

**OIL AND GAS DOCKET NO. 03-0225067**

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**THE APPLICATION OF MITCHELL ENERGY CORPORATION FOR INCREASED NET GAS OIL RATIO AUTHORITY FOR ITS LAKE CREEK UNIT WELL NO. 78, LAKE CREEK (CHASE) FIELD, MONTGOMERY COUNTY, TEXAS**

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**Heard by:** Margaret Allen, Technical Hearings Examiner

**Procedural history**

Application received: June 6, 2000

Hearing held: September 13, 2000

**Appearances**

Mark Stephenson  
Marianne Chambers Fox

Representing  
Mitchell Energy Corporation

**EXAMINER'S REPORT AND RECOMMENDATION**

**STATEMENT OF THE CASE**

Mitchell Energy is requesting increased net gas/oil ratio authority, with a daily gas limit of 500 MCF, for its Lake Creek Unit, Well No. 78, in the Lake Creek (Chase) Field, Montgomery County, Texas. Mitchell also requested that the overproduction for this well be canceled.

**DISCUSSION OF THE EVIDENCE**

The Lake Creek (Chase) Field has been producing since the 1940's and still has about 10 producing wells. Lake Creek Unit Well No. 78 was drilled in 1997, and plugged back to the Chase from the Lake Creek (Wilcox Consolidated) Field in September of 1999. Three different sandstones were perforated: between 8869 and 8873 feet; between 8924 and 8928 feet and between 8988 to 8990 feet. Based on log analysis, Mitchell expected these three sandstones to have small oil accumulations underlain by water, but Well No. 78 potentialized as a gas well. The production characteristics of nearby wells have also been erratic and unpredictable, with some classified as gas wells and others as oil wells.

The initial potential of Well No. 78, in the Chase formation, was 24 barrels of oil and 569 MCF of gas, for a gas/oil ratio of 23,667 cubic feet per barrel. The top daily field allowable is 157 barrels of oil and 314 MCF. The oil allowable of Well No. 78 is penalized to 12 barrels per day due to the high gas/oil ratio. During July, 2000, average daily production was 351 MCF and 11 BO, and cumulative production has been 136 MMCF and 6000 BO. As water production has generally

increased over time, Well No. 78 has experienced loading problems. Mitchell expects the well will eventually have to be placed on gas lift.

Because of mechanical problems, Mitchell could not run a production test to determine which of the three sandstones perforated is contributing most of the gas. Mitchell did not run a complete step-rate test, but did provide daily production figures on two choke sizes. When production was stabilized on a 17/64th inch choke, daily rates averaged 10 barrels of oil and 60 barrels of water, with a gas/oil ratio about 28,000. When the well's choke was increased to an inch, the oil rate stayed the same and water production increased slightly. Daily gas production increased slightly at first but then decreased, and the average gas/oil ratio for the first six days in September was 30,725.

Well No. 78 has accumulated 1399 barrels and 41,500 MCF of overproduction, and it would have to be shut-in for 4.5 months to make up this overage. The subject field is located near The Woodlands, a rapidly-growing suburb of Houston and Mitchell is striving to reduce the length of time it will take to deplete this well and the field in general. The current completion is essentially a salvage operation and if Well No. 78 were damaged by a long shut-in, it would not be replaced. The other wellbores in the area are too old to be recompleted to recover the remaining reserves that Well No. 78 can recover. Producing at a reduced rate would require gas lift be installed immediately to keep the well unloaded, though it is operationally difficult to choke back a well on gas lift.

The well's production has declined such that current daily gas production is about 314 MCF, which is the field's allowable. When this well is put on gas lift, its daily gas production may rise and Mitchell is therefor requesting the well's daily gas limit be increased to 500 MCF/D.

### **FINDINGS OF FACT**

1. Notice of this hearing was issued to operators of record in the Lake Creek (Chase) Field on June 19, 2000.
2. The Lake Creek (Chase) Field was discovered in the 1940's, and most of the numerous lenticular sandstones are nearly depleted.
3. Mitchell recompleted the Lake Creek Unit, Well No. 78, to the Chase in September of 1999, and perforated three sandstones it thought to be oil bearing.
4. This completion resulted in relatively high gas producing rates as the initial potential was 24 barrels of oil and 569 MCF of gas, for a gas/oil ratio of 23,667 cubic feet per barrel.
5. The top daily field allowable is 157 barrels of oil and 314 MCF, and the oil allowable of Well No. 78 is penalized to 12 barrels per day due to the high gas/oil ratio.
6. As water production has generally increased over time, Well No. 78 has experienced loading problems and will eventually need gas lift.

7. Well No. 78 has accumulated 1399 barrels and 41,500 MCF of overproduction which should be canceled.
  - a. The well would have to be shut-in for 4.5 months to make up this overage.
  - b. The subject field is located near The Woodlands, a rapidly-growing suburb of Houston and it is reasonable to reduce the length of time it will take to deplete this well and the field in general.
  - c. The current completion is essentially a salvage operation and if Well No. 78 were damaged by a long shut-in, it would not be replaced.
  - d. The other wellbores in the area are too old to be recompleted to recover the remaining reserves that Well No. 78 can recover.
  - e. Producing at a reduced rate would require gas lift be installed immediately to keep the well unloaded, though it is operationally difficult to choke back a well on gas lift.
8. Most of the gas is probably from only one of the three sandstones perforated but mechanical problems prevent the operator from performing a production test to determine which of the sands.
9. Restricting gas production will not result in increased oil recovery, and in fact, the current gas production is providing natural gas lift.
10. The well's production has declined such that it is now close to the field's yardstick gas allowable, but increasing water production indicates artificial gas lift will eventually be necessary.
11. The installation of gas lift will probably increase the gas production for a time above the yardstick allowable and increasing the daily gas limit to 500 MCF will allow the well to operate efficiently at that time.

#### CONCLUSIONS OF LAW

1. Proper notice was given as required by statute.
2. All things have been done or occurred to give the Railroad Commission jurisdiction to resolve this matter.
3. Granting increased gas oil ratio authority will prevent waste and protect correlative rights.

**EXAMINER'S RECOMMENDATION**

Based on the above findings and conclusions, the examiner recommends that net gas/oil ratio authority, with a daily gas limit of 500 MCF, be approved for Mitchell's Lake Creek Unit Well No. 78 in the Lake Creek (Chase) Field. All overproduction for this well should also be canceled.

Respectfully submitted,

Margaret Allen  
Technical Hearings Examiner

Date of Commission Action: October 10, 2000

Exhibits

1. Map
2. Proration schedule
3. Form W-2
4. Cross section
5. Monthly production history
6. Overage status
7. Daily production rates
8. Wellbore schematic
9. Market letter