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Subject: Expert Report: Technical feasibility and risk evaluation for HDD bore proposed by Pinelands Preservation Alliance (PPA) and alternative HDD alignments beneath Greater Egg Harbor Bay (GEHB)

Mr. Fontaine:

As requested, I have evaluated the technical feasibility and risks associated with a proposed long horizontal directional drilled (HDD) bore beneath Greater Egg Harbor Bay (GEHB) for installation of a 24-inch diameter steel gas pipeline for South Jersey Gas. The GEHB HDD bore was proposed by the Pinelands Preservation Alliance (PPA) as part of an alternative to the alignment recommended by South Jersey Gas's (SJC) design consultant, Woodard and Curran. The GEHB HDD bore proposed by PPA would be approximately 8,700 feet long, and would need to be approximately 36-inches in diameter to allow installation of a 24-inch diameter steel gas pipeline. Two other alternative GEHB HDD bore alignments were evaluated. In addition, I evaluated the relative risks and technical feasibility of the two longest proposed HDD bores along Alternative A Route.

I have relied on my extensive experience in geotechnical engineering, design and construction observations for long, large diameter HDD bores, my expertise in evaluating risks of inadvertent drilling fluid returns, sometimes referred to as hydrofractures, my expertise evaluating pipe stresses and pullback loads, and my extensive experience and knowledge of HDD design and construction good practices. I have reviewed documents provided to me, including available geotechnical data, aerial photographs, drawings, and engineering reports associated with the proposed gas pipeline. Figures referenced in the report are included at the end of the report. A list of documents I reviewed and/or relied upon is included in Appendix A.

My expert opinions are summarized below, followed by discussion of evidence supporting my opinions.

1. ***The anticipated ground conditions for the PPA proposed GEHB HDD crossing are extremely unfavorable.*** The ground conditions anticipated for the GEHB HDD crossing proposed by PPA, based on my review of available geotechnical boring logs and geotechnical reports, are extremely unfavorable, and likely insurmountable. I reviewed logs of 104 borings that were

drilled for 3 investigations in the near vicinity of the proposed HDD GEHB crossing. These borings were drilled over a period of 42 years by different geotechnical engineers. Almost without exception, the logs indicated extensive depths of highly unfavorable, low blow count, very soft to soft organic silt and clay. The logs of three borings drilled on land for the 1973 B. L. England Generating Station foundation investigation revealed extremely weak, soft soils (Harroun, 1973). Of 50 borings drilled for the 1970 Garden State Parkway (GSP) investigation, logs of 41 borings indicated intervals of low blow count, i.e. very soft to soft weak soils (Knoerle, Bender, Stone, and Associates, 1970). Fifty-one borings were drilled in 2011 for the New Jersey Turnpike Authority (NJTPA) GSP bridge replacement project investigation (Michael Baker, 2011). Every one of the 51 boring logs indicated very low blow count very soft to soft and weak soils, with some boring logs noting these unfavorable soils over extensive depth intervals. The logs and depth intervals where very soft to soft soils were noted on the 2011 boring logs are tabulated in Appendix B.

The available geotechnical information I reviewed indicates that very soft to soft organic silt and clay with low blow counts (weight of hammer or weight of rod were noted in many instances) were encountered in the vast majority (91%) of borings in the vicinity of the PPA proposed GEHB HDD bore, including numerous notations of these low blow count, weak, compressible materials at extensive depths. These extremely unfavorable soils would be anticipated along much or all of the proposed HDD bore alignment. Very soft to soft organic clay and silt deposits are unstable, will collapse around the HDD bore, will result in inadvertent drilling fluid returns, and will make it impossible to maintain circulation. These ground conditions will result in very poor steering response, inability to maintain design alignment and grade, and will make it impossible to install the pipe. Risks of adverse consequences to sensitive environmental features will be extremely high, as a result of the Contractor's inability to maintain circulation and avoid inadvertent drilling fluid returns.

2. ***Work areas and pipe layout areas are inadequate for PPA proposed GEHB HDD crossing.*** The pipe layout area for the PPA proposed HDD bore crossing of GEHB is inadequate for fabrication and staging of the pipeline in one continuous string for pullback. The 24-inch steel pipe cannot be bent around sharp curves. My review of the available drawings indicates that only approximately 2,500 feet of layout area is available near the south end of the PPA proposed GEHB crossing. The pipe fabrication and layout area would require use of an abandoned roadway that extends from North Shore Road near the intersection of Clay Avenue, southeast to Garden State Parkway. In order to take advantage of this area, the pipe would have to be deflected approximately 30°. Even if the pipe could be deflected by 30° within the layout area, the layout area is still inadequate to allow fabrication of a single continuous pipe string, and instead would have to be fabricated in at least four pipe segments. Very little work area exists at the northern end of the bore and would likely require clearing a significant amount of trees to accommodate the drilling equipment.

   Fabrication and pullback of the pipeline in a continuous string reduces the risks of getting the pipeline stuck and being unable to complete the installation. When the pipeline must be staged in multiple shorter strings to accommodate the available layout area, long delays are incurred at each stopping point, to position, weld, inspect the weld, coat the welded joint, inspect and test the coating, and resume pulling. Pullback forces increase after each stop, bore instability increases with time, and the bore would collapse. The very high pulling forces could exceed the rig pullback capacity.

3. ***The HDD intercept method and conductor casings would be required to attempt the PPA GEHB HDD Crossing.*** The work areas available to execute the PPA proposed GEHB HDD bore are highly constrained and inadequate. Very long HDD bores must be drilled using the intersect method, with a large HDD drill rig and separation plant (mud pump, mechanical shakers, and hydrocyclones) and other equipment at each end of the bore. Approximately ¾ acre is required at each end for the equipment. Traffic and access to private property must be maintained. The intersect method can reduce risk of inadvertent drilling fluid returns, especially if conductor casing is installed at each end of the bore. The conductor casings and the use of two HDD rigs would help maintain circulation, reduce risk of settlement damage to existing utilities above the HDD bore, reduce the length of the drilling fluid flow path, and reduce drilling fluid pumping pressures. For the extensive very soft and soft organic soils anticipated along much or all of the PPA proposed GEHB HDD bore path, the conductor casings would have to be very long. Installation of the conductor casings would require use of a percussive hammer, which is very noisy. The fabrication and installation of the conductor casings would be disruptive to nearby residents and businesses. Conductor casing, if left in place, could pose high risks of corrosion to the gas pipeline. Removal of the conductor casings would introduce high risks of settlement damage to surface roads, utilities, and other features. The use of the intersect method and conductor casing would reduce risks for the GEHB HDD crossing, but would not render it feasible.

4. ***The PPA Proposed GEHB Crossing is Fatally Flawed and Beyond the State of the Industry.*** The PPA proposed HDD bore crossing of GEHB would be approximately 8,700 feet long, and would need to be approximately 36-inches in diameter to allow installation of 24-inch steel pipe. HDD bores up to 10,000 feet have been completed by highly skilled and experienced contractors in stable ground conditions, i.e. ground conditions which provide bore stability, allow circulation of drilling fluids to be maintained, reduce risks of inadvertent drilling fluid returns, and allow the product pipe to be pulled back without bore collapse. Favorable (stable) ground conditions include stiff to hard clay and cohesive silt, dense to very dense sand to clayey sand, and soft to medium strength competent rock. The soil conditions for the GEHB HDD crossing are anticipated to be very unfavorable, and therefore a long, large diameter HDD crossing is ill-advised. However, even if the ground conditions were favorable, an HDD bore of the required diameter and length needed to cross GEHB would be extremely challenging, even when attempted by highly skilled and experienced Contractors in favorable ground conditions.

5. ***The alternative alignments investigated for GEHB HDD crossing are also fatally flawed.*** In addition to the construction risks identified and discussed above, permitting risks must be identified and addressed. The proposed GEHB HDD crossing alignment is parallel and encroaches on the NJTPA GSP Right of Way (ROW). A permit would be required to construct the gas pipeline within the NJTPA GSP ROW. NJTPA's letter of July 14, 2014 indicates that there are no circumstances or exceptions under which such a permit for parallel occupancy

of the gas pipeline would be approved (NJTPA, 2014). Consequently, any GEHB crossing would have to be outside the GSP ROW.

I investigated two alternative alignments for an HDD crossing of GEHB outside the NJTPA GSP ROW. Specifically, I reviewed alternative GEHB alignments identified and described by Woodard and Curran, illustrated in Figure 1. Figure 1 shows alternative gas pipeline routes for portions of Alternatives A, B, and G, including three alternative GEHB crossing alignments, and the two longest HDD bores proposed along the Alternative A route. The PPA proposed alignment shown in purple on Figure 1 has been discussed previously. The other two alignments are shown in yellow and black. The yellow alignment represents an approximately 7,000-foot long HDD bore with a horizontal curve that makes a bend of approximately 68°, along Alternative Route B. The black alignment represents an approximately 12,700' long HDD bore with a horizontal curve that also makes a bend of approximately 68°.

The two alternative GEHB HDD bores are near the PPA proposed GEHB HDD bore alignment. Therefore, ground conditions along the yellow and black alternative GEHB crossing alignments would be expected to be very similar to the ground conditions anticipated and described previously for the PPA proposed crossing of GEHB, i.e. predominantly low blow count, weak, very soft to soft organic soils. No 36-inch diameter by 12,700' long HDD bore alignment with a 68° horizontal curve through weak, very soft to soft organic soils has ever been successfully completed. In fact, no 12,000-foot long HDD bore has ever been completed in *any* ground conditions. The extreme length, diameter, and severe horizontal curved geometry represent extremely risky uncharted territory, far outside the state of practice in the industry, and should not be attempted.

The 7,000-foot long bore has precedent within the HDD state of practice for length, but the 36-inch diameter, severe 68° horizontal curve, and weak, very soft to soft soils present extremely high risks that should be avoided. Neither of these alternative GEHB HDD bores has sufficient pipe layout area to accommodate the full pipe string length, necessitating one or more stops during pullback to position, weld, inspect the weld, and resume pullback. The interruptions significantly increase the risks of the pipe becoming stuck.

The severe horizontal curves in both alignments would substantially increase pipe pullback loads and bending stresses. Such severe horizontal curves cannot be achieved in very soft to soft organic soils, and very loose to loose sands because of the poor steering response. The end result of attempting either of these alignments would be certain failure and expensive Contractor claims for defective design. My evaluation led me to conclude that while possible to select an HDD bore alignment outside the GSP ROW, each of the risk factors identified previously related to extreme length, diameter, disruption to residents, inadequate pipe layout, highly constrained work areas, highly unfavorable soil conditions, and high risk of inadvertent drilling fluid returns would remain. In fact, any attempt to complete the 12,700 foot long alternative GEHB HDD bore would be certain to fail.

The cumulative effects of the identified risks for the Pinelands proposed HDD bore alignment, and the two alternative GEHB HDD alignments evaluated renders any proposed GEHB HDD crossing not feasible. Any GEHB HDD crossing would violate good design practice in numerous ways and present extreme risks.

6. ***Alternative A alignments for Cedar Swamp Creek and Atlantic City Electric HDD bores are technically feasible and avoid or mitigate fatal flaws.*** Good HDD design practice dictates that risks be identified and avoided if possible. Risks that cannot be avoided must be mitigated, but risk avoidance always trumps mitigation. The PPA proposed GEHB HDD crossing and alternative GEHB crossings present very high risks that should be avoided. The identified risks can be avoided by selecting a route/alignment which reduces bore lengths, places the bore in more favorable anticipated ground conditions, provides adequate work area and pipe layout area, reduces risk of adverse environmental consequences, and reduces disruption to residents and businesses.

   The South Jersey Gas design team has achieved substantial risk avoidance and reduction in its recommended route which avoids the excessively long and risky GEHB HDD crossing. I evaluated the two longest HDD bores along the recommended Alternative Route A. Specifically, I evaluated the Cedar Swamp Creek (CSC) bore and the Atlantic City Electric (ACE) bore. These bores are shown on Figure 1. The CSC HDD bore would be approximately 4,500 feet long. The ACE HDD bore would be approximately 5,330 feet long.

   Cedar Swamp Creek Crossing. The CSC bore lies beneath Tuckahoe Road and would be approximately 70 feet deep along much of the bore alignment. This bore has a horizontal curve with a radius of approximately 2,600 feet and a deflection of approximately 20° along a portion of the HDD bore. Boring BS-04 was drilled approximately 1,000 feet from the proposed HDD bore exit point. The boring log is depicted in Figure 2 on the HDD bore profile. The log of BS-04 indicates very loose sand for the upper 15 feet of the bore, underlain by firm silt for the next 15 feet. Loose sands and loose silty sands were encountered for the next 25 feet, underlain by dense to very dense sand and silty sand to the bottom of the boring at approximately 94.5 foot depth. The HDD bore would be within the lower dense to very dense sands at this location. Boring BS-11 was drilled approximately 280 feet west of the CSC HDD bore entry along the alignment. Soils encountered in BS-11 at and near pipe elevation were very dense silty sand, with a thin lens or layer of very loose sand approximately 10 feet above the pipe, overlain by approximately 60 feet of medium dense to dense sand. Seven borings were drilled in 1964 for the reconstruction of Tuckahoe Road. These borings lie primarily within the horizontal curve portion of the proposed HDD bore. The logs of these 7 borings indicate that the soils at and near the HDD bore elevations are stiff to hard silt and medium dense to dense sand. Very loose to loose sands were encountered in the upper 14 to 20 feet below ground surface. These very loose to loose sands would be expected within the relatively short, straight tangent sections of the HDD bore near entry and exit, where neither vertical nor horizontal steering is required. My review of the available boring logs indicates that the majority of the proposed CSC HDD bore would be expected to be within the stiff to hard silt and dense to very dense sand, with excellent steering response. The stiff to hard silt and dense to very dense sand would provide excellent protection against inadvertent drilling fluid returns.

Layout area for the CSC HDD bore would be constrained, but the pipe could be accommodated in two strings. The proposed 4,500-foot long by 36-inch diameter HDD bore, while challenging, would have a high probability of success. The length and diameter are within the state of practice, successful precedent exists, and the soils encountered at and near HDD bore depth are predominantly stiff to hard silt and dense to very dense sand and silty sand, which are stable and represent favorable ground conditions for HDD construction. The proposed geometry, including the relatively gentle 20° horizontal bend presents low to moderate risks with successful precedent. The proposed 4,500-foot long CSC HDD bore presents far lower risks than any of the alternative GEHB HDD bores evaluated.

Atlantic City Electric Crossing. The proposed ACE HDD bore along Alternative Route A would be approximately 5,330 feet long by 36-inch diameter. The bore, as depicted, would include two horizontal curves, each with approximately 30° deflection. Adequate pipe layout area exists for at least 4,500 feet of the pipe string, and possibly for the entire 5,330-foot pipe string. The bore would be approximately 60 feet deep for the majority of its length. Boring BS-07 was drilled along the HDD bore alignment approximately 700 feet east of the HDD exit point, and is shown in Figure 3. Boring BS-08 was drilled approximately 1,150 feet west of the HDD entry and BS-09 was drilled within 200 feet of the entry. The soils encountered in BS-07 at and near the proposed HDD bore elevation were medium dense to dense sand, overlain by soft silt from approximately 5 feet above the bore to approximately 30 feet above the bore, with approximately 17 feet of firm silt above the soft silt. The upper 13 feet of surficial soils were soft silt and very loose sand. The medium dense to dense sand encountered at and near the proposed pipe elevation represent favorable soils for HDD construction, although the overlying soft silt presents risks for inadvertent drilling fluid returns. Since these soils would be expected near HDD entry and exit at shallow depth on land, these risks could be mitigated by mobilizing equipment to clean up any drilling fluid returns. The soils encountered in BS-08 at and near the proposed HDD bore elevation were medium dense to very dense sands, overlain by a thin layer of firm silt, and approximately 25 feet of medium dense to dense sand. Surficial soils to approximately 22 feet depth were very loose sands. The relatively thick medium dense to dense sands and firm silt represent favorable ground conditions from HDD bore elevation to approximately 40 feet above the bore. These soils would provide good protection against inadvertent drilling fluid returns and would provide reasonable stability against bore collapse and loss of circulation.

The soils encountered in BS-09 at and near HDD bore elevation were medium dense to dense sand and firm silt, overlain by approximately 10 feet of very soft silt and very loose sand, and approximately 10 feet of stiff silt. Surficial soils to approximately 30 feet depth were interbedded soft to firm silt. These three borings indicate favorable ground conditions at and near HDD bore elevation, overlain by relatively thin layers or lenses of soft or loose soils. The indicated soil conditions are generally favorable for HDD construction and far superior to the ground conditions indicated by borings within GEHB. The proposed ACE HDD bore presents far lower risks than any of the GEHB bores evaluated, due to its shorter length, much longer pipe layout areas, and much more favorable anticipated ground conditions.

7. ***The two longest Alternative A HDD alignments present far lower risks than the GEHB bores.*** The two long HDD bores proposed by the South Jersey Gas design team along the Alternative A alignment present far lower risks than any of the potential GEHB HDD bores identified and evaluated. The Cedar Swamp Creek and ACE HDD bore lengths are well within the HDD industry state of practice. The lengths of all of the potential GEHB HDD bores are near the edge or beyond the state of practice in the industry. The soils encountered in borings drilled in the vicinity of the CSC and ACE HDD bores are generally favorable for HDD construction. The soils encountered in borings in the vicinity of the potential GEHB HDD crossings are extremely unfavorable for HDD construction. The GEHB crossings present very high risks of inadvertent drilling fluid returns, and present very high risks of bore collapse and loss of circulation. Steering response would be extremely poor for the potential GEHB crossings. The inadequate pipe layout area for the GEHB crossings, coupled with the extreme bore lengths and adverse soils conditions, present extremely high risk of failure to complete the bore. Adverse environmental consequences are far more likely for the potential GEHB bores, because of the long aqueous crossing. It would be impossible to mobilize and clean up the numerous inadvertent drilling fluid returns which would occur along the bottom of the GEHB. In summary, the potential GEHB HDD crossings are technically unsound, without successful precedent, fatally flawed, and should be avoided. The Alternative A alignment long HDD bores are within the state of practice of the HDD industry, have numerous successful precedents, are technically sound, and are far superior to the GEHB crossing alternatives.

I have reached my expert opinions with a high degree of scientific certainty, based on my review of available documents and my extensive experience and expertise in HDD design and construction oversight. I reserve the right to supplement or revise my opinions should additional evidence or facts become available which would warrant reconsideration.

Sincerely,

David Bennett PhD, PE (CA)

Figure 1. Depiction of portions of alternative routes A, B, and G, three alternative GEHB HDD crossings, and two longest HDD bores proposed along alternative A route.

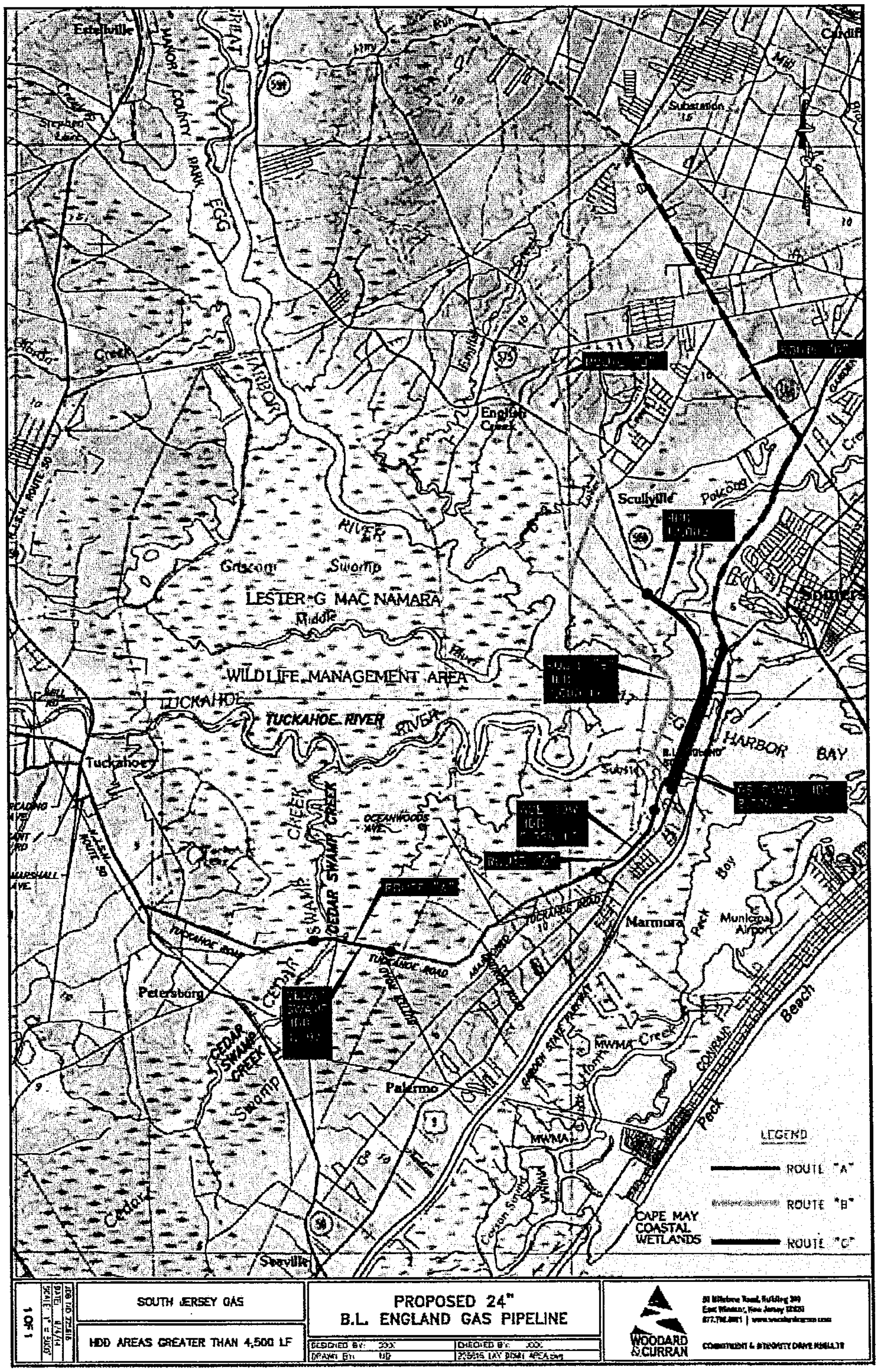


Figure 2. Profile of proposed Cedar Swamp Creek HDD crossing and BS-04 boring log.

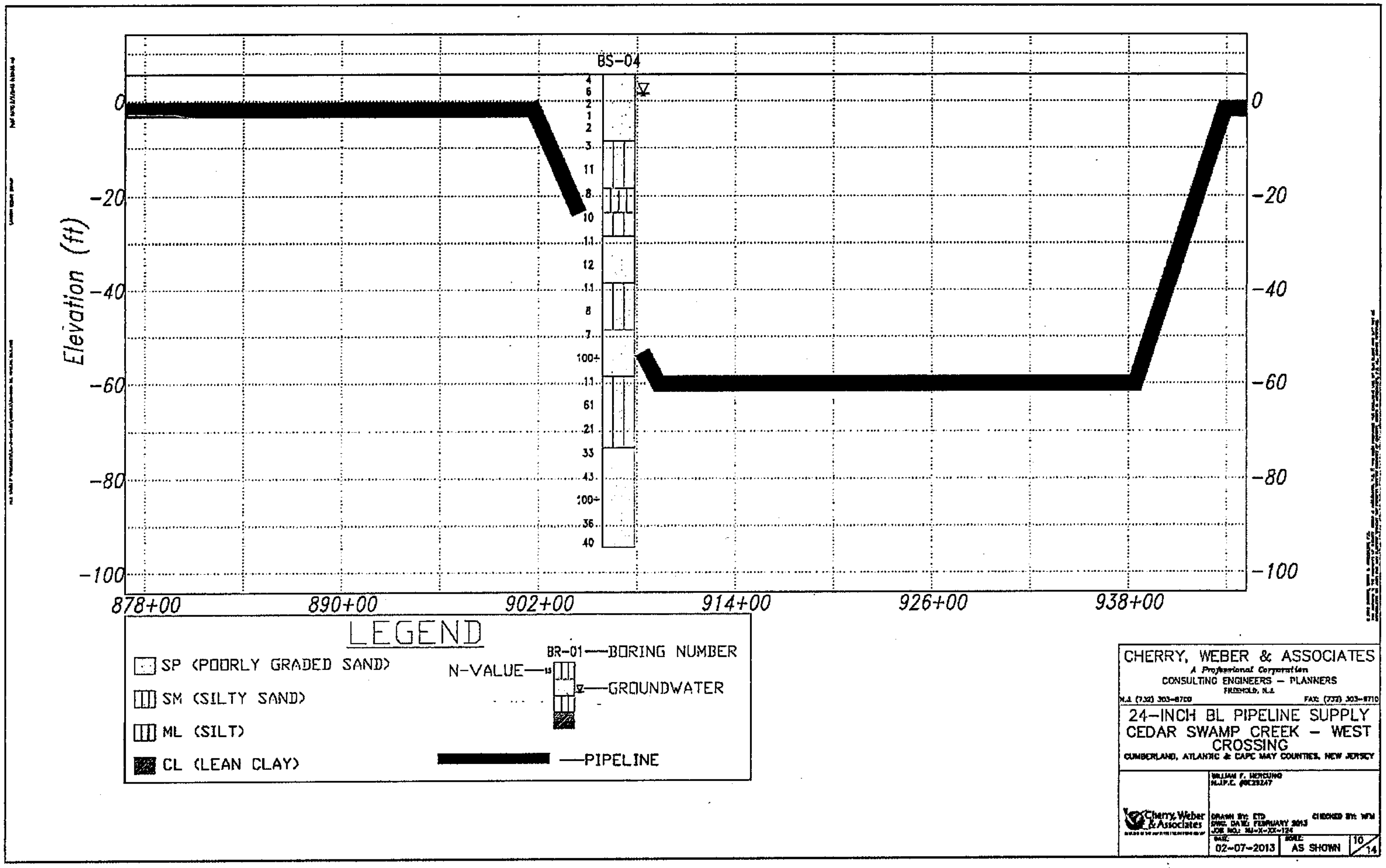
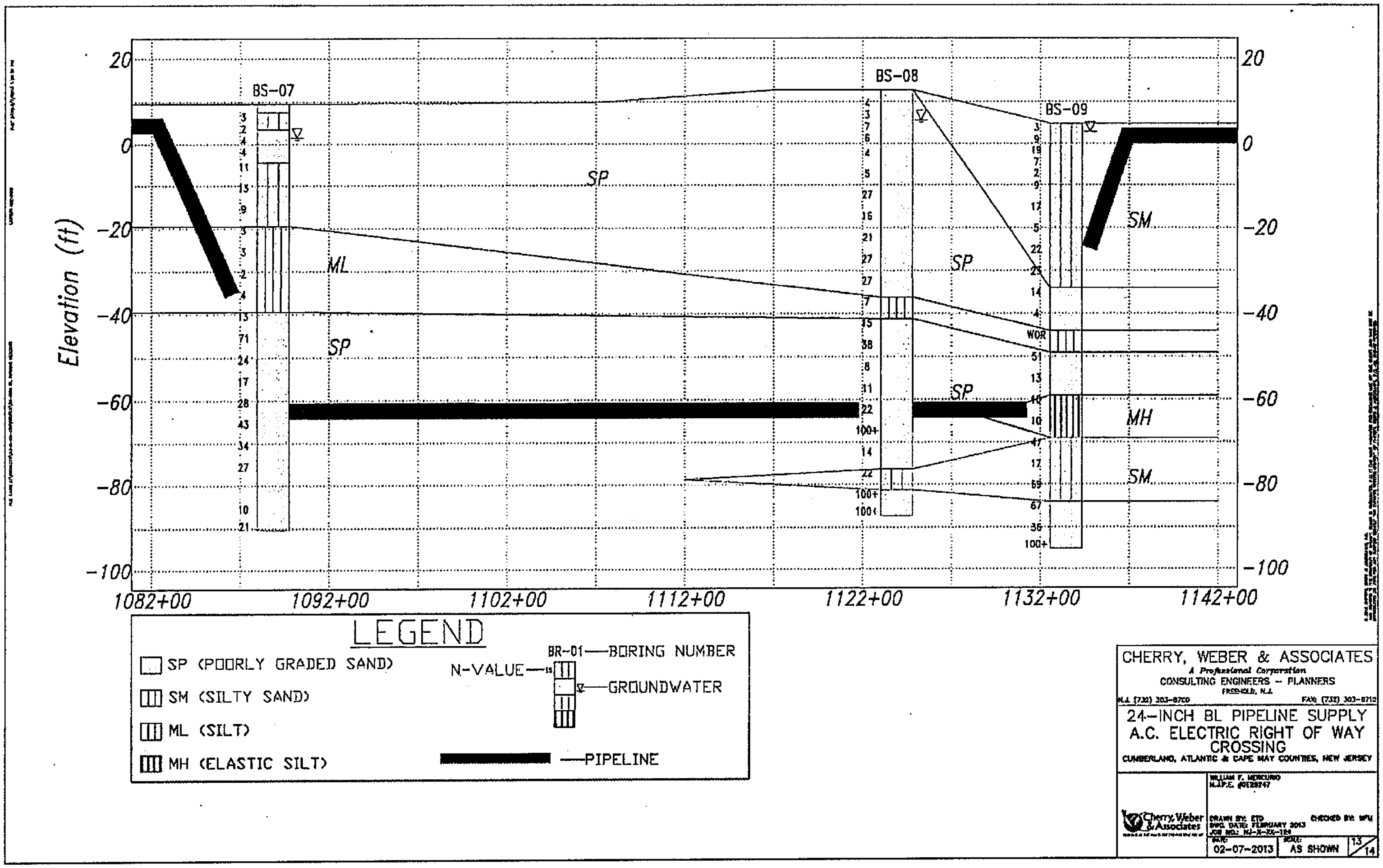


Figure 3. Profile of Atlantic City Electric proposed HDD crossing and BS-07, BS-08, and BS-09 boring logs.



Appendix A: List of Documents Reviewed and Relied Upon

Bennett, David, and Ariaratnam, Samuel, 2008. "HDD Good Practices Guidelines", HDD Consortium, 3rd edition, copyright, North American Society for Trenchless Technology

Bennett, David, and Wallin, Kathryn, 2008. "Step-by-Step Method for Evaluation of Hydrofracture Risks on HDD Projects". Proceedings, No-Dig 2008, Dallas, TX

Cherry, Weber & Associates, 2013. "Geotechnical Engineering Report: 24-inch BL England Pipeline Supply Project", July 10, 2013.

Harroun Incorporated, 1973. "Engineering Soil and Foundation Analysis, BL England Generating Station, Unit No. 3 Natural Draft Cooling Tower ", prepared for United Engineers and Constructors, April, 1973.

Hyland Design Group, 2012. Drawing Sheet 1 of 1, BL England Generating Station Wetlands Conservation Area, August 21, 2012.

Hyland Design Group, 2008. Drawing Sheet 1 of 2 1, BL England Generating Station Plan of Freshwater Wetlands/Water Delineation, April 8, 2008.

Knoerle, Bender, Stone & Associates, 1970. " New Jersey Turnpike Authority, Garden State Parkway, Contract 77-526 Grading, Drainage, Paving, and Structures, Greater Egg Harbor Crossing Improvement", profiles of boring logs and boring location plan, August, 1970.

Michael Baker, 2011. Boring logs from 2011 New Jersey Turnpike Authority Garden State Parkway Bridge Replacement Project Geotechnical Investigation.

New Jersey Turnpike Authority, 2014. Letter with attachments to Mr. Steven Ewing, VP, Woodard and Curran: Subject-Proposed Gas Line Installation for BL England Power Plant, July 14, 2014.

Pinelands Preservation Alliance Staff, undated. "Review of Alternatives", printout of PowerPoint presentation, 20 pages.

Sprague and Henwood, 1964. "Profile of Boring Logs, Reconstruction of Tuckahoe Road Crossing at Cedar Swamp Creek", April 23, 1964

Woodard and Curran, 2013. "Alternatives Analysis Addendum to the June 18, 2012 South Jersey Gas-BL England Gas route Analysis Report", January 10, 2013.

Woodard and Curran, 2012. "South Jersey Gas-BL England Gas Route Analysis Report, June 18, 2012.

Woodard and Curran, 2014. “Proposed 24” BL England Gas Pipeline”, Plan view map of Routes A, B, and G.

Woodard and Curran, 2013. “Cedar Swamp Creek – HDD”, two drawings depicting plan and profile views of Atlantic City Electric HDD bore.

Appendix B: Boring Logs and Depth Intervals with Very Soft to Soft Soils

2011 NJTPA GSP Bridge Replacement Geotechnical Investigation (Michael Baker, 2011)

Boring Number	Very Soft to Soft Soils? (1 = yes)	Elevation of Very Soft Soils (3 blow counts or less)	Elevation of Soft Soils (4 to 7 blow counts)
B-1	1	1.4 to 0.4, -1.6 to -6.1, -22.1 to -26.1, -32.1	0.4 to -1.6, -33.1, -38.1
B-2	1	5.4 to -0.6, -10.6, -21.6 to -29.1	-1.6 to -4.6, -11.6
BL-3	1	3.3 to 0.3, -22.7	-0.7 to -1.7, -4.7 to -5.7, -23.7
BL-4	1	3.4 to -1.6, -3.6, -22.4	-2.6
B-4A	1	0.1, -20.4	-3.9
BL-7	1	-46.0, -50.2, -55.7	0.3, -4.7 to -9.7, -17.7, -30.2, -35.2, -47.0 to -49.2, -51.2, -56.7, -85.7
B-8	1	4.7, 2.7, 0.7, -1.3, -4.2 to -34.7, -41.7 to -51.2, -55.7 to -61.7, -66.7 to -68.7, -75.7, -85.7	3.7, 1.7, -0.3, -36.7
B-9	1	3.2 to 2.2, -5.8 to -35.3, -42.3, -57.8 to -62.8, -67.3 to -72.3, -77.3, -87.3	-1.8, -3.8, -47.3, -52.3
B-10	1	-1 to -36, -55.5	1 to 0, -60.5 to -66.5, -86
B-11	1	0.6 to -0.4, -4.2 to -20.7, -25.7 to -41.7	4.8 to 3.6, -1.4, -21.7
B-12	1	6, 2 to 1, -2 to -18.8, -23.8, -28.8	0 to -1, -33.8, -58.8, -73.8, -84.3
B-13	1	0.6 to -32.5, -40	
BL-16	1	-5 to -9, -31 to -42	7 to 5, -6, -10 to -28, -46.7, -76.7, -81.7
B-17	1	3.4 to 2.4, -4.6, -6.6, -12.6 to -37.1	1.4, -0.6, -5.6, -7.6
B-18	1	0.9, -13.6 to -39.1	-0.1 to -1.1, -5.1, -7.1 to -12.6, -40.1 to -44.1
B-19	1	-3.6 to -10.1, -35.6	0.4, -40.6
BL-20	1	3.4	5.4 to 4.4, 1.4, -7.2, -20.6
BL-20A	1	-36	
BL-21	1	-3.1 to -3.3, -25.2	1.7, -20.2 to -24.2, -34.6, -59.3
BL-22	1	-20, -24.5	1.9, -4, -15, -21, -25.5, -34.5 to -25.5, -49.5
BL-23	1	-35.5	-3.5, -20.5 to -25.5, -64.4
BL-24	1	0.9, -19.6, -35.9, -36.9	-1, -3.1 to -4.1, -20.6, -44.6, -59.6 to -60.6
WB-1	1	-16.1 to -25.1, -61.1	-5.6 to -6.6, -26.1, -51.1, -62.1, -82.2 to -83.2

WB-2	1	-3.3 to -9.6, -12.9 to -19.6, -23.8 to -24.8, -34.1 to -35.1, -83.1, -108.8	-58.5 to -63.6, -109.8
WB-3	1	-4.5 to -30, -35 to -48, -60	-31, -50, -75 to -76
WB-4	1	-5.5 to -51	-56 to -61
WB-5	1	-7.3 to -42.8	-47.8
WB-6	1	7.8 to -46.3, -113.3	-63.7, -114.3
WB-7	1	-11.9 to -41.4, -108.4 to -111.4	-42.4, -52.4 to -53.4, -72, -112.4
WB-8	1	-27.3 to -42.5, -52.5	-43.5, -53.5, -147
WB-9	1	-50.5 to -60, -71, -105, -117, -156, -158	-62, -116, -157
WB-10	1	-10.5 to -41	-62.2, -156.5
WB-11	1	-2 to -51.5, -102 to -105	-57.5 to -62.5
WB-12	1	-2.5 to -52, -58 to -62, -108	-53, -113.5 to -114.5
WB-13	1	-4.7 to -45.7, -56.2 to -60.7	
WB-14	1	-5.6 to -46.1, -118 to -120	-57.1 to -61.9, -76, -115
WB-15	1	-6 to -49.5, -119	-56, -61 to -64.5
WB-16	1	-5.4 to -46.4, -56.6, -70.6 to -71.6	-57.6, -65.9, -120
WB-17	1	-4.1 to -47.6, -69	-54, -59 to -60, -70, -104, -114
WB-18	1	-3.5 to -52, -69 to -70	-99.3, -109.2
WB-19	1	-3.3 to -49.3, -58, -68, -88.8, -94.3, -99.4	-59, -69, -89.8, -95.3, -118
WB-20	1	-2.3 to -49	-67, -77 to -87
WB-21	1	-1.4 to -36, -66, -81 to -83	-37, -72
WB-22	1	-6.1 to -36, -46.4	-37 to -41, -51, -56, -61 to -63, -76 to -79
WB-23	1	-11.3 to -37.7, -81	-38.7, -46, -51, -61
WB-24	1	-16.1 to -40, -81, -86	-41, -46, -82, -87, -96 to -98, -112
WB-25	1	-17.2 to -36.7, -77 to -79, -107	-37.7, -42, -47
WB-26	1	-18.9 to -38.4, -53, -73, -79 to -82, -94	-44, -48, -54 to -58, -74
WB-27	1	-15.1 to -38.6, -75, -80, -103 to -105	-45, -50, -55, -60, -95, -100
WB-28	1	-7.8 to -37	-42, -52, -72, -78 to -82, -94, -99
WB-29	1	0.8 to -37.7, -77 to -83	-51, -56, -76, -96
	51		