PROJECT UPDATES — February 2017

Summary — Project personnel at the Bureau, along with our UT-Austin, SMU, and TAMU research partners, continue to make progress on this successful program as highlighted below.

Network Installation and Operations
- Seven permanent TexNet stations were installed in February bringing the total number to 14 of 22.

Synopsis of Recent Seismicity in Texas
- TexNet recorded 90 earthquakes (M≤2.5) in Texas in the areas of DFW, Pecos, Snyder, Fashing and elsewhere. These events will be assessed for location, depth, and magnitude in the coming weeks.
- A total of eight earthquakes (M≤1.0) occurred in the Ft. Worth Basin; none were reported as felt by people. Three events were associated with the Irving-Dallas sequence and five with the Venus, Johnson Co. sequence.

Partnerships
- SMU continues to maintain SMU network and real-time archiving of continuous waveform data to IRIS and provide updated SMU earthquake catalogs, upon request.

Ongoing Research
- SMU focused on seismic velocity imaging of the Azle earthquake sequence using ambient noise tomography combined with local earthquake data and stress drop/moment.
- The Bureau completed the initial fault framework and petrophysical analyses in the Ft. Worth Basin (FWB) injection intervals. The stratigraphic framework and 3D geomodel are 75% complete.
- The Bureau is developing the fluid flow model of the Ft. Worth Basin, including sensitivity tests of changes in fault location, salinity, and temperature.
- The Bureau geomechanics group completed numerical simulations to assess the effect of fault dip, permeability, and contrast in poroelastic parameters on the basement fault reactivation potential.
- UT Petroleum Engineering implemented an embedded discrete fracture model, constructed a Timpson, TX earthquake case study, and began characterizing geological properties for input to detailed FWB flow modeling.
- TAMU finished sensitivity analysis and started history matching the model by varying the sensitivity parameters. Once reasonable seismic event arrival times are achieved, the next step will be to calibrate the model with seismic event location and magnitude.
- The UT Hazards and Risk group has compiled and documented data on facade damage from recent earthquakes in Oklahoma to identify the types of construction methods or building ages that are most vulnerable to damage. Data are being gathered on the building stock throughout Texas with particular focus on the DFW area. This information will be used in regional risk assessments of masonry facades.
- UT Social Science is analyzing responses from the Texas public survey. Case study interviews with oil and gas company executives are almost complete and the recordings are now being transcribed.

Outreach
- A new video providing an overview of the program was completed: TexNet: Texas Earthquake Monitoring.
- The Bureau hosted a disposal-well injection-data stakeholder meeting with representatives from the Texas RRC, petroleum operators, petroleum data service providers, and researchers from TexNet-CISR.
- SMU's DeShon spoke at a luncheon held by the Dallas Association of Petroleum Land Men.
- The Bureau is working with the Texas Legislature to formalize the TexNet program for 2018-2019 funding.