west virginia department of environmental protection

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

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

June 09, 2016

WELL WORK PERMIT

Vertical Well

This permit, API Well Number: 47-9502363, issued to ANTERO RESOURCES CORPORATION, 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 all 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.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days 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.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-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) 926-0499 ext. 1654.

James Martin
Chief

Operator's Well No: Jackman #1V
Farm Name: Donald E. Moore
API Well Number: 47-9502363
Permit Type: Vertical Well
Date Issued: 06/09/2016

Promoting a healthy environment.

9502363

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. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code §22-6-20, which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.

2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.

3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.

4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.

5. 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.

6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours

7. Well work activities shall not constitute a hazard to the safety of persons.

8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced, drilling ceased, completion of any other permitted well work and completion of the well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

4709502363

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WW - 2B
(Rev. 8/10)

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

1) Well Operator: Antero Resources Corporation

Operator ID	County	District	Quadrangle
494507062	095 - Tyler	McElroy	Shirley 7.5'

2) Operator's Well Number: Jackman #1V 3) Elevation: 1042'

4) Well Type: (a) Oil____ or Gas X

(b) If Gas: Production X / Underground Storage ____

Deep ____ / Shallow X

5) Proposed Target Formation(s): Marcellus Proposed Target Depth: 6900'
6) Proposed Total Depth: 6900' Feet Formation at Proposed Total Depth: Marcellus
7) Approximate fresh water strata depths: 341', 407'
8) Approximate salt water depths: 1208', 1302', 2112'

9) Approximate coal seam depths: 421', 615', 729'

DMH 6/2/16 JS 6/2/16

10) Approximate void depths,(coal, Karst, other): None Identified

11) Does land contain coal seams tributary to active mine? No

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)
Drill, perforate, fracture a new vertical shallow well and complete the Marcellus formation.
*Antero will be air drilling the fresh water string which makes it difficult to determine when freshwater is encountered, therefore we have built in a buffer for the casing setting depth which helps to ensure that all fresh water zones are covered.

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	20"	J-55	106.5#	40'	40'	38 Cu. Ft - CTS
Fresh Water	13-3/8"	H-40	48#	460'	460' *see #12	639 Cu. Ft. - CTS
Coal	9-5/8"	J-55	36#	2510'	2510'	1022 Cu. Ft. - CTS
Intermediate						
Production	5-1/2"	P-110	20#	6900'	6900'	1488 Cu Ft.
Tubing	2-7/8"	L-80	6.5#	6500'		
Liners						

Packers: Kind: N/A
Sizes: N/A
Depths Set N/A

9502363

WW-2A1
(Rev. 1/11)

Operator's Well Number Jackman #1V

INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

(1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;

(2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Loren E. Bagley, et al	Sancho Oil & Gas Corporation	1/8	0361/0752
Sancho Oil & Gas Corporation	Antero Resources Corporation	Assignment & Bill of Sale	0436/0316

Acknowledgement of Possible Permitting/Approval In Addition to the Office of Oil and Gas

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources
- WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

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Well Operator: Antero Resources Corporation
By: Its: Kevin Kilstrom, Senior Vice President of Production

9502363

WW-2B1
(5-12)

Well No. Jackman 1V

West Virginia Department of Environmental Protection
Office of Oil and Gas

NOTICE TO SURFACE OWNERS

The well operator named below is preparing to file for a permit from the state to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

Be advised, you have the right to sample and analyze any water supply at your own expense.

Listed below is the laboratory chosen by operator to perform analysis, and contactor chosen to collect sample.

Certified Laboratory Name: Pace Analytical
Sampling Contractor: GHD Pty Ltd

Well Operator: Antero Resources Corporation
Address: 1615 Wynkoop Street
Denver, CO 80212
Telephone: 303-357-7310

FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underling which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site, the Chief may require the operator to test wells up to 2000 feet from the proposed site.

No water sources were identified within 1,000' of this well site and ten within 2000', however please be advised that Antero Resources Corporation will attempt sampling of the water source identified on the surface owner's property listed below.

Gary Nichols - 206 Whitetail Ln. Alma, WV 26320 (2 water sources)
James D. Spencer - 62 Whitetail Ln. Alma, WV 26320
Louis L. & Mary A. Blattner - 665 Fairmont Pike Wheeling, WV 26003
Donna Brumbaugh - 15625 Valentine Rd. Thompson, OH 44086
Jimmie J Griffin - 4028 McElroy Creek Rd. Alma, WV 26320 (4 water sources)
Donald E. Moore - 770 Newell St. Painesville, OH 44077

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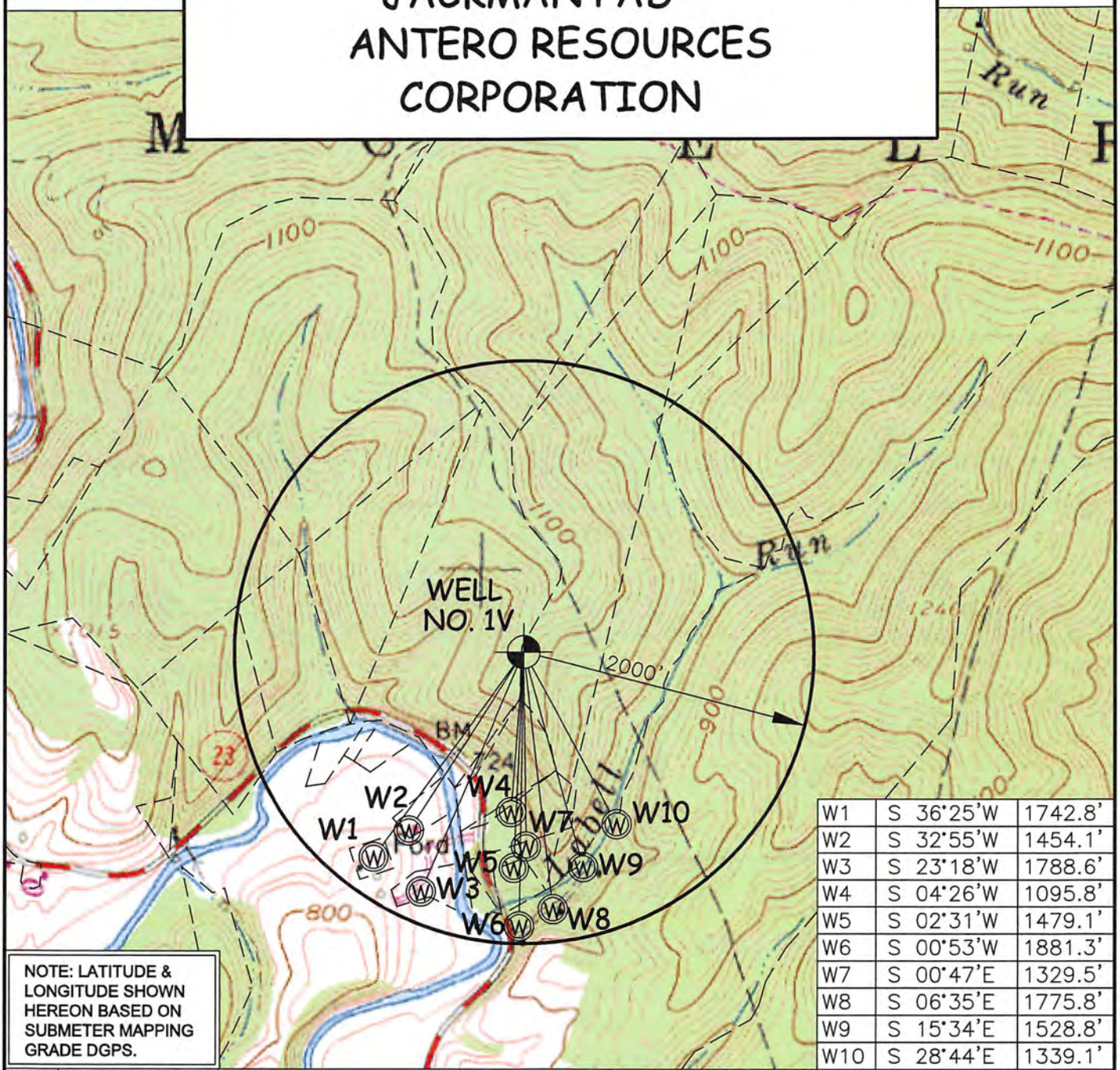
FORM WW-9

JACKMAN PAD
ANTERO RESOURCES CORPORATION

PAGE OF



W1	S 36°25'W	1742.8'
W2	S 32°55'W	1454.1'
W3	S 23°18'W	1788.6'
W4	S 04°26'W	1095.8'
W5	S 02°31'W	1479.1'
W6	S 00°53'W	1881.3'
W7	S 00°47'E	1329.5'
W8	S 06°35'E	1775.8'
W9	S 15°34'E	1528.8'
W10	S 28°44'E	1339.1'

NOTE: LATITUDE & LONGITUDE SHOWN HEREON BASED ON SUBMETER MAPPING GRADE DGPS.

WELL	SURFACE OWNER	ADDRESS	DIST-TAX MAP-PAR	WELL LATITUDE	WELL LONGITUDE
W1	GARY NICHOLS	206 WHITETAIL LN. ALMA. WV 26320	5-16-20.3	39°24'40.12"	80°47'38.88"
W2	JAMES D SPENCER	62 WHITETAIL LN , ALMA , WV 26320	5-16-20.1	39°24'41.95"	80°47'35.80"
W3	GARY L NICHOLS	206 WHITETAIL LN ALMA WV 26320	5-16-20.2	39°24'37.79"	80°47'34.67"
W4	LOUIS L. BLATTNER	665 FAIRMONT PIKE , WHEELING , WV 26003	5-16-07.3	39°24'43.32"	80°47'26.84"
W5	DONNA BRUMBAUGH	15625 VALENTINE RD , THOMPSON , OH 44086	5-16-07.2	39°24'39.52"	80°47'26.52"
W6	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD , ALMA , WV 26320	5-16-08	39°24'35.53"	80°47'25.98"
W7	DONALD E MOORE	770 NEWELL ST , PAINESVILLE , OH 44077	5-16-07	39°24'40.99"	80°47'25.49"
W8	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD , ALMA , WV 26320	5-16-08	39°24'36.72"	80°47'23.04"
W9	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD , ALMA , WV 26320	5-16-08	39°24'39.63"	80°47'20.46"
W10	JIMMIE J GRIFFIN	4028 MCELROY CREEK RD , ALMA , WV 26320	5-16-08	39°24'42.62"	80°47'17.55"

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WILLOW LAND SURVEYING, PLLC
P.O. BOX 17, PENNSBORO, WV 26415
(304) 659-1717

TOPO SECTION(S) OF ; SHIRLEY 7.5'

JOB #: 16-015WA

DATE: 05/12/16

DRAWN BY: T.B.S.

FILE: JACKMAN1VWATERMAP

SCALE : 1-INCH = 1000-FEET

0' 1000' 2000' 3000'

9502363

WW-2A
(Rev. 6-14)

1). Date: May 13, 2016

2.) Operator's Well Number Jackman #1V

3.) API Well No.: 47- State / 095 County - Permit

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

4) Surface Owner(s) to be served:
(a) Name Donald E. Moore
Address 770 Newell St.
Painesville, OH 44077
(b) Name Robert J. Kocher
Address 845 Middle Island Rd.
Middlebourne, WV 26149
(c) Name *PLEASE SEE ATTACHMENT
Address

5) (a) Coal Operator
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY
(b) Coal Owner(s) with Declaration
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY
Name
Address
(c) Coal Lessee with Declaration
Name NO DECLARATIONS ON RECORD
Address WITH COUNTY

6) Inspector Derek Haught
Address 601 57th Street, SE
Charleston, WV 25304
Telephone 304-477-4148

TO THE PERSONS NAMED ABOVE TAKE NOTICE THAT:

___ Included is the lease or leases or other continuing contract or contracts by which I hold the right to extract oil and gas

OR

X Included is the information required by Chapter 22, Article 6, Section 8(d) of the Code of West Virginia (see page 2)

I certify that as required under Chapter 22-6 of the West Virginia Code I have served copies of this notice and application, a location plat, and accompanying documents pages 1 through ___ on the above named parties by:

___ Personal Service (Affidavit attached)
X Certified Mail (Postmarked postal receipt attached)
___ Publication (Notice of Publication attached)

I have read and understand Chapter 22-6 and 35 CSR 4, and I agree to the terms and conditions of any permit issued under this application.

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, 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 and imprisonment.

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144026297
MY COMMISSION EXPIRES JULY 21, 2018

Well Operator Antero Resources Corporation
By: Kevin Kilstrom
Its: Senior Vice President of Production
Address: 1615 Wynkoop Street
Denver, CO 80202
Telephone: 303-357-7310
Email:

Subscribed and sworn before me this 13 day of May, 2016

Notary Public

My Commission Expires July 21, 2018

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MAY 16 2016
WV Dept. of Environmental Protection

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a part of our 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

9502363

WW-2A Notice of Application Attachment (JACKMAN PAD):

List of Surface Owner(s) with Proposed Disturbance associated with Jackman Well Pad:

ROAD AND/OR OTHER DISTURBANCE – These owners were only notified if their tract is overlying the oil and gas leasehold being developed by the proposed well work as outlined in WV Code 22-6-9(c)(2).

TM 16 PCL 7.2
Owner: Donna Brumbaugh
(ON LEASE)
Address: 15625 Valentine Rd.
Thompson, OH 44086

TM 6 PCL 7.3
Owner: Louis L. & Mary A. Blattner
(ON LEASE)
Address: 665 Fairmont Pike
Wheeling, WV 26003

TM 16 PCL 7 & 7.4
Owner: Donald E. Moore
(ON LEASE)
Address: 770 Newell St.
Painesville, OH 44077

TM 16 PCL 7.5
Owner: Robert J. Kocher
(ON LEASE)
Address: 845 Middle Island Rd.
Middlebourne, WV 26149

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WV Department of
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Office of Oil and Gas

JUN 06 2016

WV Department of
Environmental Protection

WW-9
(5/13)

Page _____ of _____

API Number 47 - 095 - _____
Operator's Well No. Jackman #1V

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Antero Resources Corporation OP Code 494507062

Watershed (HUC 10) McElroy Creek Quadrangle Shirley 7.5'

Elevation 1042' County Tyler District McElroy

DMH 6/2/16
JS 6/2/16

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

Will a pit be used for drill cuttings? Yes _____ No X

If so, please describe anticipated pit waste: No pit will be used at this site (Drilling and Flowback Fluids will be stored in tanks. Cuttings will be tanked and hauled off site.)

Will a synthetic liner be used in the pit? Yes _____ No X If so, what ml.? N/A

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
■ Underground Injection (UIC Permit Number *UIC Permit # will be provided on Form WR-34)
■ Reuse (at API Number Future permitted well locations when applicable. API# will be provided on Form WR-34)
■ Off Site Disposal (Supply form WW-9 for disposal location) (Meadowfill Landfill Permit #SWF-1032-98)
_____ Other (Explain Northwestern Landfill Permit #SWF-1025/WV0109410

Will closed loop system be used? Yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Surface - Air/Freshwater, Intermediate - Dust/Stiff Foam, Production - Water Based Mud

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

Additives to be used in drilling medium? Please See Attachment

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Stored in tanks, removed offsite and taken to landfill

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

-Landfill or offsite name/permit number? Meadowfill Landfill (Permit #SWF-1032-98), Northwestern Landfill (Permit # SWF-1025/WV0109410)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, 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

Company Official (Typed Name) Cole Kilstrom

Company Official Title Environmental & Regulatory Manager

KARA QUACKENBUSH
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20144028297
MY COMMISSION EXPIRES JULY 21, 2018

Subscribed and sworn before me this 13 day of May, 2016

Kara Quackenbush Notary Public

My commission expires July 21, 2018

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4709502363

Form WW-9
WV Department of
Environmental Protection

Operator's Well No. Jackman #1V

Well Site (1.62) + Access Rd. (2.79) + Topsoil/Excess (0.57) + Existing Additional Area (4.67) = 11.65 acres

Proposed Revegetation Treatment: Acres Disturbed 11.65 acres Prevegetation pH _____

Lime 2-4 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2-3 Tons/acre Hay or straw or Wood Fiber (will be used where needed)

Seed Mixtures

Area I Seed Type	lbs/acre	Area II Seed Type	lbs/acre
Annual Ryegrass	40	Crownvetch	10-15
		Tall Fescue	30

*or type of grass seed requested by surface owner

Attach:
Drawing(s) of road, location,pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: [signature]

Comments:

Title: Oil + Gas Inspector Date: 6/2/16

Field Reviewed? (✓) Yes ( ) No

9502363

Form WW-9 Additives Attachment

SURFACE INTERVAL

1. Fresh Water
2. Soap –Foamer AC
3. Air

INTERMEDIATE INTERVAL

STIFF FOAM RECIPE:

1) 1 ppb Soda Ash / Sodium Carbonate-Alkalinity Control Agent
2) 1 ppb Conqor 404 (11.76 ppg) / Corrosion Inhibitor
3) 4 ppb KLA-Gard (9.17 ppg) / Amine Acid Complex-Shale Stabilizer
4) 1ppb Mil Pac R / Sodium Carboxymethylcellulose-Filtration Control Agent
5) 12 ppb KCL / Potassium Chloride-inorganic Salt
6) Fresh Water 80 bbls
7) Air

PRODUCTION INTERVAL

1. Alpha 1655
   Salt Inhibitor
2. Mil-Carb
   Calcium Carbonate
3. Cottonseed Hulls
   Cellulose-Cottonseed Pellets – LCM
4. Mil-Seal
   Vegetable, Cotton & Cellulose-Based Fiber Blend – LCM
5. Clay-Trol
   Amine Acid Complex – Shale Stabilizer
6. Xan-Plex
   Viscosifier For Water Based Muds
7. Mil-Pac (All Grades)
   Sodium Carboxymethylcellulose – Filtration Control Agent
8. New Drill
   Anionic Polyacrylamide Copolymer Emulsion – Shale Stabilizer
9. Caustic Soda
   Sodium Hydroxide – Alkalinity Control
10. Mil-Lime
    Calcium Hydroxide – Lime
11. LD-9
    Polyether Polyol – Drilling Fluid Defoamer
12. Mil Mica
    Hydro-Biotite Mica – LCM

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13. Escaid 110
    Drilling Fluild Solvent – Aliphatic Hydrocarbon
14. Ligco
    Highly Oxidized Leonardite – Filteration Control Agent
15. Super Sweep
    Polypropylene – Hole Cleaning Agent
16. Sulfatrol K
    Drilling Fluid Additive – Sulfonated Asphalt Residuum
17. Sodium Chloride, Anhydrous
    Inorganic Salt
18. D-D
    Drilling Detergent – Surfactant
19. Terra-Rate
    Organic Surfactant Blend
20. W.O. Defoam
    Alcohol-Based Defoamer
21. Perma-Lose HT
    Fluid Loss Reducer For Water-Based Muds
22. Xan-Plex D
    Polysaccharide Polymer – Drilling Fluid Viscosifier
23. Walnut Shells
    Ground Cellulosic Material – Ground Walnut Shells – LCM
24. Mil-Graphite
    Natural Graphite – LCM
25. Mil Bar
    Barite – Weighting Agent
26. X-Cide 102
    Biocide
27. Soda Ash
    Sodium Carbonate – Alkalinity Control Agent
28. Clay Trol
    Amine Acid complex – Shale Stabilizer
29. Sulfatrol
    Sulfonated Asphalt – Shale Control Additive
30. Xanvis
    Viscosifier For Water-Based Muds
31. Milstarch
    Starch – Fluid Loss Reducer For Water Based Muds
32. Mil-Lube
    Drilling Fluid Lubricant

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OFFICE OF OIL AND GAS

MAY 20 2016

Antero Resources
1615 Wynkoop Street
Denver, CO 80202
Office 303.357.7310
Fax 303.357.7315

June 1, 2016

West Virginia Department of Environmental Protection
Office of Oil and Gas
Attn: Mr. Josh Westbrook
601 57th Street
Charleston, WV 25304

RE: Jackman Unit 1V (API # 47-095-02363)
Sent via Email

Mr. Westbrook:

After submitting the original application for the Jackman Unit 1V vertical well permit, we were notified by one of the surface owners that the surface tract where the well is located was mistakenly mislabeled due to inaccurate information at the county courthouse.

Therefore, we have updated the plat and design to show the correct owner for Tax Map 16 Parcel 7 (changed from Donald E. Moore to Robert J. Kocher). Please note that this update should not affect the notifications originally submitted as Mr. Kocher was notified as a surface owner on 5/13/2016.

The mylar plat is being overnighted via FedEx to your office. Please find enclosed the updated plat and design.

If you have any questions please feel free to contact me at (303) 357-7323.

Sincerely,

Ashlie Steele

Ashlie Steele
Permitting Supervisor
Antero Resources Corporation

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Enclosures

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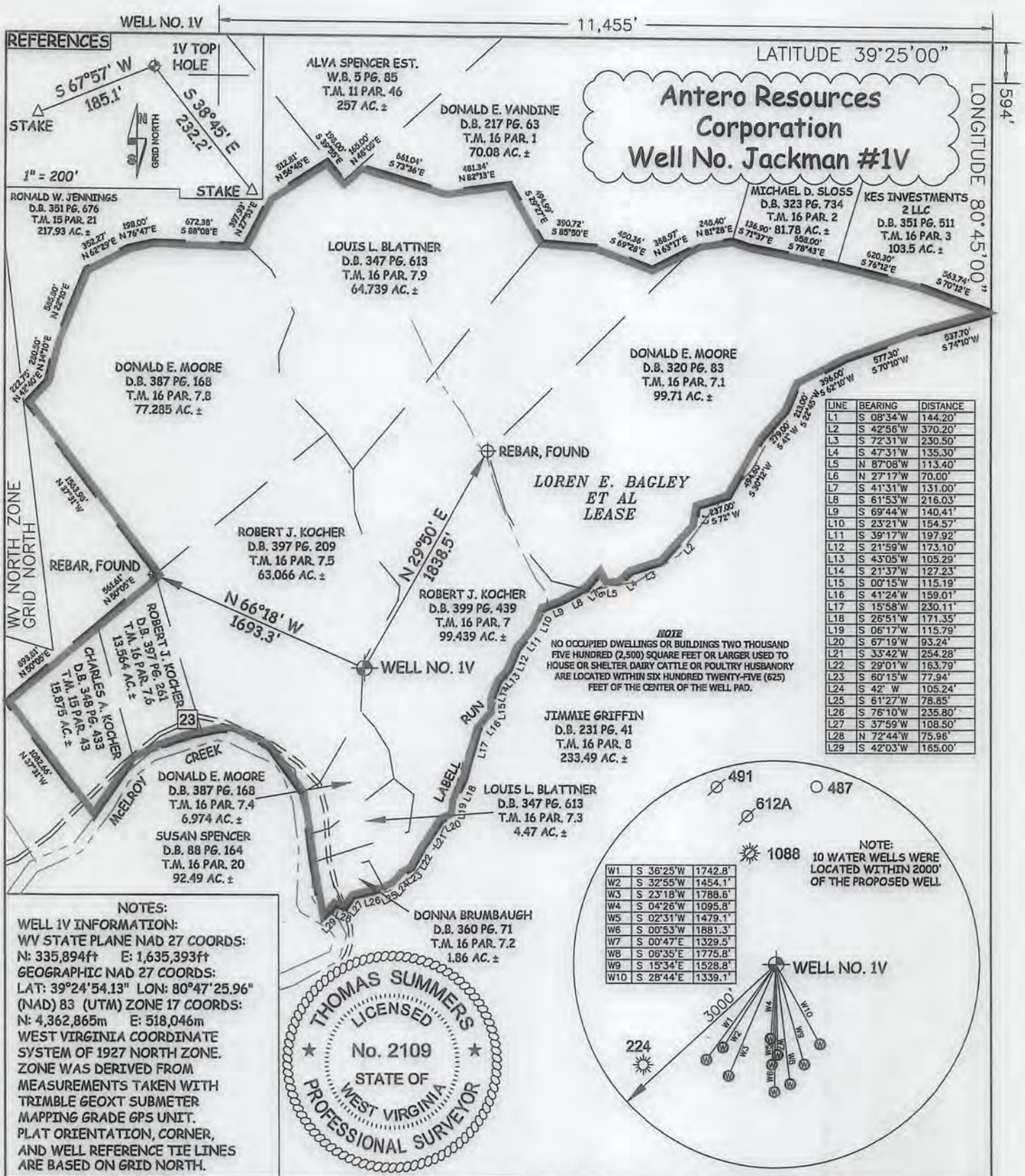
JUN 02 2016



LINE	BEARING	DISTANCE
L1	S 08°34'W	144.20'
L2	S 42°56'W	370.20'
L3	S 72°31'W	230.50'
L4	S 47°31'W	135.30'
L5	N 87°08'W	113.40'
L6	N 27°17'W	70.00'
L7	S 41°31'W	131.00'
L8	S 61°53'W	216.03'
L9	S 69°44'W	140.41'
L10	S 23°21'W	154.57'
L11	S 39°17'W	197.92'
L12	S 21°59'W	173.10'
L13	S 43°05'W	105.29'
L14	S 21°37'W	127.23'
L15	S 00°15'W	115.19'
L16	S 41°24'W	159.01'
L17	S 15°58'W	230.11'
L18	S 26°51'W	171.35'
L19	S 06°17'W	115.79'
L20	S 67°19'W	93.24'
L21	S 33°42'W	254.28'
L22	S 29°01'W	163.79'
L23	S 60°15'W	77.94'
L24	S 42° W	105.24'
L25	S 61°27'W	78.85'
L26	S 76°10'W	235.80'
L27	S 37°59'W	108.50'
L28	N 72°44'W	75.96'
L29	S 42°03'W	165.00'

NOTE
NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

NOTE:
10 WATER WELLS WERE LOCATED WITHIN 2000' OF THE PROPOSED WELL

W1	S 36°25'W	1742.8'
W2	S 32°55'W	1454.1'
W3	S 23°18'W	1788.6'
W4	S 04°26'W	1095.8'
W5	S 02°31'W	1479.1'
W6	S 00°53'W	1881.3'
W7	S 00°47'E	1329.5'
W8	S 06°35'E	1775.8'
W9	S 15°34'E	1528.8'
W10	S 28°44'E	1339.1'

NOTES:
WELL 1V INFORMATION:
WV STATE PLANE NAD 27 COORDS:
N: 335,894ft E: 1,635,393ft
GEOGRAPHIC NAD 27 COORDS:
LAT: 39°24'54.13" LON: 80°47'25.96"
(NAD) 83 (UTM) ZONE 17 COORDS:
N: 4,362,865m E: 518,046m
WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

JOB # 16-015WA
DRAWING # JACKMAN1V
SCALE 1" = 500'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE 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 RULES ISSUED AND PERSCRIBED BY THE DEPTARTMENT OF ENVIRONMENTAL PROTECTION.

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
266 HUSHERS RUN RD PENNSBORO
WEST VIRGINIA 26415

LEGEND
Surface Owner Boundary Lines +/-
Adjoining Surface Tracts +/-
Found monument, as noted

THOMAS SUMMERS P.S. 2109

DATE 05/31/16
OPERATOR'S WELL# JACKMAN #1V

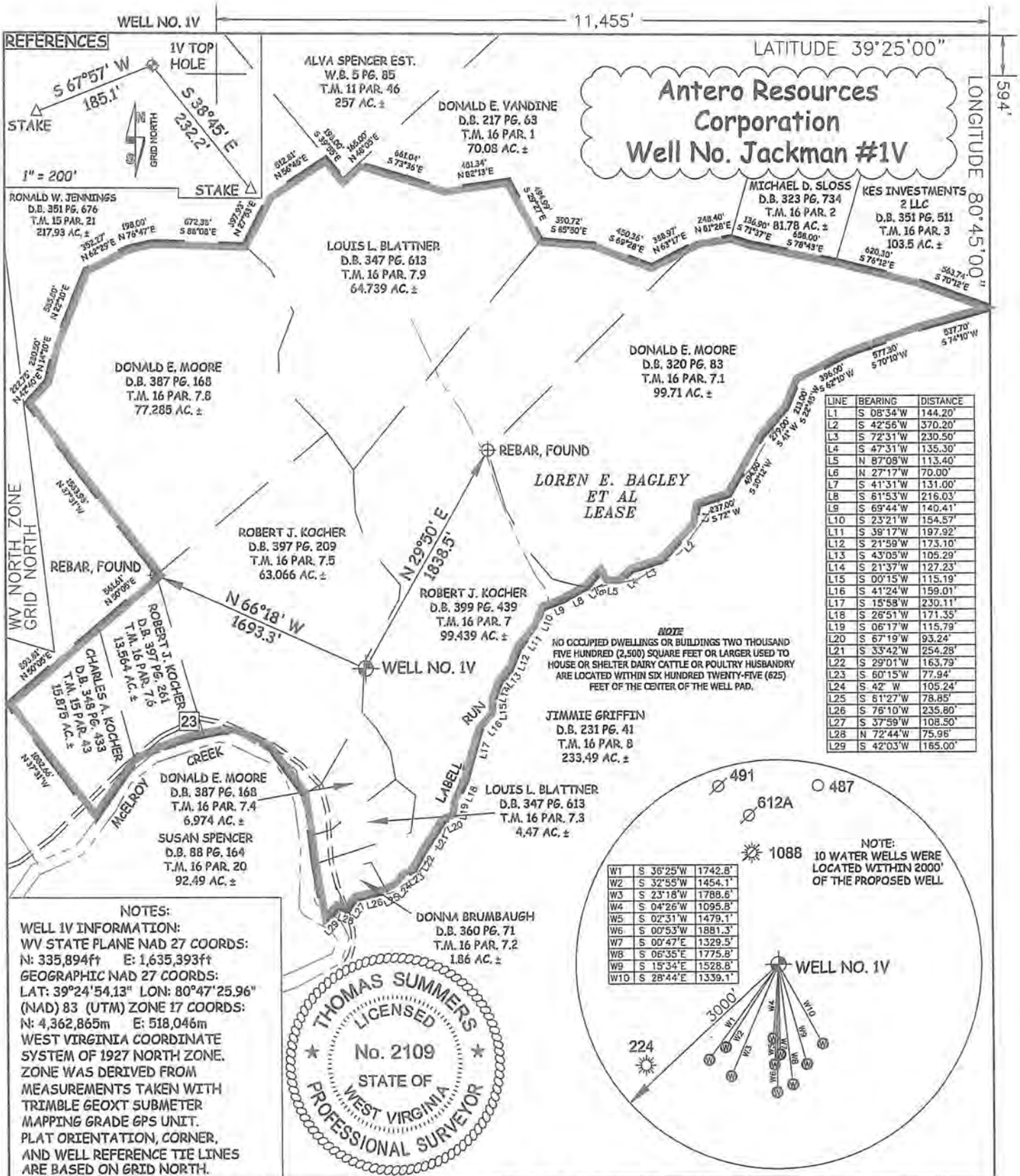
STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

API WELL # 47 – 095 – 02363
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,050' - ORIGINAL 1,042' - AS-BUILT WATERSHED McELROY CREEK
QUADRANGLE SHIRLEY 7.5' DISTRICT McELROY COUNTY TYLER
SURFACE OWNER ROBERT J. KOCHER ACREAGE 99.439 ACRES +/-
OIL & GAS ROYALTY OWNER LOREN E. BAGLEY ET AL LEASE ACREAGE 502.5 ACRES±
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___ ESTIMATED DEPTH 6,900'
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

FORM WW-6



LINE	BEARING	DISTANCE
L1	S 08°34'W	144.20'
L2	S 42°56'W	370.20'
L3	S 72°31'W	230.50'
L4	S 47°31'W	135.30'
L5	N 87°08'W	113.40'
L6	N 27°17'W	70.00'
L7	S 41°31'W	131.00'
L8	S 61°53'W	216.03'
L9	S 69°44'W	140.41'
L10	S 23°21'W	154.57'
L11	S 39°17'W	197.92'
L12	S 21°59'W	173.10'
L13	S 43°05'W	105.29'
L14	S 21°37'W	127.23'
L15	S 00°15'W	115.19'
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L17	S 15°58'W	230.11'
L18	S 26°51'W	171.35'
L19	S 06°17'W	115.79'
L20	S 67°19'W	93.24'
L21	S 33°42'W	254.28'
L22	S 29°01'W	163.79'
L23	S 60°15'W	77.94'
L24	S 42° W	105.24'
L25	S 61°27'W	78.85'
L26	S 76°10'W	235.80'
L27	S 37°59'W	108.50'
L28	N 72°44'W	75.96'
L29	S 42°03'W	165.00'

NOTE
NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.

NOTE:
10 WATER WELLS WERE LOCATED WITHIN 2000' OF THE PROPOSED WELL

W1	S 36°25'W	1742.8'
W2	S 32°55'W	1454.1'
W3	S 23°18'W	1788.6'
W4	S 04°26'W	1095.8'
W5	S 02°31'W	1479.1'
W6	S 00°53'W	1881.3'
W7	S 00°47'E	1329.5'
W8	S 06°35'E	1775.8'
W9	S 15°34'E	1528.8'
W10	S 28°44'E	1339.1'

NOTES:
WELL 1V INFORMATION:
WV STATE PLANE NAD 27 COORDS:
N: 335,894ft E: 1,635,393ft
GEOGRAPHIC NAD 27 COORDS:
LAT: 39°24'54.13" LON: 80°47'25.96"
(NAD) 83 (UTM) ZONE 17 COORDS:
N: 4,362,865m E: 518,046m
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THOMAS SUMMERS LICENSED No. 2109 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

JOB # 16-015WA
DRAWING # JACKMAN1V
SCALE 1" = 500'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE 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 RULES ISSUED AND PERSCRIBED BY THE DEPTARTMENT OF ENVIRONMENTAL PROTECTION.

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
266 HUSHERS RUN RD PENNSBORO
WEST VIRGINIA 26415

LEGEND
Surface Owner Boundary Lines +/-
Adjoining Surface Tracts +/-
Found monument, as noted

THOMAS SUMMERS P.S. 2109

DATE 05/31/16
OPERATOR'S WELL# JACKMAN #1V

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS

API WELL #
47 — 095 — 02363
STATE COUNTY PERMIT

WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,050' - ORIGINAL 1,042' - AS-BUILT WATERSHED McELROY CREEK
QUADRANGLE SHIRLEY 7.5' DISTRICT McELROY COUNTY TYLER
SURFACE OWNER ROBERT J. KOCHER ACREAGE 99.439 ACRES +/-
OIL & GAS ROYALTY OWNER LOREN E. BAGLEY ET AL LEASE ACREAGE 502.5 ACRES±
PROPOSED WORK: DRILL X CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION X
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___ ESTIMATED DEPTH 6,900'
TARGET FORMATION MARCELLUS
WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD
DENVER, CO 80202 CHARLESTON, WV 25313

COUNTY NAME PERMIT

RECEIVED
OFFICE OF OIL AND GAS
JUN 02 2016

FORM WW-6

n Well Pad

-Built
ources Corporation
er County
roy District
: 39.415093°
de -80.790363°
d Creek Watershed

RECEIVED
Office of Oil and Gas

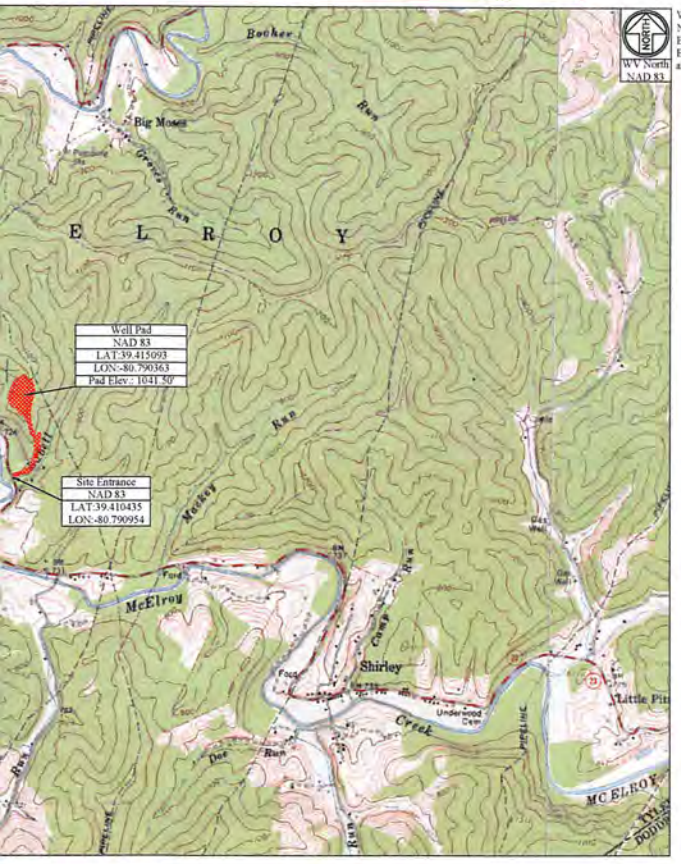
JUN 06 2016

WV Department of
Environmental Protection

Pertinent Site Information
Jackman Well Pad
Emergency Number: 304-758-4275
McElroy District, Tyler County, WV
Watershed: Middle Island Creek
Antero Resources Emergency Number: 800-878-1373

4709502363

: Site As-Built



WV State Plane Coordinate System
North Zone, NAD 83
Elevations Based on NAV88
Established By Survey Grade GPS
and OPUS Post-Processing

0 4000 6000
7.5' Quadrangle: Shirley
ed: Middle Island Creek

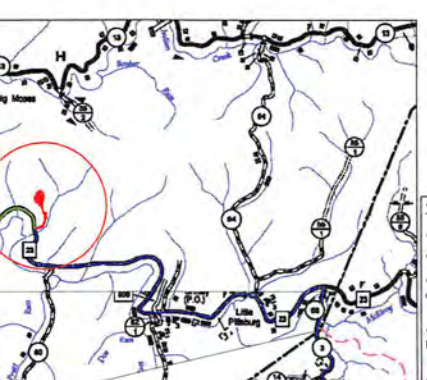
Property Owner Information - Jackman Drill Pad						
McElroy District - Tyler County						
Owner	TM - Parcel	Well Pad	Access Road	Topsoil/Excess	Existing Add. Area	Total Disturbed
Donna Brumbaugh	16-7.2	0.00	0.44	0.00	0.18	0.62
Robert J Kocher	16-7	1.71	1.73	0.27	2.07	5.78
Mary Ann Blattner	16-7.3	0.00	0.50	0.00	0.08	0.58
Donald E Moore	16-7.4	0.00	0.06	0.00	0.19	0.25
Robert J Kocher	16-7.5	1.91	0.06	0.30	2.15	4.42
	Site Totals (Ac)	3.62	2.79	0.57	4.67	11.65

Access Road			
Surface Owner	TM - Parcel	Road Length	Type
Donna Brumbaugh	16-7.2	325.16'	Existing Access Road
Robert J Kocher	16-7	1,490.94'	Existing Access Road
Mary Ann Blattner	16-7.3	58.40'	Existing Access Road

Disturbed Area	
Well Pad Construction	3.62 Ac
Access Road Construction	2.79 Ac
Topsoil / Excess Material	0.57 Ac
Existing Additional Area	4.67 Ac
Total Disturbed Area	11.65 Ac
Additional Information	
Total Linear Feet of Access Road	1,874.50'

Site Locations (NAD 83)		
Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.410435	-80.790954
Center of Well Pad	39.415093	-80.790363

Dmt
6/2/16
6/2/16



Location Map
Scale: 1" = 1 Mile

Well Location Restrictions

All Pad construction complies with the following restrictions.

*250' from an existing well or developed spring used for human or domestic animals.

*625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy
measured from the center of the pad.

*100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake,
pond or reservoir.

*300' from the edge of disturbance to a naturally reproducing trout stream.

*1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code 22-6A-12)

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities and Volumes
N1-N3	Site Notes
2	Overall Plan View
3	Overall Plan View (Aerial)
4-5	Plan View
6-7	Rehabilitation Plan View
8	Cross Sections - Well Pad
9	Cross Sections - Well Pad Access Road
G1	Grading Plan
S1	Site Reclamation
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details
M1	Midstream Production Details

JOHN P. SEE
REGISTERED
006051
STATE OF
WEST VIRGINIA
PROFESSIONAL ENGINEER

As-Built Certification

This as-built certification certifies that the depicted topography, property, and structures are representative of the existing conditions. The gas well drilling pad site was designed and constructed under the supervision of another company and therefore, the reasonable close conformance with the design drawings cannot be certified nor can the construction means and methods used to develop the site be certified. It is recommended this gas well drilling pad is included in the existing comprehensive maintenance and inspection program for gas well drilling pads or that a comprehensive maintenance and inspection program be developed to monitor the pads condition to insure the continued safe operation.

John P. See RPE 6051 Date 05/19/2016

Revision

Date

Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

Kelly Surveying
P.O. Box 254
Dailey, WV 26259
(304)338-6988

Cover Sheet
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
Designed By: BC
File No.
Sheet 1 of 9

Jackm

A

Antero Re

T

Mc

Latitu

Longit

Middle Isla

Exhibit A

Site Entrance	Well Pad
WV-N NAD 83 N: 334226.07	WV-N NAD 83 N: 335920.09
WV-N NAD 83 E: 1603762.92	WV-N NAD 83 E: 1603954.28
WV-N NAD 27 N: 334190.72	WV-N NAD 27 N: 335884.74
WV-N NAD 27 E: 1635204.10	WV-N NAD 27 E: 1635395.47
Lat. NAD 83: 39.410435	Lat. NAD 83: 39.415093
Lon. NAD 83: -80.790954	Lon. NAD 83: -80.790363
Lat. NAD 27: 39.410354	Lat. NAD 27: 39.415012
Lon. NAD 27: -80.791127	Lon. NAD 27: -80.790536
UTM 17 NAD 83 N: 4362345.44	UTM 17 NAD 83 N: 4362862.50
UTM 17 NAD 83 E: 517996.65	UTM 17 NAD 83 E: 518046.34
	Pad Elev.: 1042.00'

Well Table

Jackman IV
WV-N NAD 83 N: 335929.40
WV-N NAD 83 E: 1603951.80
WV-N NAD 27 N: 335894.04
WV-N NAD 27 E: 1635392.99
Lat. NAD 83: 39.415118
Lon. NAD 83: -80.790372
Lat. NAD 27: 39.415037
Lon. NAD 27: -80.790545
UTM 17 NAD 83 N: 4362865.32
UTM 17 NAD 83 E: 518045.54

Site Locations (NAD 27)		
Structure	Latitude (DD)	Longitude
Site Entrance	39.410354	-80.791
Center of Well Pad	39.415012	-80.790

Project Contacts

Antero Resources

Robert Wirks - Project Coordinator
304-842-4100 Off. 304-627-7405 Cell

Shawn Bennett - Construction Coordinator
304-842-4100 Off. 304-641-0071 Cell

Survey and Engineer

Kenneth Kelly
304-338-6985 Off.

John P. See
304-442-0220 Off.

Zackary Summerfield
304-338-6987 Off.

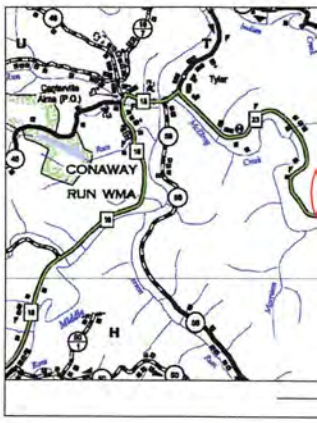
Geotechnical Engineer

American Geotech, Inc.
Kanti Patel
304-340-4277 Off.

Approach Routes:

* From US Rt 50 West, Turn right onto Co Rt 9 (Tarkiln Run Rd). Follow Co Rt 9 for 157 ft. Turn Left onto Co Rt 3 (Big Flint Rd). Follow Co Rt 3 for 0.2 mi. Turn Right to stay on Co Rt 3. Follow Co Rt 3 for 11.6 mi. Turn Left onto WV Rt 23 West. Follow WV Rt 23 West for 4.9 mi. The site entrance will be on the Right (East) side of the road.

From US Rt 50 East, Turn left onto Bunnell Run. Follow Bunnell Run for 0.5 mi. Continue on W Myles Ave (Old US 50 W). Follow W Myles Ave for 0.9 mi. Turn Left on Masonic Ave. Follow Masonic Ave for 0.2 mi. Turn Left onto Broadway St. Follow Broadway St for 318 ft. Turn Right onto Main St. Follow Main St for 305 ft. Turn Right onto Wells Ave. Follow Wells Ave for 308 ft. Turn Left onto 1st St. Follow 1st St for 0.1 mi. Continue on WV Rt 74 North (Mountain Dr). Follow WV Rt 74 North for 10.8 mi. Turn Slight Left onto WV Rt 18 North. Follow WV Rt 18 North for 5.2 mi. Turn Right onto WV Rt 23 East. Follow WV Rt 23 East for 3.7 mi. The site entrance will be on the Left (East) side of the road.



Environmental:

Wetland Delineations as provided by GAI Consultants dated March 14, 2016

Topographic Information:

The topographic information shown herein is based on aerial photography by Kelly Surveying PLLC, Dailey, WV

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
West Virginia State Law Section XIV: Chapter 24-C requires that you call two business days before you dig in the state of West Virginia.
IT'S THE LAW

811 Know what's below. Call before you dig.

Floodplain Conditions	
Do site construction activities take place in a floodplain:	NO
Permit needed from county floodplain coordinator:	NO
Flood Hazard Zone	X
HEC-RAS Study completed:	N/A
Floodplain shown on drawings:	N/A
FIRM Map Number(s) for site:	54095C0175C
Acreages of construction in floodplain:	N/A

Jackman Well Pad

As-Built
Antero Resources Corporation
Tyler County
McElroy District
Latitude 39.415093°
Longitude -80.790363°
Middle Island Creek Watershed

RECEIVED
OFFICE OF OIL AND GAS
JUN 01 2016

Pertinent Site Information
Jackman Well Pad
Emergency Number: 304-758-4275
McElroy District, Tyler County, WV
Watershed: Middle Island Creek
Antero Resources Emergency Number: 800-878-1373

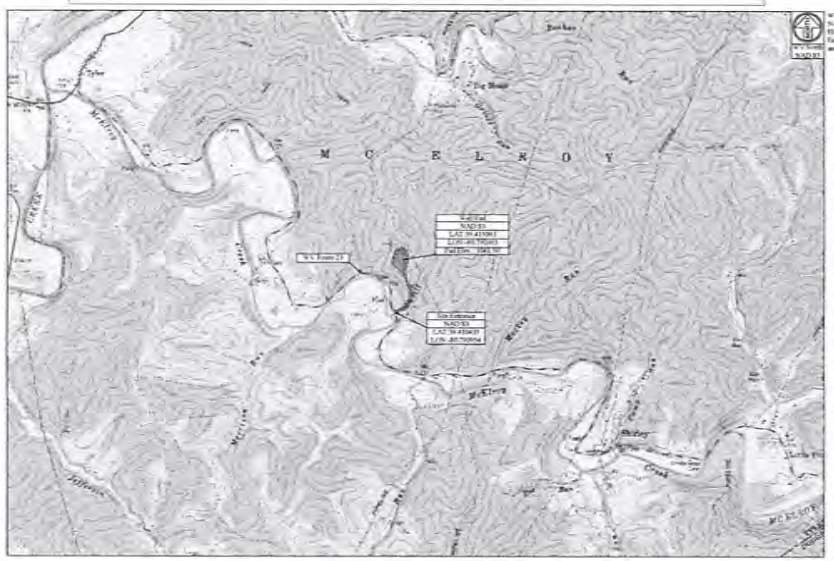
Exhibit A: Site As-Built

WEST VIRGINIA COUNTY MAP

Site Entrance	Well Pad
WV-N NAD 83 N: 334228.07	WV-N NAD 83 N: 330920.06
WV-N NAD 83 E: 1601762.42	WV-N NAD 83 E: 1600864.28
WV-N NAD 27 N: 334190.72	WV-N NAD 27 N: 329884.74
WV-N NAD 27 E: 1658254.10	WV-N NAD 27 E: 1657354.47
Lat. NAD 83: 39.415833	Lat. NAD 83: 39.415093
Long. NAD 83: -80.790654	Long. NAD 83: -80.790363
Lat. NAD 27: 39.415554	Lat. NAD 27: 39.414822
Long. NAD 27: -80.791127	Long. NAD 27: -80.790836
UTM 17 NAD 83 N: 4362549.44	UTM 17 NAD 83 N: 4362242.50
UTM 17 NAD 83 E: 513966.85	UTM 17 NAD 83 E: 513866.36
	Pad Elev.: 1045.09'

Well Table

Jackman IV
WV-N NAD 83 N: 334194.40
WV-N NAD 83 E: 1601917.80
WV-N NAD 27 N: 329884.66
WV-N NAD 27 E: 1658302.99
Lat. NAD 83: 39.415022
Long. NAD 83: -80.790322
Lat. NAD 27: 39.414287
Long. NAD 27: -80.790845
UTM 17 NAD 83 N: 4362269.32
UTM 17 NAD 83 E: 513868.34



W.V. State Plane Coordinate System North Zone, NAD 83
Elevations Based on NAVD88 Established By Survey Grade GPS and OPUS Post-Processing.

USGS 7.5' Quadrangle: Shirley
Watershed: Middle Island Creek

Property Owner Information - Jackman Drill Pad
McElroy District - Tyler County

Owner	TM - Parcel	Well Pad	Access Road	Cement Excess	Existing Add. Area	Total Disturbed
Donna Brumbaugh	10-7-2	0.00	0.44	0.00	0.10	0.62
Robert J Kocher	10-7	1.71	1.13	0.55	0.07	3.75
Mary Ann Harman	10-7-3	0.00	0.00	0.00	0.08	0.08
Donald E Moore	10-7-4	0.00	0.06	0.00	0.10	0.16
Robert J Kocher	10-7-9	1.41	0.06	0.00	2.75	4.22
Site Totals (Ac)		3.12	2.79	0.55	4.07	11.09

Access Road

Surface Owner	TM - Parcel	Road Length	Type
Donna Brumbaugh	10-7-2	825.18	Existing Access Road
Robert J Kocher	10-7	1,649.04	Existing Access Road
Mary Ann Harman	10-7-3	38.40	Existing Access Road

Disturbed Area

Well Pad Construction	3.02 Ac
Access Road Construction	2.79 Ac
Topsoil / Excess Material	0.55 Ac
Existing Additional Area	4.07 Ac
Total Disturbed Area	11.03 Ac
Additional Information	
Total Center Foot of Access Road	1,324.62'

Site Locations (NAD 27)

Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.415554	-80.791127
Center of Well Pad	39.415022	-80.790836

Site Locations (NAD 83)

Structure	Latitude (DD)	Longitude (DD)
Site Entrance	39.415833	-80.790654
Center of Well Pad	39.415093	-80.790363

Project Contacts

Antero Resources
Robert Wells - Project Coordinator
304-842-4089 OH 304-627-7405 Cell
Shawn Bennett - Construction Coordinator
304-842-4089 OH 304-641-0971 Cell

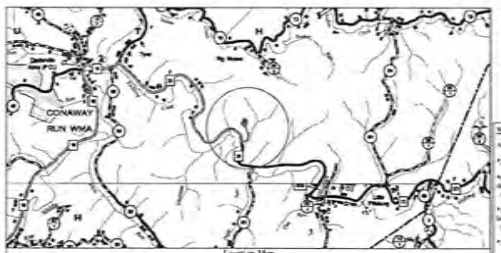
Survey and Engineer
Kenneth Kelly
304-338-4095 OH
John P. Poe
304-842-0228 OH
Zachary Summerfield
304-338-4095 OH

Geotechnical Engineer
American Geotech, Inc.
Kent Pettit
304-364-5277 OH

Approach Routes:

* From US Rt 50 West, Turn right onto Co Rt 9 (Tarkiln Run Rd). Follow Co Rt 9 for 157 ft. Turn Left onto Co Rt 5 (Big Flint Rd). Follow Co Rt 5 for 0.2 mi. Turn Right to stay on Co Rt 5. Follow Co Rt 5 for 11.6 mi. Turn Left onto WV Rt 23 West. Follow WV Rt 23 West for 4.9 mi. The site entrance will be on the Right (East) side of the road.

* From US Rt 50 East, Turn left onto Bunnell Run. Follow Bunnell Run for 0.5 mi. Continue on W Mains Ave (Old US 50 W). Follow W Mains Ave for 0.9 mi. Turn Left on Masonic Ave. Follow Masonic Ave for 0.2 mi. Turn Left onto Broadway St. Follow Broadway St for 318 ft. Turn Right onto Main St. Follow Main St for 305 ft. Turn Right onto Wells Ave. Follow Wells Ave for 308 ft. Turn Left onto 1st St. Follow 1st St for 0.1 mi. Continue on WV Rt 74 North (Mountain Dr). Follow WV Rt 74 North for 10.8 mi. Turn Slight Left onto WV Rt 18 North. Follow WV Rt 18 North for 5.2 mi. Turn Right onto WV Rt 23 East. Follow WV Rt 23 East for 3.7 mi. The site entrance will be on the Left (East) side of the road.



Location Map
Scale: 1" = 1 Mile

Well Location Restrictions:

All Pad or restriction complies with the following restrictions:

*250' from an existing well or developed spring used for human or domestic animals.

*625' from an occupied dwelling or barn greater than 2,500 SF used for poultry or dairy.

*Pad is located more than 625' from the center of the pad.

*100' from the edge of disturbance to wetlands, perennial streams, natural or artificial lake, pond or reservoir.

*100' from the edge of disturbance to a naturally reproducing trout stream.

*1,000' of a surface or ground water intake to a public water supply.

(Well Location Restrictions of WV Code §22-6A-5)

Environmental:
Wetland Delineation as provided by GAI Consultants
dated March 24, 2016

Topographic Information:
The topographic information shown herein is based on aerial photography by Kelly Surveying PLLC, Dallas, WV.

MISS UTILITY OF WEST VIRGINIA
1-800-245-4848
West Virginia State Law Section 24-7, Chapter 24-C requires that you call two business days before you dig in the state of West Virginia
IT'S THE LAW

811 Know what's below. Call before you dig.

Floodplain Conditions	
Do any construction activities take place in a floodplain	NO
Permit needed from county floodplain coordinator	NO
Flood Hazard Zone	X
HEC-RAS Study completed	N/A
Floodplain shown on drawings	N/A
FEMA Map Number(s) for site	54095C0175C
Acreage of construction in floodplain	N/A

Sheet	Description
1	Cover Sheet
V1	Schedule of Quantities and Volumes
N1-N3	Site Notes
2	Overall Plan View
3	Overall Plan View (Aerial)
4-5	Plan View
6-7	Rehabilitation Plan View
8	Cross Sections - Well Pad
9	Cross Sections - Well Pad Access Road
G1	Grading Plan
S1	Site Reclamation
D1-D2	Erosion and Sediment Control Details
R1	Access Road Details
P1	Pad Details
M1	Midstream Production Details

As-Built Certification

This as-built well location and limit of disturbance topography, property, and elevations are representative of the existing conditions. The pad and all disturbance has been staked and constructed under the supervision of Antero Resources and therefore is an accurate representation of the design drawings except for modifications to cut and fill slopes and to detail to the site conditions. It is recommended that pad and drilling pit is included in the geotechnical investigation and structural and inspection program for pad and drilling pits so that a comprehensive inspection and operation program for the pad and drilling pit can be conducted to assure the continued safe operation

Date of As-Built Survey: _____ Date: _____

JOHN P. POE
LICENSED
PROFESSIONAL SURVEYOR
STATE OF WEST VIRGINIA

Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

Kelly Surveying

Cover Sheet
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 05/10/2016
Scale: As Shown
Designed By: BC
File No.
Sheet 1 of 9

Schedule of Quantities & Volumes

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As Built

Earthwork

Volumes		
Existing Surface	*Cut (CY)	*Fill (CY)
Grading Plan	863.83	1,876.58
Access Road Slip Repair	1,846.32	1,846.32
Well Pad Slip Repair	2,618.19	2,618.19

Access Road Face Drains	220 LF
#57 Stone	60.00 tons
4" Perforated Pipe	220 LF
Site Drain Materials 50% Coverage	550 SF
Solid Outlet Pipe	40 LF
Nonwoven Geotextile	220 SY

Access Road Toe Key Drains	110 LF
R-5 Stone	552.44 tons

Well Pad Face Drains	400 LF
#57 Stone	110.00 tons
4" Perforated Pipe	400 LF
Site Drain Materials 50% Coverage	1000 SF
Solid Outlet Pipe	320 LF
Nonwoven Geotextile	400 SY

Well Pad Toe Key Drains	100 LF
R-5 Stone	287.99 tons

Well Pad Gallery Drains and Outlets	240 LF
R-5 Stone	200.00 tons

Access Road Surfacing	
12" Min. 8% Ratio	4,506 SY
2" Stone Surfacing 3/4" or 1-1/2"	475.57 Tons
6" Stone Surfacing #1 & #2	1,426.71 Tons
10 oz Filter Fabric	4,506 SY

Well Pad Surfacing	
12" Min. 8% Ratio	9,724 SY
2" Stone Surfacing 3/4" or 1-1/2"	1,026.34 Tons
6" Stone Surfacing #1 & #2	3,079.02 Tons
10 oz Filter Fabric	9,724 SY

Erosion and Sediment Control

Super Silt Fence		1292	
SSF#1	78	SSF#16	81
SSF#2	39	SSF#17	58
SSF#3	43	SSF#18	70
SSF#4	75	SSF#19	56
SSF#5	54	SSF#20	59
SSF#6	55	SSF#21	31
SSF#7	48	SSF#22	36
SSF#8	41	SSF#23	40
SSF#9	30	SSF#24	23
SSF#10	28	SSF#25	35
SSF#11	40	SSF#26	35
SSF#12	39	SSF#27	12
SSF#13	30	SSF#28	40
SSF#14	25	SSF#29	35
SSF#15	30	SSF#30	26

12" Filter Sock		395	
FS12#1	395		

12" Wattles		423	
W12#1	117	W12#3	98
W12#2	102	W12#4	106

Seeding and Mulching	0.29 Acres

*NOTE:

THE ACTUAL CROSS SECTIONS TO BE CONSTRUCTED WILL, UNLESS OTHERWISE DIRECTED BY THE ENGINEER, BE DERIVED FROM APPLICATION OF THE TYPICAL CROSS SECTIONS SHOWN ON THE DESIGN DRAWINGS. EXISTING GROUND SURFACE AND ESTIMATED TOP OF ROCK LINES INDICATED ON THE DESIGN DRAWINGS CROSS SECTIONS AND/OR PLAN VIEW DRAWINGS ARE APPROXIMATE. THE ACTUAL SUBSURFACE CONDITIONS ENCOUNTERED ON THE SITE MAY DIFFER FROM THE TYPICAL CROSS SECTIONS. THESE DIFFERENCES MAY BE SIGNIFICANT. AND IF SO, THE DESIGN CROSS SECTIONS MAY NOT REPRESENT THE ACTUAL WORK NECESSARY TO COMPLETE THE WORK TO BE PERFORMED UNDER THE SCOPE OF THE PROJECT.

Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

Kelly Surveying

Schedule of Quantities & Volumes
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 06/19/2016
Scale: As Shown
Designed By: KW
File No.
Sheet VI of VI

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

1. PERMITS:
THE CONTRACTOR IS RESPONSIBLE IN VERIFYING WITH THE OWNER THAT ALL ASSOCIATED AND JURISDICTIONAL PERMITS HAVE BEEN OBTAINED AND ARE ON SITE BEFORE DISTURBING ANY HISTORICAL OR ENVIRONMENTAL RESOURCE. THE OWNER IS RESPONSIBLE FOR OBTAINING ALL PERMITS FROM THE AGENCY OR AGENCIES HAVING JURISDICTION OVER THE PROPOSED PROJECT (I.E. LAND, STREAM, US ARMY CORPS OF ENGINEERS, STORM WATER, OFFICE OF OIL AND GAS, WVDEP ETC.). THIS PLAN SET DOES NOT ACKNOWLEDGE THAT ALL PERMITS HAVE BEEN OBTAINED.

2. PROJECT CONTROL DATUM:
SURVEY GRADE GPS WAS USED TO ESTABLISH PROJECT CONTROL, POST PROCESSED BY OPUS ONLINE POSITIONING USER SERVICE. http://www.ngs.noaa.gov/OPUS/

a. PROJECT HORIZONTAL DATUM:
THE HORIZONTAL DATUM FOR THE PROJECT IS BASED ON THE WV STATE PLANE COORDINATE SYSTEM (SPC) NORTH AMERICAN DATUM 1983 NAD83.
WV NORTH ZONE 26853, WV SOUTH ZONE 26854 DEPENDING ON LOCATION OF THE PROJECT.

b. PROJECT VERTICAL DATUM:
ALL ELEVATIONS FOR THE PROJECT ARE GIVEN IN FEET, AND DATUM IN MEAN SEA LEVEL (MLS). ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC SURVEY, NORTH AMERICAN VERTICAL DATUM NAVD 88, GEOID 09 AS PUBLISHED BY NOAA.
http://www.ngs.noaa.gov/datasheets/

3. MATERIAL TESTING AND INSTALLATION GOVERNING CRITERIA:
IF THE PROJECT PLAN SET INFORMATION OR DETAILS DO NOT DEPICT A SPECIFIC INSTALLATION PROCESS OF MATERIAL, THE ITEM OR MATERIAL SHALL BE INSTALLED, TESTED OR CONSTRUCTED ACCORDING TO THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAYS ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS AASHTO, CURRENT EDITION AND INSTALLED, TESTED ACCORDING TO THE AMERICAN SOCIETY FOR TESTED MATERIALS ASTM CURRENT EDITION. THE MORE STRINGENT OF THE TWO AASHTO, ASTM SHALL APPLY WHEN IN CONFLICT. ANY COMMERCIAL PRODUCT OR ITEM SHALL BE INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS, NO ITEM OR PRODUCT SHALL BE INSTALLED OR USED THAT EXCEEDS THE MANUFACTURES RECOMMENDATIONS.

4. DESIGNER, SIGNING ENGINEER AND SIGNING SURVEYOR:
KELLY SURVEYING PLLC., KELLY SURVEYING, ENGINEER, SIGNING ENGINEER, SIGNING SURVEYOR SHALL MEAN KELLY SURVEYING PLLC OR A REPRESENTATIVE OF KELLY SURVEYING PLLC, INSPECTOR, TECHNICIAN, ANY INDIVIDUAL OR ORGANIZATION PERFORMING TASKS, DUTIES OR PREPARATION OF PROJECT PLAN COMPONENTS UNDER THE DIRECTION OF KELLY SURVEYING PLLC AND THE SIGNING ENGINEER.

5. PROJECT PLAN SET, WELL SITE PLAN, CONSTRUCTION DRAWINGS PLAN OR ANY REFERENCE THEREOF:
PROJECT PLAN, PROJECT, PROJECT PLAN SET, CONSTRUCTION DRAWINGS, DESIGN, DETAILS ANY REFERENCE TO PROJECT, PROJECT PLAN, PROJECT PLAN SET, CONSTRUCTION DRAWINGS, DESIGN, SCOPE OF WORK AND OR SIMILAR WORDS IN THE CONSTRUCTION NOTES, CONSTRUCTION OR DESIGN DRAWINGS, CONSTRUCTION OR DESIGN SPECIFICATIONS OR ANY PORTION OF THE PROJECT DEVELOPED BY KELLY SURVEYING PLLC.
SHALL MEAN AND INCLUDE COMMON SENSE ITEMS, THE PLAN VIEWS, CROSS SECTIONS, PROFILES, DETAILS, NOTES, ADDITIONAL ATTACHMENTS AND OTHER ELEMENTS, APPURTENANCES OR REFERENCES CITED IN THE NOTES, INCLUDING ITEMS REQUIRED BY THIS TYPE OF CONSTRUCTION WHICH A COMPETENT CONTRACTOR SHOULD BE FAMILIAR WITH.

a. OWNER:
OWNER SHALL MEAN THAT ORGANIZATION IDENTIFIED IN THE PROJECT PLAN SET TITLE BORDER AS THE "THIS DOCUMENT WAS PREPARED FOR: (OWNER)" OR ANY INDIVIDUAL OR ORGANIZATION PERFORMING TASKS, DUTIES OR ANY FUNCTION FOR THE OWNER.
THE OWNER HAS FINAL APPROVAL IN ALL MATERIALS, WORKMANSHIP, MEASUREMENTS, OR ANY AND ALL APPURTENANCES.

b. CONTRACTOR:
CONTRACTOR SHALL MEAN ANY ORGANIZATION OR INDIVIDUAL ASSOCIATED WITH INSTALLATION OF AN ITEM ON THE PROJECT PLAN SET OR ANY ORGANIZATION OR INDIVIDUAL ASSOCIATED WITH THE WORKMANSHIP OF AN ITEM OR MATERIAL LISTED IN THE PROJECT PLAN SET, ANY ORGANIZATION OR INDIVIDUAL PERFORMING DUTIES ON OR ASSOCIATED WITH THE SCOPE OF WORK FOR THE PROJECT. THE PROJECT MAY HAVE MULTIPLE CONTRACTORS, A PRIME CONTRACTOR OR A PRIME CONTRACTOR WITH SUBCONTRACTORS. THE OWNER MAY DESIGNATE PORTIONS OF THE PROJECT TO BE COMPLETED BY CONTRACTORS SPECIALIZING IN VARIOUS MATERIAL INSTALLATION. (I.E. EROSION AND SEDIMENT CONTROL INSTALLERS), ANY INDIVIDUAL FIRM OR ORGANIZATION ASSOCIATED WITH THE SCOPE OF WORK OTHER THAN KELLY SURVEYING PLLC OR THE OWNER.

6. EQUIPMENT:
THE CONTRACTOR SHALL MOBILIZE EQUIPMENT SUFFICIENT TO PERFORM THE SCOPE OF WORK EFFICIENTLY AND IN A TIMELY MANNER. THE EQUIPMENT SHALL BE OF SIZE AND HORSEPOWER TO PERFORM EARTH WORK AND INSTALLATION OF ITEMS DEPICTED ON THE PROJECT PLAN SET. A SINGLE DRUM VIBRATORY ROLLER 11 TO 18 TONS, ARTICULATED TRUCK(S), PANS, DOUBLE DRUM OR PAD FOOTED ROLLER "SHEEPS-FOOT" ROLLER CATERPILLAR 815 SERIES OR EQUIVALENT, , MEDIUM AND LARGE CLASS DOZERS CATERPILLAR D6T, D6N, D8T WITH RIPPER OR EQUIVALENT EXCAVATORS MEDIUM AND LARGE CLASS SUCH AS CATERPILLAR 374L OR EQUIVALENT WITH HYDRAULIC HAMMERS AND OTHER ATTACHMENTS WOULD BE CONSIDERED EQUIPMENT NECESSARY TO PERFORM THIS TYPE OF EARTHWORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MOBILIZE AND MANAGE EQUIPMENT TO ACHIEVE THE TEST RESULTS SPECIFIED IN THE PROJECT PLAN SET. YOU CAN NOT USE SEVEN ARTICULATED TRUCKS HAULING TO ONE SMALL FILL AREA WHERE ONE SMALL DOZER AND AN UNDERSIZED ROLLER ARE INSTALLING LIFTS OF LOOSE MATERIAL 15 INCHES, COMPACTED TO 12 INCHES WITH A 95 PERCENT COMPACTION REQUIREMENT.

7. GEOTECHNICAL INVESTIGATION:
WHERE A GEOTECHNICAL REPORT HAS BEEN PROVIDED TO THE CONTRACTOR, THE DATA ON SUBSURFACE SOIL CONDITIONS IS NOT INTENDED AS A REPRESENTATION OR WARRANTY OF THE CONTINUITY OF SUCH CONDITIONS BETWEEN BORINGS OR INDICATED SAMPLING LOCATIONS. IT SHALL BE EXPRESSLY UNDERSTOOD THAT KELLY SURVEYING PLLC AND AMERICAN GEOTECH WILL NOT BE RESPONSIBLE FOR ANY INTERPRETATIONS OR CONCLUSIONS DRAWN THERE FROM BY THE CONTRACTOR. DATA IS MADE AVAILABLE FOR THE CONVENIENCE OF THE CONTRACTOR.

IN ADDITION TO ANY REPORT THAT MAY BE MADE AVAILABLE TO THE CONTRACTOR, THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING ANY OTHER SOIL INVESTIGATIONS HE/THEY FEEL(S) IS NECESSARY FOR PROPER EVALUATION OF THE SITE FOR THE PURPOSES OF PLANNING AND/OR BIDDING THE PROJECT.
PRIOR TO COMMENCING EARTHWORK THE CONTRACTOR SHALL DETERMINE IF THE MATERIAL IS SUITABLE FOR RIPPING OR IF BLASTING IS NECESSARY. THE CONTRACTOR IS RESPONSIBLE FOR RIPPING OR BLASTING TO OBTAIN THE PARTICLE SIZE SUITABLE FOR CONSTRUCTION OF ENGINEERED FILLS. 6 TO 10 INCH PARTICLE SIZE SHOULD BE USED FOR BIDDING PURPOSES.

THE TEST BORING CORE SAMPLES ARE AVAILABLE FOR THE CONTRACTOR'S EXAMINATION, UPON REQUEST TO THE OWNER. A 48-HOUR NOTICE TO ARRANGE FOR THE CONTRACTOR TO EXAMINE THESE SAMPLES IS REQUIRED BY THE OWNER.

a. TOE KEYS, BONDING BENCHES; SUBSURFACE DRAINAGE
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL ALL SUBSURFACE FEATURES DETAILED IN THE PROJECT PLAN SET AND THE GEOTECHNICAL REPORT.
DEPICTED ON THE PROJECT PLAN SET DETAILS ARE GENERIC REPRESENTATIONS OF THE SUBSURFACE DRAINAGE AND STABILITY BENCHES/BONDING BENCHES AND TOE KEYS. ALL SUBSURFACE ITEMS MUST BE TO THE SATISFACTION AND APPROVAL OF REQUIREMENTS AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

CONSTRUCTION TOLERANCES:
a. SLOPES:
GRADE THE SURFACE OF THE EARTHWORK TO CONFORM TO THE LINES, GRADES, AND CROSS-SECTIONS OR PROFILE AS SHOWN ON THE PROJECT PLAN SET.
IN FINAL GRADING OF THE SURFACE OF EARTHWORK, MAINTAIN A TOLERANCE OF 0.5 FOOT ABOVE OR BELOW THE PLAN CROSS-SECTION OR PROFILE.
SLOPES SHALL BE NO STEEPER THAN A (2:1) TWO HORIZONTAL TO ONE VERTICAL, WITHOUT THE APPROVAL OF THE DESIGN ENGINEER.

b. WELL PAD OR FACILITY PADS:
GRADE THE SURFACE OF WELL PAD TO FLOW AT ±(1) ONE PERCENT TO ALL OUTLET FEATURES OR SUMP LOCATIONS.
MAXIMUM GRADE OF ANY AREA OUTSIDE THE WELL PAD DRILL LOCATION BOX SHALL BE ±(2)TWO PERCENT EXCEPT THE TRANSITION AREA TO THE SUMP LOCATION.
THE WELL PAD DRILL LOCATION BOX SHALL BE GRADED TO ±0.05 FEET.
ALL NON WELL PAD, TANK PADS, STORAGE OR STAGING PAD AREAS SHALL BE GRADED TO HAVE POSITIVE FLOW OF MIN ONE (1) PERCENT, MAXIMUM TWO (2) PERCENT TO THE OUTSIDE ARE OF THE PAD OR TO THE SUMP OR CONTROLLING STRUCTURE.

c. DITCHES AND CHANNELS:
SHAPE THE BOTTOM OF DITCHES SO THAT THE DITCH OR CHANNEL DOES NOT IMPOUND WATER AND WILL HAVE POSITIVE FLOW MINIMUM ±(0.5) HALF PERCENT AND TRANSFERS WATER TO AN APPROVED DISCHARGE POINT.
THE DITCH DEPTH OR CHANNEL DEPTH SHALL BE MEASURED AFTER THE DITCH OR CHANNEL LINING OR AGGREGATE TREATMENT IS INSTALLED, MINIMUM DEPTH OF ANY DITCH SEGMENT SHALL BE 1.5 FEET AFTER LINING OR AGGREGATE INSTALLED.

d. ROADS:
ALL ROAD SURFACES SHALL DRAIN TO THE SHOULDER OR DITCH LINE, MINIMUM ONE (1) PERCENT, PROFILE OF ROAD ±(2) TWO PERCENT.

e. IMPOUNDMENTS:
THE TOP OF ALL IMPOUNDMENT EMBANKMENTS SHALL BE WITHIN ±0.1 FOOT, ONE TENTH OF A FOOT OF PROPOSED GRADE. THIS SHALL BE MEASURED AT THE OUTER EDGE OF THE LINER TRENCH.

THE BOTTOM OF ALL IMPOUNDMENTS SHALL HAVE A SLOPED BOTTOM OR A SLOPED AREA IN THE BOTTOM TO DRAIN TO A CENTRAL LOCATION OF ±(2) PERCENT TWO PERCENT.
THE LOCATION MAY BE ADJUSTED BY THE OWNER DEPENDING ON FUTURE PUMPING REQUIREMENTS.

f. CULVERT PIPES:
ALL PIPES SHALL HAVE A MINIMUM COVER OF 1.0 FOOT ONE FOOT OR ½ ONE HALF THE DIAMETER OF THE PIPE(WHICHEVER IS GREATER). MEASURED FROM FINISHED GRADE.
PIPES SHALL NOT HAVE A DROP OF MORE THAN (4) FOUR INCHES FROM THE OUTLET INVERT TO THE DITCH OR CHANNEL LINING OR TREATMENT.

g. SEDIMENT AND EROSION CONTROL DEVICES:
ALL SEDIMENT AND EROSION CONTROL DEVICE SHALL BE INSTALLED ±0.5 FEET VERTICAL FROM CONTOUR OR ±(3) THREE FEET HORIZONTALLY FROM THE PROJECT PLAN SET.
DRAINAGE CONTROL STRUCTURE
IF A DRAINAGE CONTROL STRUCTURE CANNOT BE INSTALLED PER THE PROJECT PLAN SET, THE CONFIGURATION CAN VARY, THE DRAINAGE CONTROL STRUCTURE VOLUME WILL THE CONTROLLING TOLERANCE. (117) ONE HUNDRED AND SEVENTEEN CUBIC YARDS OF STORAGE ARE REQUIRED FOR SEDIMENT TRAPS.

h. ADDITIONAL TOLERANCES:
THE PROJECT PLAN SET INCLUDES DETAILS THAT DEPICT ITEMS AND SPECIFICATIONS FOR ITEMS.
PLEASE REVIEW THE ENTIRE PROJECT PLAN SET FOR ADDITIONAL INFORMATION.

i. AS BUILT SURVEYS OR TOLERANCE VERIFICATION:
BEFORE ANY AS-BUILT CAN BE CONSIDERED CERTIFIABLE, A COMPLETE CONSTRUCTION SCHEDULE DETAILING SITE CONDITIONS PROJECT AREAS WORKED, APPROXIMATE DEPTH OF FILL PLACED AND WEATHER CONDITIONS WILL BE PROVIDED.
ON FRESH WATER IMPOUNDMENTS PRIOR TO THE INSTALLATION OF THE IMPERVIOUS LINER, OR DRILL PADS THE DESIGN ENGINEER WILL BE CONTACTED TO PERFORM A GRADE VERIFICATION SURVEY FOR THE AS-BUILT. ANY VARIANCE IN GRADE WILL BE AT THE ENGINEER'S DISCRETION AS ACCEPTABLE.

9. CONTRACTOR SUPERINTENDENT, SUPERVISOR OR FOREMAN:
THE CONTRACTOR SHALL AT ALL TIMES HAVE A COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN ON SITE AND AT LOCATIONS WHERE WORK IS BEING PERFORMED. THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN SHALL BE EXPERIENCED IN THE TYPE OF CONSTRUCTION FOR THE SCOPE OF WORK BEING PERFORMED.
THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN SHALL BE ABLE TO FULLY UNDERSTAND THE PROJECT PLAN SET AND COMMUNICATE WITH KELLY SURVEYING PLLC IN A PROFESSIONAL MANNER ABOUT PROJECT PLAN SET ITEM INSTALLATION AND INTENT.
THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN SHALL ASSIST OR MAKE AVAILABLE TO KELLY SURVEYING PLLC THE NECESSARY RESOURCES TO SAFELY MONITOR OR TEST ALL MATERIALS AND WORKMANSHIP.
ACCESS SHALL BE MADE AVAILABLE TO SAFELY OBTAIN SAMPLES, READINGS OR MEASUREMENTS OF ALL MATERIALS OR WORKMANSHIP.
THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN SHALL BE CAPABLE OF UNDERSTANDING AND PROVIDING INFORMATION TO KELLY SURVEYING PLLC, ITS REPRESENTATIVES INSPECTORS, COMPACTION TECHNICIANS OR ANY SUBCONTRACTOR.
THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN SHALL BE ABLE TO DIRECT, SUPERVISE GIVE INSTRUCTION TO SUBORDINATES MANAGE AND BE RESPONSIBLE FOR THE PROJECT, SHALL BE THERE DAILY AND FAMILIAR WITH ALL ASPECTS OF THE PROJECT.
IF THE CONTRACTOR SUBCONTRACTS OUT A PORTION OF THE PROJECT, THE SUBCONTRACTOR MUST ALSO PROVIDE A COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN.
IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE CONSTRUCTION FOREMAN(S) THE APPROPRIATE PLANS INCLUDING ALL REVISIONS, EXHIBITS, AND MODIFICATIONS. THE GEOTECHNICAL EXHIBIT IS REQUIRED TO BE ON SITE.

10. MISS UTILITY OF WEST VIRGINIA, CALL BEFORE YOU DIG UTILITIES, CONSTRUCTION ENTRANCE, WELL SITE BOUNDARY FLAGGING:
AT LEAST THREE (3) DAYS BEFORE INITIATING ANY EARTH WORK DISTURBANCE OR ANY ACTIVITY NOTIFICATION SHALL BE GIVEN TO MISS UTILITY OF WEST VIRGINIA.
1(800) 245-4848 OR 811 FOR BURIED UTILITY LOCATION AND MARKING.
KELLY SURVEYING PLLC HAS MADE A DILIGENT ATTEMPT TO IDENTIFY ALL UTILITIES AS SHOWN ON THE PROJECT PLAN SET. ANY UTILITIES FOUND THAT ARE NOT ON THE PROJECT PLAN SET PLEASE CONTACT KELLY SURVEYING PLLC AT (304)338-6985.

a. WELL SITE BOUNDARY (WSB) AND IDENTIFICATION:
WELL SITE BOUNDARY AND WORK AREA WILL BE CLEARLY MARKED AND IDENTIFIED AS SHOWN IN THE STAKING GUIDE DETAILS (BLUE AND WHITE STRIPED RIBBON).
DO NOT DISTURB AREAS OUTSIDE THE WELL SITE BOUNDARY (WSB). DO NOT MOBILIZE OR PARK, STORE MATERIALS OR STAGE ANY PORTION OF THE PROJECT OUTSIDE THE FLAGGED PROJECT WORK AREA OR WELL SITE BOUNDARY (WSB). PRIOR TO ANY SITE ACTIVITY A SITE VISIT SHOULD BE MADE FOR THE CONTRACTOR TO FAMILIARIZE THE WORK AREAS AND PROTECTED RESOURCES.
IN NON-WOODED AREAS, THE PROPOSED E&S CONTROLS SHALL BE STAKED AND INSTALLED BEFORE ANY OTHER CONSTRUCTION ACTIVITIES BEGIN.

b. CONSTRUCTION ENTRANCE:
A STABILIZED CONSTRUCTION ENTRANCE(S) AS SHOWN IN THE DETAILS OF THE PROJECT PLAN SET AT THE LOCATION(S) AS SHOWN ON THE PROJECT PLAN SET WILL BE INSTALLED TO PREVENT ANY SOIL OR SEDIMENT FROM BEING CARRIED ONTO THE ROADWAYS.
ENTRY TO AND FROM THE CONSTRUCTION SITE SHALL BE RESTRICTED TO THE STABILIZED APPROVED ENTRANCE. A MEETING SHALL BE HELD WITH ALL EMPLOYEES AND VENDORS TO ASSURE THEY ARE AWARE OF THE CORRECT ENTRANCE AND THE SIGNIFICANCE OF THE CONSTRUCTION ENTRANCE.
ANY SOIL OR DEBRIS TRANSPORTED ONTO ROADWAYS SHALL BE REMOVED. DEPOSITS SHALL BE COMPLETELY REMOVED BY SHOVELING AND/OR SWEEPING. WASHING SHALL NOT BE UTILIZED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE OWNER.
ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF AT AN APPROVED FACILITY IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM WATER.

11. MATERIAL MODIFICATION:
THE DESIGN ELEMENTS DEPICTED AND TO BE CONSTRUCTED WILL, UNLESS OTHERWISE DIRECTED BY THE OWNER, BE DERIVED FROM THE PROJECT PLAN SET.

a. PROJECT PLAN DESIGN MATERIAL OR PLAN MODIFICATION:
ALL MODIFICATIONS, INCLUDING MATERIAL MODIFICATIONS ARE REQUIRED TO BE APPROVED PRIOR TO IMPLEMENTATION OR MODIFICATION. ANTICIPATE A FIVE DAY REVIEW PERIOD FOR ANY MODIFICATION. ALL MODIFICATIONS MUST BE SUBMITTED ON THE APPROVED FORM.
THE MODIFICATION SHALL BE APPROVED BY WVDEP OFFICE OF OIL AND GAS AS A CONDITION OF THE PERMIT.
IF THE MODIFICATION IS NECESSARY FOR HUMAN AND ENVIRONMENTAL SAFETY, THE MODIFICATION IS TO BE DOCUMENTED WITHIN ONE WORKING DAY OF THE MODIFICATION OR INSTALLATION, REASON FOR MODIFICATION.
THE MODIFICATION WILL BE RECORDED ON A MODIFICATION SUMMARY FORM.
THE MODIFICATION FORM WILL BE SUBMITTED TO KELLY SURVEYING PLLC AND THE OWNER.
THE MODIFICATION FORM WILL BE MAINTAINED ON SITE FOR REVIEW BY THE WVDEP INSPECTOR.

12. MATERIALS AND WORKMANSHIP:
ALL MATERIALS AND WORKMANSHIP SHALL BE IN CLOSE CONFORMANCE WITH THE PROJECT PLAN SET. ANY SUBSTITUTION FOR MATERIALS LISTED IN THE PROJECT PLAN SET SHALL BE APPROVED BY KELLY SURVEYING PLLC. OR THE OWNER BEFORE INSTALLATION.
IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN APPROVAL BEFORE ALLOWING THE MATERIALS TO BE DELIVERED ON SITE. KELLY SURVEYING PLLC RESERVES THE RIGHT TO REFUSE OR REJECT ANY MATERIAL. MATERIALS OR WORKMANSHIP DEEMED INADEQUATE TO SATISFY THE SCOPE OF THE PROJECT.
KELLY SURVEYING PLLC., THE OWNER OR ITS REPRESENTATIVES RESERVE THE RIGHT TO CHANGE ANY PORTION OF THE PROJECT PLAN SET.
MATERIALS OR WORKMANSHIP FAILING QUALITY STANDARDS SHALL BE IMMEDIATELY CORRECTED BEFORE ANY PROGRESSIVE STEP IS INITIATED. (IF A LIFT FAILS COMPACTION IT SHALL BE CORRECTED BEFORE INITIATING AN ADDITIONAL LIFT.)

13. SCOPE OF WORK:
THE PROJECT PLAN SET DEPICTS THOSE ITEMS IDENTIFIED BY THE OWNER TO KELLY SURVEYING PLLC AS SCOPE OF WORK AND WERE DEVELOPED FOR THE OWNER TO COMPLETE THE EARTH WORK PORTION WITH ADDITIONAL ITEMS AS DIRECTED BY THE OWNER INCLUDED IN THE SCOPE OF WORK.
THE COMMUNICATIONS FROM THE OWNER MAY HAVE BEEN THROUGH VERBAL DIRECTION, EMAIL OR OTHER MEANS OF COMMUNICATION. (PLEASE SEE PROJECT DESCRIPTION TO THE RIGHT.)

14. PROJECT PLAN SET VOLUMES AND DISCREPANCY NOTIFICATION PRIOR TO BIDDING OR INSTALLATION:
THE ITEMS DEPICTED IN THE PROJECT PLAN SET MAY BE INSUFFICIENT TO DEPICT THE SCOPE OF WORK, THE PLAN SET WAS DEVELOPED TO ASSIST THE CONTRACTOR WITH LOCATION OF ITEMS TO BE INSTALLED, INFORMATION FOR ITEMS TO BE INSTALLED, BASIC GUIDELINES FOR ITEMS TO BE INSTALLED.
THE PROJECT PLAN SET WAS NOT DEVELOPED AS AN INSTRUCTION MANUAL.
IT IS THE CONTRACTORS RESPONSIBILITY TO REVIEW THE PROJECT PLAN SET AND DETERMINE THOSE ITEMS NECESSARY TO COMPLETE THE INTENT OF THE SCOPE OF WORK.

DESIGN ELEMENTS SHOWN ON PROJECT PLAN SET SUCH AS BUT NOT LIMITED TO EXISTING GROUND, DEPTH OF ROCK, QUALITY OF SUBSURFACE MATERIAL, , VOLUMETRIC OR QUANTITY OF MATERIAL LISTED ARE TO BE CONSIDERED APPROXIMATE. THE ACTUAL SUBSURFACE OR SITE CONDITIONS ENCOUNTERED MAY DIFFER FROM THE PROJECT PLAN SET. THESE DIFFERENCES MAY BE SIGNIFICANT, AND IF SO, THE PROJECT PLAN SET MAY NOT REPRESENT THE ACTUAL WORK NECESSARY TO COMPLETE THE WORK OR INTENT OF THE SCOPE OF WORK FOR THE PROJECT.

THE VOLUMES OR ANY FORM OF MATERIAL QUANTIFICATION ON THE PROJECT PLAN SET OR ANY SUPPLEMENT OR ADDENDUM TO THE PLAN SET, ANY EMAIL OR REFERENCE OR CORRESPONDENCE RELATED TO VOLUMETRIC OR QUANTITY OF ANY MATERIAL IS FOR ESTIMATION PURPOSES ONLY, THE DIFFERENCE FROM THE VOLUMES OR QUANTITIES OF ANY MATERIAL NECESSARY TO COMPLETE THE PROJECT OR ANY PORTION OF THE PROJECT MAY VARY SIGNIFICANTLY FROM THE VOLUMES OR QUANTITIES LISTED IN THE PROJECT PLAN SET OR ANY PORTION, CORRESPONDENCE ADDENDUM TO THE PROJECT PLAN SET. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL VOLUMES OR QUANTITIES PRIOR TO STARTING ANY PORTION OF THE PROJECT THAT MAY HAVE A VOLUME OR QUANTITY NOTED IN THE PROJECT PLAN SET.
IT IS THE CONTRACTORS RESPONSIBILITY TO BRING ATTENTION TO ANY DISCREPANCY PRIOR TO BIDDING THE PROJECT OR REQUEST CLARIFICATION PRIOR TO BIDDING.

THERE MAY BE AN INSTANCE WHERE A MATERIAL IS TO BE EXCAVATED, AN UNSUITABLE MATERIAL REMOVED, (COAL, CLAY...) AND THE MATERIAL IS PLACED BACK IN THE ORIGINAL LOCATION. ALL VOLUMES OR QUANTITIES ARE BASED ON FINISHED GRADE OR FINISHED LENGTH PROJECT ITEM OVERLAPS, SHRINK OR SWELL FACTORS ARE NOT CONSIDERED IN ANY BID ITEM UNLESS OTHERWISE NOTED.
IT IS THE CONTRACTORS RESPONSIBILITY TO IDENTIFY AND NOTIFY KELLY SURVEYING PLLC ANY DISCREPANCIES PRIOR TO CONSTRUCTING, EXCAVATING OR INSTALLING ANY ITEM IDENTIFIED AS DEFICIENT IN ESTIMATION OR UNDER ESTIMATED.
ANY ITEM DISCREPANCY SHALL BE ACCURATELY QUANTIFIED BEFORE OR DURING INSTALLATION. THE OWNER RESERVES THE RIGHT TO PAY FOR ANY ITEM AFTER THE BID IS ACCEPTED.
IF THE CONTRACTOR INSTALLS OR CONSTRUCTS ANY ITEM HAVING A DISCREPANCY, THE CONTRACTOR SHALL PRODUCE AND MAKE AVAILABLE ALL INFORMATION PERTAINING TO THE VOLUME OR QUANTITY SO THAT IT MAY BE CONSIDERED A PAYABLE ITEM.
IF THE CONTRACTOR PERFORMS AN ORIGINAL GROUND SURVEY PRIOR TO STARTING ANY EARTH WORK OPERATIONS AND DETERMINES THERE IS A DISCREPANCY COMPARED TO THE PROJECT PLAN SET THE CONTRACTOR SHALL NOTIFY KELLY SURVEYING PLLC. PRIOR TO STARTING EARTH WORK OPERATIONS, AND SHALL PROVIDE KELLY SURVEYING PLLC WITH THE ORIGINAL GROUND SURVEY WITH LOCATION OF DISCREPANCY IDENTIFIED. THE ORIGINAL GROUND SURVEY SHALL BE BASED ON A TWO FOOT INTERMEDIATE, 10 FOOT INDEX CONTOUR INTERVAL, ANY ORIGINAL GROUND SURVEY PROVIDED BY THE CONTRACTOR SHALL BE BASED ON A TWO FOOT INTERMEDIATE, 10 FOOT INDEX CONTOUR INTERVAL.

15. PROJECT, CONSTRUCTION SEQUENCE:
THE PROJECT PLAN SET DEPICTS A GENERAL CONSTRUCTION SEQUENCE OR TIMELINE FOR INSTALLATION/ CONSTRUCTION ACTIVITIES.
THIS IS KELLY SURVEYING PLLC'S ANTICIPATED SEQUENCE OF EVENTS TO CONSTRUCT THE PROJECT.

EXCEPTING EROSION AND SEDIMENT CONTROL INSTALLATION, THE SEQUENCE SHALL BE CLEARING, EROSION SEDIMENT CONTROL DEVICE INSTALLATION, GRUBBING.
THE GRUBBING OR CLEARING AND GRUBBING IN CONJUNCTION WITH EROSION SEDIMENT CONTROL DEVICE INSTALLATION.
GRUBBING SHALL NOT BE COMPLETED PAST THE INSTALLATION OF EROSION SEDIMENT CONTROL DEVICE INSTALLATION BY THE END OF THE CURRENT WORK DAY.

IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE SEQUENCE AND ORDER OF EVENTS NECESSARY TO COMPLETE THE SCOPE OF WORK.
KELLY SURVEYING PLLC SHALL BE PROVIDED ANY VARIANCE OR CONTRACTORS CONSTRUCTION SEQUENCE IN WRITING PRIOR TO INITIATING ANY CONSTRUCTION ACTIVITIES OR MOBILIZING EQUIPMENT TO THE PROJECT.
IT IS THE CONTRACTORS RESPONSIBILITY TO MANAGE THE PROJECT MATERIAL MANAGEMENT IS A KEY ELEMENT IN EARTH WORK AND THE SCOPE OF WORK; KELLY SURVEYING WILL NOT PROVIDE ANY WAIVER OR DEVIATION FROM THE PROJECT PLAN SET BECAUSE OF POOR PROJECT MANAGEMENT.

16. ACKNOWLEDGEMENT:
UPON SUBMISSION OF THE BID AND/OR BEING AWARDED THE PROJECT, THE CONTRACTOR CERTIFIES THAT HE/SHE HAS THOROUGHLY AND COMPLETELY REVIEWED THE PROJECT PLAN SET AND AGREES TO ALL STANDARDS AND SPECIFICATIONS WITHIN. THE CONTRACTOR ALSO CERTIFIES THAT HE/SHE WILL THOROUGHLY AND COMPLETELY REVIEW THE DESIGN SET WITH THE COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN FOR THE SITE AND ANY NEW/ADDITIONAL COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN FOR THE SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND COMPETENT SUPERINTENDENT, SUPERVISOR OR FOREMAN TO ENSURE THAT ALL WORKERS ARE FAMILIAR WITH THE STANDARDS AND SPECIFICATIONS WITHIN THE PROJECT PLAN SET PERTAINING TO THEIR ASSIGNED TASKS.

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THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

Kelly Surveying

Construction Control, Tolerances and Miscellaneous General Notes
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
Designed By: DC
File No.
Sheet N1 of N1

Jackman Drill Pad

Antero Resources Corporation

Exhibit A: Site As-Built

1. EROSION AND SEDIMENT CONTROL STANDARD OPERATING PROCEDURES (DESIGN STANDARDS):

DESIGNS SHALL INCLUDE EROSION AND SEDIMENT (E&S) CONTROL SYSTEMS AND FACILITES TO CONTROL STORM AND GROUND WATER FLOWS. THE PURPOSE OF THE E&S DESIGN IS TO LIMIT THE CREATION AND TRANSPORT OF SEDIMENT LADEN WATER WITHIN THE CONSTRUCTION SITE AND PREVENT, TO THE MAXIMUM EXTENT, THE TRANSPORT OF SEDIMENT OFF THE CONSTRUCTION SITE. THE PROJECT PLAN SET EMPLOYS BEST MANAGEMENT PRACTICES (BMPS) SUCH AS SILT FENCE, SUPER SILT FENCE, COMPOST FILTER SOCK, VELOCITY BARRIERS, RETENTION CHANNELS, COMPOST FILTER SOCK PYRAMID TRAP, ROCK DITCH, CHECK DAM, CONCRETE WEIR, CATCH BASIN, EROSION CONTROL BLANKET, INLET/OUTLET PROTECTION, LEVEL SPREADER, SCOUR HOLE, DRAINAGE BENCH, CULVERTS, DITCH RELIEF CULVERTS, WATTLES. THE SITE TEMPORARY SEEDING, THE SITE SEEDING OR A COMBINATION OF THE ABOVE CONTROL DEVICES AS APPROPRIATE IN THE DESIGN PROCESS. THE STORM WATER CONTROL SYSTEM DESIGN CONSIDERATIONS INCLUDE THOSE ITEMS NECESSARY TO COMPLY WITH THE RULES AND REGULATIONS AS PROMULGATED BY COUNTY, STATE, FEDERAL GOVERNMENT.

a. FILL AND CUT SLOPES SHALL BE LIMITED TO 50' VERTICAL FEET OR LESS. SLOPES EXCEEDING 50' MUST INCORPORATE FILL OR CUT BENCHES GRADED WITH DRAINS TO THE EDGES OF THE SLOPES.

b. FILL AND CUT SLOPES SHALL BE 2H:1V OR FLATTER. TOPSOIL OR ENGINEERED UNSUITABLE FILL STOCK PILE AREAS SHALL BE ENGINEERED WITH SLOPES 3H:1V OR FLATTER UNLESS APPROVED BY THE OWNER.

c. WHERE UPLAND DRAINAGE IN CUT SLOPE AREAS ARE ANTICIPATED TO CREATE A POTENTIAL ISSUE, AN APPROPRIATELY DESIGNED STRUCTURE (LINED DIVERSION DITCH, DOWN SLOPE STRUCTURE OR CULVERTS WITH OUTLET SCOUR PROTECTION) SHALL BE DESIGNED TO CAPTURE STORM WATER AND CARRY IT AWAY FROM CONSTRUCTION AREAS OR CONTROL STORM FLOWS ACROSS THE CONSTRUCTION SITE WITHOUT COLLECTING SEDIMENT.
THE DRAINAGE STRUCTURE MAY BE TEMPORARILY CONSTRUCTED AND PERMANENTLY CONSTRUCTED OR THE TEMPORARY STRUCTURE REHABILITATED WHEN CUT SLOPES ARE TO FINAL GRADES.

d. BMPS SHALL BE DESIGNED AS PER MANUFACTURER'S STANDARDS WITH AN EXCESS CAPACITY FOR TRAPPED SEDIMENT. DEVICES SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS (ON CONTOUR FOR SILT FENCES AND SOCKS, ETC.) OWNER SPECIFIC EROSION AND SEDIMENT PREFERRED CONTROL STRUCTURES, IF THEY MEET THE DESIGN REQUIREMENT FOR STORM WATER CONTAINMENT, WILL BE USED WHERE APPLICABLE.
THE ENGINEERED DETAILS FOR THE PREFERRED CONTROL WILL BE IN THE PROJECT PLAN SET.

e. DESIGNS SHALL INCORPORATE BMPS TO ALLOW FOR THE EXECUTION OF THE FOLLOWING CONSTRUCTION PRACTICES.

2. EROSION AND SEDIMENT CONTROL STANDARD OPERATING PROCEDURES (CONSTRUCTION):

a. **GENERAL REQUIREMENTS**
EROSION SEDIMENT CONTROL, 404 CONTROLS, OR E&S ARE DEFINED AS, BUT NOT LIMITED TO, SILT FENCE, SUPER SILT FENCE, COMPOST FILTER SOCK, VELOCITY BARRIERS, RETENTION CHANNELS, PYRAMID COMPOST FILTER SOCKS, SEDIMENT TRAP, ROCK LINED DITCH, CHECK DAM, CONCRETE WEIR, CATCH BASIN, EROSION CONTROL BLANKETS, INLET/OUTLET PROTECTION, LEVEL SPREADER, SCOUR HOLE, DRAINAGE BENCH, CULVERTS, DITCH RELIEF CULVERTS, WATTLES, SITE TEMPORARY SEEDING, SITE PERMANENT SEEDING, SITE GRADING MANAGEMENT.
THE ABOVE ITEMS, INDIVIDUALLY OR IN A COMBINATION OF THE ABOVE ITEMS ARE IDENTIFIED WITH LOCATION AND SHOWN IN THE PROJECT PLAN SET.

b. THE CONTRACTOR AND/OR INSTALLER MUST HAVE A CESSWI INSPECTOR ON SITE AT ALL TIMES DURING EROSION SEDIMENT CONTROL DEVICE INSTALLATION. THE CONTRACTOR CESSWI INSPECTOR IS RESPONSIBLE FOR THE CORRECT INSTALLATION OF THE EROSION CONTROL DEVICES AND WILL BE CAPABLE OF COMMUNICATING WITH THE DESIGN ENGINEER AND OWNER REPRESENTATIVES AS WELL AS BEING CAPABLE OF COMMUNICATING AND DIRECTING THE PROPER INSTALLATION REQUIREMENTS TO THE CONTRACTOR/INSTALLER. MANUFACTURER'S INSTALLATION INSTRUCTIONS SHALL BE FOLLOWED WHEN INSTALLING E&S CONTROLS. DEVICES SHALL NOT BE INSTALLED IN A MANNER THAT EXCEEDS THE MANUFACTURER'S RECOMMENDATIONS. SOUND JUDGEMENT AND EXPERIENCE WITH E&S CONTROL INSTALLATION SHALL BE EMPLOYED DURING INSTALLATION AND MAINTENANCE OF E&S CONTROLS. MINOR VARIATIONS OF PLACEMENT OF THE CONTROLS TO ALLOW FOR INSTALLATION IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS ARE HEREBY AUTHORIZED AS LONG AS THESE CHANGES ARE NOTED ON THE DAILY INSPECTION REPORT.

c. CONTROLS SHALL BE INSTALLED AND MAINTAINED SUCH THAT SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE WITHOUT PASSING THROUGH VARIOUS TRAPPING DEVICES TO REMOVE SEDIMENT SUCH THAT SEDIMENT DOES NOT LEAVE THE CONSTRUCTION SITE. THE CONTRACTOR IS RESPONSIBLE FOR ADDING E&S CONTROLS WHERE CONSTRUCTION ACTIVITIES OR PRACTICES CREATE CONDITIONS (UNSEALED DISTURBED AREAS, CONCENTRATED FLOWS, ETC.) WHERE SEDIMENT LADEN WATERS ARE CREATED THAT MAY LEAVE THE CONSTRUCTION SITE.

d. ALL EROSION AND SEDIMENT PREVENTION AND CONTROL BMP'S SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ENSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. NEEDED REPAIRS SHALL BE MADE AS SOON AS PRACTICABLE.
ALL E&S CONTROLS ARE TO REMAIN IN PLACE AND OPERATIONAL DURING ALL PHASES OF CONSTRUCTION.
CONSTRUCTION ACTIVITIES SHALL NOT CONTINUE OR RESUME IN AREAS THAT THE DEVICE IS NOT FUNCTIONING PROPERLY UNTIL REPAIRS TO THE CONTROL DEVICE ARE MADE AND ARE FUNCTIONAL.
ANY SEDIMENT LEAVING THE SITE OR DISCHARGING TO A SENSITIVE AREA SHALL BE STOPPED AND CONTROLLED IMMEDIATELY. CONTAMINATED AREAS SHALL BE CLEANED AND RESTORED.

e. A STABILIZED CONSTRUCTION ENTRANCE(S) AS SHOWN IN THE DETAILS OF THE PROJECT PLAN SET AT THE LOCATION(S) AS SHOWN ON THE PROJECT PLAN SET WILL BE INSTALLED TO PREVENT ANY SOIL OR SEDIMENT FROM BEING CARRIED ONTO THE ROADWAYS. (SEE GENERAL NOTES)

f. THE CONTRACTOR SHALL PROVIDE STABILIZED AREAS FOR EMPLOYEE PARKING AND STORAGE OF CONSTRUCTION MATERIALS. EROSION CONTROL BMPS SHALL BE UTILIZED AS NECESSARY TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING OR SEDIMENT BEING TRANSPORTED FROM VEHICLE PARKING AREAS.

g. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES WHICH INVOLVES POTENTIAL CONTAMINANTS (OIL, SOLVENTS, HYDRAULIC FLUID, ETC.) MUST BE CONDUCTED IN A MANNER WHICH PREVENTS CONTAMINATION OF SOILS, SURFACE WATER AND GROUND WATER. TARPS, DRIP PANS, OR OTHER APPROPRIATE MEASURES SHALL BE USED AS NECESSARY.

h. ALL POLLUTANTS OTHER THAN SEDIMENT SHALL BE STORED, HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM WATER OR SOILS.

i. AT STREAM CROSSINGS, 10' BUFFER AREAS SHOULD BE MAINTAINED. WITHIN THE BUFFERS, CLEARING, VEGETATION DISTURBANCES, EXCAVATION, AND EQUIPMENT TRAFFIC SHOULD BE MINIMIZED. ACTIVITIES SUCH AS STACKING LOGS, BURNING CLEARED BRUSH, DISCHARGING RAINWATER FROM TRENCHES, WELDING PIPE SECTIONS, REFUELING AND MAINTAINING EQUIPMENT SHOULD BE ACCOMPLISHED OUTSIDE THE BUFFERS.

3. CLEARING:

CLEARING LIMITS AND WELL SITE BOUNDARY (WSB) AREAS SHALL BE DELINEATED AND MARKED. DO NOT DISTURB MORE AREA THAN NEEDED FOR CONSTRUCTION REQUIREMENTS. ITS THE CONTRACTORS RESPONSIBILITY TO BE FAMILIAR WITH THE PLANS, UNDERSTAND WHAT AREAS REQUIRE CLEARING AND WHAT AREAS REQUIRE CLEARING AND GRUBBING.
CLEARING YES, GRUBBING NO.
ALL SENSITIVE OR CRITICAL AREAS (WETLANDS, NATURAL WATERWAYS), AND BUFFERS SHALL ALL BE CLEARLY DELINEATED AND CLEARLY MARKED, AND PROTECTED FROM SEDIMENT DEPOSITION.
CLEARING SHALL BE COMPLETED IN ACCORDANCE PROJECT PLAN SET.
CLEARING AREAS WILL BE FLAGGED BY KELLY SURVEYING PLLC. PRIOR TO CLEARING. IF ITS NOT FLAGGED, CALL. IF THE CLEARING CREW OR CONTRACTOR HAS A DIFFICULT TIME UNDERSTANDING THE WELL SITE BOUNDARY, CALL WE WILL ASSIST IN THE UNDERSTANDING OF THE CLEARING LIMITS AND WELL SITE BOUNDARY. (304)338-6986.
CLEARING IS DEFINED AS THE REMOVAL OR FALLING OF TREES, BRUSH, DOWN TIMBER, ROTTEN WOOD, RUBBISH, AND OTHER VEGETATION, AND OBJECTIONABLE MATERIALS AT OR ABOVE ORIGINAL GROUND ELEVATION NOT DESIGNATED TO BE RETAINED. CLEARING ALSO INCLUDES REMOVAL OF FENCES, POSTS, SIGNS, AND DEMOLITION OR REMOVAL OF OTHER OBSTRUCTIONS INTERFERING WITH THE PROPOSED WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FALLING ALL TREES WITHIN THE FLAGGED WELL SITE BOUNDARY (WSB), ANY FALLING OF TREES OR TIMBER IN SENSITIVE AREAS WILL BE BY HAND, NO MECHANICAL EQUIPMENT ALLOWED INSIDE THE SENSITIVE AREA BUFFER ZONES.

4. CLEARING AND GRUBBING OPTION:

*WHERE TREE CLEARING AND GRUBBING ARE REQUIRED, AN OFFSET FROM THE WSB/LOD SHALL BE AGREED UPON BY THE DESIGN ENGINEER, CONTRACTOR, AND OWNER. THIS AGREED UPON AREA IS TO BE CLEARED AND GRUBBED PRIOR TO E&S STAKING AND INSTALLATION. AS THE OFFSET AREA GRUBBING IS BEING COMPLETED, THE SURVEYOR IS TO STAKE THE PROPOSED E&S PER DESIGN AND THE CONTRACTOR SHALL FOLLOW IMMEDIATELY THEREAFTER WITH THE INSTALLATION OF THE E&S CONTROLS (SEDIMENT TRAPS, DIVERSION DITCHES, SUPER SILT FENCE, SILT SOCK, ETC.). GRUBBING IS DEFINED AS THE REMOVAL FROM BELOW THE ORIGINAL GROUND SURFACE OF STUMPS, ROOTS, STUBS, BRUSH, ORGANIC MATERIALS AND DEBRIS AS WELL AS MANMADE AND OTHER OBSTRUCTIONS INTERFERING WITH THE PROPOSED WORK. AFTER THE OFFSET AREA HAS E&S CONTROLS COMPLETELY INSTALLED AND FUNCTIONAL, THE REMAINING AREA WITHIN THE LOD MAY BE CLEARED AND GRUBBED AS REQUIRED FOR CONSTRUCTION.

5. EROSION AND SEDIMENT CONTROL MEASURES:

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND IN WORKING CONDITION PRIOR TO DISTURBING AND EXPOSING SOIL SURFACES.
(I.E. CONSTRUCTION ENTRANCE, SILT FENCE, SUPER SILT FENCE, FILTER SOCK)
THE CONTRACTOR CAN NOT DISTURB ANY AREA WITHOUT EROSION AND SEDIMENT CONTROL IN PLACE, EXCEPT FOR THE DISTURBANCE NECESSARY TO INSTALL THE EROSION AND SEDIMENT DEVICE. CLEARING YES, GRUBBING NO.
THE CONTRACTOR MAY REMOVE STUMPS FOR THE PURPOSE OF INSTALLING E&S CONTROLS. ITS PREFERRED THE CONTRACTOR REMOVE STUMPS AND OTHER OBSTACLES TO ASSURE THE DEVICE IS INSTALLED CORRECTLY.

6. GRUBBING:

THE CONTRACTOR CAN NOT DISTURB ANY AREA WITHOUT EROSION AND SEDIMENT CONTROL IN PLACE, EXCEPT FOR THE DISTURBANCE NECESSARY TO INSTALL THE EROSION AND SEDIMENT DEVICE. CLEARING YES, GRUBBING NO.
GRUBBING SHALL BE COMPLETED IN ACCORDANCE WITH PROJECT PLAN SET. REMOVAL OF ALL STUMPS AND ROOTS WITHIN THE CLEARED AREA UNLESS OTHERWISE APPROVED BY THE ENGINEER OR OWNER. GRUBBING IS DEFINED AS THE REMOVAL FROM BELOW THE ORIGINAL GROUND ELEVATION OF STUMPS, ROOTS, STUBS, BRUSH, ORGANIC MATERIALS AND DEBRIS AS WELL AS CONCRETE AND BRICK, AND OTHER OBSTRUCTIONS INTERFERING WITH THE PROPOSED WORK.
EXPOSED, BARE SOILS SHALL NOT REMAIN UN-STABILIZED FOR MORE THAN TWO DAYS DURING THE PERIOD OF OCTOBER 1 THRU APRIL 30 OR FOR MORE THAN SEVEN DAYS DURING THE PERIOD OF MAY 1 THRU SEPTEMBER 30. ALL DISTURBED SOIL SURFACES SHALL BE STABILIZED BY A SUITABLE APPLICATION OF "BEST MANAGEMENT PRACTICES" OR TEMPORARY SEEDING, TEMPORARY SEEDING IS REQUIRED FROM THE E&S DEVICE TO THE WSB/LOD AFTER E&S INSTALLATION.

a. **LIMIT WORK AREA OF DISTURBANCE**
THE CONTRACTOR SHALL PLAN HIS/HER WORK TO LIMIT THE AMOUNT OF CONSTRUCTION AREA THAT IS GRUBBED AND THEREBY DESTABILIZED/DISTURBED (I.E. DON'T GRUB A 25 ACRE SITE WHEN 10 ACRES WILL SUFFICE FOR ADEQUATE WORK FLOW AND EFFICIENCY). ADDITIONAL AREAS SHALL BE GRUBBED AS NEEDED FOR CONSTRUCTION.
LOGGING ROADS SHALL BE PLANNED AND CONSTRUCTED TO SUPPORT E&S CONTROLS AND CONSTRUCTION EFFORTS. LOGGING ROADS SHALL BE GRADED SUCH THAT STORM AND GROUNDWATER WILL NOT BE ALLOWED TO COLLECT ON THE ROAD. THE CONTRACTOR SHALL HAVE AND MAINTAIN SUFFICIENT E&S CONTROLS IN PLACE WHERE THE CONTRACTOR ALLOWS STORM AND GROUNDWATER TO PASS ACROSS THE LOGGING ROADS.
TEMPORARY SEDIMENT TRAPS, CULVERTS AND ROCK SWALES, LINED DITCHES OR PIPES EXTENDING TO THE TOE OF THE SLOPE WITH APPROPRIATE SEDIMENT TRAPPING DEVICES (SILT SOCK TRAPS, SILT BAGS, RIPRAP ETC.) SHALL BE INSTALLED AS APPROVED BY THE OWNER SO THAT STORM AND GROUNDWATER DOES NOT FLOW IN A MANNER THAT WOULD ERODE SLOPES.

7. TOP SOIL:

THE CONTRACTORS RESPONSIBILITY TO BE FAMILIAR WITH THE PLANS, UNDERSTAND WHAT AREAS REQUIRE TOPSOIL REMOVAL. DO NOT DISTURB AREAS OR STRIP TOPSOIL IN AREAS NOT NEEDED FOR CONSTRUCTION.
STRIP TOPSOIL TO WHATEVER DEPTH IT MAY OCCUR FROM AREAS TO BE EXCAVATED, FILLED, OR GRADED AND STOCKPILE AT A LOCATION AS SHOWN ON THE PROJECT PLAN SET FOR USE IN FINISH GRADING.
THE TOPSOIL SHALL NOT BE USED AS BACKFILL.
STRIP TOPSOIL AREAS IN A MANNER TO PREVENT INTERMINGLING WITH UNDERLYING SUBSOIL OR WASTE MATERIALS. STOCKPILE SUFFICIENT TOPSOIL MATERIAL TO FACILITATE SEEDING AND LANDSCAPING.
GRADE AND SHAPE STOCKPILES TO DRAIN SURFACE WATER.
PROTECT TOP SOIL STOCKPILES USING EROSIONS AND SEDIMENT CONTROL MEASURES AS SHOWN ON THE PROJECT PLAN SET OR BMP'S AS A TEMPORARY MEASURE.
DO NOT STRIP THE ENTIRE SITE AND HAUL TOP SOIL TO THE TOP SOIL PILE.
IT IS NOT DESIGNED TO HOLD A FULL PROJECT STRIPPED OF TOPSOIL.
LEAVE THE TOPSOIL IN THE AREAS BETWEEN THE EROSION CONTROL DEVICE AND THE PROPOSED FULL EXCAVATION AREAS. IMMEDIATELY SPREAD THE TOP SOIL AFTER THE EXCAVATION OR TOE KEY AREA HAS REACHED ORIGINAL GROUND PREPARE THE AREA FOR TEMPORARY SEEDING.

a. **CLEAN TOP SOIL:**
DO NOT DEPOSIT OR BURY ON THE SITE DEBRIS RESULTING FROM THE CLEARING AND GRUBBING. TREES, LOGS, BRANCHES, STUMPS, AND OTHER DEBRIS RESULTING FROM CLEARING AND GRUBBING OPERATIONS SHALL BE DISPOSED OF IN A MANNER AS DIRECTED BY THE OWNER. THE DEBRIS RESULTING FROM CLEARING AND GRUBBING SHALL NOT BE MIXED WITH THE TOPSOIL. THE MATERIAL MUST BE HAULED OFF SITE OR DISPOSED OF AT AN APPROVED FACILITY. AT NO TIME WILL THE CONTRACTOR BE ALLOWED TO COMMINGLE DEBRIS WITH TOPSOIL. IT IS THE CONTRACTORS RESPONSIBILITY TO MANAGE THE PROJECT IN A MANNER THAT WILL NOT INCREASE THE DEBRIS GENERATED BY CLEARING AND GRUBBING. MANAGE STUMPS AND ROOT MATERIAL AT CENTRALIZED LOCATIONS BEFORE CHIPPING AND GRINDING. DO NOT GRIND STUMPS IN PLACE IN AREAS THAT TOPSOIL IS TO BE REMOVED. THERE IS NO PERCENTAGES OF ALLOWABLE DEBRIS IN THE TOPSOIL PILE. THE TOPSOIL PILE IS TO BE FREE OF DEBRIS AND WOODY OR WASTE MATERIAL.

8. DEWATERING DEVICES:

DEWATERING DEVICES SHALL DISCHARGE INTO A SEDIMENT TRAP, SUMP, OR SEDIMENT POND OR EQUIVALENT DEVICE. DISCHARGE FROM THE SITE SHALL BE PROHIBITED UNTIL THE SEDIMENT IS REMOVED BY PASSING THROUGH A CONTROL STRUCTURE. THE STRUCTURE SHALL BE CONSTRUCTED TO REMOVE SEDIMENT LADEN WATER.

9. SILT FENCE OR SUPER SILT FENCE:

SILT FENCE (SF), SUPER SILT FENCE (SSF), PRIORITY 1 BELTED RETENTION FENCE (P1) OR PRIORITY 2 BELTED RETENTION FENCE (P2) SHALL USED AS A SEDIMENT CONTROL DEVICE TO PREVENT SEDIMENT LADEN WATER FROM LEAVING WELL SITE BOUNDARIES, TO MANAGE STORM WATER WITHIN THE SITE, OR TO CREATE SMALL DETENTION AREAS. SILT FENCE PRODUCTS SHALL BE INSTALLED AT LOCATIONS AS SHOWN IN THE PROJECT PLAN, ON CONTOUR WITHIN THE TOLERANCES LISTED IT THE GENERAL NOTE SECTION. THE GEOTEXTILE SHALL BE SECURELY ATTACHED TO THE POSTS AND SUPPORT SYSTEM. BE INSTALLED VERTICAL AND TIGHT BETWEEN THE POSTS, BE ENTRENCHED AS PER THE MANUFACTURES RECOMMENDATIONS BE COMPACTED ON THE UP SLOPE AND DOWN SLOPE SIDE OF THE INSTALLED FENCE. THE ENDS OF THE SEGMENT OF SILT FENCE TYPE PRODUCT SHALL BE TURNED UP SLOPE AS SHOWN ON THE PROJECT PLAN SET DETAILS. THE SILT FENCE PRODUCT SHALL BE INSTALLED TO SATISFACTION OF THE SITE INSPECTOR AND OWNER, SHALL BE INSTALLED BY A QUALIFIED INSTALLER, SHALL BE INSTALLED UNDER THE DIRECTION OF THE CONTRACTOR CESSWI INSPECTOR. THE POST SPACING AND ATTACHMENTS SHALL BE AS SHOWN IN THE PROJECT PLAN SET DETAILS.
ALL SEWN SEAMS AND OVERLAPS SHALL BE LOCATED AT A SUPPORT POST. THE SUPPORT POSTS SHALL BE EITHER WOOD OR STEEL. WOOD POSTS SHALL HAVE MINIMUM DIMENSIONS OF 1¼ BY 1¼ INCHES.
ALL POSTS WOOD OR STEEL SHALL HAVE THE MINIMUM LENGTH SHOWN IN THE PROJECT PLAN DETAILS. POST SPACING AND ATTACHMENTS SHALL BE AS SHOWN IN THE PROJECT PLAN DETAILS.
WHEN SEDIMENT DEPOSITS REACH APPROXIMATELY ½ THE HEIGHT OF THE SILT FENCE, THE DEPOSITS SHALL BE REMOVED AND THE FENCE SHALL BE RE-STABILIZED IN ACCORDANCE WITH THE INITIAL INSTALLATION.
IF TRENCHING IS NOT FEASIBLE DUE TO ROCKY SOILS OR NOT ADVISABLE DUE TO PROXIMITY TO A DOWN SLOPE SENSITIVE AREA, A DIFFERENT SEDIMENT CONTROL DEVICE THAT DOES NOT REQUIRE TRENCHING SHALL BE USED IN PLACE OF SILT FENCE, I.E. FILTER SOCK, TRIPLE STACK TWENTY FOUR INCH FILTER SOCK EQUAL SUPER SILT FENCE, THIRTY TWO INCH FILTER SOCK EQUAL SILT FENCE OR SUPER SILT FENCE WITH BACKUP SUPPORT.
BACKUP SUPPORT IS NEEDED FOR SILT FENCE IN AREAS WHERE EXTRA STRENGTH MAY BE REQUIRED, SUCH AS THE TOE OF STEEP CUT OR FILL SLOPES OR AREAS WHERE EQUIPMENT MAY PUSH EXCESSIVE SOILS TOWARD THE FENCE, OR AS REQUIRED BY THE OWNER.
WHEN BACKUP SUPPORT IS USED, WIRE SHALL HAVE ENOUGH TENSILE STRENGTH TO SUPPORT THE PRODUCT IT IS SUPPORTING, BE TIGHT WITH NO SAGGING BETWEEN POSTS, EQUIVALENT TO OR GREATER THAN AS REQUIRED TO SUPPORT THE SILT OR SUPER SILT FENCE.

10. COMPOST FILTER SOCK:

A FILTER FABRIC FILLED WITH ORGANIC MATERIAL. THE DESIGN OF THE SOCK PROVIDES INTIMATE CONTACT WITH THE GROUND PREVENTING WATER FROM FLOWING UNDERNEATH HEAVY VEGETATION SHOULD BE CUT DOWN OR REMOVED, AND EXTREMELY UNEVEN SURFACES SHOULD BE LEVELED TO ENSURE THAT THE COMPOST FILTER SOCK UNIFORMLY CONTACTS THE GROUND SURFACE.
COMPOST FILTER SOCKS SHOULD BE INSTALLED WHERE RUNOFF CAN BE FILTERED WITHOUT DAMAGING THE COMPOST FILTER SOCK OR THE AREA BEHIND THE SOCK. COMPOST FILTER SOCK SHALL BE INSTALLED TO SATISFACTION OF THE SITE INSPECTOR AND OWNER, SHALL BE INSTALLED BY A QUALIFIED INSTALLER, SHALL BE INSTALLED UNDER THE DIRECTION OF THE CONTRACTOR CESSWI INSPECTOR. THE COMPOST FILTER SOCK SHALL BE INSTALLED AS SHOWN ON THE PROJECT PLAN DETAILS OR AS DIRECTED BY THE ENGINEER.
THE ENDS OF THE FILTER SOCK SHOULD BE TURNED UP SLOPE TO FORM A SMALL DETENTION AREA AND TO PREVENT STORM WATER FROM RUNNING AROUND THE END OF THE SOCK.
STAKES SHALL BE INSTALLED THROUGH THE MIDDLE OF THE COMPOST FILTER SOCK ON 10 FT CENTERS, USING 2 IN BY 2 IN BY 3 FT WOODEN STAKES. ALTERNATIVELY, STAKES CAN BE PLACED ON THE DOWNSTREAM SIDE OF THE SOCK. STAKING DEPTH SHALL BE AS SHOWN IN THE PROJECT PLAN DETAILS. MINIMAL LOOSE COMPOST MAY BE BACKFILLED ALONG THE UP SLOPE SIDE OF THE COMPOST FILTER SOCK, FILLING THE HUNCH AREA BETWEEN THE SOIL SURFACE AND THE DEVICE IMPROVING FILTRATION AND SEDIMENT RETENTION.
COMPOST SHALL NOT BE PLACED IN A MANNER TO ALLOW WATER TO "JUMP" THE COMPOST SOCK.
SEDIMENT SHALL BE REMOVED ONCE IT HAS ACCUMULATED TO ONE HALF THE ORIGINAL HEIGHT OF THE BARRIER. COMPOST FILTER SOCKS SHALL BE REPLACED WHENEVER IT HAS DETERIORATED TO SUCH AN EXTENT THAT THE EFFECTIVENESS OF COMPOST FILTER SOCK IS REDUCED. COMPOST FILTER SOCKS SHALL REMAIN IN PLACE UNTIL DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED. ALL SEDIMENT ACCUMULATION AT THE COMPOST FILTER SOCK SHALL BE REMOVED AND PROPERLY DISPOSED OF BEFORE THE COMPOST FILTER SOCK IS REMOVED.

11. ROCK RIPRAP STONE STRIP:

MUST BE HARD, ANGULAR AND OF A QUALITY RESISTANT TO WEATHERING AND DISINTEGRATION. THE MINIMUM THICKNESS SHALL BE AS DIRECTED BY THE ENGINEER AS SHOWN IN THE PROJECT PLANS WITH A D/50 OR GREATER VALUE. INSTALLED UPSLOPE OF THE COMPOST FILTER SOCK AS SHOWN IN THE LOCATION AS SHOWN IN THE DETAILS ON THE PROJECT PLAN SET.

12. ROCK CHECK DAMS:

SMALL TEMPORARY STONE DAMS CONSTRUCTED ACROSS A DITCH USED TO REDUCE THE VELOCITY OF STORM WATER FLOWS, THEREBY REDUCING EROSION OF THE CHANNEL AND TRAPPING SEDIMENT. THIS PRACTICE IS THE REPLACEMENT FOR THE TRADITIONAL HAY/STRAW BALES AND SILT FENCE DITCH CHECKS. CONSTRUCTING A SMALL DUGOUT TRAP UPSTREAM OF THE STRUCTURE CAN ENHANCE THE SEDIMENT TRAPPING EFFICIENCY.
CONDITIONS WHERE CHECK DAMS APPLIES:
THIS PRACTICE, UTILIZING A COMBINATION OF STONE SIZES, IS LIMITED TO USE IN SMALL OPEN CHANNELS, IT IS NEVER USED IN LIVE STREAMS. CHECK DAMS CAN BE USEFUL IN THE FOLLOWING INSTANSES.TEMPORARY DITCHES OR SWALES PERMANENT DITCHES OR SWALES THAT WON'T BE STABILIZED WITH PERMANENT PROTECTION UNTIL THE END OF THE PROJECT.
TEMPORARY OR PERMANENT DITCHES AND SWALES WHICH NEED PROTECTION DURING THE ESTABLISHMENT OF GRASS LININGS.
THIS PRACTICE IS NOT A SUBSTITUTE FOR MAJOR PERIMETER TRAPPING MEASURES SUCH AS A SEDIMENT TRAP OR A SEDIMENT BASIN.
CONSTRUCTION SPECIFICATIONS SHOULD BE ADHERED TO.
SEE THE PROJECT PLAN DETAILS FOR ORIENTATION OF STONE AND A CROSS SECTIONAL VIEW OF THE CHECK DAM.
EFFORTS SHALL BE MADE TO EXTEND THE STONE TO THE TOP OF CHANNEL BANKS.
THE MAXIMUM HEIGHT OF THE DAM SHOULD BE 3.0 FEET.
THE CENTER OF THE CHECK DAM MUST BE AT LEAST 6 INCHES LOWER THAN THE OUTER EDGES. THIS IS THE SINGLE MOST IMPORTANT ASPECT IN THE PROPER INSTALLATION OF THE ROCK CHECK DAM. HIGH FLOWS MUST GO OVER THE CENTER OF THE DAM, NOT AROUND THE EDGES WHERE SEVERE EROSION CAN OCCUR.

13. OUTLET PROTECTION:

ALL CULVERT OUTLETS SHALL HAVE SOME TYPE OF ENERGY DISSIPATING STRUCTURE FOR EROSION PROTECTION SUCH AS ROCK RIPRAP OR BOULDERS (LARGE UNGRADED FIELD STONE OR SHOT ROCK) LEVEL SPREADERS.
ROCK RIPRAP MUST BE HARD, ANGULAR AND OF A QUALITY RESISTANT TO WEATHERING AND DISINTEGRATION. THE MINIMUM THICKNESS SHALL BE AS DIRECTED BY THE ENGINEER AS SHOWN IN THE PROJECT PLANS WITH A D/50 OR GREATER VALUE.

14. REMOVED SEDIMENT:

TRAPPED SEDIMENT SHALL BE REMOVED, DEPOSITED, AND STABILIZED ON SITE. AREAS DISTURBED WHILE PERFORMING CONTROL MAINTENANCE SHALL BE PERMANENTLY RE-STABILIZED.
SEDIMENT REMOVED FROM BMP'S SHALL BE DISPOSED OF IN AREAS OUTSIDE THE STEEPS SLOPES, WETLANDS, FLOOD PLANE OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL PILES.

15. INSPECTION:

CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EACH RAINFALL EVENT OF 0.5 INCHES OR GREATER. CONTROLS SHALL REQUIRE MAINTENANCE WHEN SEDIMENT DEPOSITS HAVE FILLED CONTROLS TO 50 PERCENT.

a. THE CONTRACTOR SHALL CREATE AND MAINTAIN AN INSPECTION LOG OF THE E&S CONTROL FACILITES. THE INSPECTION LOG SHALL BE KEPT AT A DESIGNATED LOCATION ON SITE AND SHALL BE AVAILABLE FOR REVIEW BY THE OWNER AND OTHERS HAVING JURISDICTION. AN INDIVIDUAL EXPERIENCED IN STORM WATER MANAGEMENT AND KNOWLEDGEABLE WITH THE CONSTRUCTION DRAWINGS AND FAMILIAR WITH THE BMP'S SHALL PERFORM THE INSPECTIONS AND MAINTAIN THE LOG. A CESSWI CERTIFIED INSPECTOR.

b. E&S CONTROL DEFICIENCIES SHALL BE REPAIRED AS SOON AS POSSIBLE. EMERGENCY TEMPORARY REPAIRS WITH FOLLOW-UP PERMANENT REPAIRS SHALL BE PERFORMED AS CONDITIONS REQUIRE TO STOP THE TRANSPORT OF SEDIMENT LADEN WATER FROM LEAVING THE SITE. CONSTRUCTION ACTIVITIES SHALL NOT CONTINUE OR RESUME UNTIL PERMANENT REPAIRS TO THE EROSION CONTROL FACILITIES ARE MADE AND THE FACILITIES ARE FUNCTIONAL. ANY SEDIMENT LEAVING THE SITE OR DISCHARGING TO A SENSITIVE AREA SHALL BE STOPPED AND CONTROLLED IMMEDIATELY. CONTAMINATED AREAS (SENSITIVE OR OTHERWISE) SHALL BE CLEANED AND RESTORED UNDER THE SUPERVISION OF THE OWNER'S ENVIRONMENTAL DEPARTMENT.

c. THE CONTRACTOR SHALL ANTICIPATE E&S REQUIREMENTS AND HAVE SUFFICIENT MATERIALS ON SITE FOR HANDLING STORM EVENTS. THE CONTRACTOR SHOULD BE PREPARED TO PROVIDE EXTRA EROSION CONTROL PROVISIONS AND EFFORT DURING WINTER AND WET WEATHER CONDITIONS BEYOND THAT NORMALLY REQUIRED DURING SUMMER AND DRY WEATHER CONDITIONS.

16. CONSTRUCTION GENERAL PRACTICE AND CONSIDERATIONS:

CONSTRUCTION PRACTICES THAT CREATE SEDIMENT LADEN WATERS SHALL BE MINIMIZED. PROJECT CONSTRUCTION SHALL BE PLANNED TO MINIMIZE EXPOSED UNCONSOLIDATED SOILS. FINE GRAINED AND UNCONSOLIDATED SOILS ON SLOPES WILL BECOME UNSTABLE WHEN SUBJECT TO EXCESSIVE MOISTURE AND RAINFALL. THEREFORE, AREAS THAT HAVE BEEN CLEARED AND GRUBBED SHALL BE LIMITED TO THE AREA NECESSARY TO PERFORM CONSTRUCTION. ALL DISTURBED SLOPES SHALL BE TRACKED IN SMOOTH OR DRUM ROLLED AT THE END OF THE DAY AND PRIOR TO FORESEEABLE STORM EVENTS.

CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. MULCH OR EROSION CONTROL BLANKETS MUST BE INSTALLED ON ALL SLOPES 3H:1V AND STEEPER. EROSION SHALL BE CONTROLLED AND PREVENTED BY SUCH MEASURES AS ROUGHENING THE SURFACE (TRACKING), INSTALLATION OF INTERCEPTOR DITCHES, TERRACING, AND COVERING WITH MATTING, WATTLES, AND/OR MULCH. OFFSITE OR UP GRADIENT RUNOFF SHALL BE PREVENTED FROM ENTERING ONTO A CUT SLOPE AND FROM UNDERCUTTING THE BASE OF FILL SLOPES BY THE USE OF DIVERSION CHANNELS. ALL DIVERSION/CONVEYANCE CHANNELS, BOTH TEMPORARY AND PERMANENT, SHALL BE STABILIZED WITH APPROPRIATE LINING (FLEXAMAT, JUTE, OR RIP RAP, ETC.) AND ROCK CHECKS TO PREVENT EROSION OF THE CHANNEL.

17. SITE STABILIZATION:

IN A TIMELY MANNER (NOT GREATER THAN 7 DAYS AFTER EARTHWORK ACTIVITIES CEASE), THE CONTRACTOR SHALL STABILIZE ALL DISTURBED AREAS. NO EXPOSED OR BARE SOIL AREAS SHALL REMAIN UNSTABILIZED FOR MORE THAN 2 DAYS DURING THE PERIOD OF OCTOBER 1 THROUGH APRIL 30 OR FOR MORE THAN 7 DAYS DURING THE PERIOD OF MAY 1 THROUGH SEPTEMBER 30. ALL DISTURBED SOIL SURFACES SHALL BE STABILIZED BY A SUITABLE APPLICATION OF BMPS (I.E. SEALING WITH A SMOOTH DRUM ROLLER, MULCHING OR MATTING, HYDROSEEDING, ETC.). DURING NON-GERMINATING PERIODS, MULCH/HYDROSEEDING MUST BE APPLIED AT SPECIFIED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE RE-DISTURBED WITHIN 1 YEAR MUST BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY VEGETATIVE METHOD.
CONSTRUCTION SHALL NOT BE CONSIDERED COMPLETE AND ACCEPTABLE UNTIL ALL DISTURBED SOIL SURFACES HAVE BEEN PROTECTED FROM EROSION OR PERMANENTLY STABILIZED. VEGETATED STABILIZATION SHALL BE FERTILIZED, WATERED, AND MAINTAINED.
EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED UNTIL ALL ACTIVITIES ON THE SITE HAVE BEEN COMPLETED AND SURFACES ARE PERMANENTLY STABILIZED, TO ENSURE THAT GROWTH OF VEGETATION IS ESTABLISHED AND SUSTAINED. AREAS SHALL BE CONSIDERED TO HAVE ACHIEVED FULL STABILIZATION WHEN IT HAS A MINIMUM UNIFORM 70% PERENNIAL VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED SURFACE EROSION AND SUBSURFACE CHARACTERISTICS TO RESIST SLIDING AND OTHER MOVEMENTS. THE SITE SHALL BE APPROVED BY THE OWNER, ENGINEER, AND APPROPRIATE AGENCIES.

18. GENERAL NOTES:

DURING DRY WEATHER CONSTRUCTION PERIODS, THE CONTRACTOR SHALL PROVIDE PROJECT-SPECIFIC DUST CONTROL MEASURES THAT MAY INCLUDE BUT ARE NOT LIMITED TO: SEEDING, MULCHING, MATTING, WATER, TACKIFIER, OR CHEMICAL SOIL STABILIZERS. THE CONTRACTOR SHALL MAINTAIN THE DUST CONTROL MEASURES THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. IMMEDIATELY RE-ESTABLISH AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS OR OTHER ACTIVITIES (WIND, WATER, VANDALISM, ETC.).

a. ***THE ABOVE NOTES ARE A MINIMUM TO ADDRESS CONTROL OF EROSION AND SEDIMENTATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL ADDITIONAL CONTROL MEASURES IN ACCORDANCE WITH THE BMPS AS NECESSARY TO STABILIZE THE CONSTRUCTION AREA AND ELIMINATE ALL SEDIMENT FROM LEAVING OR BEING DISCHARGED OFFSITE.(SEE MATERIAL INSTALLATION AND GOVERNING CRITERIA)**

b. *THE DESIGN ENGINEER RECOMMENDS THAT ALL EROSION AND SEDIMENT CONTROL STRUCTURES BE INSTALLED BY A CERTIFIED INSTALLER. INSTALLATION BY THE EARTHWORK CONTRACTOR IS NOT RECOMMENDED UNLESS THE EARTHWORK CONTRACTOR PROVIDES A CESSWI CERTIFIED INSPECTOR TO MONITOR AND INSTRUCT THE EARTHWORK CONTRACTOR ON THE PROPER INSTALLATION OF THE EROSION AND SEDIMENT CONTROL STRUCTURE.
IMPROPERLY/POORLY/INCORRECTLY INSTALLED EROSION AND SEDIMENT CONTROL STRUCTURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR/REPLACE AT THE CONTRACTORS OWN COST. ALL INSTALLATION OF E&S CONTROLS WILL BE INSTALLED TO THE SATISFACTION OF KELLY SURVEYING PLLC CESSWI CERTIFIED INSPECTORS AND THE OWNER REGARDLESS.

Antero Resources

THIS DOCUMENT PREPARED FOR ANTERO RESOURCES CORPORATION

Kelly Surveying

Minimum Erosion and Sediment Control General Notes

Jackman Drill Pad

McElroy District
Tyler County, WV

Date: [illegible]
Scale: As Shown
Designed By: JHC
File No.
Sheet [illegible]

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

1. WORK INCLUDED, BUT NOT LIMITED TO:

EXCAVATE/GRADE, CUT, INSTALL OF ANY ACTIVITY ASSOCIATED WITH THE GRADING, EXCAVATION, CUTTING OR INSTALLATION OF EARTH MATERIAL TO DEVELOP A SITE ACCEPTABLE TO PERFORM WITHOUT DETRIMENTAL IMPACTS TO THE ENVIRONMENT AND OPERATE/FUNCTION SAFELY AS A WELL DRILL PAD OR ASSOCIATED FRESH WATER IMPOUNDMENT OR ANY ASSOCIATED FACILITY OR MAINTENANCE OF SUCH FACILITIES.
ALL THE NOTES SHALL APPLY TO WORK ASSOCIATED WITH ACTIVITIES RELATED TO THE OIL AND GAS INDUSTRY, AS SHOWN ON THE PROJECT PLAN SET AND WITHIN THE WELL SITE BOUNDARIES, SPECIFIED THEREOF AND HEREIN, WHICH SHALL INCLUDE BUT NOT BE LIMITED TO, **THE FOLLOWING:**
EXCAVATION AND SITE PREPARATION, INCLUDING INSTALLATION OF E&S CONTROLS, INSTALLATION OF SUBSURFACE DRAINAGE FEATURES.
GRADING TO ESTABLISH SUBGRADES, AND FINAL GRADES, PAVEMENTS, GRAVEL SURFACES, AND GRASSED AREAS.
EXCAVATION, FILLING AND BACKFILLING AND COMPACTION.
DEWATERING OR ADDITION OF WATER AS REQUIRED.
ADDITIONAL WORK AS SPECIFIED BY THE OWNER.
PLACING OF TOPSOIL AND FINISH GRADING.

2. PROJECT CONDITION:

a. INCLEMENT WEATHER:
WHEN FILL OPERATIONS ARE CEASED DUE TO WEATHER (RAIN, FREEZING, SNOW, ETC.), CONSTRUCTION SHALL NOT BE RESUMED UNTIL THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE HAS VERIFIED SOIL STRENGTH HAS NOT BEEN ADVERSELY AFFECTED. IF SOIL STRENGTH HAS BEEN DECREASED, THE AFFECTED PORTION OF FILL SHALL BE RESCARIFIED, MOISTENED, OR DRIED AS REQUIRED AND RECOMPACTED TO THE SPECIFIED DENSITY.

b. UTILITIES:
PRIOR TO ANY EXCAVATION THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES WHICH MAY BE IN THE AREA.
SHOULD UNCHARTED, INCORRECTLY CHARTED, UNMARKED IN FIELD, OR INCORRECTLY MARKED IN THE FIELD, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONTRACTOR SHALL CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. CONTRACTOR SHALL COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATION, AND SHALL REPAIR OR ARRANGE FOR REPAIR, DAMAGED UTILITIES TO SATISFACTION OF UTILITY OWNER.

c. DRAINAGE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DRAINAGE OF THE SITE DURING CONSTRUCTION OF THE PROJECT. WATER SHALL NOT BE ALLOWED TO ACCUMULATE IN ANY OF THE EXCAVATED AREAS. STORM OR GROUND WATER COLLECTING ON SITE DURING CONSTRUCTION SHALL BE REMOVED BY PUMPING, DITCHING, OR OTHER SUITABLE MEANS.

d. COORDINATION:
THE CONTRACTOR SHALL COORDINATE THE WORK WITH THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE BY NOTIFYING THE INSPECTOR OF SCHEDULED WORK IN ADVANCE.
THE CONTRACTOR SHALL COORDINATE WORK WITH OTHER TRADES WHOSE WORK WILL BE AFFECTED ON THE SITE.

3. DEFINITIONS:

a. GEOTECHNICAL ENGINEER:
A LICENSED INDEPENDENT GEOTECHNICAL ENGINEER AND TEST LABORATORY APPROVED BY THE OWNER WORKING WITH THE DESIGN ENGINEER TO ENSURE THAT EARTHWORK AND THE PROJECT PLAN SET REFLECTS THE AVAILABLE ONSITE MATERIAL.
THAT THE AVAILABLE ONSITE MATERIAL AND COMMERCIAL MATERIAL IS TESTED TO MEET OR EXCEED THE SPECIFICATIONS FOR DENSITY AND MOISTURE CONTENT AND THE PARTICLE SIZE IS MAINTAINED OR APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
THE GEOTECHNICAL ENGINEER SHALL PREPARE A REPORT OF THEIR FINDINGS AND RECOMMENDATIONS, IT IS THE CONTRACTORS RESPONSIBILITY TO READ THE GEOTECHNICAL REPORT BEFORE BIDDING THE PROJECT. THE GEOTECHNICAL REPORT AND THE RECOMMENDATIONS PROVIDED SHALL GOVERN ALL ENGINEERED FILL OR CONTROLLED FILLS.
THE GEOTECHNICAL ENGINEER SHALL ATTEND THE PRE-CONSTRUCTION CONFERENCE.
ENGINEERED FILL, CONTROLLED FILL: CONTROLLED FILL IS DEFINED AS MATERIAL REQUIRED IN ALL AREAS ON WHICH FINAL GRADE IS NOT PLACED ON ORIGINAL OF EXCAVATED SOIL. MATERIAL SHALL BE PLACED OF MAXIMUM LOOSE LIFT THICKNESS 15 INCHES COMPACTED TO 12 INCHES.

b. ROCK:
FOR THE PURPOSES OF CLASSIFIED EXCAVATION, ROCK SHALL BE DEFINED AS MATERIAL THAT CANNOT BE DISLODGED BY A CATERPILLAR MODEL NO. D-8N, HEAVY DUTY TRACK-TYPE TRACTOR, OR OF EQUALLY RATED AT NOT LESS THAN 285 HP FLYWHEEL POWER AND EQUIPPED WITH A SINGLE SHANK HYDRAULIC RIPPER, CAPABLE OF EXERTING NOT LESS THAN 45,000 LBS BREAKOUT FORCE. THIS DEFINITION OF ROCK DOES NOT INCLUDE MATERIALS SUCH AS HARDPAN, LOOSE ROCK, OR OTHER MATERIALS THAT CAN BE REMOVED BY MEANS OTHER THAN DRILLING AND BLASTING, BUT WHICH FOR REASONS OF ECONOMY IN EXCAVATING THE CONTRACTOR CHOOSES TO REMOVE BY DRILLING AND BLASTING. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE ROCK AND IF BLASTING IS REQUIRED FOR THIS PROJECT. IF THE CONTRACTOR DETERMINES THAT BLASTING IS NECESSARY OR FOR REASONS OF ECONOMY DETERMINES TO BLAST THE MATERIAL THE CONTRACTOR SHALL PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, TREES AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS CREATED BY BLASTING OPERATIONS.

c. UNSUITABLE MATERIAL:
UNSUITABLE MATERIAL SHALL BE DEFINED AS MATERIAL THAT EXHIBITS EXCESSIVE PUMPING OR THAT DOES NOT MEET DENSITY REQUIREMENTS, THE MATERIAL CAN NOT MEET THE COMPACTION REQUIREMENTS OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

d. SATISFACTORY MATERIALS:
MATERIALS ARE SATISFACTORY AS FILL MATERIAL WHEN THEY CAN MEET THE STANDARD PROCTOR FOR THE MATERIAL CLASSIFICATION IN THE GEOTECHNICAL REPORT, CLASS A, CLASS B, CLASS C, USED AS PER THE GEOTECHNICAL REPORT.
[illegible]
MEET THE DENSITY REQUIREMENT, SATISFACTORY MATERIAL SHALL BE ABLE TO COMPACT TO 95 PERCENT OF THE STANDARD PROCTOR PER ASTM D 698 SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698, BE THE CORRECT PARTICLE SIZE PER THE PROJECT PLAN SET OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

e. UNSATISFACTORY MATERIALS:
INCLUDE THOSE MATERIALS CONTAINING ROOTS AND OTHER ORGANIC MATTER, TRASH, DEBRIS, FROZEN MATERIALS, EXCESSIVELY WET MATERIAL, MATERIAL THAT EXCEEDS THE PARTICLE SIZE OR MATERIAL DETERMINE UNSATISFACTORY BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

f. DEGREE OF COMPACTION:
IS A PERCENTAGE OF THE MAXIMUM DENSITY OBTAINED BY THE TEST PROCEDURE PRESENTED IN ASTM D 698, AS A PERCENT OF LABORATORY MAXIMUM DENSITY, OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

g. OPTIMUM MOISTURE:
MAXIMUM DENSITY CURVE FOR EACH TYPE OF SOIL USED FOR ENGINEERED CONTROLLED FILL.

h. TOPSOIL:
MATERIAL OBTAINED FROM EXCAVATIONS, SUITABLE FOR TOP SOILS SHALL CONSIST OF FRIABLE CLAY LOAM, FREE FROM ROOTS, STONES, OTHER UNDESIRABLE MATERIAL AND SHALL BE CAPABLE OF SUPPORTING A GOOD GROWTH OF GRASS.

i. SOIL BEARING CAPACITY:
SOIL UNDERNEATH ALL FOOTINGS AND STRUCTURES SHALL HAVE A MINIMUM BEARING CAPACITY OF 2000 POUNDS PER SQUARE FOOT, AS DETERMINED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE.

4. TEST BORINGS:

A SUBSURFACE INVESTIGATION HAS BEEN MADE AT THE SITE OF THE PROJECT IN ORDER TO ASCERTAIN CHARACTER OF MATERIALS TO BE EXCAVATED. THIS INFORMATION IS PROVIDED FOR GENERAL INFORMATION ONLY. ATTENTION IS DIRECTED TO THE FACT THAT THESE LOGS INDICATE MATERIALS ENCOUNTERED AT BORING LOCATIONS ONLY. NOTHING IN THE PLANS OR SPECIFICATIONS SHALL BE TAKEN AS A GUARANTEE THAT MATERIALS OTHER THAN THOSE DISCLOSED BY BORINGS WILL BE ENCOUNTERED OR THAT PROPORTIONS OF VARIOUS MATERIALS WILL NOT VARY FROM THOSE INDICATED. IF THE CONTRACTOR HAS ANY QUESTIONS OR DESIRES ADDITIONAL INFORMATION IT IS HIS RESPONSIBILITY TO ACQUIRE THIS INFORMATION AT HIS OWN EXPENSE. ALL EXCAVATION FOR PROJECT IS TO BE CONSIDERED AS BID AND NO ALLOWANCES WILL BE MADE FOR ROCK ENCOUNTERED OR REMOVAL AND REPLACEMENT OF UNSUITABLE MATERIAL.

5. CONSTRUCTION:

a. CONSERVATION OF TOPSOIL:
TOPSOIL SHALL BE REMOVED AS REQUIRED WITHOUT CONTAMINATION WITH SUBSOIL AND STOCKPILED AT CONVENIENT AREAS FOR LATER APPLICATION OR AT LOCATIONS SPECIFIED IN THE PROJECT PLAN SET. ANY SURPLUS OF TOPSOIL FROM EXCAVATIONS AND GRADING SHALL BE STOCKPILED IN A LOCATION APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

b. PLACING TOPSOIL:
ON AREAS TO RECEIVE TOPSOIL, THE COMPACTED AREA SHALL BE SCARIFIED TO A 2 INCH DEPTH FOR BONDING OF TOPSOIL WITH SUBSOIL. TOPSOIL THEN SHALL BE SPREAD EVENLY AND GRADED TO THE ELEVATIONS AND SLOPES SHOWN. TOPSOIL SHALL NOT BE SPREAD WHEN FROZEN OR EXCESSIVELY WET OR DRY OR EXCEED FOUR (4) INCHES IN DEPTH ON SLOPES STEPPER THAN THREE TO ONE (3:1).

c. EXCAVATION:
EXCAVATION SHALL BE: FOR THOSE ITEMS SPECIFICALLY INDICATED IN THE PROJECT PLAN SET, AFTER TOPSOIL REMOVAL HAS BEEN COMPLETED, EXCAVATION OF EVERY DESCRIPTION, REGARDLESS OF MATERIAL ENCOUNTERED, WITHIN THE GRADING LIMITS OF THE PROJECT SHALL BE PERFORMED TO REASONABLE CONFORMANCE TO THE LINES AND GRADES INDICATED IN THE PROJECT PLAN SET. SATISFACTORY EXCAVATED MATERIAL SHALL BE TRANSPORTED TO AND PLACED IN FILL AREAS WITHIN THE LIMITS OF THE WORK. UNSATISFACTORY MATERIAL SOFT OR OTHERWISE UNSATISFACTORY MATERIAL SHALL BE REPLACED WITH SATISFACTORY MATERIAL EXCAVATED MATERIAL OR OTHER APPROVED MATERIALS.
ALL UNSUITABLE MATERIAL INCLUDING ANY SOIL WHICH IS DISTURBED BY THE CONTRACTOR'S OPERATIONS AND SURPLUS MATERIAL SHALL BE REGRADED SEEDED AND MULCHED.
EXCAVATION AND FILLING SHALL BE PERFORMED IN A MANNER AND SEQUENCE THAT WILL PROVIDE DRAINAGE AT ALL TIMES. EXCAVATIONS SHALL BE KEPT FREE FROM WATER WHILE CONSTRUCTION THEREIN IS IN PROGRESS. IF THE CONTRACTOR FAILS TO PROVIDE ADEQUATE DRAINAGE AND THE MATERIAL BECOMES SOFT OR OTHERWISE UNSUITABLE AS A RESULT, SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SATISFACTORY ON SITE MATERIAL OR BORROW MATERIAL FROM APPROVED LOCATIONS, OR SHALL BE DRIED AND RECOMPACTED AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

d. DITCHES, GUTTERS, AND CHANNEL CHANGES:
DITCHES, GUTTERS, AND CHANNEL CHANGES OR ANY SIMILAR CONSTRUCTED CONVEYANCE SHALL BE CUT ACCURATELY TO THE CROSS SECTIONS AND GRADES INDICATED. ALL ROOTS, STUMPS, ROCK, AND FOREIGN MATTER IN THE SIDES AND BOTTOM OF DITCHES, GUTTERS, AND CHANNEL CHANGES SHALL BE TRIMMED AND DRESSED OR REMOVED TO CONFORM TO THE SLOPE, GRADE, AND SHAPE OF THE SECTION INDICATED. CARE SHALL BE TAKEN TO EXCAVATE DITCHES AND GUTTERS TO THE GRADES INDICATED.
EXCESSIVE DITCH AND GUTTER EXCAVATION SHALL BE BACKFILLED TO GRADE EITHER WITH COMPACTED TO SPECIFIED DENSITIES MATERIAL OR WITH SUITABLE STONE OR AGGREGATE TO FORM AN ADEQUATE CONVEYANCE STRUCTURE AS DIRECTED. ALL DITCHES AND GUTTERS EXCAVATED SHALL BE MAINTAINED UNTIL FINAL ACCEPTANCE OF THE WORK.
SATISFACTORY MATERIAL EXCAVATED FROM DITCHES AND CHANNEL CHANGES SHALL BE PLACED IN FILL AREAS OR AREAS APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
UNSUITABLE AND EXCESS MATERIAL SHALL BE DISPOSED OF IN DESIGNATED WASTE AREAS OR AS DIRECTED THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

e. STABILITY OF EXCAVATIONS:
MAINTAIN SIDES AND SLOPES OF EXCAVATIONS IN A MANNER SUCH THAT THE EXCAVATION PROVIDES SAFETY OF PERSONNEL, **CFR 29 PART 1926 SUBPART P**
PROTECTION OF WORK, AND COMPLIANCE WITH REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES.

f. PREPARATION OF GROUND SURFACE FOR FILL:
ALL VEGETATION SUCH AS ROOTS, BRUSH, HEAVY SODS, HEAVY GROWTH OF GRASS, AND ALL DECAYED VEGETATIVE MATTER, RUBBISH, AND OTHER UNSATISFACTORY MATERIAL WITHIN THE AREA UPON WHICH FILL IS TO BE PLACED, SHALL BE STRIPPED OR OTHERWISE REMOVED BEFORE THE FILL IS STARTED. IN NO CASE WILL UNSATISFACTORY MATERIAL REMAIN IN OR UNDER THE FILL AREA. THE AREAS SHALL THEN BE EXCAVATED TO DURABLE MATERIAL CAPABLE OF ACCEPTING SUPPORTING THE FILL.
THE DEPTH SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
ALL AREAS TO RECEIVE FILL SHALL BE COMPACTED WITH VIBRATORY ROLLERS, PNEUMATIC ROLLERS, SHEEPSFOOT ROLLERS OR OTHER MECHANICAL MEANS ACCEPTABLE TO THE GEOTECHNICAL ENGINEER OR SITE INSPECTOR. GROUND SURFACES ON WHICH FILL IS TO BE PLACED SHALL BE PLOWED, STEPPED, BENCHED, OR BROKEN UP, AS DIRECTED, IN SUCH MANNER THAT THE FILL MATERIAL WILL BOND WITH THE EXISTING SURFACE. PREPARED SURFACES ON WHICH COMPACTED FILL IS TO BE PLACED SHALL BE WETTED OR DRIED AS MAY BE REQUIRED TO OBTAIN THE SPECIFIED MOISTURE CONTENT AND DENSITY. BEFORE ANY AREA CAN RECEIVE FILL IT MUST BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

g. FILLS AND EMBANKMENTS:
FILLS AND EMBANKMENTS SHALL BE CONSTRUCTED AT THE LOCATIONS AND TO LINES AND GRADES INDICATED. THE COMPLETED FILL SHALL CONFORM TO THE PROJECT PLAN SET. APPROVED MATERIAL OBTAINED DURING EXCAVATION MAY BE USED IN FORMING REQUIRED FILL. FILL SHALL BE CONSTRUCTED WITH SATISFACTORY MATERIAL AND SHALL BE FREE FROM ROOTS, OTHER ORGANIC MATERIAL. NO FROZEN MATERIAL WILL BE PERMITTED IN THE FILL. ALL FILL MATERIAL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

h. COMPACTION:
EACH LAYER OF THE FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS DETERMINED BY ASTM D 698. MOISTURE CONTENT SHALL BE WITHIN +/-4 PERCENT POINTS OF OPTIMUM MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698.

i. FINISHED GRADE:
ALL AREAS COVERED BY THE PROJECT PLAN SET, INCLUDING EXCAVATED AND FILLED SECTIONS AND ADJACENT TRANSITION AREAS, SHALL BE UNIFORMLY SMOOTH-GRADED. THE FINISHED SURFACE SHALL BE REASONABLY SMOOTH, COMPACTED, AND FREE FROM IRREGULAR SURFACE CHANGES. THE DEGREE OF FINISH SHALL BE WITHIN THE TOLERANCES LISTED IN THE PROJECT PLAN SET EXCEPT AS APPROVED BY THE THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
DITCHES AND GUTTERS SHALL BE FINISHED TO PERMIT ADEQUATE DRAINAGE AND WITHIN THE TOLERANCES LISTED IN THE PROJECT PLAN SET.
LOW AREAS RESULTING FROM REMOVAL OF UNSUITABLE MATERIAL OR FROM EXCAVATION OF ROCK SHALL BE BROUGHT UP TO REQUIRED GRADE WITH SATISFACTORY MATERIALS, AND THE ENTIRE AREA SHALL BE SHAPED TO LINE, GRADE, AND CROSS SECTION AND SHALL BE COMPACTED AS SPECIFIED.

j. PROTECTION SITE PRESERVATION:
THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE OF THE WORK SHALL MAINTAIN GRADE OR REPAIR ALL AREAS TO THE LINES, GRADES, AND CROSS SECTIONS SHOWN IN THE PROJECT PLAN SET AND PROTECT FROM TRAFFIC,WIND,WATER EROSION, WASHOUTS, SETTLEMENT, SUBSIDENCE, OR OTHER MISHAPS WHICH MAY OCCUR, REPAIR ANY SLIDES, AND ANY SETTLEMENT OR WASHING AWAY THAT MAY OCCUR FROM ANY CAUSE PRIOR TO THE ACCEPTANCE.

k. TESTING:
THE CONTRACTOR SHALL GIVE THE OWNER OR HIS REPRESENTATIVE AT LEAST 48 HOURS NOTICE PRIOR TO OPENING ANY NEW SOIL EXCAVATION AND/OR BARROW AREAS TO BE USED IN EMBANKMENT/FILL CONSTRUCTION. SAID NOTICE IS REQUIRED TO GIVE THE OWNER ADEQUATE TIME TO OBTAIN SOIL SAMPLES FOR MOISTURE DENSITY TESTING (COMPACTION TEST) TO MONITOR FILL PLACEMENT. IF REQUIRED, THE CONTRACTOR SHALL SUPPLY THE NECESSARY EQUIPMENT AND OPERATOR TO OBTAIN THE SOIL SAMPLES.
TEST SHALL BE MADE BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE.

h. TESTING FREQUENCY:
A MINIMUM OF ONE MOISTURE-DENSITY TEST SHALL BE PERFORMED FOR EACH CLASSIFICATION OF FILL MATERIAL, A MINIMUM OF ONE TEST PER LIFT OR PER 1000 SQUARE FEET OR FRACTION THEREOF IS REQUIRED FOR FILL MATERIAL OR AS DETERMINED BY THE GEOTECHNICAL ENGINEER.

i. VISUAL INSPECTION:
UPON COMPLETION OF AND DURING THE INSTALLATION OF ANY PRODUCT OR MATERIAL OR ALL EARTH WORK OPERATIONS, CUTTING, FILLING ETC.
THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE SHALL VISUALLY INSPECT ALL MATERIALS AND EXCAVATIONS. THE VISUAL INSPECTION SHALL BE CONDUCTED TO ASSURE THAT THE DATA OBTAINED FROM THE TEST RESULTS AND THE PROJECT PLAN SET ARE REPRESENTATIVE OF THE SITE CONDITIONS.

6 PARTICLE SIZE USED IN FILL AREAS:

THE MATERIAL SHALL BE PLACED IN SUCCESSIVE HORIZONTAL LAYERS OF 15 INCHES IN LOOSE DEPTH, 12 INCHES COMPACTED FOR THE FULL WIDTH OF THE CROSS SECTION AND SHALL BE COMPACTED AS SPECIFIED. EACH LAYER SHALL BE COMPACTED AND TESTED BEFORE THE OVERLAYING LIFT IS PLACED. MOISTURE CONTENT OF THE FILL OR BACKFILL MATERIAL SHALL BE ADJUSTED BY WETTING OR AERATING AS NECESSARY TO PROVIDE THE MOISTURE CONTENT SPECIFIED, OR AS DETERMINED BY GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC INSPECTOR.

a. CONSTRUCTION OF FRESH WATER IMPOUNDMENTS:
CONSTRUCT THE EMBANKMENT USING MAXIMUM PARTICLE SIZES (IN ANY DIMENSION) AS:
IN TOP 36 INCHES: 3 INCHES (IN ANY DIMENSION)
36 TO 48 INCHES: 6 INCHES (IN ANY DIMENSION)
IN THE DEPTH BELOW 24 INCHES:
NOT TO EXCEED 12 INCHES (IN ANY DIMENSION), THE ENTIRE LIFT SHALL NOT BE CONSTRUCTED WITH 12 INCH MATERIAL OR THE COMPACTED THICKNESS OF THE LAYER BEING PLACED, WHICHEVER IS LESS, THE 12 INCH MATERIAL SHALL BE MIXED WITH SMALLER PARTICLES TO PRODUCE A UNIFORM VOID FREE LIFT.
SPREAD ALL MATERIAL SO THAT THE LARGER PARTICLES ARE SEPARATED FROM EACH OTHER TO MINIMIZE VOIDS BETWEEN THEM DURING COMPACTION. COMPACT AROUND THESE ROCKS IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS.
EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSIONS CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS.

ALL MATERIAL WILL BE AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

b. CONSTRUCTION OF THE WELL DRILL PAD OR FACILITY PAD:
CONSTRUCT THE PAD BASE USING MAXIMUM PARTICLE SIZES (IN ANY DIMENSION) AS:
IN TOP 48 INCHES: 3 INCHES (IN ANY DIMENSION)
48 INCHES AND BELOW: 6 TO 12 INCHES (IN ANY DIMENSION)
IN THE DEPTH BELOW 48 INCHES:
NOT TO EXCEED 12 INCHES (IN ANY DIMENSION), THE ENTIRE LIFT SHALL NOT BE CONSTRUCTED WITH 12 INCH MATERIAL OR THE COMPACTED THICKNESS OF THE LAYER BEING PLACED, WHICHEVER IS LESS., THE 12 INCH MATERIAL SHALL BE MIXED WITH SMALLER PARTICLES TO PRODUCE A UNIFORM VOID FREE LIFT.
SPREAD ALL MATERIAL SO THAT THE LARGER PARTICLES ARE SEPARATED FROM EACH OTHER TO MINIMIZE VOIDS BETWEEN THEM DURING COMPACTION. COMPACT AROUND THESE ROCKS IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS.
EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSION CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS.
ALL MATERIAL WILL BE AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.

c. ENGINEERED ADDITIONAL FILL AREAS:
3 TO 12 INCHES OR SMALLER
EXCEPTING THAT LARGER MATERIAL, LESS THAN 18 INCHES IN ANY DIMENSION CAN BE USED IN THE TOE KEY AREA TO A POINT MEASURED ON THE LOWEST POINT OF THE SLOPE 24 INCHES BELOW ORIGINAL GROUND.
WHEN AND WHERE APPROVED BY THE ENGINEER, LARGER ROCKS (NOT TO EXCEED 18 INCHES IN ANY DIMENSION) MAY BE PLACED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
COMPACT AROUND THESE ROCKS TO A FIRMNESS EQUAL TO THAT OF THE SUPPORTING SOIL. IN AREAS THAT EXCEED 12 INCH LIFT THICKNESS, PROOF ROLLING MAY BE USED TO SATISFY THE COMPACTION REQUIREMENTS.

7. PROOF ROLLING:

IMMEDIATELY FOLLOWING THE COMPLETION OF EARTH WORK OR COMPLETION OF THE LIFT IN THE AREA TO BE PROOF ROLLED AND ONLY FOR THE LIFT THAT THE GEOTECHNICAL ENGINEER OR KELLY SURVEYING PLLC HAVE GRANTED A WAIVER ON THE MATERIAL PARTICLE SIZE FOLLOWING A VISUAL INSPECTION, CONTRACTOR SHALL DEMONSTRATE THE FINISHED LIFT DOES NOT CONTAIN PREVIOUSLY UNIDENTIFIED SOFT AREAS, OBSERVING THE SURFACE FOR DISPLACEMENT OR DEFORMATION.
THE COVERAGE AREAS AND METHODS SHALL BE AS DIRECTED BY THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE.
THE LIFT SHALL THEN BE PROOF ROLLED.

PROOF ROLLING SHALL BE DONE WITH ONE PASS OF A FULLY LOADED TANDEM DUMP TRUCK EQUAL TO OR EXCEEDING 50,000 LBS OR EQUALLY SIZED APPROVED CONSTRUCTION EQUIPMENT.

THE EQUIPMENT SHALL BE OPERATED AT A SPEED THAT THE GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE OR THE KELLY SURVEYING PLLC REPRESENTATIVE CAN COMFORTABLY AND SLOWLY WALK ALONG SIDE THE EQUIPMENT.

ANY AREAS WHICH DEFLECT, RUT OR PUMP UNDER THE LOADED DUMP TRUCK SHALL BE UNDERCUT AND REPLACED WITH COMPACTED FILL MATERIAL OR OF SMALLER MATERIAL WORKED UNTIL A RELATIVELY UNYIELDING SURFACE IS ACHIEVED.

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Kelly Surveying

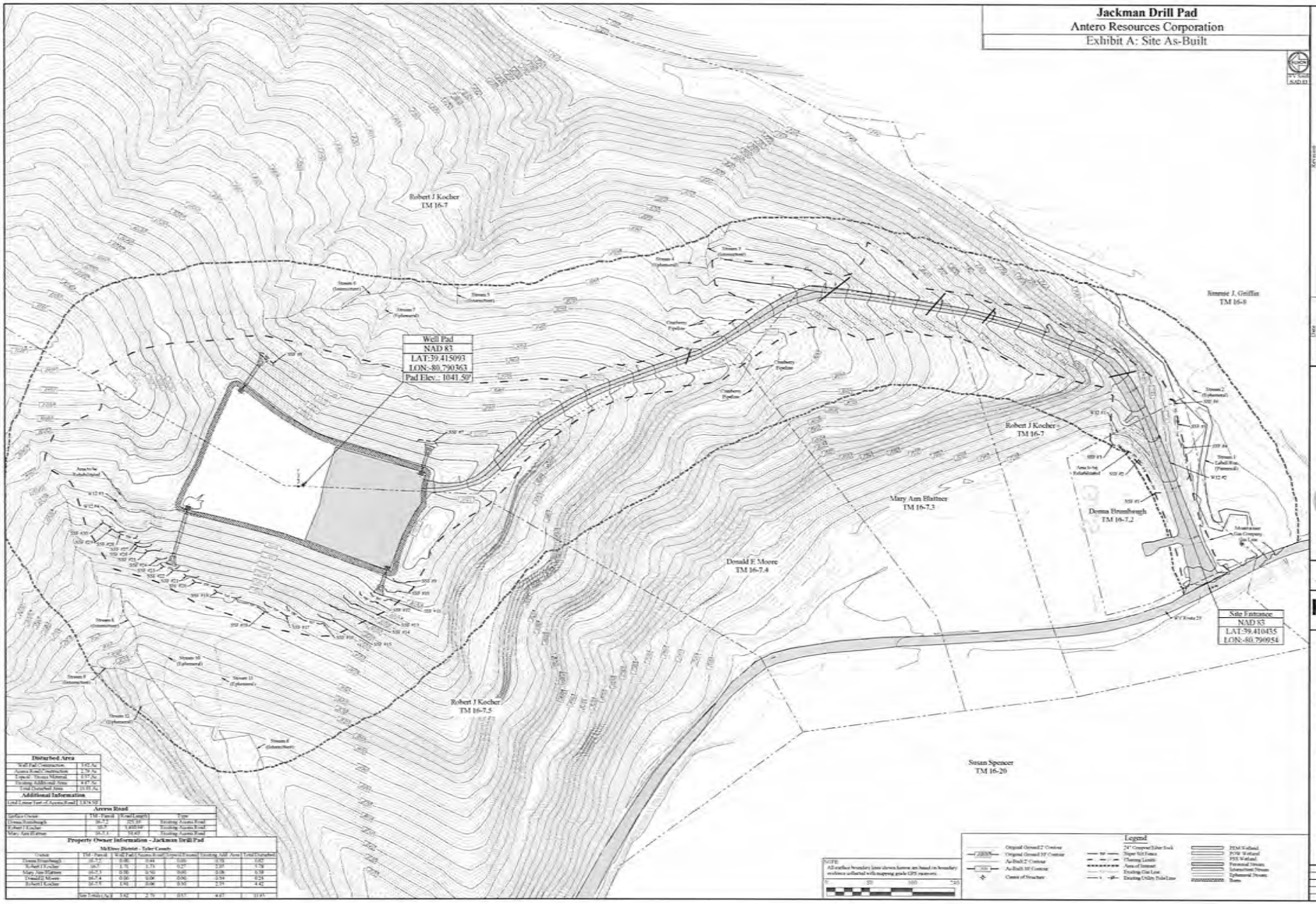
Construction and Earth Work General Notes
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: [illegible]
Scale: As Shown
Designed By: [illegible]
File No.
Sheet [illegible]

Jackman Drill Pad

Antero Resources Corporation

Exhibit A: Site As-Built



Disturbed Area	
Well Pad Construction	3.42 Ac
Access Road Construction	2.79 Ac
Topsoil / Stream Material	0.57 Ac
Existing Additional Area	4.67 Ac
Total Disturbed Area	11.45 Ac
Additional Information	
Total Linear Feet of Access Road	1,874.50'

Access Road

Surface Owner	TM - Parcel	Road Length	Type
Donna Hornbaugh	16-7.2	292.50'	Existing Access Road
Robert J Kocher	16-7	1,400.00'	Existing Access Road
Mary Ann Blattner	16-7.3	181.60'	Existing Access Road

Property Owner Information - Jackman Drill Pad

McElroy District - Tyler County

Owner	TM - Parcel	Well Pad	Access Road	Topsoil/Stream	Existing Add' Area	Total Disturbed
Donna Hornbaugh	16-7.2	0.00	0.44	0.00	0.10	0.62
Robert J Kocher	16-7	3.42	1.75	0.57	2.07	7.81
Mary Ann Blattner	16-7.3	0.00	0.30	0.00	0.08	0.38
Donald E Moore	16-7.4	0.00	0.06	0.00	0.19	0.25
Robert J Kocher	16-7.5	0.00	0.24	0.00	2.19	4.42
	Site Totals (Ac)	3.42	2.79	0.57	4.67	11.45

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Kelly Surveying

Overall Plan View

Jackman Drill Pad

McElroy District, Tyler County, WV

Date: 05-19-2016

Scale: As Shown

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File No.

Sheet 2 of 9

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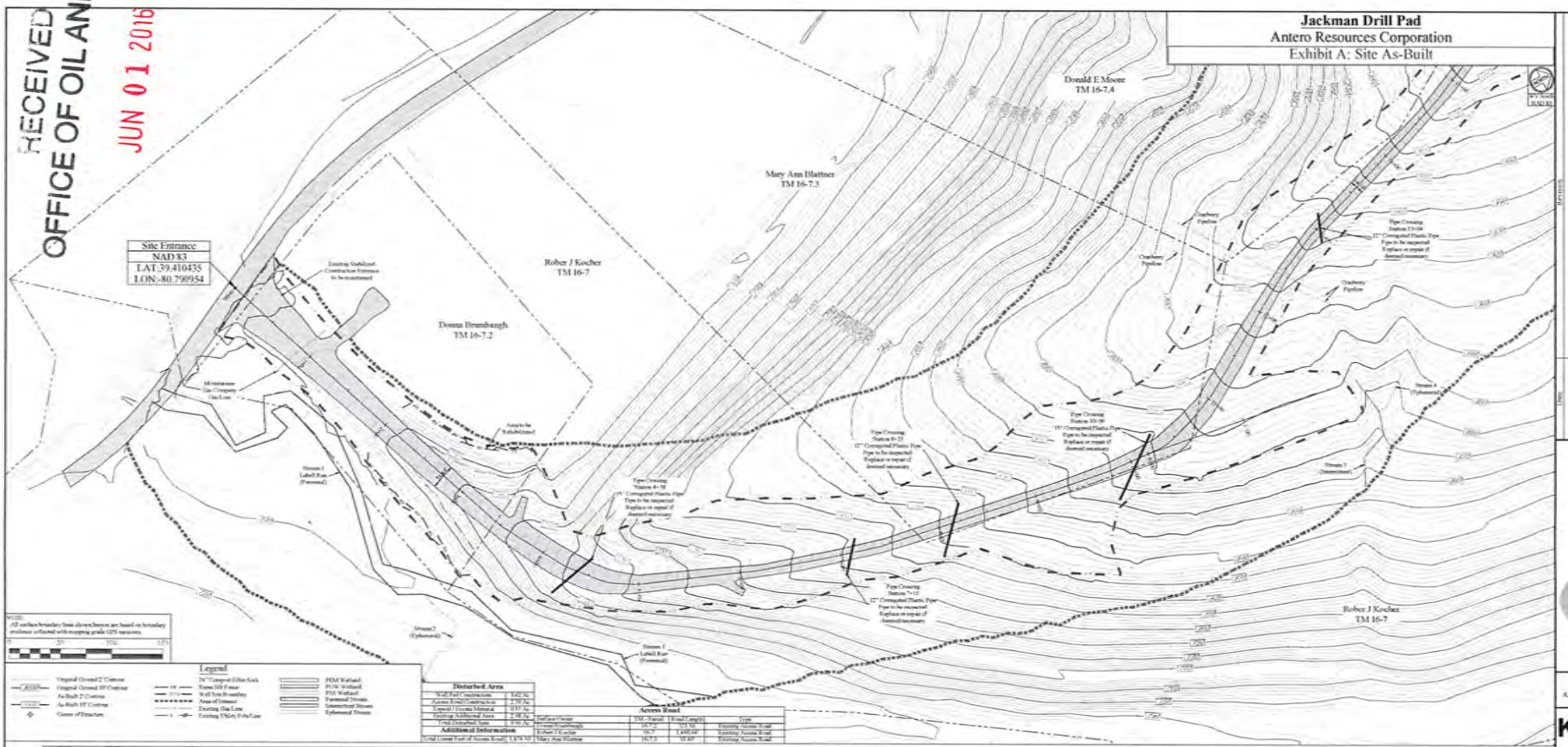
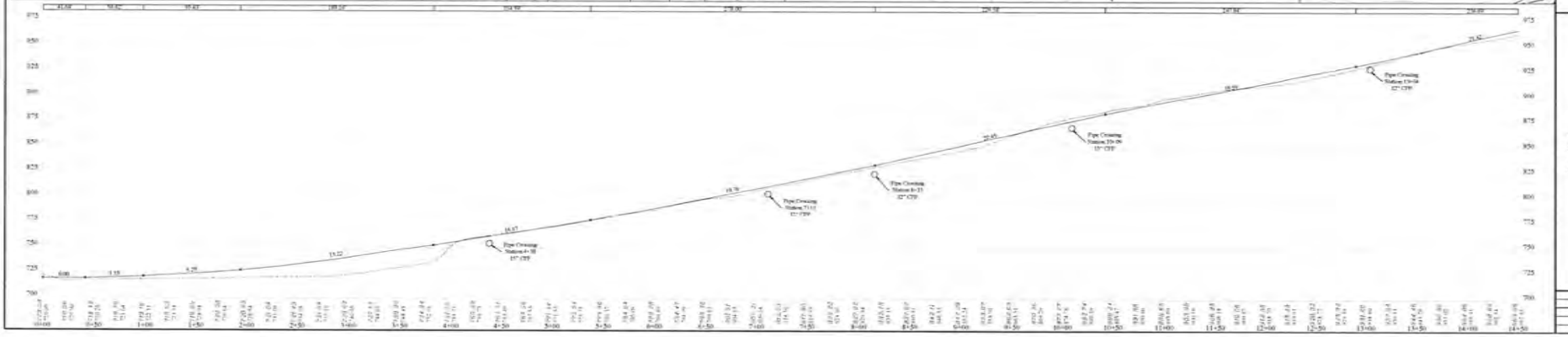
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built





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Plan View
Jackman Drill Pad
McElroy District,
Tyler County, WV

Date: 05/09/2016
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File No.
Sheet 4 of 9

Jackman Drill Pad

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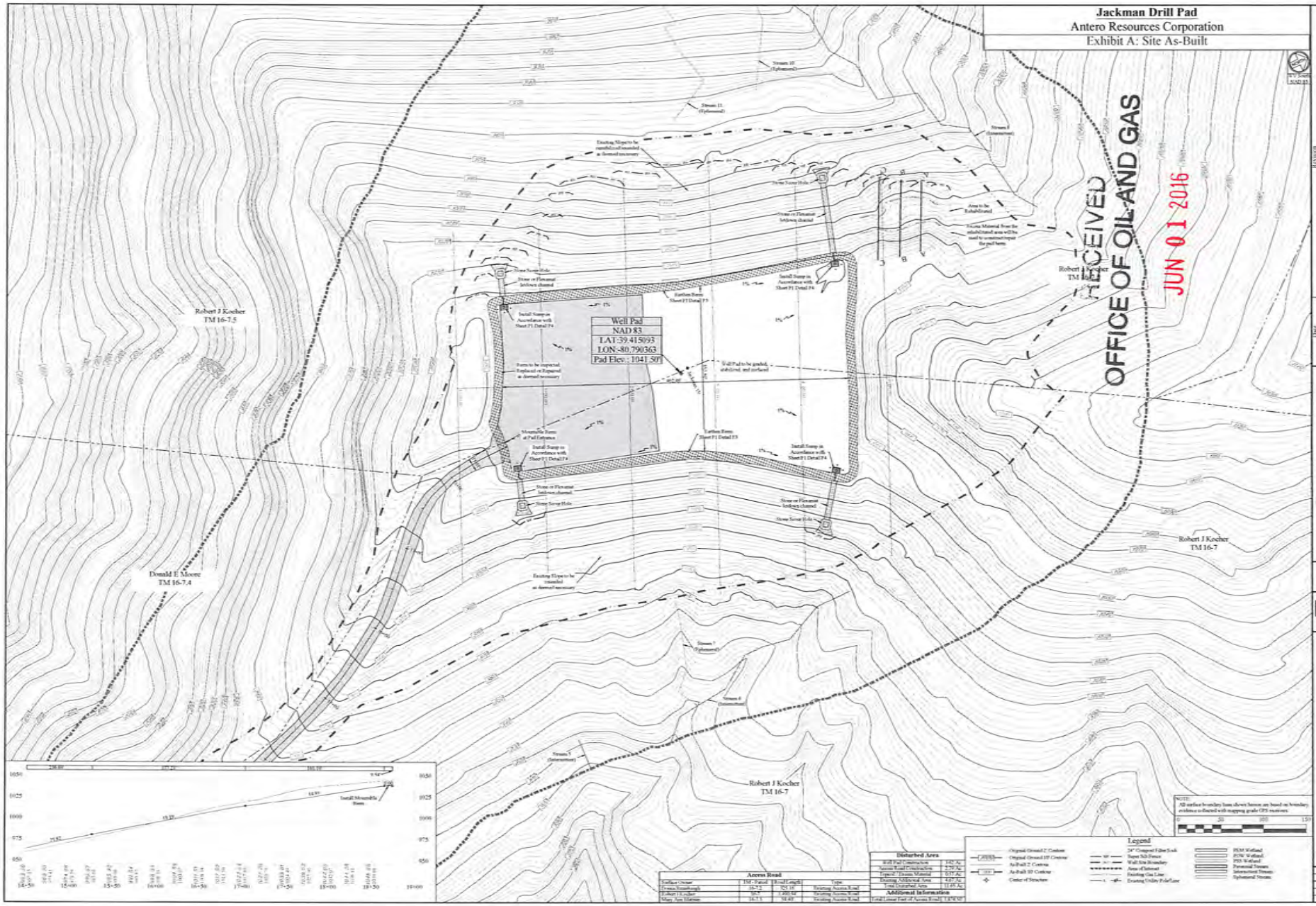
Exhibit A: Site As-Built



Jackman Drill Pad

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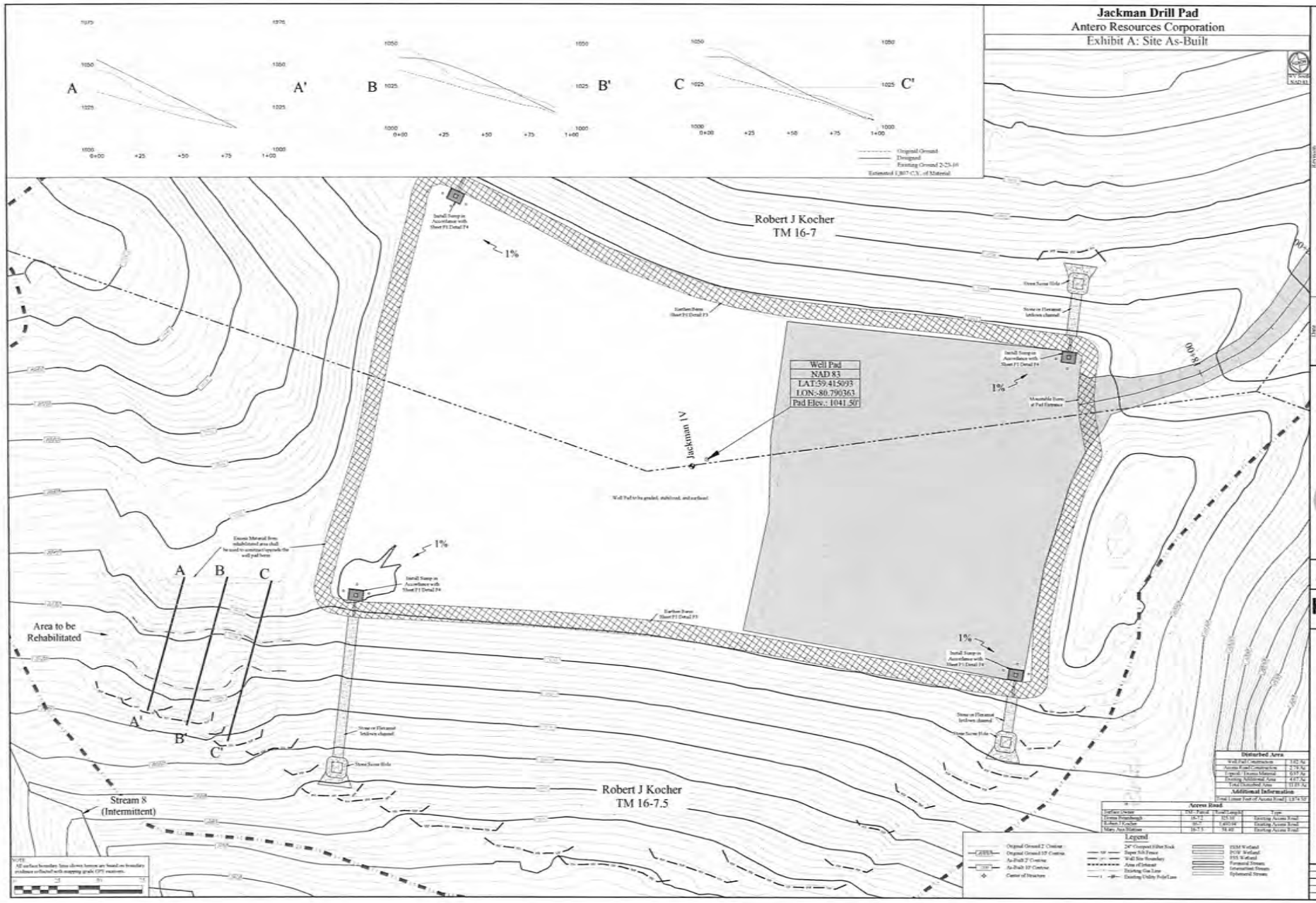
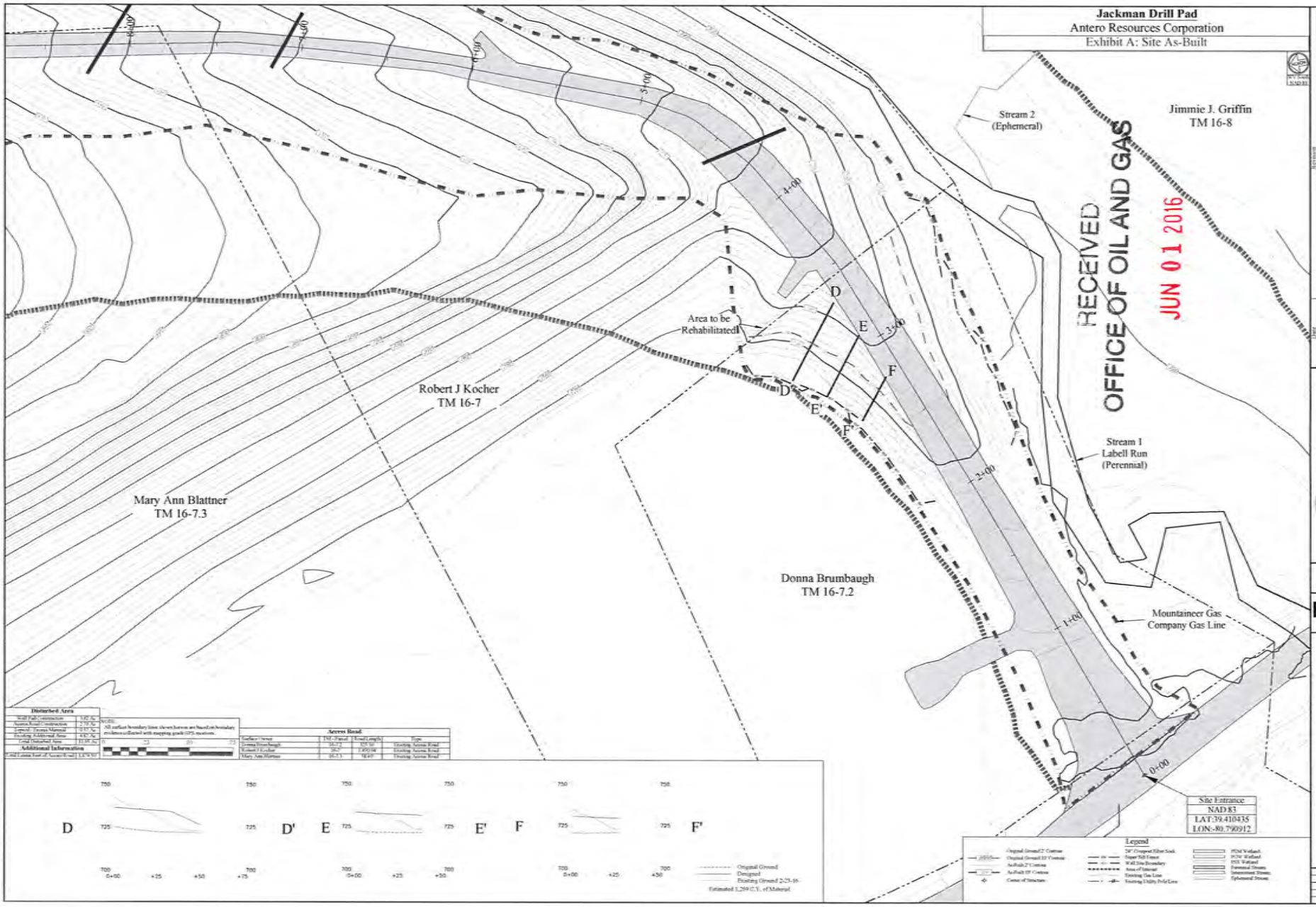
Exhibit A: Site As-Built



Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



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Disturbed Area	
Well Pad Construction	3.02 Ac
Access Road Construction	2.70 Ac
Removed: Excess Material	0.57 Ac
Existing Additional Area	4.82 Ac
Total Disturbed Area	11.01 Ac
Additional Information	
Total Linear Feet of Access Road	1,676.70'

NOTE:
All surface boundary lines shown hereon are based on boundary evidence confirmed with mapping grade GPS receivers.

0 22 50 75

Access Road			
Surface Owner	TM - Parcel	Road Length	Type
Donna Brumbaugh	16-7.2	1,017.50'	Existing Access Road
Robert J Kocher	16-7	1,000.04'	Existing Access Road
Mary Ann Blattner	16-7.3	658.67'	Existing Access Road

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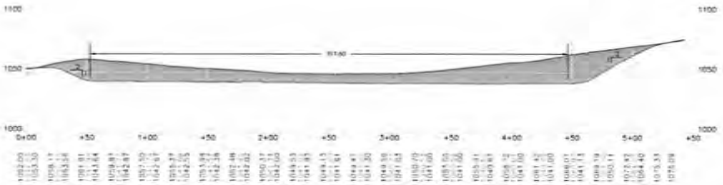
Kelly Surveying
P.O. Box 327
Doddridge, WV 26329
(304)873-2001

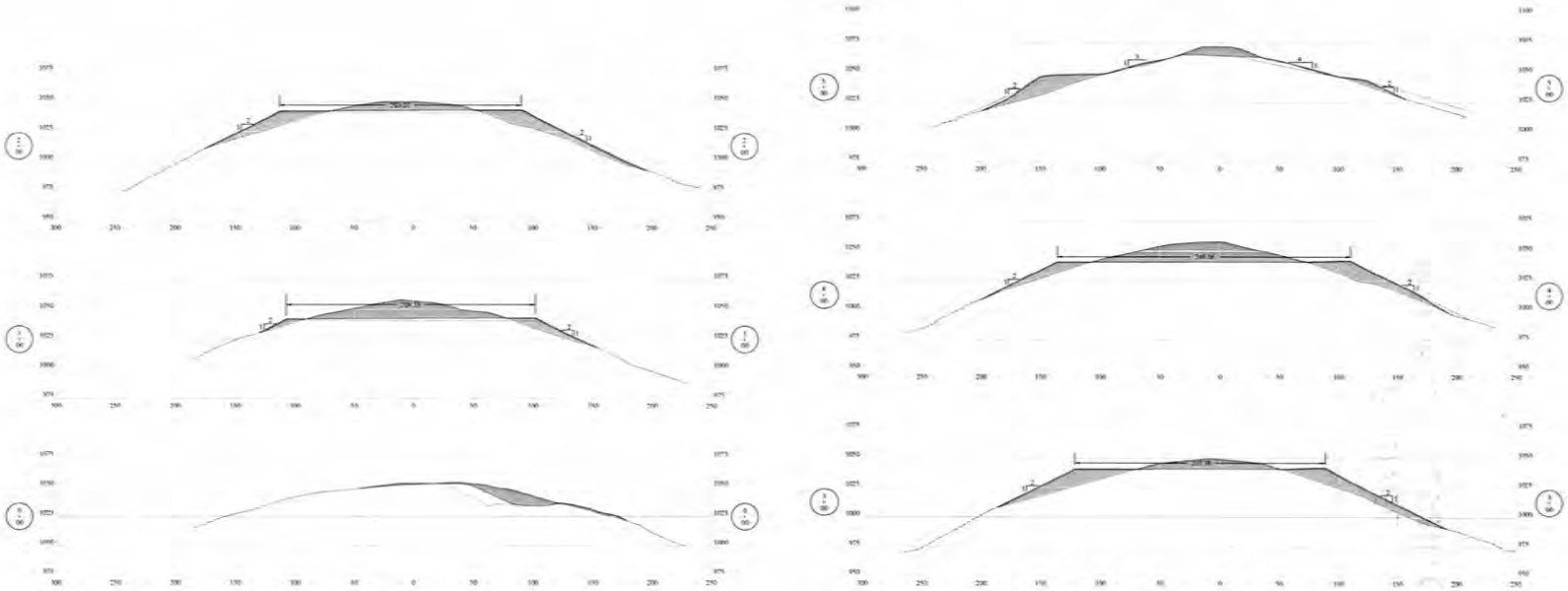
Access Road Rehabilitation Area
Jackman Drill Pad
McElroy District,
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
Designed By: JS
File No.
Sheet 7 of 9

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



Well Pad Profile



Well Pad Cross Sections

Legend

Cut
Fill
Original Ground
Design
As-Built

Revision

Date

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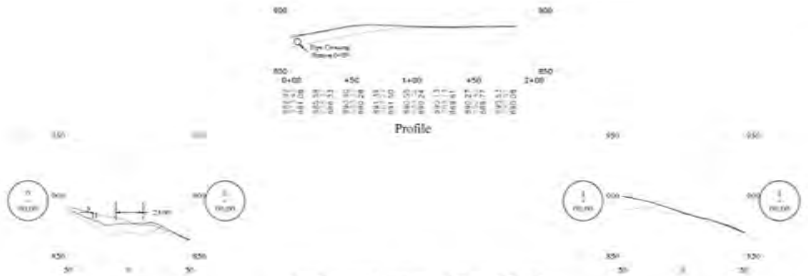
Cross Sections - Well Pad

Jackman Drill Pad

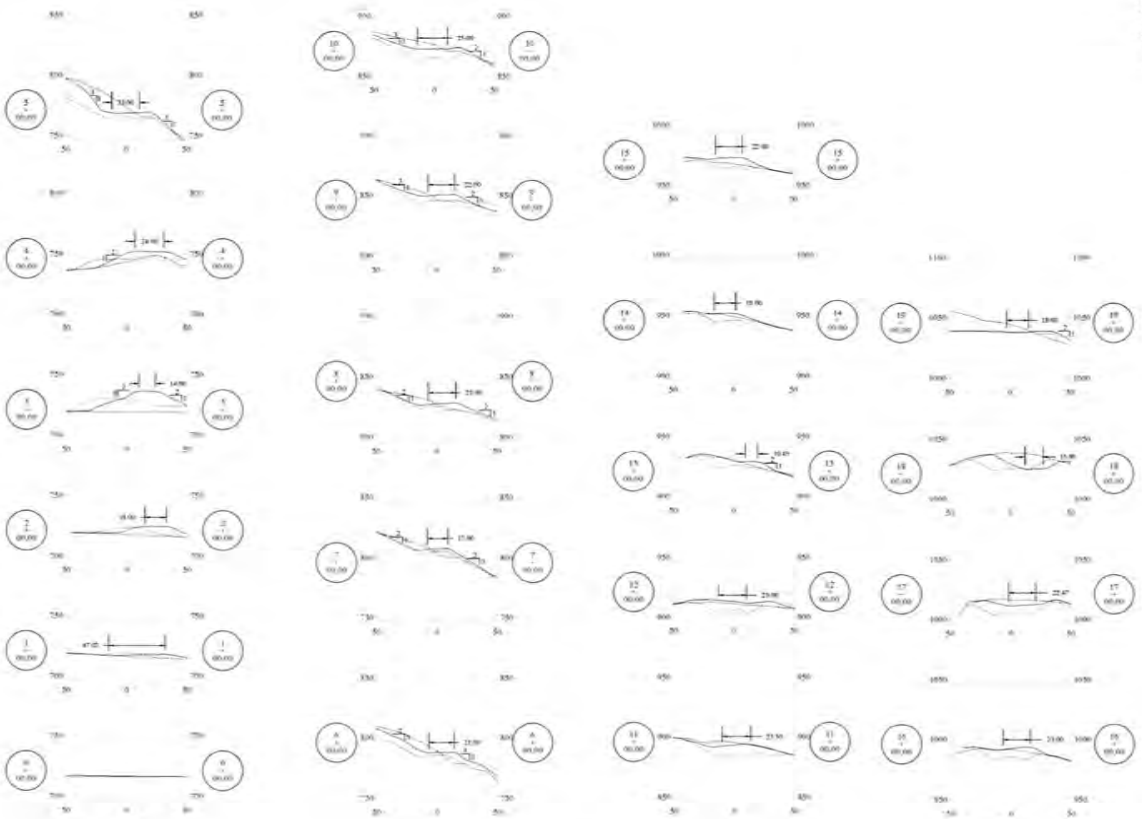
McElroy District,
Tyler County, WV

Date: 05/10/2016
Scale: As Shown
Designed By: BC
File No.
Sheet 8 of 9

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



Small Access Road Cross Sections & Profile



Access Road Cross Sections

Legend

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Cross Sections - Access Road
Jackman Drill Pad
McElroy District,
Tyler County, WV

Date: 05/19/2016
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Sheet 9 of 9

Jackman Drill Pad

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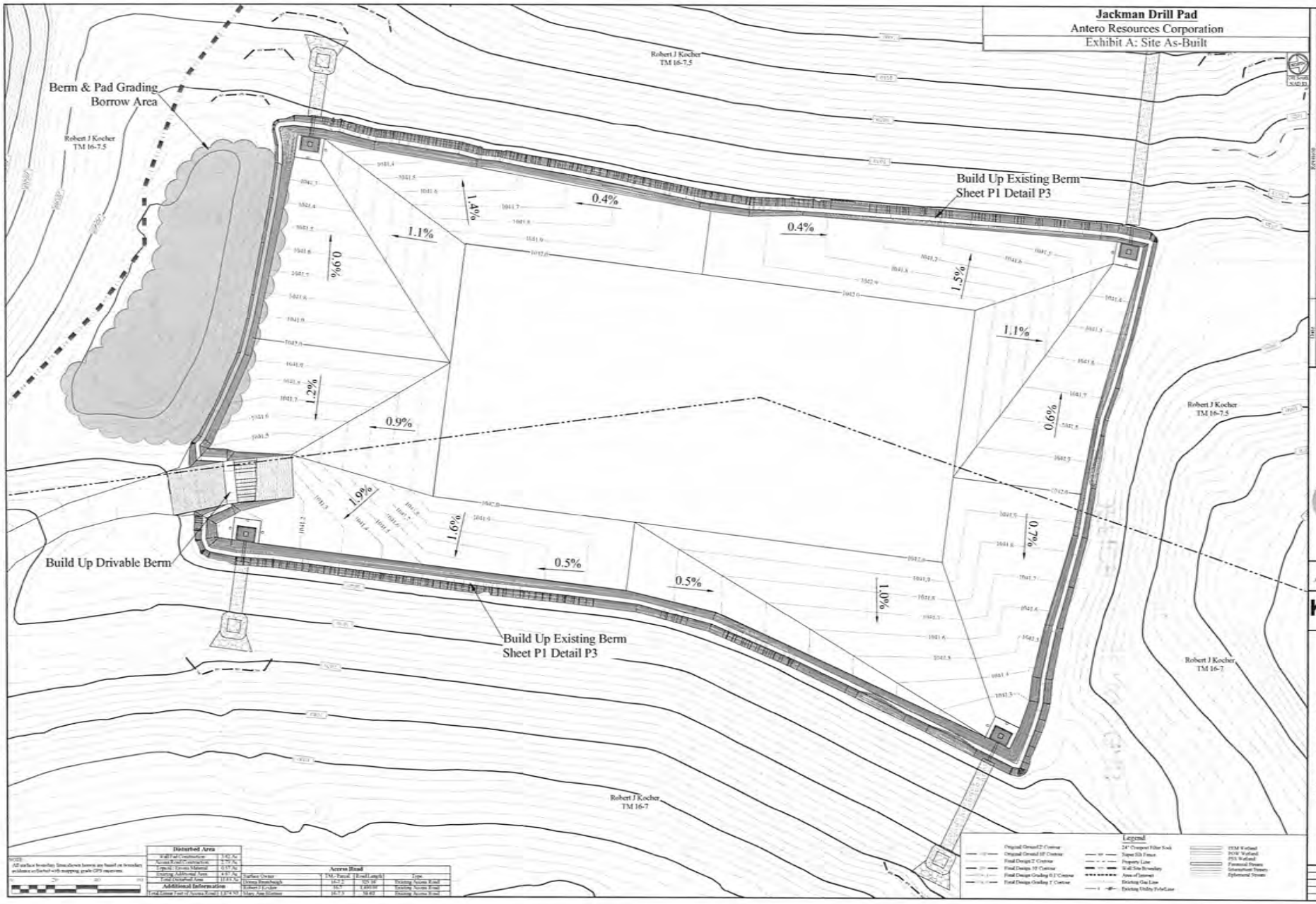
Exhibit A: Site As-Built



Disturbed Area	
Well Pad Construction	3.92 Ac
Access Road Construction	2.70 Ac
Topsoil / Excess Material	0.55 Ac
Existing Additional Area	4.87 Ac
Total Disturbed Area	11.93 Ac

Additional Information	
Total Linear Feet of Access Road	1,874.70'

Access Road			
Surface Owner	TM / Parcel	Road Length	Type
Drinnen Brandwaugh	16-7.2	325.38'	Existing Access Road
Robert J Kocher	16-7	1,480.00'	Existing Access Road
Mary Ann Hunter	16-7.5	68.82'	Existing Access Road

NOTE:
All surface boundary lines shown hereon are based on boundary evidence collected with mapping grade GPS receivers.

Revision

Date

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Well Pad Grading Plan View

Jackman Site

McElroy District
Tyler County, WV

Date: 05/10/2018
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Jackman Drill Pad

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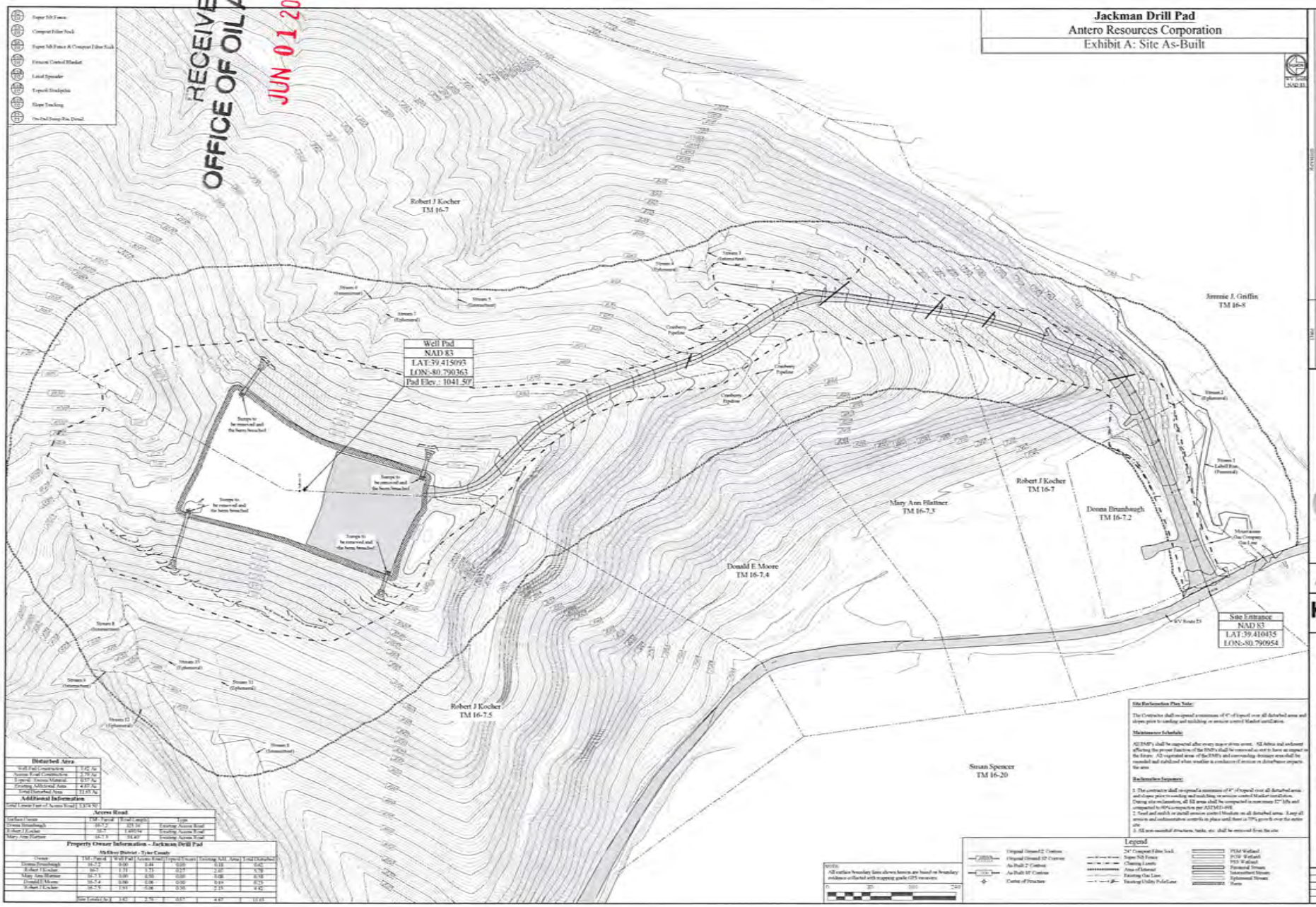
Exhibit A: Site As-Built



Disturbed Area

Well Pad Construction	7.42 Ac
Access Road Construction	2.79 Ac
Topsoil Stream Material	0.57 Ac
Existing Additional Area	4.87 Ac
Total Disturbed Area	11.85 Ac

Additional Information

Total Linear Feet of Access Road	1,874.90'

Access Road

Surface Owner	TM - Parcel	Road Length	Type
Donna Brumbaugh	16-7.2	323.16	Existing Access Road
Robert J Kocher	16-7	1,480.94	Existing Access Road
Mary Ann Blattner	16-7.3	38.40'	Existing Access Road

Property Owner Information - Jackman Drill Pad

McElroy District - Tyler County

Owner	TM - Parcel	Well Pad	Access Road	Topsoil Stream	Existing Add. Area	Total Disturbed
Donna Brumbaugh	16-7.2	0.00	0.44	0.00	0.18	0.62
Robert J Kocher	16-7	1.71	1.73	0.27	2.07	5.78
Mary Ann Blattner	16-7.3	0.00	0.50	0.00	0.08	0.58
Donald E Moore	16-7.4	0.00	0.06	0.00	0.19	0.25
Robert J Kocher	16-7.5	1.91	0.06	0.30	2.15	4.42
	Site Totals Ac	3.62	2.79	0.57	4.87	11.85

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Site Reclamation Plan

Jackman Drill Pad

McElroy District, Tyler County, WV

Date: 05-19-2016
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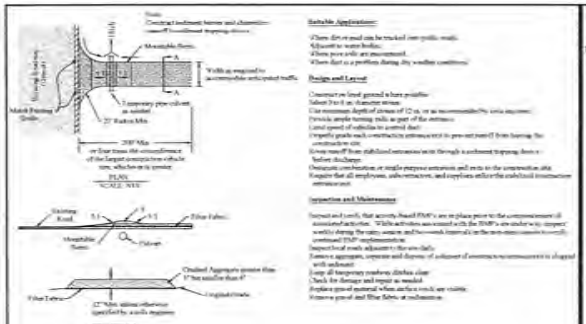
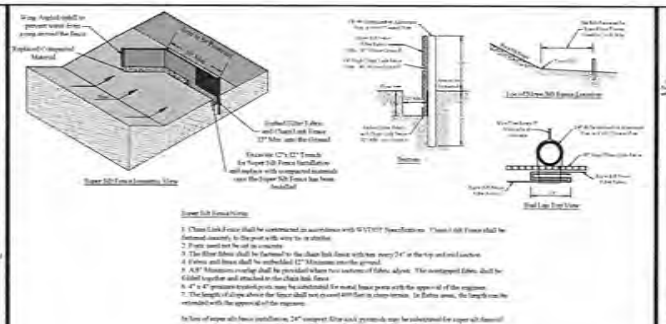
Sheet S1 of S1

Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

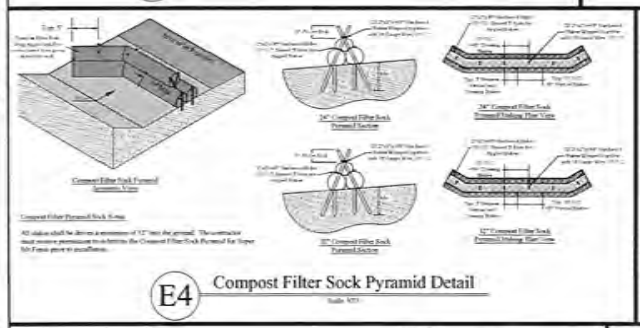


E1 Stabilized Construction Entrance Detail
Scale: NTS

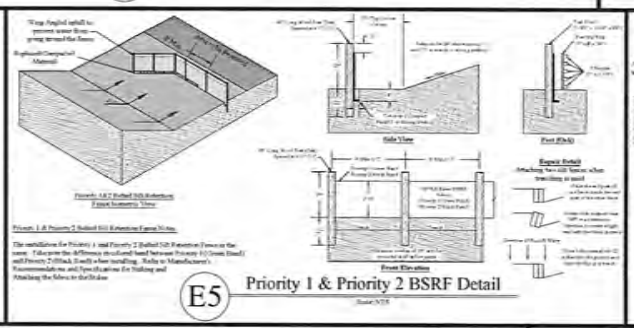


E2 Super Silt Fence Detail
Scale: NTS

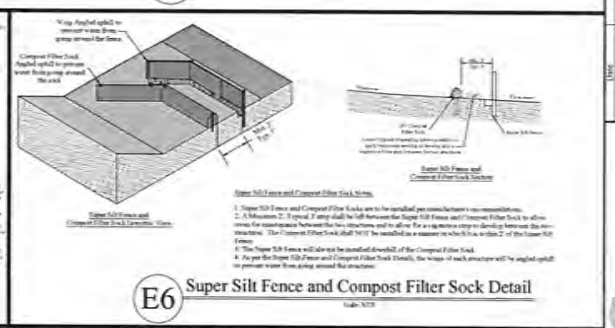
E3 Compost Filter Sock Detail
Scale: NTS



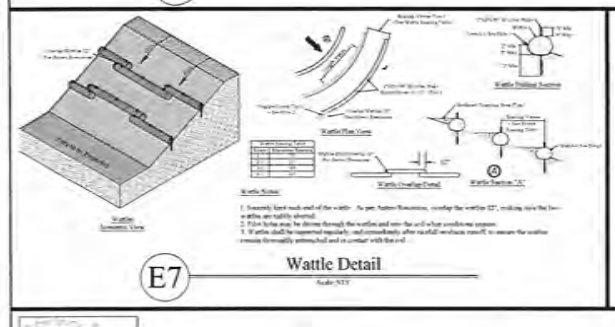
E4 Compost Filter Sock Pyramid Detail
Scale: NTS



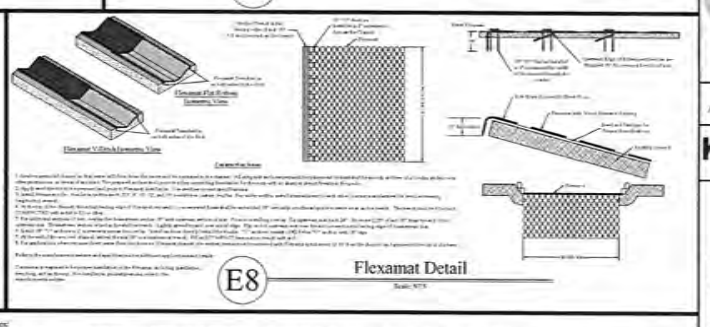
E5 Priority 1 & Priority 2 BSRF Detail
Scale: NTS



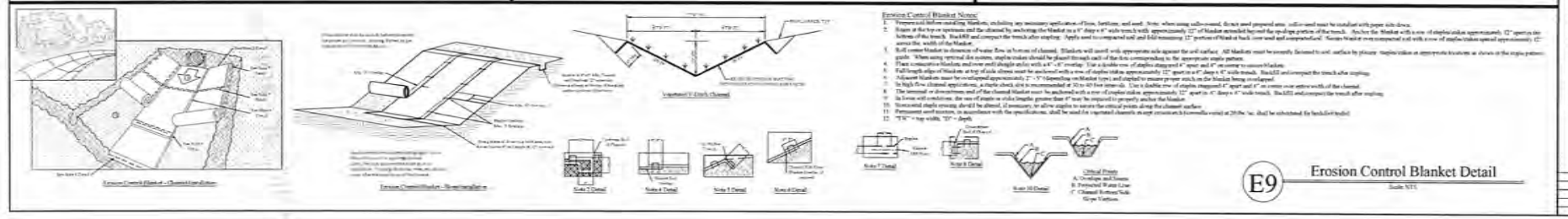
E6 Super Silt Fence and Compost Filter Sock Detail
Scale: NTS



E7 Wattle Detail
Scale: NTS



E8 Flexamat Detail
Scale: NTS



E9 Erosion Control Blanket Detail
Scale: NTS

Erosion and Sediment Control Details
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 05/19/2016
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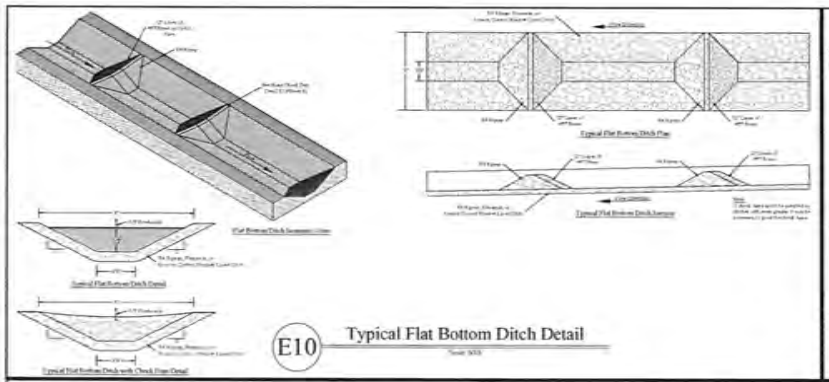
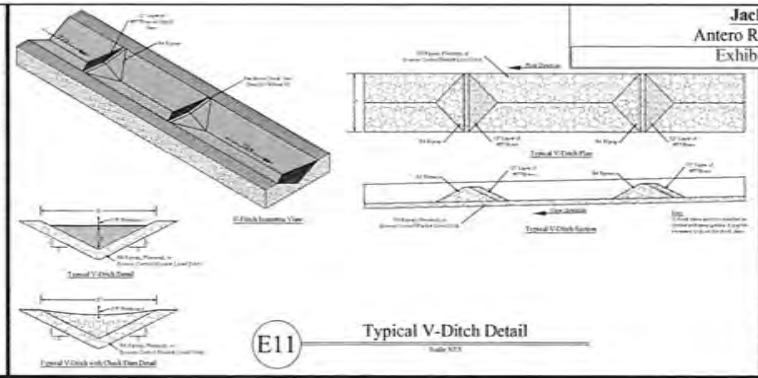
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built

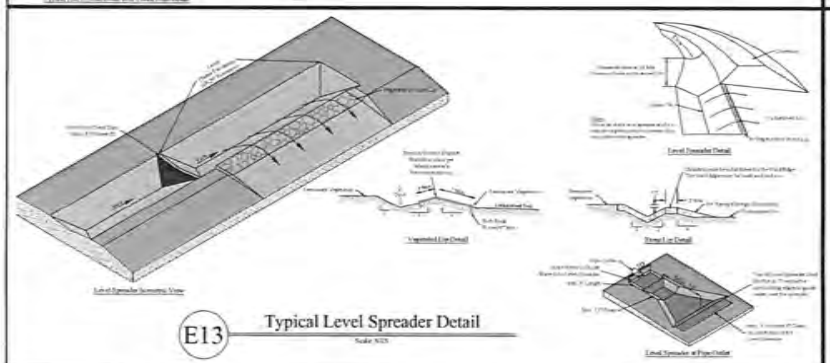


E10 Typical Flat Bottom Ditch Detail
Scale: NTS

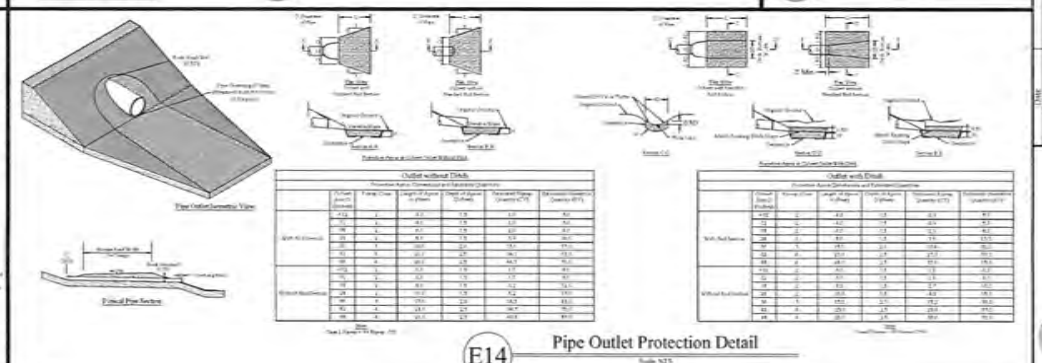


E11 Typical V-Ditch Detail
Scale: NTS

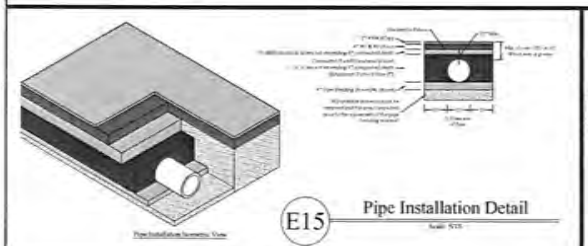
E12 Stone Check Dam Detail
Scale: NTS



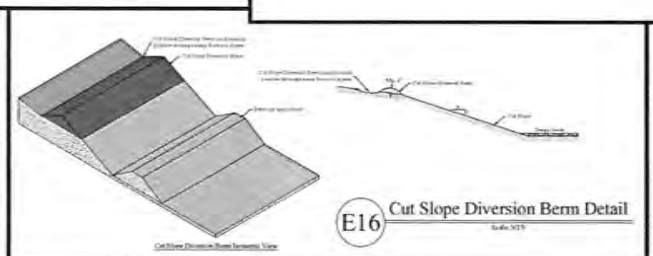
E13 Typical Level Spreader Detail
Scale: NTS



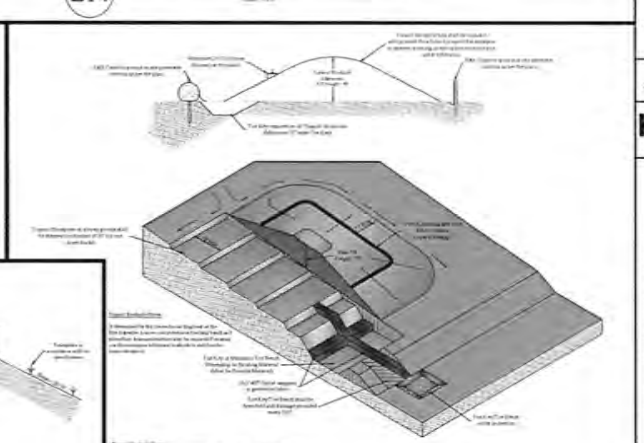
E14 Pipe Outlet Protection Detail
Scale: NTS



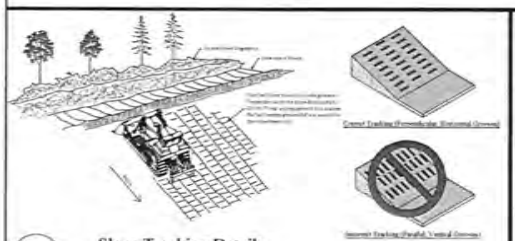
E15 Pipe Installation Detail
Scale: NTS



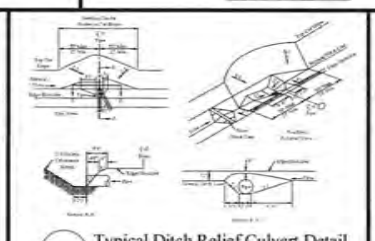
E16 Cut Slope Diversion Berm Detail
Scale: NTS



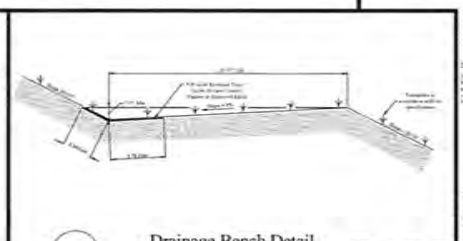
E17 Topsoil Stockpile Detail
Scale: NTS



E18 Slope Tracking Detail
Scale: NTS



E19 Typical Ditch Relief Culvert Detail
Scale: NTS



E20 Drainage Bench Detail
Scale: NTS

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Kelly Surveying

Erosion and Sediment Control Details
Jackman Drill Pad
Mellroy District
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
Designed By: BF
File No.
Sheet 02 of 10

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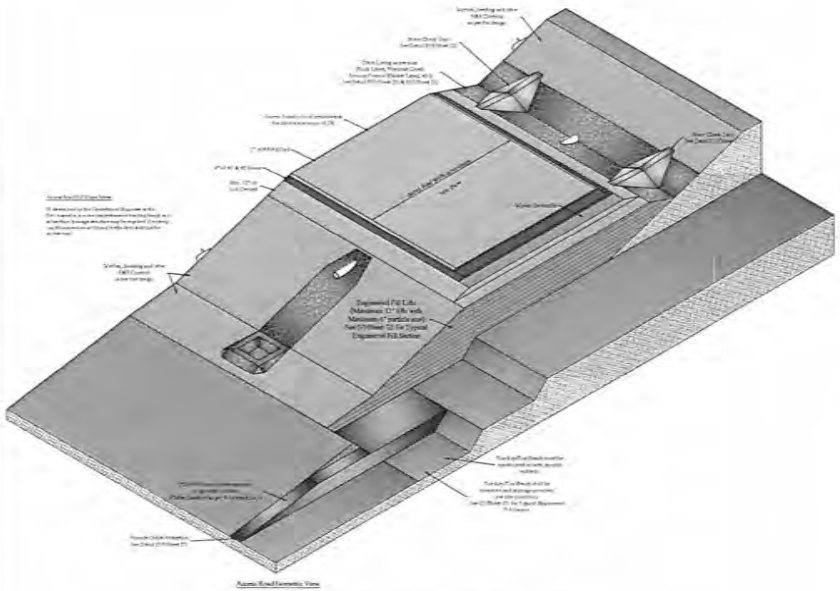
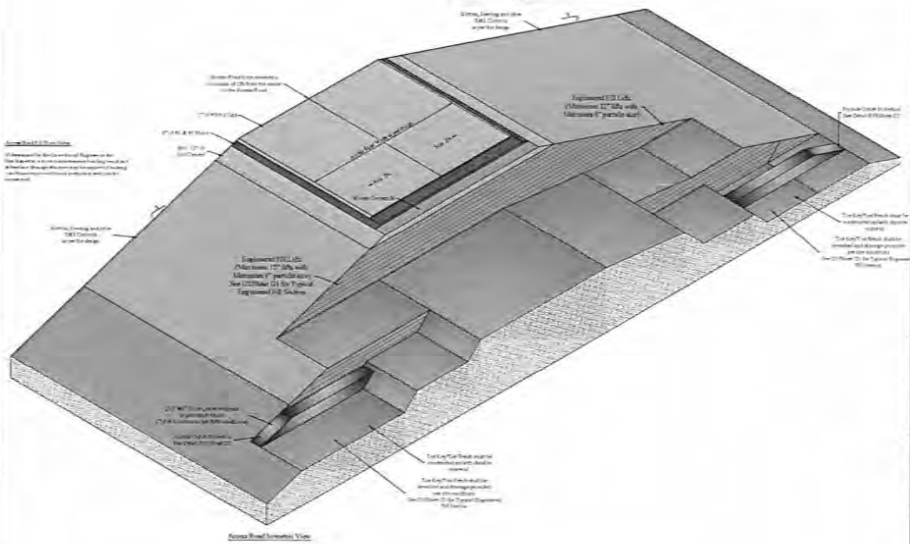
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



R1 Typical Access Road Cut Section Details
Scale: NTS



R2 Typical Access Road Fill Section Details
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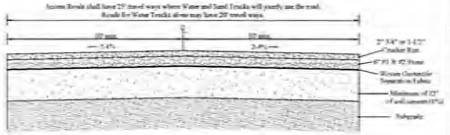
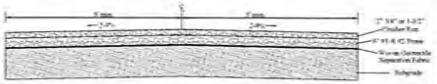


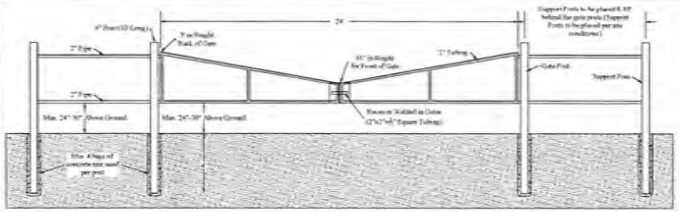
Typical Access Road Surfacing

R3 Typical Access Road Surfacing Details
Scale: NTS

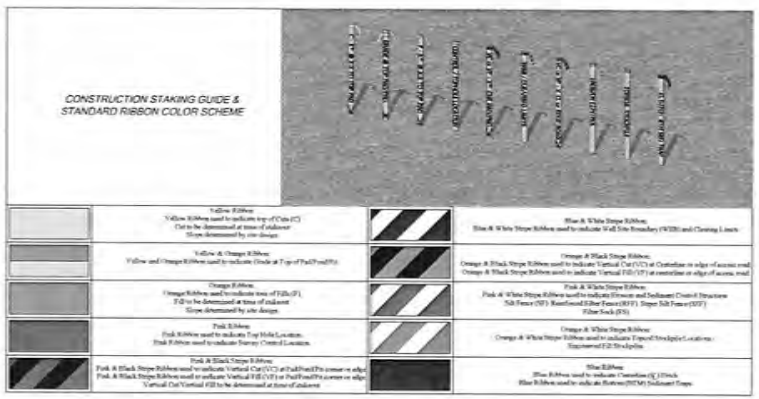


Typical Access Road Surfacing

R4 Temporary/Adjacent Access Road Surfacing Details
Scale: NTS



R5 Access Road Gate Detail
Scale: NTS



R6 Construction Staking Guide
Scale: NTS

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Kelly Surveying

Typical Access Road Details
Jackman Drill Pad
Mellroy District
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
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Sheet R1 of R1

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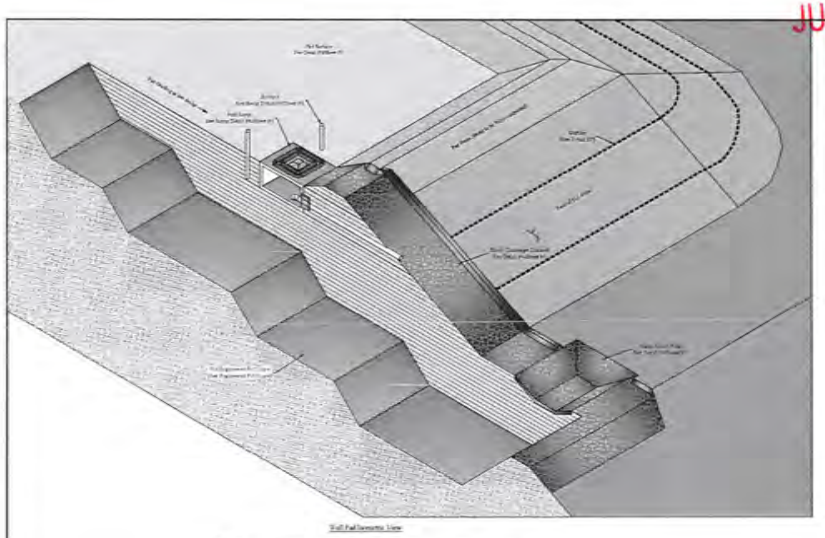
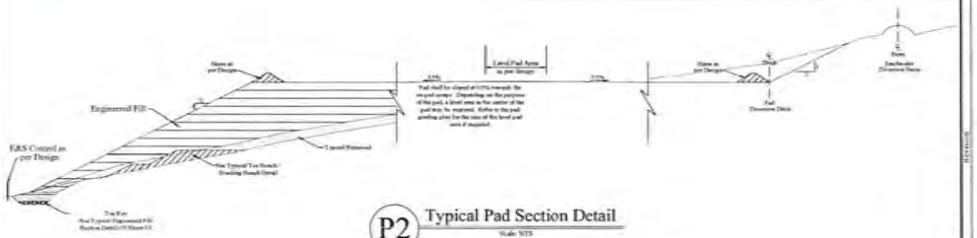
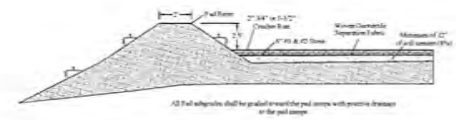
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As-Built



P1 Typical Pad Isometric View Detail
Scale: NTS



P2 Typical Pad Section Detail
Scale: NTS



P3 Pad Surfacing Detail
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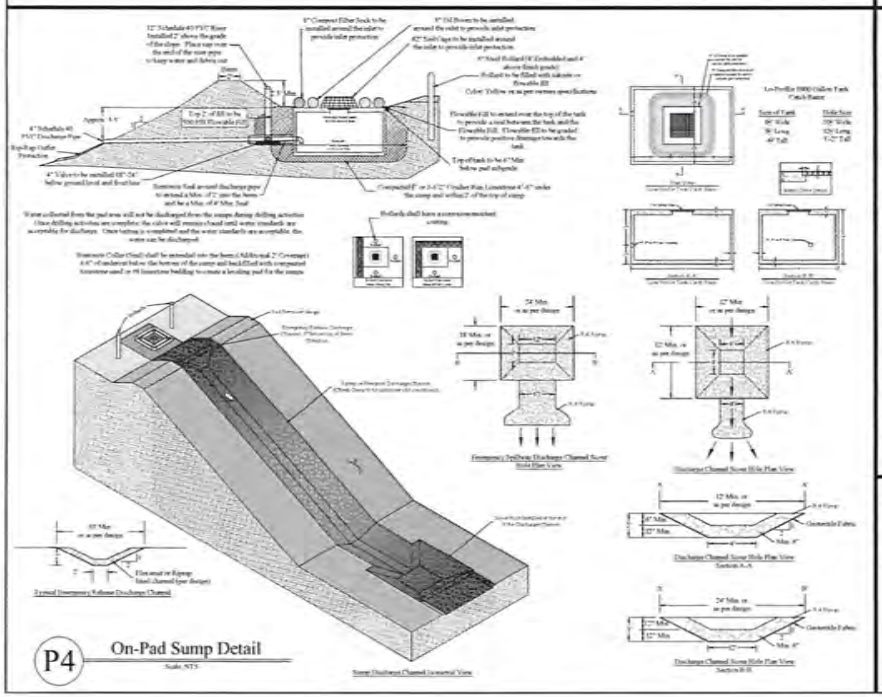
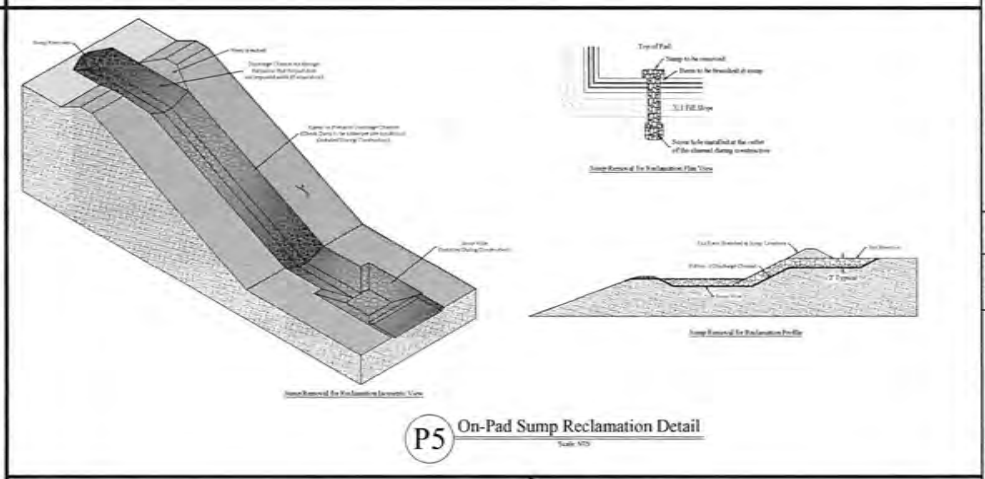
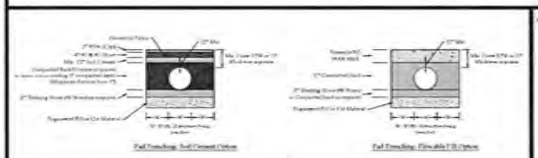


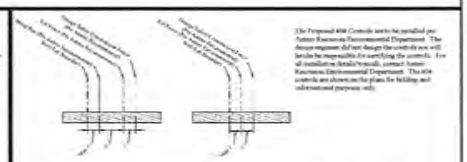
P4 On-Pad Sump Detail
Scale: NTS



P5 On-Pad Sump Reclamation Detail
Scale: NTS



P6 Typical Pad Trenching Detail
Scale: NTS



P7 Typical 404 Control Installation Details
Scale: NTS

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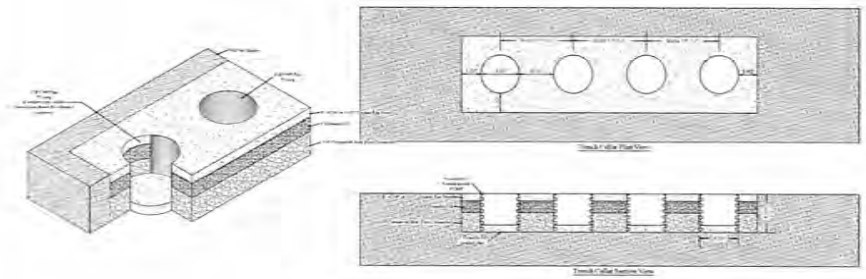
Kelly Surveying

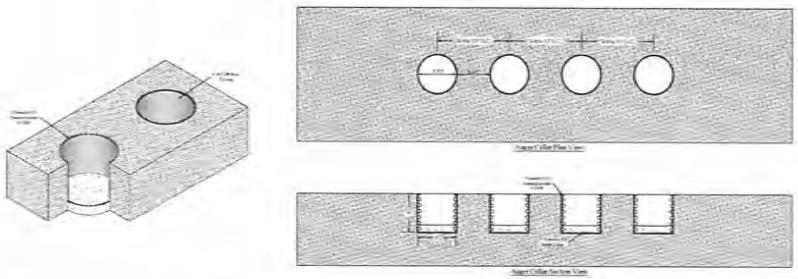
Typical Pad Details
Jackman Drill Pad
McElroy District
Tyler County, WV

Date: 05/19/2016
Scale: As Shown
Designed By: BC
File No.
Sheet P1 of P1

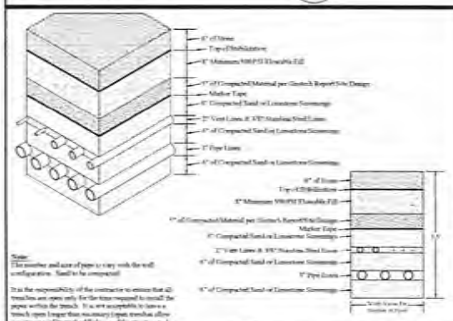
Jackman Drill Pad
Antero Resources Corporation
Exhibit A: Site As Built



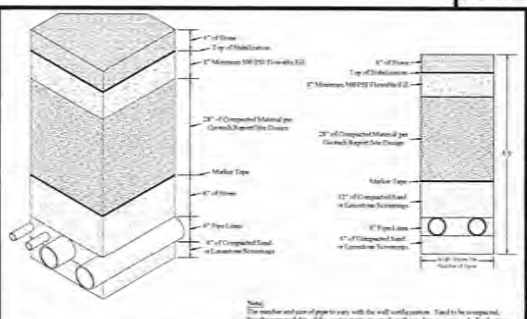
M1 Typical Trenched Cellar Detail



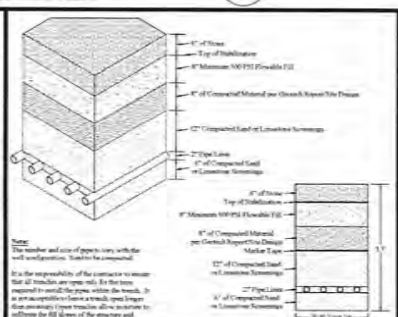
M2 Typical Augered Cellar Detail



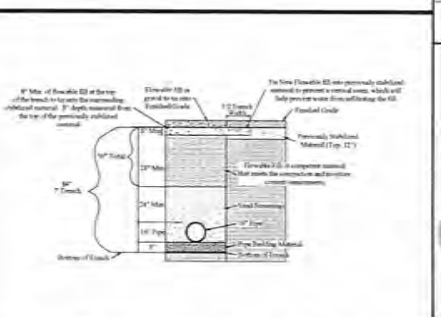
M3 Typical Well Line Detail



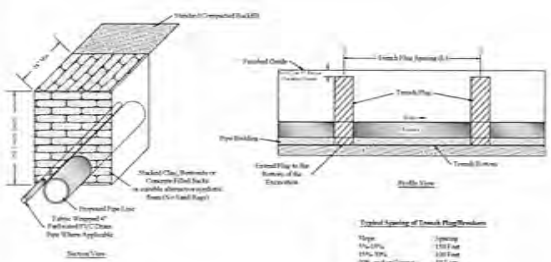
M4 Typical Sales Line Detail



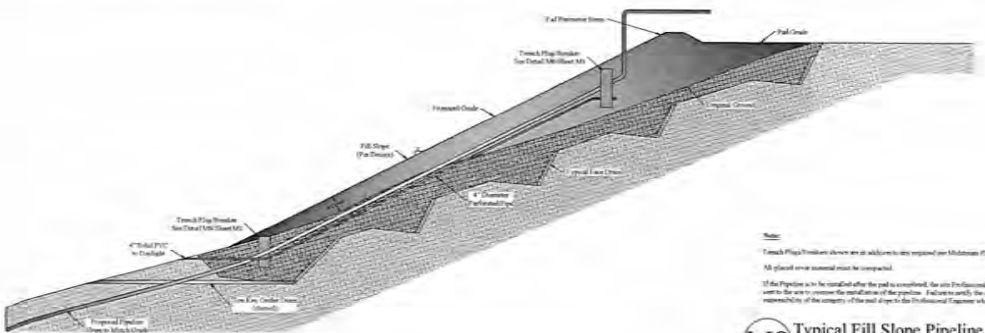
M5 Typical Tank Line Detail



M6 Typical Line Through Pad Detail



M7 Typical Impervious Trench Plug/Breaker



M8 Typical Fill Slope Pipeline Installation Section

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Key Surveying

Typical Midstream Production Details
Jackman Drill Pad
Mellroy District
Tyler County, WV

Date:	05/16/2016
Scale:	As Shown
Designed By:	KW
File No.	
Sheet M1 of M8	