



Railroad Commission

Class II Underground Injection Control Program Aquifer Exemption Project

February 12, 2018





RRC's Class II injection wells

- Statewide Rule 9 (16 Tex. Admin. Code §3.9)
 - Type 1 – disposal into a non-productive formation

- Statewide Rule 46 (16 Tex. Admin. Code §3.46)
 - Type 2 – disposal into a productive formation
 - Type 3 – injection into a productive formation for enhanced recovery

UIC Program Overview



- ~115,000 injection wells in RRC's history
 - ~55,000 injection wells in current inventory
 - ~34,500 active injection wells
 - Type 1 = 3,811
 - Type 2 = 3,349
 - Type 3 = 26,320

UIC Program Overview



EPA promulgated Underground Injection Control (UIC) regulations under the federal Safe Drinking Water Act

- Require protection of underground sources of drinking water
- Allow for EPA to approve state primary enforcement authority (primacy)

UIC Program Overview



UIC program protects underground sources of drinking water (USDWs)

- Defined as an aquifer or its portion:
 - (a)
 - (1) Which supplies any public water system; or
 - (2) Which contains a sufficient quantity of water to supply a public water system; and
 - (i) currently supplies drinking water or
 - (ii) contains less than 10,000 mg/l TDS; and
 - (b) Which is not an exempted aquifer.

UIC Program Overview



UIC program protects underground sources of drinking water (USDWs)

- Allows for aquifer exemptions based on certain criteria, including hydrocarbon extraction

UIC Program Overview



- **In 1982, EPA granted primacy to RRC to administer the Class II UIC program under the SDWA §1425**
 - EPA recognized and approved aquifer exemptions for all existing wells and production zones with initial program approval
 - Agreed to concurrence process for:
 - Expansion of current exempted production zones
 - New production zones or non-production zones

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- **Purpose**

- Review 62,500 injection wells to identify and verify records on injection permitted into potential USDWs (zones with TDS < 10,000 mg/l) after primacy
- Review and strengthen RRC's procedures for ensuring that no permits are issued for which an aquifer exemption is required without EPA concurrence



Research of RRC's database, files, and groundwater quality data

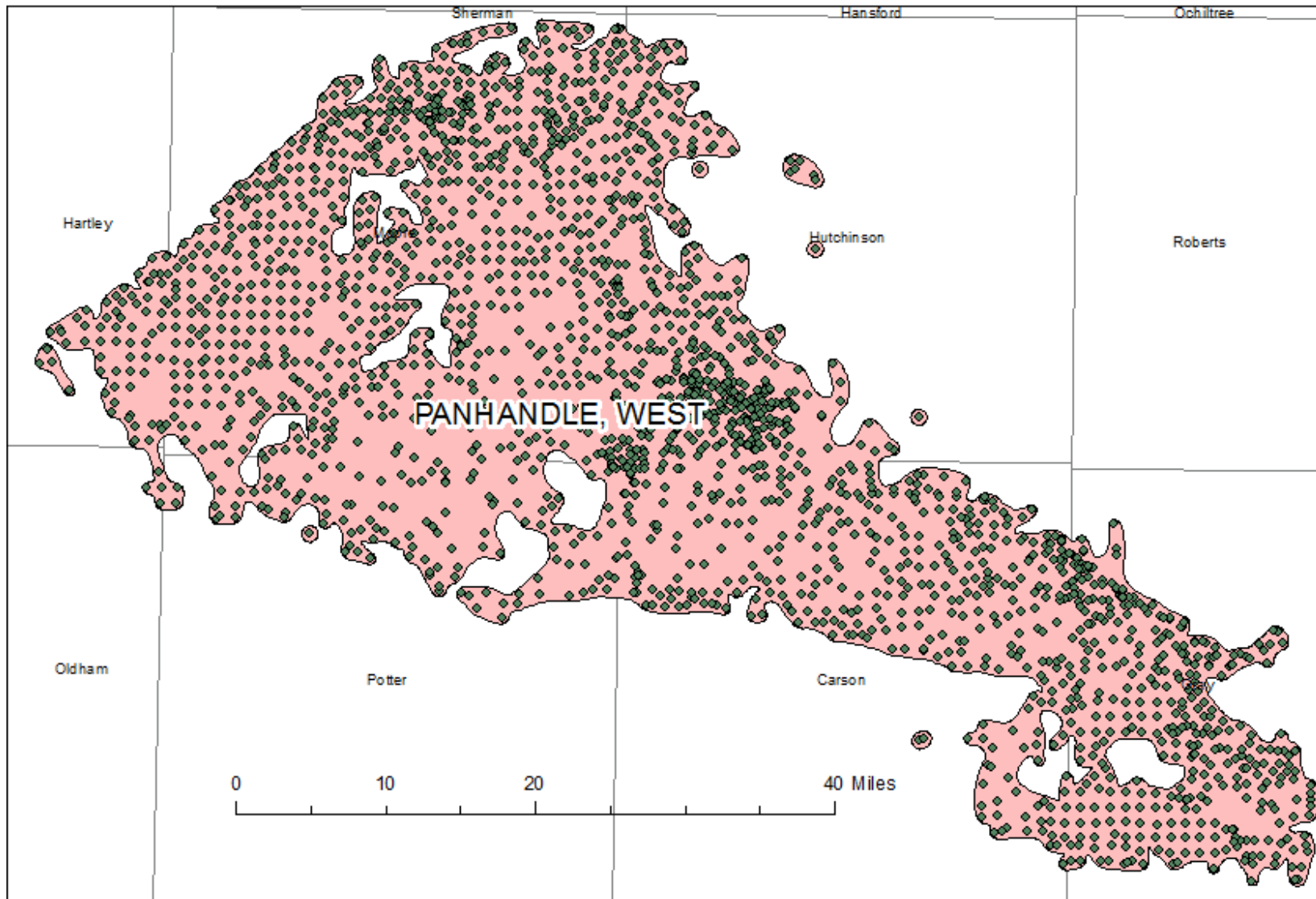
- Plugged wells, cancelled permits
- Pre- and post-primacy fields
- Well type (Type 1, 2, 3)
- Top/bottom of permitted injection interval
- Top/bottom perforations
- County maximum for TDS < 10,000 mg/l
- GAU reviews for TDS < 10,000 mg/l



Creation of digital maps of 3073 fields

- Compiled API well numbers and geographic coordinates for wells in each of the pre-primacy fields and plotted the wells using ArcGIS software
- Mapped the producing zones in these pre-primacy fields by drawing a one-half mile buffer around the wells in each field

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Findings

- No Type 1 injection authorized after primacy into a non-hydrocarbon production zone determined to be a USDW



Findings (Cont'd)

- Very limited Type 2 and 3 injection authorized after primacy into production zones that contain water with a TDS concentration of less than 10,000 mg/l outside the pre-primacy boundaries of O&G fields
 - 38 wells permitted to inject more than ½ mile from the pre-primacy production boundary of one of 13 pre-primacy fields
 - 16 wells permitted to inject into new production zones in 11 post-primacy fields



Findings (cont'd)

- All injection zones productive of hydrocarbons
- Permits for all wells include a Fluid Source Limit condition
- Injection zones for only 4 wells also a water source
 - All located > 1 mile from water well
 - Hydrocarbon production between the injection well and water well

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Conclusions

- Confirmed that RRC UIC program provides substantial and effective groundwater protection
- Enhanced data management system assists in review of applications
- Developed ability to map exempted aquifers
- Enhanced staff knowledge regarding UIC program
- Enhanced coordination between GAU and UIC staff
- Strengthened procedures for ensuring RRC issues no permits for injection wells for which an aquifer exemption is required without concurrence from EPA

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