TESTING OPERATIONS REVIEW

KGS Marvin Blan # 1
Hancock County, KY

Prepared By: ConocoPhillips
Lexington, KY - July 21, 2009
AGENDA

1. Overview
   1. HASP & Objectives
   2. Test Intervals
   3. Well Schematics
   4. Cost & Timing

2. Program Walk Through
   1. Pre-work
   2. Move in & Rig up
   3. Rig Information
   4. Location Layout
   5. Preparing the Borehole
   6. TAM International BHA
   7. Formation Water Sampling
   8. KGS Fluid Analyzer & Sampling Protocol (KGS to present)
   9. Injection Testing
   10. CO₂ Injection – (Praxair to present)
   11. P&A

3. Additional Information
   1. Well Control
   2. Public Relations & Well Site Visits
   3. Reports and Protocols
Health And Safety Plan

- Establishes Personnel Protection Standards
- Specifies Safe Operating Procedures
- Assigns Emergency Responsibilities
- Provides a Program for Contingencies
WELL OBJECTIVES

• To safely test the KGS Marvin Blan #1 well efficiently and in an environmentally acceptable manner.
• To obtain formation data (water sampling & injection data) to quantify the capability and capacity of the Knox & St. Peter formations for CO₂ sequestration.
• Perform the above objectives in a highly cost effective manner.
# Testing Intervals

## Injection Test Intervals

<table>
<thead>
<tr>
<th>Test #</th>
<th>Interval</th>
<th>Fluid</th>
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<tbody>
<tr>
<td>1</td>
<td>6,100</td>
<td>6,200</td>
</tr>
<tr>
<td>2</td>
<td>5,545</td>
<td>5,645</td>
</tr>
<tr>
<td>3</td>
<td>5,100</td>
<td>5,200</td>
</tr>
<tr>
<td>4</td>
<td>5,000</td>
<td>5,100</td>
</tr>
<tr>
<td>5</td>
<td>3,745</td>
<td>3,845</td>
</tr>
<tr>
<td>6</td>
<td>7,080</td>
<td>7,410</td>
</tr>
<tr>
<td>7</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Alt. 1</td>
<td>5,685</td>
<td>5,795</td>
</tr>
<tr>
<td>Alt. 2</td>
<td>6,650</td>
<td>6,750</td>
</tr>
<tr>
<td>Alt. 3</td>
<td>6,260</td>
<td>6,360</td>
</tr>
<tr>
<td>Alt. 4</td>
<td>5,840</td>
<td>5,940</td>
</tr>
<tr>
<td>Alt. 5</td>
<td>5,275</td>
<td>5,375</td>
</tr>
<tr>
<td>Alt. 6</td>
<td>3,940</td>
<td>4,040</td>
</tr>
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</table>

## Water Sample Intervals

<table>
<thead>
<tr>
<th>Test #</th>
<th>Interval</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5710</td>
<td>swab</td>
</tr>
<tr>
<td>2</td>
<td>5200</td>
<td>swab</td>
</tr>
<tr>
<td>3</td>
<td>3800</td>
<td>swab</td>
</tr>
<tr>
<td>Alt. 1</td>
<td>5870</td>
<td>swab</td>
</tr>
<tr>
<td>Alt. 2</td>
<td>5120</td>
<td>swab</td>
</tr>
<tr>
<td>Alt. 3</td>
<td>3760</td>
<td>swab</td>
</tr>
</tbody>
</table>
Testing depths subject to change based on field operations.
Cost & Timing

- Phase 5 Budget = ~ $ 2 MM
- Testing Phase ~ July 20th – Aug 20th

Pre-Work

- Drilling Rig departed June 24th – 25th
- Cleaned, repaired location
- Moved in 20 frac tanks and filled with water from July 6th – 20th
- Office still on location from drilling phase

Move In & Rig Up

- Rig will Mobilize from Laurel, MS July 20th
- Move in and rig up July 21st - 22nd
- Install BOPE and test
- Offload and strap 3½” tubing
Nabors Well Service Rig Data
Completion Rig

- Series 500 Model 5C National Oilwell Millennium Double
- 104’ mast rated @ 250k pounds hookload
- TGH Gardner Denver 4½” x 8” stroke pump w/ 180bbl pit
- Has sand line
Preparing the Borehole

- PU RBP retrieving tool and pull RBP’s at 60’ and 3,600’
- Run temperature profile survey (with GR & CCL) from TD to surface (note: run as deep as possible)
- Run PKR to 3,640’ and perform MIT to 1,760’
- Run in with 7-7/8” bit to 7,600’ and displace FloPro mud to 3% BIO-31 water
- Pickle TBG with 10bbls of 7½% HCl acid
- POH
# Down-Hole Tools Assembly (BHA)

**TAM International**

<table>
<thead>
<tr>
<th>Description</th>
<th>OD (in)</th>
<th>ID (in)</th>
<th>Length (ft)</th>
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<tbody>
<tr>
<td>500-TD-01 TAMDUMP</td>
<td>2 7/8</td>
<td>2 5/8</td>
<td>10.00</td>
</tr>
<tr>
<td>Crossover, 2 7/8&quot; EU box x 4 1/2&quot; IF pin</td>
<td>4.38</td>
<td>3.50</td>
<td>2.00</td>
</tr>
<tr>
<td>4 1/2&quot; IF box x pin Pup Joint</td>
<td>6.38</td>
<td>2.81</td>
<td>10.00</td>
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<tr>
<td>TAM Technologies 700-PW-02</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>700-PW-03 Premium Wash Tool</td>
<td>7.00</td>
<td>3.00</td>
<td>8.39</td>
</tr>
<tr>
<td>4 1/2&quot; IF box x pin (Top Packer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crossover, 4 1/2&quot; IF box x 3 1/2&quot; EU pin (Customer Supplied)</td>
<td>6.38</td>
<td>2.35</td>
<td>2.00</td>
</tr>
<tr>
<td>Perforated Interval Tubing, 3 1/2&quot; EU (Customer Supplied)</td>
<td>TBA</td>
<td>TBA</td>
<td>TBA</td>
</tr>
<tr>
<td>Crossover, 3 1/2&quot; EU box x 4 1/2&quot; IF pin (Customer Supplied)</td>
<td>6.38</td>
<td>2.35</td>
<td>2.00</td>
</tr>
<tr>
<td>TAM Technologies 700-PW-03</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Premium Wash Tool</td>
<td>7.00</td>
<td>3.00</td>
<td>8.39</td>
</tr>
<tr>
<td>4 1/2&quot; IF box x pin (Bottom Packer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 7/8&quot; EU Perf. Pup Joint w/Bull Plug</td>
<td>2.83</td>
<td>2.34</td>
<td>8.00</td>
</tr>
<tr>
<td>TOTAL TAM BHA LENGTH (FT)</td>
<td></td>
<td></td>
<td>50.00</td>
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</table>
Formation Water Sampling Highlights

- PU TAM inflatable straddle packer BHA spaced @ ~ 20’
- RIH to sample interval
- Run WL plug, set plug and inflate packers / test tubing, Pull WL plug and RD
- RU and acidize zone w/ 1,000 gals 15% HCl
- Flow back and RU swabbing equipment
- Swab formation water until representative sample is obtained (Note: KGS water analyzer will be testing returned fluid to determine when a representative sample is obtained)
- Release packers and move to next sampling zone and repeat procedure
KGS Fluid Analyzer & Sampling Protocol

• KGS to Present
Injection Testing Highlights

- Make up TAM Intl. BHA to proper spacing for test and install memory gauges
- RIH to Test Interval
- Run WL plug, set plug and inflate packers / test tubing, Pull WL plug and RD
- Acidize zone with 50gal/ft of 15% HCL acid
- RUN SRO to special ID sub just above top packer
- Perform Step Rate Test to determine formation parting pressure
- Run Injection test (~ 3,000 bbls of 3% BIO-31)
- Lower SRO to standing valve seat to SI well
- Record fall off
- Pull SRO
- Release packers and move to next test zone and repeat procedures
- CO2 interval to be selected based on previous 5 tests
- After last test, run temperature survey
Injection Testing Highlights - Continued

• NOTES:
  – All zones won’t have Step Rate tests
  – All zones won’t be over a 100’ interval
  – Setting depths are approximate (may be adjusted for surface space out)
  – All depths are RKB of the drilling rig = 14.7’ above GL
  – Well Tester / Reservoir Engineer to determine actual test times
  – If budget gets tight, testing program will be cut short
CO₂ Injection

• Praxair to Present
Plug & Abandonment

- Run 3½” tubing with cement diffuser to 7,640’
- Displace BIO-31 fluid with stored FloPro mud
- POH to 3,830’ and spot 270’ cement plug to cover top 50’ of Beekmantown, St. Peter plus 100’ into 8-5/8” CSG shoe. Weight test plug
- Test casing to 1,760 psi
- POH to 400’ and spot cement plug from 400’ – 5’ below GL. Weight test plug
- ND BOPE, wellhead and cut casing off 5’ below GL and weld on marker plate
- Release rig
- Initiate location remediation & Sweet Road repairs
Back up slides & Additional Information
Additional Information - 1

• Well Control
  – Using COP Well Control Manual for equipment design and procedures

• Public Relations & Wellsite Visits
  – Need to be coordinated with well operations as best possible
  – Visitors will need safety briefing and will have to wear hard hat, safety glasses and closed toe shoes
  – Visitors will have to be escorted around the wellsite and without steel toes shoes will be restricted to non-activity areas
  – Currently planned visits
    • None
• **Reports and Protocols** – All times are Rig time which is CDT
  
  - **Reports** (00:00 – 24:00 hrs w/ 00:00 – 06:00 update)
    - Daily Testing Report - Drilling Supervisor
    - Daily Executive Summary & Forecast – Drilling Supervisor
    - Daily Afternoon Update – Drilling Supervisor
    - Post Test Summary (each interval) – Test Engineer
  
  - **Live Data**
    - None
  
  - **Report Sending**
    - Rig to send DDR to: Heard for 6:30 am review/discussion
    - Rig to send DES to: KGS, COP, PE, E On US, TVA, EPA, DOGC, key vendors
    - Rig or PWH to sent DDR to: KGS, COP, PE, E On US, TVA
      - Propose to designated individuals and for then to share internally as needed
      - Bowersox to post on secure KGS site (?)
    - Rig to send DAU to: same as DES
    - Bowersox/Williams to send contractually required reports to R&B Resources LLC with transmittal
• Reports and Protocols – Continued (all times CDT)
  – Morning Calls
    • 7am Conference call (KGS conference line)
      – Moderated by Bowersox & Heard
        » Drilling Supervisor to summarize activities (1 min)
        » Test Engineer to summarize test if applicable (2 min)
        » Drilling Supervisor to summarize forecast (2 min)
      – Needs to be “short and sweet” with important items discussed briefly and issues handled offline between affected parties. Remember, the wellsite personnel have to get back to work.
      – Other call-ins to be designated by their companies
  – Contacting
    • EPA / DOGR – Bowersox is duly authorized representative
    • Rig
      – Bowersox & Heard are primary contacts
      – For others, call Bowersox or Heard, not the rig
      – Please don’t call to chat or just check on things, the supervisors out there will be very busy with HSE, operations and forward planning
      – Site visits need to be worked (initial planning) through Bowersox & Heard