

## **Potential for long term uses of Anthropogenic CO<sub>2</sub> in the Permian Basin**

**Dr. Bob Trentham**  
**University of Texas of the Permian Basin**

Presently, 3+ BCF of CO<sub>2</sub> are processed daily in the Permian Basin. In addition to the 1+ BCF of daily re-cycle CO<sub>2</sub> utilized in the EOR projects in the basin, an additional 2 BCF of “new” CO<sub>2</sub> are imported into the basin. It is estimated that a volume of CO<sub>2</sub> equal to the new CO<sub>2</sub> or ~2 BCF a day in our EOR projects is incidentally sequester. Since 1986, the number of CO<sub>2</sub> EOR projects in the basin has grown from <20 to 62, including 9 projects where CO<sub>2</sub> is being injected into the Residual Oil Zones beneath the Main Pay. This total volume of new CO<sub>2</sub> is estimated to have a value near \$700 million per year and is currently restricted by the sources or, in the case of the Cortez line from Cortez, CO to Denver City, Tx, by pipeline capacity. CO<sub>2</sub> from the Marathon Thrust Belt and expansions at McElmo Dome and Doe Canyon, in Colorado, have the potential for adding additional supplies but a significant backlog of EOR projects remains. Two CO<sub>2</sub> capture equipped coal fired power plants are being permitted in the basin; however, additional long term supplies of anthropogenic CO<sub>2</sub> will be needed.

With the addition of Residual Oil Zone EOR projects and the long term potential for Greenfield CO<sub>2</sub> EOR ROZ projects, significant additional supplies of CO<sub>2</sub> will be necessary in the long term. With the potential for CO<sub>2</sub> utilization in the Permian Basin, and the long term potential for CO<sub>2</sub> utilization in existing fields and Greenfield ROZ projects, it is critical that CO<sub>2</sub> be treated as a commodity and not as a waste product from an industrial source. All CO<sub>2</sub> EOR projects have incidental CO<sub>2</sub> Storage and long term potential for CO<sub>2</sub> Storage in conjunction with additional oil production. For energy security and environmental reasons, these types of projects should be the first place industry and government look to store anthropogenic CO<sub>2</sub>.

thins irregularly basinward. In outcrop, it is made up mostly of stacked mass-transport deposits (MTDs) that are mappable (Amerman, 2009). The underlying El Centro Member is characterized by laminated organic-rich siltstone/shale and is currently an exploration target for oil and gas using horizontal drilling and fracturing. It is recognized on wireline logs by its high radioactivity and high resistivity. Near its top is the widespread but thin Avalon sand recognized on logs by moderate radioactivity and low resistivity. It is an important lowstand deposit useful as a time marker being only slightly younger than the Guadalupian – Cisuralian (Leonardian Stage) Series boundary.

To better understand the Cutoff – upper Bone Spring relationships and promote discussion our poster consists of selected regional cross sections generally using the Avalon sand marker as the datum. Several of the northern Delaware Basin cross sections attempt correlations onto the shelf margin. Several are tied to classic cross sections and studies published by the WTGS, RGS and others. Although each of our new wireline log displays include all of the Cutoff and Bone Spring sequences, we concentrate on the interval between the top of the Cutoff Formation and the top of the 1<sup>st</sup> Bone Spring sand.