

THE APPLICATION OF UNIT PETROLEUM COMPANY TO CONSIDER EXCEPTIONS TO STATEWIDE RULE 11 FOR NINE WELLS IN VARIOUS (MORROW & GRANITE WASH) FIELDS, HEMPHILL AND ROBERTS COUNTIES, TEXAS

HEARD BY: Richard D. Atkins, P.E. - Technical Examiner

DATE OF HEARING: July 8, 2009

APPEARANCES:

Barry Hagemann
K. Michael Earnest

REPRESENTING:

Unit Petroleum Company

EXAMINER'S REPORT AND RECOMMENDATION

STATEMENT OF THE CASE

Unit Petroleum Company ("Unit") requests exceptions to Statewide Rule 11 for nine wells in Various (Morrow & Granite Wash) Fields. Unit was unable to run the required inclination surveys across the Brown Dolomite formation, as it is associated with lost circulation and differential sticking of the drill string.

This application was unopposed and the examiner recommends approval of the requested exceptions to Statewide Rule 11.

DISCUSSION OF THE EVIDENCE

Statewide Rule 11(b)(1)(A) requires that "...The first shot point of an inclination survey be made at a depth not greater than 500 feet below the surface of the ground, and succeeding shot points shall be made either at 500 foot intervals or at the nearest drill bit change thereto, but not to exceed 1,000 feet apart".

Unit uses only one PDC (polycrystalline diamond compact) bit to drill a well out from under the surface casing at about 2,800 feet down to a depth of about 9,500 feet. As a result, there is only one bit trip made on each well and, due to well conditions, Unit was unable to run all of the required inclination surveys by exceeding the 1,000 foot limit. Unit requests an exception to Statewide Rule 11(b)(1)(A) for the following wells:

OIL AND GAS DOCKET NO. 10-0262075

<u>Field Name</u>	<u>Lease Name</u>	<u>Well No.</u>	<u>API No.</u>	<u>County</u>
Mendota, N., (Morrow, Upper)	Vollmert "C"	5	42-211-33942	Hemphill
	Chambers "A"	1	42-393-31982	Roberts
Parsell (Morrow, Upper)	Warren	2	42-393-31948	Roberts
Hemphill (Granite Wash)	J.T. Brown Et al "B"	12	42-211-34025	Hemphill
Mendota, NW. (Granite Wash, SW.)	J.B. Waterfield	3	42-393-32004	Roberts
	Waterfield	6	42-393-32045	Roberts
	Waterfield "A"	3	42-393-31989	Roberts
	Waterfield "B"	5	42-393-31808	Roberts
	Waterfield "C"	7	42-393-31969	Roberts

The Permian System, Brown Dolomite formation, is a highly permeable dolomite interval, with both high natural and fracture porosity that is encountered in the Texas Panhandle area of the Anadarko Basin. The formation occurs between the base of the Panhandle Lime at approximately 3,800 feet and the top of the Douglas formation at approximately 6,400 feet. The overall thickness is approximately 2,000 feet. The Brown Dolomite produces oil and gas in some parts of the Texas Panhandle and the reservoir pressure is typically less than the hydrostatic gradient of water.

In general, the region of activity from the eastern half of Roberts County to the west half of Hemphill County seems to be the most difficult region for encountering drilling problems in the Brown Dolomite. The problems associated with drilling this zone is loss of circulation, which can cause differential sticking of the drill collars and drill pipe. Also, due to the fractured nature of the formation, wells can have structural failure in the form of small 'rocks' induced in the wellbore which can also cause drill string sticking.

Once the Brown Dolomite Interval is opened, the mud system must contain a high content of loss circulation material, and the penetration rate must be controlled to not 'overload' the mud system with cuttings that increase the hydrostatic pressure exerted on the formation. Also, drill pipe connections and pipe trip speeds must be controlled to keep from 'surging' the wellbore and exerting excess pressure on the sensitive zones in Brown Dolomite.

OIL AND GAS DOCKET NO. 10-0262075

Due to the lost circulation and wellbore structural problems, it is not recommended practice to stop the movement of drill collars across the potential loss circulation zones for any time period longer than time to add a joint of drill pipe to continue drilling. Wireline surveys typically take approximately 45 minutes during which time the drill pipe cannot be reciprocated and mud cannot be circulated. Although the present operation is to rotate the pipe while a wireline survey is being run, the risk is still high that problems will occur in the Brown Dolomite.

Unit has had lost circulation problems in 50% of it's wells and has already lost the drill string in three wells. The associated cost of differential or mechanical sticking of the drill string can be approximately \$150,000 for a fishing operation and up to \$750,000 for the loss of the drill string and side tracking to re-drill the interval.

Field rules for the subject fields require a minimum wellbore distance of 467 feet from the lease lines. Unit calculated the total wellbore displacement on each well using the maximum deviation encountered in the well for the missed survey points. The following table summarizes the results:

<u>Lease Name</u>	<u>Well No.</u>	<u>Nearest Lease Line</u>	<u>Max W-12 Displacement</u>	<u>Distance To Lease Line</u>
Vollmert "C"	5	1,463'	489'	974'
Chambers "A"	1	800'	292'	508'
Warren	2	500'	290'	210'
J.T. Brown Et al "B"	12	800'	319'	481'
J.B. Waterfield	3	1,212'	305'	907'
Waterfield	6	2,432'	300'	2,132'
Waterfield "A"	3	840'	277'	563'
Waterfield "B"	5	1,000'	267'	733'
Waterfield "C"	7	2,331'	242'	2,089'

Eight of the wells comply with the lease line spacing and the one well that does not is clearly contained within the lease boundaries. In addition, Unit is its own offset for the well that does not comply with the Field Rule lease line spacing. As a result, Unit requests an exception to Statewide Rule 11(b)(1)(A) for the subject wells.

EXAMINER'S OPINION

The examiner recommends that the exceptions to Statewide Rule 11 be approved. Loss of circulation is a known problem associated with drilling the Brown Dolomite formation and can cause the differential sticking of drill collars and drill pipe. Also, due to the fractured nature of the formation, wells can have structural failure in the form of small 'rocks' induced in the wellbore which can also cause drill string sticking. Unit did not

OIL AND GAS DOCKET NO. 10-0262075

intentionally deviate the wells and was able to obtain most of the required inclination surveys on each well. Unit did exceed the 1,000 foot limit in several places in each well, but since all of the wells are clearly contained within their lease boundaries, additional directional surveys should not be required.

FINDINGS OF FACT

1. Notice of this hearing was given to all persons entitled to notice at least ten (10) days prior to the hearing.
2. Unit Petroleum Company requests exceptions to Statewide Rule 11 for nine wells in Various (Morrow & Granite Wash) Fields.
3. The nine wells were permitted as vertical wells and not directional wells. Unit did not intentionally deviate the wells and was able to obtain most of the required inclination surveys on each well.
4. Unit uses only one PDC bit to drill a well out from under the surface casing at about 2,800 feet down to a depth of about 9,500 feet. As a result, there is only one bit trip made on each well and, due to well conditions, Unit was unable to run all of the required inclination surveys by exceeding the 1,000 foot limit.
5. Loss of circulation is a known problem associated with drilling the Brown Dolomite formation and can cause the differential sticking of drill collars and drill pipe. Also, due to the fractured nature of the formation, wells can have structural failure in the form of small 'rocks' induced in the wellbore which can also cause drill string sticking.
6. Unit has had lost circulation problems in 50% of it's wells and has already lost the drill string in three wells.
7. The associated cost of differential or mechanical sticking of the drill string can be approximately \$150,000 for a fishing operation and up to \$750,000 for the loss of the drill string and side tracking to re-drill the interval.
8. Field rules for the subject fields require a minimum wellbore distance of 467 feet from the lease lines.
9. Unit calculated the total wellbore displacement on each well using the maximum deviation encountered in the well for the missed survey points.
 - a. Eight of the wells comply with the lease line spacing and the one well that does not is clearly contained within the lease boundaries.

OIL AND GAS DOCKET NO. 10-0262075

- b. Unit is its own offset for the well that does not comply with the Field Rule lease line spacing.
- c. Unit did exceed the 1,000 foot limit in several places in each well, but since all of the wells are clearly contained within their lease boundaries, additional directional surveys should not be required.

CONCLUSIONS OF LAW

- 1. Proper notice was timely given to all parties entitled to notice pursuant to applicable statutes and rules.
- 2. All things have occurred and have been accomplished to give the Commission jurisdiction in this case.
- 3. Approval of the requested exceptions to Statewide Rule 11(b)(1)(A) for nine wells in Various (Morrow & Granite Wash) Fields will not cause waste or harm correlative rights.

EXAMINER'S RECOMMENDATION

Based on the above findings of fact and conclusions of law, the examiner recommends that the Commission grant the Statewide Rule 11 exceptions for nine wells in Various (Granite Wash & Morrow) Fields, as requested by Unit Petroleum Company.

Respectfully submitted;

Richard D. Atkins, P.E.
Technical Examiner