Oil and Gas Agreements

J. David Chase
Wyoming State Office
Reservoir Management Group (RMG)
April 30, 2019

The Life and Times of an Exploratory Unit Agreement
Unit Agreement Approval Process

July 24, 1931 - Plug job done at Federal Govt. expense

Approval Process

1. Designation
2. Final Approval
Approval Process
Agreements containing Indian Lands

1. Designation
2. BIA gives Final Approval
   BLM provides recommendation to BIA

Designation
Application includes:
- Unit area geology
- Unit target formation
- Unitized formations
- Unit boundary
- Obligation well location
- Changes from the standard form
- Unit operator
Final Approval

Applicant must show:

• All parties within unit area have been invited to join the unit, and

• 85% of acreage within the unit area is committed to the unit agreement (effective unit control)

• Noncommitted acreage does not receive any benefits of the unit

Record Title (Lessee of Record)

Entity who owns the Federal lease and who is responsible for all obligations under the lease. The record title owner may assign and relinquish the lease. Overriding royalty and operating rights are severable from record title interests.
Operating Rights (Working Interest)

Entity who has the right to enter upon the leased lands to conduct drilling and related operations, including production of oil or gas from such lands in accordance with the terms of the lease. The operating rights are assigned from the record title interest. An operating rights owner may not own a record title interest.

Fully Committed Lease

- Record title owners have signed.
- Working interest owners have signed.
- Basic royalty owners (fee tracts) have signed.
- Overriding royalty owners have signed.
Effectively Committed Lease

- Record title owners have signed.
- Working interest owners have signed.
- Basic royalty owners (fee tracts) have signed.
- Overriding royalty owners have not signed.

Partially Committed Lease (Fee)

- Lessees of record have signed.
- Working interest owners have signed.
- Basic royalty owners have not signed.
- Overriding royalty owners have signed or not signed.
Partially Committed Lease (Federal)

- Record title owners have not signed.
- Working interest owners have signed.
- Overriding royalty owners have signed or not signed.

Partially Committed Lease (Federal)

- Leases not subject to segregation.
- Leases are not subject to benefit by unit operations unless there are actual operations and/or production on the lease itself.
- Unitized drilling is permissible on the lease itself.
Noncommitted Lease

- Working interest owners have not signed.
- Lease is not subject to the unit agreement.

Let's form an Exploratory Unit Agreement

We will call the unit:

Boxelder Creek
RMG Policy

1. Exploratory units will not be larger than 25,000 acres.

2. The initial unit obligation well for a vertical well in an exploratory unit shall be located based on the following:
   a. At least one mile away from any penetration(s) of the formation in which the initial unit obligation well is proposed to test.
   b. At least one mile away from the unit boundary.

3. The initial unit obligation well should be located on Federal minerals. In special circumstances the initial obligation well may be located on nonfederal minerals where the obligation well would allow adjacent Federal minerals to participate in the production of a well in a unit participating area.
### Boxelder Creek Unit - Designation Criteria

<table>
<thead>
<tr>
<th>Boxelder Creek Unit No.</th>
<th>Obligation Well Location</th>
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<tbody>
<tr>
<td>1</td>
<td>FEDERAL</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>8</td>
<td>FEE</td>
</tr>
<tr>
<td>9</td>
<td>FEE</td>
</tr>
<tr>
<td><strong>Almond Fm. Isopach</strong></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes
- Boxelder Creek Unit Boundary
- Boxelder Creek Unit - Designation Criteria
- Tract #
- Obligation Well Location
- Federal, State, Fee designations
- Distances: 30 ft, 20 ft, 10 ft, 15 ft
Drilling to Discovery

3 Possible Well Outcomes:

1. Dry hole
2. Non-paying unit well
3. Unit paying well

Implications:

- Unit operator required to drill another well within 6 months of completion of dry hole
- Leases are not HBP (Held by Production) - as a result, leases stand on their own
Drilling to Discovery

2. Non-Paying Unit Well

Implications:

- All leases committed to the unit agreement are now HBP
  - Result of a Yates, Co. IBLA case - 1983
  - Operator often requests verification of a “Yates” well to ensure extension of all their unit leases.

Drilling to Discovery

3. Unit Paying Well

Implications:

- All leases committed to the unit agreement are now HBP
- Further drilling requirements are now handled under the “Plan of Development”
  (Wells no longer required to be drilled 6 months after previous well completed)
- Participating area will be formed
Boxelder Creek Unit

Boxelder Creek Unit No. 1 well was completed and showed an initial potential of 2,000 mcf/day.

After some production history, the operator sent a “Unit Paying Well Determination” application to the RMG.

RMG determined that the Boxelder Creek Unit No. 1 well was a “Unit Paying Well”

IMPORTANT

Drilling to Discovery

Boxelder Creek Unit

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IMPORTANT
Exploratory Unit Agreement

**Participation After Discovery**

**Participating Area (PA)**

**Definition:**

- The area that is “reasonably proven productive” by a well that produces in “unit paying” quantities.

- The area that shares in:
  - Costs and revenue of the PA well(s), and
  - Allocation of royalty
Participation After Discovery

“Reasonably proven productive”

How do we define this in order to come up with the PA boundary?

- Circle-tangent method unless additional info available
  - Simple
  - Equitable
  - Well accepted by industry

Boxelder Creek Unit

40 acre subdivisions cut 50% or more by the circle

640 acre circle
Boxelder Creek Unit

Initial Almond Formation PA “A”
effective May 1, 2010

560 Total Acres:
360 Fee acres - 64.3%
200 Federal acres - 35.7%
100.0%

Production Allocation EXAMPLE:

If PA well No. 1 produces 10,000 mcf gas during May, 2010, then

64.3% of gas, or 6,430 mcf attributed to Fee lease(s), and
35.7% of gas, or 3,570 mcf attributed to the Federal lease(s)

Federal royalty owed = 12 1/2% of gas attributed to the Federal acreage = 12 1/2% * 3,570 mcf = 446 mcf
Exploratory Unit Agreement

Plan of Development Phase

- Unit operator has 5 yrs from effective date of initial PA to develop area outside existing PA.

Boxelder Creek Unit

Plan of Development Area

- Plan of Development Phase

Initial Almond Formation PA “A” effective May 1, 2000
Boxelder Creek Unit

Plan of Development Phase

Year No. 1

- Well #2 drilled
- Positive PWD
- PA revised

Boxelder Creek Unit No. 2

1st Revision Almond Formation PA “A” effective June 1, 2011
1st Revision Almond Formation PA “A”

1,400 Total Acres:
- 880 Fee acres - 62.9%
- 520 Federal acres - 37.1%
- 100.0%

Production Allocation EXAMPLE:

If PA well No. 1 & 2 together produce 30,000 mcf gas during June, 2011, then:

62.9% of gas, or 18,870 mcf attributed to Fee lease(s), and
37.1% of gas, or 11,130 mcf attributed to the Fed. lease(s)

Federal royalty owed = 12 1/2% of gas attributed to the Federal acreage = 12 1/2% * 11,130 mcf = 1,391 mcf

Boxelder Creek Unit

Plan of Development Phase

Years 2, 3, 4 and 5
- 4 dry holes

1st Revision Almond Formation PA “A”

Dry Hole

Dry Hole

Dry Hole

Dry Hole
May 1, 2015
- Unit boundary contracts to PA boundary (5 yrs after effective date of initial PA)
- Unit continues in effect until last well in PA is plugged

Horizontal Wells in Exploratory Units
• Conventional Plays – Horizontal wells are drilled to maximize contact with the productive horizon or fracture system or to follow geologic structures (e.g., anticlinal axis).
• Unconventional Plays – Currently, many horizontal wells are drilled in unconventional plays known as “Resource Plays”…

• An unconventional resource play is one that cannot be fully or economically developed without using horizontal drilling (laterals) and multi-stage hydraulic fracturing technologies because of the low permeability of the tight formation/play (Campanga, 2015; DOE, DOI and EPA, 2014; Cander, 2012; Doust, 2010; and Houldith and Ayers, 2009)
RMG Policy

1. Exploratory units for continuous accumulation (resource) plays will not be larger than 25,000 acres
   • Assuming development with horizontal wells, all whole sections will be included in the proposed unit area which would allow an exploratory unit to be greater than 25,000 acres, but less than 25,640 acres. A typical section is 640 acres.
   • Coalbed natural gas units will be limited to 25,000 acres.

2. Unit boundaries may be based on acreage position if the proposed wells will test formations that fit the definition of a continuous accumulation play.
   • Also true also for coalbed natural gas continuous accumulation plays
3. The initial unit obligation well for a horizontal well in an exploratory unit shall be located based on the following:

A. At least one mile away from any penetration(s) of the formation in which the initial unit obligation well is proposed to test; however, if any portion of the horizontal wellbore within the target formation lies a mile away, then the distance requirement for the initial unit obligation well will have been met.

B. At least one mile away from the unit boundary; however, if any portion of the horizontal wellbore within the target formation lies a mile away, then the distance requirement for the initial unit obligation well will have been met.

C. The entire length of the lateral should be located on Federal minerals. In special circumstances the lateral may intersect nonfederal minerals.

Subsequent unit wells do not have a similar requirement.
Sometimes the distance requirement allows for a very small window, but remember that only a portion of the wellbore in the target formation needs to meet the requirement.

4. The length of the horizontal lateral within the target formation for the initial unit obligation well will be at least 1,500 feet.

5. The unit will not be validated if the unit operator chooses to complete anywhere other than the target formation unless a horizontal test of the target formation has been completed.
Section 9 Language

**Vertical Obligation Well**

- Pursuant to unit plan regulations 43 CFR 3180, the land requested, as outlined on your plat marked "Exhibit 'A', Northwest Poison Spider Unit", is hereby designated as a logical unit area. The unit agreement submitted for the area designation should provide for the drilling of one (1) test well (Initial Drilling Obligation). The test well, located in the SW/4 NW/4, Section 32, T. 34 N., R. 84 W., is to be drilled to a depth of 16,000 feet or 200 feet below the top of the Carlile Formation. The top of the Carlile Formation occurs at 14,810 feet measured depth as shown on the electric and mud logs in the Davis Oil Company Whitting #1 well located in the SW/4 SE/4, Section 2, T. 33 N., R. 84 W. The obligation well is to be drilled at the location specified or another location approved by the authorized officer.

Section 9 Language

**Horizontal Obligation Well**

- Pursuant to unit plan regulations 43 CFR 3180, the land requested, as outlined on your plat marked "Exhibit 'A', West Orpha (Deep) Unit", is hereby designated as a logical unit area. The unit agreement submitted for the area designation should provide for the drilling of one (1) test well (Initial Drilling Obligation). The test well, with a surface location in the NE/4 NW/4, Section 14, T. 33 N., R. 73 W., is to include a horizontal lateral drilled in the Middle Bench of the Niobrara Shale of not less than 1,500 feet in length. The top of the Middle Bench of the Niobrara Shale occurs at 10,590 feet measured depth as shown on the resistivity log in the Oil Field Salvage #1 Catherine well located in the SE/4 NW/4, Section 21, T. 33 N., R. 72 W. The obligation well is to be drilled at the location specified or another location approved by the authorized officer.
Participating Area (PA)

**Definition:**

- The area that is “reasonably proven productive” by a well that produces in “unit paying” quantities.
- The area that shares in:
  - Costs and revenue of the PA well(s), and
  - Allocation of royalty

**Participation After Discovery**

“Reasonably proven productive”

How do we define this in order to come up with the PA boundary?

- Circle-tangent method unless additional info available
  - Simple
  - Equitable
  - Well accepted by industry
Participating Area Considerations

- If the initial unit obligation well is determined to be a unit paying well (i.e., the well will pay out its drilling and completion costs), then an initial participating area (PA) will be formed. The participating area for the horizontal well will be established by constructing 40-acre circles around the end of the lateral and around the entry point of the wellbore into the participating area formation and by constructing tangents between them. All 10-acre subdivisions cut by the circles/tangents will be included in the participating area.
Boxelder Creek Unit

Initial Niobrara Formation PA “A” effective May 1, 2010

Production Allocation EXAMPLE:

If PA well No. 1 produces 10,000 bbls oil during May, 2010, then

- 34.2% of oil, or 3,420 bbls attributed to Fee lease(s),
- 5.3% of oil, or 530 bbls attributed to the State Lease,
- 60.5% of oil, or 6,050 bbls attributed to the Federal lease(s)

Federal royalty owed = 12 1/2% of oil attributed to the Federal acreage = 12 1/2% * 6,050 bbls = 756 bbls
**EXHIBIT B**
SCHEDULE OF LANDS AND TRACT PARTICIPATION INITIAL TSAPOT FORMATION PARTICIPATING AREA "B"
CROW (DEEP) UNIT AREA
CONVERSE COUNTY, WYOMING
EFFECTIVE APRIL 28, 2014

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<th>Non-Committed Acres</th>
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Exhibit "A" Participating Areas: Crown Unit (Sheet 2)
If the initial unit obligation well is determined to be a nonpaying unit well, then a drilling and spacing unit may need to be formed if the horizontal lateral intersected Federal and nonfederal mineral interests. In this case, the proposed drilling and spacing unit may be proposed using the same method as would be used in establishing an initial participating area. The WOGCC would approve the drilling and spacing unit and then the Reservoir Management Group would approve a communization agreement to protect both the Federal and nonfederal mineral interests.
An example of a drilling and spacing unit that was approved by the WOGCC after the RMG determined a well to be a nonpaying unit well is in the Canyon Creek Dome Unit.

A communitization agreement was approved for the established drilling and spacing unit.
Secondary Recovery Unit Agreements

Perkins Cementing Outfit, running 750 sacks of cement back of 2971’ of 10 1/2” seamless casing in 1 hour and 10 minutes. The largest cement job in the Salt Creek Field. November 1, 1930

How do these agreements differ from Exploratory Unit Agreements?

- Field has been geologically defined
- Formation specific
- Entire unit participates from effective date (No subsequent joinders required)
Secondary Recovery Unit Agreements

How do these agreements differ from Exploratory Unit Agreements?

- Involves enhanced recovery method (e.g., waterflood)
- Participation based on formula
- Can force unitize by state statute

Secondary Recovery Unit Agreements

How do these agreements differ from Exploratory Unit Agreements?

- No drilling requirements
- No PAs established
- No contraction of unit acreage allowed
0 Ft. isopach - Reservoir Boundary
Secondary Recovery
Unit Agreements

Tract Participation Formula Example:

- Hydrocarbon pore volume: 50%
- Useable well bores: 10%
- Cumulative production: 40% or 100%

The End

Plugging Operation - 1937