Shell Exploration & Production

Shell Frontier Oil & Gas Inc.
3333 Highway 6 South Blvd.
Houston, TX 77082-3101

FED EX Tracking # 7947 5112 5216

February 14, 2013

Ms. Wendy Cheung
US EPA Region 8
1595 Wynkoop St
Mail Code 8P-W-GW
Denver, Colorado 80202-1129

Dear Ms. Cheung:

SUBJECT: MIT Results – H01 (HW8101)
UIC Permit CO32210-0000
Shell Frontier Oil & Gas Inc, Oil Shale RDD Lease (COC 69166)
SECTION 35, T1S, R99W, RIO BLANCO COUNTY, COLORADO

Dear Ms. Cheung:

As required by Section B Mechanical Integrity (MI) and Appendix B of UIC Permit CO32210-0000, Shell Frontier Oil & Gas Inc. (SFOGI) is submitting the results of the Pressure Test (Part I MI) for well H01. The test was completed on December 19, 2012. Shell's review has been completed. The attachment provided includes the Test Procedure, along with results, and a Plot report from the contractor that completed the work.

The well was constructed as noted in the NEW WELL: H01 Section of the Well Construction Requirements in Appendix A of the permit. Testing was conducted to evaluate the integrity of casing, casing shoe, perforated section, and the open bore hole below the casing. Testing was performed as noted in the Test Set Up, diagram, and Testing Procedure of the attached document. Testing results demonstrate that the MIT pressure testing requirements of the permit were met.

The information has been reviewed by Senior Petrophysicist Engineer, Nilesh Kadam. It is SFOGI's interpretation that the information in the report provided meet the applicable permit requirements for this pressure test.

If you have any questions regarding the information in this submittal, please contact Florentino Vuelvas at (281) 544-7790. In addition, Nilesh Kadam can be reached by email at Nilesh.Kadam@Shell.com.

Sincerely,

F. Vuelvas

Florentino Vuelvas
Staff Environmental Engineer
Attachments (1)

cc:
FED EX Tracking # 7947 5113 1510
Paul Daggett
Bureau of Land Management -White River Field Office
220 E. Market Street
Meeker, CO 81641

FED EX Tracking # 7947 5112 0718
Travis Marshall
Division of Reclamation, Mining and Safety
101 South 3rd, Suite 301
Grand Junction, Colorado 81501

Shell Exploration & Production

Subject: **Mechanical Integrity Pressure Test Results**
Results of the MIT on well HW-8101 of Shell's ERDD Project

From: Matt Dees
Drilling Engineer, Shell

To: United States Environmental Protection Agency

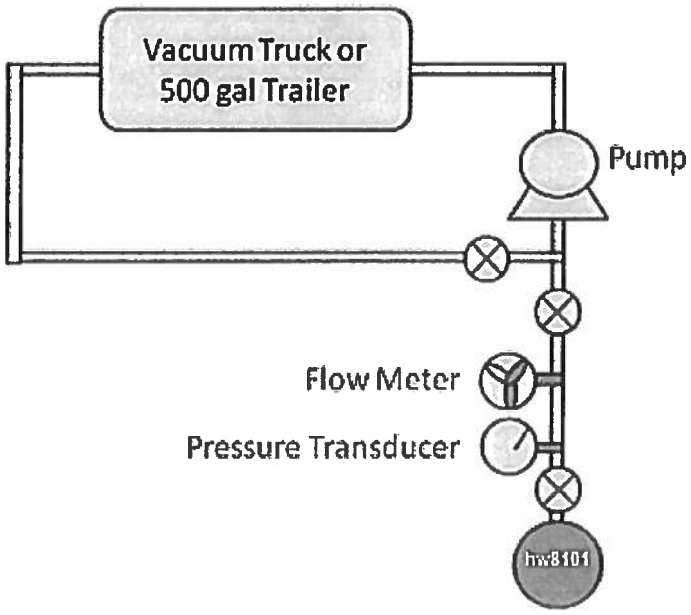
Introduction

On December 19, 2012 in Meeker, Colorado at the Shell ERDD Project on well HW-8101 a Mechanical Integrity Test (MIT) was performed to fulfill the requirements in the Underground Injection Control (UIC) permit CO32210-00000. The test satisfied the criteria of Ground Water Section Guidance No. 39 set by Part I of the Mechanical Integrity Testing. Initial notification to conduct testing was provided to USEPA by phone and e-mail on December 6, 2012. Approval to proceed with the test was received by USEPA on the same day.

The well was constructed as noted in the NEW WELL: H01 Section of the Well Construction Requirements in Appendix A of the permit. Testing was conducted to evaluate the integrity of casing, casing shoe, perforated section, and the open bore hole below the casing. Testing was performed as noted in the Test Set Up, diagram, and Testing Procedure of this document. Testing results demonstrate that the MIT pressure testing requirements of the permit were met.

Test Set Up

Below is a schematic of the test set up used by Schlumberger to perform the mechanical integrity test on the HW-8101 well.



The pressure transducer used was a Viatran Model 509, which provides data accuracy to single digit PSIG.

Testing Procedure

- Schlumberger rigs up all equipment and lines. Equipment and lines were filled and primed up to begin pressure testing.
- Pressure test lines to the master valve above the expected treating pressure; check for leaks.
- Integrity test began at 20:07 by injecting approximately 0.4 BBLs of water into well. Pressured well to 438 psig.
- Once pressure is reached, the well is isolated from the pump (pressurization source).
- After isolating the well from the pressurization source, the pressure is continuously monitored for 30 minutes to evaluate pressure and temperature changes in the tested "chamber."
- Pressure was monitored continuously and recorded at specific intervals as shown in the attached Schlumberger Job Report.
- Test concludes at 20:38. Pressure reading is 415 psig.
- Pressure change during test is 23 psig.
- Pressure is released from the well by opening valve to the 500 gallon container.

Results

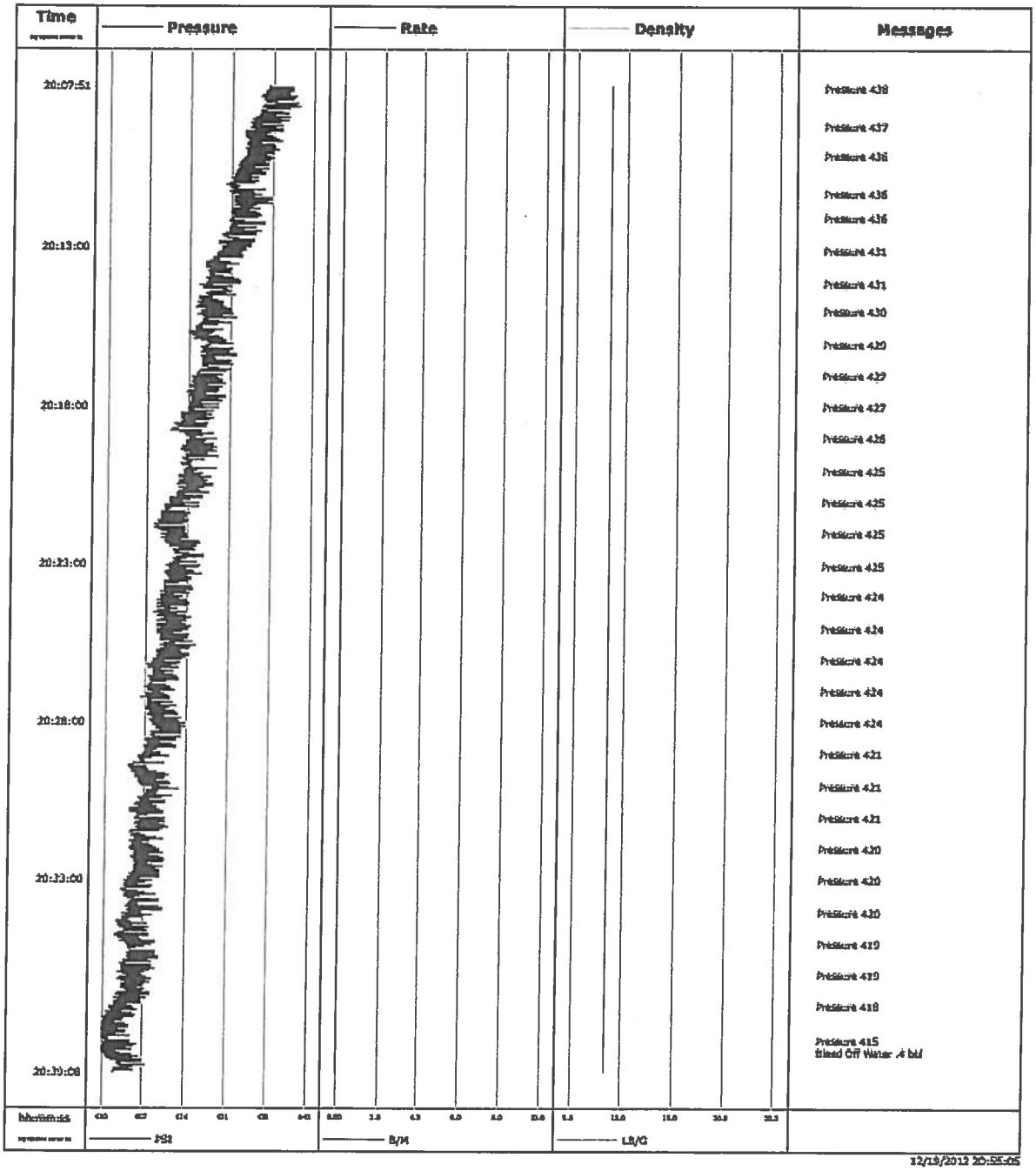
Based on the results of the integrity test it was confirmed that the well passes the criteria set by Part I of the Mechanical Integrity Test. Initial pressure was 438 PSI and after 30 minutes the final pressure was 415 PSI – a 5% change in pressure which satisfies the test criterion of 10% or less.

This test demonstrated not only the integrity of the casing but also the integrity of the casing shoe. The test pressure was applied to the casing and the entire open-hole section (from casing shoe through well total depth).

Attached: Plot report from Schlumberger.

Schlumberger **Cementing Job Report** CemCAT v1.3

Well	HW 8101	**Client**	Shell
Field	Hooker	**SIR No.**	CSFL-00439
Engineer	T Wilkinson/ TJ Morrow	**Job Type**	Injection Pressure Test
Country	United States	**Job Date**	12-19-2012



12/19/2012 20:55:05

Schlumberger

Cementing Service Report

Customer: Shell			Job Number: CSFL-00439
Well: HW 8101	Location (Legal):	Schlumberger Location: Grand Junction	Job Start: Dec/19/2012
Field: Hunter	Formation Name/Type:	Deviation:	BH Size: / Well MD: / Well TVD:
County: Rio Blanco	State/Province: Colorado	BHP: / BHST: / BHCT: / Pore Press. Gradient:	
Well Owner: 0431420524	API/UWI:		
Rig Name: Shell RC12	Drilled For: Oil	Service Via: Land	
Offshore Zone:	Well Class: New	Well Type: Development	
Drilling Fluid Type:	Max. Density:	Plastic Viscosity:	
Service Line: Cementing	Job Type: Injection Pressure Test		
Max. Allowed Tub. Press:	Max. Allowed Ann. Press:	Well Connection:	

Service Instructions:
Pressure Injection Test
400 psi for 30 Minutes

Casing/Tubing Secured ☐ | 1 Hole Vol. Circulated prior to Cement ☐

Lift Pressure:		Casing Tools:	Squeeze Job:
Pipe Rotated ☐	Pipe Reciprocated ☐	Shoe Type:	Squeeze Type:
No. Centralizers:	Top Plugs: / Bottom Plugs:	Shoe Depth:	Tool Type:
Cement Head Type:		Stage Tool Type:	Tool Depth:
Job Scheduled For: Dec/19/2012	Arrived on Location: Dec/19/2012	Stage Tool Depth:	Tail Pipe Size:
	Leave Location: Dec/19/2012	Collar Type:	Tail Pipe Depth:
		Collar Depth:	Sqz. Total Vol.:

Casing/Liner

Depth,	Size,	Weight,	Grade	Thread

Tubing/Drill Pipe

Depth,	Size,	Weight,	Grade	Thread

Perforations/Open Hole

Top,	Bottom,		No. of Shots	Total Interval
				Diameter

Treat Down	Displacement	Packer Type	Packer Depth
Tubing Vol.	**Casing Vol.**	**Annular Vol.**	**Openhole Vol.**

Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
12/19/2012	19:43:00					Started Acquisition
12/19/2012	20:07:48					Start Job
12/19/2012	20:07:48					Water Pumped .4 bbl
12/19/2012	20:07:51	437	0.0	8.43	0.0	
12/19/2012	20:07:54					Pressure 435
12/19/2012	20:07:54	433	0.0	8.43	0.0	
12/19/2012	20:09:06					Pressure 437
12/19/2012	20:09:06	439	0.0	8.43	0.0	
12/19/2012	20:10:03					Pressure 435
12/19/2012	20:10:03	435	0.0	8.43	0.0	
12/19/2012	20:11:16					Pressure 435
12/19/2012	20:11:16	431	0.0	8.43	0.0	
12/19/2012	20:12:01					Pressure 435
12/19/2012	20:12:01	431	0.0	8.43	0.1	
12/19/2012	20:13:00	433	0.0	8.43	0.1	
12/19/2012	20:13:05					Pressure 433
12/19/2012	20:13:05	429	0.0	8.43	0.1	
12/19/2012	20:14:09					Pressure 433
12/19/2012	20:14:09	433	0.0	8.43	0.1	
12/19/2012	20:15:01					Pressure 430
12/19/2012	20:15:01	431	0.0	8.43	0.1	

Well: MW 0101			Field: Monker	Job Start: Dec/19/2012	Customer: Shell	Job Number: CIFL-00439
Date	Time 24-hr clock	Treating Pressure PSI	Flow Rate B/M	Density LB/G	Volume BBL	Message
12/19/2012	20:16:02	431	0.0	8.43	0.1	
12/19/2012	20:17:03					Pressure 427
12/19/2012	20:17:03	429	0.0	8.43	0.1	
12/19/2012	20:18:00	425	0.0	8.43	0.1	
12/19/2012	20:18:01					Pressure 427
12/19/2012	20:18:01	425	0.0	8.43	0.1	
12/19/2012	20:19:01					Pressure 425
12/19/2012	20:19:01	425	0.0	8.43	0.1	
12/19/2012	20:20:02					Pressure 425
12/19/2012	20:20:02	425	0.0	8.43	0.2	
12/19/2012	20:21:02					Pressure 425
12/19/2012	20:21:02	421	0.0	8.43	0.2	
12/19/2012	20:22:02					Pressure 425
12/19/2012	20:22:02	421	0.0	8.43	0.2	
12/19/2012	20:23:00	421	0.0	8.43	0.2	
12/19/2012	20:23:05					Pressure 425
12/19/2012	20:23:05	421	0.0	8.43	0.2	
12/19/2012	20:24:02					Pressure 424
12/19/2012	20:24:02	420	0.0	8.43	0.2	
12/19/2012	20:25:03					Pressure 424
12/19/2012	20:25:03	424	0.0	8.43	0.2	
12/19/2012	20:26:02					Pressure 424
12/19/2012	20:26:02	423	0.0	8.43	0.2	
12/19/2012	20:27:03					Pressure 424
12/19/2012	20:27:03	418	0.0	8.43	0.2	
12/19/2012	20:28:00	413	0.0	8.43	0.3	
12/19/2012	20:28:03					Pressure 424
12/19/2012	20:28:03	424	0.0	8.43	0.3	
12/19/2012	20:29:01					Pressure 421
12/19/2012	20:29:01	417	0.0	8.43	0.3	
12/19/2012	20:30:01					Pressure 421
12/19/2012	20:30:01	417	0.0	8.43	0.3	
12/19/2012	20:31:01					Pressure 421
12/19/2012	20:31:01	416	0.0	8.43	0.3	
12/19/2012	20:32:02					Pressure 420
12/19/2012	20:32:02	419	0.0	8.43	0.3	
12/19/2012	20:33:00	416	0.0	8.43	0.3	
12/19/2012	20:33:02					Pressure 420
12/19/2012	20:33:02	414	0.0	8.43	0.3	
12/19/2012	20:34:02					Pressure 420
12/19/2012	20:34:02	415	0.0	8.43	0.3	
12/19/2012	20:35:03					Pressure 419
12/19/2012	20:35:03	415	0.0	8.43	0.4	
12/19/2012	20:36:02					Pressure 419
12/19/2012	20:36:02	417	0.0	8.43	0.4	
12/19/2012	20:37:01					Pressure 418
12/19/2012	20:37:01	414	0.0	8.43	0.4	
12/19/2012	20:38:00	409	0.0	8.43	0.4	
12/19/2012	20:38:07					Pressure 415
12/19/2012	20:38:07	411	0.0	8.43	0.4	

Well	Field	Job Start	Customer	Job Number
MW 8101	Muskir	Dec/19/2012	Shell	CIPL-00439

Post Job Summary

Average Pump Rates, bbl/min				Volume of Fluid Injected, bbl			
Slurry	N2	Mud	Maximum Rate	Total Slurry	Mud	Spacer	N2
0.0		0.0	0.0	0.4	0.0	0.4	

Treating Pressure Summary, psi					Breakdown Fluid		
Maximum	Final	Average	Bump Plug to	Breakdown	Type	Volume	Density
443	417	423					

Avg. N2 Percent	Designed Slurry Volume	Displacement	Mix Water Temp	Cement Circulated to Surface? ☐	Volume
		0.0 bbl		Washed Thru Perfs ☐	To

Customer or Authorized Representative	Schlumberger Supervisor	Circulation Lost ☐	Job Completed ☐
Steve Whitson	T Williamson/ D Morrow	-	-

Schlumberger — Service Quality Evaluation

Client:	Shell
Field:	Nankar
Rig:	Shell UK12
Well:	NW 8101
Service Line:	Cementing
Job Type:	Injection Pressure Test

Service Order #:	1
Date:	Dec/19/2012
Operating Time:	0.0
Client Rep:	Shell
Schlumberger Engineer:	T Wilkerson/ TJ Morrow
Schlumberger FSM:	

Main Objectives:

To be completed by Company Rep. Please answer Y (Yes) or N (No) and add any comments below.

		Score	Yes / No		Result
1	HSE				
1a	Free of lost time injury and compliance with SLB and loc. spec. HSE practice	5	yes ☐	no [x]	0
1b	Free of environmental spill or non-compliant discharge	5	yes ☐	no [x]	0
1c	Free of NPT	5	yes ☐	no [x]	0
1d	Worksite left clean	4	yes ☐	no [x]	0
				Sub-total	0%

2	Design / Preparation				
2a	Program test job simulation (CemCADE) & pump schedule / test hydraulic calcs	3	yes ☐	no [x]	0
2b	Equipment maintenance schedule completed / Crews logged	2	yes ☐	no [x]	0
2c	All materials and equipment required for job/contingency checked & on location	2	yes ☐	no [x]	0
2d	Safety / pre-job meeting conducted with all involved present	2	yes ☐	no [x]	0
				Sub-total	0%

3	Execution				
3a	Lost time < 30 mins	3	yes ☐	no [x]	0
3b	Equipment pressure tested successfully	3	yes ☐	no [x]	0
3c	All key parameters monitored and recorded accurately (Pressure, Rate, Density)	2	yes ☐	no [x]	0
3d	Plugs / darts released and tested successfully	2	yes ☐	no [x]	0
3e	Density variable met expectations	2	yes ☐	no [x]	0
3f	Personnel performed as per expectations	2	yes ☐	no [x]	0
3g	Equipment performed as per expectations	2	yes ☐	no [x]	0
3h	Job pumped per design	3	yes ☐	no [x]	0
3i	Did job start on time	2	yes ☐	no [x]	0
3j	Free of Operational failure (screen out, Cementing Exception, etc.)	3	yes ☐	no [x]	0
				Sub-total	0%

4	Evaluation				
4a	Main job objective achieved with no consequential non-productive time	10	yes ☐	no [x]	0
				Sub-total	0%

Total 0%

Comments: (Please include a brief explanation for a "NO" response and summarize any innovations attempted on this well.)

Client:	Schlumberger:
Client Signature:	**Schlumberger Signature:**