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Senate of Pennsylvania

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October 23, 2020

Ms. Karyn Yordy
Executive Assistant, Office of Programs
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street
Harrisburg, PA 17101

Dear Ms. Yordy,

Please accept the following comments in response to the HDD Reevaluation Report submitted by Sunoco Pipeline, L.P. for DEP Permit number E15-862, HDD Reference number PA-CH-0199.0000 filed on October 9, 2020.

Following my review of this report, I have a number of questions and concerns related to the stated environmental and quality of life impacts for citizens in Uwchlan and West Whiteland Township. The re-evaluation report indicates that Sunoco is requesting to utilize the originally permitted 16-inch profile for the installation of the 20-inch pipeline at this location. However, it is my understanding that in the fall of 2017, Sunoco chose to install the 16-inch pipeline using the 20-inch profile permitted by the Department due to widespread problems with the originally permitted 20-inch profile. These issues during the drilling include a groundwater flow rate of up to 70 gallons per minute between June and July of 2017. Further, on July 3, 2017 numerous residents reported cloudy drinking water and a significant loss of water pressure due to construction activities. While Sunoco has reported reaching an agreement with nearby residents with private wells that included the connection of these properties to public water supply, I would assume the risk of potential environmental contamination of this pristine aquifer remains for the 16-inch profile. The utilization of this profile may be in the best interest of Sunoco but I strongly question the appropriateness of relying on a profile with known environmental risks.

In addition to known environmental impacts to the local aquifer, water seepage north of the Shoen Road drill site has plagued this project since 2017. In fact, when drilling resumed at this location in August of this year, Sunoco reported a drastic change in the flow and quality of seep, leading to water testing required under the Seep Monitoring Work Plan. The re-evaluation

report under consideration by the DEP indicates that while the groundwater was tested, Sunoco determined that based on a field test for pH, special conductance and color, there were no impacts from drilling fluid. This analysis conflicts with local reports and photographic evidence indicating an IR of drilling fluid may have occurred at this location. With this in mind, I question the decision to avoid formal laboratory testing of this groundwater for bentonite and other drilling contamination. Groundwater contamination caused by pipeline construction at this location flows east and deposits into a tributary of the Valley Creek, an Exceptional Value waterway and I question the ability for this plan to be successful without further contamination of this important water resource.

While Sunoco and their consultant Groundwater and Environmental Services (GES) claim on page 5 of the Geologic Analysis section of the October 9, 2020 re-evaluation report that this drill site does not contain any Karst geology. However, I have serious concerns related to the number of known and unidentified sinkhole locations along nearby pipeline routes and request that DEP require Sunoco to fully investigate the possibility of sinkhole disturbance along the route prior to consideration. Further, the geophysical survey prepared and presented as attachment D this re-evaluation report:

"The geophysical survey results display anomalies along the alignment indicative of fractures that are possible locations for slightly-elevated subsidence hazards. RETTEW recommends further geo-technical investigations in the three areas labeled "A" through "C" as well as continued monitoring of all the anomalous locations as further drilling is conducted in the area. Area "C" is cited for further investigation due to its location beneath the road and proximity to the exit/entry"

For your convenience, attached please find copies of the documents referenced above. To my knowledge, no additional studies have been performed as advised and if it has been, these results have not been made available to the public or adjacent property owners. Further, the Hydrogeologic Investigation dated September 1, 2017 directly indicates that, "a recent geotechnical boring drilled near the south entry/exit was most likely in karst as the boring went 130 feet before encountering bedrock." These reports are directly contradictory and indicate a complete lack of reliable geophysical assessment and data for this site. Leading to a guessing game as to what type of rock is being drilled, potentially explaining the multitude of IRs, groundwater seeps, and numerous violations related to this drill site.

Compounding this issue, recent legal filings call into question the validity of any data presented to the department and believe it is in the best interest of all involved that additional and more extensive geophysical and hydrologic testing be performed at this site by an independent third party. After all, ground disturbance and earth movement are known to have resulted in the catastrophic failure of the Revolution Pipeline in Beaver County, Pennsylvania on September 10, 2018. If a similar pipeline explosion were to occur in the high consequence area of Southeast Pennsylvania, the resulting loss of life would be beyond unthinkable.

While Sunoco has gone through the motions of reevaluation, it is clear that the information provided will undoubtedly result in additional environmental harm. It is my strong recommendation that the Department reject this report as incomplete, call for significant public involvement including public meetings, and require Sunoco to perform a complete third party assessment of the entire project, across all 17 counties, to ensure construction activities do not cause permanent and irreparable harm to the environment and the Pennsylvania public. Otherwise, it is virtually impossible to determine if this pipeline is safe and stable. Failure to do this is gross negligence and could result in catastrophic harm, similar if not worse that what occurred in Beaver County in 2018.

Sincerely,

A handwritten signature in black ink, appearing to read "Katie Muth", with a stylized flourish at the end.

Senator Katie Muth, SD44



Notes:
 Basemap from Mapmap, January 2020.
 Survey profiles/stations from DGPS survey by RETTEW.

Geophysical Survey Legend

- 2D Proposed Pipeline
- 16-inch Pipeline & Station Number
- Microgravity Mass Deficiencies
- Possible Fracture Zone Detected By:
- Electrical Imaging
- Seismic MASW
- Seismic Refraction
- Recommended Geotechnical Follow-up



Figure 7: Geophysical Survey Results Summary

Biddle Drive
 53-0360



RETTEW Road Services, Inc.
 2820 Calverton Avenue, Lancaster, PA 17602
 Phone 717-398-0100

SURVEY DATE:	01/17/2020
RETTEW No.:	096303002
REVIEWED BY:	FRB
DRAWN BY:	CHR
DATE:	01/25/2020
SCALE:	1" = 50'
FIGURE NO.:	7 of 7

The electrical resistivity results are shown in Figure 6. The electrical profiles show a general three-layer model with a relatively conductive surface layer over a discontinuous mildly resistive layer over a more conductive layer. The upper layer is relatively discontinuous, with irregularities that could represent near-surface disturbances given the site development history. The deeper conductive (blue) anomalies below the inferred top-of-rock may represent water- or clay-bearing fractures or weathered seams within bedrock. The lowest resistivities are on the south end of the profiles, and extend from roughly where the HDD may emerge from rock to the south end of the site on Shoen Road – where possible seepage has been observed. This is consistent with wet soils.

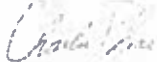
CONCLUSIONS

In general, the geophysical survey results display anomalies along the alignment indicative of fractures that are possible locations for slightly-elevated subsidence hazards. Figure 7 summarizes the anomalous areas with various colored double-arrows. Overlapping and/or adjacent arrows, and the gravity mass deficiency anomalies (red hachures) indicate the highest risk of subsidence and possible enhanced water migration. The location of these anomalies at the bottom of the hill increase the possibility of water seepage out of the ground rather than increased infiltration into the ground. RETTEW recommends further geo-technical investigations in the three areas labeled "A" through "C" as well as continued monitoring of all the anomalous locations as further drilling is conducted in the area. Area "C" is cited for further investigation due to its location beneath the road and proximity to the exit/entry. The resistivity profiles are consistent with water emerging from the HDD in rock and saturating the soils. The elevated topography (and presumably water table) could provide the hydraulic head that is driving this emergence and seepage.

LIMITATIONS

The survey described above was completed using standard and/or routinely accepted practices of the geophysical industry, and the equipment employed represents, in RETTEW's professional opinion, the best available technology. RETTEW does not accept responsibility for survey limitations due to inherent technological limitations or unforeseen site-specific conditions. We will notify you of such limitations or conditions, when they are identifiable.

We have enjoyed and appreciated the opportunity to have worked with you. If you have any questions, please do not hesitate to contact the undersigned.



Charles H. Rhine, MSc, PG
Senior Project Manager



Timothy D. Bechtel, PhD, PG
Senior Project Manager



Felicia Kegel Bechtel, MSc, PG
Director of Geophysics

**BIDDLE DRIVE CROSSING
PADEP SECTION 105 PERMIT NO. E15-862
PA-CH-0199.000-RD
(SPLP HDD No. S3-0360)**

On August 29, 2020, all seepage from the seep area stopped and no discharge was observed for the remainder of 16-inch HDD construction. HDD construction of the 16-line proceeded, without incident, until pulling of the pipe and grouting the annulus, both of which were completed by October 3, 2020.

Grouting of the southeast section of HDD annulus occurred on September 28, 2020. Grouting of the northwest section of HDD annulus occurred on October 2 and 3, 2020. On October 3rd, approximately 50 gallons of grout mixed with groundwater emerged five feet west of the original seep location. The discharge flowed through the existing seep sand bag containment, approximately 100 feet within the existing road ditch and was contained by a second existing sand bag containment. At the request of the Department, an additional sandbag containment was installed down gradient within the road ditch. The grout/groundwater mixture was recovered using sump pumps, hand tools, water pressure sprayers and vac trucks. After cleanup, a slightly turbid groundwater discharge continued to flow from the seep at approximately 1 to 2 gpm. This discharge is being addressed as per the protocol established in the Seep Monitoring Work Plan. To date the seep water has shown an elevated pH representative of the grout. As such, the discharge waters are being contained and managed while the pH drops to level suitable for the protection of aquatic life. An incident report describing the grout / groundwater mixture discharge was issued to the Department on October 5, 2020.

Monitoring wells were installed at five of the residential properties where public water hook-ups were provided to examine local groundwater levels during HDD construction (see Attachment 1). It is important to note that water levels in the monitoring wells responded to drilling activity. During periods of active drilling, the water levels declined in response to a groundwater discharge at the southeast entry/exit. The southeast entry/exit on the profiles for both the 16-inch pipe and 20-inch pipe is located at a lower elevation than the background water table, over approximately 2,450 feet of the 2,857-foot drill path (horizontal distance). As such, completion of the pilot borings for the 16-inch line created a groundwater discharge and SPLP expects similar conditions during construction of the 20-inch line. In October 2019, drilling of the pilot bore for the 16-inch line was suspended and a grout plug was installed at the southeast end of the pilot hole, causing a water level recovery. Drilling for the 16-inch HDD restarted in July 2020. The recovered water levels were maintained until approximately August 21, 2020, when the groundwater discharge began again causing water levels to decline, in response to pilot hole drilling. Construction of the 16-inch HDD, including pulling of the pipe and grouting of annulus at both end sections of the HDD, was completed in early October 2020. In response to the grouting, the groundwater discharge was reduced to approximately one gpm and the water levels in the five local monitoring wells began to rebound (see Section 2.3.4, Attachment 1). The water levels are continuing to rebound as of the submittal of this report. A similar decline in water levels, followed by recovery is expected from drilling and grouting of the completed 20-inch line.

GEOLOGIC ANALYSIS

Based on published mapping, moving southeast to northwest, the HDD profile transects the Harpers Formation and extends partially into the Chickies Formation. The Harpers Formation is a relatively thin (300 to 1,000 feet thick) unit composed of phyllite and micaceous to argillaceous quartzite. The Chickies Formation is composed predominantly of quartzite, with a basal conglomerate and interbeds of slate and phyllite. The valley floor, southeast of the southeast entry/exit point is composed of carbonates, including the Ledger Dolomite. The structure in this area is complex and the formation contacts, as shown in publications, may lack accuracy.

Published geologic maps show a major left-lateral fault within the Chickies Formation, the Ketch (Gap) Fault, passes through the HDD S3-360 path along Township Line Road at approximately Station 17+10 on the proposed profile. In addition, the alignment transects four mapped fracture traces along the northwest half of the profile. All four fracture traces trend north-northeast and the one furthest to the southeast intersects the Ketch Fault along the alignment. The other three fracture traces cross the alignment at

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approximately Stations 22+00, 24+20, and 26+10. These locations are potential zones of fracture concentration, weakness in bedrock, and preferential pathways for fluid migration (drilling fluid or groundwater). The southern end of a fifth north-northeast trending fracture trace is mapped within the alignment right-of-way (ROW) near Station 7+80 and a north-northeast trending lineament is mapped due east and south of the southeast entry/exit (see Attachment 1).

There is no known or mapped karst geology, or sinkholes along the HDD. Karst features associated with the Ledger Dolomite occur due south of the southeast entry/exit.

Deep mining has not been identified beneath or in the area of the HDD alignment.

Rettew performed a geophysical survey in February 2020, covering approximately 400 feet of the southeast end of the proposed alignment for HDD S3-0360. Three different geophysical techniques were utilized to detect and delineate subsurface voids or low-density zones and provide a top of competent bedrock profile; including microgravity, seismic refraction and multi-spectral analysis (MASW), and electrical resistivity (ERI). The seismic refraction and MASW data indicate there is a soil mantle approximately 25 to 35 feet thick over the survey lines and a potential zone of bedrock fracturing at approximately Stations 3+40 on the proposed profile. The ERI profiles show deeper, electrically more conductive anomalies, below an inferred top-of-rock at approximately Stations 0+80, 3+05 and 4+10 on the proposed profile that may represent water- or clay-bearing fractures or weathered seams within bedrock. A zone of lower resistivities was reported occurring from approximately Station 0+50 to 1+00 extending from approximately where the proposed profile may emerge from rock near Shoen Road – where groundwater seepage has been observed.

HYDROGEOLOGY, GROUND WATER, AND WELL PRODUCTION ZONES

The source of groundwater that occurs within the local bedrock aquifer at HDD S3-0360-20 is direct recharge from precipitation and regional groundwater flow from the northwest. Most of the local groundwater occurs and moves within secondary porosity created by fractures, bedding plane partings, and faults. At some locations, groundwater may fully saturate overlying unconsolidated materials or occur as a perched zone above the water table. Geotechnical boring B6-4W indicates unconsolidated weathered bedrock can be over 130 feet thick in the area of the southeast entry/exit.

Information collected during project related background sampling of 35 domestic wells showed the total depths for 16 of the wells range from 65 to 480 ft below ground surface (bgs) and the water level in five wells ranged from 22 to 260 ft bgs.

A continuous water level monitoring system with remote access has been established at five former residential wells in the area to assess pre-drill conditions and monitor for potential water level impacts during drilling of both the 16-inch and 20-inch HDD at S3-0360. Monitoring of the groundwater levels began in December 2017 and the data have been downloaded weekly. A real-time data logger was installed in the 160 Valleyview Drive monitoring well on October 18, 2019. The water level monitoring data show normal water levels generally fluctuate between 405 and 430 ft amsl.

The surface elevation of the southeastern entry/exit on the proposed profile for the 20-inch line is 353 ft above mean sea level (amsl) and the elevation of the northwestern exit/entry is 576 ft amsl. The proposed profile has a bottom elevation of approximately 279 ft amsl. Water table elevations in the area fluctuate between approximately 405 and 430 ft amsl. Given these relationships, the profile creates a preferential pathway for groundwater discharge that requires mitigation. This type of discharge occurred during initial attempts to install the 16-inch line, affected local water levels and created turbidity in a few of the domestic supply wells. As such, SPLP offered a connection to the local public water supply provided by Aqua