



Doddridge County, WV Floodplain Management

This permit gives approval for the development/project listed that impacts the FEMA-designated floodplain and/or floodway of Doddridge County, WV, pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance. ***This permit must be posted at the site of work as to be clearly visible and must remain posted during entirety of development.***

Permit #: 23-632

Date Approved: July 25, 2023

Expires: July 25, 2024

Issued to: Antero Midstream

POC: Anthony Ludovici

Company Address: 535 White Oaks Blvd. Bridgeport, WV 26330

Project Address: 5400 Greenbrier Road Salem, WV 26426

Firm: 54017C0255C

Lat/Long: 39.245604, -80.598032

Purpose of development: Perkins Bypass LP Pipeline

Issued by: George C. Eidel, Doddridge County FPM (or designee)

Date: July 25, 2023

For additional information regarding this permit, please contact
Doddridge County Floodplain Manager at 304.873.1343, or via email at
doddridgecountyfpm@gmail.com
101 Church Street Suite 102; West Union, WV 26456

FPH# 23-632

13620

KLEINFELDER OFFICE CHECKING

770 FIRST AVENUE, SUITE 400
SAN DIEGO, CA 92101

DATE 6/15/2023

19-10/1250

PAY TO THE
ORDER OF

Doddridge County Commission

\$ 250.00

Two hundred fifty and 0/100

DOLLARS

usbank.

FOR

24000016.001A / 12-0000

Paul J...

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FLOODPLAIN PERMIT #23-632

Antero Midstream Perkins Bypass LP Pipeline, 5400 Greenbrier Rd, 39.245604, -80.598032

TASK	COMPLETE (DATE)	NOTES
<i>CHECK RECEIVED</i>	6/21/2023	
<i>US ARMY CORP. ENGINEERS (USACE)</i>	N/A	
<i>US FISH & WILDLIFE SERVICES (USFWS)</i>	N/A	
<i>WV DEPT. NATURAL RESOURCES (WVDNR)</i>	N/A	
<i>WV DEPT. ENVIROMENTAL PROTECTION (WVDEP)</i>	Pending	
<i>STATE HISTORIC & PRESERVATION OFFICE (SHPO)</i>	N/A	
<i>OFFICE of LAND & STREAM (OLS)</i>	Pending	
<i>WVDOH</i>	Pending	
<i>Elevation Certificate</i>	N/A	
<i>DATE OF COMMISSION READING</i>	7/5/2023	
<i>DATE AVAILABLE TO BE GRANTED</i>	7/25/2023	
<i>PERMIT GRANTED</i>		
<i>COMPLETE</i>		

7021 1970 0001 7228 4696

7021 1970 0001 7228 4702

7021 1970 0001 7228 4719



Doddridge County Floodplain Permits

(Week of June 26, 2023)

Please take notice that on the **(21st) of (June), 2023, (Antero Midstream)** filed an application for a Floodplain Permit **(#23-632)** to develop land located at or about **(5400 Greenbrier Road)**; **Coordinates: 39.245604, -80.598032**. The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance with WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by **(July 25, 2023)** (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. **This project is for the Perkins Bypass LP Pipeline**

A handwritten signature in blue ink, appearing to read "George C. Eidel".

GEORGE C. EIDEL, CFM

Doddridge County Floodplain Manager



TRANSMITTAL

To: Mr. George Eidel
Floodplain Manager
101 Church Street, Suite #102
West Union, WV 26456-2095

Date: June 16, 2023

cc: Project File

JUN21 23 1:10PM

Subject:	Floodplain Permit Application Antero Midstream Perkins Bypass LP Pipeline Doddridge County, West Virginia
	<input checked="" type="checkbox"/> Attached <input type="checkbox"/> Under separate cover

- Via:
- Messenger/Courier
 - First Class Mail
 - FedEx
 - United Parcel
 - DHL
 - Lone Star Overnight
 - Freight
 - Other
- Transmitted:
- As Requested
 - For Approval
 - For Your Use
 - For Review & Comment

Remarks:

Enclosed please find the following documents to facilitate your review of the above referenced application:

- Attachment A – Floodplain Application
- Attachment B – Table of Adjacent Property Owners
- Attachment C – No-Rise Certificate
 - Appendix A - WV Flood Tool Map
 - Appendix B - Design Plans
 - Appendix C – National Streamflow Statistics – Drainage Area
 - Appendix D - Comparison for Calculated Flows - HEC-RAS Excel Data
- Attachment D – Permitting & Coordination Table

The attached check for fee is \$250.00. The site budget within the Floodplain is \$15,000.00 bringing the permit fee to \$250.00.

By: **Matt Albright**
Project Manager
51 Dutilh Rd., Suite 240
Cranberry Township, PA 16066
MAlbright@Kleinfelder.com
m| 609.947.5296



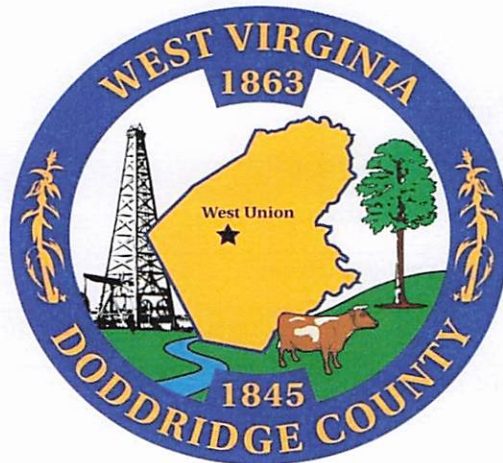
ATTACHMENT A FLOODPLAIN APPLICATION

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Applicant Information:

Please provide all pertinent data.

Applicant Information		
Responsible Company Name: Antero Midstream		
Corporate Mailing Address: 1615 Wynkoop Street		
City: Denver	State: CO	Zip: 80202
Corporate Point of Contact (POC): N/A		
Corporate POC Title: N/A		
Corporate POC Primary Phone: N/A		
Corporate POC Primary Email: N/A		
Corporate FEIN: N/A	Corporate DUNS: N/A	
Corporate Website: www.anteroresources.com		
Local Mailing Address: 535 White Oaks Blvd		
City: Bridgeport	State: WV	Zip: 26330
Local Project Manager (PM): Anthony Ludovici		
Local PM Primary Phone: (304) 627-9120		
Local PM Secondary Phone: N/A		
Local PM Primary Email: ALudovici@cecinc.com		
Person Filing Application: Anthony Ludovici		
Applicant Title: Environmental Specialist, In-House Contractor		
Applicant Primary Phone: (304) 627-9120		
Applicant Secondary Phone: N/A		
Applicant Primary Email: ALudovici@cecinc.com		



Permit#	<u>23-632</u>
Project	<u>Perkins Bypass LP Pipeline</u>
Name:	_____
Permittees Name:	<u>Antero Midstream</u>

JUN21 23 1:10PM

Doddridge County, WV

Floodplain Development Permit Application

This document is to be used for projects that impact/potentially impact the FEMA---designated floodplain and/or floodway of Doddridge County, WV pursuant to the rules and regulations established by all applicable Federal, State and local laws and ordinances, including the Doddridge County Floodplain Ordinance.

SECTION 1: GENERAL PROVISIONS (APPLICANT TO READ AND SIGN)

1. No work may start until a permit is issued.
2. The permit may be revoked if any false statements are made herein.
3. If revoked, all work must cease until permit is re-issued.
4. The permit will expire if no work is commenced within six months of issuance.
5. Applicant is hereby informed that other permits may be required to fulfill local, state, and federal requirements.
6. Applicant hereby gives consent to the Floodplain Administrator/Manager or his/her representative to make inspections to verify compliance.
7. I THE APPLICANT CERTIFY THAT ALL STATEMENTS HEREIN AND IN ATTACHMENTS TO THIS APPLICATION ARE, TO THE BEST OF MY KNOWLEDGE, TRUE AND ACCURATE.

APPLICANT'S SIGNATURE *Anthony Ludovici*

DATE 6/15/2023

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Proposed Development:

Please check all elements of the proposed project that apply.

DESCRIPTION OF WORK (CHECK ALL APPLICABLE BOXES)

A. STRUCTURAL DEVELOPMENT

<u>ACTIVITY</u>		<u>STRUCTURAL TYPE</u>	
<input type="checkbox"/>	New Structure	<input type="checkbox"/>	Residential (1 – 4 Family)
<input type="checkbox"/>	Addition	<input type="checkbox"/>	Residential (more than 4 Family)
<input type="checkbox"/>	Alteration	<input type="checkbox"/>	Non-residential (floodproofing)
<input type="checkbox"/>	Relocation	<input type="checkbox"/>	Combined Use (res. & com.)
<input type="checkbox"/>	Demolition	<input type="checkbox"/>	Replacement
<input type="checkbox"/>	Manufactured/Mobil Home		

B. OTHER DEVELOPMENT ACTIVITIES:

- Fill Mining Drilling Pipelining
- Grading
- Excavation (except for STRUCTURAL DEVELOPMENT checked above)
- Watercourse Alteration (including dredging and channel modification)
- Drainage Improvements (including culvert work)
- Road, Street, or Bridge Construction
- Subdivision (including new expansion)
- Individual Water or Sewer System
- Other (please specify)

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Project Narrative:

Describe in detail the proposed development including project name/title, type of development, estimated start and completion timeline, and its potential impact on the floodplain. Use additional copies of this page as needed.

Project Narrative:
<p>Antero Midstream (Antero) is proposing to construct approximately 0.7 miles of one 16-inch diameter low pressure (LP) gas pipeline known as the Perkins Bypass LP Pipeline (Pipeline) in Doddridge County, West Virginia (WV). The northern terminus occurs at 39.249835, -80.593643, while the southern terminus occurs at 39.243366, -80.590999.</p>
<p>The proposed Pipeline will result in a limit of disturbance of approximately 11.7 acres, of which 0.4 acres (3.4%) is located within the limits of the Greenbrier Creek regulated floodplain. The West Virginia Flood Tool Map is included in Appendix A of Attachment C and depicts the approximate location where work associated with upgrades to Access Road #1 (existing) will encroach upon the floodplain. Construction activities for the access road within the regulated floodplain will consist of but are not limited to road upgrades/maintenance activities with grading/backfill and adding stone.</p>
<p>The proposed Pipeline design plans are included in Appendix B of Attachment C.</p>
<p>A No-Rise Certification has been prepared and is included as Attachment C, which indicates that the proposed construction activities will not affect the base flood elevation.</p>
<p>A permitting and coordination table is included in Attachment D that outlines all necessary permits and current status.</p>

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 3

Property Owner Data:		
Name of Primary Owner (PO): CLARK RODNEY L		
PO Address: 5400 GREENBRIER RD		
City: SALEM	State: WV	Zip: 26426
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Surface Rights Owner Data:		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Mineral Rights Owner Data: (As Applicable)		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Development Site/Property Information:

Please provide physical description of the site/property, along with pertinent ownership (surface and mineral rights) data as applicable. Attach appropriate maps from the WV Flood Tool showing location of proposed development. Use additional copies of this page if development spans multiple property boundaries. Designate each property by number (i.e. Property 1 of 1, Property 2 of 7, etc.)

Property Designation: 1 of 1

Site/Property Information:		
Legal Description: Perkins Bypass LP Pipeline		
Physical Address/911 Address: Greenbrier Rd, Salem, WV 26426		
Decimal Latitude/Longitude: 39.2454627, -80.5978561		
DMS Latitude/Longitude:		
District: 4 (Greenbrier)	Map: 4	Parcel: See Attachment B Property Owner Table
Land Book Description: N/A		
Deed Book Reference: N/A		
Tax Map Reference: N/A		
Existing Buildings/Use of Property: N/A		

Floodplain Location Data: (to be completed by Floodplain Manager or designee)			
Community: <u> 540024 </u>	Number:	Panel:	Suffix:
Location (Lat/Long): <u> See Above </u>		Approximate Elevation: Estimated BFE: <u> 918' </u>	
Is the development in the floodway? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is the development in the floodplain? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Zone: _____	
Notes:			

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 3 of 3

Property Owner Data:		
Name of Primary Owner (PO): CLARK RODNEY L & CRYSTAL D; (SURV)		
PO Address: 5400 GREENBRIER RD		
City: SALEM	State: WV	Zip: 26426
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Surface Rights Owner Data:		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Mineral Rights Owner Data: (As Applicable)		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Property Owner Data:

Please provide data on current site/property landowner(s), both surface and mineral rights (as applicable). Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 2 of 3

Property Owner Data:		
Name of Primary Owner (PO): CLARK ROSALIE (LIFE)		
PO Address: 87 CLARK FARM DR		
City: SALEM	State: WV	Zip: 26426
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Surface Rights Owner Data:		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Mineral Rights Owner Data: (As Applicable)		
Name of Primary Owner (PO): N/A		
PO Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Adjacent and/or Affected Landowners Data

Please provide data for all adjacent and/or affected surface owners (both up and down stream) whose property may be impacted by proposed development as demonstrated by a floodplain study or survey. Use additional copies of this page as needed.

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): See Table of Property Owners (Attachment B)		
Physical Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Adjacent Property Owner Data: Upstream		
Name of Primary Owner (PO): N/A		
Physical Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): See Table of Property Owners (Attachment B)		
Physical Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Adjacent Property Owner Data: Downstream		
Name of Primary Owner (PO): N/A		
Physical Address: N/A		
City: N/A	State: N/A	Zip: N/A
PO Primary Phone: N/A		
PO Secondary Phone: N/A		
PO Primary Email: N/A		

Doddridge County Commercial/Industrial
Floodplain Development Permit Application

Contractor Data:

Please provide all pertinent data for contractors and sub---contractors that may be participating in this project. Use additional copies of this page as needed. Designate each page in relation to each property listed above.

Property Designation: 1 of 1

Contractor/Sub-Contractor (C/SC) Information:

C/SC Company Name: One contractor to be selected from the following: ACE Pipeline (#WV049594), Apex Pipeline Services, Inc. (WV040540), Integrity Kokosing Pipeline Services LLC (#WV050096), Momentum Pipeline LLC (#WV057216).		
C/SC Company Name: See Above		
C/SC WV License Number: See Above		
C/SC FEIN: TBD	C/SC DUNS: TBD	
Local C/SC Point of Contact (POC): TBD		
Local C/SC POC Title: TBD		
C/SC Mailing Address: TBD		
City: TBD	State: TBD	Zip-Code: TBD
Local C/SC Office Phone: TBD		
Local C/SC POC Phone: TBD		
Local C/SC POC E-Mail: TBD		

Engineer Firm Information:

Engineer Firm Name: The Thrasher Group, Inc.		
Engineer WV License Number: 23629		
Engineer Firm FEIN: N/A	Engineer Firm DUNS: N/A	
Engineer Firm Primary Point of Contact (POC): James Howes		
Engineer Firm Primary POC Title: Survey Project Manager		
Engineer Firm Mailing Address: 600 White Oaks Blvd		
City: Bridgeport	State: WV	Zip-Code: 26330
Engineer Firm Office Phone: 304-205-8802		
Engineer Firm Primary POC Phone: 304-288-7888		
Engineer Firm Primary POC E-Mail: jhowes@thethrashergroup.com		

Applicant

Please read print name, sign and date below:

- I certify that I am authorized to submit this application for the primary project developer.
- I certify that the information included in this application is to the best of my knowledge true and complete.
- I certify that all required Federal, State, and local permits required by law and/or ordinance for the above described development of this project have will be properly attained, are current and valid, and must be presented prior to a Doddridge County Floodplain Permit being issued.
- I understand that if in the course of the development project additional permits become required that were not needed during the initial proposal, the primary developer must notify the Doddridge County Floodplain Manager within 48 hours of such need, and that a "Stop Work" order may be issued for all project work directly impacting the floodplain or floodway, until such time the required additional permits are acquired.
- I understand that once the floodplain permit is submitted, the application will be entered into official public record at the next regularly scheduled Doddridge County Commission meeting after the date of submittal.
- I understand that from the date of submittal of the fully completed permit application, the Doddridge County Floodplain Manager has ninety (90) days to make a determination to either grant or deny said permit application. During this approval period, the Doddridge County Floodplain Manager may, at his or her discretion, conduct a review and/or additional study of provided documentation by means of an independent engineering firm. All costs associated with said review and/or study must be reimbursed to the County before issuance of approved permit.
- I understand that during the approval period, the Doddridge County Floodplain Manager of designee may at his or her discretion conduct site visits and document conditions of proposed development pursuant to the permit application.
- I understand that once the Floodplain Permit is granted, the permit will be entered into official public record. Appeals to the permit may be made no later than twenty (20) days after said issuance. If a valid appeal is submitted, as determined by the Doddridge County Floodplain Manager, a "Stop Work" order will be issued for all project development directly involving the floodplain or floodway. A public hearing by the Doddridge County Appeals Board will be scheduled no less than ten (10) days after the next regularly scheduled Doddridge County Commission meeting.
- I understand that all decisions of the Doddridge County Appeals Board shall be final.
- **I understand issuance of a Floodplain Permit authorizes me to proceed with construction as proposed.**
- In signing this application, the primary developer hereby grants the Doddridge County Floodplain Manager or designee the right to enter onto the above—described location to inspect the development work proposed, in progress, and/or completed.
- I understand that if I do not follow exactly the site—plan submitted and approved by this permit that a "Stop Work" order may be issued by the Doddridge County Floodplain Manager and that I must stop all construction immediately until discrepancies of actual work vs. proposed work is resolved.

Applicant Signature: Anthony Ludovici Date: 6/15/2023

Applicant Printed Name: Anthony Ludovici

Site Plan

A Site Plan is an accurate and detailed map of the proposed development for this project. It shows the size, shape, location and special features of the project property, and the size and location of any development planned to the property, especially as that development will impact the floodplain and/or floodway. Site plans show what currently exists on the project property, and any changes or improvements you are proposing to make. **A certified and licensed engineering firm should complete site plans.**

A SITE PLAN MUST CONTAIN THE FOLLOWING INFORMATION:

1. Legal description of the parcel, north arrow and scale
2. All property lines and their dimensions
3. Names of adjacent roads, location of driveways
4. Location of sloughs, tributaries, streams, rivers, wetlands, ponds, and lakes, with setbacks indicated, and including FEMA floodplain data based on most updated FIRM.
5. Location, size, shape of all buildings, existing and proposed, with elevation of lowest floor indicated.
6. Location and dimensions of existing or proposed on-site sewage systems.
7. Location of all propane tanks, fuel tanks or other liquid storage tanks whether above ground or below ground level.
8. Location and dimensions of any proposed pipeline placement(s) into floodplain/floodway.
9. Location and dimensions of any roadway development into floodplain/floodway. *(Includes initial development access roads)*
10. Location and dimensions of any bridge and/or culvert development into floodplain/floodway.
11. Location and dimensions of any storage yard or facility into the floodplain/floodway.
12. Location of any existing utilities and/or proposed utility placement and/or displacement.
13. Location, dimensions and depth of any existing or proposed fill on site.
14. A survey showing the **existing ground elevations** of at least location on the building site. **ELEVATION NOTE:** All vertical datum will reference either NGVD 29 or NAVD 88. Assumed datum will not be acceptable unless the property is located in an area where vertical datum has not been published. For those areas where vertical datum has not been established, a site plan with contours, elevations using assumed datum, high water marks and existing water levels of sloughs, rivers, lakes or streams and proposed lowest floor elevation.



ATTACHMENT B
TABLE OF PROPERTY OWNERS

Table of Property Owners

PROPERTY OWNER	PARCEL ID NUMBER	E-911 ADDRESS	PROPERTY OWNER ADDRESS	IN FLOODPLAIN
CLARK ROSALIE (LIFE)	09-04-0004-0009-0000	87 CLARK FARM DR, SALEM, WV 26426 5705 GREENBRIER RD, SALEM, WV 26426 5714 GREENBRIER RD, SALEM, WV 26426 5720 GREENBRIER RD, SALEM, WV 26426	87 CLARK FARM DR, SALEM, WV 26426	YES
CLARK RODNEY L & CRYSTAL D (SURV)	09-04-0004-0009-0002	5400 GREENBRIER RD, SALEM, WV, 26426 5381 GREENBRIER RD, SALEM, WV, 26426	5400 GREENBRIER RD, SALEM, WV 26426	YES
CLARK RODNEY L	09-04-0004-0009-0001	NO E-911 ADDRESS FOUND FOR THIS PARCEL	5400 GREENBRIER RD, SALEM, WV 26426	YES
CLARK ROSALIE (LIFE)	09-04-0004-0026-0000	NO E-911 ADDRESS FOUND FOR THIS PARCEL	87 CLARK FARM DR, SALEM, WV 26426	YES (DOWNSTREAM)
CLARK JAMES JR	09-04-0004-0009-0003	30 CLARK FARM DR, SALEM, WV, 26426 5729 GREENBRIER RD, SALEM, WV, 26426	PO BOX 164, SALEM, WV 26426	YES (UPSTREAM)



ATTACHMENT C
NO RISE CERTIFICATION



This is to certify that I am a duly qualified registered professional engineer licensed to practice in the State of West Virginia.

It is further to certify that based on the information provided to me, and the attached technical data supports the fact that the proposed Perkins Bypass LP Pipeline (Site) will not impact the 100-year flood elevation of Greenbrier Creek at the published sections in the Flood Insurance Study for Doddridge County (Community ID 540024) effective 10/04/2011 and will not impact the 100-year flood elevation at unpublished cross-sections in the vicinity of the Site.

Work to be performed at the Site involves road maintenance activities associated with ingress/egress along the existing access road. These activities may include material being added within the floodplain, but outside the stream ordinary high-water mark, by up to 6-inches.

The work outlined above is the focus of this Hydrologic Engineering Center-River Analysis System (HEC-RAS) analysis as it was shown to be within Flood Zone AE. Work will be confined to the floodplain and will only be performed "as-needed" to ensure safe road passage to the work area. The total watershed (drainage basin) for Greenbrier Creek at this crossing was shown to be 1.15 square miles. A peak flow from this area was calculated utilizing the National Streamflow Statistics application available online. A HEC-RAS analysis was completed, based on the drainage area above and associated flows, to verify that no influence will occur due to the proposed activities within the floodplain of Greenbrier Creek. The flows compared for the affected area are attached.

Attached are the following documents that support my findings:


West Virginia Flood Tool Map

Design Plans

National Streamflow Statistics – Drainage Area

Comparison for Calculated Flows – HEC-RAS Excel Data

Date: 6/14/2023

Signature: 

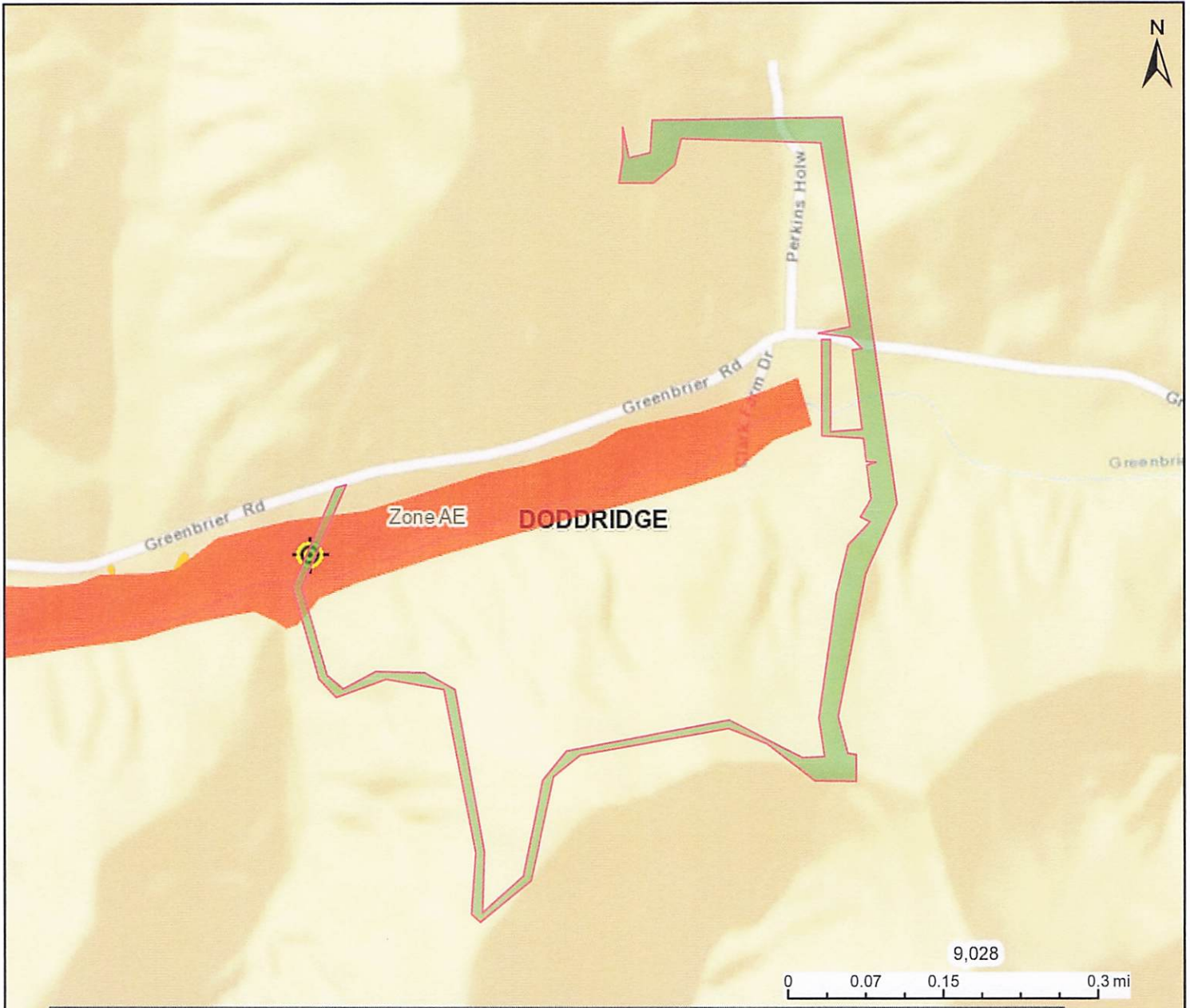
Title: Senior Professional





APPENDIX A
West Virginia Flood Tool Map

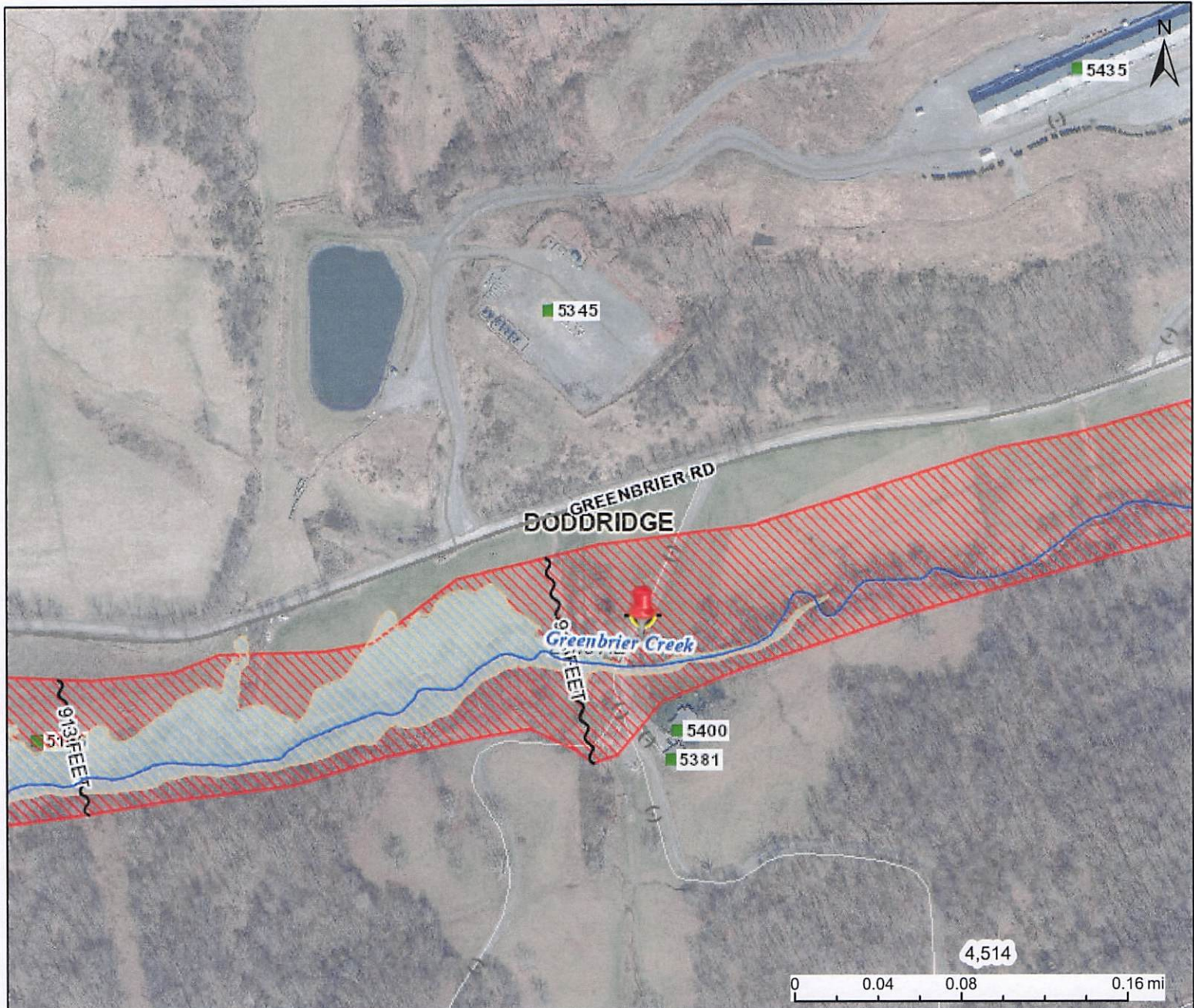
WV Flood Map-Perkins Bypass LP PL



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location

H I G H R I S K	Regulatory Floodway	Map created on 5/11/2023	
	Zone AE	1-Percent-Annual-Chance Flood Hazard Area With Base Flood Elevation (BFE)	
	Zone A	1-Percent-Annual-Chance Flood Hazard Area Without BFE (may have Advisory Flood Heights)	
	Advisory	1-Percent-Annual-Chance Future Conditions (High Risk Advisory Flood Zones)	
	Download the Full Legend for all flood tool symbols https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf		User Notes
Disclaimer: The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (https://www.MapWV.gov/flood) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.		Flood Info Location	Location is WITHIN the FEMA 100-year floodplain.
		Flood Hazard Area	AE
		Stream	Greenbrier Creek
		Watershed (HUC8)	Little Musringum-Middle Island (5030201)
		Flood Height	Flood Height 3 Refer to FIS report for BFE NAVD88
		Water Depth	
		Elevation	921.8 ft (Source: FEMA 2018-20) (NAVD88)
		Community & ID	Doddridge County (ID: 540024)
		FEMA Map & Date	54017C0255C; Effective Date: 10/4/2011
		Location (lat, long)	(39.245604, -80.598032) (WGS84)
		Parcel ID	09-04-0004-0009-0000
		E-911 Address	87 CLARK FARM DR , SALEM, WV, 26426

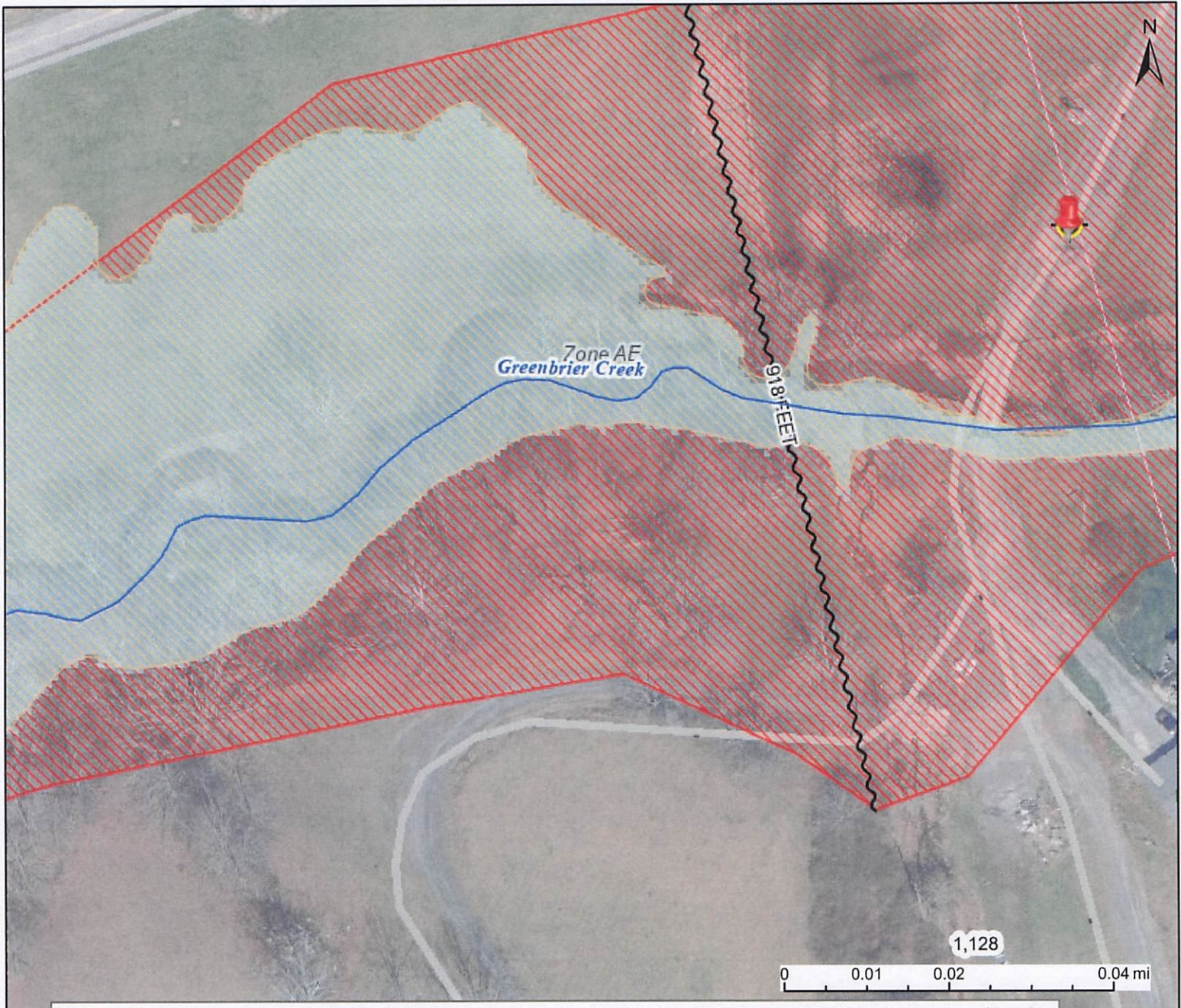
WV Flood Map - Perkins Bypass LP PL



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

H I G H R I S K		1-Percent-Annual-Chance Flood Hazard Area With Base Flood Elevation (BFE)	Map created on 6/21/2023
		Regulatory Floodway in AE Zone	
		1-Percent-Annual-Chance Flood Hazard Area Without BFE (may have Advisory Flood Heights)	
		1-Percent-Annual-Chance High Risk Advisory	
	Download the Full Legend for all flood tool symbols https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf		User Notes: AE Zone showing BFE and addresses
Disclaimer: The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (https://www.mapwv.gov/flood) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.		Flood Hazard Area: Location is WITHIN the FEMA 100-year floodplain.	
	Flood Zone: AE Stream: Greenbrier Creek Watershed (HUC8): Little Musringum-Middle Island (5030201)		
	Flood Height: 921.8 ft (Source: FEMA 2018-20) (NAVD88) Water Depth: 921.8 ft (Source: FEMA 2018-20) (NAVD88) Elevation: 921.8 ft (Source: FEMA 2018-20) (NAVD88)		
	Community & ID: Doddridge County (ID: 540024) FEMA Map & Date: 54017C0255C; Effective Date: 10/4/2011 Location (lat, long): (39.245604, -80.598032) (WGS84)		
	Parcel ID: 09-04-0004-0009-0000 E-911 Address: 87 CLARK FARM DR , SALEM, WV, 26426		

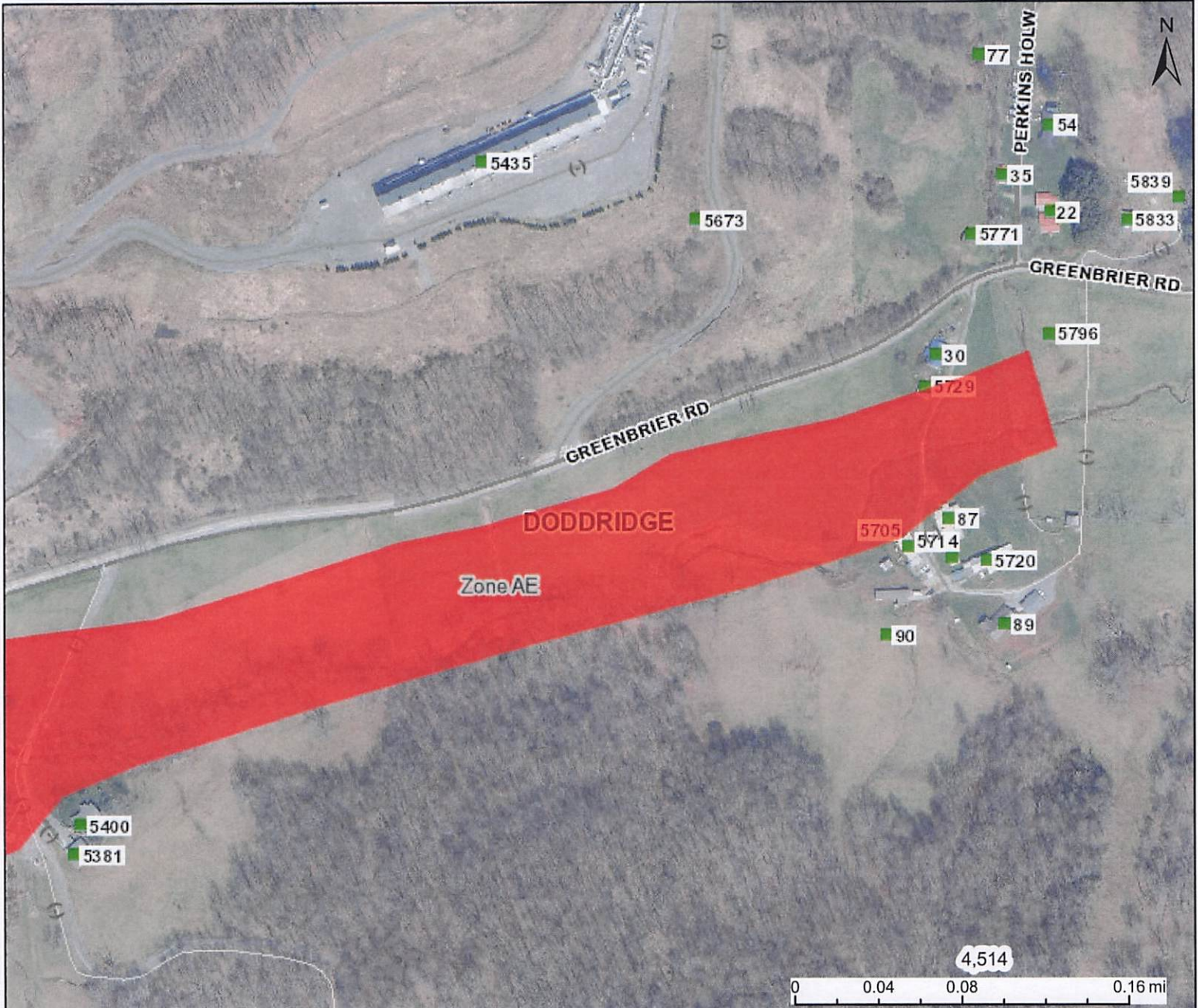
WV Flood Map - Perkins Bypass LP PL



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

H I G H R I S K		1-Percent-Annual-Chance Flood Hazard Area With Base Flood Elevation (BFE)	📍 Flood Info Location Map created on 6/21/2023 User Notes AE Zone showing BFE and addresses
		Regulatory Floodway in AE Zone	
		1-Percent-Annual-Chance Flood Hazard Area Without BFE (may have Advisory Flood Heights)	Flood Hazard Area Location is WITHIN the FEMA 100-year floodplain.
		1-Percent-Annual-Chance High Risk Advisory	Flood Zone AE Stream Greenbrier Creek Watershed (HUC8) Little Musringum-Middle Island (5030201)
	Download the Full Legend for all flood tool symbols https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf		Flood Height Flood Height 3 Refer to FIS report for BFE NAVD88 Water Depth Elevation 921.8 ft (Source: FEMA 2018-20) (NAVD88) Community & ID Doddridge County (ID: 540024) FEMA Map & Date 54017C0255C; Effective Date: 10/4/2011 Location (lat, long) (39.245604, -80.598032) (WGS84) Parcel ID 09-04-0004-0009-0000 E-911 Address 87 CLARK FARM DR , SALEM, WV, 26426
Disclaimer: The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (https://www.mapwv.gov/flood) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.			

WV Flood Map



This map is not the official regulatory FIRM or DFIRM. Its purpose is to assist with determining potential flood risk for the selected location.

	Flood Info Location Map created on 6/16/2023
<p>Download the Full Legend for all flood tool symbols https://www.mapwv.gov/flood/map/docs/wv_flood_tool_legend.pdf</p> <p>Disclaimer: The online map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. Refer to the official Flood Insurance Study (FIS) for detailed flood elevation data in flood profiles and data tables. WV Flood Tool (https://www.MapWV.gov/flood) is supported by FEMA, WV NFIP Office, and WV GIS Technical Center.</p>	<p>User Notes</p> <p>Flood Hazard Area</p> <p>Flood Zone</p> <p>Stream</p> <p>Watershed (HUC8)</p> <p>Flood Height</p> <p>Water Depth</p> <p>Elevation 0.0 ft (Source:) (NAVD88)</p> <p>Community & ID</p> <p>FEMA Map & Date</p> <p>Location (lat, long)</p> <p>Parcel ID</p> <p>E-911 Address</p>



APPENDIX B Design Plans

WVDOH GENERAL NOTES

- ALL CONSTRUCTION ON THE DIVISION OF HIGHWAYS RIGHT OF WAY WILL CONFORM TO THE FOLLOWING:
- THE FOLLOWING NOTES APPLY TO ALL PLAN SHEETS:
1. ALL METER SETTINGS ACROSS PAVED ROADS SHALL BE BORED OR MOLED, UNLESS OPEN CUT HAS BEEN APPROVED BY W.V.D.O.H. AND SPECIALLY INDICATED ON PLANS.
 2. NOTIFICATION OF PROPOSED EXCAVATION, DEMOLITION OR ANY OTHER EARTH DISTURBING ACTIVITIES ARE REQUIRED TO BE PLACED TO MISS UTILITY OF WEST VIRGINIA (1-800-245-4848) NOT LESS THAN FORTY EIGHT (48) BUSINESS HOURS BEFORE ANY SUCH WORK IS TO BEGIN.
 3. BEDDING SHALL BE PLACED ON ASPHALT SURFACE TO PROTECT THE PAVEMENT WHEN A TRENCHER OR TRACKED VEHICLE IS USED.
 4. THE WEST VIRGINIA DIVISION OF HIGHWAYS PUBLICATIONS "STANDARD SPECIFICATIONS ROADS AND BRIDGES" AND "ACCOMMODATIONS OF UTILITIES ON HIGHWAY RIGHT OF WAY" LATEST EDITION ARE PART OF THE SPECIFICATIONS AND WILL BE ADHERED TO BY THE CONTRACTOR.
 5. ALL DAMAGE TO ROAD SURFACE SHALL BE REPAIRED ACCORDING TO THE WEST VIRGINIA DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS AND DETAILS.
 6. ALL EXISTING DUMP ROCK OR RIP RAP DITCHES DISTURBED BY THE UTILITY LINE CONTRACTOR SHALL BE RESTORED WITH THE SAME SIZE, GRADE AND QUALITY OF ROCK AFTER THE UTILITY LINE HAS BEEN INSTALLED. NEW DUMP ROCK (RIP RAP) IS TO BE PLACED IN ALL LOCATIONS WHERE THE DITCH LINE GRADE IS GREATER THAN 5% AND THERE IS NO EXISTING RIP RAP.
 7. TRAFFIC CONTROL SHALL CONFORM TO THE W.V.D.O.H. PUBLICATION "TRAFFIC CONTROL FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE" OPERATION LATEST EDITION.
 8. ALL BACKFILL MATERIAL AND COMPACTION REQUIREMENT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS IN THE ACCOMMODATION OF UTILITIES ON HIGHWAY RIGHT OF WAY AND ADJUSTMENT AND RELOCATION OF UTILITY FACILITIES ON HIGHWAY PROJECTS AND SUBJECT TO D.O.H. APPROVAL. EVIDENCE OF PROPER COMPACTION BY TESTING WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE TESTING SHALL BE ONE (1) PER DAY OR EVERY 500 LINEAL FEET OR AS DETERMINED BY THE DISTRICT MANAGER (ENGINEER) OR HIS AUTHORIZED REPRESENTATIVE.
 9. UTILITY LINES SHALL BE PLACED EITHER AROUND, UNDER OR OVER DRAINAGE CULVERTS AS SHOWN ON PLANS.
 10. AGGREGATE SHOULDER STONE IS TO BE PLACED ON THE SHOULDER AT A THICKNESS EQUAL TO 6" OR ITS ORIGINAL THICKNESS WHICHEVER IS GREATER. PAVED SHOULDERS WILL BE PAVED.
 11. MAGNETIC MARKING TAPE SHALL BE INSTALLED AT A DEPTH OF 12" TO 18" BELOW THE SURFACE AND DIRECTLY ABOVE ALL LINES OR PIPE.
 12. REPAIR TO DRIVEWAYS (REPAIR) RIGHT OF WAYS SHALL CONFORM TO THE APPROPRIATE W.V.D.O.H. TYPICAL REPAIR DETAIL.
 13. CLEANUP WILL BE ACCOMPLISHED DAILY. RIGHT OF WAYS SHALL CONFORM TO THE APPROPRIATE W.V.D.O.H. REPAIR. ALL CULVERTS AND DRAINAGE DITCHES SHALL BE OPEN AND MAINTAINED DURING CONSTRUCTION. SHOULDERS WILL BE RESTORED AND STABILIZED WITH STONE. DAILY WITH APPROPRIATE STONE AT THE DISCRETION OF W.V.D.O.H.
 14. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED WITHIN SEVEN DAYS OF COMPLETION OF BACK FILL OPERATION.
 15. NO EXCESS EXCAVATION MATERIAL SHALL BE WASTED ON W.V.D.O.H. RIGHT OF WAYS WITHOUT THE AGREEMENT OF THE W.V.D.O.H.
 16. THE W.V.D.O.H. RESERVES THE RIGHT TO RELOCATE WATERLINES, FIRE HYDRANTS, AND VALVES AS DEEMED NECESSARY.
 17. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING UTILITY COMPANIES, PRIOR TO CONSTRUCTION TO OBTAIN UTILITY LOCATIONS AND PERFORMING EXPLORATORY WORK TO DETERMINE SUBSURFACE MATERIALS AND STRUCTURES THAT MAY AFFECT ITS WORK.
 18. PRIOR TO THE START OF ANY WORK WITHIN STATE HIGHWAY RIGHT-OF-WAY, THE CONTRACTOR SHALL GIVE THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION 48 HOURS NOTICE.
 19. THE CONTRACTOR IS RESPONSIBLE FOR ANY OFFSITE DISPOSAL REQUIRED. DISPOSAL SHALL BE TO AN ACCEPTABLE LEGAL SITE. CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL AT DISPOSAL SITES.
 20. ALL ELEVATION GRADES AND DISTANCES SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE PRIOR TO CONSTRUCTION.
 21. ALL CONSTRUCTION SHALL MAINTAIN 5' FROM EDGE OF PAVEMENT OR BOTTOM OF DITCH UNLESS NO OTHER PRACTICAL MEANS OF CONSTRUCTION EXISTS.
 22. PERFORM ACCEPTABLE REPAIR OF ANY AND ALL SUB-BASE FAILURES THAT ARE CAUSED BY THE CONTRACTOR'S OPERATION ON A DAILY BASIS.
 23. PERFORM TOTAL REPAIR AND/OR REPLACEMENT OF ANY DAMAGED ASPHALT SURFACE AS DETERMINED BY THE W.V.D.O.H. REPRESENTATIVE.
 24. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL MAKE A COMPLETE VIDEO SHOWING THE ROAD SURFACE OF ALL ROADS TO BE UTILIZED AND PRESENT IT TO THE UTILITY SUPERVISOR W.V.D.O.H.
 25. REMOVE DITCH-LINE OBSTACLES AND/OR RECONSTRUCTION OF THE DITCH-LINE.
 26. IN THE CASE OF MANHOLES OR VALVES IF AT ALL POSSIBLE SHALL BE PLACED OUTSIDE THE ROADWAY, SHOULDER, OR DITCH LINE. IF PLACED IN THE SHOULDER THERE IS TO BE A MINIMUM OF 8 INCHES OF COVER IN THE DITCH LINE. THERE IS TO BE 12 INCHES OF COVER BETWEEN THE MANHOLE AND THE INVERT OF THE DITCH.
 27. ANY MANHOLES OR VALVES OR VALVE BOXES PLACED IN THE ROADWAY WILL BE ON THE SAME PLANE AS THE ROADWAY AND SET FLUSH WITH ROADWAY.
 28. ANY ROADS REQUIRING AN H.L.B.C. OVERLAY, FULL WIDTH OR PARTIAL, SHALL HAVE SHOULDER STONE FROM AN APPROVED SOURCE PLACED AS PER D.O.H. SPECIFICATIONS.
 29. THE DEPARTMENT OF HIGHWAYS REQUIRES THERE BE NO WORK WITHIN THE DEPARTMENT'S RIGHT-OF-WAY DURING SNOW AND ICE REMOVAL. THERE MAY BE EXCEPTIONS FOR EMERGENCY AND CASE BY CASE SITUATIONS WITH NOTIFICATION TO THE DEPARTMENT.

UTILITY AGENCIES SERVING AREA

MISS UTILITY
1-800-245-4848
TICKET # 2309062949

WEST VIRGINIA DIVISION OF HIGHWAYS

WVDOH DIST #4
P.O. BOX 4220
CLARKSBURG, WV 26301-4220
(304) 842-1500
(304) 842-1564 FAX
LACY PRATT - UTILITY SUPERVISOR - CROSSINGS
TARA CARGER - PERMIT SUPERVISOR - TEMP. ACCESSES

RESPONSE TEAMS:

NATIONAL RESPONSE CENTER FOR REPORTING

CHEMICAL OR OIL SPILLS

1-800-424-8802

STATE EMERGENCY SPILL

NOTIFICATION

1-800-642-3074

EMERGENCY AMBULANCE, FIRE, LAW

ENFORCEMENT

911

GAS LINE CROSSINGS				
STATION	LAT	LONG	DESCRIPTION	PLAN SHEET #
2+04	39.243841	-80.590787	EX. DIVERSIFIED 4" STEEL GASLINE	06
3+98	39.249900	-80.593255	EX. DIVERSIFIED STEEL GASLINE	07

DRAWING INDEX

01	COVER	COVER SHEET
02	GNOTS	GENERAL NOTES SHEET
03	SPECS	GENERAL CONSTRUCTION SPECS SHEET
04-05	PL-INDEX-AR-INDEX	INDEX SHEETS
06-07	PLANT-PLAN2	PROPOSED ALIGNMENT PLAN AND PROFILE SHEETS
08-11	ARPS1-ARPS4	ACCESS ROAD PLAN SHEETS
12	HSP	HYDROSTATIC PROFILE SHEET
13-18	S&WC1-S&WC6	STREAM & WETLAND CROSSING SHEETS
19-29	ESCP1-ESCP11	ESCP DETAIL SHEETS

GENERAL NOTES

1. EXISTING UTILITIES SHOWN ON PLANS WHERE EVIDENCE HAS BEEN FOUND OR PROVIDED BY LOCAL UTILITIES. EXACT DEPTH AND LOCATION OF UTILITY LINES NOT KNOWN. CONTRACTOR TO VERIFY UTILITY LOCATIONS PRIOR TO CROSSING BY CONTACTING MISS UTILITY AT 1-800-245-4848 AND LOCAL UTILITY COMPANIES AS LISTED AND/OR NOT LISTED ON THIS SHEET. CONTRACTOR TO LOCATE WATER AND UTILITY SERVICES BEFORE BORING AND JACKING.
2. IN THE EVENT AN ERROR WITH THE PLANS SEEMS APPARENT, THE MATTER MUST BE TAKEN UP WITH THE ENGINEER FOR REVIEW BEFORE PROCEEDING WITH CONSTRUCTION.
3. ALL PERMITS MUST BE SECURED PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL COORDINATE ALL STREAM CROSSING INSTALLATIONS PROPOSED SO NOT TO DELAY THE CONSTRUCTION PROCESS. STREAM CROSSINGS ARE TO BE CONSTRUCTED USING AN OPEN CUT CROSSING METHOD UNLESS OTHERWISE SPECIFIED ON THE PLANS.
5. ALL PROPOSED PERMANENT FILL TO BE FILLED WITH STONE, NATURAL ROCK, OR A 20" CULVERT TO BE INSTALLED TO MAINTAIN STREAM FLOW.
6. ALL WVDOH ROAD CROSSINGS TO BE CONSTRUCTED USING AN OPEN CUT CROSSING METHOD UNLESS OTHERWISE SPECIFIED ON THE PLANS. WVDOH TO BE NOTIFIED AT LEAST 48 HOURS PRIOR TO ANY WORK WITHIN WOODY R/W.
7. ALL CONSTRUCTION TO BE DONE IN THE PROPOSED PIPELINE LIMITS OF DISTURBANCE AS SHOWN.
8. ALL CONSTRUCTION SHALL CONFORM TO THE APPLICABLE STANDARDS AND SPECIFICATIONS PROVIDED IN A SEPARATE BOUND VOLUME.
9. CONTRACTOR SHALL FIELD VERIFY EXISTING PIPE TYPES AND O.D. PRIOR TO CONNECTION.
10. PROPERTY LINES SHOWN ON PLANS WERE OBTAINED FROM PARTIAL FIELD SURVEY AND RESEARCHED INFORMATION TAKEN FROM RECORDS ON FILE IN THE LOCAL COUNTY COURTHOUSE. TO OBTAIN A MORE ACCURATE BOUNDARY LINE LOCATION, A FULL PROPERTY SURVEY IS RECOMMENDED.

EROSION & SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT MEASURES TO BE IN ACCORDANCE WITH WEST VIRGINIA ONLINE BMP MANUAL FOR STANDARD GUIDELINES AND SPECIFICATIONS AVAILABLE AT: [HTTPS://APPS.DEP.WV.GOV/DWMM/STORMWATER/BMP/INDEX.HTML](https://apps.dep.wv.gov/dwmm/stormwater/bmp/index.html)
2. EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN SHOWN ON PLANS AND DETAILED IN SPECIFICATIONS.
3. EXPOSED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPs THAT PROTECT THE SOIL FROM THE EROSIIVE FORCES OF RAINDROPS, FLOWING WATER, AND WIND.
4. CLEARING AND GRUBBING IS TO OCCUR IN THE NOTED LIMITS OF DISTURBANCE (L.O.D.) ONLY.
5. ALL GRADED AREAS THAT ARE AT FINAL GRADE MUST BE SEEDED AND MULCHED WITHIN 7 DAYS AND AREAS THAT WILL NOT BE WORKED AGAIN FOR 21 DAYS OR MORE MUST BE SEEDED AND MULCHED WITHIN 7 DAYS. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY OR PERMANENTLY CEASES IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS CONDITIONS ALLOW. WHERE CONSTRUCTION ACTIVITY WILL RESUME ON A PORTION OF THE SITE WITHIN 21 DAYS FROM WHEN ACTIVITIES CEASED, (E.G., THE TOTAL TIME PERIOD THAT CONSTRUCTION ACTIVITY IS TEMPORARILY HALTED IS LESS THAN 21 DAYS) THEN STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED.
6. AREAS WHERE THE SEED HAS FAILED TO GERMINATE ADEQUATELY (UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% WITHIN 30 DAYS AFTER SEEDING AND MULCHING MUST BE RE-SEEDED IMMEDIATELY, OR AS SOON AS WEATHER CONDITIONS ALLOW.
7. TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPs SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH BMPs.
8. EROSION AND SEDIMENT CONTROLS BMPs SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCHES PER 24 HOUR PERIOD. ANY NECESSARY OR REQUIRED REPAIRS SHOULD BE MADE IMMEDIATELY. ANTERO HAS ONLINE ACCESS TO SEVERAL RAIN GAUGE LOCATIONS IN THE GENERAL AREA OF EACH WORK LOCATION. THIS DATA WILL BE MONITORED AND USED BY INSPECTION PERSONNEL. USE OF ONLINE WEATHER TRACKING TOOLS MAY BE UTILIZED. RAINFALL DATA WILL BE RECORDED ON INSPECTION RECORDS.

CONSTRUCTION SEQUENCE OF EVENTS

1. CALL MISS UTILITY (1-800-245-4848).
2. INSTALLATION OF EROSION AND SEDIMENT CONTROL MEASURES.
3. CONSTRUCTION OF PIPELINE WITH RESTORATIONS.
4. TESTING OF PIPELINE AND APPURTENANCES.
5. WORK, CLOSE-OUT, PUNCH LIST, CLEAN UP, REPAIRS, FINAL SEEDING AND MULCHING, ETC..

LEGEND / ABBREVIATIONS

- EXISTING PIPELINE VENT
 - EXISTING GAS WELL (AS NOTED)
 - EXISTING GAS METER
 - EXISTING PIPELINE MARKER
 - EXISTING GAS VALVE
 - EXISTING MONUMENT FOUND (AS NOTED)
 - EXISTING UTILITY POLE
 - EXISTING GATE / FENCE POST
 - EXISTING PIPELINE
 - EXISTING WATER LINE
 - EXISTING FENCE
 - EXISTING OVERHEAD UTILITY
 - EXISTING UNDERGROUND UTILITY
 - EXISTING TELEPHONE
 - EXISTING GUARDRAIL
 - EXISTING UNPAVED ROAD
 - EXISTING PAVED ROAD
 - EXISTING DITCH
 - EXISTING TREELINE
 - PROPERTY LINE
 - DON RIGHT-OF-WAY LINE
 - PROPOSED PERMANENT RIGHT-OF-WAY
 - PROPOSED CONSTRUCTION RIGHT-OF-WAY/ LIMITS-OF-DISTURBANCE
 - COMPRESSOR/MILL PAD LIMITS-OF-DISTURBANCE
 - PROPOSED ANTERO BASELINE
 - PROPOSED ANTERO GAS LINE
 - PROPOSED ANTERO BURIED WATER LINE
 - PROPOSED ANTERO SURFACE WATER LINE
 - EXISTING GROUND PROFILE
 - EXISTING PIPELINE PROFILE
 - CONTROL
 - AREA-OF-INTEREST
 - PROPOSED TYPE A BMP (SEE TABLE ON SHEET 20)
 - PROPOSED TYPE B BMP (SEE TABLE ON SHEET 20)
 - PROPOSED TYPE C BMP (SEE TABLE ON SHEET 20)
 - PROPOSED ORANGE SAFETY FENCE
 - PROPOSED RIGHT-OF-WAY DIVERSION (PLAN)
 - PROPOSED ACCESS ROAD DITCH
 - PROPOSED CULVERT (AS NOTED)
 - PROPOSED 6" N-12 DUAL WALL PIPE OR EQUAL TEMPORARY CULVERT FOR CONSTRUCTION ACCESS
 - DIAMETER BETWEEN 12" - 36" WILL BE DETERMINED TO MAINTAIN STREAM FLOW.
 - DELINEATED CULVERT
 - DELINEATED STREAMS
 - DELINEATED STREAMS (PROPOSED PERMANENT FILL)
 - DELINEATED WETLANDS
 - DELINEATED WETLANDS (PROPOSED PERMANENT FILL)
 - DELINEATED GROUND WATER SEEP/SPRING
 - ROLLED EROSION CONTROL PRODUCT
 - (INDICATES AREAS WHERE SLOPE IS 3:1 OR GREATER)
 - ADDITIONAL TEMPORARY WORKSPACE
 - STONE CONSTRUCTION ENTRANCE
 - TEMPORARY TIMBERMAT CROSSING
 - PROPOSED ACCESS ROAD
 - PIPELINE MILE POST
 - PROPOSED RIGHT-OF-WAY DIVERSION (PROFILE)
 - PROPOSED EARTH TRENCH BREAKER (PROFILE)
 - PROPOSED TRENCH PUNCH DRAIN (PROFILE)
 - PROPOSED GAS LINE MARKER
 - PROPOSED TEST STATION
 - PARCEL IDENTIFICATION
- *LEGEND IS TYPICAL. NOT ALL ITEMS IN LEGEND APPEAR IN DRAWING.

PROPOSED CONSTRUCTION

- RIGHT-OF-WAY LIMITS-OF-DISTURBANCE
- CONSTRUCTION R/W LIMITS-OF-DISTURBANCE
- B.L. PROPOSED CORRIDOR
- CONSTRUCTION R/W LIMITS-OF-DISTURBANCE

DATE: 05/16/23
 SCALE: AS SHOWN
 SHEET: 02-GNOTS
 PROJECT: PERKINS BYPASS LP PIPELINE GENERAL NOTES SHEETS 02-31

THRASHER

IFP

ISSUED FOR PERMITTING

DATE: 05/16/23

AFE # A12528

SUMMARY OF MATERIALS (3D)			SUMMARY OF MATERIALS (3D)			
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY	
REVISION						
1	REVIEW FOR COMMENTS FROM KLEINFELDER & ANTERO		5/16/23	JU		
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	DATE	BY

GENERAL INFORMATION

1. ALL DESIGN, ESTIMATION OF PIPELINE AND MANIP CALCULATIONS ALONG WITH METHODS WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR RESULTS PROVIDED BY ANTERO.
2. FIELD RELEASEMENT PERFORMED AND PROVIDED BY KLEINFELDER, INC.
3. THIS SHEET IS INTENDED TO BE PLOTTED ON AHS D (24" x 36") FOR REDUCTIONS. REFER TO GRAPHIC SCALE.

Anty

PERKINS BYPASS LP PIPELINE GENERAL NOTES

PROPOSED 16" STEEL GAS LINE

DODDRIIDGE COUNTY, WEST VIRGINIA

DATE: 5/16/2023

DRAWN BY: JU (TIG) DATE: 5/16/2023

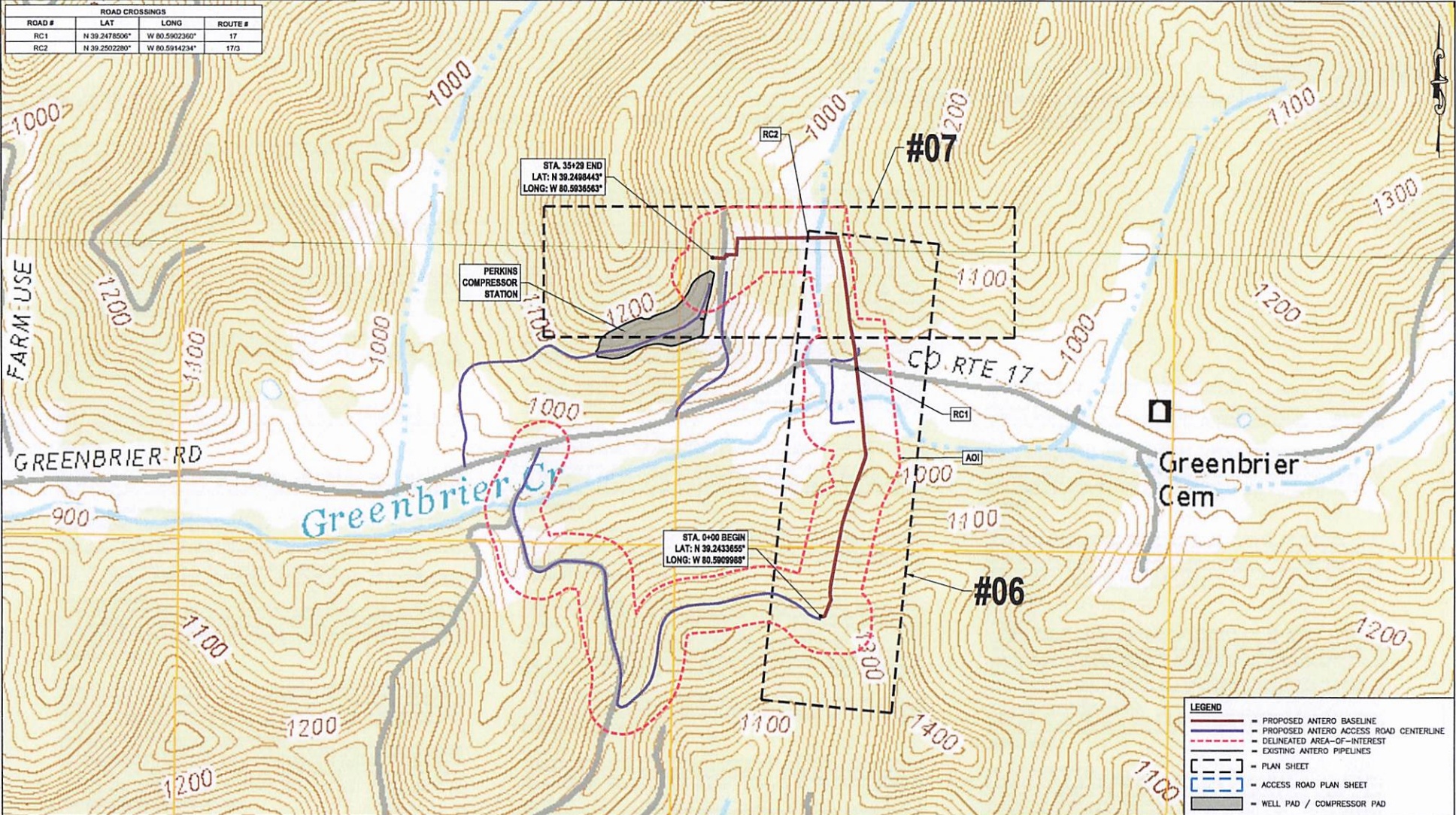
CHECKED BY: JH (TIG) AFE No.: A12528

SCALE: AS SHOWN

REVISION No.: 0

SHEET: 02-GNOTS

ROAD CROSSINGS			
ROAD #	LAT	LONG	ROUTE #
RC1	N 39.2478506°	W 80.5902360°	17
RC2	N 39.2502280°	W 80.5914234°	17D



LEGEND	
	PROPOSED ANTERO BASELINE
	PROPOSED ANTERO ACCESS ROAD CENTERLINE
	DELINEATED AREA-OF-INTEREST
	EXISTING ANTERO PIPELINES
	PLAN SHEET
	ACCESS ROAD PLAN SHEET
	WELL PAD / COMPRESSOR PAD

THRASHER

IFP
ISSUED FOR PERMITTING

DATE: 05/16/23
AFE # A12528

0 300 600
HORIZ. SCALE IN FEET

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION	
1.	ALL DESIGN STRENGTHS OF PIPELINE AND MAPS CALCULATIONS ALONG WITH RESULTS WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.
2.	FIELD RESEARCH PERFORMED AND PROVIDED BY: HLENFELDER, INC.
3.	MAKING SOURCE: BIG BEAR, WV UNOS 7.5 MINUTE QUADRANGLE DATED 2018 SALEX, WV UNOS 7.5 MINUTE QUADRANGLE DATED 2018
4.	COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY: HORIZONTAL = NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT VERTICAL = NAD 83 (GEOID), U.S. SURVEY FOOT
5.	THIS SHEET IS INTENDED TO BE PLOTTED ON A8D 8 (24" X 36") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.
6.	FOR USAGES/ABBREVIATION INFORMATION, REFER TO THE GENERAL NOTES SHEET.

Ant

**PERKINS BYPASS LP PIPELINE
PLAN INDEX SHEET**

PROPOSED 16" STEEL GAS LINE

DODDRIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JJJ (TIG) DATE: 5/17/2023
CHECKED BY: JBN (TIG) AFE No.: A12528
SCALE: AS SHOWN SHEET: 04-PL-INDEX

LAYOUT: 04-PL-INDEX
 DATE: 05/16/23
 PLOT DATE/TIME: 5/17/2023 12:15 PM
 USER: jbn.jbn

1. GRADING

THE CONTRACTOR SHALL GRADE AS NECESSARY TO MITIGATE THE NECESSITY OF ABRUPT OVER-BENDS OR SAG-BENDS. CONTRACTOR SHALL MINIMIZE THE GRADING WHERE PRACTICAL TO PREVENT UNNECESSARY DISTURBANCE AND MINIMIZE WORK REQUIRED TO RETURN THE RIGHT-OF-WAY TO ITS ORIGINAL ELEVATIONS, SLOPES, AND PROFILE AS CLOSELY AS PRACTICAL, BUT CONSISTENT WITH MINIMIZING ABRUPT OVER-BENDS AND SAG-BENDS. GRADED SURFACES SHALL BE STOCK PILED SO IT CAN BE RETURNED TO ITS ORIGINAL ELEVATION. DEPTH AND LOCATION AS OPPOSED TO SPREAD ALONG THE RIGHT-OF-WAY. THE CONTRACTOR SHALL GRUB, OR OTHERWISE REMOVE, AND DISPOSED OF ALL STUMPS, ROOTS AND DEBRIS FOUND TO BE IN THE WAY OF CONSTRUCTION WITH PERMANENT RIGHT-OF-WAY LIMITS. WHEN THE CONTRACTOR IS CUTTING GRADE ALONG OR ACROSS EXISTING PIPELINES, SPOL OR MATS SHALL BE PLACED OVER THE EXISTING LINES PER THE REQUIREMENTS OF THE OPERATING COMPANY OF THE FOREIGN PIPELINE.

2. COMPANY FOREIGN LINE AND UTILITY CROSSINGS

CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL SUCH CROSSINGS AND NOTIFY THE OWNER PRIOR TO ANY DITCHING ACTIVITY IN THE VICINITY OF THE CROSSINGS. A MINIMUM CLEARANCE OF 12 IN. OR AS REQUIRED BY THE OWNER/OPERATOR SHALL BE MAINTAINED FROM THE FOREIGN CROSSING. THE CONTRACTOR SHALL MAKE ALL REQUIRED "ONE-CALL" NOTIFICATIONS, AND KEEP DOCUMENTATION OF NOTIFICATIONS. THE CONTRACTOR SHALL KEEP THE MARKINGS REFRESHED AS NECESSARY DURING THE LENGTH OF THE CONSTRUCTION ACTIVITIES, MAKING NECESSARY RE-NOTIFICATIONS AS REQUIRED. COMPANY WILL LOCATE AND MARK LOCATIONS OF KNOWN COMPANY-OWNED FACILITIES WITHIN EXISTING OPERATING LOCATIONS.

IN AREAS WHERE UNDERGROUND FACILITIES, SUCH AS PIPELINES, ELECTRICAL LINES, FIBER OPTIC CABLES, ETC. EXISTING, EXCAVATION BY MACHINE SHALL BE LIMITED TO NO CLOSER THAN 2 FEET (IN ANY DIRECTION) TO THE FACILITY. THE FACILITY SHALL THEN BE EXPOSED AND POSITIVELY LOCATED BY HAND EXCAVATION. AFTER THE FACILITY IS EXPOSED, AND ONLY WHILE A COMPANY REPRESENTATIVE IS ON-SITE, EXCAVATION BY MACHINE IS PERMITTED TO WITHIN 1 FOOT (IN ANY DIRECTION) OF THE FACILITY. THE REMAINING EXCAVATION MUST BE HAND DUG.

3. DITCH SPECIFICATIONS

DITCH WIDTH AND DEPTH - UNLESS OTHERWISE STATED ON THE DRAWINGS OR RIGHT-OF-WAY LINE LIST, THE DITCH SHALL BE A MINIMUM OF 12 IN. WIDER THAN THE PIPE BEING LAID FOR PIPE DIAMETERS LESS THAN 12 IN. AND A MINIMUM OF 18 IN. WIDER FOR PIPE DIAMETERS 12 IN. AND GREATER AND OF SUCH DEPTH THAT THE PIPE SHALL HAVE 48 IN. MINIMUM COVER IN SOIL AND 36 IN. IN CONSOLIDATED ROCK, MEASURED FROM THE TOP OF THE PIPE TO THE AVERAGE LEVEL OF THE ORIGINAL OR RESTORED GROUND ON THE TWO SIDES OF THE DITCH, WHICHEVER IS LOWER.

CONSOLIDATED ROCK - CONSOLIDATED ROCK IS DEFINED AS ROCK LAYERS WHERE THE UPPERMOST SURFACE EXISTS AT A HIGHER ELEVATION THAN THE ELEVATION OF THE TOP OF THE PIPE. THIS CONDITION PROVIDES PROTECTION AGAINST DAMAGE FROM EXTERNAL FORCES AND JUSTIFIES COVER.

DITCH GRADING - THE BOTTOM OF THE DITCH SHALL BE CUT TO A UNIFORM GRADE SO THAT THE FULL WIDTH OF THE DITCH SHALL BE AVAILABLE FOR PROVIDING SLACK IN THE LINE WHEN LAID.

BEND EXCAVATIONS - AT OVER-BENDS AND SIDE-BENDS, THE CONTRACTOR SHALL EXCAVATE THE DITCH TO ALLOW PROPER CLEARANCE BETWEEN THE INSIDE BEND OF THE PIPE AND THE BOTTOM OR SIDE OF THE DITCH TO MAINTAIN THE MINIMUM COVER.

ROCK - IN ALL CASES WHERE ROCK, OR ANY BOULDER LARGER THAN TWO IN. IN DIAMETER IS ENCOUNTERED IN THE BOTTOM OF THE DITCH, THE DITCH SHALL BE EVENLY PADDED WITH SOIL, SAND OR OTHER PADDING MATERIAL IN ORDER TO PREVENT THE ROCK OR BOULDERS FROM COMING INTO CONTACT WITH THE PIPE COATING.

4. SPOIL BANK

THE SPOIL BANK FROM THE DITCHING OPERATIONS SHALL NOT BE PLACED ON ANY LOOSE DEBRIS OR FOREIGN MATTER WHICH MIGHT BECOME MIXED DURING PADDING AND BACKFILLING OPERATIONS. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN GAPS OR OPENINGS IN THE SPOIL BANK ACROSS CULTIVATED FIELDS, SO THAT EXCESSIVE RAINS DO NOT CAUSE WATER TO BACK UP AND FLOOD CULTIVATED SECTIONS. EXTREME CARE SHALL BE EXERCISED TO KEEP ALL DRAIN DITCHES AND WATER COURSES OPEN AND USABLE.

5. TEMPORARY BRIDGES

WHEN THE DITCH IS EXCAVATED THROUGH LANDS WHERE LIVESTOCK/WILDLIFE IS CONFINED OR THROUGH AGRICULTURAL FIELDS WHERE THE COMPANY DETERMINES IT IS DESIRABLE FOR THE LANDOWNER OR TENANT TO HAVE A PASSAGEWAY ACROSS THE DITCH, THE CONTRACTOR SHALL PLUG THE DITCH OR PROVIDE SAFE, TEMPORARY BRIDGES FOR CROSSING THE DITCH AND LEAVE AN OPENING IN THE SPOIL BANK.

6. EXCAVATING NEAR IN-SERVICE PIPELINES

WHEN DITCHING PARALLEL TO AN EXISTING PIPELINE IN THE SAME RIGHTS-OF-WAY, NEAR THE EXISTING LINE AND DEEPER THAN THE EXISTING LINE, CARE SHOULD BE TAKEN TO LEAVE SUFFICIENT DISTANCE AND SUPPORT TO ENSURE SAID LINE DOES NOT SLOUGH OFF INTO NEW EXCAVATION. IF PARALLEL LINE IS A COUPLED HIGH PRESSURE LINE, IT IS NOT PERMITTED TO EXPOSE MORE THAN ONE COUPLING AT A TIME. IN ALL INSTANCES, THE WORK SHOULD BE PLANNED SUCH THAT THE EXCAVATION IS OPEN A MINIMUM AMOUNT OF TIME.

7. HAULING AND STRINGING

THE CONTRACTOR SHALL HAIL AND STRING PIPE, CASING AND OTHER MATERIALS TO THE RIGHT-OF-WAY OR WORK AREA. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY TRUCKS AND EQUIPMENT FOR THE HAULING AND SPOTTING OF ALL MATERIALS. THE CONTRACTOR SHALL FURNISH SKIDS AND PLACE PIPE ON SKIDS ON THE RIGHT-OF-WAY IN A MANNER WHICH KEEPS BOTH ENDS FREE OF DIRT AND DEBRIS.

8. BENDING

FIELD BENDING - WHERE IT IS NECESSARY TO BEND PIPE, ONLY COLD BENDS SHALL BE EMPLOYED. THE BENDS SHALL BE FREE FROM BUCKLING, FLATTENING, CRACKS OR OTHER EVIDENCE OF MECHANICAL DAMAGE AND BENDS SHALL NOT HAVE A DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM DIAMETERS IN EXCESS OF 2.5 % OF THE NOMINAL DIAMETER. ALL BENDS SHALL MEET THE CRITERIA SET FORTH IN DOT PART 192.

GENERAL CONSTRUCTION SPECIFICATIONS

8. BENDING (CONT'D)

SLACK AND LONGITUDINAL WELDS - ALL OVER-BENDS, SAGS AND SIDE-BENDS SHALL BE MADE TO PROVIDE AN ADEQUATE AMOUNT OF SLACK IN THE PIPELINE. ON PIPE HAVING A LONGITUDINAL WELD, THE LONGITUDINAL WELD MUST BE LOCATED AS NEAR AS PRACTICABLE TO THE NEUTRAL AXIS OF THE BEND.

BENDING MACHINE - EACH BEND SHALL BE MADE USING A COMPANY APPROVED BENDING MACHINE HAVING A FULL CIRCLE BENDING SHOE WITH A NEOPRENE OR URETHANE LINING TO PRODUCE A SMOOTH, SYMMETRICAL BEND, UNLESS SPECIFIED OTHERWISE BY THE COMPANY. ON PIPE CONTAINING A LONGITUDINAL WELD, THE LONGITUDINAL WELD SHALL BE LOCATED TO NEUTRAL AXIS OF THE BEND. THE BEND SHALL BE MADE WITH AN INTERNAL BENDING MANDREL OR THE PIPE IS 12 IN. OR LESS IN OUTSIDE DIAMETER OR HAS A DIAMETER-TO-WALL THICKNESS RATIO LESS THAN 70. IF THE PIPE IS INTERNALLY COATED, THE BEARING SURFACES OF THE MANDREL SHALL BE CONSTRUCTED TO AVOID PERMANENTLY MARKING OR DAMAGING THE INTERNAL COATING. NO APPRECIABLE STRETCHING OR THINNING OF THE PIPE WALL THICKNESS SHALL BE PERMITTED.

BENDING LIMITATION - DEFLECTION SHALL BE LIMITED TO A MAXIMUM OF ONE AND ONE-HALF DEGREES PER PIPE DIAMETER MEASURED LONGITUDINALLY ALONG THE PIPE. A COMPANY ACCEPTED METHOD OF MEASUREMENT SHALL BE USED BY THE CONTRACTOR WHEN MARKING THE PIPE IN PREPARATION FOR MARKING FIELD BENDS. BENDING SHALL NOT BE ALLOWED IN A CIRCUMFERENTIAL WELD AND NOT CLOSER THAN 6 IN. TO AN OPEN END.

9. SWABBING AND CLOSING OPEN ENDS

SWABBING - EACH PIPE JOINT SHALL BE SWABBED AS NECESSARY TO REMOVE ALL DIRT AND FOREIGN MATTER FROM THE INSIDE OF THE PIPE BEFORE THE JOINTS ARE ALIGNED AND WELDED. THE SWABBING OPERATION SHALL NOT BE CARRIED ON MORE THAN FOUR JOINTS AHEAD OF THE FIRING LINE WELDERS OR ALIGNING AND WELDING OPERATIONS.

CLOSING OF PIPE ENDS - WHERE THE LINE IS WELDED IN LONG SECTIONS BY THE FIRING LINE METHOD, THE ENDS OF THE LONG SECTIONS SHALL BE CLOSED AND KEPT CLOSED IN A MANNER APPROVED BY THE COMPANY UNTIL THE LONG SECTIONS ARE FINALLY JOINED. DURING THE LAYING OPERATIONS, CLOSE ATTENTION SHALL BE GIVEN TO OPEN ENDS TO ENSURE A COMPLETELY OPEN AND CLEAN LINE, FREE OF ANY OBSTRUCTIONS. ALL REASONABLE PRECAUTIONS SHALL BE TAKEN TO PREVENT WATER FROM ENTERING THE LINE.

PREVENTION OF FOREIGN MATTER IN THE PIPELINE - THE OPEN END OF THE LINE SHALL BE SECURELY CLOSED AT THE END OF EACH SPOON WORK TO PREVENT ENTRANCE OF SMALL ANIMALS OR OTHER INTRODUCTION OF FOREIGN MATTER OF ANY NATURE AND SHALL NOT BE REOPENED UNTIL WORK IS RESUMED. ANY OBSTRUCTIONS REMAINING IN THE LINE AFTER THE COMPLETION THEREOF SHALL BE REMOVED.

10. POSITIONING OF LONGITUDINAL SEAM

IN INSTANCES WHERE PIPE OTHER THAN SEAMLESS IS FURNISHED BY THE COMPANY, THE LONGITUDINAL SEAMS OF SUCH PIPE SHALL BE STAGGERED BY NOT MORE THAN 45°. LONGITUDINAL WELD SEAMS SHALL HAVE A MINIMUM FOUR-INCH CIRCUMFERENTIAL OFFSET BETWEEN ADJOINING JOINTS. UNLESS OTHERWISE SPECIFIED, THE LONGITUDINAL SEAMS ON ADJACENT PIPE SHALL BE STAGGERED, PLACING ONE APPROXIMATELY IN THE 10 O'CLOCK POSITION AND THE OTHER APPROXIMATELY IN THE 2 O'CLOCK POSITION.

11. LOWERING-IN PIPE

OVER-BENDS, SIDE-BENDS AND SAG-BENDS - ALL OVER-BENDS SHALL BE MADE AND INSTALLED TO CLEAR THE HIGH POINT OF THE BOTTOM OF THE DITCH BY AT LEAST 12 IN. AT THE POINT OF BEND. AT SIDE-BENDS, THE PIPE SHALL BE BENT AND LOWERED TO LAY AGAINST THE OUTSIDE WALL AT THE BOTTOM OF THE DITCH. ALL SAG-BENDS SHALL CONTINUOUSLY LIE ON FIRM GROUND AT THE BOTTOM OF THE DITCH.

PIPE SLINGS AND CRADLES - THE CONTRACTOR SHALL PROVIDE PADDED SLINGS FOR HANDLING COATED AND WRAPPED PIPE. THE USE OF BELTING REINFORCED WITH WIRE CABLE SHALL NOT BE PERMITTED. ANY METHOD OF LOWERING-IN WHICH PREVENTS DAMAGE TO THE COATING SHALL BE ACCEPTABLE; HOWEVER, THE USE OF CRADLES IS PREFERRED.

CONDITION OF DITCH - PRIOR TO LOWERING-IN THE CONTRACTOR SHALL PROVIDE, TO THE SATISFACTION OF THE COMPANY, A DITCH WHICH IS FREE FROM EXCESS DEBRIS, LARGE ROCKS AND ROOTS, WELDING RODS, SKIDS OR OTHER SUCH OBJECTS WHICH CAN CAUSE DAMAGE TO THE PIPE AND ITS PROTECTIVE COATING DURING LOWERING-IN OPERATIONS. THE CONTRACTOR SHALL PUMP WATER FROM THE DITCH, BELL HOLES OR OTHER TIE-IN EXCAVATIONS PRIOR TO LOWERING-IN.

ROCK DITCH PADDING - IN ALL CASES WHERE ROCKS 2 IN. AND LARGER ARE ENCOUNTERED IN THE BOTTOM OF THE DITCH AND NO ADDITIONAL PIPE COATING PROTECTION IS PROVIDED, THE CONTRACTOR SHALL PROVIDE PADDING MATERIAL PLACED EVENLY AND CONTINUOUSLY TO A MINIMUM DEPTH OF 8 IN. ALONG THE BOTTOM OF THE DITCH AS APPROVED BY THE COMPANY.

SUPPORTS - THE CONTRACTOR SHALL CONSTRUCT THE PIPELINE TO LIE ON THE BOTTOM OF THE PIPE TRENCH. ALL BENDS SHALL BE MADE TO FIT THE PIPE DITCH. WHERE PIPE CANNOT BE DIRECTLY SUPPORTED BY THE BOTTOM OF THE TRENCH, SUPPORT SHALL BE PROVIDED BY SANDBAGS OR OTHER COMPANY APPROVED MATERIALS. SANDBAGS SHALL BE PLACED AT POINTS TO PROVIDE STRESS-FREE SUPPORT FOR THE PIPELINE SUBSEQUENT TO BACKFILLING. SPACING INTERVALS FOR SANDBAG SUPPORTS SHALL BE 15 FT. OR LESS AS REQUIRED BY THE COMPANY. SUPPORTS COMPRISED OF MATERIALS OTHER THAN SANDBAGS SHALL BE CONSTRUCTED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND AT SPACING INTERVALS NO GREATER THAN THE APPROPRIATE MAXIMUM INTERVAL RECOMMENDED BY THE MANUFACTURER. SUPPORT SHALL BE PLACED AT POINTS TO PROVIDE A STRESS-FREE INSTALLATION SUBSEQUENT TO BACKFILL. THE CONTRACTOR SHALL NOT USE ANY SUPPORT METHOD WITHOUT THE PRIOR APPROVAL OF THE COMPANY AND WITHOUT PROVIDING THE COMPANY WITH THE MANUFACTURER'S RECOMMENDED INSTALLATION DIRECTIONS FOR THE SPECIFIC METHOD BEING USED.

TIE-INS - SECTIONS OF THE PIPELINE EXCAVATED FOR TIE-INS SHALL BE SUPPORTED WITH SANDBAGS OR OTHER APPROVED MATERIALS AT INTERVALS INDICATED ABOVE. SUPPORTS SHALL BE PLACED IMMEDIATELY AFTER FINAL TIE-IN TO PROVIDE A STRESS-FREE INSTALLATION SUBSEQUENT TO THE BACKFILLING OPERATION.

12. BACKFILLING

AFTER LOWERING-IN HAS BEEN COMPLETED, BUT BEFORE BACKFILLING, THE DITCH SHALL BE PUMPED DRY IN UPLAND AREAS AND THE LINE SHALL BE INSPECTED TO ENSURE THAT NO SKIDS, BRUSH, STUMPS, TREES, BOULDERS OR DEBRIS ARE IN THE DITCH. NO SUCH MATERIALS OR DEBRIS ARE TO BE BACKFILLED INTO THE DITCH. AFTER THE PIPE HAS BEEN INSPECTED AND APPROVED BY THE COMPANY, AFTER ALL DAMAGE TO THE PROTECTIVE COATING HAS BEEN REPAIRED AND AFTER THE COATING ON THE PIPE HAS HAD SUFFICIENT TIME TO CURE, THEN THE CONTRACTOR SHALL BACKFILL THE DITCH SUFFICIENTLY TO PREVENT FLOATING. THE CONTRACTOR SHALL COMPLETE THE FILLING OF THE DITCH TO PRODUCE A TRIM BACKFILL. EXCAVATED MATERIAL SHALL BE PLACED IN THE DITCH TOPSOIL WHERE IT HAS BEEN SEGREGATED, SHALL BE BACKFILLED AS CLOSE AS POSSIBLE TO ITS ORIGINAL LOCATION.

ROCK, TWO INCHES IN DIAMETER AND LARGER, OR LIKE MATERIALS SHALL NOT BE BACKFILLED DIRECTLY ONTO THE PIPE. WHERE SUCH MATERIALS ARE ENCOUNTERED, THE CONTRACTOR SHALL HAIL, IF NECESSARY, SUFFICIENT EARTH OR SAND TO BE BACKFILLED AROUND AND OVER THE PIPE TO FORM A PROTECTIVE PADDING OR CUSHION TO A MINIMUM OF EIGHT INCHES OR, AS OTHERWISE SPECIFIED IN THE SCOPE OF WORK, IN DEPTH BETWEEN THE PIPE AND ANY GRAVEL OR SMALL BROKEN ROCK TO BE BACKFILLED. LARGE ROCK OR BOULDERS IN EXCESS OF 24 IN. IN DIAMETER, WIDTH OR LENGTH, SHALL NOT BE BACKFILLED INTO THE DITCH. SUCH ROCK SHALL BE DISPOSED OF PROPERLY.

13. TRENCH BREAKER

THE CONTRACTOR SHALL INSTALL EROSION BREAKERS IN THE DITCH OVER, UNDER AND AROUND THE PIPE TO PROVIDE FULL PROTECTION AGAINST BACKFILL WASHING AT VARIOUS POINTS ALONG THE PIPELINE. BREAKER INSTALLATIONS AND SPACING SHALL COMPLY WITH THE FOLLOWING SPECIFICATIONS AS WELL AS COMPANY, LOCAL, STATE, AND FEDERAL REQUIREMENTS.

- BREAKER MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, DECOMPOSABLE BAGS, SAND AND ANY OTHER MATERIALS REQUIRED TO FACILITATE THE PROPER PLACEMENT OF THE BREAKER MATERIAL IN THE DITCH.
- BREAKER INSTALLATIONS MAY BE COMPRISED OF EITHER A MULTIPLE SANDBAG CONFIGURATION OR BY OTHER APPROVED METHODS. ALL BREAKER INSTALLATIONS SHALL MEET WITH THE APPROVAL OF THE COMPANY.
- BREAKER SIZE IS DEPENDENT ON THE EXTENT AND CONDITION OF THE DITCH IN LENGTH, WIDTH, SLOPE AND GRADE. AT A MINIMUM, BREAKERS SHALL EXTEND THE WIDTH AND DEPTH OF THE DITCH.
- BREAKERS SHALL BE SPACED ALONG THE DITCH IN ACCORDANCE WITH THE COMPANY'S ENVIRONMENTAL STANDARDS.

14. DIRT PADDING

THE CONTRACTOR SHALL INSTALL ROCK-FREE DIRT PADDING IN AREAS DESIGNATED BY THE COMPANY. TOPSOIL SHALL NOT BE USED FOR PADDING THE DITCH. DIRT PADDING SHALL BE INSTALLED IN THE BOTTOM OF THE DITCH TO A MINIMUM DEPTH OF 8 IN. PRIOR TO LOWERING-IN THE PIPELINE. IF OTHER ACCEPTABLE SUPPORT FOR PROTECTING THE BOTTOM OF THE PIPE IS NOT UTILIZED, A MINIMUM OF 8 IN. OF DIRT PADDING SHALL BE INSTALLED AS COVER ON TOP OF THE LINE AS PROTECTION PRIOR TO BACKFILLING. ACCEPTABLE ROCK-FREE PADDING MATERIAL MAY BE OBTAINED DIRECTLY FROM THE SPOIL, OR BY USING A PADDING MACHINE WITH MATERIAL TAKEN DIRECTLY FROM THE SPOIL OR ROCK-FREE PADDING MATERIAL CAN BE HAULED IN BY THE CONTRACTOR.

15. CLEAN-UP

THE CONTRACTOR SHALL KEEP THE RIGHT-OF-WAY CLEAR OF LITTER, SKIDS, DEFECTIVE MATERIALS, AND ALL OTHER CONSTRUCTION DEBRIS IMMEDIATELY BEHIND ITS OPERATIONS. TO THE SATISFACTION OF THE COMPANY, UPON COMPLETION OF THE BACKFILL, THE CONTRACTOR WILL CLEAN THE RIGHT-OF-WAY IN A NEAT AND ACCEPTABLE CONDITION. SURPLUS MATERIALS SHALL BE ASSEMBLED AND DELIVERED BY CONTRACTOR TO A LOCATION DESIGNATED BY THE COMPANY. FENCES SHALL BE RECONSTRUCTED TO THE ORIGINAL LINE AND GATES INSTALLED AS INDICATED BY THE COMPANY. THE CONTRACTOR SHALL FURNISH GATES, FENCING AND POSTS.

THE RIGHT-OF-WAY SHALL BE DISKED, LIMED, SEEDED AND FERTILIZED DURING THE CLEAN-UP OPERATION. THE CONTRACTOR SHALL FURNISH THE LIME, SEED AND FERTILIZER. SEEDING, FERTILIZING AND MULCHING MUST BE DONE WITHIN 8 DAYS OF FINAL CLEAN UP OR IN ACCORDANCE WITH COMPANY ENVIRONMENTAL REQUIREMENTS.

PIPELINE MARKERS SHALL BE INSTALLED AT POINTS DESIGNATED BY THE COMPANY DURING CLEAN-UP OPERATIONS. THE COMPANY SHALL FURNISH LINE AND AERIAL MARKERS.

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ISSUED FOR PERMITTING
 DATE: 05/16/23
 AFE # A12528

SUMMARY OF MATERIALS (3D)

SUMMARY OF MATERIALS (3D)

GENERAL INFORMATION

NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLENFELDER & ANTERO	5/16/23 JEU

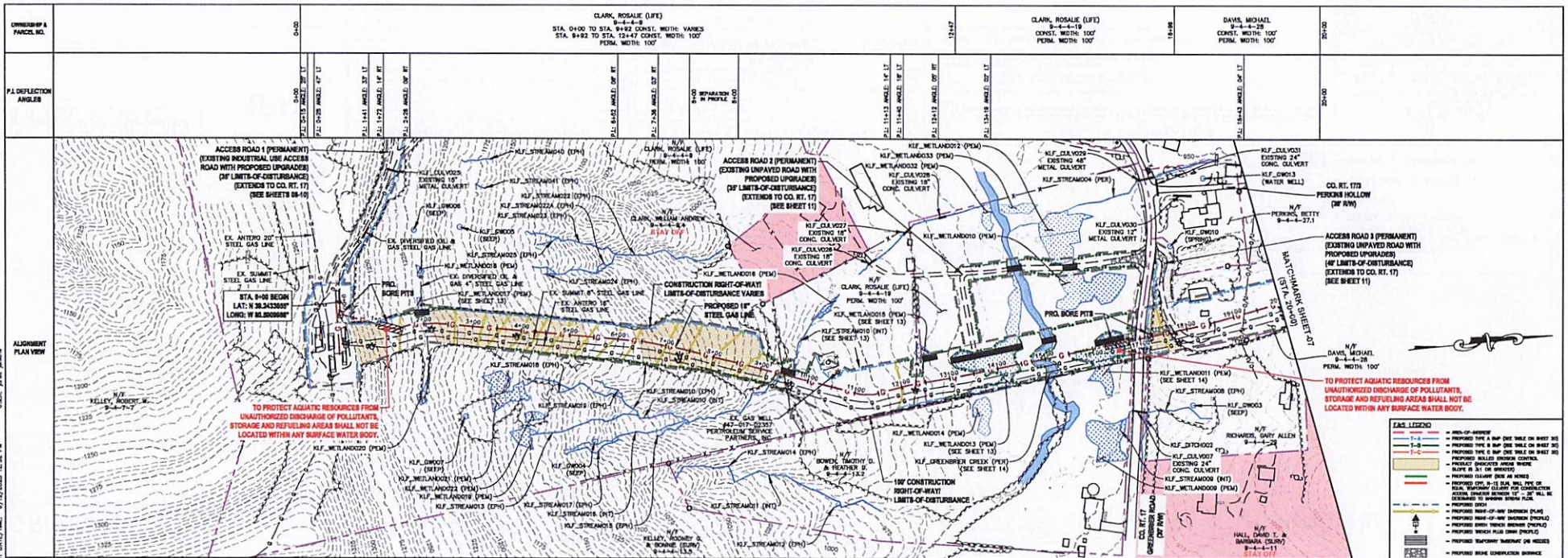
Antero
 Midstream

**PERKINS BYPASS LP PIPELINE
 GENERAL CONSTRUCTION SPECS**

PROPOSED 16" STEEL GAS LINE

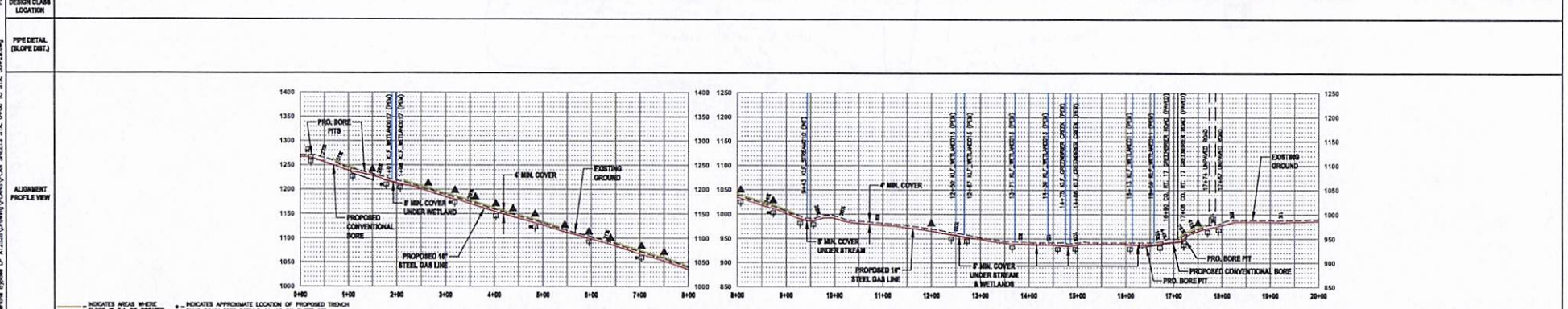
DODDRIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JEU (TIG) DATE: 6/12/2023
 CHECKED BY: JEU (TIG) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 0 SHEET: 03-SPECS



FILE LEGEND

- PROJ. OF-OWNER
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- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 79
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- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 96
- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 97
- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 98
- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 99
- PROPOSED 16" DIA. STEEL GAS LINE ON SHEET 100



THRASHER

IFP

ISSUED FOR PERMITTING

DATE: 05/16/23

AFE # A12528

0 100 200
HORIZ. SCALE IN FEET

0 100 200
VERT. SCALE IN FEET

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY
1	REQUIRED PER COMMENTS FROM SLEMPLEDER & ANTENO	6/16/23 JLU

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY
1	REQUIRED PER COMMENTS FROM SLEMPLEDER & ANTENO	6/16/23 JLU

GENERAL INFORMATION

- ALL DESIGN STRENGTH OF PIPELINE AND SHAP CALCULATIONS ALIGN WITH ROUTING WIRE PERFORMED BY ANTENO AND PROVIDED TO THROUGHT FOR REVIEW ON THE PLAN. THROUGHTS ARE NOT SUBJECT TO BE CHANGED BY FIELD RELATIONS PERFORMED AND PROVIDED BY SLEMPLEDER, INC.
- CONDUIT SYSTEM LEVEL FOR SHAPING AND THROUGHTS CORRECTED TO BE AT THE SAME LEVEL AS THE LOCAL COUNTY U.S. BENCHMARK POINT IS LOCATED AT THE LOCAL COUNTY COURTHOUSE. TO OBTAIN A MORE ACCURATE BOUNDARY LINE LOCATION, A FIELD PROPERTY SURVEY IS RECOMMENDED.
- ALL EXISTING FORCE MAINS AND OTHER EXISTING UNDER CONSTRUCTION TO BE REPLACED BY CONSTRUCTION POST-CONSTRUCTION.
- THIS SHEET IS TO BE USED IN CONNECTION WITH THE GENERAL INFORMATION SHEET.
- ALL SHEET BOUNDS EXCEPT ALIGNMENT PLAN VIEW REFERENCE THE ALIGNMENT PROFILE VIEW.
- THIS SHEET IS INTENDED TO BE PLOTTED ON A 24" X 36" FOR INDUSTRY, REFER TO BIDDING SEALS.
- FOR LEGEND/ABBREVIATION INFORMATION, REFER TO THE GENERAL NOTES SHEET.

Anti

PERKINS BYPASS LP PIPELINE

STA. 0+00 TO STA. 20+00

PROPOSED 16" STEEL GAS LINE

DOODRIDGE COUNTY, WEST VIRGINIA

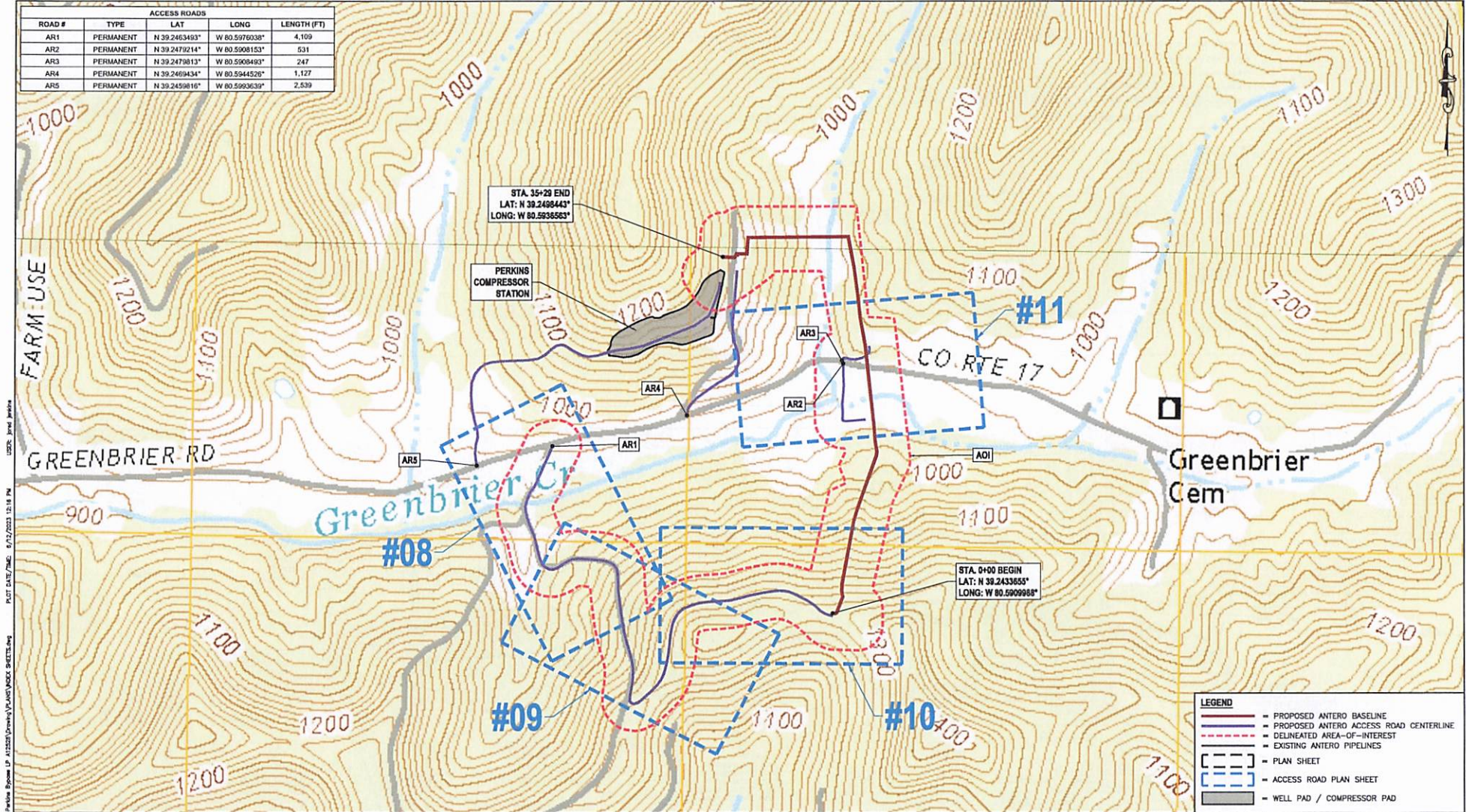
DRAWN BY: JLU (TTO) DATE: 6/12/2023

CHECKED BY: JLU (TTO) AFE No.: A12528

SCALE: AS SHOWN

REVISION No.: 0 SHEET: 06-PLAN1

ROAD #	TYPE	LAT	LONG	LENGTH (FT)
AR1	PERMANENT	N 39.2463493°	W 80.5976038°	4,109
AR2	PERMANENT	N 39.2479214°	W 80.5908153°	531
AR3	PERMANENT	N 39.2479813°	W 80.5908493°	247
AR4	PERMANENT	N 39.2469434°	W 80.5944526°	1,127
AR5	PERMANENT	N 39.2459816°	W 80.5993639°	2,539



DATE: 05/16/23
 DRAWN BY: JTH (110)
 CHECKED BY: JTH (110)
 SCALE: AS SHOWN
 SHEET: 05-AR-INDEX
 PROJECT: PERKINS BYPASS LP PIPELINE ACCESS ROAD INDEX SHEET
 DATE: 05/16/23
 TIME: 10:18 AM

THRASHER

IFP
ISSUED FOR PERMITTING

DATE: 05/16/23
AFE # A12528

0 300 600
HORIZ. SCALE IN FEET

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION		
1.	ALL DESIGN, STRENGTH OF PIPELINE AND MAJOR CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.	
2.	FIELD DELINEATION PERFORMED AND PROVIDED BY: KLEINFELDER, INC.	
3.	MAPPING SOURCE: BDO ISAAC, WV LOTS 7.5 MINUTE QUADRANGLE DATED 2019 SCALE: BY LOTS 7.5 MINUTE QUADRANGLE DATED 2019	
4.	COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY: HORIZONTAL - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT VERTICAL - NAD 83 GEODESIC, U.S. SURVEY FOOT	
5.	THIS SHEET IS INTENDED TO BE PLOTTED ON A8E 0 (22" X 34") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.	
6.	FOR LEGEND/ABBREVIATION INFORMATION, REFER TO THE GENERAL NOTES SHEET.	

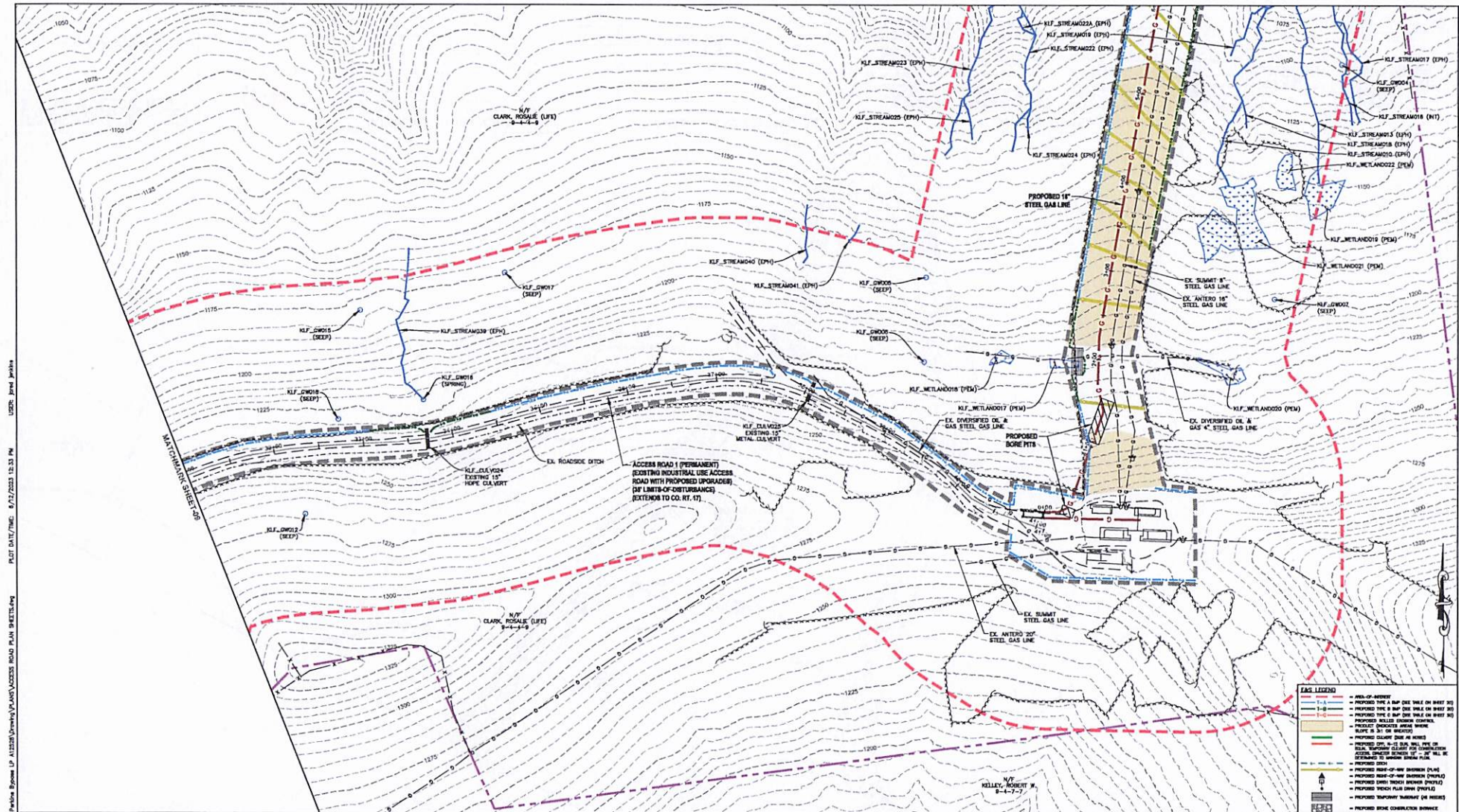
Antero

PERKINS BYPASS LP PIPELINE ACCESS ROAD INDEX SHEET

PROPOSED 16" STEEL GAS LINE

DODDRIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JTH (110) DATE: 5/16/2023
 CHECKED BY: JTH (110) AFE No: A12528
 SCALE: AS SHOWN SHEET: 05-AR-INDEX
 REVISION No:



LAYOUT FILE: A12528.dwg
 USER: JPH
 PLOT DATE/TIME: 8/13/2023 10:33 AM
 C:\Users\jph\AppData\Local\Autodesk\LT\2023\Profiles\jph\A12528.dwg

LEGEND	
	AREA OF INTEREST
	PROPOSED 16" STEEL GAS LINE ON SHEET 10
	PROPOSED 16" STEEL GAS LINE ON SHEET 11
	PROPOSED 16" STEEL GAS LINE ON SHEET 12
	PROPOSED 16" STEEL GAS LINE ON SHEET 13
	PROPOSED 16" STEEL GAS LINE ON SHEET 14
	PROPOSED 16" STEEL GAS LINE ON SHEET 15
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	PROPOSED 16" STEEL GAS LINE ON SHEET 100

THRASHER

IFP
ISSUED FOR PERMITTING

DATE: 05/16/23
AFE # A12528

0 50 100
HORIZ. SCALE IN FEET

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLEMPFLER & ANTERO	8/16/23 JPH

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLEMPFLER & ANTERO	8/16/23 JPH

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLEMPFLER & ANTERO	8/16/23 JPH

GENERAL INFORMATION

1. ALL DESIGN STRENGTH OF PIPELINE AND MASS CALCULATIONS ALONG WITH SOILING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR REVIEW. THE LOCAL COUNTY ENGINEER HAS REVIEWED THIS DRAWING FOR THE COMPLETION OF THESE CALCULATIONS AND FOR ROUTE PROVIDED BY ANTERO.

2. FIELD DELINEATION PERFORMED AND PROVIDED BY KLEMPFLER, INC.

3. COORDINATE SYSTEM USED FOR MAPPING AND EPOGRAPHY: HORIZONTAL - NAD 83 WEST VIRGINIA STATE PLANE NORTH; ELEV. U.S. SURVEY FOOT

4. ALL STATIONING SHOWN IS HORIZONTAL AND PERTAINS TO THE BASELINE OF THE PROPOSED CONSTRUCTION. IT IS NOT A DIRECT REPRESENTATION OF WHERE THE PIPELINE WILL BE INSTALLED. INSTALLATION WITHIN THE PROPOSED CORRIDOR WILL BE COORDINATED IN THE FIELD BY ANTERO CONSTRUCTION REPRESENTATIVE.

5. THE BOUNDARY MONUMENTS FOUND AND PROPERTY LINES SHOWN ON THIS DRAWING WERE OBTAINED FROM PARTIAL FIELD SURVEY AND PROPOSED REVISIONS TO THE BOUNDARY MONUMENTS ARE FILED IN THE LOCAL COUNTY CLERK'S OFFICE. TO OBTAIN A MORE ACCURATE BOUNDARY LINE LOCATION, A FULL PROPERTY SURVEY IS RECOMMENDED.

6. ALL EXISTING FENCES AND ROADS DESTROYED DURING CONSTRUCTION TO BE REPLACED BY CONTRACTOR POST-CONSTRUCTION.

7. SEE SHEETS 20 A TO 27 REGARDING MATERIALS, DIMENSIONS AND DIMENSIONS TO BE INSTALLED ON ACCESS ROADS.

8. THIS SHEET IS INTENDED TO BE PLOTTED ON A84 X 347" FOR INDICATIONS. REFER TO DRAWING SCALE.

9. FOR LEGEND/ABBREVIATION INFORMATION, REFER TO THE GENERAL NOTES SHEET.

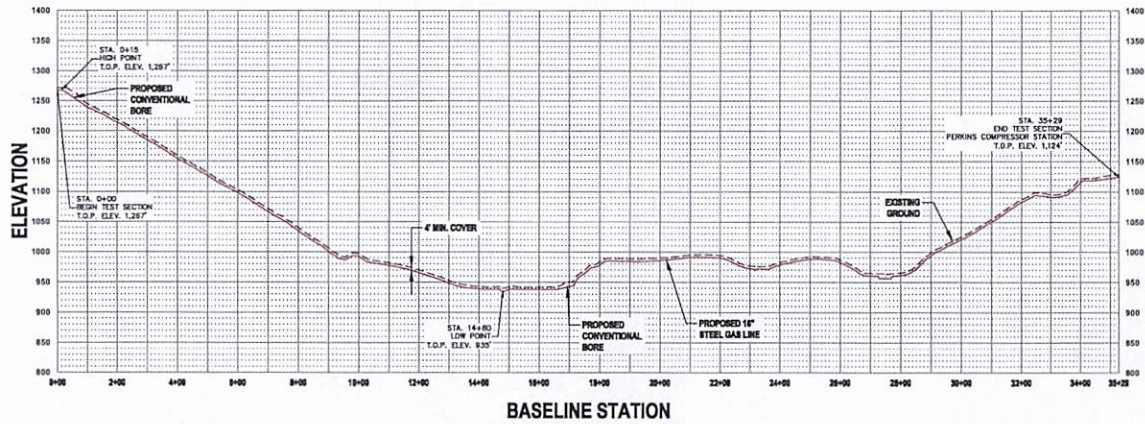
Ant

PERKINS BYPASS LP PIPELINE ACCESS ROAD PLAN SHEET
PROPOSED 16" STEEL GAS LINE

DODDRIEGE COUNTY, WEST VIRGINIA

DRAWN BY: JPH (TTO) DATE: 8/13/2023
CHECKED BY: JPH (TTO) AFE No.: A12528
SCALE: AS SHOWN SHEET: 10-ARPPS3

LAYOUT: IAF, IAFP
 CADD FILE: R:\000\1030-11422-00-ANTERO-Perkins Bypass LP A12523\Drawings\10-MISC\HYDROSTATIC PROFILE SHEET.dwg
 USER: jmk4
 PLOT DATE/TIME: 6/12/2023 12:18 PM



HYDROSTATIC PROFILE		Station	Elevation (ft mas)
Start Point		0+00	1,267
Low Point		14+80	935
High Point		0+15	1,267
End Point		35+29	1,124
Differential			332 ft.
Static Head Pressure @ 935' Elevation			144 PSI
Overall Slope Length (3D)			3,622 ft.

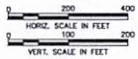
THRASHER

IFP

ISSUED FOR PERMITTING

DATE: 05/16/23

AFE # A12528



SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

REVISION

NO.	DESCRIPTION	DATE	BY
1	ISSUED PER COMMENTS FROM RHEINFELDER & ANTERO	5/10/23	JMJ

GENERAL INFORMATION

- ALL DESIGN STRENGTHS OF PIPELINE AND MAJOR CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR REVIEW. ON THE PLANS, THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.
- REFER TO ANTERO MIDSTREAM PRESSURE TESTING PROCEDURE.
- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY: HORIZONTAL - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT; VERTICAL - NAVD 83 (GEOIDAL), U.S. SURVEY FOOT.
- ALL STATIONING SHOWN IS HORIZONTAL AND PERTAINS TO THE BASELINE OF THE PERMITTED CORRIDOR. IT IS NOT A DIRECT REPRESENTATION OF WHERE THE PIPELINE WILL BE INSTALLED. INSTALLATION WITHIN THE PERMITTED CORRIDOR WILL BE COORDINATED IN THE FIELD BY ANTERO CONSTRUCTION REPRESENTATIVE.
- THIS SHEET IS INTENDED TO BE PLOTTED ON ANSI D (22" x 34") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

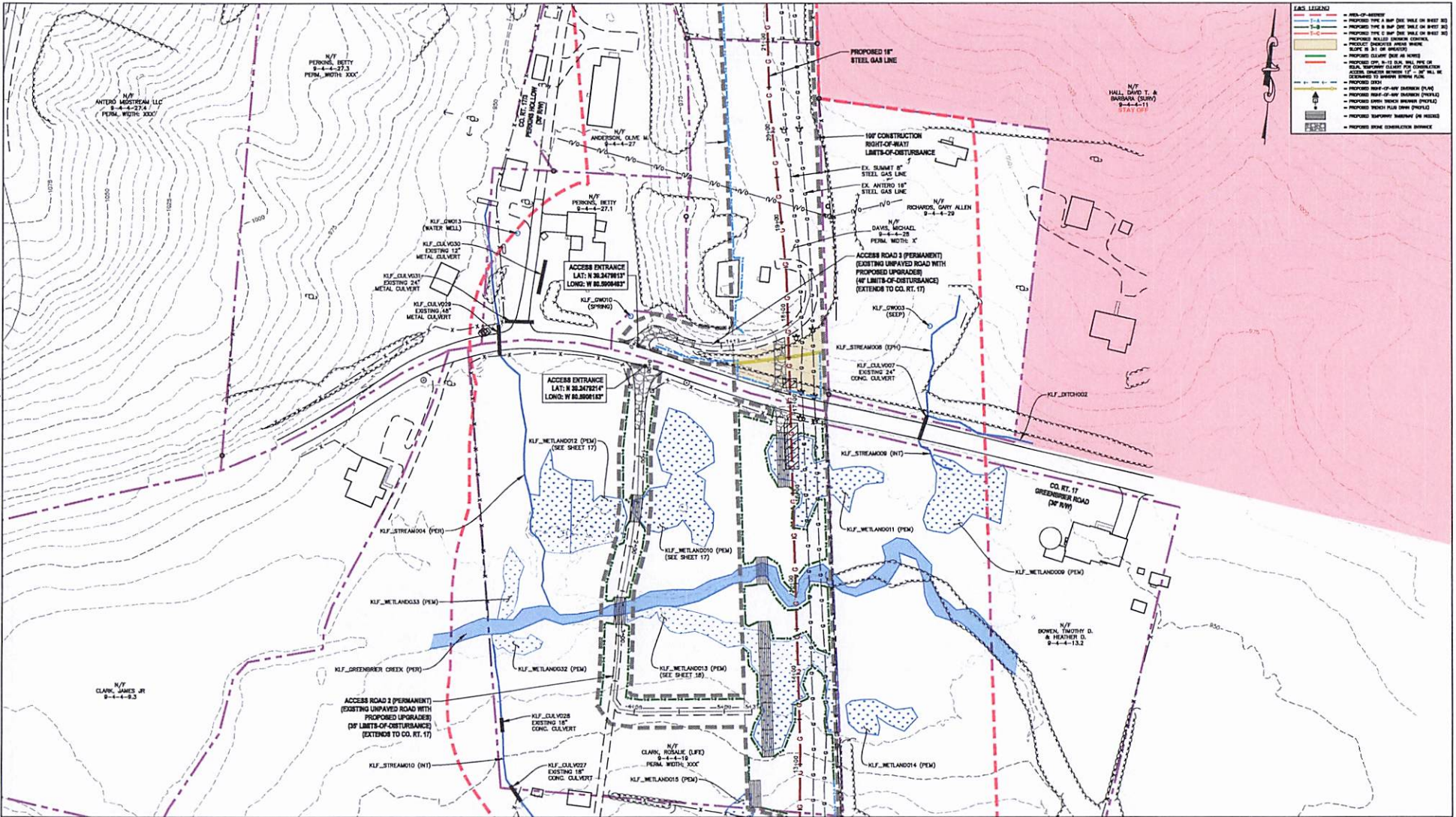
Antero
Midstream

**PERKINS BYPASS LP PIPELINE
HYDROSTATIC PROFILE**

PROPOSED 16" STEEL GAS LINE

DODDORIDGE COUNTY, WEST VIRGINIA

DRAWN BY:	JMJ (TJD)	DATE:	5/12/2023
CHECKED BY:	JMK (TJD)	AFE No.:	A12528
SCALE:	AS SHOWN		
REVISION No.:	0	SHEET:	12-HSP



AS LEGEND

- PROPOSED 16" STEEL GAS LINE ON SHEET 03
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 03
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 02
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 04
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 05
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 06
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 07
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 08
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 09
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 10
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- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 99
- PROPOSED 16" R/W OF 16" STEEL GAS LINE ON SHEET 100

THRASHER

IFP
ISSUE FOR PERMITTING

DATE: 05/16/23
AFE # A12528

HORIZ. SCALE IN FEET
0 50 100

NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY
1	REVISION		1	REVISION	

SUMMARY OF MATERIALS (3D)			SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY
1	REVISION		1	REVISION	

SUMMARY OF MATERIALS (3D)			SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY
1	REVISION		1	REVISION	

- GENERAL INFORMATION**
- ALL DESIGN, STRENGTH OF PIPELINE AND HAZOP CALCULATIONS ALONG WITH RECORDS WERE PROVIDED BY ANTERO AND PROVIDED TO THRASHER FOR RECORD ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR HAZOP PROVIDED BY ANTERO.
 - FIELD DELINEATION PERFORMED AND PROVIDED BY KLENFELDER, INC. HORIZONTALS - 1440 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY. VERTICALS - NAVD 83 (BENCH), U.S. SURVEY FOOT.
 - THE BOUNDARY MONUMENTS FOUND AND PROPERTY LINES SHOWN ON THIS DRAWING WERE OBTAINED FROM FEDERAL FIELD SURVEY AND RECORDED REVENUE TAXES FROM VARIOUS RECORDS BY FILE IN THE LOCAL COUNTY OFFICE. TO OBTAIN A MORE ACCURATE BOUNDARY LINE LOCATION, A FULL PROPERTY SURVEY IS RECOMMENDED.
 - ALL EXISTING FENCES AND ROADS OBTAINED DURING CONSTRUCTION TO BE REPLACED BY CONSTRUCTOR POST-CONSTRUCTION.
 - SEE SHEETS 20 & 27 REGARDING MATERIALS, CULVERTS AND OTHERS TO BE INSTALLED ON ACCESS ROADS.
 - THIS SHEET IS INTENDED TO BE PLOTTED ON AHS D (24" x 36") FOR REDUCATIONAL REFER TO GRAPHIC SCALE.
 - FOR LEGEND/ABBREVIATION INFORMATION, REFER TO THE GENERAL NOTES SHEET.

Antu

PERKINS BYPASS LP PIPELINE ACCESS ROAD PLAN SHEET
PROPOSED 16" STEEL GAS LINE

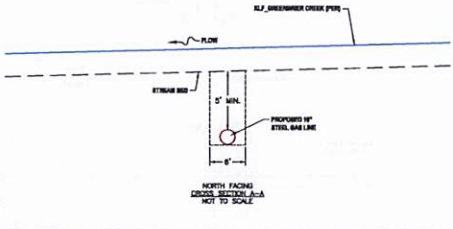
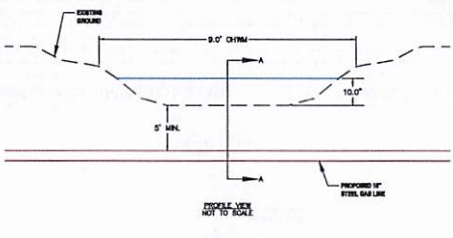
DOODRIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JEU (TTO) DATE: 6/12/2023
CHECKED BY: JEU (TTO) AFE No.: A12528
SCALE: AS SHOWN SHEET: 11 - ARPS4
REVISION No.: 0

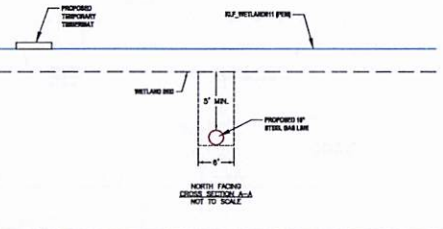
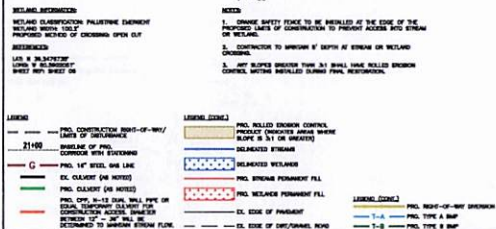
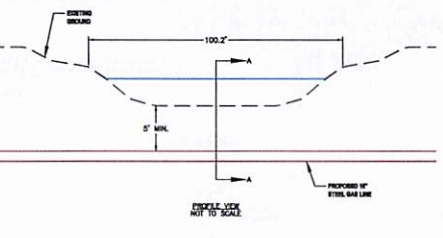
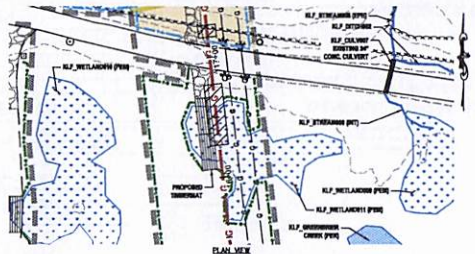
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 CHECKED BY: JEU (TTO) AFE No.: A12528
 SCALE: AS SHOWN SHEET: 11 - ARPS4
 REVISION No.: 0
 PROJECT DATE/TIME: 6/12/2023 10:23 AM
 USER: JEU (TTO)

LAYOUT DATE: 05/16/23
 DATE PLOTTED: 8/12/2023 12:24 PM
 USER: jared.mack
 PROJECT: PERKINS BYPASS LP PIPELINE STREAM AND WETLAND CROSSINGS SHEETS.dwg
 PLOT DATE/TIME: 8/12/2023 12:24 PM

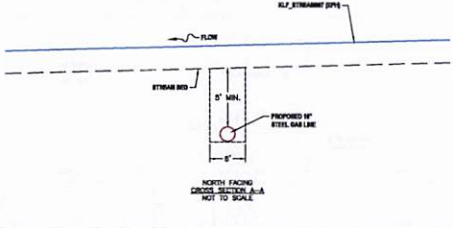
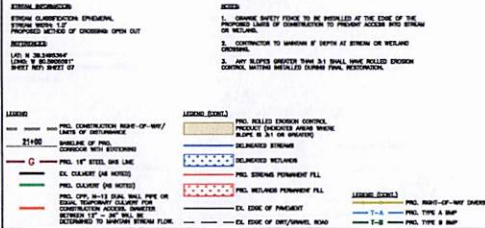
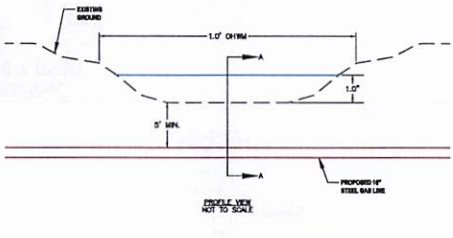
STREAM CROSSING KLF_GREENBRIER CREEK (PER)



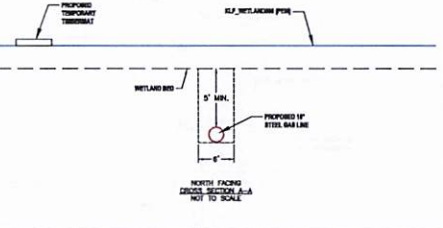
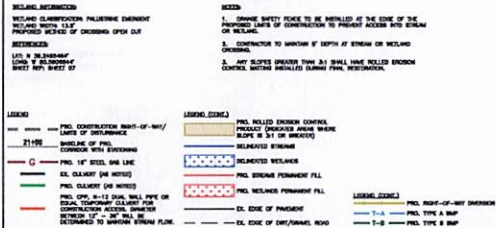
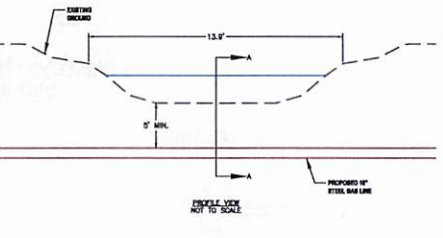
WETLAND CROSSING KLF_WETLAND011 (PEM)



STREAM CROSSING KLF_STREAM007 (EPH)



WETLAND CROSSING KLF_WETLAND008 (PEM)



THRASHER

IFP
ISSUED FOR PERMITTING

DATE: 05/16/23
AFE # A12528

**PERKINS BYPASS LP PIPELINE
STREAM & WETLAND CROSSINGS**

PROPOSED 16" STEEL GAS LINE

DODDRIE COUNTY, WEST VIRGINIA

DRAWN BY: JMJ (TTO) DATE: 8/12/2023
 CHECKED BY: JMH (TTO) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 0 SHEET: 14-S&WC2

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

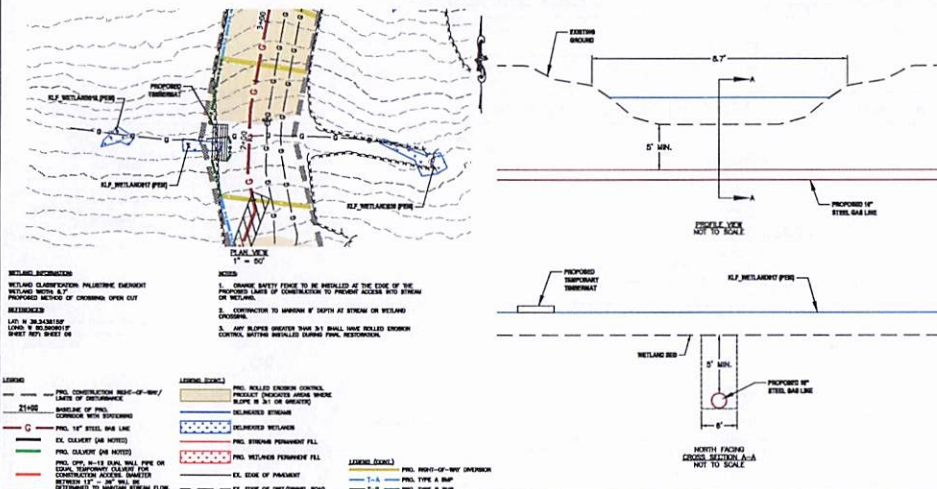
SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

REVISION			
NO.	DESCRIPTION	DATE	BY
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTERO	8/15/23	JMJ

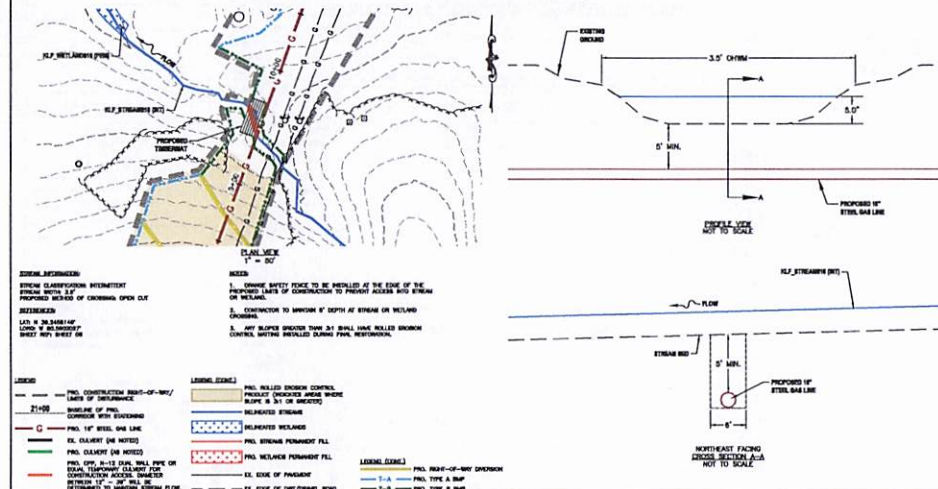
GENERAL INFORMATION		
1.	ALL DESIGN STRENGTH OF PIPELINE AND MAJOR CALCULATIONS ALONG WITH NOTINGS WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.	
2.	FIELD DELINEATION PERFORMED AND PROVIDED BY KLEINFELDER, INC.	
3.	COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHIC SURVEILLANCE - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT VERTICAL - NAD 83 (BENCH), U.S. SURVEY FOOT	
4.	ALL STATIONING SHOWN IS HORIZONTAL AND PERTAINS TO THE BASELINE OF THE PERMITTED CORRIDOR. IT IS NOT A DIRECT REPRESENTATION OF WHERE THE PIPELINE WILL BE INSTALLED. INSTALLATION WITHIN THE PERMITTED CORRIDOR WILL BE COORDINATED IN THE FIELD BY ANTERO. CONSTRUCTION REPRESENTATIVE.	
5.	THIS SHEET IS INTENDED TO BE PLOTTED ON ANSI D (22" x 34"), FOR REDUCTIONS, REFER TO GRAPHIC SCALE.	

DRAWN BY: JEU (170) DATE: 8/12/2023 12:54 PM
 CHECKED BY: JEU (170) AFE No.: A12528
 SCALE: AS SHOWN SHEET: 13-S&WC1
 PROJECT NAME: PERKINS BYPASS LP PIPELINE CROSSING STREAM AND WETLAND CROSSING DETAILS

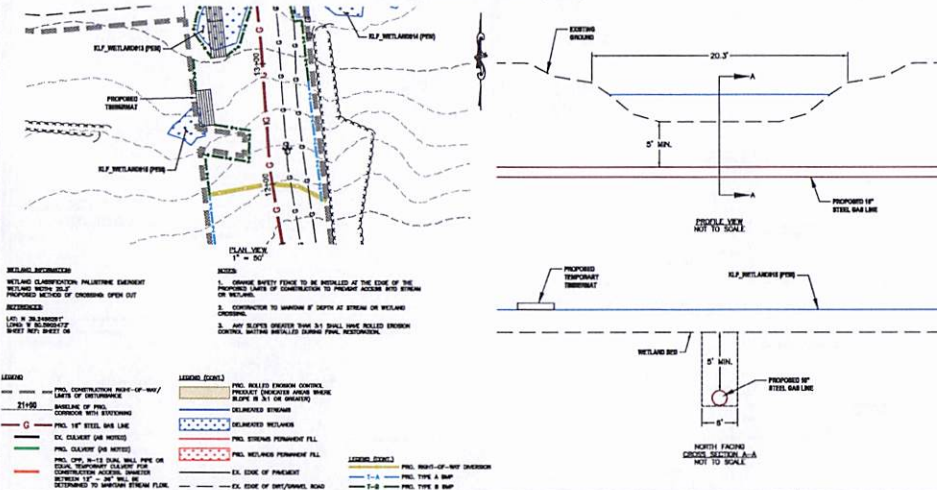
WETLAND CROSSING KLF_WETLAND017 (PEM)



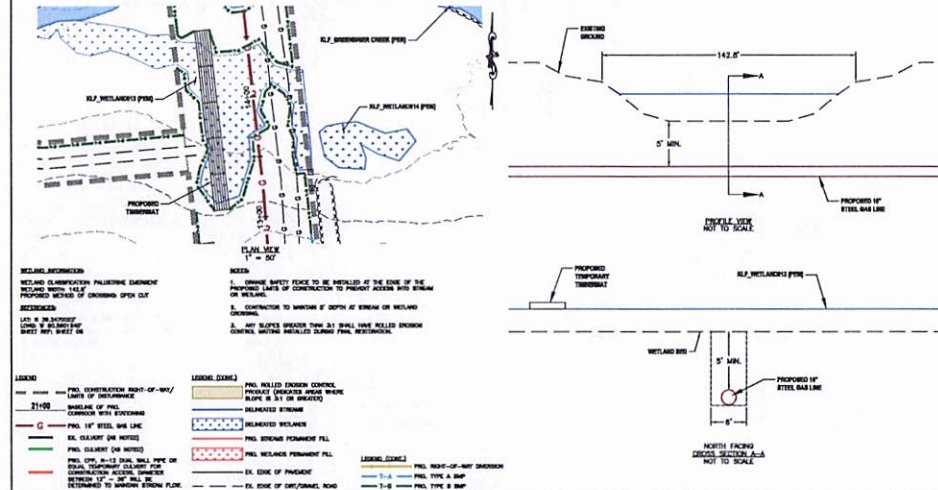
STREAM CROSSING KLF_STREAM010 (INT)



WETLAND CROSSING KLF_WETLAND015 (PEM)



WETLAND CROSSING KLF_WETLAND013 (PEM) - CROSSING 1



IFP
 ISSUED FOR PERMITTING
 DATE: 05/16/23
 AFE # A12528

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

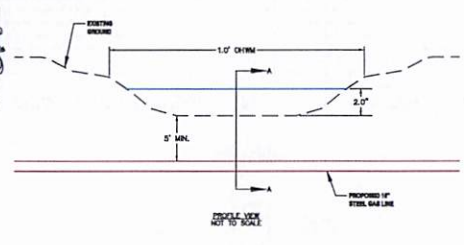
GENERAL INFORMATION		
1.	ALL SERIAL, STRENGTHS OF PIPELINE AND MAP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.	
2.	FIELD DELINEATION PERFORMED AND PROVIDED BY KLEINFELDER, INC.	
3.	COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY INFORMATION - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT VERTICAL - NAD 83 (GEODESIC), U.S. SURVEY FOOT	
4.	ALL STATIONING SHOWN IS HORIZONTAL AND PERTAINS TO THE BASELINE OF THE PERMITTED CORRIDOR. IF IT IS NOT A DIRECT REPRESENTATION OF WHERE THE PIPELINE WILL BE INSTALLED, INSTALLATION WITHIN THE PERMITTED CORRIDOR WILL BE COORDINATED IN THE FIELD BY ANTERO CONSTRUCTION REPRESENTATIVE.	
5.	THIS SHEET IS INTENDED TO BE PLOTTED ON A85 D (24" X 36"), FOR REDUCTIONS, REFER TO GRAPHIC SCALE.	

Ant
 PERKINS BYPASS LP PIPELINE
 STREAM & WETLAND CROSSINGS
 PROPOSED 16" STEEL GAS LINE
 DODDORIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JEU (170) DATE: 8/12/2023
 CHECKED BY: JEU (170) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: SHEET: 13-S&WC1

LAYOUT LINE: 5/15/23
 LAYOUT FILE: W:\30310\100-114200-ANTIO-Perkins Bypass LP 114200-000-Stream Crossing and Wetland Crossings-Submittals.dwg
 PLOT DATE/TIME: 8/12/2023 10:51 PM
 USER: jared.jones

STREAM CROSSING KLF_STREAM006 (EPH)



STREAM INFORMATION
 STREAM CLASSIFICATION PERMANENT EMBANKMENT WITH 1:1 PROPOSED METHOD OF CROSSING OPEN CUT

REVISIONS
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED ENOUGH CORNER, WITHIN ROLLED CORNER PERM. RESTRICTION.

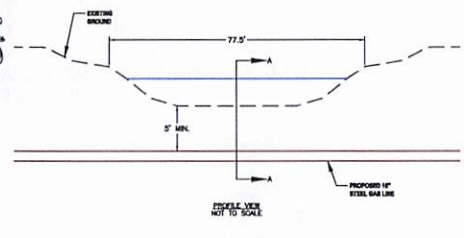
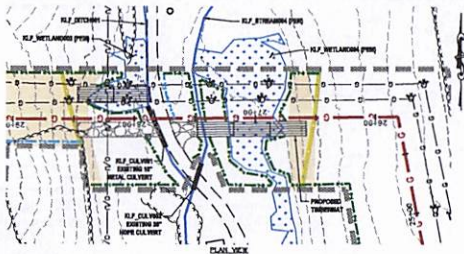
LEGEND

--- PROL. CONSTRUCTION RIGHT-OF-WAY/ LINES OF ENCLOSURE	--- PROL. ROLLED ENOUGH CORNER, PROTECT INDICATED ANGLE WHERE SLOPE IS 3:1 OR GREATER
--- 21+00 BOUNDARY OF P.M. CORROSION WITH EXISTING	--- DELINEATED STREAM
--- PROL. 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. 16"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS STRUCTURE BETWEEN 10' & 30' SHALL BE DETERMINED TO MATCH STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF ASPHALT/PAVEMENT ROAD	--- EX. EDGE OF ASPHALT/PAVEMENT ROAD

LEGEND (CONT.)

--- PROL. RIGHT-OF-WAY DIMENSION	--- PROL. RIGHT-OF-WAY DIMENSION
--- 1-A PROL. TYPE A BWP	--- 1-B PROL. TYPE B BWP

WETLAND CROSSING KLF_WETLAND004 (PEM)



WETLAND INFORMATION
 WETLAND CLASSIFICATION PALUDINE EMBANKMENT WITH 7:1 PROPOSED METHOD OF CROSSING OPEN CUT

REVISIONS
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED ENOUGH CORNER, WITHIN ROLLED CORNER PERM. RESTRICTION.

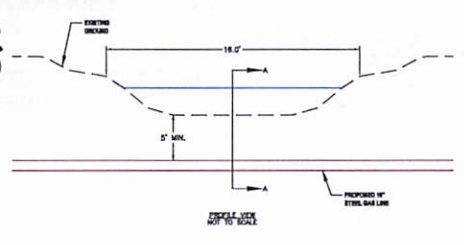
LEGEND

--- PROL. CONSTRUCTION RIGHT-OF-WAY/ LINES OF ENCLOSURE	--- PROL. ROLLED ENOUGH CORNER, PROTECT INDICATED ANGLE WHERE SLOPE IS 3:1 OR GREATER
--- 21+00 BOUNDARY OF P.M. CORROSION WITH EXISTING	--- DELINEATED STREAM
--- PROL. 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. 16"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS STRUCTURE BETWEEN 10' & 30' SHALL BE DETERMINED TO MATCH STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF ASPHALT/PAVEMENT ROAD	--- EX. EDGE OF ASPHALT/PAVEMENT ROAD

LEGEND (CONT.)

--- PROL. RIGHT-OF-WAY DIMENSION	--- PROL. RIGHT-OF-WAY DIMENSION
--- 1-A PROL. TYPE A BWP	--- 1-B PROL. TYPE B BWP

WETLAND CROSSING KLF_WETLAND007 (PEM)



WETLAND INFORMATION
 WETLAND CLASSIFICATION PALUDINE EMBANKMENT WITH 1:1 PROPOSED METHOD OF CROSSING OPEN CUT

REVISIONS
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED ENOUGH CORNER, WITHIN ROLLED CORNER PERM. RESTRICTION.

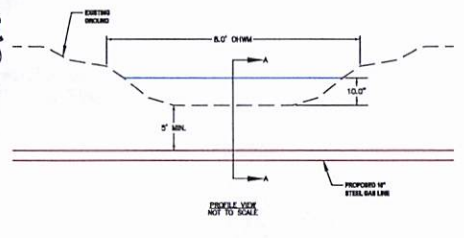
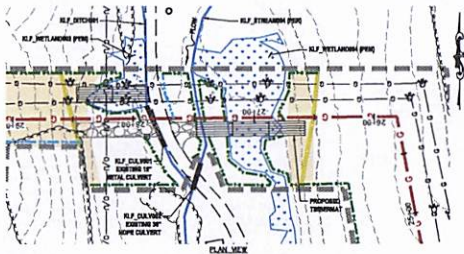
LEGEND

--- PROL. CONSTRUCTION RIGHT-OF-WAY/ LINES OF ENCLOSURE	--- PROL. ROLLED ENOUGH CORNER, PROTECT INDICATED ANGLE WHERE SLOPE IS 3:1 OR GREATER
--- 21+00 BOUNDARY OF P.M. CORROSION WITH EXISTING	--- DELINEATED STREAM
--- PROL. 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. 16"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS STRUCTURE BETWEEN 10' & 30' SHALL BE DETERMINED TO MATCH STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF ASPHALT/PAVEMENT ROAD	--- EX. EDGE OF ASPHALT/PAVEMENT ROAD

LEGEND (CONT.)

--- PROL. RIGHT-OF-WAY DIMENSION	--- PROL. RIGHT-OF-WAY DIMENSION
--- 1-A PROL. TYPE A BWP	--- 1-B PROL. TYPE B BWP

STREAM CROSSING KLF_STREAM004 (PER)



STREAM INFORMATION
 STREAM CLASSIFICATION PERMANENT EMBANKMENT WITH 1:1 PROPOSED METHOD OF CROSSING OPEN CUT

REVISIONS
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED ENOUGH CORNER, WITHIN ROLLED CORNER PERM. RESTRICTION.

LEGEND

--- PROL. CONSTRUCTION RIGHT-OF-WAY/ LINES OF ENCLOSURE	--- PROL. ROLLED ENOUGH CORNER, PROTECT INDICATED ANGLE WHERE SLOPE IS 3:1 OR GREATER
--- 21+00 BOUNDARY OF P.M. CORROSION WITH EXISTING	--- DELINEATED STREAM
--- PROL. 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. CULVERT (ON NOTES)	--- PROL. STREAM PERMANENT FILL
--- PROL. 16"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS STRUCTURE BETWEEN 10' & 30' SHALL BE DETERMINED TO MATCH STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF ASPHALT/PAVEMENT ROAD	--- EX. EDGE OF ASPHALT/PAVEMENT ROAD

LEGEND (CONT.)

--- PROL. RIGHT-OF-WAY DIMENSION	--- PROL. RIGHT-OF-WAY DIMENSION
--- 1-A PROL. TYPE A BWP	--- 1-B PROL. TYPE B BWP



IFP
 ISSUED FOR PERMITTING

DATE: 05/18/23
 AFE # A12528

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

REVISION		
NO.	DESCRIPTION	DATE
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTIO	8/15/23

GENERAL INFORMATION

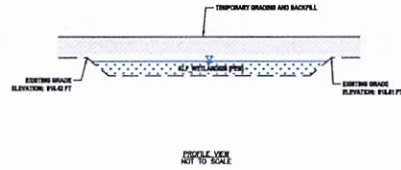
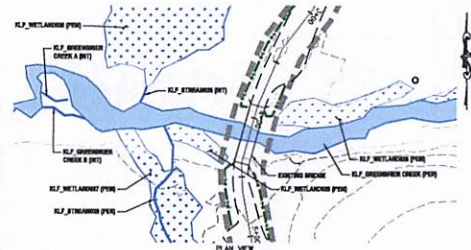
- ALL SERIAL NUMBERS OF PIPELINE AND MAP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTIO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTIO.
- FIELD DELINEATION PERFORMED AND PROVIDED BY KLEINFELDER, INC.
- COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY: HORIZONTAL - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT; VERTICAL - NAD 83 GEODESIC, U.S. SURVEY FOOT.
- ALL ELEVATIONS SHOWN IS HORIZONTAL AND PERTAINS TO THE BASELINE OF THE PERMITTED CORROSION. IT IS NOT A DIRECT REPRESENTATION OF WHERE THE PIPELINE WILL BE INSTALLED. INSTALLATION WITHIN THE PERMITTED CORROSION WILL BE COORDINATED BY ANTIO. CONSTRUCTION REPRESENTATIVE.
- THIS SHEET IS INTENDED TO BE PLOTTED ON A8D D (24" X 36") FOR INSTRUCTIONS, REFER TO DRAWING SCALE.

Antio
 PERKINS BYPASS LP PIPELINE
 STREAM & WETLAND CROSSINGS
 PROPOSED 16" STEEL GAS LINE
 DODDORIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JJJ (TJ) DATE: 8/12/2023
 CHECKED BY: JBN (TJ) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: SHEET: 15-S&WC3

LAYOUT (IN) DIMS: 10' 0" TO 1/8" = 1' 0" (AS SHOWN) UNLESS OTHERWISE NOTED
 PLAN DATE/TIME: 8/12/2023 10:30 AM
 USER: JAMES JAMES

WETLAND CROSSING KLF_WETLAND028 (PEM)



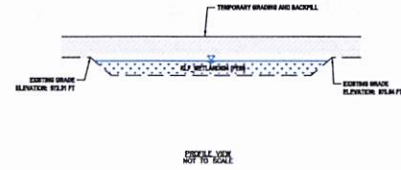
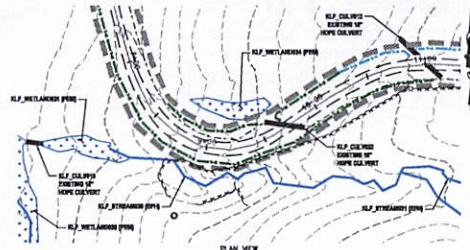
WETLAND INFORMATION
 WETLAND CLASSIFICATION PALLETINE ELEMENT
 WETLAND FROM 10:17
 PROPOSED METHOD OF CROSSING TEMPORARY DRAWING & BACKFILL

NOTES
 1. CHANGE SAFETY FENCE TO BE INSTALLED AT THE EDGE OF THE PROPOSED LIMITS OF CONSTRUCTION TO PREVENT ACCESS INTO STREAM OR WETLAND.
 2. CONNECTION TO STREAM IF DEPTH AT STREAM OR WETLAND EXCEEDS:
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED STONOR CONTROL, NOTING ROLLED STONOR PERM. RESTRICTIONS.

LEGEND

--- PRL CONSTRUCTION RIGHT-OF-WAY/ LINES OF DELINEATION	--- PRL ROLLED STONOR CONTROL, PROTECT (DESIGNED AREA WHERE SLOPE IS 3:1 OR GREATER)
--- 21+00 BOUNDARY OF PRL CORRIDOR WITH EXISTING	--- DELINEATED STREAM
--- PRL 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CLEARANCE (ON NOTES)	--- PRL STREAM PERMANENT FILL
--- PRL CLEARANCE (ON NOTES)	--- PRL WETLAND PERMANENT FILL
--- PRL 60"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS, DIMENSION BETWEEN 10' & 20' SHALL BE DETERMINED TO APPROX. STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF IMP./ANIMAL ROAD	--- PRL RIGHT-OF-WAY DIVISION
	--- 1-A PRL TYPE A B&P
	--- 1-B PRL TYPE B B&P

WETLAND CROSSING KLF_WETLAND034 (PEM)



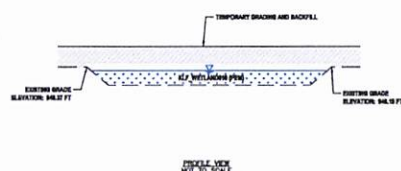
WETLAND INFORMATION
 WETLAND CLASSIFICATION PALLETINE ELEMENT
 WETLAND FROM 10:17
 PROPOSED METHOD OF CROSSING TEMPORARY DRAWING & BACKFILL

NOTES
 1. CHANGE SAFETY FENCE TO BE INSTALLED AT THE EDGE OF THE PROPOSED LIMITS OF CONSTRUCTION TO PREVENT ACCESS INTO STREAM OR WETLAND.
 2. CONNECTION TO STREAM IF DEPTH AT STREAM OR WETLAND EXCEEDS:
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED STONOR CONTROL, NOTING ROLLED STONOR PERM. RESTRICTIONS.

LEGEND

--- PRL CONSTRUCTION RIGHT-OF-WAY/ LINES OF DELINEATION	--- PRL ROLLED STONOR CONTROL, PROTECT (DESIGNED AREA WHERE SLOPE IS 3:1 OR GREATER)
--- 21+00 BOUNDARY OF PRL CORRIDOR WITH EXISTING	--- DELINEATED STREAM
--- PRL 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CLEARANCE (ON NOTES)	--- PRL STREAM PERMANENT FILL
--- PRL CLEARANCE (ON NOTES)	--- PRL WETLAND PERMANENT FILL
--- PRL 60"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS, DIMENSION BETWEEN 10' & 20' SHALL BE DETERMINED TO APPROX. STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF IMP./ANIMAL ROAD	--- PRL RIGHT-OF-WAY DIVISION
	--- 1-A PRL TYPE A B&P
	--- 1-B PRL TYPE B B&P

WETLAND CROSSING KLF_WETLAND010 (PEM)



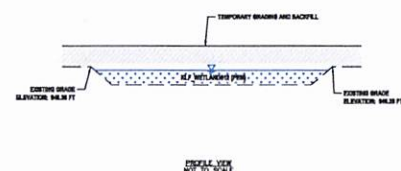
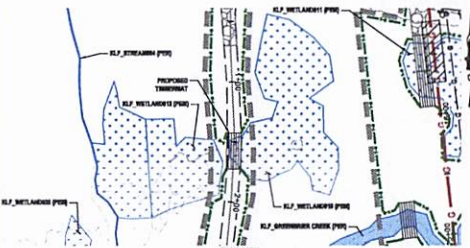
WETLAND INFORMATION
 WETLAND CLASSIFICATION PALLETINE ELEMENT
 WETLAND FROM 10:17
 PROPOSED METHOD OF CROSSING TEMPORARY DRAWING & BACKFILL

NOTES
 1. CHANGE SAFETY FENCE TO BE INSTALLED AT THE EDGE OF THE PROPOSED LIMITS OF CONSTRUCTION TO PREVENT ACCESS INTO STREAM OR WETLAND.
 2. CONNECTION TO STREAM IF DEPTH AT STREAM OR WETLAND EXCEEDS:
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED STONOR CONTROL, NOTING ROLLED STONOR PERM. RESTRICTIONS.

LEGEND

--- PRL CONSTRUCTION RIGHT-OF-WAY/ LINES OF DELINEATION	--- PRL ROLLED STONOR CONTROL, PROTECT (DESIGNED AREA WHERE SLOPE IS 3:1 OR GREATER)
--- 21+00 BOUNDARY OF PRL CORRIDOR WITH EXISTING	--- DELINEATED STREAM
--- PRL 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CLEARANCE (ON NOTES)	--- PRL STREAM PERMANENT FILL
--- PRL CLEARANCE (ON NOTES)	--- PRL WETLAND PERMANENT FILL
--- PRL 60"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS, DIMENSION BETWEEN 10' & 20' SHALL BE DETERMINED TO APPROX. STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF IMP./ANIMAL ROAD	--- PRL RIGHT-OF-WAY DIVISION
	--- 1-A PRL TYPE A B&P
	--- 1-B PRL TYPE B B&P

WETLAND CROSSING KLF_WETLAND012 (PEM)



WETLAND INFORMATION
 WETLAND CLASSIFICATION PALLETINE ELEMENT
 WETLAND FROM 10:17
 PROPOSED METHOD OF CROSSING TEMPORARY DRAWING & BACKFILL

NOTES
 1. CHANGE SAFETY FENCE TO BE INSTALLED AT THE EDGE OF THE PROPOSED LIMITS OF CONSTRUCTION TO PREVENT ACCESS INTO STREAM OR WETLAND.
 2. CONNECTION TO STREAM IF DEPTH AT STREAM OR WETLAND EXCEEDS:
 1. ANY SLOPE GREATER THAN 3:1 SHALL HAVE ROLLED STONOR CONTROL, NOTING ROLLED STONOR PERM. RESTRICTIONS.

LEGEND

--- PRL CONSTRUCTION RIGHT-OF-WAY/ LINES OF DELINEATION	--- PRL ROLLED STONOR CONTROL, PROTECT (DESIGNED AREA WHERE SLOPE IS 3:1 OR GREATER)
--- 21+00 BOUNDARY OF PRL CORRIDOR WITH EXISTING	--- DELINEATED STREAM
--- PRL 16" STEEL GAS LINE	--- DELINEATED WETLAND
--- EX. CLEARANCE (ON NOTES)	--- PRL STREAM PERMANENT FILL
--- PRL CLEARANCE (ON NOTES)	--- PRL WETLAND PERMANENT FILL
--- PRL 60"-18" DIAM. WALL PIPE OR CONSTRUCTION ACCESS, DIMENSION BETWEEN 10' & 20' SHALL BE DETERMINED TO APPROX. STREAM FLOW	--- EX. EDGE OF PAVEMENT
--- EX. EDGE OF IMP./ANIMAL ROAD	--- PRL RIGHT-OF-WAY DIVISION
	--- 1-A PRL TYPE A B&P
	--- 1-B PRL TYPE B B&P

THRASHER

IFP
 ISSUED FOR PERMITTING
 DATE: 05/10/23
 AFE # A12528

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION		
NO.	DESCRIPTION	DATE BY
1.	ALL DESIGN STRENGTHS OF PIPELINE AND SHAFT CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTRO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTRO.	
2.	FIELD DELINEATION PERFORMED AND PROVIDED BY KLENFELDER, INC.	
3.	COORDINATE SYSTEM USED FOR MAPPING AND TOPOGRAPHY: HORIZONTAL - NAD 83 WEST VIRGINIA STATE PLANE, NORTH ZONE, U.S. SURVEY FOOT VERTICAL - NAD 83 (GEOID), U.S. SURVEY FOOT	
4.	ALL EXISTING SHOWN IS HORIZONTAL AND PERTAINS TO THE BOUNDARY OF THE PERMITTED CORRIDOR. IT IS NOT A DIRECT REPRESENTATION OF THE FIELD. THE PROFILE WILL BE INSTALLED. INSTALLATION WITHIN THE PERMITTED CORRIDOR WILL BE COORDINATED IN THE FIELD BY ANTRO CONSTRUCTION REPRESENTATIVE.	
5.	THIS SHEET IS INTENDED TO BE PLOTTED ON A8D 3 (22" x 34") FOR REDUCTIONS, REFER TO DRAWING SCALE.	

Anti
 PERKINS BYPASS LP PIPELINE
 STREAM & WETLAND CROSSINGS
 PROPOSED 16" STEEL GAS LINE
 DOODRIDGE COUNTY, WEST VIRGINIA
 DRAWN BY: JSH (110) DATE: 8/12/2023
 CHECKED BY: JSH (110) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 2 SHEET: 17--S&WC5

GENERAL NOTES

- ANTERO WILL OBTAIN AN ENCROACHMENT PERMIT (FORM M-105) FROM THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
- ANY DISCREPANCIES FOUND BY THE CONTRACTOR BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE MANAGER. IN WRITING. WHO SHALL PROMPTLY ADDRESS SUCH PROBLEMS. WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
- WORK SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS, DETAILS AND TYPICALS. ANY DEVIATIONS OR ADDITIONS MUST BE APPROVED BY ANTERO PROJECT MANAGEMENT OR DEBARDED PROJECT REPRESENTATIVE.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR, AT HIS OR HER EXPENSE, OF ALL EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. FORTY-FOUR HOUR NOTICE TO ANY EXCAVATION THE CONTRACTOR SHALL CALL WEST VIRGINIA 811.
- ALL MATERIALS USED FOR FILL OR BACK FILL SHALL BE FREE OF WOOD, ROCKS, Boulders, ROCKS, Boulders, ORGANIC MATERIAL, OR ANY OTHER NON-COMPATIBLE SOIL TYPE MATERIALS. UNSATISFACTORY MATERIALS ALSO INCLUDE UNAPPROVED MAN MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE.
- A PRE-CONSTRUCTION KICK-OFF MEETING SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION.
- IF SPRINGS OR SEEPS AND/OR AN ACCUMULATION OF GROUND WATER IS OBSERVED ON A SIDE CUT OR CUT SLOPE PIPE TRENCH IMMEDIATELY NOTIFY THE ON-SITE INSPECTOR FOR AN EVALUATION AND CONSIDERATION OF THE INSTALLATION OF A DRAINAGE SYSTEM.
- EROSION CONTROL, BLANKETS ARE REQUIRED FOR SLOPES OF 3:1 OR GREATER.
- HYDROMULCH (BONDED FIBER MATRIX) CAN BE UTILIZED AS A SUBSTITUTE TO EROSION CONTROL, BLANKETS WITH APPROVAL FROM ANTERO, EXCEPT FOR ON RESTORED STREAM BANKS AND ROAD BANKS. HYDROMULCH (BONDED FIBER MATRIX) SHALL ONLY BE A VALID SUBSTITUTE FOR EROSION CONTROL, BLANKETS DURING GRASS GROWING SEASONS.
- HYDROGEL PRESSURE TEST - WATER FROM ANTERO APPROVED SOURCES ONLY TO BE USED FOR HYDROTEST. NO DRAINAGE IS PERMITTED WITHOUT PRIOR ANTERO APPROVAL AND APPLICABLE PERMITS. NOTIFICATION REQUIRED TO ANTERO ENVIRONMENTAL PRIOR TO HYDROTEST.

EROSION AND SEDIMENT CONTROL PLAN NARRATIVE/CONSTRUCTION SEQUENCES

EROSION AND SEDIMENT (E&S) CONTROL MEASURES FOR THE PIPELINE CONSTRUCTION ACTIVITIES CONSIST OF COMPOST FIBER SOCK, SILT FENCE, ROUGH-TOE HEDGE ROW OVERSLOPS, TRENCH BREAKERS (PULS) AND TEMPORARY AND PERMANENT BEEDING AND MULCHING ON ANY OTHER APPROVED BMP. AREAS LOCATED WITHIN TOTAL MAXIMUM DAILY LOSS (TMDL) WATERSHEDS MAY SUBSTITUTE SILT FENCE AND COMPOST FIBER SOCK WITH AN ENHANCED BMP. BMP SPECIFICATIONS FOR THE E&S CONTROL PLAN (E&S) AREA TO BE UTILIZED BY THE CONSTRUCTION CONTRACTOR ACCORDING TO THE PROVIDED PLAN STRAWHAY SALES WILL NOT BE USED AS AN E&S CONTROL MEASURE THAT MAY BE USED AS A VIOLATION OFFENSE.

GENERAL SEQUENCE FOR PIPELINE CONSTRUCTION

1. PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES, CLEARLY MARK ALL FIELD AND PLANTING LIMITS, SENSITIVE AREAS, AND TREES THAT ARE TO BE PRESERVED WITHIN THE CONSTRUCTION AREA. THESE SHALL BE CLEARLY MARKED, BOTH IN THE CLEARING AND IN THE PLANS, TO PREVENT DAMAGE AND OFFSITE IMPACTS.
2. INSTALL STORM CONSTRUCTION ENTRANCES AT ALL LOCATIONS WHERE ACCESS ROADS WILL BE ACCESSING A PUBLIC ROADWAY.
3. INSTALL TEMPORARY E&S CONTROLS (SILT FENCE, ROW OVERSLOPS, ETC) PRIOR TO ANY EARTH DISTURBING ACTIVITIES, WHICH INCLUDES GRUBBING AND EXCAVATION, TO INSURE TO THE MAXIMUM EXTENT PRACTICABLE, THAT MINIMAL EROSION OR SEDIMENT OCCURS.
4. ROW OVERSLOPS AND/OR OTHER EROSION AND SEDIMENT CONTROL DEVICES WILL BE INSTALLED AS DEPICED ON THE PLAN SHEETS AND SPECIFIED IN THE DETAIL SHEETS. CLEARING AND GRUBBING IS REQUIRED. SEE BELOW REGARDING THE MANAGEMENT AND DISPOSAL OF DEBRIS.
5. AFTER ACCESS TO AND ALONG THE PROPOSED UTILITY LINE HAS BEEN PROVIDED, THE GENERAL CLEARING AND GRUBBING OF THE TREES AND BRUSH ALONG THE ROW FOR THE PIPE TRENCH SHALL BE COMPLETED TO THE E&S PLAN. ALL POLLUTANTS, INCLUDING WHITE MATERIALS AND COMBUSTION DEBRIS, THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF SURFACE WATERS. UNWORKED TREES AND DEBRIS SHALL HAVE A GARBAGE BAG WITH A HANGAR ON AT EVERY WATERBAY OUTLET. LANDOWNER ACCESS CONTROL, AROUND A MINIMUM OF EVERY 100' (CLEARING / GRUBBING MATERIAL WILL BE DISPOSED OF PROPERLY AND / OR LAND APPLIED AS PER LANDOWNER STIPULATIONS.
6. MANHOUSING DURING THE ROW WILL BE CONDUCTED WHERE NECESSARY TO PROVIDE AN EVEN SURFACE FOR SAFE AND EFFICIENT OPERATION OF CONSTRUCTION EQUIPMENT. GRADING WILL BE MINIMAL AMOUNT NECESSARY AND BMPs WILL BE INSTALLED PROMPTLY. TIE STAMPS, LIME AND BRUSH ROCKS AND BOLLERS WILL BE REMOVED FOR SAFETY CONCERNS OR LAND APPLIED AS PER LANDOWNER STIPULATIONS.
7. EXCAVATE PIPELINE TRENCH - A MINIMUM COVER AS SPECIFIED IN THE MIDDLESTREAM CONSTRUCTION SPECIFICATIONS SHALL BE PROVIDED ABOVE PIPELINE AT ALL WETLANDS, STREAMS AND ROADSWAYS.
8. THE PROPOSED CONSTRUCTION ROW WILL BE USED AS A WORK AREA FOR TRENCH EXCAVATION, EQUIPMENT MOVEMENT, AND THE STORAGE OF SOIL STOCKPILES, AS NEEDED. EQUIPMENT SOIL STOCKPILES AND OTHER MATERIALS AREA TO REMAIN UNOCCUPIED BY BMP DURING CONSTRUCTION ACTIVITIES.
9. REGRADING OF TOPSOIL AND SUBSOIL WILL BE PERFORMED WHERE TRENCH EXCAVATION TAKES PLACE IN AN AGRICULTURAL, WETLAND, OR RESIDENTIAL AREA. IF BEST MANAGEMENT PRACTICES TO SALVAGE AND REGRADATE TOPSOIL WERE APPLICABLE.
10. TEMPORARY E&S CONTROLS FOR STREAM CROSSINGS SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE E&S PLAN AND ASSOCIATED DETAIL SHEETS.
11. STREAM AND RIVER PIPELINE CROSSING CONSTRUCTION METHODS WILL BE INSTALLED AT LOCATIONS SHOWN ON THE E&S PLAN SHEETS AND AS SPECIFIED ON THE DETAIL SHEETS. WATERBODIES WILL BE CROSSED WITH TEMPORARY BRIDGES, SUCH AS TIMBER MATS OR APPROVED EQUAL CROSSINGS, PRIOR TO CROSSING THE CONVEYANCE. STREAMBANK STABILIZATION WILL BE PERFORMED IMMEDIATELY FOLLOWING COMPLETION OF THE PIPELINE INSTALLATION.
12. WETLAND CROSSINGS WITHIN FOR UTILITY CROSSINGS WILL BE KEPT TO A MINIMUM AND WILL BE STABILIZED BY PLACING TAMER MATS, BIRPH, OR PRE-FABRICATED TAMER MATS, AS SHOWN ON THE DETAIL SHEETS. ALL MATERIALS USED TO STABILIZE ACCESS ROADS IN WETLANDS AREA WILL BE REMOVED FROM THE WETLAND UPON COMPLETION OF THE PIPELINE CONSTRUCTION. A BARRIER (GEOTEXT FABRIC) SHOULD BE USED TO PREVENT TAMPING OF SOILS.
13. PIPELINE SECTIONS WILL BE TRANSPORTED TO THE WORK AREA AND STRUNG ALONG THE WORKING SIDE OF THE ROW PARALLEL TO THE TRENCH LINE. THE PIPELINE WILL BE KEPT TO CONFORM TO THE TRENCH CONTOUR, ALIGNED, WELDED AND PLACED ON TEMPORARY SUPPORTS ALONGSIDE THE TRENCH. WELLS WILL BE VISUALLY AND RADIO GRAPHICALLY INSPECTED AND REPAIRED AS NECESSARY. THE PIPE SECTION WILL BE INSTALLED WITHIN THE TRENCH AND PLACED ON FACING MATERIALS LAGS ON THE TRENCH BOTTOM TO PROTECT THE PIPE COATING. ANY WETNESS ENCOUNTED DURING CONSTRUCTION WORK WILL BE DRAINAGE USING A PUMP AND HOSE. WATER WILL BE RELEASED INTO A FILTER BAY AND / OR DEWATERING STRUCTURE. FEAT WILL BE USED IN AREAS WHERE SLOPES ARE TO BE GRADATED FOR DRAINAGE LOCATIONS, WHEN AVAILABLE. VISUALLY OBSERVABLE SINK HOLES, IDENTIFIED AREAS OF DEWATERING ACTIVITY, WILL BE AVOIDED WHEN POSSIBLE.
14. INSTALL TRENCH BREAKERS AT LOCATIONS AS SHOWN ON THE E&S PLAN SHEETS AND AS SPECIFIED ON THE DETAIL SHEETS.
15. THE TRENCH WILL BE SUBSEQUENTLY BACKFILLED WITH SUITABLE EXCAVATED MATERIAL. THE BACKFILL MATERIAL WILL BE SLIGHTLY CROWNED UPWARD AREAS TO ALLOW FOR SETTLEMENT THAT MAY OCCUR. CROWNING THE SOIL SURFACE OVER THE PIPELINE WILL HELP PREVENT FUTURE STORMWATER RELATED FLOODING FROM RESTORED TO THEIR ORIGINAL TOPOGRAPHIC CONTOURS.
16. EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPs THAT PROTECT THE SOIL FROM EROSION FORCES OF RAINFALL, FLOWING WATER AND WIND.
17. ALL DISTURBED AREAS THAT ARE AT FINAL GRADE MUST BE SEEDING AND MULCHED WITHIN SEVEN DAYS AND AREAS THAT WILL NOT BE WORKED AGAIN FOR 21 DAYS OR MORE MUST BE SEEDING AND MULCHED WITHIN SEVEN DAYS. FOR DISTURBED AREAS WITH SLOPES OF 3:1 OR GREATER, THE AREA WILL BE VERTICALLY TRACED AND EROSION CONTROL FABRIC SHALL BE INSTALLED AFTER MULCH AND SOIL SUPPLEMENTS HAVE BEEN APPLIED. THE TEMPORARY PERMANENT BEEDING AND MULCH MATS ON THE DETAIL SHEETS CONSIST OF THE TYPE OF SEED AND APPLICATION RATE THAT SHALL BE APPLIED. INCLUDING THE NURSE CROP THAT SHALL BE USED DURING CERTAIN TIME OF THE YEAR TO PROMOTE STABILIZATION OF THE SOIL. UNTIL THE PERMANENT BEEDING STABILIZATION AREAS INSIDE THE SEED HAS FAILED TO GERMINATE ADEQUATELY (UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70% WITHIN 30 DAYS AFTER SEEDING AND MULCHING MUST BE RESEED IMMEDIATELY, OR AS SOON AS WEATHER CONDITIONS ALLOW.
18. IN THE UNLIKELY EVENT THAT THERE ARE EXCESS EXCAVATED MATERIALS REMAINING AFTER THE ROW HAS BEEN BACKFILLED, THE MATERIAL WILL BE DISPOSED OF WITHIN THE EXISTING ROW IN AN UPLAND AREA. MATERIAL WILL BE SPREAD IN A THIN LAYER AND TIED INTO EXISTING CONTOURS TO CREATE POSITIVE DRAINAGE FOR STORMWATER RUNOFF.
19. INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROLS WILL BE, AT A MINIMUM, PERFORMED ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH PER 24 HOUR PERIOD UNTIL THERE IS A UNIFORM, PERENNIAL, 70 PERCENT VEGETATIVE COVER ESTABLISHED. TEMPORARY BMPs WILL BE REMOVED UPON ACHIEVING VEGETATIVE STABILIZATION. THE 70 PERCENT REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT A PERCENT OF THE SITE. THESE INSPECTIONS WILL COMMENCE AT THE START OF EARTH DISTURBING ACTIVITY (GRUBBING). COVERAGE WAS ONLINE ACCESS TO SEVERAL RAIN GAUGE LOCATIONS IN THE GENERAL AREA OF EACH WORK LOCATION. THIS DATA WILL BE MONITORED AND USED BY INSPECTOR PERSONNEL. USE OF ONLINE WEATHER TRACKING TOOLS MAY BE UTILIZED. RAINFALL DATA WILL BE RECORDED ON INSPECTION RECORDS.
20. NO SEDIMENT TRACKING ON THE PUBLIC ROADWAY IS ALLOWED. IN THE EVENT THAT SEDIMENT IS INADVERTENTLY TRACKED ONTO THE ROAD, THE ROAD SHALL BE CLEANED THOROUGHLY BY THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR PICKUP SHEEPING.

21. CONSTRUCTION ACCESS RESTORATION SHALL BE EQUAL OR BETTER THAN THE PRE-CONSTRUCTION CONDITION.
22. APPLICABLE STABILIZATION PRACTICES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY AND PERMANENT SEEDING, SOCCING, MULCHING, EROSION CONTROL, FABRICS AND MATTING, THE EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED, AND DUST CONTROL.
23. SELECTED SOIL STABILIZATION MEASURES SHALL BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, AND ESTIMATED DURATION OF USE.
24. SOIL STOCKPILES MUST BE TEMPORARILY STABILIZED.
25. ALL SLOPE SLIP REPAIRS, ROW MAINTENANCE ITEMS, LANDOWNER DISTURBANCES, PUNCH LIST ITEMS, AND ANY OTHER POST CONSTRUCTION ACTIVITIES WILL BE CONSIDERED PART OF THE STABILIZATION PHASE AND NOT THE GRADING PHASE. UPON REACHING FINAL GRADE, ANTERO CONSIDERS THE GRADING PHASE TO BE COMPLETE AND THE SITE TRANSFERRED TO THE STABILIZATION PHASE. THESE POST CONSTRUCTION ACTIVITIES MAY BE REQUIRED DURING STABILIZATION FOLLOWING THE COMPLETION OF THE CONSTRUCTION SEQUENCE (ITEMS 1-24 ABOVE).
- 25.A. E&S CONTROL RE-INSTALLATION MAY REQUIRE FIELD ADJUSTMENT FROM THE ORIGINAL E&S PLAN TO MAXIMIZE EFFECTIVENESS.

THE CONSTRUCTION SEQUENCE FOR THE SUBSURFACE INSTALLATION OF THE WATER PIPELINE WILL FOLLOW THE ABOVE REFERENCED GENERAL CONSTRUCTION SEQUENCE (ITEMS 1-25A ABOVE). THE CONSTRUCTION SEQUENCE FOR THE SURFACE INSTALLATION OF THE WATER PIPELINE CONSISTS OF THE FOLLOWING:

1. ACCESS THE ROW VIA STABILIZED CONSTRUCTION ENTRANCES. GROUND DISTURBANCE THROUGHOUT THE ROW IS NOT EXPECTED SINCE THE WATER PIPELINE(S) ARE PLACED ON THE GROUND SURFACE EXCEPT WHERE LANDOWNER STIPULATIONS ACCESS MAY REQUIRE THE SURFACE WATER PIPELINE(S) TO BE BURIED, IN WHICH CASE THE ABOVE REFERENCED GENERAL CONSTRUCTION SEQUENCE WOULD BE FOLLOWED.
2. STRING OUT THE SURFACE WATER PIPELINE(S) ALONG THE ENTIRE ROW AND FUSE TOGETHER.
3. IF STREAM AND/OR WETLAND CROSSINGS ARE REQUIRED, THEY WILL BE PERFORMED AS AERIAL CROSSINGS VIA BEAMS / AIR BRIDGES, WHICH WILL BE SITUATED OUTSIDE THE LIMITS OF EACH WETLAND AND THE ORDINARY HIGH WATER MARK OF EACH STREAM, WOOD STREAM AND / OR WETLAND CROSSINGS MAY REQUIRE THE SURFACE WATER PIPELINE(S) TO BE INSTALLED SUBSURFACE AND WOULD FOLLOW THE ABOVE REFERENCED GENERAL CONSTRUCTION SEQUENCE.

PIPELINE BMPs INSTALLATION AND REMOVAL SEQUENCE

TEMPORARY AND PERMANENT BMPs WILL BE USED DURING CONSTRUCTION ACTIVITIES TO AVOID AND/OR MINIMIZE ADVERSE ENVIRONMENTAL EFFECTS OF CONSTRUCTION ACTIVITIES.

INSPECTIONS OF ALL E&S CONTROLS SHALL BE CONDUCTED, AT A MINIMUM, ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH PER 24 HOUR PERIOD. ALL NECESSARY CLEANING, REPAIR AND/OR MAINTENANCE SHALL BE MADE AS SOON AS POSSIBLE AFTER THE INSPECTION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT INSPECTIONS AND REPAIRS ARE MADE AS OUTLINED HEREIN. ALL SEDIMENT COLLECTED IN ANY EROSION CONTROL DEVICE, INCLUDING EROSION CONTROL, LANDOWNER ACCESS CONTROL, AND/OR A MINIMUM OF PROPERLY AT A WV DEPARTMENT OF ENVIRONMENTAL PROTECTION (WVDEP) APPROVED LOCATION. THE FOLLOWING MAINTENANCE WILL BE PERFORMED UNTIL STABILIZATION HAS BEEN ACHIEVED:

1. TEMPORARY EROSION AND SEDIMENT CONTROL, BMPs SHOULD BE REMOVED FOLLOWING CONFIRMATION THAT 70 PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED SOIL RESULTS FROM REMOVAL OF BMPs OR VEGETATION SHALL BE STABILIZED.
2. WHENEVER INSPECTION AND/OR MONITORING REVEALS THAT THE BMPs IDENTIFIED IN THE E&S PLAN ARE INADEQUATE, THE E&S PLAN SHALL BE ADJUSTED TO MAXIMIZE EFFECTIVENESS AS APPROPRIATE, IN A TIMELY MANNER.
3. MAINTENANCE OF THE E&S PLAN - THE E&S PLAN SHALL BE RETAINED ON-SITE. THE E&S PLAN SHALL BE MODIFIED WHENEVER THERE IS A SIGNIFICANT CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF ANY BMP. THE DEP MUST BE NOTIFIED OF CERTAIN CHANGES TO THE CONSTRUCTION SWPPP, AS IDENTIFIED IN THE CONSTRUCTION SWPPP, DEPENDING ON THE SIGNIFICANCE OF THE REVISION. A PERMIT MODIFICATION MAY NEED TO BE SUBMITTED TO THE DEP.

THE FOLLOWING IS A GENERAL BMP INSTALLATION SEQUENCE FOR PIPELINE CONSTRUCTION ACTIVITIES:

4. A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROVIDED AT ALL LOCATIONS WHERE CONSTRUCTION TRAFFIC WILL BE ACCESSING A PUBLIC ROAD DIRECTLY FROM A DISTURBED AREA.
5. TEMPORARY SEDIMENT BARRIERS, SUCH AS APPROPRIATELY SIZED SILT FENCE OR ENHANCED BMPs WILL BE PLACED DOWN SLOPE OF WORK AREAS AND AROUND SOIL STOCKPILES, AS NEEDED.
6. APPROPRIATELY SIZED FENCING WILL BE PLACED AROUND WETLANDS AND WATERBODIES ADJACENT TO THE WORK AREA PRIOR TO ANY TRENCHING ACTIVITIES.
7. STOCKPILES WILL NOT EXCEED 30 FEET IN HEIGHT.
8. TEMPORARY STREAM AND WETLAND CROSSINGS SHALL BE INSTALLED AS INDICATED ON THE E&S PLAN SHEETS AND AS PER THE E&S DETAIL SHEETS. FOR ALL OTHER SURFACE OR STORMWATER CONVEYANCES THAT ARE NOT IDENTIFIED ON THE PLAN SHEETS AS STREAMS DUE TO THE LACK OF DEFINED BED AND BANK CONDITIONS, A TEMPORARY BRIDGE, SUCH AS A TAMER MAT OR AN APPROVED EQUAL, SHALL BE INSTALLED, PRIOR TO CROSSING THE CONVEYANCE IF THERE IS FLOWING WATER PRESENT AT TIME OF CONSTRUCTION IN THAT AREA.
9. ROW OVERSLOPS WILL BE INSTALLED IMMEDIATELY AFTER INITIAL DISTURBANCE OF THE SOIL. IN ACCORDANCE WITH THE DETAILS AND SPACING SIZING REQUIREMENTS AS DEPICED IN THE RIGHT OF WAY OVERSLOP OUTLET (WATERBAY) DETAILS. ROW OVERSLOPS WILL BE CONSTRUCTED OF SOIL TO REDUCE RUNOFF VELOCITY AND DIVERT WATER OFF OF THE PIPELINE ROW.
10. TRENCH DEWATERING, IF NEEDED, WILL BE CONDUCTED USING A PUMP AND HOSE. WATER WILL BE RELEASED INTO A FILTER BAG AND / OR DEWATERING STRUCTURE. FEAT WILL BE USED IN AREAS WHERE SLOPES ARE TO BE GRADATED FOR DRAINAGE LOCATIONS, WHEN AVAILABLE. VISUALLY OBSERVABLE SINK HOLES, IDENTIFIED AREAS OF DEWATERING ACTIVITY, WILL BE AVOIDED WHEN POSSIBLE.
11. TRENCH BREAKERS WILL BE INSTALLED IN SLOPING AREAS GREATER THAN FIVE PERCENT AND ON SLOPES ADJACENT TO STREAMS, WETLANDS, AND ROADS CROSSINGS TO PREVENT SUBSURFACE EROSION. TRENCH BREAKERS WILL BE INSTALLED IN ACCORDANCE WITH THE SPACING REQUIREMENTS.
12. THE WORK AREA WILL BE BACKFILLED FOLLOWING PIPELINE INSTALLATION OR OTHER EXCAVATION WORK. IN AREAS WHERE TOPSOIL HAS BEEN SEGRGATED, THE SUBSOIL WILL BE REPLACED FIRST, AND THEN THE TOPSOIL WILL BE SPREAD OVER THE AREA FROM WHICH IT WAS REMOVED. DISTURBED AREAS WILL BE RESTORED TO THEIR ORIGINAL TOPOGRAPHIC CONTOURS.
13. ROW OVERSLOPS WILL BE INSTALLED AT INCREMENTS ACROSS SLOPES ADJACENT TO CONSTRUCTION ROW TO REDUCE EROSION AND FLOW LENGTH OF RUNOFF. PUMPS WILL BE INSTALLED AT THE END OF ROW OVERSLOPS AND WRAPPED WITH 18 INCH DIAMETER OR LARGER COMPOST FIBER SOCK AND/OR A ROW OF FILTER FENCING OR EQUIVALENT IN VIEW OF PRIORITY ONE SILT SAVER FENCING. EROSION AND SEDIMENT CONTROLS MUST BE INSTALLED AS DEPICED ON THE E&S PLAN SHEETS AND ACCORDING TO DETAIL SPECIFICATIONS.
14. IMMEDIATELY FOLLOWING BACKFILLING, ALL DISTURBED AREAS WILL BE GRADED IN PREPARATION FOR SEEDING AND MULCHING. THE CONSTRUCTION SITE SHOULD BE STABILIZED AS SOON AS POSSIBLE AFTER COMPLETION. ESTABLISHMENT OF FINAL COVER MUST BE INITIATED AS SOON AS CONDITIONS ALLOW.
15. FOR THREE TO SIX STEEP SLOPES THE DISTURBED AREA WILL BE VERTICALLY TRACED, EROSION CONTROL FABRIC WILL BE INSTALLED.
16. TEMPORARY SEDIMENT BARRIERS WILL BE MAINTAINED UNTIL VEGETATION HAS BECOME ESTABLISHED WITH A UNIFORM COVERAGE OF SEEDING OF 70 PERCENT OR MORE WITHIN THE DISTURBED ROW. ONCE THIS COVERAGE HAS BEEN OBTAINED, APPROPRIATE CONTROLS WILL BE REMOVED FROM THE WORK AREA. AREAS DISTURBED DURING THE REMOVAL OF THE EROSION CONTROLS WILL BE STABILIZED IMMEDIATELY. THE 70 PERCENT REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT A PERCENT OF THE SITE.
17. ALL WASTE MATERIAL WILL BE TRANSPORTED OFF-SITE FOR RECYCLING AND/OR DISPOSAL. WHERE FEASIBLE, CONSTRUCTION WASTE MATERIALS WILL BE RECYCLED OR WILL BE TAKEN TO AN APPROVED FACILITY FOR DISPOSAL, AS STATED PREVIOUSLY. EXCESS SOIL MATERIAL, IF ANY, WILL BE SPREAD AND REVEGETATED WITHIN THE ROW. OFF-SITE SPILL, AND/OR BORROW SITES MUST BE OPERATED UNDER A CURRENT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT.
18. TEMPORARY STOCKPILES NEEDED BMPs SUCH AS SILT FENCE / SOCK OR ENHANCED BMPs PLACED ADJACENT TO ROW.
19. CONTRACTOR IS EXPECTED TO MINIMIZE DISTURBANCE WITHIN THE ROW.

MAINTENANCE SCHEDULE

AFTER CONSTRUCTION IS COMPLETED AND 70% UNIFORM PERENNIAL VEGETATION HAS BEEN ACHIEVED, ALL BMPs WILL BE REMOVED AND ANY LAND DISTURBED BY REMOVAL WILL BE STABILIZED UNLESS OTHERWISE SPECIFIED. ALL MAINTENANCE MUST BE COMPLETED AS SOON AS CONDITIONS ALLOW AFTER AN INSPECTION CONFIRMS THAT A BMP IS NOT FUNCTIONING AS INTENDED AS A RESULT OF WEATHER OR OTHER CAUSES.

1. INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROLS WILL BE, AT A MINIMUM, PERFORMED ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.5 INCH PER 24 HOUR PERIOD UNTIL THERE IS A UNIFORM, PERENNIAL, 70 PERCENT VEGETATIVE COVER ESTABLISHED. TEMPORARY BMPs WILL BE REMOVED UPON ACHIEVING VEGETATIVE STABILIZATION. THE 70 PERCENT REQUIREMENT REFERS TO THE TOTAL AREA VEGETATED AND NOT A PERCENT OF THE SITE. THESE INSPECTIONS WILL COMMENCE AT THE START OF EARTH DISTURBING ACTIVITY (GRUBBING). ANTERO HAS ONLINE ACCESS TO SEVERAL RAIN GAUGE LOCATIONS IN THE GENERAL AREA OF EACH WORK LOCATION. THIS DATA WILL BE MONITORED AND USED BY INSPECTOR PERSONNEL. USE OF ONLINE WEATHER TRACKING TOOLS MAY BE UTILIZED. RAINFALL DATA WILL BE RECORDED ON INSPECTION RECORDS.
2. SEDIMENT MUST BE REMOVED WHERE ACCUMULATION REACHES ONE-HALF THE ABOVE GROUND HEIGHT OF A MAT WITH ALL TYPES.
3. BMPs (ALL TYPES) WHICH HAVE BEEN UNDERMINED OR TOPPED, SHOULD IMMEDIATELY BE REPAIRED.
4. REQUIRED REPAIRS OR MAINTENANCE SHALL BE MADE.
5. LOSS OF SEDIMENT CONTROL, INSPECTION MUST BE KEPT WITH THE INSPECTOR CONSTRUCTION RECORDS AND INCLUDE DATE, TIME, AND CONDITION OF BMPs AND ANY NECESSARY MAINTENANCE.
6. TEMPORARY AND PERMANENT E&S CONTROL BMPs SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. MAINTENANCE AND REPAIR SHALL BE CONDUCTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND AFTER ANY STORM EVENT GREATER THAN 0.5 INCH OF RAIN PER 24 HOUR PERIOD.
7. TEMPORARY E&S CONTROL BMPs SHOULD BE REMOVED FOLLOWING CONFIRMATION THAT 70 PERCENT PERENNIAL VEGETATIVE COVER IS ESTABLISHED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON-SITE. DISTURBED SOIL RESULTING FROM REMOVAL OF BMPs OR VEGETATION SHALL BE STABILIZED.

MATERIAL WASTE HANDLING AND RECYCLING

1. GARBAGE DISPOSAL IS HANDLED THROUGH ONE OF THE LOCAL WASTE MANAGEMENT PROVIDERS/FACILITIES, IF NECESSARY. THE CONTRACTOR WILL OBTAIN A PERMIT FOR THE DURATION OF THE WORK WHICH WILL BE DISPOSED OF AT A LICENSED PERMITTED MUNICIPAL LANDFILL.

2. THE CONTRACTOR WILL DISPOSE OF ALL SCRAP MATERIAL. THE SCRAP MATERIAL MUST BE REMOVED FROM THE SITE AND DISPOSED OF OR RECYCLED AT A PROPERLY LICENSED/PERMITTED FACILITY. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY PERMITS AND/OR DISPOSAL FEES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO ASSURE THAT ALL MATERIALS ARE HANDLED AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE LAWS, RULES, AND REGULATIONS. INCLUDING BUT NOT LIMITED TO THOSE ISSUED BY THE ENVIRONMENTAL PROTECTION AGENCY, WVDEP, AND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

3. CONSTRUCTION WASTE MATERIALS, INCLUDING BUT NOT LIMITED TO BENTONITE, POLY PIPE SHAVINGS, AND SANDPAPERS, WILL BE TAKEN TO THE NEAREST APPROVED FACILITY FOR DISPOSAL. EXCESS SOIL MATERIAL, IF ANY, WILL BE SPREAD AND REVEGETATED WITHIN THE ROW. OFF-SITE SPILL, AND/OR BORROW SITES MUST BE OPERATED UNDER A CURRENT NPDES.

SEEDING

1. SEE DETAILS 20-31 FOR TEMPORARY SEEDING, PERMANENT SEEDING, AND MULCHING REQUIREMENTS.
2. EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPs THAT PROTECT THE SOIL FROM EROSION FORCES OF RAINFALL, FLOWING WATER AND WIND.
3. PERMANENT SEEDING/MULCHING
4. ALL DISTURBED AREAS THAT ARE AT FINAL GRADE OR AREAS THAT WILL NOT BE WORKED AGAIN FOR 21 DAYS OR MORE MUST BE SEEDING AND MULCHED WITHIN SEVEN DAYS. WHERE THE INITIATION OF STABILIZATION MEASURES BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITY TEMPORARILY CEASED IS PRECEDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS CONDITIONS ALLOW. WHERE CONSTRUCTION ACTIVITY WILL RESUME ON A PORTION OF THE SITE WITHIN 21 DAYS FROM WHEN ACTIVITIES CEASED, (E.G. THE TOTAL TIME PERIOD THAT CONSTRUCTION ACTIVITY IS TEMPORARILY HALTED IS LESS THAN 21 DAYS) THEN STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE BY THE SEVENTH DAY AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED. AREAS WHERE THE SEED HAS FAILED TO GERMINATE ADEQUATELY (UNIFORM PERENNIAL VEGETATION COVER WITH A DENSITY OF 70% WITHIN 30 DAYS AFTER SEEDING AND MULCHING MUST BE RESEED IMMEDIATELY, OR AS SOON AS WEATHER CONDITIONS ALLOW.

TEMPORARY SEEDING/MULCHING

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POLLUTANT CONTROLS

1. ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS THAT OCCUR ON SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF SURFACE WATER. WOODY DEBRIS MAY BE CHIPPED AND SPREAD ON SITE.
2. COVER, CONTAINMENT, AND PROTECTION FROM VULNERABLE SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-HAZARDOUS WASTE PRESENT ON THE SITE.
3. MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, SOLVENT AND DEGREASING CLEANING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR ON SURFACE WATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF NECESSARY, OVER THE VEHICLE.
4. APPLICATION OF AGRICULTURAL CHEMICALS, INCLUDING FERTILIZERS AND PESTICIDES SHALL BE CONDUCTED IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICALS TO SURFACE WATER RUNOFF. MANUFACTURER'S RECOMMENDATIONS FOR APPLICATION RATES AND PROCEDURES SHALL BE FOLLOWED.
5. BMPs SHALL BE USED TO PREVENT OR TREAT CONTAMINATION OF SURFACE WATER RUNOFF BY PROTECTING SOURCES. THESE SOURCES INCLUDING BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHINGS AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, AND CONCRETE PUMPING AND MOVER WASHOUT WATERS.
6. REPORT SPILLAGE OR DISCHARGE OF POLLUTANTS THAT IMPACT SURFACE OR GROUNDWATER TO ANTERO PERSONNEL IMMEDIATELY.

SUMMARY OF MATERIALS (3D)		SUMMARY OF MATERIALS (3D)				
NO.	DESCRIPTION	NO.	DESCRIPTION			
REVISION						
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTERO	1/5/23	JW			
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	DATE	BY

GENERAL INFORMATION

1. ALL DESIGN STRENGTH OF PIPELINE AND MAP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.
2. THIS SHEET IS INTENDED TO BE PLOTTED ON A8E (22" x 34") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

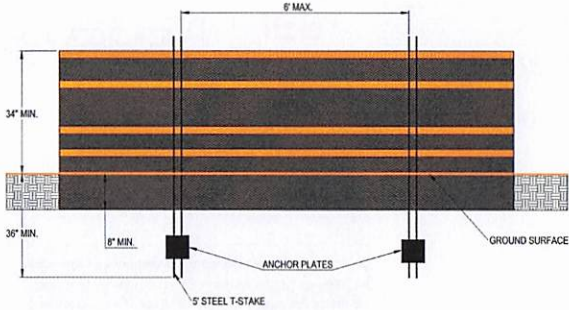
PERKINS BYPASS LP PIPELINE ESCP DETAILS

PROPOSED 16" STEEL GAS LINE

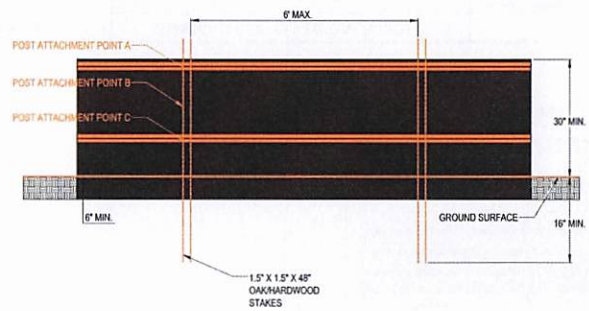
DODDORIDGE COUNTY, WEST VIRGINIA

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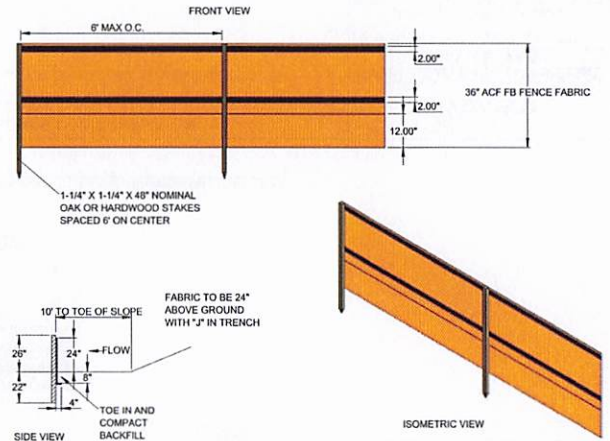
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 DATE: 05/16/23
 AFE # A12528
 PERKINS BYPASS LP GAS LINE ESCP DETAIL SHEET 14



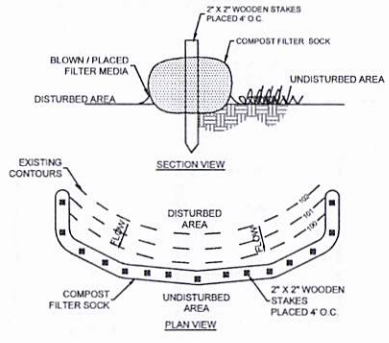
A ACF ENVIRONMENTAL SMARTFENCE 42
 NTS



B ACF ENVIRONMENTAL SMARTFENCE 36 (SD) WITH WOOD POSTS
 NTS



C ACF ENVIRONMENTAL FILTRATION BARRIER (SMARTFENCE FB) WITH WOOD POSTS
 NTS



A COMPOST FILTER SOCK
 NTS

- CONDITIONS WHERE PRACTICE APPLIES:**
- INSTALL ON DISTURBED AREAS THAT REQUIRE IMMEDIATE EROSION PROTECTION.
 - USE ON SLOPES REQUIRING STABILIZATION UNTIL PERMANENT VEGETATION CAN BE ESTABLISHED.
 - CAN BE USED ALONG THE PERIMETER OF THE PIPELINE AS A CHECK DAM IN UNLINED DITCHES AND AROUND TEMPORARY STOCKPILES.
 - SOCK CAN BE STAKED TO THE GROUND USING MALLOW CUTTINGS FOR ADDED VEGETATION.
 - EROSION CAN OCCUR BENEATH AND BETWEEN SOCKS IF NOT PROPERLY ENTRENCHED, ALLOWING WATER TO PASS BELOW AND BETWEEN SOCKS. IT IS THEREFORE VERY IMPORTANT TO INSTALL SOCKS CORRECTLY.
 - ROLLS ARE A SHORT-TERM SOLUTION TO HELP ESTABLISH NATIVE VEGETATION.
 - ROLLS STORE MOISTURE FOR VEGETATION PLANTED IMMEDIATELY UP-SLOPE.

- CONSTRUCTION SPECIFICATIONS:**
- IT IS ORIGINAL THAT SOCK IS INSTALLED PERPENDICULAR TO THE FLOW DIRECTION AND PARALLEL TO THE SLOPE CONTOUR.
 - NARROW TRENCHES SHOULD BE DUG ACROSS THE SLOPE ON CONTOUR TO A DEPTH OF 3 TO 5 INCHES ON CLAY SOILS AND SOILS WITH GRADUAL SLOPES. ON LOOSE SOILS, STEEP SLOPES, AND DURING HIGH RAINFALL EVENTS, THE TRENCHES SHOULD BE DUG TO A DEPTH OF 5 TO 7 INCHES, OR 2/3 OF THE THICKNESS OF THE SOCK.
 - START CONSTRUCTION OF TRENCHES AND INSTALLING SOCK FROM THE BASE OF THE SLOPE AND WORK UP-SLOPE. EXCAVATED MATERIAL SHOULD BE SPREAD EVENLY ALONG THE SLOPE AND COMPACTED USING HAND TAMPING OR OTHER METHOD. CONSTRUCT TRENCHES AT CONTOUR INTERVALS OF 3 TO 30 FEET AWAY DEPENDING ON THE STEEPNESS OF THE SLOPE, SOIL TYPE, AND RAINFALL. THE STEEPER THE SLOPE, THE CLOSER TOGETHER THE TRENCHES SHOULD BE CONSTRUCTED.
 - INSTALL THE SOCK SNUGLY INTO THE TRENCHES AND ADJUST TIGHTLY END TO END. DO NOT OVERLAP THE ENDS.
 - INSTALL STAKES AT EACH END OF THE SOCK, AND AT A MINIMUM OF 4-FOOT CENTERS ALONG THE ENTIRE LENGTH OF THE SOCK.
 - IF REQUIRED, INSTALL PILOT HOLES FOR THE STAKES USING A STRAIGHT BAR TO DRIVE HOLES THROUGH THE SOCK AND INTO THE SOIL.
 - AT A MINIMUM, WOODEN STAKES SHOULD BE APPROXIMATELY 2 X 2 X 24 INCHES. MALLOW CUTTINGS OR 1/2-INCH REBAR CAN ALSO BE USED FOR STAKES.
 - STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE SOCK, LEAVING 2 TO 3 INCHES OF THE STAKE PROTRUDING ABOVE THE SOCK.

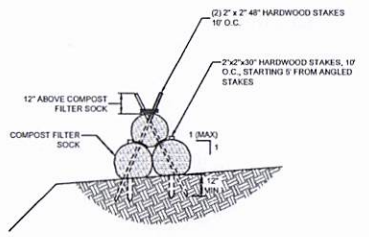
A COMPOST FILTER SOCK
 NTS

- MAINTENANCE:**
- INSPECT SOCK AT LEAST ONCE A WEEK AND AFTER EACH RAIN EVENT GREATER THAN 0.5 INCH.
 - REPAIR OR REPLACE SPLIT, TORN, RAVELING, OR SLUMPING SOCK.
 - REMOVE SEDIMENT ACCUMULATIONS WHEN EXCEEDING 1/2 THE HEIGHT BETWEEN THE TOP OF THE SOCK AND THE GROUND SURFACE.
 - REPAIR ANY RILLS OR GULLIES PROMPTLY.
 - RESEED OR REPLANT VEGETATION IF NECESSARY UNTIL THE SLOPE IS STABILIZED.

Slope Percent	Minimum Slope Length Where Endsoil Control is Not Necessary*			
	8 to 10% and Endsoil Control	10 to 15% and Endsoil Control	15 to 20% and Endsoil Control	20 to 25% and Endsoil Control
2 to 4 ft high	100 sq ft	200 sq ft	400 sq ft	800 sq ft
5	400 sq ft	800 sq ft	1,600 sq ft	3,200 sq ft
10	100 sq ft	200 sq ft	400 sq ft	800 sq ft
15	100 sq ft	200 sq ft	400 sq ft	800 sq ft
20	100 sq ft	200 sq ft	400 sq ft	800 sq ft
25	100 sq ft	200 sq ft	400 sq ft	800 sq ft
30	100 sq ft	200 sq ft	400 sq ft	800 sq ft
35	100 sq ft	200 sq ft	400 sq ft	800 sq ft
40	100 sq ft	200 sq ft	400 sq ft	800 sq ft
45	100 sq ft	200 sq ft	400 sq ft	800 sq ft
50	100 sq ft	200 sq ft	400 sq ft	800 sq ft

* Based on a hole a peak of 20 to 25 ft in 2 ft of slope. A 100 sq ft area is based on a 100 ft x 100 ft area of slope, and should be used as a maximum to determine length of required endsoil control. For 100 ft x 100 ft area of slope.

** Slope height of Endsoil Control after installation and with compacted backfill must be determined by State Storm University.



C TRIPLE STACK FILTER SOCK
 NTS

THRASHER

IFP
ISSUED FOR PERMITTING

DATE: 05/16/23
AFE # A12528

SUMMARY OF MATERIALS (3D)			SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTONIO		1	REVISED PER COMMENTS FROM KLEINFELDER & ANTONIO	

SUMMARY OF MATERIALS (3D)			SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY	NO.	DESCRIPTION	QTY
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTONIO		1	REVISED PER COMMENTS FROM KLEINFELDER & ANTONIO	

GENERAL INFORMATION

- ALL DESIGN, STRENGTH OF PIPELINE AND SOUP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTI AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTI.
- THIS SHEET IS INTENDED TO BE PLOTTED ON A8 (24" X 36") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

Anti

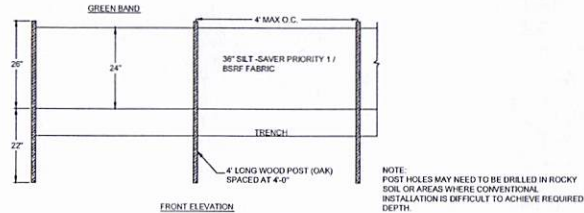
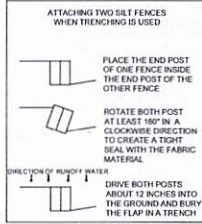
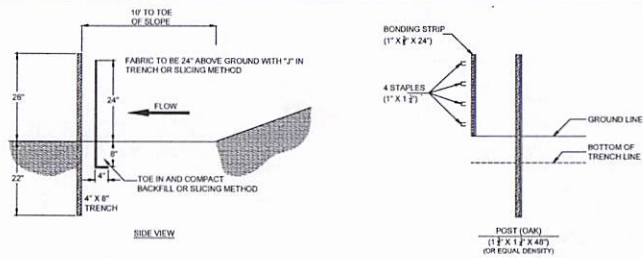
PERKINS BYPASS LP PIPELINE ESCP DETAILS

PROPOSED 16" STEEL GAS LINE

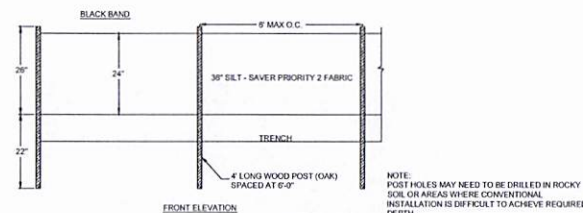
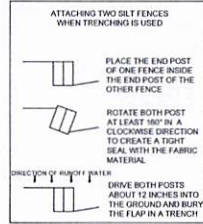
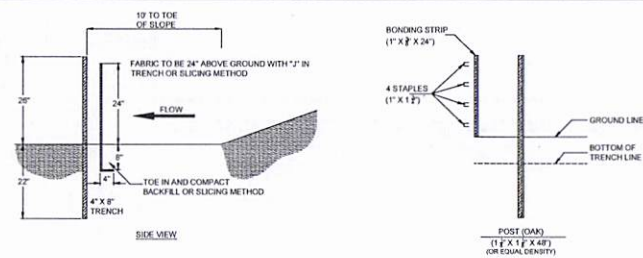
DODDRIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JDU (TTO) DATE: 6/22/2023
 CHECKED BY: JRI (TTO) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 0 SHEET: 22-ESCP4

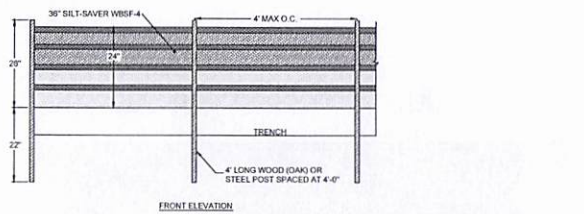
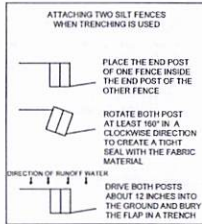
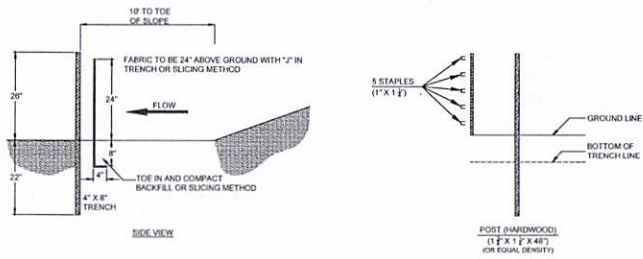
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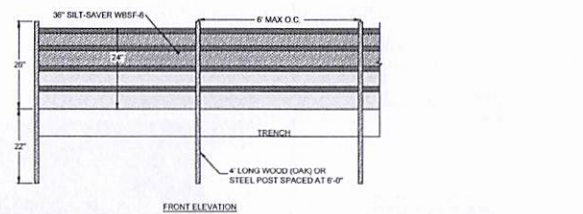
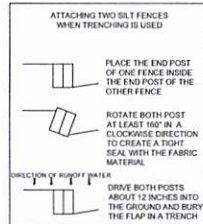
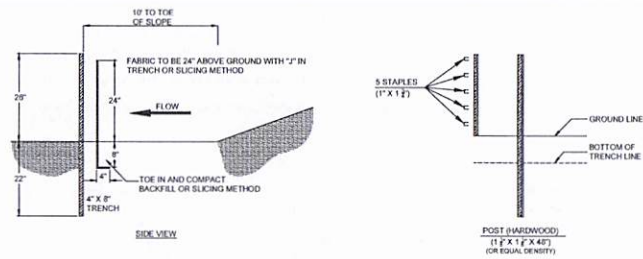
7
A NTS
SILT SAVER SILT FENCE PRIORITY 1



7
B NTS
SILT SAVER SILT FENCE PRIORITY 2



8
A NTS
HEAVY DUTY WOVEN BELTED WBSF2S-4 SILT FENCE 2 STAGE



8
B NTS
MEDIUM DUTY WOVEN BELTED WBSF2S-6 SILT FENCE 2 STAGE

THRASHER

IFP

ISSUED FOR PERMITTING
 DATE: 05/16/23
 AFE # A12528

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

GENERAL INFORMATION

- ALL DESIGN, STRENGTH OF PIPELINE AND MAOP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROMISED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.
- THIS SHEET IS INTENDED TO BE PLOTTED ON ANSI D (22" x 34") FOR REDUCTIONS, REFER TO GRAPHIC SCALE.

Antero
 Midstream

**PERKINS BYPASS LP PIPELINE
 ESCP DETAILS**

PROPOSED 16" STEEL GAS LINE

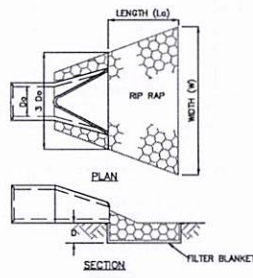
DODDORIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JDU (TIG) DATE: 6/12/2023
 CHECKED BY: JWH (TIG) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 0 SHEET: 21-ESCP3

REVISION

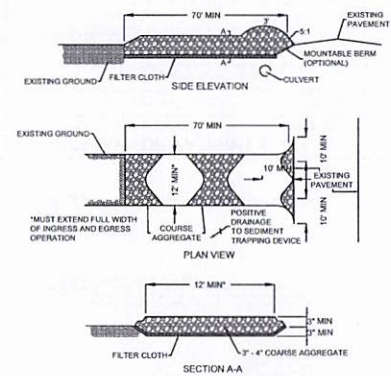
NO.	DESCRIPTION	DATE	BY
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTERO	5/16/23	JDU

USGS Final Plans
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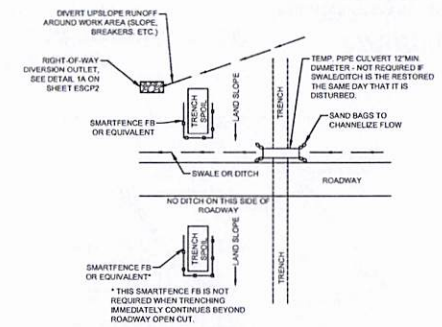
- NOTES:**
1. IF FLARED END SECTION IS DISCHARGING INTO DITCH FROM THE SIDE, EXTEND RPP RAP UP DITCH BANK ON OFF-SIDE A MINIMUM OF 4 FEET.
 2. USE WOOD RPP RAP GRADATION AND FILTER BLANKET REQUIREMENTS PER SECTION 3.17 OF THE WEST VIRGINIA EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICE MANUAL.
 3. A SUITABLE NON-WOVEN GEOTEXTILE FABRIC, USED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, MAY BE SUBSTITUTED FOR FILTER BLANKET UNDER THE RPPRAP.
 4. $d = 1.5$ TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6".

17 RPP RAP APRON
NTS

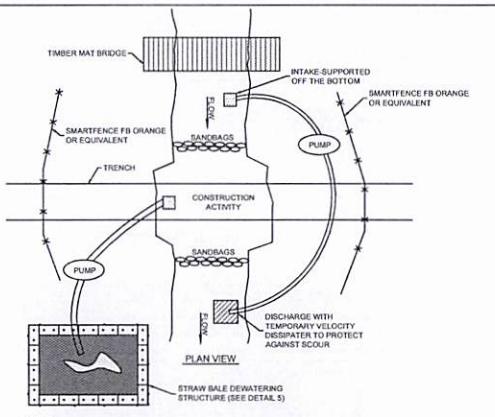


- CONSTRUCTION PREPARATIONS:**
1. CLEAR THE SURFACE AND SET AREA OF ALL MOUNTING, ROOTS, AND OTHER OBSTACLES BARRIERS, AND PROTECT THEM TO REMAIN AFTER CONSTRUCTION.
 2. THE SURFACE SHALL BE LEVEL TO WITHIN 1/4" TOLERANCE THROUGHOUT THE ENTIRE AREA.
 3. THE SURFACE SHALL BE PROTECTED FROM TRACKS AND OTHER DAMAGE.
 4. IT IS RECOMMENDED TO HAVE A STOCKPILE OF STONE ON-SITE.
- NOTES:**
- REMOVE THE GRASS, PAID IN A CONCRETE TO PREVENT WEAR OR REMOVE FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE TRENCH CONSTRUCTION BY ADDITIONAL 4" MINIMUM DEPTH. UNDESIRABLE MATERIAL, RUBBER, OR TRACKS SHALL BE REMOVED FROM THE SURFACE.
- CONSTRUCTION SHALL BE PROCEEDED ONLY, BUT AT A MINIMUM 10' FROM THE EDGE AND FROM THE EDGE OF 1/4" MIN. DEPTH.

18 STABILIZED CONSTRUCTION ENTRANCE
NTS

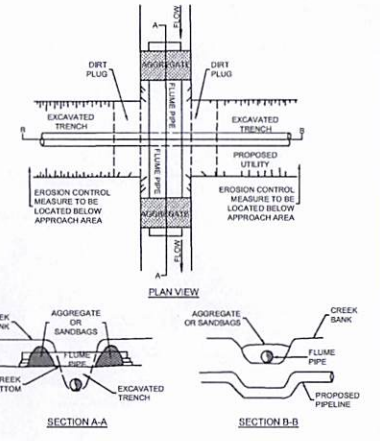


19 OPEN CUT ROAD CROSSING
NTS

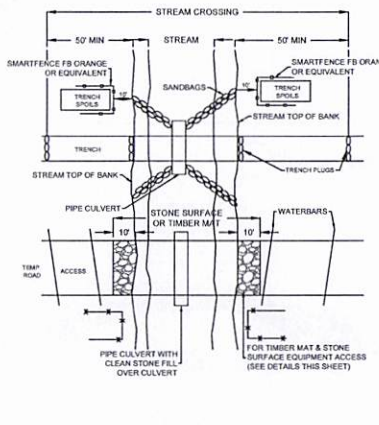


- NOTES:**
1. DEWATERING STRUCTURE SHOULD BE PLACED IN WELL VEGETATED STRIP.
 2. TOP 6"-12" OF NATURAL STREAM SUBSTRATE SHOULD BE ISOLATED DURING IN-STREAM TRENCHING AND RESTORED UPON COMPLETION OF FINAL STREAM STABILIZATION.
 3. ENVIRONMENTAL INSPECTOR MUST VERIFY DAM AND PUMP AROUND SETUP.
 4. MUST BE A MINIMUM OF 5 FEET OF COVER FROM TOP OF PIPE TO NATURAL GROUND.
 5. PIPE SAG SECTION SHOULD BE WELDED PRIOR TO TRENCHING ACTIVITY COMMENCES.
 6. ACCUMULATION OF TRENCH WATER MUST BE PUMPED TO DEWATERING STRUCTURE.
 7. IN-STREAM WORK MUST BE COMPLETED WITHIN 24 HOURS (HIGH WATER MARK TO HIGH WATER MARK).
 8. STREAM BUFFER AREA MUST BE RESTORED WITHIN 72 HOURS.

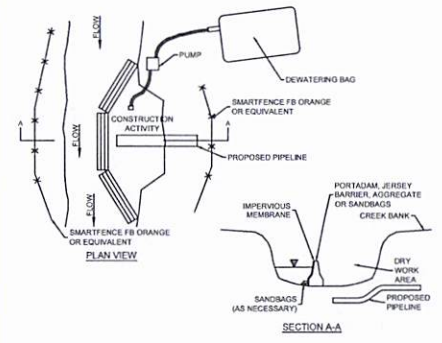
20 OPEN CUT STREAM CROSSING
NTS



21 FLUME PIPE CROSSING
NTS



22 FLUMED STREAM CROSSING WITH ACCESS ROAD
NTS



23 COFFERDAM CROSSING
NTS

THRASHER

IFP
ISSUED FOR PERMITTING
DATE: 05/16/23
AFE # A12528

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

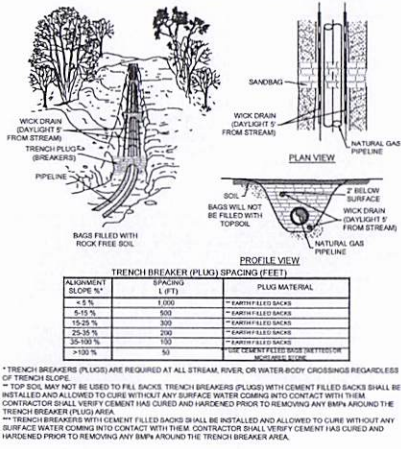
SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION		
1.	ALL GENERAL SPECIFICATIONS OF PIPELINE AND SHIP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTIRO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTIRO.	
2.	THIS SHEET IS INTENDED TO BE PLOTTED ON A22 (24" x 36") FOR REDUCTIONS. REFER TO GRAPHIC SCALE.	

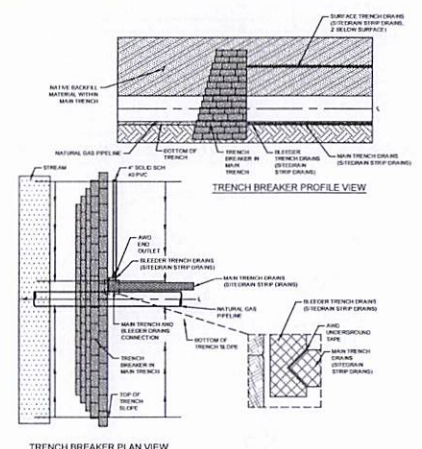
Anti
PERKINS BYPASS LP PIPELINE
ESCP DETAILS
PROPOSED 16" STEEL GAS LINE
DODDORIE COUNTY, WEST VIRGINIA

DRAWN BY: JBJ (T10) DATE: 8/12/2023
CHECKED BY: JBI (T10) AFE No.: A12528
SCALE: AS SHOWN
REVISION No.: 0 SHEET: 24-ESCP6

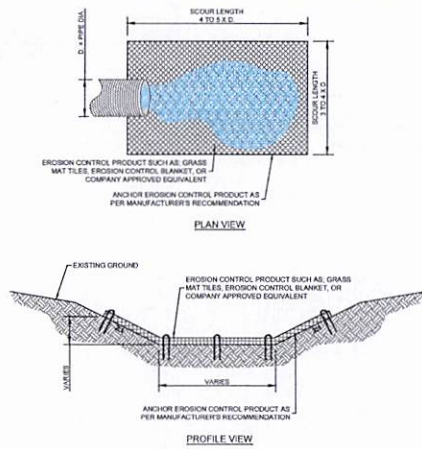
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11 PERMANENT TRENCH BREAKER
NTS

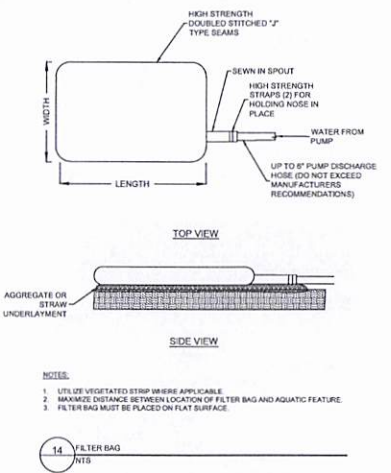


12 AMERICAN WICK DRAIN DETAIL
NTS

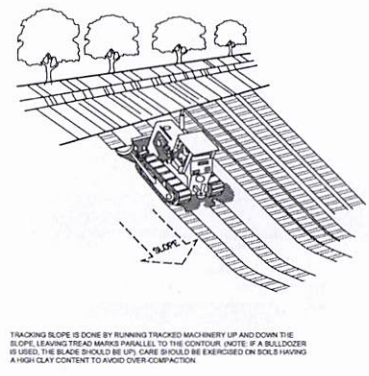


13 TRENCH PLUG DRAIN OUTFALL EROSION PROTECTION DETAIL
NTS

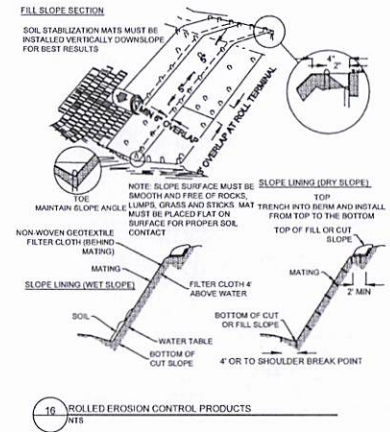
NOTES
 1) PREPARE SOIL BEFORE INSTALLING EROSION CONTROL PRODUCTS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
 2) FOR CULVERT AND OUTFALL APPLICATIONS, SCOUR PROTECTION SHOULD EXTEND A MINIMUM WIDTH OF 3-4 TIMES THE PIPE DIAMETER AND A MINIMUM LENGTH OF 4-5 TIMES THE PIPE DIAMETER (SEE PLAN VIEW). WITH STEEPER CHANNEL GRADIENTS, THE LENGTH OF SCOUR PROTECTION MAY NEED TO BE EXTENDED.
 3) PLACE STAPLES/ANCHORS IN THE APPROPRIATE PATTERN. IN SOFT OR HIGHLY ERODIBLE SOILS, PERCUSSION EARTH ANCHORS MAY BE REQUIRED.
 4) TRENCH PLUG DRAIN OUTFALL TO DISCHARGE FLUSH WITH FINAL GRADE ELEVATION OR NO MORE THAN 12" OF OVERHANG.
 (SEE MANUFACTURERS RECOMMENDATIONS FOR ADDITIONAL INSTALLATION INSTRUCTIONS)



14 FILTER BAG
NTS



15 TRACKING
NTS



16 ROLLED EROSION CONTROL PRODUCTS
NTS

THRASHER

IFP

ISSUED FOR PERMITTING
 DATE: 05/16/23
 AFE # A12528

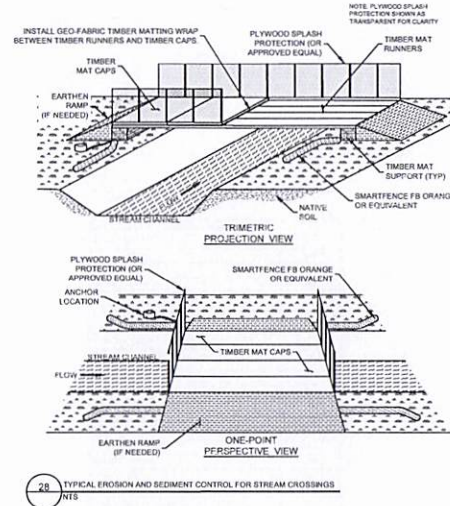
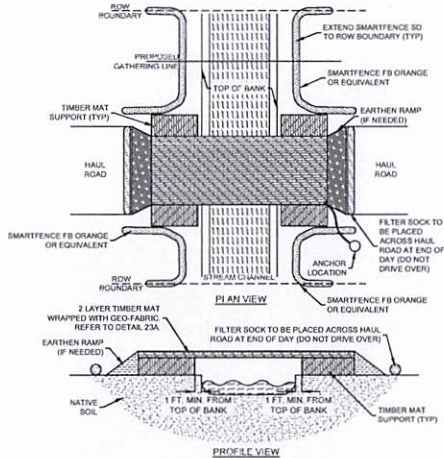
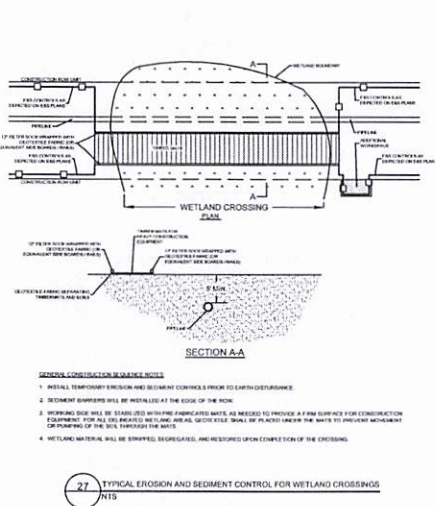
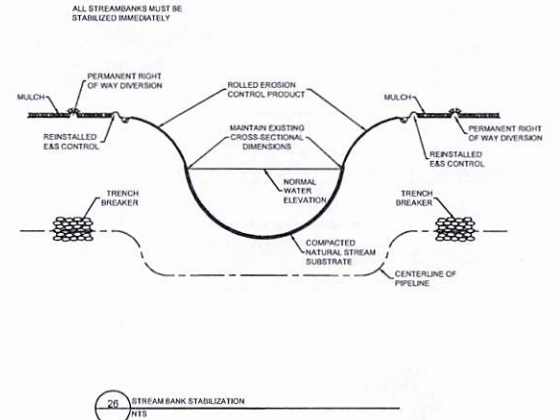
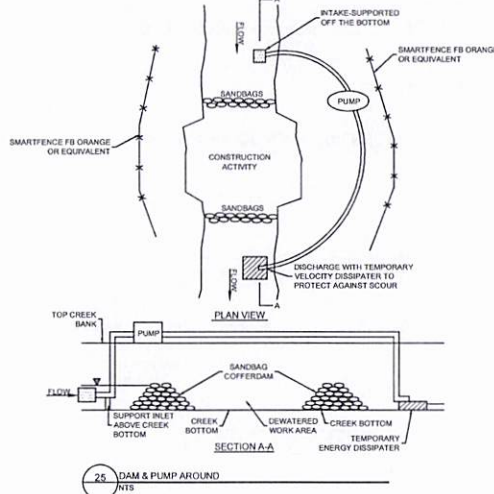
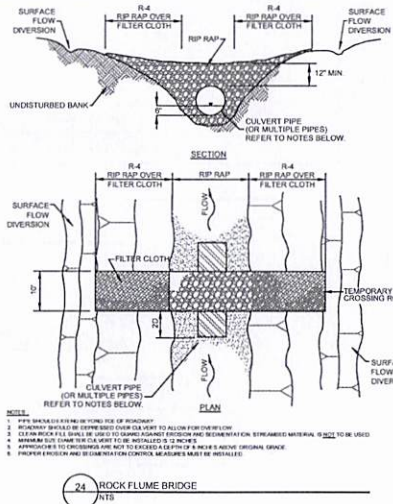
SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION		
1.	ALL DESIGN, STRENGTH OF PIPELINE AND SHAFT CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.	
2.	THIS SHEET IS INTENDED TO BE PLOTTED ON ANSI D (22" x 34"), FOR REDUCTIONS, REFER TO GRAPHIC SCALE.	

Antero
 Midstream
PERKINS BYPASS LP PIPELINE ESCP DETAILS
 PROPOSED 16" STEEL GAS LINE
 DODDRIDGE COUNTY, WEST VIRGINIA
 DRAWN BY: JAV (TIG) DATE: 6/12/2023
 CHECKED BY: JAV (TIG) AFE No: A12528
 SCALE: AS SHOWN SHEET: 23-ESCP5
 REVISION No: 0

DRAWN BY: EBBY
 CHECKED BY: JEN (170) DATE: 6/12/2023
 SCALE: AS SHOWN SHEET: 25-ESCP7
 PROJECT: PERKINS BYPASS LP PIPELINE ESCP DETAILS
 DATE: 6/12/2023



- CONSTRUCTION SPECIFICATIONS AND GENERAL SPECIFICATIONS**
1. CROSSING ALIGNMENT SHALL BE AT RIGHT ANGLE TO THE STREAM, WHERE THE APPROACH CONDITIONS DICTATE, THE CROSSING MAY VARY 15 DEGREES FROM THE LINE DRAWN PERPENDICULAR TO THE CENTERLINE OF THE STREAM.
 2. TIMBER MATTING RUNNERS SHALL BE PLACED PERPENDICULAR TO STREAM AND ADJACENT TO ONE ANOTHER.
 3. TIMBER MATTING CAPS SHALL BE PLACED PARALLEL TO STREAM AND ADJACENT TO ONE ANOTHER FOR THE ENTIRE SPAN OF THE BRIDGE.
 4. TIMBER MATTING CAPS SHALL BE WRAPPED UNDERNEATH AND ALONG THE SIDES OF TIMBER MAT WITH GEO-FABRIC MATERIAL OR APPROVED EQUAL. EXTEND GEO-FABRIC MATERIAL AT MINIMUM 3 FEET ON EITHER SIDE TO ALLOW ENOUGH MATERIAL TO WRAP UP AND TIE INTO PLYWOOD SPLASH PROTECTION FENCING (OR APPROVED EQUAL) TO CONTROL SEDIMENT FROM ENTERING STREAM.
 5. PLYWOOD SPLASH PROTECTION FENCING (OR APPROVED EQUAL) SHALL BE SECURELY ATTACHED ALONG THE OUTER SIDES OF TIMBER MATTING TO CONTROL SEDIMENT COLLECTION AND ALLOW GEO-FABRIC MATERIAL TO BE STAPLED TO OUTSIDE OF PLYWOOD.
 6. BRIDGE SHALL BE CONSTRUCTED MINIMUM 1 FOOT OUTSIDE TOP OF BANK.
 7. BRIDGE SHALL BE SECURELY ANCHORED AT ONLY ONE END USING STEEL CABLE OR CHAIN. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL ANCHORS. ANCHORING SHALL BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
 8. ALL AREAS DISTURBED DURING BRIDGE INSTALLATION SHALL BE STABILIZED IMMEDIATELY.
 9. PLYWOOD SPLASH PROTECTION (OR APPROVED EQUAL) SHALL BE WELL MAINTAINED, CLEARING SEDIMENT WHEN NECESSARY.
 10. FILTER SOCK SHALL BE PLACED ALONG BOTH ENTRANCES OF THE BRIDGE WHEN NOT IN USE FOR MORE THAN 24 HOURS AND/OR PRIOR TO PRECIPITATION EVENTS. DO NOT DRIVE OVER FILTER SOCK.

THRASHER

IFP

ISSUED FOR PERMITTING
DATE: 05/16/23
AFE # A12528

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

GENERAL INFORMATION

1. ALL DESIGN, STRENGTH OF PIPELINE AND MAP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTRO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTRO.
2. THIS SHEET IS INTENDED TO BE PLOTTED ON A8 (22" x 34") FOR REDUCTIONS, REFER TO DRAWING SCALE.

REVISION

NO.	DESCRIPTION	DATE	BY
1	REVISED PER COMMENTS FROM KLEINFELDER & ANTRO	5/16/23	JU

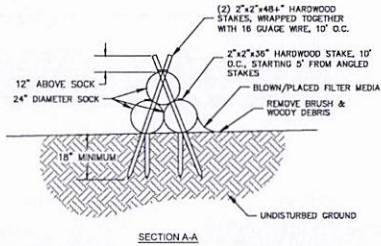
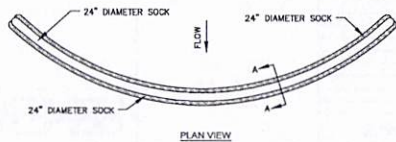
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**PERKINS BYPASS LP PIPELINE
ESCP DETAILS**

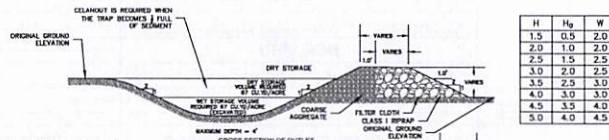
PROPOSED 16" STEEL GAS LINE

DODDORIDGE COUNTY, WEST VIRGINIA

DRAWN BY: JU (170) DATE: 6/12/2023
 CHECKED BY: JEN (170) AFE No.: A12528
 SCALE: AS SHOWN SHEET: 25-ESCP7
 REVISION No.: 0



42 TRIPLE STACK FILTER SOCK SEDIMENT TRAP
NTS



TEMPORARY SEDIMENT TRAP NOTES:

- THE TOTAL WIDTH & GENERAL NEARBY: THE CONTRACTOR SHALL DESIGN AND SIZE EACH TRAP ACCORDING TO THE FOLLOWING PLAN.
- SEDIMENT TRAP SHALL BE USED IN AREAS WHERE THE TOTAL DISTURBED DRAINAGE AREA IS LESS THAN 5 ACRES.
- THE NATURAL OR ANY SEDIMENT TRAP FUNDAMENTAL SHALL BE MADE OF ROCKS OR OTHER SUITABLE UNDESIGNED ORGANIC MATERIAL, LARGE STONES, AND OTHER FUNCTIONAL MATERIAL. THE FUNDAMENTAL SHOULD BE CONSTRUCTED BY LAYING OR TAMPING BETWEEN THE TRAP ELEMENTS.
- ANY SEDIMENT TRAP FUNDAMENTAL SHALL BE BUILT WITH TEMPORARY VEGETATION (MANGROVES) AFTER INSTALLATION.
- CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
- THE SEDIMENT TRAP SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILIZED.
- ALL CUT AND FILL SURFACING THE SEDIMENT TRAP SHALL BE 2:1 OR FLATTER.
- SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 OF THE ORIGINAL SEDIMENT DEPTH FROM THE TRAP SHALL BE REPORTED IN A SURFACE AREA IN SUCH A MANNER THAT WILL NOT EXCEED AND CAUSE SEDIMENTATION PROBLEMS.
- THE SEDIMENT MEDIA IS BEING REGULATED TO ENSURE THAT IT IS STRUCTURALLY SOUND AND HAS NOT BEEN DAMAGED BY EROSION OR CONSTRUCTION ACTIVITIES.
- A RIPRAP TRAP CHAINING MAY BE NECESSARY IF A CONJECTURE TO DUSTY CLIMATIC CONDITIONS.
- FILTER SOCKS SHALL BE REGULARLY CHECKED TO ENSURE THAT FLOW THROUGH PERFORMANCE IS MAINTAINED. STONES CHECKED WITH SEDIMENT SHALL BE REMOVED AND CLEANED OR REPLACED.

NOTES:

TEMPORARY SEDIMENT TRAPS ARE ESSENTIALLY SMALL SEDIMENT PONDS. THEY GIVE THE WATER A PLACE TO POOL AND SLOW DOWN THIS REDUCES THE CHANCES OF ADDITIONAL EROSION WHILE ALLOWING ANY SEDIMENT IN THE WATER TO SETTLE OUT. THE OUTLET IS DESIGNED OUT OF GRAVELS OF DIFFERENT DIMENSIONS WHICH CREATES A FILTER AS WELL.

43 TEMPORARY SEDIMENT TRAP
NTS

NOTES:

ON MOST LOCATIONS ANTERO WILL ALSO CONSTRUCT EROSION AND SEDIMENT (EAS) CONTROLS ABOVE AND BEYOND THE EAS CONTROLS LISTED ON THE PLAN SHEETS. THESE CONTROLS WILL BE CATEGORIZED AS PHASE I, PHASE II, AND PHASE III CONTROLS. THESE CONTROLS WILL BE INSTALLED TO BOTH PROVIDE EXTRA EAS PROTECTION, AND TO ELIMINATE THE CHANCES OF MATERIALS SUCH AS SOIL OR GRAVEL BEING PLACED IN A STREAM OR WETLAND. THE SITE PLANS AND DELINEATIONS ARE REVIEWED AND THESE CONTROLS ARE SPECIFIED IN ANTERO'S CONSTRUCTION RELEASE WHICH IS SENT OUT JUST PRIOR TO CONSTRUCTION BEGINNING. THE PHASE I, II, AND III CONTROLS WILL BE CONSTRUCTED AS FOLLOWS:



PHASE I
THIS IS ESSENTIALLY ORANGE SAFETY FENCE LIKE SHOWN ABOVE. THIS MEASURE IS PUT IN PLACE TO LET CONTRACTORS KNOW THAT NO WORK IS TAKE PLACE BEYOND THIS POINT. THIS CONTROL IS TYPICALLY UTILIZED WHEN THERE IS A WETLAND OR STREAM LOCATED IN THE AREA BUT NOT WITHIN APPROXIMATELY 100 FEET OF THE DISTURBANCE.

44 SUPPLEMENTAL 404 CWA BMP CONTROLS
NTS



PHASE II
THIS CONTROL CONSISTS OF TYPICAL SILT FENCE, SUPER SILT FENCE, OR FILTER SOCK. THIS CONTROL WILL BE INSTALLED AS DESCRIBED IN THE PREVIOUS SECTIONS. THIS CONTROL WILL TYPICALLY BE USED WHEN WETLANDS OR STREAMS ARE LOCATED WITHIN 100 FEET OF THE DISTURBED AREA.

44 B SUPPLEMENTAL 404 CWA BMP CONTROLS
NTS



PHASE III
THIS CONTROL CONSISTS OF SUPER SILT FENCE WITH ORANGE CONSTRUCTION FENCE ACTING AS THE VISIBLE PORTION OF THE BARRIER. THIS CONTROL IS USED TO PREVENT SOILS OR GRAVELS FROM ENTERING STREAMS OR WETLANDS DURING CONSTRUCTION. THE SUPER SILT FENCE CAN BE USED IN CONJUNCTION WITH OTHER EAS METHODS. THIS CONTROL IS USED IN AREAS WHERE STREAMS OR WETLANDS ARE WITHIN APPROXIMATELY 50 FEET OF THE DISTURBED AREA.

*NOTE THAT THE DISTANCES MENTIONED IN THE PHASE I, II, AND III CONTROLS ARE A GUIDELINE NOT A RULE FOR THE DECISION OF WHEN AND WHERE TO USE THESE CONTROLS.

44 C SUPPLEMENTAL 404 CWA BMP CONTROLS
NTS

DEFINITIONS:

- RIP RAP - LOOSE STONE USED TO FORM A FOUNDATION FOR A BREAKWATER OR OTHER STRUCTURE. THIS STONE IS TYPICALLY 3 INCHES OR GREATER IN DIAMETER.
- FILTER CLOTH - TYPICALLY TYPAR OR ANOTHER SUCH MATERIAL, (USUALLY WOVEN) WHICH IS DESIGNED TO ALLOW WATER TO FLOW BUT RETAIN SEDIMENT.
- AGGREGATE - TERM USED TO IDENTIFY ANY TYPE SOLID DENSE MATERIAL USED DURING CONSTRUCTION TYPICALLY GRAVELS, SANDS, AND STONES.
- EMBANKMENT - A WALL OR BANK OF EARTH OR STONE.
- CLASS 1 RIP RAP - TYPICAL RIP RAP WITH STONES OF A DIAMETER BETWEEN 8 AND 18 INCHES.

45 DEFINITIONS
NTS

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THRASHER

IFP
ISSUED FOR PERMITTING
DATE: 05/16/23
AFE # A12528

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)		
NO.	DESCRIPTION	QTY

GENERAL INFORMATION		
1.	ALL DESIGN STRENGTH OF PIPELINE AND MANIP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTERO AND PROVIDED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTERO.	
2.	THIS SHEET IS INTENDED TO BE PLOTTED ON A8.5 @ (22" x 34") FOR REDUCTIONS. REFER TO GRAPHIC SCALE.	

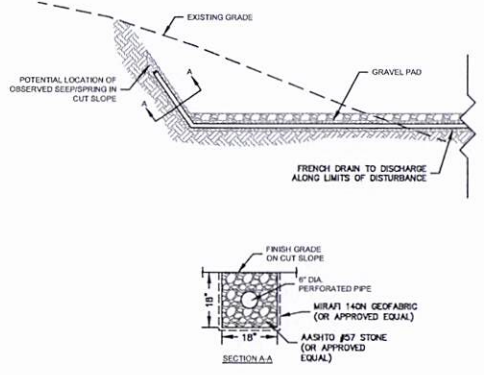
Antero
Midstream

**PERKINS BYPASS LP PIPELINE
ESCP DETAILS**

PROPOSED 16" STEEL GAS LINE

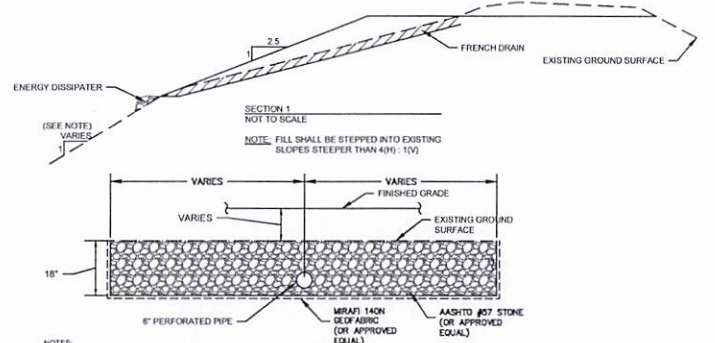
DODDRIDGE COUNTY, WEST VIRGINIA

DRWN BY: JUV (TJD) DATE: 8/12/2023
 CHECKED BY: JHV (TJD) AFE No.: A12528
 SCALE: AS SHOWN
 REVISION No.: 0 SHEET: 28-ESCP10



NOTE:
IF EVIDENCE OF A SEEPS/SPRING IN A CUT SLOPE IS OBSERVED, THE CONTRACTOR SHOULD INSTALL A FRENCH DRAIN PER DETAIL 39 ABOVE.

49. FRENCH DRAIN AT OBSERVED SEEPS/SPRING IN CUT SLOPES
NTS



- NOTES:**
- WHERE SPRINGS OR SEEPS ARE ENCOUNTERED DURING CONSTRUCTION, DRAINABLE FILL AND PERFORATED PIPES (FRENCH DRAINS) SHOULD BE INSTALLED TO PROVIDE A DRAINAGE PATH FOR SEEPAGE FROM THE EXISTING SLOPE.
 - THE FRENCH DRAIN SHOULD CONSIST OF A 8 INCH DIAMETER PERFORATED PIPE SURROUNDED BY DRAINABLE FILL, INSTALLED IN AN 18 INCH DEEP TRENCH ALONG THE EXISTING DRAINAGE FEATURE OR SEEP. PRIOR TO DRAINABLE FILL PLACEMENT, THE TRENCH SHOULD BE LINED WITH A LAYER OF GEOTEXTILE, SUCH AS MIRAFI 140N, OR APPROVED EQUAL, WITH SUFFICIENT OVERLAP TO PROVIDE AN ENVELOPE AROUND THE PIPE. TRENCH TO PREVENT THE MIGRATION OF FINES INTO THE FRENCH DRAIN.
 - THE FRENCH DRAIN SHOULD DAYLIGHT BEYOND THE TOE OR SIDE OF THE SLOPE AND EXTEND UP TO THE CREST OF THE SLOPE TO FACILITATE DRAINAGE THROUGH THE FILL SECTION. THE AS-BUILT WIDTH OF THE FRENCH DRAIN SHOULD BE A FUNCTION OF THE WIDTH OF THE SPRING, SEEP OR DRAINAGE FEATURE OBSERVED DURING CONSTRUCTION.
 - THE FRENCH DRAIN SHOULD BE CONSTRUCTED TO SPAN THE ENTIRE WIDTH OF THE OBSERVED SPRING OR SEEP.

47. FRENCH DRAIN AND DRAINABLE FILL SECTION AT OBSERVED SEEPS/SPRING OR EXISTING DRAINAGE FEATURE LOCATION
NTS



Typical Polymer Stabilized Fiber Matrix Application Rates

Maximum Rainfall of 5 20"

SLOPE	6:1	5:1	4:1	3:1	2:1	1.5:1	1:1
Soil Stabilizer (gal/acre)	4	5	6	7	8	9	10
Fiber (lb/acre)	1,500	1,500	1,500	1,500	2,000	2,500	3,000

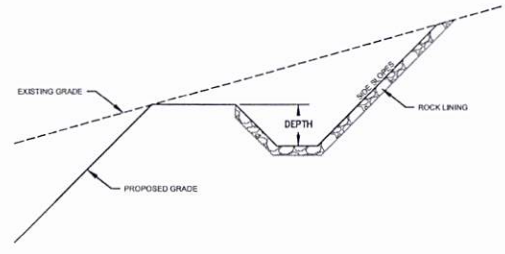
Maximum Rainfall of > 20" and for Site Winterization

SLOPE	<=1:1	4:1	2:1
Soil Stabilizer (gal/acre)	6	8	10
Fiber (lb/acre)	2,000	2,500	3,000

NOTES:
A BONDED FIBER MATRIX (BFM) IS AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. BFM'S MAKE USE OF A CROSS-LINKED HYDROPHOBIC TACKIFIER TO BOND THERMALLY PROCESSED WOOD FIBERS. APPLICATION RATES VARY ACCORDING TO SITE CONDITIONS. FOR SLOPES UP TO 3H:1V THE BFM SHOULD BE APPLIED AT A RATE OF 3,000 LB/ACRE. STEEPER SLOPES MAY NEED AS MUCH AS 4,000 LB/ACRE.
BFM'S SHOULD ONLY BE USED WHEN NO RAIN IS FORECASTED FOR AT LEAST 48 HOURS FOLLOWING THE APPLICATION. THIS IS TO ALLOW THE TACKIFIER SUFFICIENT TIME TO CURE PROPERLY. ONCE PROPERLY APPLIED, A BFM IS TYPICALLY 80% EFFECTIVE IN PREVENTING ACCELERATED EROSION. BFM'S SHOULD NOT BE APPLIED BETWEEN SEPTEMBER 30 AND APRIL 1.
A POLYMER STABILIZED FIBER MATRIX (PSFM) CAN ALSO BE AN EFFECTIVE METHOD OF STABILIZING STEEP SLOPES WHEN USED PROPERLY. PSFM MAKE USE OF A LINEAR SOIL STABILIZING TACKIFIER THAT WORKS DIRECTLY ON SOIL TO MAINTAIN SOIL STRUCTURE, MAINTAIN PORE SPACE CAPACITY AND FLOCCULATE DISLODGED SEDIMENT THAT WILL SIGNIFICANTLY REDUCE RUNOFF TURBIDITY. PROPERLY APPLIED, A PSFM MAY BE AS MUCH AS 99% EFFECTIVE.

NOTES:
UNLIKE ROLLED BLANKETS, THERE IS NO NEED TO SMOOTH THE SLOPE PRIOR TO APPLICATION OF HYDRAULICALLY APPLIED BLANKETS. IN FACT, SOME ROUGHENING OF THE SURFACE, EITHER NATURAL OR MECHANICALLY INDUCED, IS PREFERABLE. HOWEVER, LARGE ROCKS, THOSE > 9 INCHES, AND EXISTING TILLS SHOULD BE REMOVED PRIOR TO APPLICATION. TRACKING OR GROOVING OF SLOPES SHOULD BE CONSIDERED TO SLOW WATER FLOWS DURING A STORM EVENT. SLOPE INTERRUPTION DEVICES SUCH AS STAIR STEP GRADING OR BENCHING SHOULD BE APPLIED PRIOR TO THE APPLICATION. MIXING AND APPLICATION RATES SHOULD FOLLOW MANUFACTURER'S RECOMMENDATIONS.
HYDRAULICALLY APPLIED BLANKETS ARE TYPICALLY APPLIED IN TWO STAGES, UNLESS SPECIFICALLY RECOMMENDED TO BE APPLIED IN ONE APPLICATION BY THE MANUFACTURER. THE SEED MIXTURE AND SOIL AMENDMENTS SHOULD BE APPLIED FIRST. IF THE SEED IS APPLIED AT THE SAME TIME AS THE HYDRAULICALLY APPLIED BLANKET, THE BONDED FIBERS MAY KEEP THE SEED FROM MAKING SUFFICIENT CONTACT WITH THE SOIL TO GERMINATE. AFTER THE SEED MIXTURE IS APPLIED, THE BFM, FOM, OR PSFM SHOULD BE SPRAYED OVER THE AREA AT THE REQUIRED APPLICATION RATE. (SEE ABOVE TABLES)

48. BONDED FIBER MATRIX (HYDROMULCH)
NTS



NOTE:
DRAINAGE CHANNEL DIMENSIONS AND LINING WILL BE DETERMINED BY ENGINEER AS APPLICABLE.

49. TYPICAL ROCK LINED CHANNEL
NTS

THRASHER

IFP
ISSUED FOR PERMITTING
DATE: 05/16/23
AFE # A12528

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

SUMMARY OF MATERIALS (3D)

NO.	DESCRIPTION	QTY

GENERAL INFORMATION

- ALL DESIGN, STRENGTH OF PIPELINE AND SHARP CALCULATIONS ALONG WITH ROUTING WERE PREPARED BY ANTIC AND PROMISED TO THRASHER FOR INCLUSION ON THE PLANS. THRASHER ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THESE CALCULATIONS AND/OR ROUTE PROVIDED BY ANTIC.
- THIS SHEET IS INTENDED TO BE PLOTTED ON A8E @ (22" X 34") FOR REDUCTIONS, REFER TO DRAWING SCALE.

Anti
PERKINS BYPASS LP PIPELINE
ESCP DETAILS
PROPOSED 16" STEEL GAS LINE
DODDRIDGE COUNTY, WEST VIRGINIA
DRAWN BY: JUI (T10) DATE: 5/12/2023
CHECKED BY: JRM (T10) AFE No.: A12528
SCALE: AS SHOWN SHEET: 29-ESCP11
REVISION No.: 0

DRAWN BY: JUI (T10) DATE: 5/12/2023
 CHECKED BY: JRM (T10) AFE No.: A12528
 SCALE: AS SHOWN SHEET: 29-ESCP11
 REVISION No.: 0
 PLOT DATE/TIME: 6/12/2023 12:20 PM
 CADD: JRM, JUI, JRM



APPENDIX C
National Streamflow Statistics – Drainage Area

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 4]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	4430	ft ³ /s

Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (<https://pubs.usgs.gov/wsp/1887/report.pdf>)

➤ Bankfull Statistics**Bankfull Statistics Parameters [Appalachian Highlands D Bieger 2015]**

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.15	square miles	0.07722	940.1535

Bankfull Statistics Parameters [Appalachian Plateaus P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.15	square miles	0.081081	536.995602

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.15	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Appalachian Highlands D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	16.1	ft
Bieger_D_channel_depth	1.17	ft
Bieger_D_channel_cross_sectional_area	19	ft ²

Bankfull Statistics Flow Report [Appalachian Plateaus P Bieger 2015]

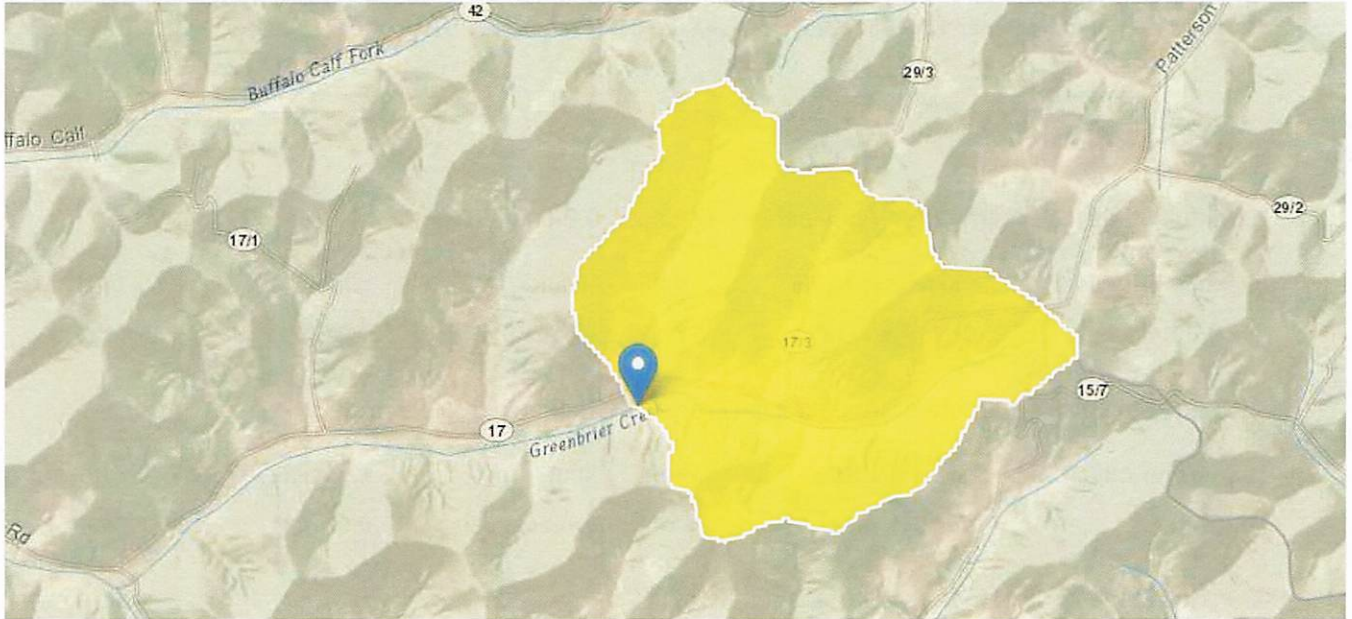
Statistic	Value	Unit
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	1.17	ft
Bieger_P_channel_cross_sectional_area	19.4	ft ²

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	13	ft
Bieger_USA_channel_depth	1.24	ft
Bieger_USA_channel_cross_sectional_area	18.4	ft ²

StreamStats Report - Perkins Bypass, Ex. Bridge

Region ID: WV
 Workspace ID: WV20230613203351968000
 Clicked Point (Latitude, Longitude): 39.24676, -80.59231
 Time: 2023-06-13 16:34:15 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.15	square miles
ELEVMAX	Maximum basin elevation	1506	feet
PRECPRIS00	Basin average mean annual precipitation for 1971 to 2000 from PRISM	47.01	inches
RELIEF	Maximum - minimum elevation	572	feet

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.15	square miles	0.1	10000

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	16.1	ft
Bieger_D_channel_depth	1.17	ft
Bieger_D_channel_cross_sectional_area	19	ft ²
Bieger_P_channel_width	16.7	ft
Bieger_P_channel_depth	1.17	ft
Bieger_P_channel_cross_sectional_area	19.4	ft ²
Bieger_USA_channel_width	13	ft
Bieger_USA_channel_depth	1.24	ft
Bieger_USA_channel_cross_sectional_area	18.4	ft ²

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G., 2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_campaign=PDFCoverPag)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.15.0

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1



APPENDIX D
Comparison for Calculated Flows - HEC-RAS
Excel Data

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: GreenCreek

Flow File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_EX.f01

Flow Data (cfs)

River	Reach	RS	PF 1
Greenbreir Creek	CL Greenbrier	350	4430

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
Greenbreir Creek	CL Greenbrier	PF 1	Normal S = 0.0091
Known WS = 921.8			

GEOMETRY DATA

Geometry Title: Greenbreir Creek

Geometry File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_EX.g02

CROSS SECTION

RIVER: Greenbreir Creek

REACH: CL Greenbrier RS: 350

INPUT

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X   X  XXXXXX   XXXX       XXXX       XX       XXXX
X   X  X        X   X       X   X       X   X       X
X   X  X        X        X   X       X   X       X
XXXXXXXX XXXX   X        XXX XXXX   XXXXXX   XXXX
X   X  X        X        X   X       X   X       X
X   X  X        X   X       X   X       X   X       X
X   X  XXXXXX   XXXX       X   X       X   X       XXXXX
```

PROJECT DATA

Project Title: PERK_EX
Project File : PERK_EX.prj
Run Date and Time: 6/14/2023 11:50:32 AM

Project in English units

PLAN DATA

Plan Title: Plan 01
Plan File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_EX.p01

Geometry Title: Greenbreir Creek
Geometry File : C:\Users\DMcMullen\OneDrive -
Kleinfelder\Documents\TEMPHEC\PERK_EX.g02

Flow Title : GreenCreek
Flow File : C:\Users\DMcMullen\OneDrive -
Kleinfelder\Documents\TEMPHEC\PERK_EX.f01

Plan Summary Information:

Number of: Cross Sections	=	3	Multiple Openings	=	0
Culverts	=	0	Inline Structures	=	0
Bridges	=	0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

RIVER: Greenbreir Creek
 REACH: CL Greenbrier RS: 200

INPUT

Description:

Station Elevation Data		num= 186							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.8	7.56	936.29	10.56	936	11.57	935.86	17.25	935
18.8	934.8	24.62	934	24.88	933.97	33.72	933	34.78	932.86
40.93	932	43.86	931.54	47.25	931	51.02	930.5	54.63	930
56.11	929.8	62.05	929	65.5	928.66	71.35	928	73.83	927.77
82.05	927	89.41	926.26	92.05	926	103.84	925.26	107.91	925
117.56	924.57	129.87	924	135.27	923.76	153.16	923	154.12	923
154.7	922.99	158.4	922.98	160.48	922.98	162.99	922.96	164.2	922.96
166.79	922.95	174.9	922.76	192.44	922.39	194.74	922.38	195.33	922.37
200.36	922.18	204.83	922	207.98	922	209.52	921.99	209.88	921.99
210.67	921.98	221.7	921.41	226.58	921.18	227.85	921.15	228.44	921.11
229.46	921.05	230.74	921	231.58	921	231.83	920.99	234.19	920.98
235.75	920.92	235.84	920.91	238.45	920.91	243.3	920.96	243.36	920.95
246.04	920.95	254.68	920.82	255.45	920.82	258.01	920.81	260.28	920.76
263.53	920.82	266.32	920.8	268.27	920.77	269.85	920.74	270.63	920.7
278.21	920.86	280.01	920.93	281.19	920.98	282.76	920.99	285.03	920.99
286.13	921	287.74	921	288.37	921.01	291.07	921.01	293.68	921.02
301.71	921.03	311.22	921.03	315.62	921.39	316.59	921.35	316.97	921.4
319.98	921.18	320.11	921.21	320.29	921.22	320.54	921.22	322	921
325.64	920.17	326.34	920	326.93	919.95	327.09	919.92	328.8	919.79
331.01	919.68	331.38	919.55	332.03	919.47	333.09	919.19	333.28	919.14
333.99	919	335.35	918.97	339.06	918.72	340.14	918.59	345.63	918
347.8	917.55	350.54	917	356.43	917	357.07	917.14	359.97	918
361.2	918.45	362.85	919	367.57	919.97	367.71	920	367.93	920.06
370.56	920.76	371.49	921	373.63	921.81	374.27	922	375.65	922.44
376.43	922.65	378.05	923	381.23	923.2	382.13	923.28	383.71	923.39
389.43	923.75	393.29	924	394.15	924.01	394.49	924.05	395.49	924.11
400.08	924.36	401.8	924.48	404.3	924.66	408.81	925	411.32	925.34
417.21	925.92	418.04	926	422.05	926.52	423.55	926.74	426.32	927
433.25	927.48	434.23	927.55	441.52	928	443.87	928	445.6	928.01
449.01	928.01	450.15	928	452.78	928	453.54	927.99	454.33	927.99
455.54	928	456.84	928	457.04	928.01	457.77	928.01	460.85	928.14
465.2	928.29	465.53	928.31	469.51	928	470.93	927.65	473.03	927.13
473.41	927.05	473.65	927	474.75	926.79	475.21	926.7	477.01	926.56
477.94	926.5	481.61	926.66	483.34	926.72	485.85	926.5	488.61	926.29
490.27	926.25	491.06	926.25	495.23	926.6	498.76	927	500.56	927.17
501.01	927.26	502.16	927.59	503.42	927.99	503.43	927.99	503.45	928
505.32	928.56	506.96	929	508.71	929.09	508.89	929.09	515.05	929.17
516.27	929.16								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val

Description:

Station Elevation Data		num= 187							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.67	.49	940.59	4.11	940	6.29	939.65	10.4	939
16.02	938.19	17.27	938	18.05	937.89	24.14	937	28.68	936.23
30.13	936	33.41	935.55	35.96	935.18	37.08	935	38.47	934.78
44.16	934	51.12	933.16	52.4	933	56.29	932.48	59.8	932
63.77	931.56	68.69	931	71.43	930.7	74.45	930.38	77.85	930
80.64	929.64	85.56	929	91.39	928.28	92.66	928.13	93.74	928
95.61	927.78	102.46	927	108.19	926.45	110.72	926.22	113.3	926
126.48	925.3	129.41	925.14	131.79	925	153.21	924.09	155.14	924
156.21	923.97	156.97	923.96	176.02	923.53	200.09	923	201.35	923
202.63	922.99	206.19	922.99	218.47	922.73	219.57	922.71	237.54	922.63
252.08	922.57	253.99	922.62	255.91	922.67	256.08	922.67	260.82	922.77
261.61	922.77	263.22	922.75	264.12	922.77	264.58	922.78	265.03	922.78
267.71	922.76	269.21	922.71	271.56	922.62	272.74	922.57	273.37	922.55
274.63	922.5	275.25	922.48	277.3	922.41	278.18	922.37	280.23	922.3
281.68	922.26	283.16	922.22	284.16	922.2	285.83	922.15	286.05	922.15
293.85	922	294.53	921.98	294.56	921.98	296.87	921.96	299.77	921.98
299.82	921.98	300.93	921.97	301.16	921.96	301.54	921.94	301.7	921.93
302.98	921.87	303.35	921.85	305.03	921.75	306.81	921.62	313.09	921.11
313.61	921.07	313.8	921.06	314.29	921	314.42	920.96	314.88	920.81
316.28	920.35	317.6	920	323.27	919.04	323.4	919	323.68	918.9
325.37	918.44	327.01	918	327.58	917.99	330.26	917.95	330.46	917.95
330.91	917.96	331.74	917.97	333.24	917.99	334.19	918	336.71	918.84
337.32	919	339.51	919.66	340.6	920	341.03	920	341.36	920.01
342.98	920.01	343.79	920.02	347.55	920.02	350.17	920	351.13	920
352.65	919.99	353.95	920	354.66	920	355.11	920.08	357.25	920.52
359.44	921	359.73	921.13	360.75	921.58	361.64	922	361.91	922.27
362.68	923	362.93	923.29	363.47	924	364.4	924.99	364.41	925.01
365.07	926	365.33	926.36	365.79	927	366.19	927.63	366.42	928
366.67	928.4	366.99	929	367.35	929.4	367.71	930	368.14	930.49
368.53	931	369.08	931.57	369.47	932	369.87	932.4	370.45	933
371.18	933.51	371.65	934	372.17	934.17	374.1	935	379.17	935.98
379.31	936	380.07	936.08	384.33	936.5	385.92	936.65	386.95	936.74
389.64	937	394.25	937.47	398.17	937.84	399.56	938	401.84	938.32
406.21	939	410.25	939.61	413.21	940	415.36	940.25	422.72	941
423.12	941.02	423.61	941.05	432.49	941.46	435.23	941.54	439.26	941.69
442.87	941.73	444.44	941.77	446.2	941.83	447.75	941.87	450.84	942
452.83	942.11	456.39	942.28	457.16	942.33	458.95	942.42	460.73	942.48
461.26	942.51	467.95	942.99						

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	303.35	.1	361.64	.05

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	303.35	361.64		150	150	150		.1	.3

CROSS SECTION

SUMMARY OF MANNING'S N VALUES

River: Greenbreir Creek

Reach	River Sta.	n1	n2	n3
CL Greenbrier	350	.05	.1	.05
CL Greenbrier	200	.05	.1	.05
CL Greenbrier	100	.05	.1	.05

SUMMARY OF REACH LENGTHS

River: Greenbreir Creek

Reach	River Sta.	Left	Channel	Right
CL Greenbrier	350	150	150	150
CL Greenbrier	200	100	100	100
CL Greenbrier	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Greenbreir Creek

Reach	River Sta.	Contr.	Expan.
CL Greenbrier	350	.1	.3
CL Greenbrier	200	.1	.3
CL Greenbrier	100	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S. E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude	# Chl
(ft)	(ft)	(ft/s)	(cfs) (sq ft)	(ft) (ft)	(ft)	
CL Greenbrier	350	PF 1	4430.00	917.95	926.15	

0 .05 315.62 .1 373.63 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 315.62 373.63 100 100 100 .1 .3

CROSS SECTION

RIVER: Greenbreir Creek
 REACH: CL Greenbrier RS: 100

INPUT

Description:

Station Elevation Data		num= 139							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	927.42	.64	927.31	1.32	927.19	2.61	927	10.31	926.03
10.53	926	12.37	925.8	17.67	925.23	20.06	925	20.2	925
20.37	924.99	20.53	924.99	24.27	924.7	25.31	924.62	30.11	924.31
31.4	924.23	32.02	924.18	35.5	924	42.32	923.69	43.36	923.63
44.84	923.55	45.77	923.49	50.2	923.27	50.9	923.22	55.32	923
55.97	922.97	56.35	922.95	61.73	922.69	63.73	922.58	75.44	922
79.5	921.69	80.01	921.64	81.1	921.54	83.42	921.34	86.31	921.15
86.66	921.12	88.97	921	90.8	920.99	91.9	920.99	101.99	920.63
106.57	920.52	108.23	920.44	109.34	920.41	110.55	920.35	111.67	920.31
113.03	920.26	113.91	920.22	121.12	920	122.06	920	122.39	919.99
125.61	919.99	131.86	919.82	134.09	919.78	135.05	919.73	138.79	919.65
140.08	919.59	141.12	919.56	141.98	919.53	143.23	919.49	144.17	919.45
147.52	919.36	152.21	919.23	154.48	919.15	155.56	919.11	156.99	919.08
157.1	919.08	157.25	919.07	158.81	919.06	161.12	919.01	163.41	919.01
165.16	919	177.76	919	183.29	918.89	184.78	918.88	184.94	918.88
185.83	918.87	186.88	918.85	188.02	918.84	188.15	918.84	189.39	918.83
190.86	918.81	200.77	918.59	226.5	918.01	227.04	918.01	227.29	918
252.69	918	255.4	917.58	260.17	917	263.01	917	263.27	916.99
264.96	916.99	270.56	916.98	272.5	916.97	273.43	916.97	276.04	916.98
276.85	916.98	278.07	916.99	282.09	917	283.23	917.21	288.52	918
290.66	918.04	294	918.21	299.58	918.41	303.24	918.35	303.74	918.36
304.28	918.36	306.27	918.4	309.19	918.52	310.71	918.65	313.3	918.89
314.18	919	316.5	919.63	317.31	919.87	318.1	920	319.62	920.3
323.22	921	324.05	921.07	324.42	921.07	325.06	921.09	325.47	921.11
326.18	921.16	327.43	921.23	334.51	921.64	339.35	922	340.93	922.01
341.27	922.02	345.58	922.13	347.33	922.16	348.61	922.17	351.61	922.26
362.35	922.61	365.69	922.7	368.11	922.77	373.29	923	391.21	923.93
392.48	924	404.9	924.77	408.72	925	416.01	925.63		

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.05	252.69	.1
			288.52
			.05

Bank Sta: Left Right Coeff Contr. Expan.
 252.69 288.52 .1 .3

HEC-RAS HEC-RAS 6.3.1 September 2022
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X      X  XXXXXX      XXXX      XXXX      XX      XXXX
X      X  X          X      X      X  X      X  X      X
X      X  X          X          X  X      X  X      X
XXXXXXXX XXXX      X          XXX XXXX      XXXXXX      XXXX
X      X  X          X          X  X      X  X          X
X      X  X          X      X      X  X      X  X          X
X      X  XXXXXX      XXXX      X  X      X  X      XXXXX
```

PROJECT DATA

Project Title: PERK_PR
Project File : PERK_PR.prj
Run Date and Time: 6/14/2023 1:16:59 PM

Project in English units

PLAN DATA

Plan Title: Plan 02
Plan File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_PR.p02

Geometry Title: PERK_PR
Geometry File : C:\Users\DMcMullen\OneDrive -
Kleinfelder\Documents\TEMPHEC\PERK_PR.g01

Flow Title : GreenCreek
Flow File : C:\Users\DMcMullen\OneDrive -
Kleinfelder\Documents\TEMPHEC\PERK_PR.f01

Plan Summary Information:

Number of:	Cross Sections =	4	Multiple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20

924.45	926.53	0.007654		4.36	914.32	253.70		0.31
CL Greenbrier	200		PF 1	4430.00	917.00	923.64		
923.26	924.48	0.028813		6.79	608.02	249.53		0.56
CL Greenbrier	100		PF 1	4430.00	916.97	921.80		
921.06	922.42	0.014640		4.97	714.94	258.60		0.41

Description:

Station Elevation		Data		num= 187					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	940.67	.49	940.59	4.11	940	6.29	939.65	10.4	939
16.02	938.19	17.27	938	18.05	937.89	24.14	937	28.68	936.23
30.13	936	33.41	935.55	35.96	935.18	37.08	935	38.47	934.78
44.16	934	51.12	933.16	52.4	933	56.29	932.48	59.8	932
63.77	931.56	68.69	931	71.43	930.7	74.45	930.38	77.85	930
80.64	929.64	85.56	929	91.39	928.28	92.66	928.13	93.74	928
95.61	927.78	102.46	927	108.19	926.45	110.72	926.22	113.3	926
126.48	925.3	129.41	925.14	131.79	925	153.21	924.09	155.14	924
156.21	923.97	156.97	923.96	176.02	923.53	200.09	923	201.35	923
202.63	922.99	206.19	922.99	218.47	922.73	219.57	922.71	237.54	922.63
252.08	922.57	253.99	922.62	255.91	922.67	256.08	922.67	260.82	922.77
261.61	922.77	263.22	922.75	264.12	922.77	264.58	922.78	265.03	922.78
267.71	922.76	269.21	922.71	271.56	922.62	272.74	922.57	273.37	922.55
274.63	922.5	275.25	922.48	277.3	922.41	278.18	922.37	280.23	922.3
281.68	922.26	283.16	922.22	284.16	922.2	285.83	922.15	286.05	922.15
293.85	922	294.53	921.98	294.56	921.98	296.87	921.96	299.77	921.98
299.82	921.98	300.93	921.97	301.16	921.96	301.54	921.94	301.7	921.93
302.98	921.87	303.35	921.85	305.03	921.75	306.81	921.62	313.09	921.11
313.61	921.07	313.8	921.06	314.29	921	314.42	920.96	314.88	920.81
316.28	920.35	317.6	920	323.27	919.04	323.4	919	323.68	918.9
325.37	918.44	327.01	918	327.58	917.99	330.26	917.95	330.46	917.95
330.91	917.96	331.74	917.97	333.24	917.99	334.19	918	336.71	918.84
337.32	919	339.51	919.66	340.6	920	341.03	920	341.36	920.01
342.98	920.01	343.79	920.02	347.55	920.02	350.17	920	351.13	920
352.65	919.99	353.95	920	354.66	920	355.11	920.08	357.25	920.52
359.44	921	359.73	921.13	360.75	921.58	361.64	922	361.91	922.27
362.68	923	362.93	923.29	363.47	924	364.4	924.99	364.41	925.01
365.07	926	365.33	926.36	365.79	927	366.19	927.63	366.42	928
366.67	928.4	366.99	929	367.35	929.4	367.71	930	368.14	930.49
368.53	931	369.08	931.57	369.47	932	369.87	932.4	370.45	933
371.18	933.51	371.65	934	372.17	934.17	374.1	935	379.17	935.98
379.31	936	380.07	936.08	384.33	936.5	385.92	936.65	386.95	936.74
389.64	937	394.25	937.47	398.17	937.84	399.56	938	401.84	938.32
406.21	939	410.25	939.61	413.21	940	415.36	940.25	422.72	941
423.12	941.02	423.61	941.05	432.49	941.46	435.23	941.54	439.26	941.69
442.87	941.73	444.44	941.77	446.2	941.83	447.75	941.87	450.84	942
452.83	942.11	456.39	942.28	457.16	942.33	458.95	942.42	460.73	942.48
461.26	942.51	467.95	942.99						

Manning's n Values		num= 3	
Sta	n Val	Sta	n Val
0	.05	303.35	.1
		361.64	.05

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	303.35	361.64		150	150	150		.1	.3

CROSS SECTION

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: GreenCreek
Flow File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_PR.f01

Flow Data (cfs)

River	Reach	RS	PF 1
GB CR PR	CL Greenbrier	350	4430

Boundary Conditions

River	Reach	Profile	Upstream
Downstream			
GB CR PR	CL Greenbrier	PF 1	Normal S = 0.0091
Known WS = 921.8			

GEOMETRY DATA

Geometry Title: PERK_PR
Geometry File : C:\Users\DMcMullen\OneDrive - Kleinfelder\Documents\TEMPHEC\PERK_PR.g01

CROSS SECTION

RIVER: GB CR PR
REACH: CL Greenbrier RS: 350

INPUT

0 .05 315.62 .1 373.63 .05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 315.62 373.63 3.74 3.74 3.74 .1 .3

CROSS SECTION

RIVER: GB CR PR
 REACH: CL Greenbrier RS: 196.26

INPUT

Description:

Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	921.23	4.64	921	5.11	920.99	5.64	920.98	9.89	920.74
13.69	920.59	14.12	920.55	15.63	920.55	16.32	920.52	19.1	920.55
19.72	920.52	20.63	920.5	21.88	920.5	23.85	920.48	28.26	920.42
30.72	920.44	32.09	920.43	33.3	920.41	41.44	920.55	43.31	920.54
44.62	920.52	45.69	920.49	46.21	920.47	51.31	920.58	61.75	920.97
62.41	921	64.25	921.01	65.36	921.01	66.05	921.02	68.13	921.02
75.36	921.05	81.15	921.05	82.57	921.06	85.99	921.06	94.17	921.72
94.62	921.7	95.39	921.8	96.41	921.72	96.93	921.81	97.62	921.86
98.63	921.85	102.65	921.75	103.92	921.61	104.19	921.5	105.57	921.24
105.92	921.2	106.36	921.12	107.57	920.78	108.46	920.5	109.18	920.35
110.88	920.02	113.44	919.5	119.16	918.34	122.03	918	123.01	917.82
127.25	917	131.72	917	134.31	917.66	135.11	917.84	135.66	918
135.89	918.09	138.6	919.5	141.05	920	143.67	920.5	146.53	921.28
147.35	921.5	147.57	921.65	149.1	922.5	149.43	922.15	151.53	923
152.34	923.07	155.06	923.3	156.61	923.42	157.52	923.5	160.22	923.67
163.14	923.91	164.48	924	165.76	924.02	166.49	924.03	167.65	924.05
170.71	924.1	173.34	924.38	180.87	924.82	181.8	924.87	183.7	925
184.6	925.13	188.98	925.65	190.47	925.84	191.12	925.93	191.83	926
197.54	926.69	200.23	927	200.27	927	200.53	927.01	200.82	927.02
201.16	927.03	201.94	927.04	207.1	927.54	211.58	927.84	213.32	927.97
213.73	928	219.61	928						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	98.63	.1	149.1	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 98.63 149.1 96.26 96.26 96.26 .1 .3

CROSS SECTION

RIVER: GB CR PR
 REACH: CL Greenbrier RS: 100

RIVER: GB CR PR
 REACH: CL Greenbrier RS: 200

INPUT

Description:

Station Elevation Data num= 186									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	936.8	7.56	936.29	10.56	936	11.57	935.86	17.25	935
18.8	934.8	24.62	934	24.88	933.97	33.72	933	34.78	932.86
40.93	932	43.86	931.54	47.25	931	51.02	930.5	54.63	930
56.11	929.8	62.05	929	65.5	928.66	71.35	928	73.83	927.77
82.05	927	89.41	926.26	92.05	926	103.84	925.26	107.91	925
117.56	924.57	129.87	924	135.27	923.76	153.16	923	154.12	923
154.7	922.99	158.4	922.98	160.48	922.98	162.99	922.96	164.2	922.96
166.79	922.95	174.9	922.76	192.44	922.39	194.74	922.38	195.33	922.37
200.36	922.18	204.83	922	207.98	922	209.52	921.99	209.88	921.99
210.67	921.98	221.7	921.41	226.58	921.18	227.85	921.15	228.44	921.11
229.46	921.05	230.74	921	231.58	921	231.83	920.99	234.19	920.98
235.75	920.92	235.84	920.91	238.45	920.91	243.3	920.96	243.36	920.95
246.04	920.95	254.68	920.82	255.45	920.82	258.01	920.81	260.28	920.76
263.53	920.82	266.32	920.8	268.27	920.77	269.85	920.74	270.63	920.7
278.21	920.86	280.01	920.93	281.19	920.98	282.76	920.99	285.03	920.99
286.13	921	287.74	921	288.37	921.01	291.07	921.01	293.68	921.02
301.71	921.03	311.22	921.03	315.62	921.39	316.59	921.35	316.97	921.4
319.98	921.18	320.11	921.21	320.29	921.22	320.54	921.22	322	921
325.64	920.17	326.34	920	326.93	919.95	327.09	919.92	328.8	919.79
331.01	919.68	331.38	919.55	332.03	919.47	333.09	919.19	333.28	919.14
333.99	919	335.35	918.97	339.06	918.72	340.14	918.59	345.63	918
347.8	917.55	350.54	917	356.43	917	357.07	917.14	359.97	918
361.2	918.45	362.85	919	367.57	919.97	367.71	920	367.93	920.06
370.56	920.76	371.49	921	373.63	921.81	374.27	922	375.65	922.44
376.43	922.65	378.05	923	381.23	923.2	382.13	923.28	383.71	923.39
389.43	923.75	393.29	924	394.15	924.01	394.49	924.05	395.49	924.11
400.08	924.36	401.8	924.48	404.3	924.66	408.81	925	411.32	925.34
417.21	925.92	418.04	926	422.05	926.52	423.55	926.74	426.32	927
433.25	927.48	434.23	927.55	441.52	928	443.87	928	445.6	928.01
449.01	928.01	450.15	928	452.78	928	453.54	927.99	454.33	927.99
455.54	928	456.84	928	457.04	928.01	457.77	928.01	460.85	928.14
465.2	928.29	465.53	928.31	469.51	928	470.93	927.65	473.03	927.13
473.41	927.05	473.65	927	474.75	926.79	475.21	926.7	477.01	926.56
477.94	926.5	481.61	926.66	483.34	926.72	485.85	926.5	488.61	926.29
490.27	926.25	491.06	926.25	495.23	926.6	498.76	927	500.56	927.17
501.01	927.26	502.16	927.59	503.42	927.99	503.43	927.99	503.45	928
505.32	928.56	506.96	929	508.71	929.09	508.89	929.09	515.05	929.17
516.27	929.16								

Manning's n Values num= 3					
Sta	n Val	Sta	n Val	Sta	n Val

CL Greenbrier	196.26	.05	.1	.05
CL Greenbrier	100	.05	.1	.05

SUMMARY OF REACH LENGTHS

River: GB CR PR

Reach	River Sta.	Left	Channel	Right
CL Greenbrier	350	150	150	150
CL Greenbrier	200	3.74	3.74	3.74
CL Greenbrier	196.26	96.26	96.26	96.26
CL Greenbrier	100			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: GB CR PR

Reach	River Sta.	Contr.	Expan.
CL Greenbrier	350	.1	.3
CL Greenbrier	200	.1	.3
CL Greenbrier	196.26	.1	.3
CL Greenbrier	100	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit
W.S. E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude	# Chl
(ft)	(ft)	(ft/s)	(cfs)	(ft)	(ft)	
	(ft/ft)		(sq ft)	(ft)		
CL Greenbrier	350	PF 1	4430.00	917.95	926.04	
924.45	926.44	0.008480	4.54	885.78	252.29	0.32
CL Greenbrier	200	PF 1	4430.00	917.00	924.85	
925.21	0.007773	4.13	938.09	295.46	0.30	
CL Greenbrier	196.26	PF 1	4430.00	917.00	923.45	
923.45	925.03	0.041352	7.52	463.68	156.91	0.66
CL Greenbrier	100	PF 1	4430.00	916.97	921.80	
921.05	922.42	0.014640	4.97	714.94	258.60	0.41

INPUT

Description:

Station Elevation Data		num= 139							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	927.42	.64	927.31	1.32	927.19	2.61	927	10.31	926.03
10.53	926	12.37	925.8	17.67	925.23	20.06	925	20.2	925
20.37	924.99	20.53	924.99	24.27	924.7	25.31	924.62	30.11	924.31
31.4	924.23	32.02	924.18	35.5	924	42.32	923.69	43.36	923.63
44.84	923.55	45.77	923.49	50.2	923.27	50.9	923.22	55.32	923
55.97	922.97	56.35	922.95	61.73	922.69	63.73	922.58	75.44	922
79.5	921.69	80.01	921.64	81.1	921.54	83.42	921.34	86.31	921.15
86.66	921.12	88.97	921	90.8	920.99	91.9	920.99	101.99	920.63
106.57	920.52	108.23	920.44	109.34	920.41	110.55	920.35	111.67	920.31
113.03	920.26	113.91	920.22	121.12	920	122.06	920	122.39	919.99
125.61	919.99	131.86	919.82	134.09	919.78	135.05	919.73	138.79	919.65
140.08	919.59	141.12	919.56	141.98	919.53	143.23	919.49	144.17	919.45
147.52	919.36	152.21	919.23	154.48	919.15	155.56	919.11	156.99	919.08
157.1	919.08	157.25	919.07	158.81	919.06	161.12	919.01	163.41	919.01
165.16	919	177.76	919	183.29	918.89	184.78	918.88	184.94	918.88
185.83	918.87	186.88	918.85	188.02	918.84	188.15	918.84	189.39	918.83
190.86	918.81	200.77	918.59	226.5	918.01	227.04	918.01	227.29	918
252.69	918	255.4	917.58	260.17	917	263.01	917	263.27	916.99
264.96	916.99	270.56	916.98	272.5	916.97	273.43	916.97	276.04	916.98
276.85	916.98	278.07	916.99	282.09	917	283.23	917.21	288.52	918
290.66	918.04	294	918.21	299.58	918.41	303.24	918.35	303.74	918.36
304.28	918.36	306.27	918.4	309.19	918.52	310.71	918.65	313.3	918.89
314.18	919	316.5	919.63	317.31	919.87	318.1	920	319.62	920.3
323.22	921	324.05	921.07	324.42	921.07	325.06	921.09	325.47	921.11
326.18	921.16	327.43	921.23	334.51	921.64	339.35	922	340.93	922.01
341.27	922.02	345.58	922.13	347.33	922.16	348.61	922.17	351.61	922.26
362.35	922.61	365.69	922.7	368.11	922.77	373.29	923	391.21	923.93
392.48	924	404.9	924.77	408.72	925	416.01	925.63		

Manning's n Values		num= 3			
Sta	n Val	Sta	n Val	Sta	n Val
0	.05	252.69	.1	288.52	.05

Bank Sta:	Left	Right	Coeff	Contr.	Expan.
	252.69	288.52	.1		.3

SUMMARY OF MANNING'S N VALUES

River:GB CR PR

Reach	River Sta.	n1	n2	n3
CL Greenbrier	350	.05	.1	.05
CL Greenbrier	200	.05	.1	.05

HEC-RAS River: Greenbrier Creek Profile: PF 1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev
				(cfs)	(ft)	(ft)
Greenbrier	100	PF 1	Pre	4430	916.97	921.80
Greenbrier	100	PF 1	Post	4430	916.97	921.80
Proposed Matting Bridge: River Sta 196.26						
Greenbrier	200	PF 1	Pre	4430	917.00	923.64
Greenbrier	200	PF 1	Post	4430	917.00	924.85
Greenbrier	350	PF 1	Pre	4430	917.95	926.15
Greenbrier	350	PF 1	Post	4430	917.95	926.04



ATTACHMENT D
PERMITTING & COORDINATION TABLE

Permitting & Coordination Table

Permitting Agency	Permit/Coordination Required	Submitted	Received (Anticipated)	Status
USACE ¹	NWP 12	Not Applicable	Not Applicable	PCN Not Required (Non-Reporting)
	Mitigation Plan	Not Applicable	Not Applicable	Not Required
USFWS ²	Threatened & Endangered Species (Section 7 Coordination)	Not Applicable	Not Applicable	Not Applicable
WVSLPO ³	Section 106 Coordination	Not Applicable	Not Applicable	Not Applicable
	Phase I & Architectural Survey			
WVDNR-OLS ⁴	Stream Activity Application	05/18/23	(06/17/23)	Pending
WVDNR-WRS ⁵	Threatened & Endangered State Species	Not Applicable	Not Applicable	Not Applicable
	Spawning Waiver	To Be Determined	To Be Determined	To Be Determined
County Floodplain	Doddridge County Floodplain Application	06/16/23	(07/16/23)	Pending
WVDEP ⁶	401 WQC Program Notification	Not Applicable	Not Applicable	Blanket Approval
	NPDES ⁷ Permit	Not Applicable	Not Applicable	Not Required
	Construction Stormwater General Permit	05/24/2	(06/23/23)	Pending
WVDOH ⁸	Utility Permit	To Be Submitted	To Be Submitted	To Be Submitted

- 1 United States Army Corps of Engineers
- 2 United States Fish and Wildlife Service
- 3 West Virginia Division of Culture and History, State Historic Preservation Office
- 4 West Virginia Division of Natural Resources Office of Land and Stream
- 5 West Virginia Division of Natural Resources – Wildlife Resources Section
- 6 West Virginia Department of Environmental Protection
- 7 National Pollutant Discharge Elimination System
- 8 West Virginia Division of Highways

The Doddridge Independent

The Doddridge Independent PUBLISHER'S CERTIFICATE

I, Michael D. Zorn, Publisher of The Doddridge Independent, A newspaper of general circulation published in the town of West Union, Doddridge County, West Virginia, do hereby certify that:

Please take notice that on the (21st) of (June), 2023, (Antero Midstream) filed an application for a Floodplain Permit (#23-632) to develop land located at or about (5400 Greenbrier Road); Coordinates: 39.245604, -80.598032. The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance with WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment

was published in The Doddridge Independent
2 times commencing on Friday, June 30, 2023 and
Ending on Friday, July 7, 2023 at the request of:

**George Eidel, Doddridge County Floodplain
Manager & Doddridge County Commission**

Given under my hand this Monday, September 11, 2023

The publisher's fee for said publication is:

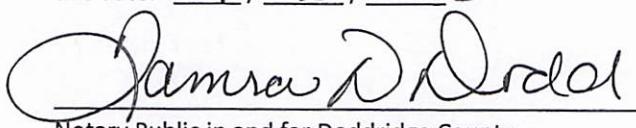
\$ 31.05 1st Run/\$ 23.29 Subsequent Runs

This Legal Ad Total: \$ 54.34


Michael D. Zorn
Publisher of The Doddridge Independent

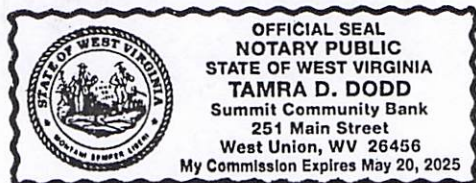
Subscribed to and sworn to before me on

this date: 09 / 12 / 2023


Notary Public in and for Doddridge County

My Commission expires on

The 20 day of May 2025



Floodplain Public Notice • Legal Notice

Please take notice that on the (21st) of (June), 2023, (Antero Midstream) filed an application for a Floodplain Permit (#23-632) to develop land located at or about (5400 Greenbrier Road); Coordinates: 39.245604, -80.598032. The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance with WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by (July 25, 2023) (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. This project is for Perkins Bypass LP Pipeline
C2-6/30 - 7/07

INVOICE

The Herald Record LLC
177 MAIN STREET
WEST UNION, WV 26456
United States

Phone: 304-873-1600
Fax: 304-666-1017
Mobile: 304-266-2247
TheHeraldRecord.com

Doddridge County OFFICE OF EMERGENCY MANAGEMENT
101 Church Street
West Union, West Virginia 26456
United States

Invoice Number: 4147
Invoice Date: July 11, 2023
Payment Due: July 11, 2023
Amount Due (USD): \$55.74

Items	Quantity	Price	Amount
CLASS II LEGAL AD -- FLOOD PLAIN #23-632 RUN DATES: 6/28/23 & 7/5/23	1	\$55.74	\$55.74

Total: \$55.74

Amount Due (USD) : \$55.74

STATE of WEST VIRGINIA;
COUNTY OF DODDRIDGE, TO WIT:

I, Tamela B. Beamer, Editor of THE HERALD RECORD, a certified weekly newspaper published regularly in Doddridge County, West Virginia, Do Hereby Certify Upon Oath that the accompanying Legal Notice entitled:

Doddridge County Floodplain Permits
(Week of June 26, 2023)

Please take notice that on the (21st) of (June), 2023, (Antero Midstreams) filed an application for a Floodplain Permit (#23-632) to develop land located at or about (5400 Greenbrier Road); Coordinates: 39.245604, - 80.598032 The Application is on file with the Floodplain Manager of the County and may be inspected or copied during regular business hours in accordance with WV Code Chapter 29B Freedom of Information, Article 1 Public Records and county policy and procedures. Any interested persons who desire to comment shall present the same in writing by (July 25th, 2023) (20 calendar days after the announcement at the regularly scheduled Doddridge County Commission Meeting) delivered to the Floodplain Manager of the County at 105 Court Street, Suite #3, West Union, WV 26456. This project ifor the Perkins Bypass LP Pipeline.

George Eldel, CFM, OEM
Doddridge County Floodplain Manager

Doddridge County Floodplain Permit
23- 632

was published in said paper for 2 successive weeks beginning with the issue of June 28, 2023 and ending with the issue of July 5, 2023 that contains 274 word space at .115 cents per word and amounts to the sum of \$31.85 FOR THE FIRST PUBLICATION.

SECOND PUBLICATION IS 75% OF THE FIRST PUBLICATION and each other publication thereafter \$ 23.89 for the TOTAL OF:
\$ 55.74.

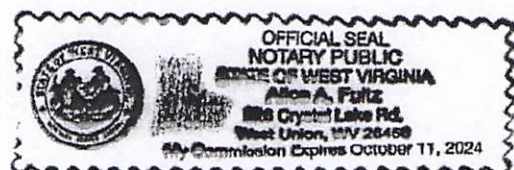
Editor,

Tamela B. Beamer

SWORN TO AND SUBSCRIBED BEFORE ME THIS
THE 13th day of July, 2023

NOTARY PUBLIC

Alison A. Fultz



USPS TRACKING #



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

9590 9402 7059 1225 4206 21

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Postal Service**

• Sender: Please print your name, address, and ZIP+4® in this box•

Doddridge County Office of
Emergency Management/Floodplain Manager
101 Church Street, Suite 102
West Union, WV 26456

23-632

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Rodney L. & Crystal D. Clark
 5400 Greenbrier Road
 Salem, WV 26426



9590 9402 7059 1225 4206 21

2. Article Number (Transfer from service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X

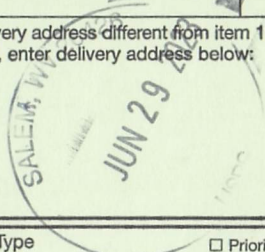
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D. Is delivery address different from item 1? Yes

If YES, enter delivery address below:

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3. Service Type

- Adult Signature
- Adult Signature Restricted Delivery
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- Collect on Delivery Restricted Delivery
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- Insured Mail Restricted Delivery (over \$500)
- Priority Mail Express®
- Registered Mail™
- Registered Mail Restricted Delivery
- Signature Confirmation™
- Signature Confirmation Restricted Delivery

USPS TRACKING #



First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

9590 9402 7059 1225 4206 14

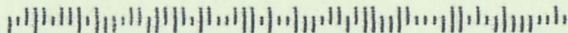
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Doddridge County Office of
Emergency Management/Floodplain Manager
101 Church Street, Suite 102
West Union, WV 26456

23-632

6-119427



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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

Rosalie Clark
 87 Clark Farm Drive
 Salem, WV 26426



9590 59 1225 4206 14

2. (transfer from service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature

X [Signature]

Agent

Addressee

B. Received by (Printed Name)

Bruce Clark

C. Date of Delivery

6/28/23

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If YES, enter delivery address below:

No

3. Service Type

- Adult Signature
- Adult Signature Restricted Delivery
- Certified Mail®
- Certified Mail Restricted Delivery
- Collect on Delivery
- Collect on Delivery Restricted Delivery
- Insured Mail
- Insured Mail Restricted Delivery (over \$500)

Priority Mail Express®

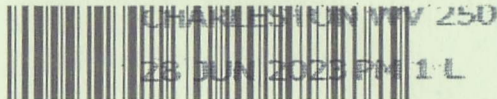
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Signature Confirmation™

Signature Confirmation Restricted Delivery

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USPS
Permit No. G-10

9590 9402 7059 1225 4206 45

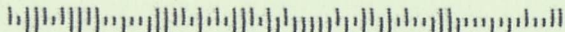
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• Sender: Please print your name, address, and ZIP+4® in this box•

Doddridge County Office of
Emergency Management/Floodplain Manager
101 Church Street, Suite 102
West Union, WV 26456

23-632

6-119427



SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Jan Clark, Jr.
P.O. Box 164
Salem, WV 26426



9590 9402 7059 1225 4206 45

2. Article Number (Transfer from service label)

COMPLETE THIS SECTION ON DELIVERY

A. Signature

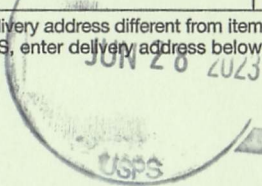
X

-
- Agent
-
-
- Addressee

B. Received by (Printed Name)

C. Date of Delivery

- D. Is delivery address different from item 1? Yes
 If YES, enter delivery address below: No



3. Service Type

- | | |
|--|---|
| <input type="checkbox"/> Adult Signature | <input type="checkbox"/> Priority Mail Express® |
| <input type="checkbox"/> Adult Signature Restricted Delivery | <input type="checkbox"/> Registered Mail™ |
| <input type="checkbox"/> Certified Mail® | <input type="checkbox"/> Registered Mail Restricted Delivery |
| <input type="checkbox"/> Certified Mail Restricted Delivery | <input type="checkbox"/> Signature Confirmation™ |
| <input type="checkbox"/> Collect on Delivery | <input type="checkbox"/> Signature Confirmation Restricted Delivery |
| <input type="checkbox"/> Collect on Delivery Restricted Delivery | |
| <input type="checkbox"/> Insured Mail | |
| <input type="checkbox"/> Insured Mail Restricted Delivery (over \$500) | |

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 Adult Signature Required \$ _____
 Adult Signature Restricted Delivery \$ _____

Postage \$.60

Total Postage and Fees \$ 8.10

Sent To Rodney L. Clark

Street and Apt. No., or PO Box No. 5400 Greenbrier Rd.

City, State, ZIP+4® Salem, WV 26426 23-632



7021 1970 0001 7228 4696

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Certified Mail Fee \$ 4.15

Extra Services & Fees (check box, add fee as appropriate)

- Return Receipt (hardcopy) \$ 3.35
 Return Receipt (electronic) \$ _____
 Certified Mail Restricted Delivery \$ _____
 Adult Signature Required \$ _____
 Adult Signature Restricted Delivery \$ _____

Postage \$.60

Total Postage and Fees \$ 8.10

Sent To James Clark, Jr.

Street and Apt. No., or PO Box No.
P.O. Box 164

City, State, ZIP+4®
Salem, WV 26426

23-632



7021 1970 0001 7228 4719

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WEST UNION, WV

JUN 26 2023
Postmark Here

USPS 26456-9998

Certified Mail Fee \$4.15

Extra Services & Fees (check box, add fees as appropriate)

- Return Receipt (hardcopy) \$3.35
- Return Receipt (electronic) \$
- Certified Mail Restricted Delivery \$
- Adult Signature Required \$
- Adult Signature Restricted Delivery \$

Postage \$.60

Total Postage and Fees \$8.10

Sent To Rosalie Clark

Street and Apt. No., or PO Box No.
87 Clark Farm Dr.

City, State, ZIP+4®
Salem, WV 26426

23-632

7021 1970 0001 7228 4702