SUNOCO PIPELINE
An ENERGY TRANSFER Company

535 Fritztown Road
Sinking Spring, PA 19608

October 10, 2018

Via Electronic Mail
Mr. Scott R. Williamson
Program Manager
Waterways and Wetlands Program
Department of Environmental Protection|
South-central Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110

Re: Hydrogeological Re-evaluation Report
Susquehanna River 16" Horizontal Directional Drill Location (S2-0280)
Application No. E67-920 & E22-619
Fairview Township, York County
Lower Swatara Township, Dauphin County

Dear Mr. Williamson:

In compliance with the Corrected Stipulated Order dated August 10, 2017 (Order), a Reevaluation Report on the above-referenced horizontal directional drill ("HDD") was submitted to the Department on August 17, 2017. The Department requested more information by letter dated September 7, 2018. Please accept this letter as the Sunoco Pipeline, L.P. (SPLP) response. Your requests are bolded below followed by the response.

1. **In the boring log for the Geobore B-2 in 2017, there is a note of petroleum odors at a depth of 13 to 15 feet below ground surface (ft bgs). However, there is no discussion in the report pertaining to the petroleum odors and what happens if the HDD drill encounters this layer. If the layer is contaminated, then steps must be taken to mitigate any spread of the contamination. For example, mitigation measures like casing off this layer or disposal of contaminated drilling mud. Please explain what steps will be taken if contamination is encountered.**

The location of Geobore B-2 is 135 foot (ft) north of the entry point of the 16-inch HDD; therefore the sub-surface ground conditions at the geotech bore location are likely not representative of those at the HDD entry. During the 20-inch setup and drilling, neither the contractor staff nor SPLP's on-site inspectors noted any petroleum odors during that HDD.

If a hydrocarbon odor is noted upon excavation of the entry pit for the 16-inch HDD, then SPLP will follow the procedures set out in Section 6.2 of the overarching Pennsylvania Pipeline Project – Water Supply Assessment Preparedness, Prevention, and Contingency Plan (Water Supply Plan). If a hydrocarbon odor is noted at the entry pit or recycling unit during HDD operations, one sample of drilling fluid per day will be collected for laboratory analysis to determine the presence or absence of volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) at concentrations exceeding

the applicable Residential MSCs for Groundwater. The sample will be collected from drill fluid returns in the entry pit after the re-establishment of full circulation for the day.

If VOCs or SVOCs are detected in drilling fluid at concentrations exceeding the applicable Residential MSCs for Groundwater, a voluntary shut-down of HDD operations will be implemented along with the specific notifications and spill cleanup procedures as documented in Section 6.2 of the Water Supply Plan. If necessary, SPLP will mitigate the spread of any impacts by casing off the impacted layer from the borehole to a point beyond the zone of contamination. Alternatively, SPLP's contractor could elect to collect and dispose of all cuttings and fluids at a licensed facility.

Construction may continue unless the SPLP Environmental Compliance Coordinator, in consultation with SPLP Rapid Response personnel, determines that proceeding with construction poses a threat to health, safety, or the environment.

2. The Tetra Tech Geobores B-1 and B-2 of 2017 are not located on Figures 3 and 4 -the cross-section and plan view maps provided in Attachment 2. These borings along with the 2014 borings, SB-01 and SB-03 should be on the plan view maps and the cross-sectional/profile maps. In addition, these maps should also have the boring logs box for Geobores B-1 and B-2 on them.

The cross-section and plan view maps have been revised and are included as Attachment 1 with this letter.

3. Based on the information in the Re-evaluation report, it appears that only one core boring was sent for rock strength analysis from the Dauphin County (east shore) side. Since there are different rock types on the York County (west shore) verses Dauphin County sides of the Susquehanna River, the Department would expect each rock type to be analyzed for compressive strength. Also, the inadvertent returns (IR) occurred on the western side of the river during the HDD installation of the 20" pipeline. If the cores were retained, then rock strength analysis should be completed for the west shore diabase rock and the results analyzed and incorporated into Re-evaluation report and the HDD design, as applicable.

The cores are not available for additional testing. However, information from the actual drilling of the 20-inch pipeline provide has been incorporated into the drilling plan for the 16-inch pipe. During drilling for the 20-inch pipeline, silty and sandy cuttings were retrieved indicating the presence of the Gettysburg Formation shale and/or sandstone beginning at the eastern HDD entry/exit pit and extending approximately 4,312 feet to the west. Between approximately 4,312 feet to 4,755 feet along the profile, the Gettysburg Formation shale and/or sandstone was intermingled with cuttings consisting of crystalline sands derived from pyroxene and hornblende, as well as plagioclase feldspar, indicating the presence the diabase. Diabase cuttings were observed from approximately 4,755 feet to approximately 7,434 feet, at the western HDD entry/exit pit.

During the pilot phase, drilling rates in the diabase ranged from 0.03 to 0.72 feet per minute (ft/min) based on the daily footage totals recorded by the PG monitoring the drilling. The pilot phase was

conducted using 12.25 to 12.758-inch diameter, tri-cone rotary bits. Drilling rates during the ream phase of drilling within the diabase ranged from 0.01 to 0.49 ft/min based on the daily footage totals recorded by the PG monitoring the drilling. The ream phase of drilling was conducted using 30-inch to 32-inch diameter, 5-cone bit rotary bits. These rates of progress are indicative of high to very high rock strength and hardness.

SPLP submits that we have been, and are, in complete compliance with the terms and requirements of analysis of the Order, as agreed to by the Department, and that no further analysis is required for the Department to consent to the start of this HDD.

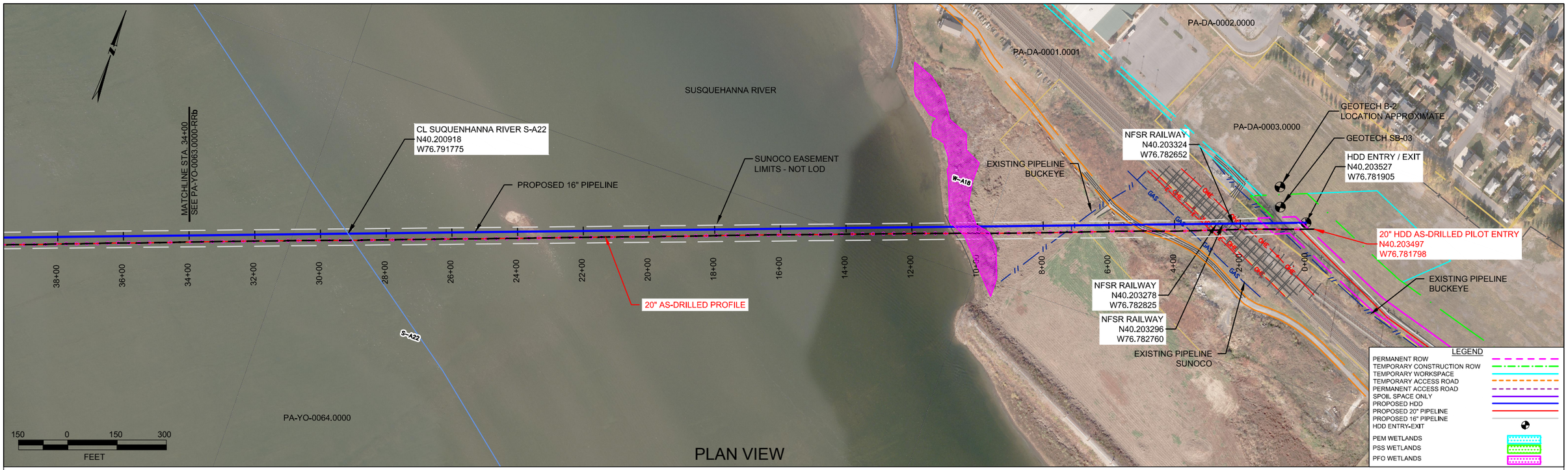
Sincerely,

Larry J. Gremminger, CWB
Geotechnical Evaluation Leader
Mariner II Pipeline Project

Attachments:
1-HDD Plan and Profiles

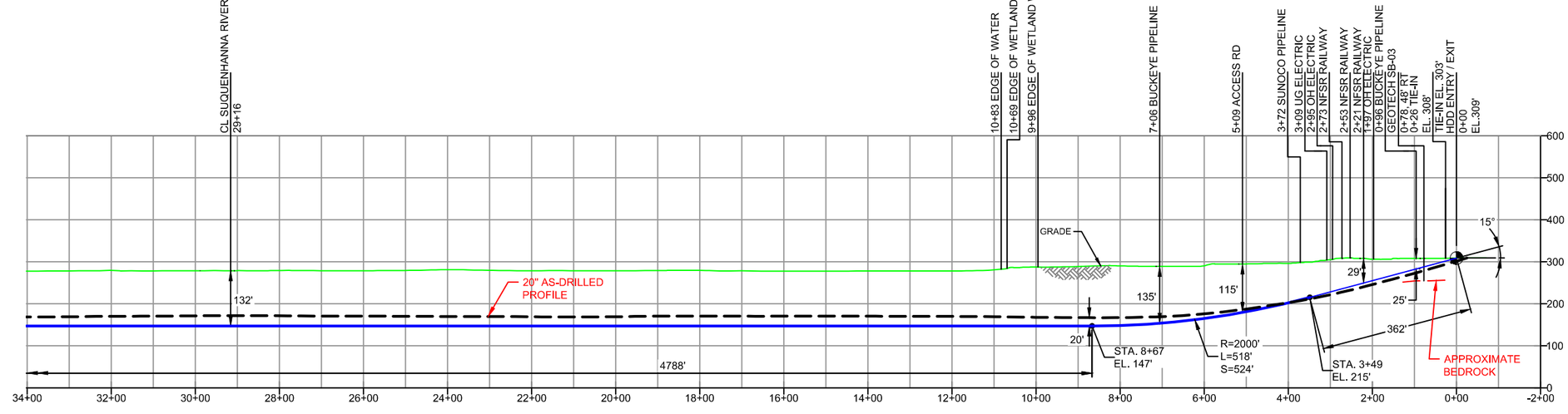
ATTACHMENT 1

16-INCH HDD PLAN AND PROFILES (AMENDED)



PLAN VIEW

PROFILE VIEW



YORK COUNTY, PENNSYLVANIA - FAIRVIEW TOWNSHIP
DAUPHIN COUNTY, PENNSYLVANIA - LOWER SWATARA TOWNSHIP
S2-0280-16

GEOTECH SB-03

NOTE: REFER TO TEST BORING LOG S2-0280 FOR COMPLETE SOIL MATERIAL DESCRIPTION

GEOTECH B-2

NOTE: REFER TO TEST BORING LOG B-2 INTERTEK PROJECT # 04911488 FOR COMPLETE SOIL MATERIAL DESCRIPTION

DESIGN AND CONSTRUCTION:

1. CONTRACTOR SHALL FIELD VERIFY DEPTH OF ALL EXISTING UTILITIES SHOWN OR NOT SHOWN ON THIS DRAWING.
2. THE MINIMUM SEPARATION DISTANCE FROM EXISTING SUBSURFACE UTILITIES SHALL NOT BE LESS THAN 10 FEET AS MEASURED FROM THE OUTSIDE EDGE OF THE UTILITY TO OUTSIDE OF PROPOSED PIPELINE.
3. DESIGNED IN ACCORDANCE WITH CFR 49 195 & ASME B31.4
4. CROSSING PIPE SPECIFICATION:
   HDD HORZ. LENGTH (L=):7380'
   HDD PIPE LENGTH (S=):7436'
   16" x 0.438" W.T., X-70, APISL, PSL2, ERW, BFW
   COATING: 14-16 MILS FBE WITH 40 MILS MIN. ARO (POWERCRETE R95)
5. INTERNAL DESIGN PRESSURE 2100 PSIG (SEAM FACTOR 1.0, DESIGN FACTOR 0.50 (HOOP STRESS)).
6. INSTALLATION METHOD: HORIZONTAL DIRECTIONAL DRILL (HDD).
7. PIPELINE WARNING MARKERS SHALL BE INSTALLED ON BOTH SIDES OF ALL ROAD, RAILWAY, AND STREAM CROSSINGS.
8. CARRIER PIPE NOT ENCASED.
9. PIPE / AMBIENT TEMPERATURE MUST BE NO LESS THAN 30°F DURING PULLBACK WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.
10. CONDUCT 4-HOUR PRE-INSTALLATION HYDROTEST OF HDD PIPE STRING TO MINIMUM 2625 PSIG.
11. PIPELINE AND CROSSING TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH LAST APPROVED AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION SPECIFICATIONS FOR PIPELINES CONVEYING FLAMMABLE AND NON-FLAMMABLE SUBSTANCES.
12. BLASTING NOT PERMITTED.
13. SEE SUNOCO PENNSYLVANIA PIPELINE PROJECT ESRI WEBMAP FOR ACCESS ROAD ALIGNMENT.
14. SUNOCO PIPELINE, L.P.'S HORIZONTAL DIRECTIONAL DRILL INADVERTENT RETURN CONTINGENCY PLAN WILL BE IMPLEMENTED AT ALL TIMES.
15. SUNOCO PIPELINE, L.P.'S EROSION AND SEDIMENTATION CONTROL PLAN WILL BE IMPLEMENTED AT ALL TIMES.

NOTES

1. ALL COORDINATES SHOWN ARE IN LATITUDE AND LONGITUDE. ALL MSL ELEVATIONS ARE NAD83
2. STATIONING IS BASED ON HORIZONTAL DISTANCES.
3. ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP ARE NOT RESPONSIBLE FOR LOCATION OF FOREIGN UTILITIES SHOWN IN PLOT PLAN OR PROFILE. THE INFORMATION SHOWN HEREON IS FURNISHED WITHOUT LIABILITY ON THE PART OF ROONEY ENGINEERING, INC. AND SUNOCO PIPELINE, LP, FOR ANY DAMAGES RESULTING FROM ERRORS OR OMISSIONS THEREIN.
4. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UTILITIES. CONTACT ONE CALL AT 811 PRIOR TO DIGGING.
5. SUNOCO EMERGENCY HOTLINE NUMBER IS #1-800-786-7440.

REF. DRAWING

ES-4.20	TO	ES-4.04	EROSION & SEDIMENT PLAN	
SHEET 13	TO	SHEET 2	AERIAL SITE PLAN	
DWG NO		DWG NO	DESCRIPTION	

REVISIONS

NO.	DESCRIPTION	BY	DATE	CHK	DATE	APP	DATE
EP5	UPDATED NOTE 5 AND 10 PER INCREASED 16" MOP	MRS	04/10/18	RMB	04/10/18	CAG	04/10/18
EP4	RELOCATED DRILL ENTRY/EXIT - DESIGN CHANGE PER CLIENT REQUEST	MRS	02/19/18	RMB	02/19/18	AMC	02/19/18
EP3	REVISED PER PADEP COMMENTS RECEIVED 01-30-17	DLM	02/01/17	RMB	02/01/17	CAG	02/01/17
3	DESIGN CHANGE - RELOCATED DRILL ENTRY/EXIT	MRS	01/06/17	RMB	01/06/17	AAW	01/06/17
2	REVISED PER ENGINEERING COMMENTS	MRS	08/31/16	RMB	08/31/16	AAW	08/31/16
1	REVISED PER COMMENTS FROM REI REVIEW	MRS	02/19/16	RMB	02/19/16	AAW	02/19/16

Sunoco Logistics Partners L.P.

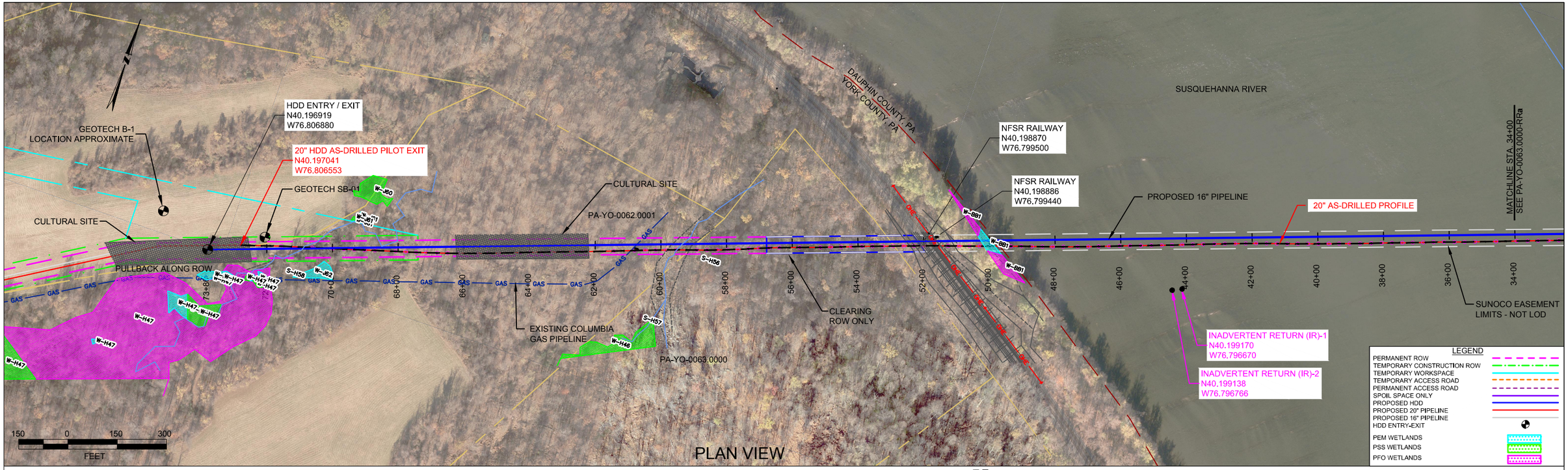
TETRA TECH ROONEY
(303) 792-5911

SUNOCO PIPELINE, L.P.

HORIZONTAL DIRECTIONAL DRILL
SUSQUEHANNA RIVER
PENNSYLVANIA PIPELINE PROJECT

SCALE: 1"=300'

DWG. NO: PA-YO-0063.0000-RRa-16



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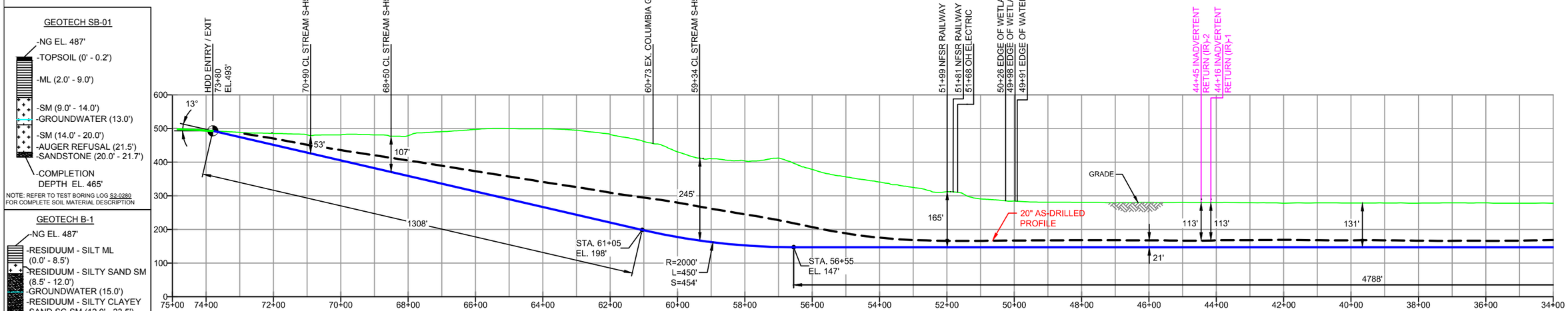

GEOTECH SB-01

NOTE: REFER TO TEST BORING LOG S2-0280 FOR COMPLETE SOIL MATERIAL DESCRIPTION

GEOTECH B-1

NOTE: REFER TO TEST BORING LOG B-1 INTERTEK PROJECT # 04911488 FOR COMPLETE SOIL MATERIAL DESCRIPTION

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