BLACK HILLS PLATEAU PRODUCTION COMPANY

DRILLING PROGRAM

Homer Deep Unit #7-23DH
SHL: 1894' FSL, 2648' FWL, NESW Sect. 7 T8S R98W
BHL: 660' FSL, 1085' FEL SESE Sect. 20 T8S R98W
Garfield & Mesa Counties, Colorado

NOTE: This drilling program is as of January 15, 2015. Well is being proposed as a horizontal in the Mancos/Niobrara formation.

1) Estimated Formation Tops of Important Geological Markers:

Location GL: 5,669.0' (Graded), KB: 5,693.0' (Estimated)

Formation	MD	TVD	Subsea TVD	Lithology	Oil/Gas/Water
Wasatch	Surface	Surface	Surface	Sandstone & Shale	No Potential Gas
Mesaverde	859	859	4,825	Sandstone	Gas or Water
Cameo Coal	2,895	2,895	2,789	Coal, Silt & Sandstone	Oil, Gas or Water
Rollins	3,214	3,214	2,470	Sandstone	Oil, Gas or Water
Cozzette	3,383	3,383	2,301	Sandstone & Silt	Oil, Gas or Water
Corcoran	3,589	3,589	2,095	Sandstone & Silt	Oil, Gas or Water
Mancos	3,797	3,797	1,877	Shale & Silt	Oil, Gas or Water
Mancos 'A'*	4,264	4,264	1,420	Shale & Silt	Oil, Gas or Water
Moab	5,000	5,000	684	Bentonite Marker	
Mancos 'B'*	5,454	5,454	230	Shale & Silt	Oil, Gas or Water
Niobrara*	6,827	6,470	-786	Calcareous Shale & Silt	Oil, Gas or Water
Target/Landing*	8,476	7,109	-1,425	Calcareous Shale & Silt	Oil, Gas or Water
Permit TD	16,199	6,914	-1,230		

* Projected completion intervals.

2) Proposed Casing and Cementing Program

Hole Size (in)	Casing Size (in)	Depth Set MD	Wt./Ft., Grade, & Joint	Cement
30	20	120	Line Pipe	To surface w/ Class 3; 320 sx
14-3/4	10-3/4	1,000	40.5#, J55, ST&C	Cemented to surface w/ Lead: 170 sx Class G (12.3 ppg) Tail: 250 sx Class G (12.8 ppg)
9-7/8	7-5/8 (DV Tool @ ±3,800')	6,650	29.7#, N-80, LTC	Cemented 200' into surface casing w/ Stage 1 - Lead: 125 sx Class G (12.5 ppg) Tail: 325 sx Class G (13.5 ppg) Stage 2 – Tail: 500 sx Class G (12.5 ppg)
6-3/4	4-1/2 x 5-1/2 Tapered String (XO @ ±6,000')	16,199	4-1/2: 11.6#, P-110, LTC 5-1/2: 17#, P-110, LTC	Cemented 200' into intermediate casing w/ Lead: 125 sx HALCEM (12.6 ppg) Tail: 1400 sx HALCEM (13.5 ppg)

Yields

Surface:		
Surface Lead	Class G	Yield = 2.35 ft3/sk (12.3 ppg)
Surface Tail	Class G	Yield = 2.08 ft3/sk (12.8 ppg)
Intermediate - Stage 1:		
Intermediate Lead	Class G	Yield = 1.77 ft3/sk (12.5 ppg)
Intermediate Tail	Class G	Yield = 1.50 ft3/sk (13.5 ppg)
Intermediate - Stage 2:		
Intermediate Tail	Class G	Yield = 2.27 ft3/sk (12.5 ppg)

Production:

Longstring Lead	Class G	Yield = 1.75 ft3/sk (12.6 ppg)
Longstring Tail	Class G	Yield = 1.51 ft3/sk (13.5 ppg)

- The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressures zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use.
- The surface casing shall be set at 1,000' and cemented back to surface either during the primary cement job or by remedial cementing. Cementing to surface will isolate all potential fresh water zones. Slurry designed for full coverage with 50% excess.
- Intermediate casing is designed to have cement lifted at least 200' above TOG. Actual cement volumes will be determined by caliper log plus 10% excess. If caliper logs are not available, volume will be assumed hole size to TD plus 25% excess.
- Production casing is designed to have cement lifted at least 200' into the intermediate shoe. Actual cement volumes will be determined by caliper log plus 10% excess. If caliper logs are not available cement volumes will be calculated at 25% excess.
- Centralizers will be installed per approved centralizer program from cement vendor.
- All waiting on cement times will be adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out. 2,500 psi compressive strength in 72 hours.

Casing Design (All casing will be new or reconditioned and tested to meet or exceed API standards):

Casing String				Casing Strength Properties			Minimum Design Factors		
Size (in)	**Weight (lb/ft)**	**Grade**	**Connection**	**Collapse (psi)**	**Burst (psi)**	**Tensile (1000 lb)**	**Collapse**	**Burst**	**Tension**
10-3/4	40.5	J/K-55	STC	1,580	3,130	420	1.10	1.10	1.80
7-5/8	29.7	N-80	LTC	4,790	6,890	575	1.10	1.10	1.80
5-1/2	17.0	P-110	LTC	7,460	10,640	546	1.10	1.10	1.80
4-1/2	11.6	P-110	LTC	7,560	10,690	367	1.10	1.10	1.80

Casing Design Considerations/Safety Factors:

A. Surface Casing @ 1,000' MD; 10-3/4" 40.5# J/K-55

Purpose: Protect shallow fresh water and contain MASP to TD	
Maximum anticipated mud weight at surface casing depth:	9.0 ppg
Maximum anticipated mud weight at intermediate TD:	9.8 ppg
Maximum anticipated equivalent formation pressure at TD:	11.0 ppg
TVD at production casing point:	6,350 ft
Surface setting depth:	1,000 ft
Max pore pressure:	0.572 psi/ft

Collapse Design:

Evacuated casing with 9.0 ppg drilling fluid density	
Load = 9.0 ppb * 0.052 * 1000 ft	468 psig
Rating	1,580 psig
Safety Factor	3.38

Burst Design:

Assume kick with partially evacuated hole and influx gradient of 0.22 psi/ft	
(Calculations assume shoe will not break down)	
MASP (Load) = 6,350 ft * (0.572-0.22) psi/ft	2,235 psig
Rating	3,130 psig
Safety Factor	1.40

Tensile Design:

Designed on Air Weight * Buoyancy + OverPull Margin	
Load = 1000 ft * 40.5 lb/ft * 0.862 + 100,000 lbs (OPM)	134,911 lbs
Rating	420,000 lbs
Safety Factor	3.11
OverPull with S.F. = 420,000 lbs / 1.8 – 34,911 lbs	198,422 lbs

B. Intermediate Casing @ 6,650' MD; 7-5/8" 29.7# N-80

Maximum anticipated mud weight at Total Depth:	9.8 ppg
Maximum anticipated equivalent formation pressure at TD:	11.0 ppg
TVD at production casing point:	7,109 ft
Assumed Gas Gradient for Production Operations:	0.22 psi/ft

Collapse Design:

Designed on evacuated casing properties with 9.8 ppg drilling fluid density with no internal back-up	
Load = 9.8 ppg * 0.052 * 7,109 ft	3,623 psig
Rating	4,790 psig
Safety Factor	1.32

Burst Design:

Maximum Surface Shut-In Pressure	
MASSIP (Load) = 7,109 ft * (0.572-0.22) psi/ft	2,502 psig
Rating	6,890 psig
Safety Factor	2.75

Tensile Design:

Designed on Air Weight * Buoyancy + OverPull Margin	
Load = (6,650 ft * 29.7 lb/ft * 0.850) + 100,000 lbs (OPM)	267,900 lbs
Rating	575,000 lbs
Safety Factor	2.15
OverPull with S.F. = 575,000 lbs / 1.8 – 156,500 lbs	151,500 lbs

C. Production Casing @ 16,199' MD; 5-1/2" 17# P-110 x 4-1/2" 11.6# P-110

Maximum anticipated mud weight at Total Depth:	11.5 ppg
Maximum anticipated equivalent formation pressure at TD:	11.0 ppg
TVD at production casing point:	7,109 ft
Cross-Over Location	6,000 ft
Maximum Surface Treating Pressure for Fracture Operations	6,500 psig
Assumed Gas Gradient for Production Operations:	0.22 psi/ft

Collapse Design:

Designed on evacuated casing properties with 11.5 ppg drilling fluid density with no internal back-up	
Load = 11.5 ppg * 0.052 * 7,069 ft	4,227 psig
Rating	7,460 psig
Safety Factor	1.76

Burst Design:

Design Consideration #1: Maximum Surface Shut-In Pressure

MASSIP (Load) = 7,069 ft * (0.572-0.22) psi/ft	2,488 psig
Rating	10,640 psig
Safety Factor	4.28

Design Consideration #2: Maximum Surface Treating Pressure During Frac Operations

MSTP	6,500 psig
Rating	10,640 psig
Safety Factor	1.64

Tensile Design:

Designed on Air Weight * Buoyancy + OverPull Margin	
Load = (6,000 ft * 17.0 lb/ft + 1,109' * 11.6 lb/ft) * 0.824 + 100,000 lbs (OPM)	194,700 lbs
Rating	546,000 lbs
Safety Factor	2.80
OverPull with S.F. = 546,000 lbs / 1.8 – 94,300 lbs	208,600 lbs

3) Operator's Minimum Specifications for Pressure Control:

Please reference enclosed BOP Diagram.

The blowout preventer assembly shall consist of one 11" 5,000 psi double ram preventer, and an 11" 5,000 psi annular preventer. All will be hydraulically operated. The BOP pipe and blind rams will be hydraulically tested to 100% of working pressure (if isolated from the surface casing with a test plug) or to 70% of the internal yield of the surface casing after nippling up. The annular preventer will be tested to 50% of its' working pressure rating for 10 minutes or until provisions for the test are met. The pipe rams and blind rams will be function tested on each trip out of the hole, but not more than once per day. All such checks will be noted on the daily Tour Sheets.

Accessories to the BOPE include an upper and lower kelly cock, a sub on the floor with a full opening valve to be stabbed into the drill string when the kelly is not in the drill string, a drill pipe float (except for lost circulation conditions), and a choke manifold with a pressure rating equivalent to the BOP stack. An accumulator with a minimum of 1.5 times the volume of fluid necessary to close all BOP equipment will be part of the BOP system.

Remote controls capable of both opening and closing all preventers will be readily accessible to the driller. A manual locking device (i.e., hand wheels) or automatic locking devices shall be installed as part of the system. The BOP will be kept in good mechanical working order. Checks and inspections will be recorded on daily Tour Sheets.

Primary BOP actuating control will be located either in the doghouse or on the rig floor.

Sufficient mud volume and weight material will be maintained on location to overcome any flows.

Auxiliary Equipment:

a) A Kelly Cock will be kept in the drill string at all times.
b) A float will be used at the bit at all times (except for lost circulation drilling condition).
c) A full-opening drill pipe stabbing valve (inside BOP) with proper drill pipe connection will be on the rig floor at all times.
d) The drilling fluids systems will be visually monitored at all times.

4) Mud Program:

Hole (in)	Depth (ft)	Type	Weight (ppg)	Viscosity (cps)	Fluid Loss (cc)	Solids (%)
30	120	Spud Mud	8.9-9.4	60 - 80	<10	1 - 5
14-3/4	1,000	Gel/Polymer	9.0-10.0	50 - 65	≤6	≤6
9-7/8	6,550	Gel/Polymer	9.5-11.5	45 - 55	≤5	≤5-6
6-3/4	16,199	Gel/Polymer	10.0-12.0	40 - 45	≤5	≤5-6

* Sufficient mud material(s) to maintain mud properties, control lost circulation and contain a blowout will be available at the well site during drilling operations.

** A closed loop system will be utilized during drilling operations.

5) Auxiliary Equipment:

1. A Kelly Cock will be kept in the drill string at all times.
2. A float will be used at the bit at all times (except for lost circulation drilling condition).
3. A full-opening drill pipe stabbing valve (inside BOP) with proper drill pipe connection will be on the rig floor at all times.
4. The drilling fluids systems will be visually monitored at all times.

6) Testing, Logging and Core Programs:

Deviation Surveys:

0' to 1,000'	Totco (7º) – survey every ±200'
1,000' to 5,300'	Totco (7º) – survey every ±300'
5,300' to TD	±90 ft MWD w/ INC, AZM , & GR

Mud Log:

2-Man Unit with chromatograph	3000' to TD
Samples:	
100 ft samples	3,000' to 3,500'
30 ft samples	3,500' to 7,000'
10 ft samples	7,000' to 7,600'
10-30 ft samples	7,600' to TD

M/LWD Logging Program:
MWD Gamma Ray and/or Resistivity with surveys from 3,500' – TD

Open Hole Logging Program:

Triple Combo w/Spectral GR/DIL/FDC/CNL-Sonic	1,000' to 6,650' MD

Cores: Possible sidewall cores in Williams Fork and/or Mancos

DST's: None planned

7) Anticipated Abnormal Pressures or Temperatures:

1. No abnormal pressures or temperatures are anticipated.
2. No H_2S gas has been encountered in or known to exist in the general area.
3. Pressures; Mancos pressure 0.57 psi/ft.
4. Estimated bottom-hole pressure is 4,052 psi.

8) Anticipated Starting Dates and Approximate Duration:

Starting Date:	April 1, 2015
Spud Date:	April 1, 2015
Drilling Days:	45 days
Completion Days:	30 days

Notes: Per OnShore Order 1, 3/7/07 the former 8 point drilling plan (also referred to as the Subsurface Use Plan)

Due to the voluminous requirements of horizontal drilling, a larger well pad and pit are being proposed. The pit will be lined with 2 synthetic liners, each having a minimum of 24 mil thickness as per COGCC regulation 904.c.(1). The pit will contain freshwater and/or recycled flowback water for makeup water during drilling and fracture stimulation during completions.