

	ILLINOIS DEPARTMENT OF NATURAL RESOURCES Office of Oil and Gas Resource Management One Natural Resources Way Springfield, Illinois 62702-1271	
HIGH VOLUME HORIZONTAL HYDRAULIC FRACTURING PERMIT APPLICATION HVHFF-10		

References to "1-xx" or "§1-xx" are to the Hydraulic Fracturing Regulatory Act., 225 ILCS 732/1-1 et seq. References to "240.xxx" and "245.xxx" are to 62 Ill. Admin. Code 240 and 245, respectively.

Attachment: DirectionalDrillingPlan

Please save attachment and use the file name above.

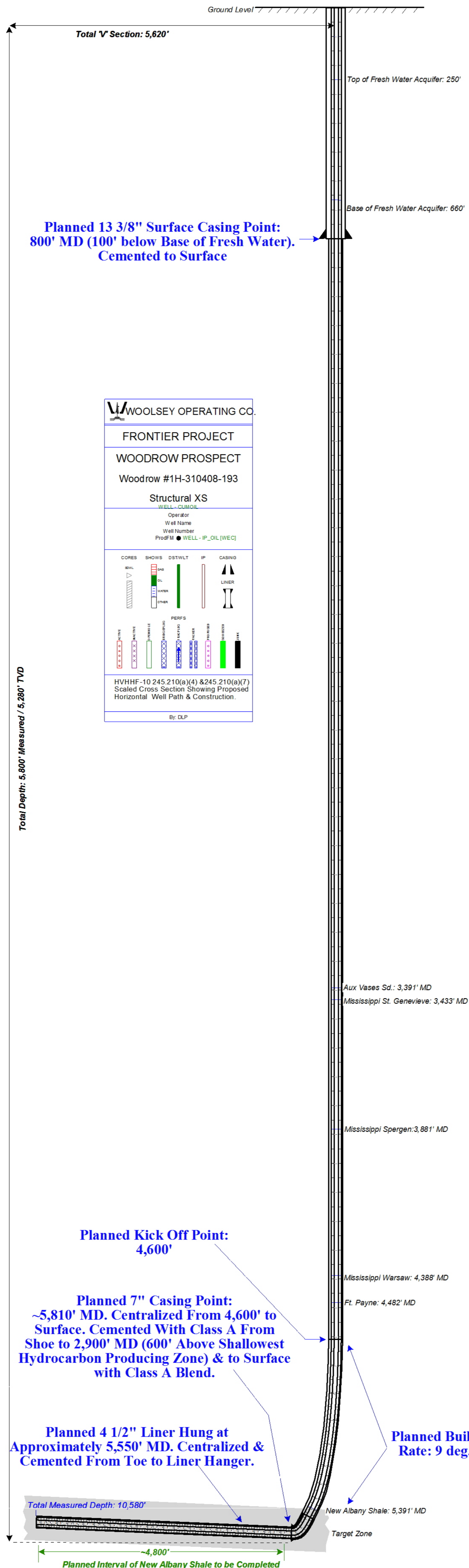
Directional Drilling Plan. §1-35(b)(4); 245.210(a)(4).

- (a) What is the total true vertical depth to which the well will be drilled or deepened? _____
- (b) What is the total measured depth to which the well will be drilled or deepened? _____
- (c) What is the proposed build angle of the well? _____
- (d) What is the proposed direction (heading) of the well? _____
- (e) At what depth will the well deviate from vertical? _____
- (f) At what verticle depth will the well enter the formation that will be stimulated? _____
- (g) What is the angle and direction of any nonvertical portion of the wellbore prior to total target depth/actual final depth? _____
- (h) What is the estimated length of the proposed horizontal lateral or wellbore? _____
- (i) What is the planned horizontal deviation of the horizontal lateral or wellbore? _____
- (j) What is the planned direction/heading of the horizontal lateral or wellbore? _____
- (k) What is the planned bottom hole location of the well (provide both PLSS and GPScoordinates)? _____

Scaled Cross (Top is Soil Surface). 245.210(a)(4), 245.210(a)(7). Attach a diagram of the well bore, showing in scaled cross-section of the following:

- 1) the well bore from the surface through the horizontal leg's total length
- 2) the dimensions and information stated in this Directional Drilling Plan
- 3) the features described in the Underground Fresh Water Plan in the following section; and
- 4) the formations to be stimulated as required by 245.210(a)(6)(A) and as described in the geological description in Attachment titled HVHFFOperationsPlan.

**PROPOSED:
WOOLSEY OPERATING COMPANY
WOODROW #1H-310408-193**



Total "V" Section: 5,620'

Top of Fresh Water Aquifer: 250'

Base of Fresh Water Aquifer: 660'

**Planned 13 3/8" Surface Casing Point:
800' MD (100' below Base of Fresh Water).
Cemented to Surface**

WOOLSEY OPERATING CO.	
FRONTIER PROJECT	
WOODROW PROSPECT	
Woodrow #1H-310408-193	
Structural XS	
WELL - CUMDOL	
Operator	
Well Name	
Well Number	
ProdM ● WELL-IP_OIL[WEC]	
CORES	SHOWS
DST/WLT	IP
CASING	LINER
PERFS	
HVHFF-10 245.210(a)(4) & 245.210(a)(7) Scaled Cross Section Showing Proposed Horizontal Well Path & Construction. By: DLP	

Total Depth: 5,800' Measured / 5,280' TVD

Aux Vases Sd.: 3,391' MD

Mississippi St. Genevieve: 3,433' MD

Mississippi Spergen: 3,881' MD

Mississippi Warsaw: 4,388' MD

Ft. Payne: 4,482' MD

**Planned Kick Off Point:
4,600'**

**Planned 7" Casing Point:
~5,810' MD. Centralized From 4,600' to
Surface. Cemented With Class A From
Shoe to 2,900' MD (600' Above Shallowest
Hydrocarbon Producing Zone) & to Surface
with Class A Blend.**

**Planned 4 1/2" Liner Hung at
Approximately 5,550' MD. Centralized &
Cemented From Toe to Liner Hanger.**

**Planned Build
Rate: 9 deg.**

Total Measured Depth: 10,580'

New Albany Shale: 5,391' MD

Target Zone

Planned Interval of New Albany Shale to be Completed ~4,800'