

## **An Overview of the Little Cedar Creek and Brooklyn Fields**

(December 2012)

### **Little Cedar Creek Field**

The Little Cedar Creek Field was discovered by Hunt Oil Company in 1994 with the drilling of the Cedar Creek Land & Timber Company 30-1 No. 1 Well, Permit No. 10560, in Section 30, Township 4 North, Range 12 East, in Conecuh County, Alabama. The well was drilled to a total depth of 12,100 feet and completed in the Upper Jurassic Smackover Formation as an oil producer. The initial flow rate of the well was 108 barrels of oil per day and 49,000 cubic feet of gas per day through a 12/64-inch choke with a flowing tubing pressure of 248 psi.

Located approximately 10 miles southeast of Evergreen, Alabama, the Little Cedar Creek Field remained a one-well field until Midroc Operating Company of Dallas, Texas, became operator of the field in May 2000. Since that time, Midroc has drilled over 70 wells into the Smackover reservoir. In January 2006, Sklar Exploration Company, L.L.C. drilled its first well in Little Cedar Creek Field. Sklar has since drilled 20 additional wells in the field. Columbia Petroleum LLC became the third operator active in the field when it drilled a well in October 2008 and Fairways Exploration & Production, LLC became the fourth when it drilled a well in October 2010. In the summer of 2011, Midroc Operating Company contracted Pruet Production Company of Jackson, Mississippi, to operate its wells in the field and to continue field development with new drilling. Development of this oil reservoir continues, primarily to the northeast and southeast. To date the field limits have been expanded to include more than 22,000 acres in Townships 4 and 5 North, Ranges 12 and 13 East, Conecuh County, Alabama.

The Smackover Oil Pool in the Little Cedar Creek Field consists of two main porosity zones separated by a dense nonproductive zone. The Smackover Oil Pool in the field is officially defined as those strata of the Smackover Formation productive of hydrocarbons in the interval between the depths of 11,490 and 11,580 feet measured depth in the Pugh 22-2 Well, Permit No. 13472, which is located in Section 22, Township 4 North, Range 12 East. The highest known water (oil/water contact) in Little Cedar

Creek Field, as indicated on the high resolution induction log for the McCreary 21-1 #1 well, is at a subsea depth of 11,365 feet.

The field is located near the up-dip limit of the Smackover Formation, and the trapping mechanism is interpreted as stratigraphic. There is no faulting or structural closure based on current well control. The Smackover Formation simply displays monoclinial dip to the southwest at a rate of about 200 feet per mile.

The western portion of the Little Cedar Creek field was unitized January 1, 2005. This partial field-wide unit includes over 6,100 acres and was unitized based on a two phase allocation formula. Phase I was based on 50% net hydrocarbon pore volume and 50% productivity. Phase II became effective March 1, 2011, when 5,622,557 barrels of oil had been produced from the unit, and is based on 100% net hydrocarbon pore volume.

The net hydrocarbon pore volume determination for the upper Smackover uses a porosity cutoff of 10%, while the lower Smackover zone uses a porosity cutoff of 6%. Net hydrocarbon pore volume is defined as porosity greater than the applicable cutoff, multiplied by the number of feet of pay meeting the minimum porosity value, multiplied by hydrocarbon saturation as determined by log analysis.

As additional data became available with the drilling of new wells within the unit area, allocations for unit tracts were recalculated or redetermined. Technical exhibits presented at a public hearing in support of the last redetermination of the tract allocations for the unit can be viewed from the State Oil and Gas Board's webpage under the "Exhibits" tab of "Hearings" for Board Order 2007-122.

In October 2007, Midroc Operating Company began a gas-injection secondary recovery project within the Upper Zone of the Smackover Formation in the unitized portion of the field. A response to the gas injection has been observed in the field. Production from wells surrounding the two injection sites has increased since the project was initiated. Establishing a second unit for the same purpose is currently being considered.

Since 2005, Little Cedar Creek Field has been the top oil-producing field in the State. Cumulative production from the field has exceeded 16 million barrels of oil. The significant increase in oil production from this field since 2005 is primarily responsible for reversing the declining trend in the State's oil production.

### **Brooklyn Field**

In August 2007, Sklar Exploration Company, L.L.C., drilled and completed a wildcat, the Logan 5-7 No. 1 Well, Permit No. 15363, located about three miles south of the Little Cedar Creek Field in Section 5, Township 3 North, Range 13 East, in Escambia County. The well initially tested 21 barrels of oil per day and produced an average of 8 barrels of oil per day from the Smackover Formation. About a year and a half later, in January 2009, Sklar drilled another wildcat, the Johnston-Steward 32-12 No. 1 Well, Permit No. 15934, located in Section 32, Township 4 North, Range 13 East, in Conecuh County, about a mile northwest of the Logan 5-7 No. 1 Well, in the direction of Little Cedar Creek Field. It produced 16 barrels of oil from the Smackover Formation before it was plugged and abandoned. Consequently, the field limits of Little Cedar Creek Field were not expanded to include the two wells, and the Logan 5-7 No. 1 Well produced independently as a wildcat well for another two and a half years.

In October 2010, Fletcher Petroleum Corp. of Gulf Shores, Alabama, spudded the Amos 36-3 Well, Permit No. 16376, as a wildcat at a location just over a mile south of the Little Cedar Creek Field boundary in Section 36, Township 4 North, Range 12 East, in Conecuh County. The well was drilled to a total depth of 11,968 feet and completed as an oil producer from a reservoir within the Smackover Formation. The well encountered a reservoir pressure significantly higher than the reservoir pressure in the wells of the Little Cedar Creek Field, showing it to be a separate and distinct reservoir from the Smackover Oil Pool of the Little Cedar Creek Field. The initial flow rate of the discovery well was 531 barrels of oil per day and 374,100 cubic feet of gas per day through an 18/64-inch choke with a flowing tubing pressure of 950 psi.

Following the discovery, Sklar Exploration Company, L.L.C., and Pruet Production Company, in addition to Fletcher Petroleum Corp., drilled and completed several development wells in the same reservoir roughly along a line parallel to the southern boundary of Little Cedar Creek Field. Subsequently, the Brooklyn Field was established in September 2011, and the Logan 5-7 No. 1 Well and the Johnston-Steward 32-12 No. 1 Well, drilled years earlier, were incorporated into the field boundaries. To date the field limits have expanded to include nearly 4,500 acres and 26 producing wells. Developmental drilling continues in a southwest-northeast direction along a line parallel to Little Cedar Creek Field and extending into the adjacent Escambia County.

The Smackover Oil Pool in the Brooklyn Field is understood to be separated from the Smackover Oil Pool in Little Cedar Creek Field by a “tight” low permeability barrier within the Smackover Formation. The Smackover Oil Pool in the Brooklyn Field is officially defined as those strata of the Smackover Formation productive of hydrocarbons in the interval between the depths of 11,572 feet and 11,769 feet measured depth in the Mary Mack 30-14 Well, Permit No. 16398, which is located in Section 30, Township 4 North, Range 13 East, in Conecuh County.

Reported production for the Brooklyn Field, through July 2012, is over 1.5 million barrels of oil and 1.4 billion cubic feet of gas.