DIGITAL TERRAIN MODEL NOTES:
THE BASIS OF THE DESIGN IS A DIGITAL TERRAIN MODEL (DTM) DERIVED FROM DATA OBTAINED WITH LIGHT EMITTING RADAR (LIDAR) FROM AN AIRCRAFT. THE CONSTRUCTION STAKING OF THE DESIGN IS DONE WITH SURVEY GRADE GLOBAL POSITIONING SURVEY (GPS) EQUIPMENT. THE DTM ELEVATIONS AND GPS ELEVATIONS MAY VARY BY VALUES OF LESS THAN 0.5 FOOT TO 2 FEET. FOR EARTHWORK COMPUTATIONS, THE DTM MODEL IS ACCEPTED AS VALID. DURING CONSTRUCTION STAKING, THE ELEVATION OF THE WELL BORE WILL BE DETERMINED WITH GPS METHODS. THIS ELEVATION WILL BE THE PUBLISHED ELEVATION.

WELL PAD CUT-FILL TABLE						
POINT	CATCH POINT			HINGE PT.	CUT	SLOPE
NO.	STATION	OFFSET	ELEV.	ELEV.	FILL(+)	H:V
1	-0+28.80	-149.00	5495.70	5476.50	-19.20	1.5:1
2	0+25.00	-199.48	5493.50	5476.50	-17.00	1.5:1
3	1+75.00	-198.49	5492.80	5476.50	-16.30	1.5:1
4	3+00.00	-192.33	5488.70	5476.50	-12.20	1.5:1
5	4+50.00	-182.29	5482.00	5476.50	-5.50	1.5:1
6	6+05.00	-178.64	5473.40	5476.50	3.10	1.5:1
7	6+37.49	-149.00	5471.50	5476.50	5.00	1.5:1

WELL SITE DESIGN AND CONSTRUCTION NOTES:
1. The graded well pad elevation was selected to approximate balance of excavation to embankment and to provide a stockpile of earth for the eventual frac pit reclamation.
2. The approximate volume of the frac pit is 10,480 C.Y. Material for frac pit reclamation will be obtained from the waste material stockpile.
3. The area of the proposed pad and waste material stockpile is 8.06 acres within the computed catch lines. The area of the channel change within the computed catch lines is 0.15 acres. This area does not include the area of the topsoil stockpile nor the small additional area required for grading machine travel. The estimated area of the disturbance limits of the pad as shown is 9.53 acres. The estimated area of the disturbance limits of the channel change is 0.31 acres. The area enclosed on the perimeter of the pad and channel change at a 10 foot width for potential BMP installations is 0.53 and 0.15 acres, respectively.
4. A permanent water diversion channel is planned at the north west side of the pad. See Exhibit VI-B for the channel profile.
5. Approximately 1,310 feet of existing fence is to be removed and 1,802 of new fence and an 8' x 18' cattle guard is to be installed.
6. The well will be drilled with a semi-closed loop mud system. During the drilling of the well, the cuttings will be placed in the temporary cuttings storage area shown. This area will be constructed on the pad surface elevation with dikes of a 5-foot height. The interior of the area and berm inslopes will be lined with a liner meeting BLM specifications.
7. Immediately after completion of drilling of the proposed well, the cuttings will be removed from the temporary storage area and buried in the permanent storage area shown for that well. This area will be excavated with nearly vertical slopes to a 10-foot depth. A liner meeting BLM specifications will be installed in the excavation. The cuttings will then be placed in the excavation. The liner will be closed over the cuttings and covered with earth. This will be a short duration operation requiring perhaps one day of work.

DIVERSION CHANNEL NOTES:
1. The existing channel to be diverted and the existing channel to the west to receive the diversion are each approximately 8 feet in width.
2. The proposed channel is planned with an 8 foot flat bottom width with 1.5:1 side slopes.
3. The estimated drainage area is 4.4 acres. The slope of the basin is 0.16. Using the Rational Method the flows for a 10-year and 25-year event are 1.1 CFS and 2.1 CFS, respectively. The normal depth of flow in the channel for a 25-year event is less than 0.2 foot.
4. The profile of the proposed channel is shown on Exhibit VI-B.

ESTIMATED EARTHWORK QUANTITIES

PAD TOPSOIL (6" DEPTH)	5,910 C.Y.
CHANNEL TOPSOIL (3" DEPTH)	60 C.Y.
ROAD TOPSOIL (6" DEPTH)	90 C.Y.
PAD EXCAVATION	51,520 C.Y.
CHANNEL EXCAVATION	1,000 C.Y.
CHANNEL SUB-EXCAVATION	40 C.Y.
ROAD EXCAVATION	0 C.Y.
PAD EMBANKMENT (10% SHRINK ASSUMED)	40,730 C.Y.
CHANNEL EMBANKMENT (10% SHRINK ASSUMED)	10 C.Y.
ROAD EMBANKMENT (10% SHRINK ASSUMED)	650 C.Y.
WASTE MATERIAL	11,170 C.Y.
TOTAL EARTHWORK VOLUME	58,620 C.Y.

PREPARED BY:
P.E. GROSCH CONSTRUCTION, INC.
SURVEYORS - ENGINEERS - CONSTRUCTORS
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SUR:			PRJ. #:	25a12	
DES:	SAG	8/27/12	REC:	lidar	
DWN:	SAG	8/12/12	FILE:	T7400/GpkData-v8/Client/Black Hills E&P/Colo/Mesa	
REV:	SAG	11/21/12	DWG:	25A12 HDU 9-41/Dgn/9-41R_ex6A-site	

SCALE: 1" = 80'
0 80 160 240
CONTOUR INTERVAL: TWO FEET

OWNER
BLACK HILLS PLATEAU PRODUCTION COMPANY, LLC
DENVER, COLORADO

PROJECT
HOMER DEEP UNIT 9-41AH
HOMER DEEP UNIT 9-41BH
NE¼ NE¼, SECTION 9, T. 8 S., R. 98 W.
GARFIELD COUNTY, COLORADO

DRAWING TITLE
EXHIBIT VI-A
DRAWING DESCRIPTION
WELL SITE GRADING PLAN - REVISED