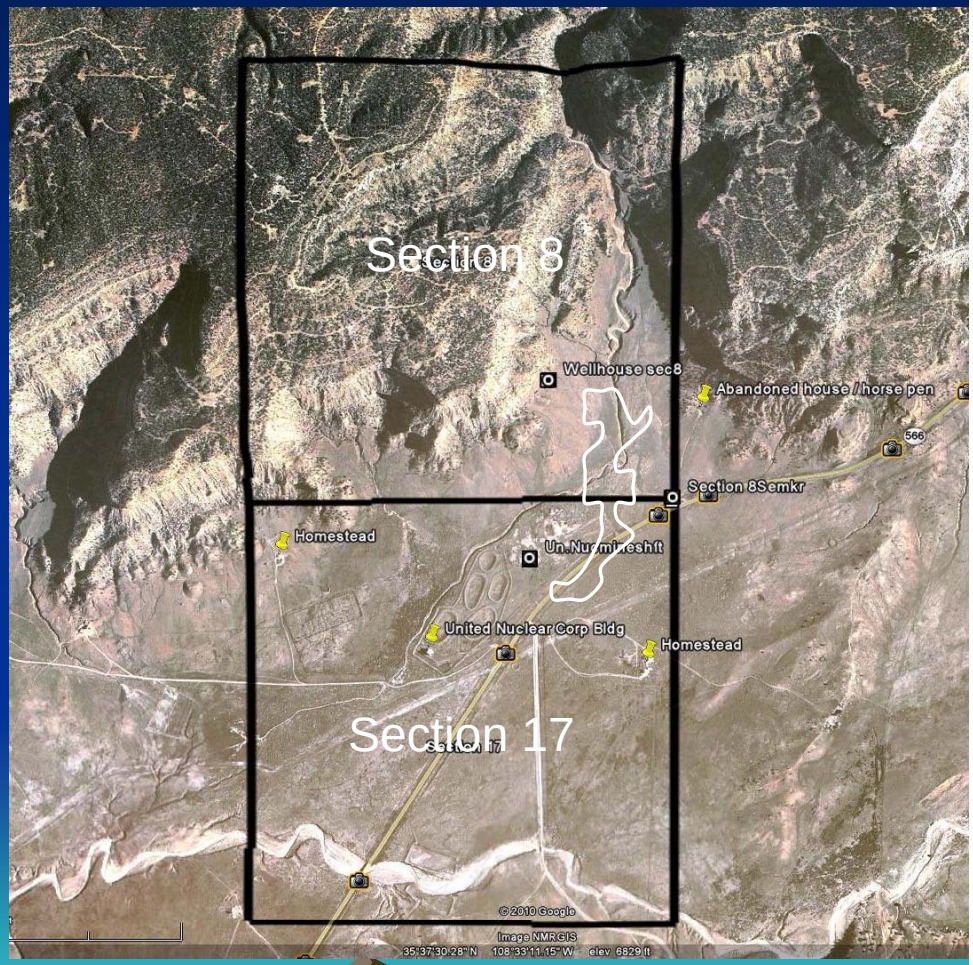




Church Rock (Section 8)

- A long-standing dispute over State/Tribal jurisdiction of Section 8, near Church Rock, New Mexico, was recently settled by the US Court of Appeals 10th District, effectively handing Section 8 back to the State and Region 6 EPA UIC oversight.

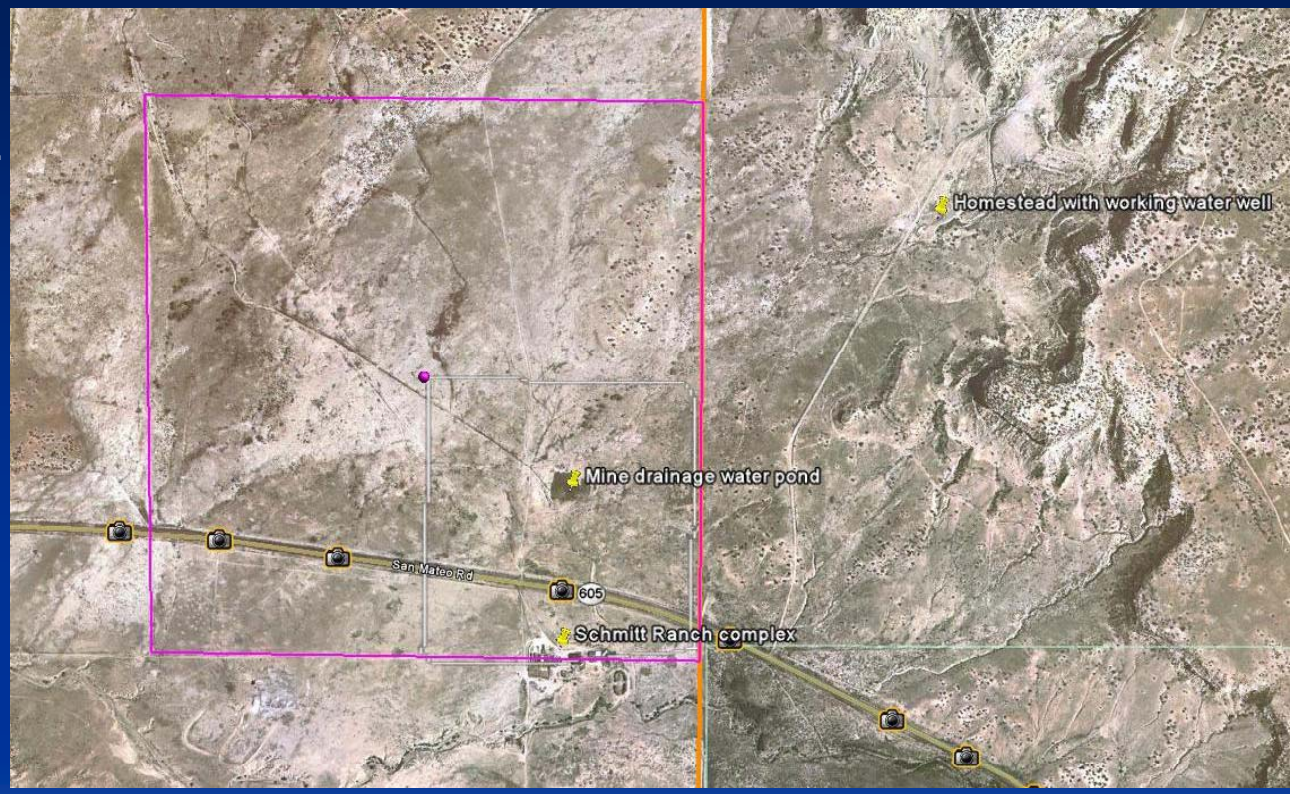
- Region 9 maintains DI primacy over the adjacent Section 17 for the Navajo Tribe who have a current ban on uranium mining. Section 17 holds approximately 1/3rd of the ore body which extends from the SW quarter of Section 8, 480'- 800' BGL.



- Holding both a state discharge plan and EPA Region 6 exemption for Section 8 since the late 1980s, Uranium Resources Inc, (URI) is moving ahead to commence ISL mining operations.
- Both the State and Region are reviewing their respective past approvals.
- Members of the GW/UIC Section recently inspected the location and found it remains isolated as a potential USDW.
- The exemption may have to be revisited as it appears to exempt a portion of Section 17 as well.

Ambrosia Lake

- In addition, 6WQ-SG inspected another URI proposed ISL site, Section 13 near Ambrosia Lake, NM.
- One residence and one ranch compound holding 3 families within the ¼ mile buffer zone were identified. 3 water wells and an abandoned windmill were located.
- The ranch owner is the section's land owner and it contained several archeological sites.
- URI is currently examining cores taken from the site to determine leachability.



The End