This paper describes the results to date of a jointly funded DOE/ ChevronTexaco CO2 pilot project in the Lost Hills Field, Kern County, California. Based on the results of CO2 injectivity tests performed in the field in 1999, a pilot project was initiated in 2000. The pilot consists of four inverted (injector-centered) 5-spot patterns covering approximately 10 acres, and is located in a portion of the field that has been under waterflood since 1992. The target reservoir is the Belridge Diatomite of the Monterey Formation. The pilot location was selected based on geology, reservoir quality and reservoir performance of the waterflood. The goal of the CO2 pilot has been to resolve issues associated with CO2 utilization rate, premature CO2 breakthrough, and overall uncertainty in the unproven CO2 flood process in diatomites and siliceous shales.

A comprehensive monitoring and surveillance program has been implemented for the pilot. This paper summarizes the injection and production performance and the monitoring results to date, including CO2 injection tracers, crosswell electromagnetics, crosswell seismic, CO2 injection profiling, cased-hole resistivity, and tiltmeter data. While initial results were promising with good injectivity and oil response, later monitoring efforts showed early CO2 breakthrough and sanding of producers. Also monitoring efforts showed that while some of the CO2 was entering the diatomite, the early breakthrough of CO2 was due to the existence of fractures and faults. The results presented in this paper may be applicable to evaluate and design other potential San Joaquin Valley CO2 projects.