west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
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Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

PERMIT MODIFICATION APPROVAL
Horizontal / Horizontal Well - 1

CUNNINGHAM ENERGY, LLC
3230 PENNSYLVANIA AVENUE

CHARLESTON, WV 25302

Re: Permit Modification Approval for KING 21H
47-015-02907-00-00

CUNNINGHAM ENERGY, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: KING 21H
Farm Name: TAYLOR, ROBERT
U.S. WELL NUMBER: 47-015-02907-00-00
Horizontal / Horizontal Well - 1
Date Issued: 10/28/2016

Promoting a healthy environment.

WW - 2B
(Rev. 8/10)

15-2907

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: CUNNINGHAM ENERGY, LLC

494508594	CLAY - 15	UNION - 5	ELKHURST 7.5'
Operator ID	County	District	Quadrangle

2) Operator's Well Number: KING 21H 3) Elevation: 1,291'

4) Well Type: (a) Oil X or Gas _____

(b) If Gas: Production _____ / Underground Storage _____

Deep _____ / Shallow _____

5) Proposed Target Formation(s): BIG INJUN Proposed Target Depth: 2,150'
6) Proposed Total Depth: 5,200 MD Feet Formation at Proposed Total Depth: BIG INJUN
7) Approximate fresh water strata depths: 200'
8) Approximate salt water depths: 1475' - 1525'

9) Approximate coal seam depths: NO COAL LISTED ON TITLE

10) Approximate void depths,(coal, Karst, other): NONE

11) Does land contain coal seams tributary to active mine? NONE

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)
DRILL AND STIMULATE A NEW SHALLOW HORIZONTAL OIL WELL.

13)

CASING AND TUBING PROGRAM

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	13"	LS	43.6 LBS	30'	30'	CTS
Fresh Water	9 5/8"	LS	26 LBS	400'	400'	CTS
Coal						
Intermediate	7"	J-55	20 LBS	1900'	1900'	CTS
Production	4 1/2"	N-80	11.6 LBS	5140'	5140'	CTS
Tubing						
Liners						

Packers: Kind:
Sizes:
Depths Set

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Office of Oil and Gas
SEP 10 2016
WV Department of
Environmental Protection

WW-9
(5/16)

API Number 47 - 15 - 02907
Operator's Well No. KING 21H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name CUNNINGHAM ENERGY, LLC OP Code 494508594

Watershed (HUC 10) TRIBUTARY OF WADE FORK Quadrangle ELKHURST 7.5'

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes ☑ No ☐

Will a pit be used? Yes ☑ No ☐

If so, please describe anticipated pit waste: DRILL CUTTINGS, FLUIDS FROM DRILLING AND FRACTURING

Will a synthetic liner be used in the pit? Yes ☑ No ☐ If so, what ml.? 20 MIL.

Proposed Disposal Method For Treated Pit Wastes:

- ■ Land Application (if selected provide a completed form WW-9-GPP)
- ■ Underground Injection (UIC Permit Number 39-2210 UIC)
- ____ Reuse (at API Number ____)
- ____ Off Site Disposal (Supply form WW-9 for disposal location)
- ____ Other (Explain ____

Will closed loop systembe used? If so, describe: NO

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. AIR; FRESHWATER

-If oil based, what type? Synthetic, petroleum, etc. ____

Additives to be used in drilling medium? SOAP, KCL, and/or CLAY STABILIZER

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. LEAVE IN PIT/HAUL IF NEEDED

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) CEMENT AND LIME

-Landfill or offsite name/permit number? CITY OF CHARLESTON LANDFILL

Permittee shall provide written notice to the Office of Oil and Gas of any load of drill cuttings or associated waste rejected at any West Virginia solid waste facility. The notice shall be provided within 24 hours of rejection and the permittee shall also disclose where it was properly disposed.

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on April 1, 2016, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature [signature]

Company Official (Typed Name) RYAN E.M. CUNNINGHAM

Company Official Title PRESIDENT

Official Seal
Notary Public, State of West Virginia
Joseph M. Morias
220 1/2 Walnut
Bridgeport, WV 26164
My commission expires January 23, 2022

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SEP 10 2016
WV Department of Environmental Protection

Subscribed and sworn before me this 7th day of September, 20 16

[signature] Notary Public

My commission expires January 23, 2022

Form WW-9

Operator's Well No. KING 21H

15-2907

Proposed Revegetation Treatment: Acres Disturbed 2.75 Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-10-10

Fertilizer amount 1/3 TON lbs/acre

Mulch HAY - 2 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
KY - 31	40	ORCHID GRASS	15
ALSIKE CLOVER	5	ALSIKE CLOVER	5
ANNUAL RYE	15		

Attach:
Maps(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided). If water from the pit will be land applied, provide water volume, include dimensions (L, W, D) of the pit, and dimensions (L, W), and area in acres, of the land application area.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____

Comments: _____

Title: _____ Date: _____

Field Reviewed? (_____) Yes (_____) No

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WW-9- GPP
Rev. 5/16

API Number 47 - 15 - 02907
Operator's Well No. KING 2H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
GROUNDWATER PROTECTION PLAN

Operator Name: CUNNINGHAM ENERGY, LLC

Watershed (HUC 10): Tributary of Porter Creek, Tributary of Wado Fork of Little Sycamore Creek, in the Elk Watershed Quad: Elkhurst 7.5

Farm Name: ROBERT TAYLOR

1. List the procedures used for the treatment and discharge of fluids. Include a list of all operations that could contaminate the groundwater.

Prior to discharge of fluid from a drilling pit, the fluid will be circulated by placing a pump with suction in one end of the pit and the fluid discharged into the other end of the pit, lime will be added as necessary to the discharge end of the pit, and the fluid circulated for turnover of two pit volumes. Field samples will be taken of the pit fluid to determine pre-discharge parameters respective to WVDEP - OOG regulations; and, any visable free floating oil other than trace amounts that may be present will be removed from the suction/discharge area of the pit. Samples will be taken at varous points of the discharge for testing.

2. Describe procedures and equipment used to protect groundwater quality from the list of potential contaminant sources above.

Drilling pits will be lined with a minimum of 20 mil thickness synthetic liner. Drill cuttings disposal will be in conformace with the Fluids/Cuttings Disposal & Reclamation Plan (Form WW-9) as submitted within the approved application for this well. Land application of treated drilling pit wastewaters will conform with the applicable procedures specified within the WVDEP OOG's General Water Pollution Control Permit No. GP-WV-1-88.

3. List the closest water body, distance to closest water body, and distance from closest Well Head Protection Area to the discharge area.

The pad for this well in posistioned upon a ridgetop area near the topographic drainage divide, at an approximate equidistant 1000 feet from the headwater area of an unnamed tributary of Porter Creek to the northwest.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

Well driling, associated casing installation and cementing, well stimulation, and other typical activities as may be encountered during the exploratory, developmental, maintenance/reworking, treatment operations and closure phases of this well are already regulated in the approved well work permit and provide groundwater protection measures.

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5. Discuss any existing groundwater quality data for your facility or an adjacent property.