



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street, S.E.
Charleston, WV 25304
(304) 926-0450
fax: (304) 926-0452

Austin Caperton, Cabinet Secretary
www.dep.wv.gov

Tuesday, September 24, 2019
WELL WORK PLUGGING PERMIT
Vertical Plugging

CABOT OIL & GAS CORPORATION
2000 PARK LANE, SUITE 300
PITTSBURGH, PA 15275

Re: Permit approval for CABOT 50
47-079-01538-00-00

This well work permit is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to any additional specific conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas Inspector.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. Please be advised that form WR-38, Affidavit of Plugging and Filling Well, is to be submitted to this office within 90 days of completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

Per 35 CSR 4-5.2.g this permit will expire in two (2) years from the issue date unless 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: CABOT 50
Farm Name: AMHERST INDUSTRIES, INC.
U.S. WELL NUMBER: 47-079-01538-00-00
Vertical Plugging
Date Issued: 9/24/2019

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code §22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
2. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
3. Well work activities shall not constitute a hazard to the safety of persons.

1) Date August 5, 2019
2) Operator's
Well No. CABOT #50
3) API Well No. 47-079 - 01538

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil ___ / Gas x / Liquid injection ___ / Waste disposal ___ /
(If "Gas, Production x or Underground storage ___) Deep x / Shallow ___

5) Location: Elevation 1,004.23' Watershed Guano Creek of Kanawha River
District Pocatalico County Putnam Quadrangle Bancroft

6) Well Operator Cabot Oil & Gas Corporation 7) Designated Agent Phillip J. Hill
Address 2000 Park Lane, Suite 300 Address 29 Starbuck Lane
Pittsburgh, PA 15275 Saulsville, WV 25876

8) Oil and Gas Inspector to be notified 9) Plugging Contractor
Name Allen Flowers Name CONSERV - Contractor Service Inc. of WV
Address 165 Grassy Lick Lane Address 929 Charleston Road
Liberty, WV 25124 Spencer, WV 25276

10) Work Order: The work order for the manner of plugging this well is ^{RECEIVED} as follows:
See Attached Sheet
Office of Oil and Gas

AUG 23 2019
WV Department of
Environmental Protection

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector  Date 8-20-2019

Well Name: Cabot 50
 API- 47-079-01538
 Engineer: Marcus Barnes
 Date: 9/23/2019

Casing Details:

24"- 95'- Cement to surface
 18.625"- 338'- Cement to surface
 13.375"-2,260'- Cement to surface
 9.625"- 7,023'- Cement to surface
 7" Liner- 6,705-9,963'- Cement to top of liner
 4.5"-14,500- TOC- 9,960'

Objective P&A Wellbore

1. MIRU SR and Associated Equipment.
2. Bullhead well dead, then set two-way check in hanger and ND tree and NU BMV and BOP Stack and test.
3. RU wireline and RIH with 4" GR to 13250'. POOH and PU 10K CIBP and set at 13,250'.
4. TIH and spot cement plug on plug from 13,000-13,250'. WOC and tag and report to state.
5. Spot gel above cement plug to 10,213. TOOH.
6. RU wireline freepoint and determine spot to cut casing, estimating at 9,900'.
7. PU casing cutter and cut casing. POOH and check to ensure casing is free. Pipe weight is 15.1 lb/ft- Casing will weigh 149K in air, and approximately 131K in water.
8. LD production casing.
9. TIH w/workstring and set cement plug from 9713-10213'. WOC and tag and report to state.
10. Spot gel above cement plug to 6,955'.
11. TIH w/workstring and set cement plug from 6455-6955'. WOC and tag and report to state.
12. Spot gel above cement plug to 5,700'.
13. TIH w/workstring and set cement plug from 5,500-5,700', with latex additive. WOC and tag and report to state.
14. Spot gel above cement plug to 1,290'.
15. TIH w/workstring and set cement plug from 890-1290'. WOC and tag and report to state.
16. Spot gel above cement plug to 250'.
17. Set cement plug from 250' to surface.
18. ND from well and erect monument per required state specification.
19. RDMO, clean up location and turn well over to construction for reclamation.

Well: Cabot 50
API- 47-079-01538

24"- 95'- CTS

18"- 338'- CTS

13 3/8"- 2,260'- CTS

Hydrogen Sulfide Show
at 5,554-5,666'

9 5/8"- 7,023'- CTS

7" Liner- 6,705-9,963'- CTS

6% Gel Between Plugs

4 1/2" - 14,500'- TOC 9,960'

Cement- 0-250'

Cement- 890-1290'

Cement- 5500-5700' (requires
latex additive due to H2S
show)

Cement- 6,455-6,955

Cement - 9713-10213

Casing Cut-9900'

Cement 13,000-13,250'

CIBP-13,250

Perfs- 13,406-13,552'

CIBP- 14,085'

CIBP

CIBP- 14,110'

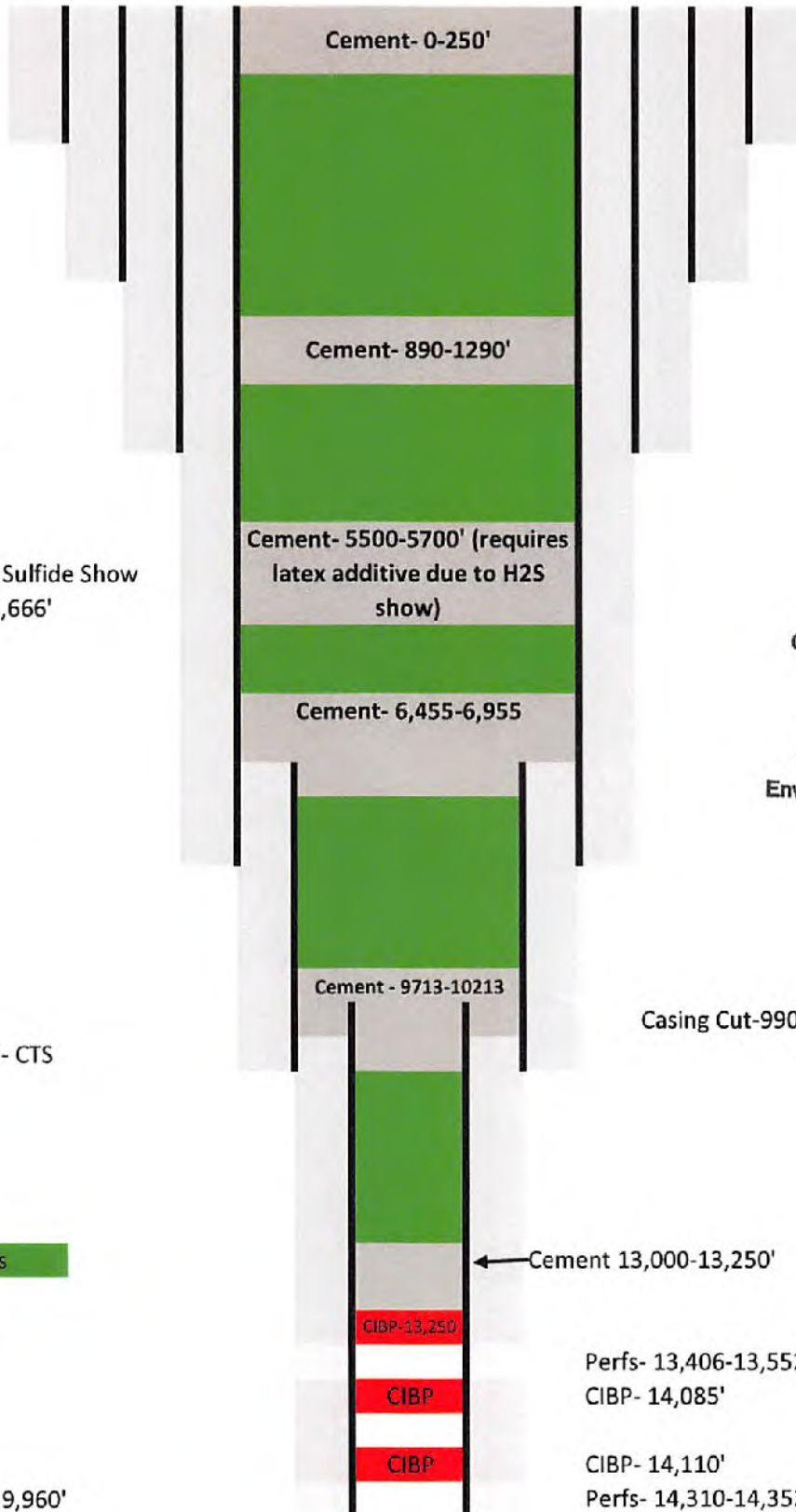
CIBP

Perfs- 14,310-14,352'

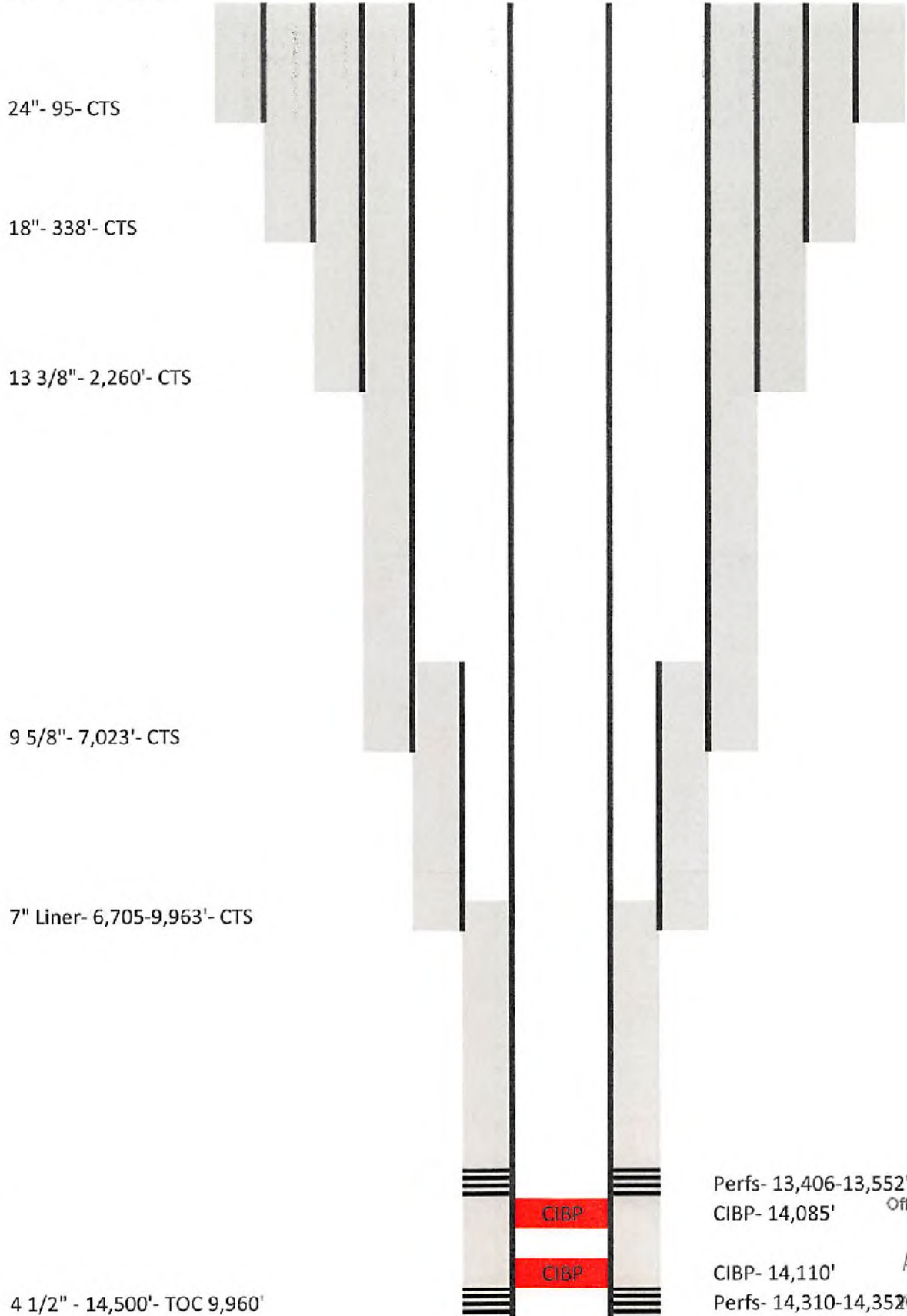
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Well: Cabot 50
API- 47-079-01538



24"- 95'- CTS

18"- 338'- CTS

13 3/8"- 2,260'- CTS

9 5/8"- 7,023'- CTS

7" Liner- 6,705-9,963'- CTS

4 1/2" - 14,500'- TOC 9,960'

Perfs- 13,406-13,552' RECEIVED
CIBP- 14,085' Office of Oil and Gas

CIBP- 14,110' AUG 07 2019
Perfs- 14,310-14,352' Department of
Environmental Protection

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State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-079-01538 County Putnam District Pocatalico
 Quad Bancroft Pad Name Cabot 50 Field/Pool Name _____
 Farm name Amherst Industries, Inc. Well Number Cabot 50
 Operator (as registered with the OOG) Cabot Oil & Gas Corporation
 Address Five Penn Center West, Suite 401 City Pittsburgh State PA Zip 15276

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
 Top hole Northing _____ Easting _____
 Landing Point of Curve Northing _____ Easting _____
 Bottom Hole Northing _____ Easting _____

Elevation (ft) 1004.23 GL Type of Well New Existing Type of Report Interim Final
 Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
 Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
 Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
 Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
 Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
 Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)
SEE ATTACHED PAGE 5 of 8

Date permit issued 6/6/2014 Date drilling commenced 08/09/2014 Date drilling ceased 10/27/2014
 Date completion activities began 11/21/2014 Date completion activities ceased 1/19/2015
 Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft None Reported Open mine(s) (Y/N) depths N
 Salt water depth(s) ft 2105-2150' Void(s) encountered (Y/N) depths N
 Coal depth(s) ft 405' Cavern(s) encountered (Y/N) depths Office of N RECEIVED Oil and Gas
 Is coal being mined in area (Y/N) N

Reviewed by Aug 07 2019

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API 47-079 - 01538 Farm name Amherst Industries, Inc. Well number Cabot 50

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	24"	24"	95	New	A-252-2/94.62#		N/A
FW	22"	18-5/8"	338 GL	New	J-55/87.5#		15 bbls cement to surface
Surface	17-1/2"	13-3/8"	2260 KB	New	J-55/54.5#		60 bbls cement to surface
Intermediate 1	12-1/4"	9-5/8"	7023 KB	New	L-80/47#		1 bbl cement to surface
Liner	8-1/2"	7"	9963-6076 KB	New	T-95/26#		8 bbls cement to surface
Production	6-1/8"	4-1/2"	14500 KB	New	Q-125/15.1#		no returns to surface
Packer type and depth set		DV tool and Weatherford ACP packer ran on intermediate string and set at 3995'					

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface							
Coal							
Intermediate 1		SEE ATTACHED PAGE 6 of 8					
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) 14,520' Loggers TD (ft) 14,520'
 Deepest formation penetrated Rogersville Formation Plug back to (ft) 14,085'
 Plug back procedure RIH and set CIBP @ 14085. Pressured up to 7000 psi and set BOT CIBP.

Kick off depth (ft) N/A

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING FW String: No Centralizers
Surface String: Ran (1) 17" bowspring centralizer every joint from 2260' to 24" (56 total)
Intermediate String: Ran (1) 12" bowspring centralizer every joint from 7021' to 73' (158 total)
Liner String: Ran (1) 8" solid body centralizer every joint from 9961' to 6780' (78 total)
Production String: Ran (1) 5 5/8" solid body spiral centralizer every joint from 14,498' to 8052' (158 total)

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS 0.54" OD, 60° phasing, 4 SPF

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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API 47-079-01538 Farm Name Amherst Industries, Inc. Well Number Cabot #50**Well Record Attachment - MUD TYPE(S) AND ADDITIVE(S)**

Alluminum Stearate
Sodium Carboxymethyl
Barium Sulfate
Methyl Alcohol, Amine
Caustic Soda Anhydrous
Calcium Chloride
Calcium Carbonate
Wood Shavings
Citric Acid Anhydrous
Sulfomethlyated Tannin
Glutaraldehyde
Cellulose (2)
Biopolymer
Potassium Chloride
Calcium Hydroxide
Mineral Fiber, Mineral Oil
Isopropanol
Xanthan Gum
Barium Sulfate (2), Clay, Quartz, Calcite
Petroleum Distillate Hydrotreate Light
Bentonite
Crystalline Quartz, Silica
Mixed Alcohols
Defoamer
Ammonium Bisulfite Solution
Sodium Chloride
Sodium Carbonate
Sodium Bicarbonate
Zinc Carbonate

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API 47-079-01538 Farm Name Amherst Industries, Inc. Well Number Cabot #50

Well Record Attachment - CEMENT DATA

Cement Data	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yeild (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor	Drilled with Dual-Rotary Bit - No Cement Used						
Fresh Water	Halcem	370	15.6	1.198	443	0	8
Surface	Extendacem	760	12.5	2.28	1733	0	8
	Halcem	470	15.6	1.19	559		
Intermediate	Tuned Light	610	11.5	2.55	1556	0	8
	ExpandaCem	530	11.5	3.03	1606		
Liner	Econocem	50	13.1	1.74	70	6076	8
	Shalcem	400	15.2	1.2	480		
Production	Densecem	250	17.5	1.67	418	9599	8

Well Record Attachment - CEMENT ADDITIVES

Cement Data	Class/Type of Cement	Cement Blend / Additives
Fresh Water	Halcem	class a cement and 2% Calcium Chloride
Surface	Extendacem	75% Class A Cement, 25% Enhancer 923 (cement material), 8 to 12% Silicalite (light weight material), 0.2 to 0.6% Halad 567 (fluid loss material), 2 to 7% NaCl, 0.1 to 0.5% HR-7 (cement retarder), 2 to 7% Microbond (expansive additive), 1 to 5% econolite (light weight additive), 0.1 to 0.5% HR-5 (cement retarder), 4 to 11 lb/sk Kol-Seal (lost circulation material)
	Halcem	Class A with 1% Calcium Chloride
Intermediate	Tuned Light	Class G cement, 15 to 25% Light weight glass beads, 10 to 14% Silicalite, 0.3% Calcium Chloride, 0.1% D-air (defoamer), 12 to 18% NaCl, 0.2 to 0.6% HR-7
	ExpandaCem	75% Class A Cement, 25% Enhancer 923 (cement material), 8 to 12% Silicalite (light weight material), 0.2 to 0.6% Halad 567 (fluid loss material), 2 to 7% NaCl, 2 to 7% Microbond (expansive additive), 1 to 5% econolite (light weight additive), 0.1 to 0.5% HR-5 (cement retarder), 4 to 11 lb/sk Kol-Seal (lost circulation material)
Liner	Econocem	65% Class A 35% Pozmix, 2 to 8% Bentonite (suspending agent), 0.3% D-air, 0.1 to 1.5% HR-7
	Shalcem	75% Class A 25% Pozmix, 1 to 5% Silicalite, 0.2 to 0.8% Halad 567, 0.1 to 0.4% FWCA (suspending agent), 0.1 to 0.7% HR-7
Production	Densecem	Class A cement, 55 to 65 lb/sk Barite (weighting material), 0.2 to 0.6% Halad 567, 0.1 to 0.5% CFR-3 (dispersant), 6 to 16% NaCl, 0.4 to 1% Halad 322, 0.1 to 0.5% HR-5, 0.05% to 0.2% SA-1015 (suspending agent)

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API 47-079-01538

Form Name Amherst Industries, Inc. Well number Cabot 50

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Formation tops for the Cabot 50

FORMATION TOP NAME	MD TOP	MD BOTTOM	LITHOLOGY	AGE	SOURCE	GAS/OIL/H2S/FW
SAND/SHALE	0	405	S.S./SHALE	PENN	MUD LOG	
COAL	405	407	COAL	PENN	MUD LOG	
SAND/SILTSTONE	407	1096	S.S./SILT.	PENN	MUD LOG	
SAND/CARB. SHALE	1096	1170	S.S./SHALE	PENN	MUD LOG	
SAND/SILTSTONE	1170	1866	S.S./SILT.	PENN	MUD LOG	GAS @ 1390', 1495, 1615
SHALE	1866	1880	SHALE	MISSISSIPPIAN	MUD LOG	
BIG LIME	1880	2105	LIMESTONE	MISSISSIPPIAN	ELOG	
BIG INJUN SANDSTONE	2105	2170	S.S.	MISSISSIPPIAN	ELOG	
WEIR	2170	2312	SILT.	MISSISSIPPIAN	ELOG	
WEIR SHALE	2312	2563	SHALE	MISSISSIPPIAN	ELOG	
SUNBURY	2563	2582	SHALE	MISSISSIPPIAN	ELOG	
BEREA	2582	2600	S.S.	MISSISSIPPIAN	ELOG	
UPPER DEV.	2600	3800	SHALE/SILT	DEVONIAN	ELOG	
HURON	3800	4238	SHALE	DEVONIAN	ELOG	
ELK SILTSTONE	4238	4330	SILT.	DEVONIAN	ELOG	
DEV. SHALE MIDDLE	4330	4625	SHALE	DEVONIAN	ELOG	
RHINESTREET SHALE	4625	4780	SHALE	DEVONIAN	ELOG	
TULLY	4780	4840	LIMESTONE	DEVONIAN	ELOG	
MARCELLUS	4840	4864	SHALE	DEVONIAN	ELOG	GAS @ 4845'
ONONDAGA	4864	4970	LIMESTONE	DEVONIAN	ELOG	
ORISKANY	4970	4992	S.S.	DEVONIAN	ELOG	
HELDERBERG LS	4992	5185	LIMESTONE	DEVONIAN	ELOG	
SALINA LS	5185	5554	DOL/LIMESTONE	SILURIAN	ELOG	
TONOLOWAY	5554	5666	DOLOMITE	SILURIAN	ELOG	H2S SHOW, TRACE
NEWBURG	5666	5678	S.S.	SILURIAN	ELOG	
BASS ISLAND	5678	5900	DOLOMITE	SILURIAN	ELOG	
LOCKPORT	5900	5940	DOLOMITE	SILURIAN	ELOG	
BIG SIX	5940	5948	S.S.	SILURIAN	ELOG	
ROSE HILL	5948	6275	RED SHALE	SILURIAN	ELOG	
TUSCARORA	6275	6440	S.S./SILT.	SILURIAN	ELOG	
JUNIATA SHALE	6440	6950	RED SHALE	ORDOVICIAN	ELOG	
MARTINSBURG SHALE	6950	7500	SHALE/LIMESTONE	ORDOVICIAN	ELOG	
UTICA SHALE	7500	7995	SHALE	ORDOVICIAN	ELOG	
TRENTON	7995	8280	LIMESTONE	ORDOVICIAN	ELOG	GAS @ 8162'
BLACK RIVER	8280	9056	LIMESTONE	ORDOVICIAN	ELOG	GAS @ 8670', 8955'
CHAZY/KNOX	9056	9657	DOLOMITE	ORDOVICIAN	ELOG	GAS @ 9330', 9385'
ST. PETER SANDSTONE	9657	9742	S.S.	ORDOVICIAN	ELOG	
BEEKMANTOWN	9742	10742	DOLOMITE	ORDOVICIAN	ELOG	GAS @ 10185'
ROSE RUN SS.	10742	11000	S.S./DOL.	ORDOVICIAN	ELOG	
COPPER RIDGE DOL	11000	11953	DOLOMITE	ORDOVICIAN	ELOG	GAS @ 11760'
CONASAUGA	11953	13570	LIMESTONE/DOL/S.S.	CAMBRIAN	ELOG	GAS @ 12300' - 13410'
ROGERSVILLE FORMATION	13570	14520	LIMESTONE/DOL/SHALE	CAMBRIAN	ELOG	GAS @ 14205' - 14320'

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API 47-079-01538 Farm Name Amherst Industries, Inc. Well Number Cabot #50**Well Record Attachment - WELL SERVICE COMPANIES**Conductor Drilling Contractor Minichi, Inc.Address 453 Ziegler Street, Dupont, PA 18641Drilling Contractor SidewinderAddress 952 Echo Lane, Suite 460, Houston, TX, 77024Logging Company Weatherford International, LTD.Address 121 Hillpointe Drive, Suite 300, Canonsburg, PA 15317Cementing Company Halliburton Energy ServicesAddress 121 Champion Way, Suite 110, Canonsburg, PA 15317Perforating Company Halliburton Energy ServicesAddress 121 Champion Way, Suite 110, Canonsburg, PA 15317Stimulating Company Halliburton Energy ServicesAddress 121 Champion Way, Suite 110, Canonsburg, PA 15317RECEIVED
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Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	12/17/2014
State:	
County:	
API Number:	47-079-01538
Operator Name:	Cabot Oil & Gas
Well Name and Number:	Cabot 50
Longitude:	0
Latitude:	0
Long/Lat Projection:	
Production Type:	
True Vertical Depth (TVD):	0
Total Water Volume (gal)*:	139,152

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid	Fresh Water	7732-18-5	100.00%	86.19892%	
PREMIUM PROP PLUS	Halliburton	Proppant	Aluminum oxide	1344-28-1	100.00%	11.74791%	
			Crystalline silica, cristobalite	14464-46-1	5.00%	0.58747%	
BE-9W	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00%	0.00504%	
CL-41	Halliburton	Crosslinker	Inorganic salt	Confidential	30.00%	0.00723%	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-371-8226
			Lactic acid	50-21-5	30.00%	0.00723%	
FDP-S1061-12	Halliburton	Friction Reducer	Inorganic salt	Confidential	30.00%	0.01075%	
Clu-Web™	Halliburton	Additive	Sodium chloride	7847-14-5	60.00%	0.04637%	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive	Acetic acid	64-19-7	60.00%	0.01626%	
			Acetic anhydride	108-24-7	100.00%	0.02702%	
FE-2A	Halliburton	Additive	Citric acid	77-92-9	60.00%	0.01867%	
GasPerm 1000™	Halliburton	Surfactant	Isopropanol	67-63-0	30.00%	0.00075%	
			Terpenes and Terpenoids, sweet orange-oil	68647-72-3	30.00%	0.00075%	
HAI-08 ACID INHIBITOR	Halliburton	Corrosion Inhibitor	Methanol	67-56-1	60.00%	0.00271%	
			Propargyl alcohol	107-19-7	10.00%	0.00045%	
LP-65 MC	Halliburton	Scale inhibitor	Ammonium chloride	12125-02-9	10.00%	0.00572%	
Oilperm FMM-3	Halliburton	Surfactant	Terpenes and Terpenoids, sweet orange-oil	67-63-0	5.00%	0.00911%	
			Isopropanol	67-63-0	30.00%	0.05457%	
WG-38 GELLING AGENT	Halliburton	Gelling Agent	Contains no hazardous substances	NA	100.00%	0.08445%	
PermVia VFR-10	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00%	0.03839%	
			Alcohols, C12-16, ethoxylated	68551-12-2	10.00%	0.01280%	
			Ammonium chloride	12125-02-9	10.00%	0.01280%	
			9-Octadecenamamide, n,n-bis-2(hydroxy-ethyl)-(Z)	93-83-4	5.00%	0.00640%	
BA-40LM, TOTETANK	Halliburton	Buffer	Potassium carbonate	584-08-7	30.00%	0.01064%	
			Sodium carbonate	497-19-8	30.00%	0.01064%	
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.00151%	
OPTIFLO-III DELAYED RELEASE BREAKER	Halliburton	Breaker	Ammonium persulfate	7727-54-0	100.00%	0.00760%	
			Crystalline silica, quartz	14808-80-7	30.00%	0.00233%	
OptiKleen-WF™	Halliburton	Concentrate	Sodium perborate tetrahydrate	10488-00-7	100.00%	0.00414%	
<small>Ingredients Listed Below: The List and Part of the Fluid Composition Provided by Halliburton When Do Not Appear on the National Safety Data Sheets (NSDS)</small>							
		Other Ingredient(s)	Alcohol alkoxy amine	Confidential			Office of Oil and Gas
		Other Ingredient(s)	Alcohols, C12-16, ethoxylated	61791-08-0			
		Other Ingredient(s)	Alcohols, C14-15, ethoxylated	68951-67-7			
		Other Ingredient(s)	Aluminum Silicate	1302-76-7			AUG 07 2019
		Other Ingredient(s)	Amine salts	Confidential			
		Other Ingredient(s)	Amine salts	Confidential			
		Other Ingredient(s)	Citrus, extract	Confidential			wy Department of Environmental Protection
		Other Ingredient(s)	Cured acrylic resin	Confidential			
		Other Ingredient(s)	Ethoxylated fatty acid	Confidential			
		Other Ingredient(s)	Ethoxylated fatty acid	Confidential			

	Other Ingredient(s)	Ethoxylated fatty acid	Confidential		
	Other Ingredient(s)	Fatty acid ester	Confidential		
	Other Ingredient(s)	Fatty acid fatty oil amide	Confidential		
	Other Ingredient(s)	Fatty acids, tall oil	Confidential		
	Other Ingredient(s)	Glycol	Confidential		
	Other Ingredient(s)	Glycol	Confidential		
	Other Ingredient(s)	Glycol	Confidential		
	Other Ingredient(s)	Hydrochloric acid	7647-01-0		
	Other Ingredient(s)	Inorganic salt	Confidential		
	Other Ingredient(s)	Olefins	Confidential		
	Other Ingredient(s)	Olefins	Confidential		
	Other Ingredient(s)	Olefins	Confidential		
	Other Ingredient(s)	Olefins	Confidential		
	Other Ingredient(s)	Organic phosphonate	Confidential		
	Other Ingredient(s)	Polyacrylate	Confidential		
	Other Ingredient(s)	Polyscharride	Confidential		
	Other Ingredient(s)	Propylene glycol	57-55-8		
	Other Ingredient(s)	Quaternary amine	Confidential		
	Other Ingredient(s)	Quaternary amine	Confidential		
	Other Ingredient(s)	Quaternary amine	Confidential		
	Other Ingredient(s)	Reaction product of acetophenone, formaldehyde, thiourea and oleic acid in dimethyl formamide	68527-49-1		
	Other Ingredient(s)	Sodium chloride	7647-14-5		
	Other Ingredient(s)	Sodium sulfate	7757-82-8		
	Other Ingredient(s)	Terpenes and Terpenoids	Confidential		
	Other Ingredient(s)	Water	7732-18-5		

* Total Water Volume sources may include fresh water, produced water, and/or recycled water
 ** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of this information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(l) and Appendix D.

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 Office of Oil and Gas
 AUG 07 2019
 WV Department of
 Environmental Protection

Hydraulic Fracturing Fluid Product Component Information Disclosure

Fracture Date:	1/8/2015
State:	
County:	
API Number:	47-079-01538
Operator Name:	Cabot Oil & Gas
Well Name and Number:	Cabot 50
Longitude:	0
Latitude:	0
Long/Lat Projection:	
Production Type:	
True Vertical Depth (TVD):	0
Total Water Volume (gal)*:	492,372

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration In Additive (% by mass)**	Maximum Ingredient Concentration In HF Fluid (% by mass)**	Comments
Fresh Water	Operator	Base Fluid	Fresh Water	7732-18-5	100.00%	86.66232%	Density = 8.33
FE ACID - < 10% HCL	Halliburton	Solvent	Hydrochloric acid	7647-01-0	10.00%	0.11790%	
CARBOPROP 40/70, BULK	Halliburton	Proppant	Crystalline silica, cristobalite	14464-48-1	30.00%	1.90207%	
			Mullite	1302-93-8	100.00%	6.34020%	
			Silica, amorphous - fumed	7831-86-0	30.00%	1.90207%	
PROP - CERAMIC 30/50	Halliburton	Proppant	Crystalline silica, cristobalite	14464-48-1	30.00%	1.47075%	
			Mullite	1302-93-8	100.00%	4.90251%	
			Silica, amorphous - fumed	7831-86-0	30.00%	1.47075%	
BE-9W	Halliburton	Biocide	Tributyl tetradecyl phosphonium chloride	81741-28-8	10.00%	0.00556%	
CL-41	Halliburton	Crosslinker	Inorganic salt	Confidential	30.00%	0.00702%	Denise Tuck, Halliburton 3000 N. Sam Houston Pkwy E., Houston, TX 77032 281-871-8226
			Lactic acid	50-21-5	30.00%	0.00702%	
CL-42	Halliburton	Crosslinker	Aluminum chloride	7784-13-6	30.00%	0.00363%	
Clu-Web™	Halliburton	Additive	Sodium chloride	7647-14-5	60.00%	0.03543%	
FE-1A ACIDIZING COMPOSITION	Halliburton	Additive	Acetic acid	64-19-7	60.00%	0.01365%	
			Acetic anhydride	108-24-7	100.00%	0.02274%	
FE-2A	Halliburton	Additive	Citric acid	77-92-9	60.00%	0.01572%	
GasPerm 1000™	Halliburton	Surfactant	Isopropanol	87-83-0	30.00%	0.00017%	
			Terpenes and Terpenoids, sweet orange-oil	66847-72-3	30.00%	0.00017%	
HAI-OS ACID INHIBITOR	Halliburton	Corrosion Inhibitor	Methanol	67-58-1	60.00%	0.00226%	
			Propargyl alcohol	107-19-7	10.00%	0.00038%	
LP-65 MC	Halliburton	Scale Inhibitor	Ammonium chloride	12125-02-9	10.00%	0.00429%	
Oilperm FMM-3	Halliburton	Surfactant	Terpenes and Terpenoids, sweet orange-oil	67-83-0	5.00%	0.00835%	
			Isopropanol	87-83-0	30.00%	0.05006%	
FR-86	Halliburton	Friction Reducer	Hydrotreated light petroleum distillate	64742-47-8	30.00%	0.02390%	
BA-40L BUFFERING AGENT	Halliburton	Buffer	Potassium carbonate	584-08-7	60.00%	0.00759%	
SP BREAKER	Halliburton	Breaker	Sodium persulfate	7775-27-1	100.00%	0.00232%	
WG-39 GELLING AGENT	Halliburton	Gelling Agent	Contains no hazardous substances	NA	100.00%	0.12289%	
OPTIFLO-III DELAYED RELEASE BREAKER	Halliburton	Breaker	Ammonium persulfate	7727-54-0	100.00%	0.00634%	
			Crystalline silica, quartz	14808-80-7	30.00%	REMOVED	
CALCIUM CHLORIDE - HI-TEST PELLETS	Halliburton	Accelerator	Calcium chloride	10043-52-4	96.00%	Office of Oil and Gas 0.25874%	
<p>Ingredients Listed Below This Line are Part of the Fluid Compositions Provided by Halliburton. They do not apply to the material safety data sheets (MSDS).</p>							
		Other ingredient(s)	Acetic acid	64-19-7		REMOVED	
		Other ingredient(s)	Acetic anhydride	108-24-7		REMOVED	
		Other ingredient(s)	Alcohol alkoxy amine	Confidential		REMOVED	
		Other ingredient(s)	Alcohols, C12-16, alkoxyated	81791-08-0		REMOVED	
		Other ingredient(s)	Alcohols, C12-16, alkoxyated	88551-12-2		REMOVED	
		Other ingredient(s)	Alcohols, C14-15, alkoxyated	88951-67-7		REMOVED	

Office of Oil and Gas
Environmental Protection

WW-4A
Revised 6-07

1) Date: August 5, 2019
2) Operator's Well Number
CABOT #50

3) API Well No.: 47 - 079 - 01538

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

4) Surface Owner(s) to be served:	5) (a) Coal Operator
(a) Name <u>Amherst Industries, Inc.</u>	Name <u>None</u>
Address <u>2 Port Amherst Drive</u>	Address _____
<u>Charleston, WV 25306</u>	_____
(b) Name _____	(b) Coal Owner(s) with Declaration
Address _____	Name <u>Amherst Industries, Inc.</u>
_____	Address <u>2 Port Amherst Drive</u>
_____	<u>Charleston, WV 25306</u>
(c) Name _____	Name _____
Address _____	Address _____
_____	_____
6) Inspector <u>Allen Flowers</u>	(c) Coal Lessee with Declaration
Address <u>165 Grassy Lick Lane</u>	Name <u>Ark Land Company</u>
<u>Liberty, WV 25124</u>	Address <u>City Place One, Suite 300</u>
Telephone <u>(304)552-8308</u>	<u>St. Louis, MO 63141</u>

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

- (1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
- (2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-5. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.

Well Operator Cabot Oil & Gas Corporation
 By: Kenneth L. Marcum
 Its: Regulatory Supervisor
 Address 2000 Park Lane, Suite 300
Pittsburgh, PA 15275
 Telephone (412) 249-3850

Commonwealth of Pennsylvania - Notary Seal
 Constance C. Carden, Notary Public
 Washington County
 My commission expires November 16, 2021
 Commission number 1252953
 MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

Subscribed and sworn before me this 10th day of August, 2019
Constance C. Carden Notary Public
 My Commission Expires November 16, 2021

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Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as needed for regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.

47-079-01538P

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9214 8969 0099 8780 1206 2813 44

OFFICIAL USE

Certified Mail Fee \$ \$3.50	Electronic Return Receipt Requested	Postmark Here	Code: Cabot #50 P&A
Extra Services & Fees (check box, add fee as appropriate)			
<input type="checkbox"/> Return Receipt (hardcopy) \$ \$1.60			
<input type="checkbox"/> Return Receipt (electronic) \$			
<input type="checkbox"/> Certified Mail Restricted Delivery \$ \$0.00			
<input type="checkbox"/> Adult Signature Required \$			
<input type="checkbox"/> Adult Signature Restricted Delivery \$			
Postage \$ \$1.900			
Total Postage and Fees \$ \$7.000			
Sent To Ark Land Company City Place One Suite 300 St. Louis, MO 63141			
PS Form 3800, April 2015 8/6/2019 2:08:55PM See Reverse for Instructions			

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9214 8969 0099 8780 1206 2812 52

OFFICIAL USE

Certified Mail Fee \$ \$3.50	Electronic Return Receipt Requested	Postmark Here	Code: Cabot #50 P&A
Extra Services & Fees (check box, add fee as appropriate)			
<input type="checkbox"/> Return Receipt (hardcopy) \$ \$1.60			
<input type="checkbox"/> Return Receipt (electronic) \$			
<input type="checkbox"/> Certified Mail Restricted Delivery \$ \$0.00			
<input type="checkbox"/> Adult Signature Required \$			
<input type="checkbox"/> Adult Signature Restricted Delivery \$			
Postage \$ \$1.900			
Total Postage and Fees \$ \$7.000			
Sent To Allen Flowers 165 Grassy Lick Lane Liberty, WV 25124			
PS Form 3800, April 2015 8/6/2019 2:05:34PM See Reverse for Instructions			

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OFFICIAL USE

Certified Mail Fee \$ \$3.50	Electronic Return Receipt Requested	Postmark Here	Code: Cabot #50 P&A
Extra Services & Fees (check box, add fee as appropriate)			
<input type="checkbox"/> Return Receipt (hardcopy) \$ \$1.60			
<input type="checkbox"/> Return Receipt (electronic) \$			
<input type="checkbox"/> Certified Mail Restricted Delivery \$ \$0.00			
<input type="checkbox"/> Adult Signature Required \$			
<input type="checkbox"/> Adult Signature Restricted Delivery \$			
Postage \$ \$1.900			
Total Postage and Fees \$ \$7.000			
Sent To Amherst Industries, Inc. 2 Port Amherst Drive Charleston, WV 25306			
PS Form 3800, April 2015 8/6/2019 2:11:44PM See Reverse for Instructions			

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Office of Oil and Gas

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WV Department of
Environmental Protection

SURFACE OWNER WAIVER

Operator's Well
Number

Cabot #50

INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

**NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.
WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:**

Chief, Office of Oil and Gas
Department of Environmental Protection
601 57th St. SE
Charleston, WV 25304
(304) 926-0450

Time Limits and methods for filing comments. The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

Comments must be in writing. Your comments must include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

- 1) The proposed well work will constitute a hazard to the safety of persons.
- 2) The soil erosion and sediment control plan is not adequate or effective;
- 3) Damage would occur to publicly owned lands or resources;
- 4) The proposed well work fails to protect fresh water sources or supplies;
- 5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate or seek review of the violation..."

If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.

VOLUNTARY STATEMENT OF NO OBJECTION

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

FOR EXECUTION BY A NATURAL PERSON
ETC.

FOR EXECUTION BY CORPORATION,
AGENCY OR

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Office of Oil and Gas

WV Department of
Environmental Protection

_____	Date _____	Name _____	_____
Signature		By	_____
		Its	_____
			Date _____
		Signature	Date _____

WW-4B

API No.	47-079-01538 P
Farm Name	_____
Well No.	Cabot #50

**INSTRUCTIONS TO COAL OPERATORS
OWNERS AND LESSEE**

The well operator named on the obverse side of WW-4 (B) is about to abandon the well described in the enclosed materials and will commence the work of plugging and abandoning said well on the date the inspector is notified. Which date shall not be less than five days after the day on which this notice and application so mailed is received, or in due course should be received by the Department of Environmental Protection Office of Oil & Gas.

This notice and application is given to you in order that your respective representatives may be present at the plugging and filling of said well. You are further notified that whether you are represented or not the operator will proceed to plug and fill said well in the manner required by Section 24, Article 6, Chapter 22 of the Code and given in detail on obverse side of this application.

NOTE: If you wish this well to be plugged according to 22-6-24(d) then as per Regulation 35CSR4-13.9 you must complete and return to this office on form OB-16 "Request by Coal Operator, Owner, or Lessee for plugging" prior to the issuance of this plugging permit.

WAIVER

The undersigned coal operator ____/ owner ____/ lessee ____/ of the coal under this well location has examined this proposed plugging work order. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: _____

By: _____

Its _____

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Environmental Protection



CERTIFIED MAIL

August 5, 2019

Mr. Allen Flowers
165 Grassy Lick Lane
Liberty, WV 25124

*Received by
M... on 8-20-19
47-079-01538P*

Re: CABOT #50
Pocatalico District, Putnam County, WV
API # 47-079-01538
Written Application to plug and abandon wellbore

Dear Mr. Flowers:

Enclosed are the following forms for the subject well:

- Form WW-4A Notice of Application to Plug and Abandon Well (1 copy)
- Form WW-4B Application for a Permit to Plug and Abandon (1 copy)
- Well Location Plat Certified Copy of WVDEP Well Location Plat
- Form WW-9 Reclamation Plan (1 copy)

Copies of the Well Permit Application and Voluntary Statement of No Objection have been sent to the appropriate surface owner(s) and coal operator(s), owner(s) and lessee(s) for signature.

Please make necessary recommendations and sign the Reclamation Plan before forwarding to Chief, Division of Oil & Gas, 601 57th Street, Charleston, WV 25304

If you have any questions or need additional information, please contact me at 412-249-3850.

Sincerely,

Kenneth L. Marcum
Regulatory Supervisor

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WV Department of
Environmental Protection

WW-9
(5/16)

API Number 47 - 079 - 01538
Operator's Well No. CABOT #50

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

Operator Name Cabot Oil & Gas Corporation OP Code

Watershed (HUC 10) Guano Creek of Kanawha River Quadrangle Bancroft

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:

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application (if selected provide a completed form WW-9-GPP)
- Underground Injection (UIC Permit Number)
- Reuse (at API Number)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain No treated pit wastes will be produced)

Will closed loop system be used? If so, describe: N/A

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. no drilling proposed

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

Additives to be used in drilling medium? N/A

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. No cuttings produced during plugging operation

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

-Landfill or offsite name/permit number?

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 Kenneth L. Marcum

Company Official (Typed Name) Kenneth L. Marcum

Company Official Title Regulatory Supervisor

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Office of Oil and Gas

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Subscribed and sworn before me this 6th day of August, 2019

Constance C. Carden

My commission expires November 16, 2021

Notary Public
Constance C. Carden, Notary Public
Washington County
My commission expires November 16, 2021
Commission number 1252953
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

WV Department of Environmental Protection

Cabot Oil & Gas Corporation

Proposed Revegetation Treatment: Acres Disturbed _____ Prevegetation pH 6.5

Lime 2 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20/20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch Pulp Fiber at 1000 to 1500 lbs. Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
(Grain Rye - 100) (Red Clover - 5) (Fescue - 40)		(Grain Rye - 100) (Red Clover - 5) (Fescue - 40)	
(Annual Rye - 20) (White Clover - 5)		(Annual Rye - 20) (White Clover - 5)	
(Perennial Rye - 10) (Alta Sweet Clover - 5)		(Perennial Rye - 10) (Alta Sweet Clover - 5)	
(Yellow Clover - 5) (Birdsfoot Trefoil - 10)		(Yellow Clover - 5) (Birdsfoot Trefoil - 10)	

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

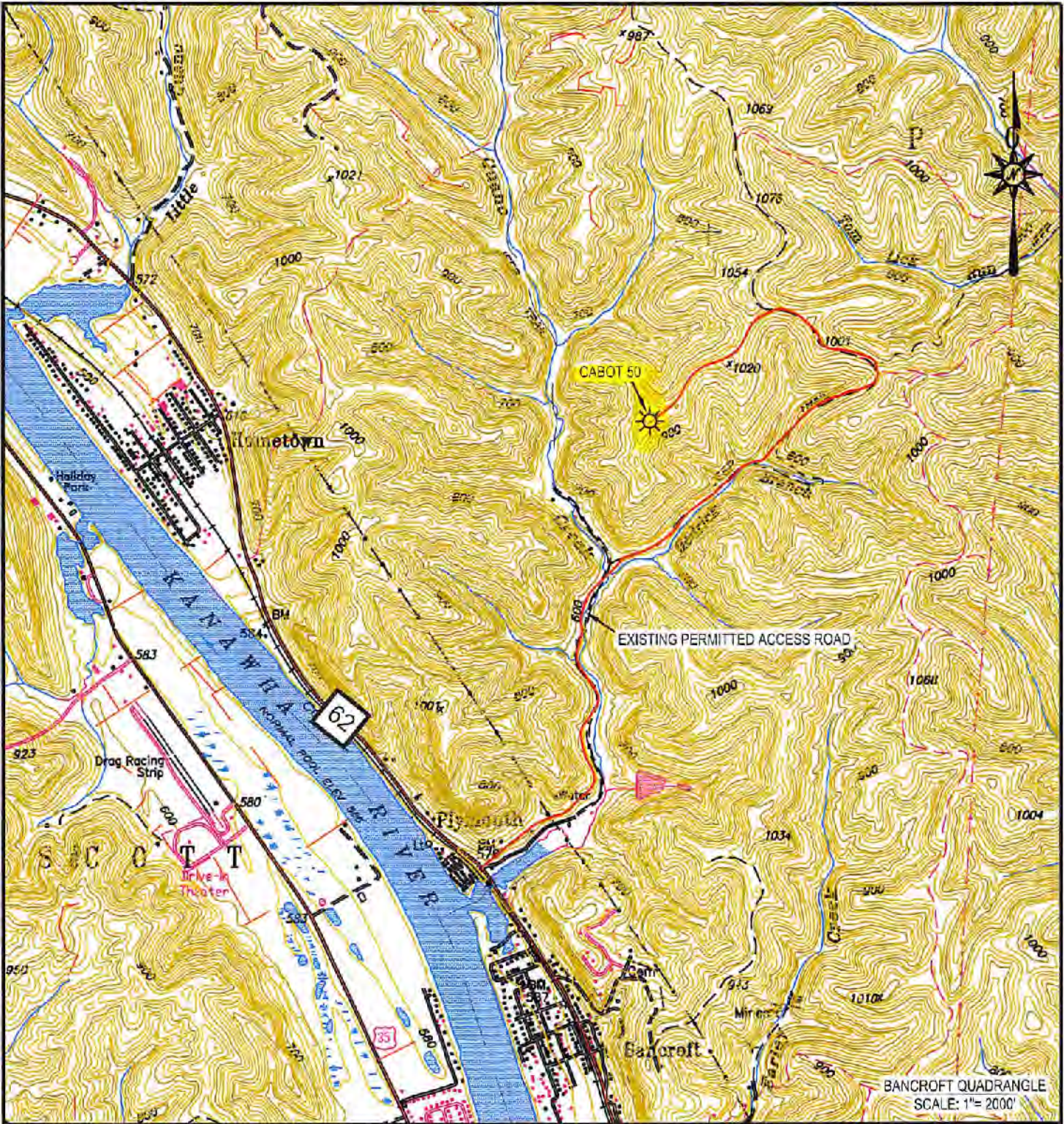
Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Atlas Flowers

Comments: Remove all berries, stumps and cuttings from around well pad. Reseed and mow. Can root inspect 24H before plug begins.

Title: Inspection Date: 8-19-2019

Field Reviewed? Yes No



 Cabot Oil & Gas Corporation

CABOT 50 RECEIVED
Office of Oil and Gas
LOCATION MAP

 **CUNNINGHAM**
LAND SURVEYING & MAPPING SERVICES, LLC

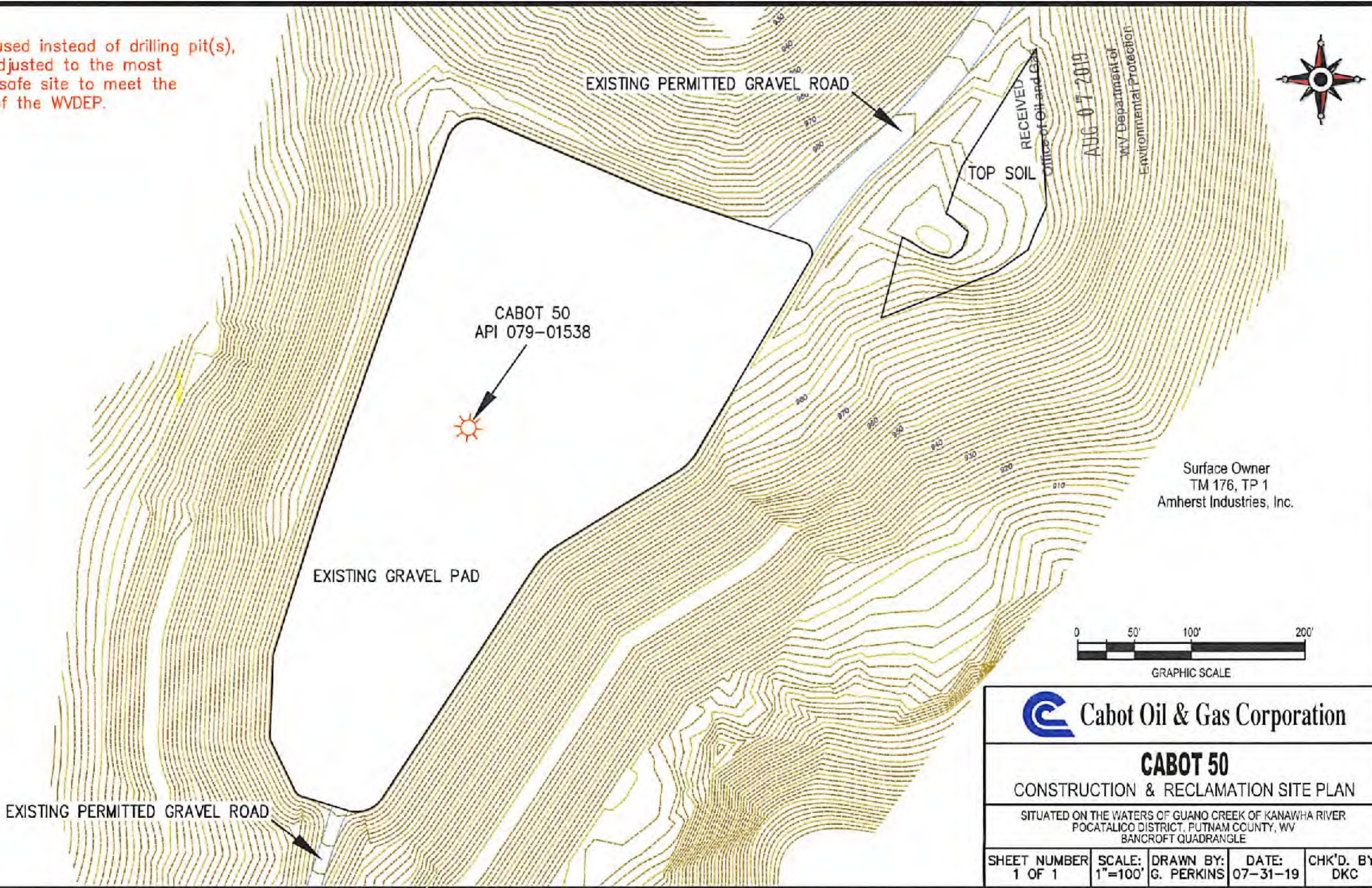
LOCATED ON THE WATERS OF GUANO CREEK
OF THE KANAWHA RIVER
UNION DISTRICT, PUTNAM-COUNTY, WV
BANCROFT QUADRANGLE

5213 STEPHEN WAY
CROSS LANES, WEST VIRGINIA 25313
VOICE (304) 561-4129 • FAX (304) 775-0703
E-MAIL ADDRESS • DKCUNNINGHAM@SUDDENLINK.NET

PROJECT NO. CABOT	DWG. NO. CABOT 50 TOPO
DATE: 07/22/19	SCALE: AS NOTED
DRAWN BY: G. PERKINS	CHK'D BY: D.K.C.
FILE: C:\PROJECT FOLDER\CABOT	

47-079-01538P

Note:
Tanks will be used instead of drilling pit(s),
and may be adjusted to the most
environmental safe site to meet the
requirements of the WVDEP.



 Cabot Oil & Gas Corporation

CABOT 50
CONSTRUCTION & RECLAMATION SITE PLAN

SITUATED ON THE WATERS OF GUANO CREEK OF KANAWHA RIVER,
POCATALICO DISTRICT, PUTNAM COUNTY, WV
BANCROFT QUADRANGLE

SHEET NUMBER	SCALE:	DRAWN BY:	DATE:	CHK'D. BY:
1 OF 1	1"=100'	G. PERKINS	07-31-19	DKC

Surface Owner
TM 176, TP 1
Amherst Industries, Inc.

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WV Department of
Environmental Protection

GENERAL NOTES:

THIS DRAWING REPRESENTS A SCHEMATIC REPRESENTATION OF THE PROPOSED WELL SITE AND ACCESS ROAD. PROPOSED STRUCTURES SUCH AS THE DRILLING PIT, ROADWAY, CULVERTS, SEDIMENT BARRIERS, ETC. ARE SHOWN IN THEIR APPROXIMATE PREPLANNING CONFIGURATION. GIVEN UNFORESEEN CIRCUMSTANCES, THE AS-BUILT LOCATION OF THESE STRUCTURES MAY VARY SLIGHTLY FROM THE LOCATION SHOWN ON THE ATTACHED DRAWINGS.

ALL ROADS SHOWN THEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH GUIDELINES AND REQUIREMENTS OF WEST VIRGINIA DEPARTMENT OF OIL AND GAS EROSION AND SEDIMENT CONTROL MANUAL.

ALL CULVERTS SHOWN ON THIS DRAWING ARE PROPOSED AND WILL BE A MINIMUM OF 15" IN DIAMETER UNLESS OTHERWISE NOTED.

DITCH LINES AND CULVERTS WILL BE INSTALLED WHENEVER PRACTICAL. HOWEVER PORTIONS OF THE EXISTING/ PROPOSED ROADS WHICH ARE LOCATED IN SOLID ROCK SHALL NOT REQUIRE DITCHES OR CROSS DRAINS, UNLESS OTHERWISE WARRANTED BY FIELD CIRCUMSTANCES.

SUPPLEMENTAL DRAINAGE AND/OR SEDIMENT CONTROL STRUCTURES MEASURES IN ADDITION TO THOSE SHOWN ON THE ATTACHED DRAWINGS WILL BE INSTALLED WHEN AND WHERE DEEMED NECESSARY. SUCH ADDITIONAL MEASURES MAY CONSIST OF EITHER STRAW BALES, SILT FENCES OR OTHER MEASURES OUTLINED IN THE WEST VIRGINIA DEPARTMENT OF OIL AND GAS EROSION AND SEDIMENT CONTROL FIELD MANUAL.

SEDIMENT BASINS (TRAPS) WILL BE CONSTRUCTED AT ALL CULVERTS AND CROSS DRAINS INLETS AS REQUIRED IN THE WEST VIRGINIA DEPARTMENT OF OIL AND GAS EROSION AND SEDIMENT CONTROL MANUAL. FIELD CONDITIONS SUCH AS ROCK OUTCROPS AND BEDROCK MAY PROHIBIT INLET TRAPS BEING INSTALLED WHEN THESE CONDITIONS EXIST. ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED AS NEEDED.

A SEDIMENT BARRIERS OF EITHER BRUSH, STRAW BALES, FILTER FENCE, ETC. WILL BE INSTALLED AND MAINTAINED BELOW THE OUT FALL OF ALL PROPOSED CULVERTS AND AT ALL OTHER STORM WATER DRAINAGE POINTS FROM EITHER THE ROADWAY OR THE LOCATION.

ALL NECESSARY TIMBER OR BRUSH WILL BE REMOVED FROM ROUTE OF THE ROADWAY AND LOCATION BY CLEANING AND GRUBBING ACTIVITIES. ANY SALVAGEABLE TIMBER WILL BE CUT AND STACKED TO THE SIDE OF THE ROADWAY OR REMOVED TO A STOCKPILE AREA. THE REMAINING TIMBER OR BRUSH WILL BE CUTUP AND WIND ROWED BELOW THE OUTSLOPE OF THE CONSTRUCTION AREAS TO BE UTILIZED AS A SEDIMENT BARRIER.

SEPARATE PERMITS WILL BE OBTAINED FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION FOR ALL POINTS OF INGRESS AND EGRESS FROM COUNTY AND STATE ROADS. THESE INGRESS AND EGRESS POINTS WILL BE MAINTAINED IN ACCORDANCE WITH CURRENT WEST VIRGINIA DEPARTMENT OF TRANSPORTATION REGULATIONS. A STABILIZED CONSTRUCTION ENTRANCE CONSISTING OF 8" OF CRUSHED STONE WILL BE CONSTRUCTED FOR A MINIMUM DISTANCE OF 50' FROM THE INGRESS AND EGRESS POINTS OF ALL PUBLIC ROADWAYS IN ACCORDANCE WITH CURRENT WEST VIRGINIA DEPARTMENT OF TRANSPORTATION REGULATIONS.

ALL CULVERTS SHOWN ON THE ATTACHED DRAWINGS ARE TO BE CONSIDERED PERMANENT AND WILL REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION ACTIVITIES UNLESS NOTED OTHERWISE. A STABILIZED OUTLET CONTROL DEVICE SUCH AS RIP RAP, NATURAL STONE, BRUSH, ETC. WILL BE INSTALLED BELOW THE OUT FALL OF ANY ROADWAY CULVERT(S) WHICH ARE NOT LOCATED IN A STREAM OR CREEK.

PERMANENT CROSS DRAINS OR WATER BARS WILL BE INSTALLED AS AN INTEGRAL PART OF THE RECLAMATION PROCESS AND SHALL BE SPACED IN ACCORDANCE WITH AS-BUILT ROADWAY SLOPES AND TABLE 11-4 OF THE WEST VIRGINIA DEPARTMENT OF OIL AND GAS EROSION AND SEDIMENT CONTROL FIELD MANUAL.

TEMPORARY SEEDING AND MULCHING WILL BE UTILIZED TO PROVIDE A VEGETATIVE COVER ON ALL DISTURBED AREAS I.E. ROADWAYS, LOCATION, ROAD/LOCATION SLOPES AND ANY OTHER AREAS THAT ARE DISTURBED BY CONSTRUCTION ACTIVITIES.

THE LOCATION OF DRILLING PIT(S) MAY BE ADJUSTED TO THE MOST ENVIRONMENTAL SAFE SITE TO MEET THE REQUIREMENTS OF THE WVDEP.

CONTRACTORS NOTE:

IT IS THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION AND CONDITION OF ALL UNDERGROUND UTILITIES, SANITARY SEWERS, STORM SEWERS, ETC. PRIOR TO THE COMMENCEMENT OF ANY/OR CONSTRUCTION ACTIVITIES. DIG WITH C.A.R.E. CALL MISS UTILITY 1-800-245-4848.

ROAD GRADE (%)	DISTANCE (FT)
1	400
2	250
5	135
10	80
15	60
20	45

ROAD GRADE (%)	DISTANCE (FT)
2-5	500-300
6-10	300-200
11-15	200-100
16-20	100



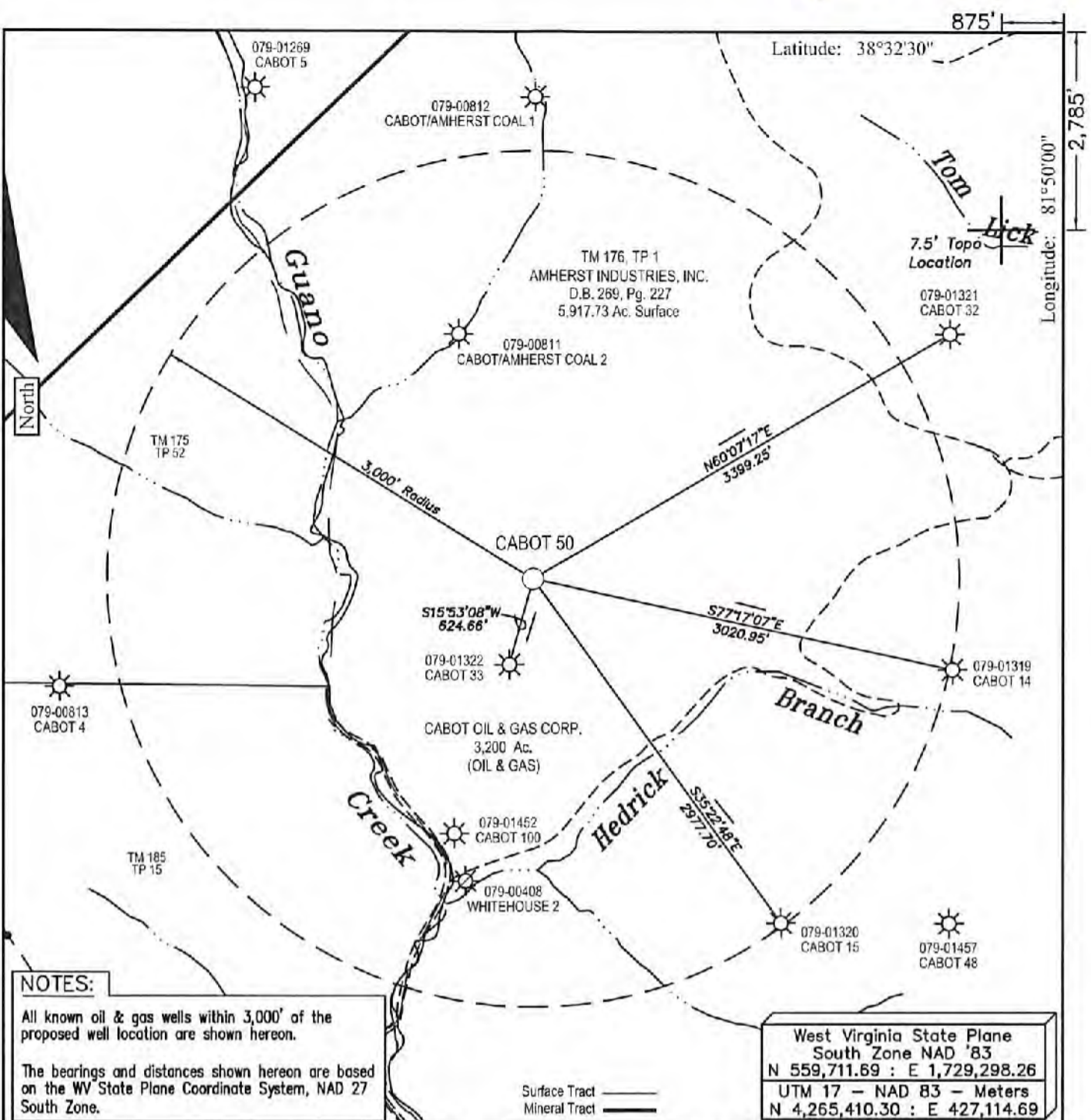
1-800-245-4848

DRAWING LEGEND

- PROPOSED ROAD -----
- EXISTING ROAD _____
- STRAW BALES [Symbol]
- SILT FENCE [Symbol]
- BRUSH BARRIER [Symbol]
- TREE LINE [Symbol]
- ROCK RIP RAP [Symbol]
- CROSS DRAIN [Symbol]
- CULVERT [Symbol]
- DRILLING PIT [Symbol]
- ROAD DITCH [Symbol]
- GAS LINE [Symbol]
- FENCE LINE [Symbol]
- ROCK OUTCROP [Symbol]
- WATER WELL [Symbol]
- HOUSE/STRUCTURE [Symbol]
- UTILITY POLE [Symbol]
- SPRING [Symbol]
- WET SPOT [Symbol]
- PIT WASTE APP. AREA [Symbol]

DRIVING DIRECTIONS FOR CABOT 50

- 1.) FROM CHARLESTON, WV, DRIVE WEST ON INTERSTATE 64 FOR 14 MILES± TO THE NITRO, WV, INTERCHANGE AND EXIT THE HIGHWAY.
- 2.) AT THE BOTTOM OF THE EXIT RAMP, BEAR TO THE RIGHT AND CONTINUE NORTH ON STATE ROUTE 25 FOR 0.8 MILES± TO THE INTERSECTION OF STATE ROUTE 25 AND 62 NEAR THE HARDEE'S RESTAURANT AT ROCKY FORK.
- 3.) BEAR LEFT AT THE INTERSECTION AND CONTINUE IN A NORTHERLY DIRECTION ON STATE ROUTE 62 FOR 5.4 MILES± TO THE INTERSECTION OF SECONDARY ROUTE 62/1 AT THE ENTRANCE TO THE AMHERST PUBLIC HUNTING AND FISHING AREA WHICH IS LOCATED JUST NORTH OF BANCROFT, WV, ON THE RIGHT-HAND SIDE OF THE ROAD.
- 4.) TURN RIGHT ONTO SECONDARY ROUTE 62/1, PASSING THROUGH THE STEEL GATE AND CONTINUE UP THE HOLLOW WITH THE EXISTING LEASE ROAD FOR 3.0 MILES± TO THE EXISTING WELL SITE AS SHOWN ON THE "CONSTRUCTION AND RECLAMATION PLAN".



FILE #:

DRAWING #: Cabot 50 ww6

SCALE: 1" = 1000'

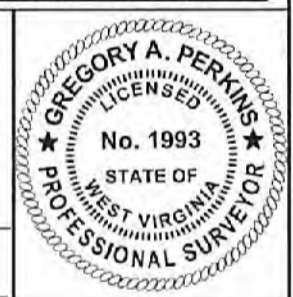
MINIMUM DEGREE OF ACCURACY: 1 : 12,729

PROVEN SOURCE OF ELEVATION: Global Positioning System (GPS)

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

R.P.E.: _____ L.L.S.: 1993



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304



DATE: July 19, 2019

OPERATOR'S WELL #: Cabot 50

API WELL #: 47 079 01538 P

STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: Guano Creek of Kanawha River ELEVATION: 990.00'

COUNTY/DISTRICT: Putnam / Pocatalico QUADRANGLE: Bancroft

SURFACE OWNER: Amherst Industries, Inc. ACREAGE: 5,917.73

OIL & GAS ROYALTY OWNER: Cabot Oil & Gas Corporation ACREAGE: 1,800

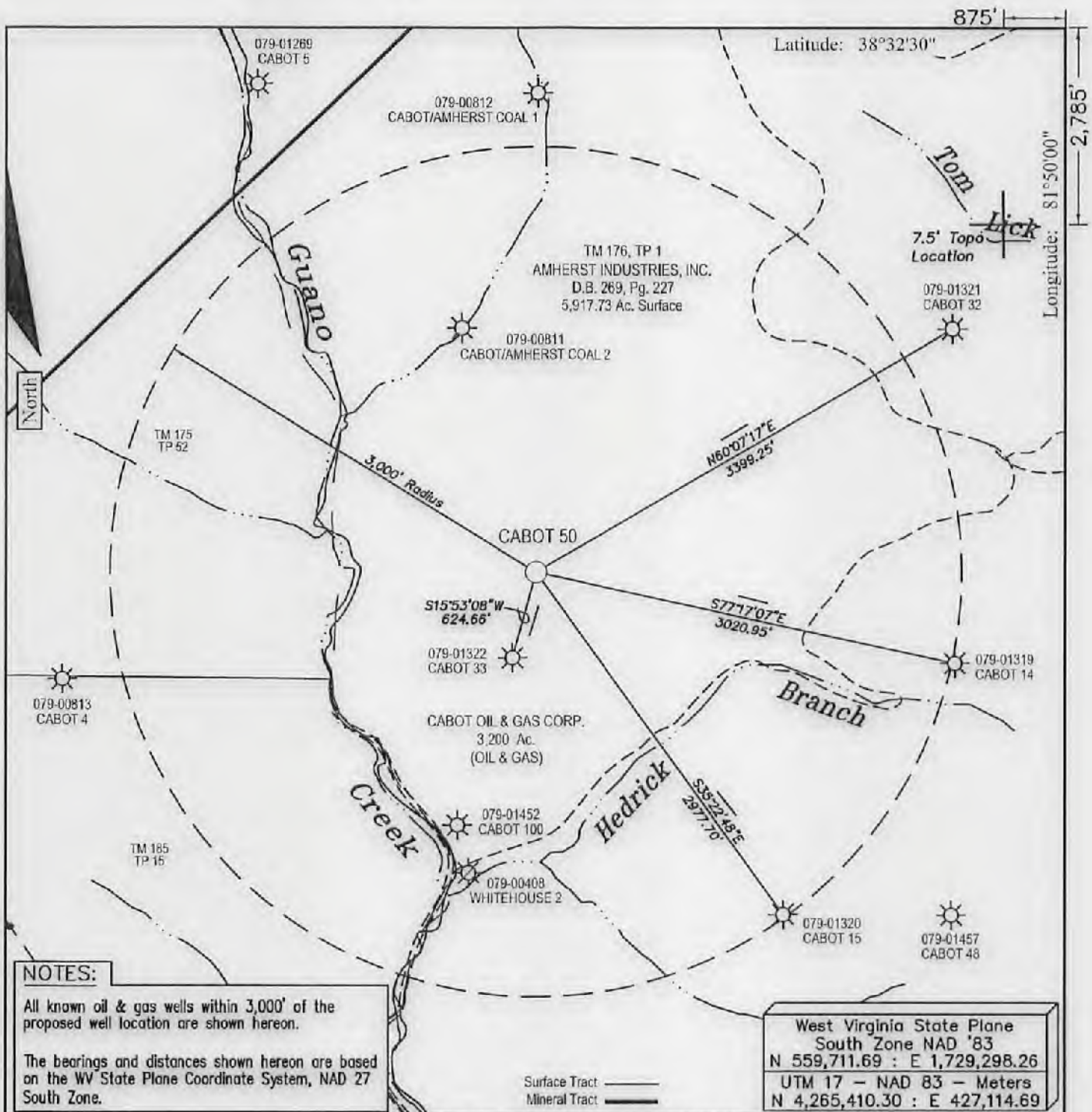
LEASE #: 47-9123M DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: ROGERSVILLE SHALE ESTIMATED DEPTH: 14,08.5'

WELL OPERATOR Cabot Oil & Gas Corp. DESIGNATED AGENT Phillip J. Hill
Address 2000 Park Lane, Suite 300 Address 29 Starbuck Lane
City Pittsburgh State PA Zip Code 15276 City Saulsville State WV Zip Code 25876

RECEIVED
Office of Oil and Gas
JUG 07 2019

WV Department of Environmental Protection



NOTES:

All known oil & gas wells within 3,000' of the proposed well location are shown hereon.

The bearings and distances shown hereon are based on the WV State Plane Coordinate System, NAD 27 South Zone.

Surface Tract: Mineral Tract:

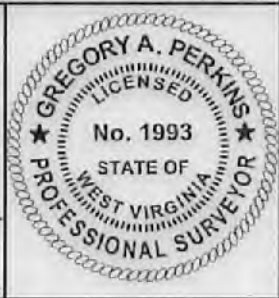
West Virginia State Plane
South Zone NAD '83
N 559,711.69 : E 1,729,298.26
UTM 17 - NAD 83 - Meters
N 4,265,410.30 : E 427,114.89

FILE #: _____
DRAWING #: Cabot 50 ww6
SCALE: 1" = 1000'
MINIMUM DEGREE OF ACCURACY: 1 : 12,729
PROVEN SOURCE OF ELEVATION: Global Positioning System (GPS)

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIROMENTAL PROTECTION.

Signed:

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LEASE #: 47-9123M DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____
TARGET FORMATION: ROGERSVILLE SHALE ESTIMATED DEPTH: 14,085'
WELL OPERATOR Cabot Oil & Gas Corp. DESIGNATED AGENT Phillip J. Hill
Address 2000 Park Lane, Suite 300 Address 29 Starbuck Lane
City Pittsburgh State PA Zip Code 15276 City Saulsville State WV Zip Code 25876