pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

May 23, 2019

Mr. Matthew Gordon
Sunoco Pipeline, L.P.
535 Fritztown Road
Sinking Spring, PA 19608

Re: Hydrogeological HDD Re-Evaluation Report
Lewisberry Road Crossing 16" Horizontal Directional Drill Location (S2-0260-16)
Permit No. E67-920
Fairview Township, York County

Dear Mr. Gordon:

The Pennsylvania Department of Environmental Protection (DEP) is requesting more information from Sunoco Pipeline, L.P. (SPLP) related to the HDD Re-Evaluation for the Lewisberry Road site, HDD# S2-0260-16 and permitted under Permit E67-920, posted on the DEP Mariner East II pipeline portal webpage on February 21, 2019.

1. As required by Paragraph 4 and 5 of the Environmental Hearing Board's August 10, 2017 Corrected Stipulated Order (Order), SPLP failed to fully utilize information gathered during the HDD of the 20-inch pipeline as part of the HDD Re-evaluation for the 16-inch pipeline. While SPLP made changes to the proposed 16-inch pipeline profile based on information gathered during the 20-inch pipeline, the HDD re-evaluation doesn't adequately tie the 20-inch information into a geologic analysis. SPLP identifies that they possess a complete geologic profile from the 20-inch HDD. However, the complete geologic profile or representation of such is not included within the report. Please submit a detailed geologic map, complete with profiles, along with a detailed narrative describing how the "complete geologic profile from the drilling of the 20-inch pipeline and vertical geotechnical data" were used to help determine the proposed 16-inch HDD profile location. The proposed 16-inch design seems to rely on the 20-inch "as-built", however there is no description of how the "as-built" was used in determining the proposed 16-inch HDD path. The re-evaluation should describe how the 20-inch "as-built" was used in determining the proposed 16-inch HDD path.

   The loss of returns (LOR) and flowback to the drill pit needs to be analyzed and described in detail as part of the re-evaluation. Inclusion of incident reports and photographs would be appropriate as part of the demonstration. Please gather geologic and drilling information collected by various site personnel during the 20-inch bore which can be used to synthesize a

comprehensive evaluation of the loss of return. The HDD re-evaluation report should discuss the operational or geologic cause of each LOR, and the drilling procedure or technique used to progress the boring.

The type of information described above, and any other relevant data gained in the intervening time period since the 20-inch HDD began to present, should be used to describe and support why the chosen bore path for the 16-inch pipeline was determined and how such information has been used to minimize the potential for IRs or the potential for water supply impacts to occur. Part of the discussion of construction alternatives, including why HDD activity is still the preferred methodology for pipeline construction at this location should be included in the re-evaluation report.

2. Relating to the overall *HDD Re-evaluation Analysis* and the *Geology and Hydrogeological Evaluation Report*:

   a. There is no evaluation of the data and no data-based correlation for why the revised 16-inch pathway was chosen. Please provide a discussion of how the data presented was used in designing and as support for this proposed HDD bore path and profile.

   b. Between the Horizontal Directional Drill Analysis, the Geologic Report, and the maps included with this submission, the western portion of the HDD is variously described as being underlain by diabase, quartz conglomerate, and quartz fanglomerate. Please accurately and consistently describe the bedrock underlying the HDD.

   c. *Section 1.0 Introduction* of the Geologic Report states that HDD S2-0260 is located within the Piedmont Upland Section of the Piedmont Physiographic Province, while Section 2.0 Geology and Soils states that the HDD is in the Gettysburg-Newark Lowland Section of the Piedmont Physiographic Province. Please clarify.

   d. *Section 5.0 Geotechnical Evaluation*:

      i. The section ends with the statement Skelly and Loy and RETTEW relied on these reports and incorporated their data into the general geologic and hydrogeologic framework of the analysis of the proposed 16-inch drill at HDD S2-0260-16 for this report. Please specify where this data was incorporated into the re-evaluation. The data is presented but is not further discussed.

      ii. Additionally, this section of the report presents information and data, but no evaluation of the data and information is made in relation to the re-design of the proposed 16-inch bore path.

      iii. The description of SB-01 does not match the attached log. The description states the total depth of SB-01 was 7.2 ft. BGS, yet groundwater was

encountered at 14.2 ft BGS. The graphical depiction of SB-01 on the left margins of both the permitted and redesigned 16-inch HDD plan/profile maps is not consistent with the log for SB-01, as it leaves out the cored section from 20-28 ft BGS that was collected after auger refusal at 19.7 ft BGS. Please revise.

iv. The description of SB-03 calls the "total depth of the boring" at 22.8 ft BGS, however the drilling log for SB-03 calls refusal at 18.5 ft BGS. Please revise.

v. The section describes the results of core borings B-1 and B-2, however, a boring log and core photos were only included for B-2. None of the maps contain any reference to B-1, except for Figure 2 Boring Location Plan, where it is listed as "**ON-HOLD**". Please explain the disposition of core boring B-1.

vi. Boring SB-01 is located approximately 150 feet southeast of core boring B-1, as depicted on Figure 2 Boring Location Plan. SB-01 hit refusal in sandstone at 19.7 ft and then cored sandstone from 20 ft to 28 ft, while core boring B-1 is described as encountering diabase from 12 ft to 114 ft. The location of B-1 as depicted on Figure 2 Boring Location Plan is mapped as being underlain by Gettysburg Formation Quartz Fanglomerate. Please explain.

vii. The section states "the compressive strength of a portion of the bedrock core at a depth of 36.5 feet was 550 pounds per square inch . . . ". There is no indication as to which boring this data comes from, although it must have come from either B-1 or B-2, since none of the SB-borings extend to 36 ft. The type of bedrock is not identified. In neither B-1 nor B-2, is the profile depth near 36 ft below grade. Please clarify and revise the report as applicable.

e. *Section 7.0 Geophysical Survey Considerations:*

i. States "the only limestone conglomerate mapped in the area of the site is located approximately 2,000 feet NW of the HDD bore path." Skelly and Loy's Figure 2 Geology Map shows Gettysburg Formation *Limestone Conglomerate* underlying the east-central portion of the path, between the Gettysburg Formation Quartz Fanglomerate to the west and diabase to the east. Please clarify or revise.

ii. If the bore path is not within a karst setting, it appears that geophysics may be useful in detecting fractures and soft spots, thereby providing useful data to aide in this HDD pathway design. Please further explain why geophysical data were not collected and reconsider whether its use could be beneficial to preventing IRs, LORs and water supply impacts at this site.

f. *Analysis of geologic strength at profile depth:*
RQDs are provided on the core boring logs and one unconfined compressive strength test was run on an unknown core section, but the data is never used to justify the revised 16-inch HDD profile location. There is no analysis in the re-evaluation report specifically tying the revised drill path to any specific zones noted on the core boring logs as having high RQDs, or why the revised 16-inch path was chosen. Please identify the core section where a compressive strength test was run and provide a discussion addressing the use of this data in designing the bore path.

g. The section Conclusions states "...Sunoco will employ the following HDD best management practices . . . SPLP will provide the drilling crew and company inspectors the location(s) data on potential zones of higher risk for fluid loss and IRs, including areas of potential zones of fracture concentration identified by the fracture trace analysis, so the monitoring can be enhanced when drilling through these locations." If this information is available, please include it in the revision for DEP review.

3. Relating to the *Analysis of well production zones* and use of information obtained during construction of the 20-inch pipeline;

The re-evaluation report fails to include evaluation of the data and information collected for the nine private water supplies within 450 feet of the proposed HDD, the water supplies that are in the vicinity (beyond 450 feet) of the proposed HDD, and the water supply complaint that SPLP received at this HDD site. It is also unclear about whether any of the private water supplies identified within 450 feet are the same as any of the water supplies within 0.5 miles that were identified from the PaGWIS database.

In addition, *Attachment 3 Well Location Map* has a parcel marked as "Public Water Supply/Landowner Confirmed No Well" on Bradley Circle, just west of Roof Park. More recent aerial photography shows a new house in that location. Please update the private water supply inventory and ensure this residence is contacted.

Any private or public water supply data and information obtained within 450 feet, or otherwise obtained in the vicinity of the 20-inch or proposed 16-inch HDD, should be used and discussed as part of this HDD re-evaluation. This data should include but not be limited to: any applicable water supply sampling data obtained and any water supply complaints that SPLP received for water supplies within 450 feet of the HDD or within the general vicinity during construction of the 20-inch pipeline. The results of the SPLP's water supply sampling program, investigation and disposition of any complaints, and any correlation or non-correlation to SPLP's construction activities should be evaluated and discussed in the HDD re-evaluation report. Use of this information should be used to demonstrate that the proposed 16-inch HDD activity will minimize the potential for IR's and impacts to water supplies. Please revise the re-evaluation report to include this information.

4. Related to Pipe Stress Radius: Provide further explanation of how the following statement applies to this HDD re-evaluation: "Pipe stress allowances are an integral part of the design calculations performed for each HDD."

The DEP's review of the geologic aspects of this HDD re-evaluation and the geologic related comments represented above were completed by Licensed Professional Geologist.

Upon receipt, DEP will post SPLP's response to this letter on the DEP pipeline portal webpage for public comment. The public will have 5 additional business days from the date of posting on the website to provide DEP any additional comment.

If you have any questions or would like to discuss this letter, please contact me at scwilliams@pa.gov or 717.705.4799.

Sincerely,

Scott R. Williamson
Program Manager
Waterways & Wetlands Program

cc: Larry Gremminger, Energy Transfer Partners/Sunoco Pipeline, L.P. (pdf copy)
Monica Styles, Sunoco Pipeline, L.P. (pdf copy)
Doug Hess, P.G., Skelly and Loy
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