Citation Oil & Gas Corporation (COGC) currently has 5 water injection wells at West Buffalo B Unit (WBBU) in Harding Co., SD. injecting into the Red River B. Current maximum pressure limits for all of the water injectors at WBBU range from 1540-1550 psi. The pressures were originally derived from a step rate test performed on the State #14-16 vertical injection well on August 16th, 1989. COGC recently conducted step rate tests on the Clarkson #2-26H (horizontal injector) water injection well. Results of the step rates are considered to be exclusive to the Clarkson #2-26H and not valid for vertical water injectors. Therefore, Citation Oil and Gas requests an authorized maximum injection pressure of 2,010 psi for the Clarkson #2-26H water injection well.

COGC performed a step rate test on the Clarkson #2-26H (FIG #1 attached) on July 18th, 2012. The test was performed in 5 minute step intervals ranging from rates of 0.3 bpm to 3 bpm. Typical step rate results with injection pressure plotted versus rate show two straight line trends with the first trend line possessing a steeper decline representing matrix injection. The second trend line is typically shallower and characterizes fracture extension pressures. The intersection point of the two lines is used to estimate fracture extension pressure. The plotted results for the first step rate for the Clarkson #2-26H (FIG #1) do not exhibit a typical step rate trend and the straight line trend indicates that this step rate did not achieved a high enough rate to fracture the formation. Therefore, a second step rate test was performed on August 29th, 2012 (FIG #2 attached) with 5 minute step intervals ranging from 1 bpm to 5.5 bpm. The pressure and rate data from the first step rate and second step rate test were merged and plotted accordingly (FIG #3 attached). Table #1 on FIG #3 contains the averaged rates and averaged surface injection pressures during the step rate. The results from the merged step rate analysis remain the same as there are 2 distinct slopes but the trend is the inverse of a typical step rate plot. The line plotted in FIG #3 exhibits a slight exponential trend and then deviates to an increasing linear trend. The point of deviation on this trend line corresponds to 2010 psi surface pressure or the requested
authorized maximum injection pressure. This deviation point corresponding to 2010 psi is not to be confused with the parting pressure of the formation.

The Clarkson #2-26H step rate results reveal that much higher injection rates will be required to exceed the parting pressure of the formation. FIG #4 plots the surface injection pressure and the bottom hole pressure (BHP) versus rate. Table #2 on FIG #4 contains the calculated friction pressures (Pf) at corresponding step rates. Pf was calculated using the imperial form of the Hazen-Williams equation.

\[
P_f = \left[0.002083(L)(100/C)^{1.85}(Q^{1.85}/d^{0.8655})\right]/2.31
\]

\[P_f = \text{friction pressure (psi)}\]
\[L = \text{tubing length (ft)}\]
\[C = \text{friction coefficient (90 for used tubing)}\]
\[Q = \text{flow rate (gpm)}\]
\[d = \text{inside tubing diameter (in.)}\]

Note the trend of the BHP pressure curve on FIG #4 and that increasing the rate lowers the BHP due to increasing friction pressure. The black dashed line represents the bottom hole fracture pressure based on a fracture gradient of 0.617 psi/ft. The fracture gradient was derived from the original State #14-16 step rate and falls in line with estimated fracture gradients throughout the field. The bottom hole fracture pressure for the Clarkson #2-26H = (Fracture gradient x TVD of the lateral) = (0.617 psi/ft x 8422 ft) = 5196 psi. The BHP’s fall below this line verifying that current and requested maximum injection pressures will not meet or exceed the estimated fracture pressure of the formation. Furthermore, the top confining zone (Stony Mt. Shale) will typically have a fracture gradient of 1.0 psi/ft or greater. However, the red dashed line represents a bottom hole fracture pressure (7100 psi) of the Stony Mt. Shale assuming a conservative fracture gradient of 0.85 psi/ft. FIG #4 illustrates that current and requested maximum injection pressures not only fall below the Red River B parting pressure but also below the confining zone parting pressure. Therefore, it is reasonable to conclude that horizontal injectors should be evaluated independently and utilizing vertical injection well step rate data will result in ultra-conservative injection pressures for horizontal injection wells.

The step rate test performed for the Clarkson #2-26H validates the suspicion that in order to exceed parting pressures in this horizontal injector rates beyond the capability of the surface equipment would be required. The information supplied should provide ample support to accept the requested maximum injection pressure of 2010 psi. Currently, the Clarkson #2-26H is averaging 694 bwipd at 1515 psi. It is anticipated that COGC will inject +/- 900 bwipd with the approved increase in maximum allowable pressure limits.
If, after reviewing the above information and attachments, you have any questions or concerns, please call.

Sincerely,

Jeremy Wagner
Operations Engineer
Citation Oil and Gas Corporation

Cc: Bob Christofferson
    Region Manager
    Citation Oil and Gas Corporation
Clarkson #2-26H step rate analysis 7-18-2012
WBPU Clarkson #2-26H pressure/rate/time 8/29/12

Note: 3.0, 0.75 bpm steps performed earlier 7/18/12.

- Ran out of water had to switch valves on water transport, down 5 minutes
- ISP = 1650 psi
- 6 bpf
- 5 bpf
- 4 bpm
- 3 bpm
- 2 bpm
- 1 bpm
Clarkson #2-26H step rate analysis

Data points used from step rate on 7-18-12
Data points used from step rate on 8-29-12

REQUESTED MAXIMUM SURFACE INJECTION PRESSURE = 2050 psi
Corresponds to BHP = (SFC INJ @ 3 bpm + P_{hysteresis})

<table>
<thead>
<tr>
<th>AVE RATE</th>
<th>AVE INJ PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 bpm</td>
<td>1480 psi</td>
</tr>
<tr>
<td>0.5 bpm</td>
<td>1490 psi</td>
</tr>
<tr>
<td>0.75 bpm</td>
<td>1520 psi</td>
</tr>
<tr>
<td>1 bpm</td>
<td>1550 psi</td>
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<tr>
<td>2 bpm</td>
<td>1750 psi</td>
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<tr>
<td>3 bpm</td>
<td>2050 psi</td>
</tr>
<tr>
<td>4 bpm</td>
<td>2370 psi</td>
</tr>
<tr>
<td>5 bpm</td>
<td>2760 psi</td>
</tr>
<tr>
<td>5.5 bpm</td>
<td>2950 psi</td>
</tr>
</tbody>
</table>

FIG #3

Will require much higher injection rates to achieve BHP's high enough to exceed frac gradient. *See FIG #4
Clarkson #2-26H step rate analysis

Estimated confining Stony Mt. Shale frac gradient = 0.85 psi/ft corresponds to 7,100 psi BHP

STATE #14-15 step rate frac gradient = 0.617 psi/ft corresponds to 5,196 psi BHP

Table #2

<table>
<thead>
<tr>
<th>Rate BPM</th>
<th>Friction PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>11</td>
</tr>
<tr>
<td>0.5</td>
<td>29</td>
</tr>
<tr>
<td>0.75</td>
<td>62</td>
</tr>
<tr>
<td>1</td>
<td>106</td>
</tr>
<tr>
<td>2</td>
<td>383</td>
</tr>
<tr>
<td>3</td>
<td>810</td>
</tr>
<tr>
<td>4</td>
<td>1380</td>
</tr>
<tr>
<td>5</td>
<td>2086</td>
</tr>
<tr>
<td>5.5</td>
<td>2488</td>
</tr>
</tbody>
</table>

FIG #4
CITATION OIL AND GAS CORPORATION
WELLBORE DIAGRAM AND INFORMATION

Well Name: WBBU #2-26H WIW
Date: August 2, 2008
County: Harding

Field: WBBU
Location: SW/NW Sec. 26-T21N-R03E
State: South Dakota

Surface: 2390' FNL 880' FWL
Sec. 26-T21N-R03E
Harding County, SD
Completed: December 4, 1994
Converted to WIW: February 24, 1995
Elevation: 3,214' GRD
KB: 3,235'

Wellhead = 7 1/6" (3M) Surface:
Completed: December 4, 1994
Converted to WIW: February 24, 1995
Elevation: 3,214' GRD
KB: 3,235'

TOC @

TUBING DETAIL 8/08

<table>
<thead>
<tr>
<th>Qty</th>
<th>Description</th>
<th>Length</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>---</td>
<td>KB</td>
<td>21</td>
<td>21.00</td>
</tr>
<tr>
<td>---</td>
<td>Tension</td>
<td>1.50</td>
<td>22.50</td>
</tr>
<tr>
<td>1</td>
<td>2 7/8&quot; 6.5# J-55 tbg</td>
<td>31.46</td>
<td>53.96</td>
</tr>
<tr>
<td>1 ea</td>
<td>2 7/8&quot; 6.5# J-55 tbg sub - 4', 8'</td>
<td>12.35</td>
<td>66.31</td>
</tr>
<tr>
<td>250</td>
<td>2 7/8&quot; 6.5# J-55 tbg</td>
<td>7,860.25</td>
<td>7,926.56</td>
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<tr>
<td>1</td>
<td>Retrieving head</td>
<td>1.75</td>
<td>7,928.31</td>
</tr>
<tr>
<td>1</td>
<td>Shut off valve</td>
<td>1.33</td>
<td>7,929.64</td>
</tr>
<tr>
<td>1</td>
<td>Baker A-3 double grip 5 1/2&quot; pkr</td>
<td>3.45</td>
<td>7,931.76</td>
</tr>
<tr>
<td></td>
<td>pkr w/nickel platted mandrel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CASING DETAIL

<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
<th>Grade</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 3/4&quot;</td>
<td>40.5</td>
<td>K-55</td>
<td>Surf - 1936</td>
</tr>
<tr>
<td>7 5/8&quot;</td>
<td>29.7, 33.7</td>
<td>P110/595</td>
<td>Surf - 8706</td>
</tr>
</tbody>
</table>

Open Hole from 8,706' - 11,200'

Baker Pkr @ 7932' KB

PBTD: 11,300' MD
TD: 8422' TVD & 11,300' MD
IN THE MATTER OF THE APPLICATION OF
CITATION OIL & GAS CORP., HOUSTON, TEXAS,
TO INCREASE THE MAXIMUM INJECTION
PRESSURE AT THE EXISTING CLARKSON 2-26H
INJECTION WELL LOCATED IN THE SW ¼ NW ¼
SECTION 26, TOWNSHIP 21 NORTH, RANGE 3
EAST, IN THE WEST BUFFALO "B" RED RIVER
UNIT, HARDING COUNTY, ABOUT 15 MILES
NORTHWEST OF BUFFALO, SOUTH DAKOTA.

Notice is hereby given to the public and to all interested persons that pursuant to South Dakota Codified
Laws (SDCL) Chapter 1-26 and Chapter 45-9 and further pursuant to the Administrative Rules of South
Dakota (ARSD) 74:12:07 and 74:12:09, the following matter has come to the attention of the Secretary of
the Department of Environment and Natural Resources, hereinafter “Secretary.”

Citation Oil & Gas Corp. has submitted an application to the Secretary requesting an increase in the
injection pressure at the Clarkson 2-26H well from 1,550 pounds per square inch to 2,010 pounds per
square inch. No other permit condition changes were requested. The requested pressure increase will not
cause new fractures or propagate existing fractures in the confining zone and will not affect any
underground sources of drinking water.

The Secretary recommends approval of the application with the following conditions:

1) Injection operations authorized under the permit to inject must be conducted in accordance
with SDCL Chapter 45-9, ARSD 74:12 and any applicable orders or rules promulgated by the
board;

2) The maximum injection rate must not exceed 1,000 barrels of water per day;

3) The maximum pressure must not exceed 2,010 pounds per square inch during injection
operations;

4) A mechanical integrity test must be successfully conducted prior to increasing the tubing
injection pressure to 2,010 pounds per square inch. The well casing must pass the mechanical
integrity test at 1,000 pounds per square inch surface pressure. The operator is required to
notify the Secretary a minimum of 72 hours prior to running a mechanical integrity test;

5) Once mechanical integrity is established, the well must be retested at least once every five
years to ensure that mechanical integrity is maintained, unless the department indicates
differently;

6) If an unsuccessful pressure test occurs, the operator must cease operations immediately if it
is determined the injection will threaten any underground source of drinking water. If the
failure is not threatening ground water, the operator must cease operations within 48 hours
after receipt of the department secretary’s notice, and take corrective action on the well as
soon as feasible. Corrective action options include repairing the well so that a successful test
result can be obtained, plugging and abandoning the well, or any other action approved by
the department.
Authority for the Secretary to approve this application is contained in ARSD 74:12:07 and 74:12:09. Unless a person files a petition requesting a hearing on the above application pursuant to the provisions of ARSD 74:09:01 on or before November 27, 2012, the Secretary’s recommendation will be considered final and the Secretary will approve the application in accordance with that recommendation. For additional information about the application, please contact Brian J. Walsh, Environmental Scientist III, Ground Water Quality Program, Department of Environment and Natural Resources, 523 East Capitol Avenue, Pierre, SD 57501; 605.773.3296 or email brian.walsh@state.sd.us.

October 29, 2012

Steven M. Pirner
Secretary

Published once at the total approximate cost of ______________.