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DIRECTOR, OIL AND GAS DIVISION  
D. CRAIG PEARSON  
DISTRICT DIRECTOR

## RAILROAD COMMISSION OF TEXAS

### OIL AND GAS DIVISION

**OPERATOR Name:** SHELL WESTERN E&P

**RE: Lease:** UNIVERSITY 19 PW UNIT

**Address1:** PO BOX 576

**Address2:**

**City:** HOUSTON

**State:** TX

**Well No:** 1406H

**Sec:** 9 **Block:** 19

**County:** LOVING

**Survey Name:** UL

**SWR13EX Application Number:** 13269

**Drilling Permit No:** 823045

### SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for the **LEASE NAME:** UNIVERSITY 19 PW UNIT ;  
**WELL NUMBER:** 1406H has been approved by the Railroad Commission of Texas District Office.

- a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.
- b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.
- c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.
- d. The casing and cement program shall adhere to the following specifications:  
  
Set 4900 feet of surface casing with a multistage tool set at a depth of not less than 1150 feet. Circulate cement from the multistage tool to the ground surface. If cement does not circulate to surface during the first stage, the multistage tool MUST be opened and neat cement be circulated from the tool to the surface.

The proposed alternative drilling fluid program for the fresh water protected interval is hereby approved.

Please notify the Midland District Office immediately if any gas, H<sub>2</sub>S or otherwise, is encountered before surface casing is set.

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted on 02/27/2017.  
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: Erik Hanson

DATE: 03/03/2017

D. CRAIG PEARSON

DISTRICT DIRECTOR



APPLICATION FOR APPROVAL OF SURFACE CASING > 3500 FEET  
Statewide Rule 13(b)(1)(A)  
RAILROAD COMMISSION OF TEXAS

Operator's Name and Address: Shell Western E&P  
150 N. Dairy Ashford  
Houston, Texas 77079

P5 Number: 774719

Area for review: District 8  
Lease Name: UNIVERSITY 19 PW UNIT 1406H  
Field Name: Phantom (Wolfcamp) County: Loving  
Survey: University Land Abstract: U9  
Drilling Permits: 823045

Note: Attach a map if the request is for more than one pad.

How will the operator maintain well control during drilling operations:

While drilling the surface hole Shell utilizes drilling fluid of sufficient weight to overbalance the formations being penetrated.  
In the event that flow is encountered a low-pressure rotating head is rigged-up under the rig floor to divert flow to the reserve pit.

How will the operator ensure cement is circulated to surface and that there is adequate bonding of cement:

A DV tool is placed below the water table (as defined by the GAU), and Shell pumps a minimum of 250% excess cement for the second stage of the surface cement job. Depending on nearby offsets the amount of excess pumped has been as high as 300%. Adequate bonding of cement is achieved by utilizing the centralizer program as outlined in RRC Rule 3.13 (b) (1) (G). A second stage of cement is only included in this request plan as a contingency measure to achieve cement returns to surface, in which case the DV tool would be opened.

How will the operator prevent the migration of formation fluids thru the annular space:

All cement slurries pumped by Shell comply with RRC Rule 3.13 (b) (1) (D) and Rule 3.13 (b) (1) (E). These slurries have been effective in preventing migration of formation fluids after the cement has been placed in the 100+ wells Shell has drilled in the Permian.

Signature: Sondra Bienvenu Name: Sondra Bienvenu Date: 02/27/2017 Phone: 832-337-3100

RRC Use Only ►

RRC District Office Action:			
<input checked="checked" type="checkbox"/> Approved	<input type="checkbox"/> Approved as Modified	<input type="checkbox"/> Denied	By <u>Erik Hanson</u> Date: <u>3-3-17</u>
Remarks/Modifications:			



APPLICATION FOR APPROVAL OF SURFACE CASING > 3500 FEET  
Statewide Rule 13(b)(1)(A)  
RAILROAD COMMISSION OF TEXAS

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How will the operator prevent the migration of formation fluids thru the annular space:

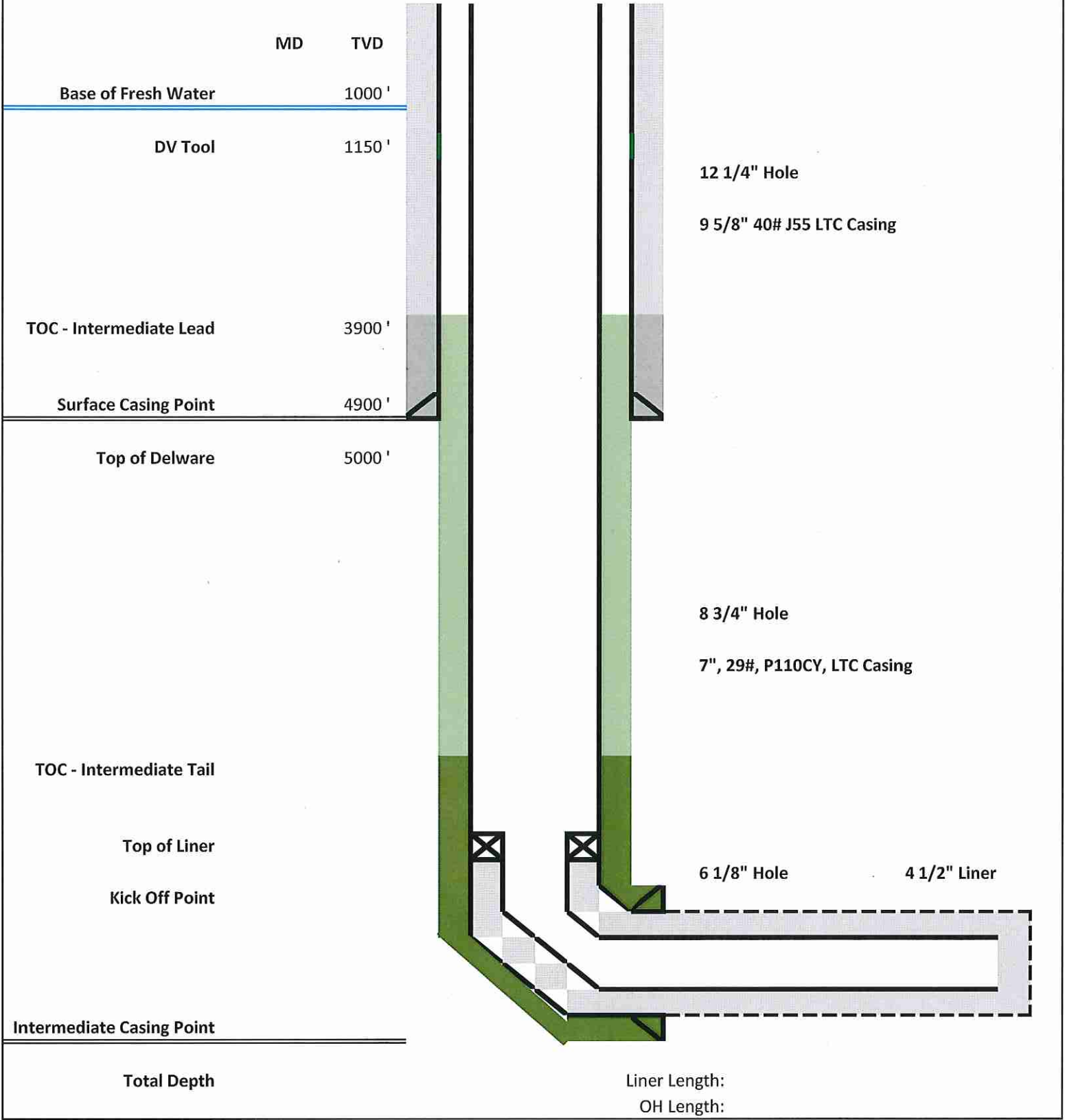
All cement slurries pumped by Shell comply with RRC Rule 3.13 (b) (1) (D) and Rule 3.13 (b) (1) (E). These slurries have been effective in preventing migration of formation fluids after the cement has been placed in the 100+ wells Shell has drilled in the Permian.

Signature: Sondra Bienvenu Name: Sondra Bienvenu Date: 02/27/2017 Phone: 832-337-3100

RRC Use Only ►

RRC District Office Action:			
<input type="checkbox"/> Approved	<input type="checkbox"/> Approved as Modified	<input type="checkbox"/> Denied	By: _____
Date: _____			
Remarks/Modifications:			

University 19 PW Unit 1406H



## GROUNDWATER PROTECTION DETERMINATION

Form GW-2



## Groundwater Advisory Unit

**Date Issued:** 01 February 2017**GAU Number:** 166499**Attention:** SHELL WESTERN E&P  
PO BOX 576  
HOUSTON, TX 77001**Operator No.:** 774719**API Number:**  
**County:** LOVING  
**Lease Name:** University 19 PW Unit  
**Lease Number:**  
**Well Number:** 1407H  
**Total Vertical Depth:** 12000  
**Latitude:** 31.699414  
**Longitude:** -103.410281  
**Datum:** NAD27**Purpose:** New Drill**Location:** Survey-UL; Block-19; Section-9

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

The interval from the land surface to a depth of 300 feet, and the Rustler, the top of which is estimated to occur from 500 to 550 feet depth and the base of which is estimated to occur from 950 to 1000 feet depth by reconnaissance-level evaluation, must be protected.

This recommendation is applicable for all wells drilled in this sec. 9.

Note: Unless stated otherwise, this recommendation is intended to apply only to the subject well and not for area-wide use. This recommendation is for normal drilling, production, and plugging operations only. It does not apply to saltwater disposal operation into a nonproductive zone (RRC Form W-14).

This determination is based on information provided when the application was submitted on 01/25/2017. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

Form GW-2      P.O. Box 12967 Austin, Texas 78771-2967      512-463-2741      Internet address: www.rrc.texas.gov  
Rev. 02/2014



# RAILROAD COMMISSION OF TEXAS

1701 N. Congress  
P.O. Box 12967  
Austin, Texas 78701-2967

Status: IN\_PROGRESS  
Date  
Application ID: 13269  
Version No.:  
Payment Trace No.:

## STATEWIDE RULE 13 EXCEPTION APPLICATION

### PREPARER INFORMATION

Preparer Name: Sondra Bienvenu Phone Number: 832-3372100  
E-mail: sondra.bienvenu@shell.com Fax Number:

### FILING INFORMATION

GW-1 Application ID: 166499 GAU Areal Extent: Radius:  
API Number: 30133213 Drilling Permit Number: 823045 DP Effective Date: 02/15/2017  
Is this a Tubing Exception Only NO Is this a First Time Tubing NO  
Is this an area-wide NO Associated SWR13E application:

### OPERATOR INFORMATION

Operator Name: SHELL WESTERN E&P Operator No.: 774719  
Address Line 1: PO BOX 576  
Address Line 2: City: HOUSTON  
State: TX Postal Code: 77001

### WELL IDENTIFICATION INFORMATION

Field Name: PHANTOM (WOLFCAMP)  
County: LOVING District: 08 Well Number: 1406H  
Lease Name: UNIVERSITY 19 PW UNIT

### GPS COORDINATES INFORMATION

NAD: NAD 27 Format: Degrees, Minutes, Seconds State Plane Zone:  
Latitude Degrees: 31 Longitude Degrees: -103  
Latitude Minutes: 41 Longitude Minutes: 24  
Latitude Seconds: 57.4 Longitude Seconds: 38.28  
Decimal Degrees Latitude: Decimal Degrees Longitude:  
State Plane X-Coordinate: State Plane Y-Coordinate:

### SURVEY INFORMATION

Survey Name: UL Abstract No.: U9  
Block: 19 Township: Section: 9  
Tract: Lot: League:  
Labor: Porcion: Share:

### REFERENCE LINES INFORMATION

Reference Line: Survey  
First Distance: 1567 First Direction: Northeast  
Second Distance: 635 Second Direction: Southeast

### ADDITIONAL INFORMATION

Nearest Town: Mentone Distance to Nearest Town: 11.1 Direction to Nearest Town: SE  
Total Vertical Depth: 12000 Measured Depth:

APPLICATION INFORMATION

Application ID:

13269

Operator Name:

SHELL WESTERN E&P

Well Number:

1406H

Lease Name:

UNIVERSITY 19 PW UNIT

REQUEST INFORMATION

Reason for this Request:

☐ Economic

☒ Technical

☐ Other

Additional Information for Other Reason for this Request:

Is this a proposed injection or disposal well?

NO

Is this a Minimum Separation well?

NO

Are there any water wells within 1/4 mile of this proposed well location?

NO

Are there any INJECTION or DISPOSAL wells within 1/4 mile of the proposed well location?

NO

Have there been any blowouts within one mile of this wellsite ?

NO

WATER WELLS

INJECTION OR DISPOSAL WELLS

BLOWOUTS



**APPLICATION INFORMATION**

<b>Application ID:</b>	13269	<b>Operator Name:</b>	SHELL WESTERN E&P
<b>Well Number:</b>	1406H	<b>Lease Name:</b>	UNIVERSITY 19 PW UNIT

**REQUEST INFORMATION**

**Has the well drilled and completed?** NO

**Completion Tracking Number:**

**Remarks for the Application:**

Remarks: Lead/filler cement is to be pumped at 250% excess. A second stage (see multi-stage lead/filler) is only included in this request plan as a contingency measure to achieve cement returns to surface, in which case the DV tool would be opened.

**GAU INFORMATION**

**GAU Areal Extent:** **Radius Distance:**

**Base of Usable Quality Water (feet. determined by GAU):**

**Separation Points:**

**GAU Recommendation Statements:**

The interval from the land surface to a depth of 300 feet, and the Rustler, the top of which is estimated to occur from 500 to 550 feet depth and the base of which is estimated to occur from 950 to 1000 feet depth by reconnaissance-level evaluation, must be protected.

This recommendation is applicable for all wells drilled in this sec. 9.

**APPLICATION INFORMATION**

**Application ID:** 13269  
**Well Number:** 1406H

**Operator Name:** SHELL WESTERN E&P  
**Lease Name:** UNIVERSITY 19 PW UNIT

**EXCEPTION INFORMATION****Exception Request:**

☐ Short Surface Casing ☒ Excess Surface Casing ☐ Single-string ☐ Tubing

**Alternate Program Request:**

☒ Drilling Fluid ☐ Non-API Cement ☐ Other

**Additional Information for Other Alternate Program Request:**

**APPLICATION INFORMATION**

<b>Application ID:</b>	13269	<b>Operator Name:</b>	SHELL WESTERN E&P
<b>Well Number:</b>	1406H	<b>Lease Name:</b>	UNIVERSITY 19 PW UNIT

**PROPOSED CASING AND CEMENTING PROGRAM**

**Conductor Casing**

Hole Size(in.)	Casing O.D.(in.)	Grade	Weight (lb./ft.)	Shoe Setting Depth(ft.)	Multi-Stage Tool Depth(ft.)	No. of Centralizers	Centralizers Placement

**Cementing - Conventional**

Slurry Type	Cement Type	Free Water Content(mL water per 250 mL cement)	No. of Sacks	Yield (cu.ft./sk.)	24Hr Comp Strength (psi)	72Hr Comp Strength (psi)	Cement Height(ft.)	Percent excess Cement	Top of Cement(ft.)
Tail/Critical Cement									
Lead/Filler Cement									

Slurry Type	Cement Additives
Tail/Critical Cement	
Lead/Filler Cement	

### APPLICATION INFORMATION

<b>Application ID:</b> 13269	<b>Operator Name:</b> SHELL WESTERN E&P
<b>Well Number:</b> 1406H	<b>Lease Name:</b> UNIVERSITY 19 PW UNIT

### PROPOSED CASING AND CEMENTING PROGRAM

#### Surface Casing

Hole Size(in.)	Casing O.D.(in.)	Grade	Weight (lb./ft.)	Shoe Setting Depth(ft.)	Multi-Stage Tool Depth(ft.)	No. of Centralizers	Centralizers Placement
12.25	9.625	J55	40	4900	1150	30	2 on shoe track and 1/4 jt to surface

Tapered Hole Size(in.)	Tapered Casing O.D.(in.)	Tapered Grade	Tapered Weight (lb./ft.)	Tapered Setting Crossover Depth(ft.)

#### Cementing - Conventional

Slurry Type	Cement Type	Free Water Content(mL water per 250 mL cement)	No. of Sacks	Yield (cu.ft./sk.)	24Hr Comp Strength (psi)	72Hr Comp Strength (psi)	Cement Height(ft.)	Percent excess Cement	Top of Cement(ft.)
Tail/Critical Cement	Class C	0.4	505	1.35	1206	1826	1000	100	3900
Lead/Filler Cement	Class C	1.05	2724	1.84	490	652	3900	300	0

Slurry Type	Cement Additives
Tail/Critical Cement	100% Cement, Premium C + 0.35%BWOB R-3 + 0.15%BWOB A-2 SODIUM METASILICATE + 0.005 gal/sack FP-6L + 0.005 lbm/sack Static Free + 55.987% Rig Water
Lead/Filler Cement	65% Cement, Premium C + 35% Fly Ash (Pozzolan) + 4%BWOB Bentonite + 0.9%BWOB R-3 + 0.65%BWOB A-2 SODIUM METASILICATE + 0.005 gal/sack FP-6L + 0.005 lbm/sack Static Free

#### Cementing - Multi-Stage Tool

Slurry Type	Cement Type	Free Water Content(mL water per 250 mL cement)	No. of Sacks	Yield (cu.ft./sk.)	24Hr Comp Strength (psi)	72Hr Comp Strength (psi)	Cement Height(ft.)	Percent excess Cement	Top of Cement(ft.)
Tail/Critical Cement									
Lead/Filler Cement	Class C	0	678	1.89	564	564	1150	300	0

Slurry Type	Cement Additives
Tail/Critical Cement	
Lead/Filler Cement	65% Cement, Premium C + 35% Fly Ash (Pozzolan) + 4%BWOB Bentonite + 2%BWOB A-2 SODIUM METASILICATE + 0.01 gal/sack FP-6L + 0.005 lbm/sack Static Free + 96.864% Rig