

July 2, 2019

Delivered via FedEx Overnight Delivery

Ms. Bobbi Coleman
South Carolina Department of Health and Environmental Control
Assessment Section, UST Management Division
Bureau of Land and Waste Management
2600 Bull Street
Columbia, South Carolina 29201



**Subject: Response to Comments for DHEC Letter Titled, "Review of Monitoring Data and Response to Comments", dated May 3, 2019
Plantation Pipe Line Company
Lewis Drive Remediation Site
Belton, South Carolina
Site ID #18693, "Kinder Morgan Belton Pipeline Release"**

Dear Ms. Coleman,

On behalf of Plantation Pipe Line Company (Plantation), Jacobs Engineering Inc. (Jacobs) has prepared this response to comments received from the South Carolina Department of Health and Environmental Control (DHEC) in a letter date-stamped May 3, 2019. Each DHEC comment is presented below, followed by Plantation's response. It is our understanding that these comments include the review of the fourth quarterly report, though it is not noted as a document reviewed in DHEC's letter. Many of the responses contained herein were discussed with DHEC during the May 17, 2019 meeting. Action items from that meeting have been provided under separate cover.

As was discussed at the May 17, 2019 meeting with DHEC, Plantation is highly concerned about numerous allegations presented in DHEC's May 3, 2019 letter that Plantation believes are incorrect, not representative of the vast body of data available for the site, and misleading to the public and third parties interested in the remediation of the Lewis Drive site. Plantation believes that remediation is progressing extremely well and that there are only minor areas that need some additional remediation outside of the current air sparging system. For example, to address increased contaminant concentrations in the vicinity of MW-38 and MW-46, Plantation is planning oxidant injections in these areas. Depending on the injection results, potential expansion of the air sparging system will be considered. Please note that Plantation believes that the impacts at MW-46 occurred prior to the installation of the air sparge system near Cupboard Creek. Those impacts are not a result of insufficient treatment by the air sparge system.

Comment 1: *The majority of the wells were not gauged October and November 2018. DHEC specifically stated that monthly gauging must continue and the Corrective Action Plan Addendum (CAPA) be followed in the November 19, 2018 conference call and in previous correspondences (Coleman to Aycock) on December 11, 2018, May 8, 2018, and December 14, 2017. Regarding Plantation Pipe Line's (PPLs) request to change the gauging and sampling of monitoring wells and recovery features, DHEC concurs with quarterly gauging and monitoring with the exception of MW-7, MW-15B, MW-17B, MW-20, MW-26, MW-34, MW-36, MW-37, MW-38, MW-39, MW-40, and MW-41. DHEC prefers monthly sampling, as*

stated in the December 11, 2018 correspondence (Coleman to Aycock). However, DHEC agrees to sampling of these wells every 6 weeks as proposed in the January 17, 2019 Response to Comments Correspondence and agreed to in the April 5, 2019 meeting. However, groundwater monitoring well MW-46 must be included in the more frequent monitoring schedule to be conducted every 6 weeks. In regard to sampling newly installed wells MW-51, MW-52, MW-53, and MW-54, DHEC agrees to the amended sampling schedule from monthly to every six weeks for the remainder of the initial four sampling events. Based upon the initial data collected from MW-51, MW-52, MW-53, and MW-54, sampling frequency can be re-evaluated for these wells. A revised CAPA will need to be provided as a stand-alone document when the Annual Report (AR) is submitted. All proposed changes will need to be provided in a different colored font.

Response: Noted. To reduce confusion and as agreed to at a meeting held May 17, 2019, a comprehensive monitoring, reporting, and product recovery plan covering the period from April 1, 2019 through March 31, 2020 was submitted to DHEC on May 30, 2019. The plan will supersede any monitoring and reporting requirements laid out in previous correspondence, any version of the Corrective Action Plan, and the Interim Free Product Recovery Plan, Revision 4. This plan will expire on March 31, 2020 and will be replaced with a revised plan to be discussed and agreed upon by Plantation and DHEC for the next year or period.

Comment 2: Surface water samples were not collected nor analyses run on surface water October and November 2018. DHEC specifically stated that monthly gauging must continue and the CAPA must be followed in the November 19, 2018 conference call and in previous correspondences (Coleman to Aycock) on December 11, 2018, May 8, 2018, and December 14, 2017. The only agreement regarding changes to the surface water sampling schedule was provided in the December 11, 2018 correspondence whereby DHEC agreed that surface water sampling locations FP-1, FP-2, FP-3, and SW-6 could be omitted from routine sampling. A revised CAPA will need to be provided as a stand-alone document when the AR is submitted. All proposed changes will need to be provided in a different colored font. DHEC does not concur with the proposal to sample all monitoring wells and surface water on a quarterly basis. Surface water must continue to be sampled monthly as discussed in the April 5, 2019 meeting.

Response: Noted. Section 3.5 of the CAPA Rev 2 states that "Surface water samples will be collected weekly during startup, monthly for the first 6 months of operations, and quarterly for the following year of operations from each of the 17 locations indicated on Figure 2. As needed, any recommended alterations to the monitoring frequency after the first year will be proposed to DHEC and will be summarized in the Annual Report..." By October and November 2018, the system had been running for over 6 months and the sampling frequency was believed to be on a quarterly schedule. Obviously, there was a misunderstanding.

To reduce confusion going forward and as agreed to at the May 17, 2019 meeting, a comprehensive monitoring, reporting, and product recovery plan covering the period from April 1, 2019 through March 31, 2020 was submitted to DHEC on May 30, 2019. The plan will supersede any monitoring and reporting requirements laid out in previous correspondence, any version of the Corrective Action Plan, and the Interim Free Product Recovery Plan, Revision 4.

Comment 3: PPLs request to remove two features located up-gradient of Brown's Creek, Recovery Trench 2 (RT-2) and the reactive core mats installed to address seeps, was evaluated by DHEC as discussed in the April 5, 2019 meeting. Regarding RT-2, DHEC has had concerns regarding its effectiveness, as the water table elevation in many points within the trench has in the past been frequently above the trench's screened interval as stated in the December 11, 2018 correspondence (Coleman to Aycock). DHEC's evaluation of this request is provided in comment 18.

Response: There appears to have been a misunderstanding about the reactive core mats. The mats were never proposed to be removed, just filled and graded over to smooth the area. Portions of the mats would be filled where depressed and if at grade, left alone.

The RT trenches were never designed or intended for monitoring and only have vertical casings because of how the trench had to be constructed (i.e., utilizing a series of extraction points versus a continuous dug trench with gravel backfill/french drain). PPL no longer has any intention to remove these site features.

Regarding Comment 18, the monitoring wells noted are along the edge of Brown's Creek. As discussed at the May 17, 2019 meeting, it is impossible to construct the wells to bridge the water table and be close to Brown's Creek which was the intent of the existing wells. Because of the depth to water in these areas it would not be possible to provide a reasonable surface seal. Since installation, the water table has been nearly at ground surface in these seven wells, submerging their screened intervals. Nearby upgradient monitoring wells, MW-15 and MW-25, have screened intervals that bracket the water table and have no signs of free product. Regardless, in Brown's Creek Zone and Cupboard Creek Zone, there has been no free product measured since May 4, 2017 and dissolved concentrations do not support the presence of free product.

Comment 4: *PPLs request to remove 43 product recovery features was evaluated. In regard to the trench in the area of Brown's Creek please see comments 3 and 18. In regard to the recovery sumps (RSs) in the area of the Hayfield Zone, ground water elevation changes have been significant, in some locations that range being greater than 15 feet. In regard to the recovery wells (RWs) and Recovery Trench 1 (RT-1), the variation tends not to be as great. Considering that the current groundwater elevation is significantly elevated when compared to the past groundwater elevation, DHEC requests that product recovery features remain in place. DHEC agrees to quarterly gauging for all RWs, RS-1, RS-2, RS-5, RS-14 and RT-1 and semi-annual gauging of the remainder of the RSs ensuring that one of the two events captures when groundwater elevation is expected to be at its lowest. DHEC notes PPLs concerns that the product recovery features were never intended for monitoring the effectiveness of the remediation system, that they are an eyesore and are detrimental to public perception of the site, and are no longer useful for their initial purpose. However, in that a pilot study was never conducted to determine the effective radius of influence of the air sparge system, these additional monitoring points are beneficial in recording the impact of the air sparge system as many are closer to the air sparge system than groundwater monitoring wells. Additionally, many of the product recovery features were installed in the known preferential path of contaminant movement which aids in monitoring the effectiveness of the corrective action system. A revised CAPA will need to be provided as a stand-alone document when the AR is submitted. All proposed changes will need to be provided in a different colored font.*

Response: We disagree with the statement/argument above. Plantation is no longer pursuing removal of the recovery features, and will no longer gauge them. As of March 5, 2019, each of these features has been gauged an average of 311 times since March 2015, and 75 times since system start up in March 2017. A comprehensive data set is available for evaluation. Plantation believes that removal of the piezometers and recovery features has nothing to do with determining the radius of influence of the air sparge system. These features serve no purpose for monitoring radius of influence or for other means. Product recovery was an interim measure implemented during the ER phase of the release. It was supplanted by the current air sparge remediation system which has been operational since March 2017.

Additionally, given Plantation's extensive experience in implementing air sparging in the piedmont soils, there was no need to conduct a pilot test. The systems at Lewis Drive were conservatively spaced to achieve the desired performance. In fact, the performance of the system to date has been outstanding. The system has provided marked reductions in dissolved hydrocarbon concentrations and free product in the established treatment zones. Dissolved concentrations continue to show an overall decreasing trend, and in areas outside the treatment zones, concentrations are stable. From April 2018 to March 2019, the amount of free product recovered decreased from approximately 4,210 gallons to only 9.12 gallons (99.9% reduction). From December 2018 to March 2019, no monitoring wells or recovery wells/features within the BCPZ or the CCPZ contained measurable product. Continual adjustments are being made to the system to focus treatment in the areas most needed. Given the vast amount information that exists at this site it is incorrect for DHEC to be making these kinds of statements.

Comment 5: *Regarding PPLs request to remove all remaining one inch diameter wells/ piezometers at the site, DHEC re-evaluated the value of these wells for gauging and based on this re-evaluation believes that comments provided in the May 8, 2018 correspondence (Coleman to Aycock), "As these piezometers*

have value as a resource to monitor the free phase petroleum levels in key areas and are beneficial as a measure of comparison due to their existence near the initiation of site assessment" remain valid. The majority of the one inch diameter wells/ piezometers within the CAPA (TW-55, TW-59, TW-60, TW-64, TW-66, TW-67, TW-73, and TW-96) are useful to monitor areas where monitoring wells are not present and for those near the air sparge system aid in evaluating the radius of influence of the system. Further, based upon additional re-evaluation, DHEC requires that TW-28, TW-41, TW-42, TW-45, TW-46, TW-59, and TW-94 be included in the CAPA for routine free product gauging and groundwater elevation measurement due to their location in the path of the greatest contaminant migration towards Brown's Creek and for those one inch diameter wells/ piezometers near the air sparge system these wells aid in evaluating the radius of influence of the system. A revised stand-alone CAPA will need to be provided when the AR is submitted. All proposed changes will need to be provided in a different colored font.

Response: We disagree with the argument/statement above. Plantation is no longer pursuing removal of the piezometers, and will no longer gauge them. Plantation believes that removal of the piezometers has nothing to do with determining the radius of influence of the air sparge system as discussed in more detail in the response above. These features serve no purpose for monitoring radius of influence or for other means. The latter part of this comment is addressed by the monitoring, reporting, and product recovery plan covering the period from April 1, 2019 through March 31, 2020, referenced in the response to Comment 1 in this correspondence. .

Comment 6: Conflicts between Table 4 (Groundwater Elevation and Product Thickness Data) and Table 5 (Dissolved Oxygen Results for Groundwater) in the Third Quarter Monitoring Report were noted in regard to the presence of FPP in MW-16, MW-18, and MW-20. Table 4 does not document the presence of FPP in MW-16 or MW-20 on July 11, 2018 whereas Table 5 does document the presence of FPP in these wells. Also Table 4 does not document the presence of FPP in MW-16 or MW-18 on September 11, 2018 whereas Table 5 does document the presence of FPP. This will need to be corrected in revised table(s) provided in a separate appendix within the AR.

Response: Noted. Revised tables will be provided in the annual report and an errata document will be provided to include with the above referenced documents. Please note that there are cases where a product sheen is observed in a well, but there is not a measurable amount of product (i.e., <0.01 ft). This will be noted where applicable in the upcoming annual report.

Comment 7: Please clarify what data is being used to create contour lines for dissolved benzene in the area of MW-46 and the area of MW-45 | MW-23. Figure 4A in the Third and Fourth Quarter Monitoring Reports illustrate a discontinuous plume; however, data to support this determination is lacking. Data or a revised figure will need to be provided in as a separate appendix within the AR.

Response: We have no data to support a separation or to show a connection with other parts of the plume in this area of the site. Obviously, the impacts in MW-46 migrated in some means to arrive at MW-46, however, any depiction of such would be only based on supposition and not data. The benzene contour lines that depict an isolated impact at MW-46 use data from four wells upgradient from MW-46 (MW-21, MW-45, MW-23, and MW-26), which had no benzene concentrations above detection limits for the December 2018 groundwater sampling event.

Comment 8: Data being used to create the 1,000 ppb contour line for dissolved benzene around MW-17B on Figure 4B in the Third Quarter Monitoring Report will need to be provided. To DHEC's knowledge there are no other bedrock wells in the area. Clarification or a revised figure will need to be provided in a separate appendix within the AR.

Response: Noted. An errata will be provided for the above subject report and all other reports where isoconcentration lines have been depicted for bedrock impacts. Please note that it was and is inappropriate for isoconcentration lines to be drawn in bedrock given the fractured nature of the media. As such, no contours have been presented since the submittal of the third quarter monitoring report.

Comment 9: *PPL stated in the January 17, 2019 correspondence (Waldron to Coleman) that bubbling or other qualitative observation would be provided in the gauging table. However this could not be located. In the future these observations will need to be provided on Table 4 (Groundwater Elevation and Product Thickness Data) and a revision to Table 4 will need to be provided in a separate appendix within the AR.*

Response: Noted. An updated format for Table 4 was submitted in the 4th Qtr. Monitoring Report, which was submitted to SCDHEC at the same time the May 3 letter was being produced. The requested information will be provided moving forward. A revised version of Table 4 is provided. See response to Comment 6.

Comment 10: *The Project Manager for the site must be copied on all correspondence, plans, and or reports sent to DHEC going forward. Copies of previously documents submitted to the Bureau of Air Quality and the Bureau of Water and any responses received must be provided in a separate appendix within the AR.*

Response: Agreed. The project manager for the site will be copied on all future correspondence sent to DHEC and any documents that have not been previously provided. A copy of the most recent letters to the above noted departments is attached. Should DHEC believe that other correspondence exists that DHEC does not have, please let us know and such will be provided.

The annual report will not contain any previously submitted documents to the Bureau of Air Quality and the Bureau of Water since those are in DHEC's communication record and are not a part of the ongoing monitoring and reporting for the site.

Comment 11: *In that wells are no longer being sampled monthly, low flow sampling purging and sampling procedures will need to be conducted. A revised stand-alone Quality Assurance Project Plan (QAPP) will need to be provided when the AR is submitted. All proposed changes will need to be provided in a different colored font. Should sampling be conducted prior to submittal or approval of the revised QAPP, low flow purging and sampling should be conducted and stabilization achieved prior to sampling following low flow purging procedures.*

Response: The wells will continue to be sampled in accordance with the Site Quality Assurance Project Plan (QAPP). We could not find any EPA or DHEC guidance that uses frequency as a determining factor for sampling method. Furthermore, there is no technical justification to change monitoring methods and using low flow purging would be wasteful and contrary to DHEC and EPA's objectives to reduce/minimize waste production.

Comment 12: *PPL agreed in the January 17, 2019 correspondence (Waldron to Coleman) that a standardized field data sheet will be used during future sampling events. However, these sheets could not be located. In the future standardized field data sheets will need to be provided.*

Response: Agreed. Future reports will contain the standardized sampling data sheets.

Comment 13: *In the future water supply wells should be sampled using EPA Method 524.2.*

Response: Agreed.

Comment 14: *Trend graphs must be enlarged in hard copy as agreed upon during the November 19, 2018 conference call in all future reports. Legible hard copies are necessary.*

Response: Agreed. Future reports will have 2 trend graphs per page.

Comment 15: *As discussed and agreed upon during the November 1, 2018 meeting and documented in the December 11, 2018 correspondence (Coleman to Aycock) neither MW-17 nor MW-19 will be abandoned. These monitoring wells will remain on the routine monitoring schedule.*

Response: Agreed. These wells will not be abandoned. There have been several opportunities in which these wells have sufficient water to sample.

Unnumbered statement in the body of the May 3 letter: *In the future any proposed changes to the CAPA must be provided in a stand-alone document. Review of monitoring report or any other miscellaneous document provided by PPL that discusses changes to the CAPA does not constitute approval of any changes to the CAPA.*

Response: Agreed. Furthermore, as agreed to in a May 17, 2019 meeting, Plantation has submitted a table summarizing comprehensive monitoring, reporting, and product recovery for the period April 1, 2019 to March 31, 2020. This table will supersede any plan published previously.

Comment 16: *Elevated contaminant concentrations in bedrock have continued to be unaddressed. DHEC requests an evaluation of the elevated contaminant concentrations in the bedrock aquifer be provided within the AR.*

Response: This is an inappropriate comment by DHEC and it is not correct or representative of the remediation work completed at the site. PPL has been evaluating hydrocarbon concentrations in the bedrock since the initial phases of the site investigation and have discussed with DHEC specific areas of the site where bedrock impacts are a concern. PPL has identified several areas of the site, such as MW-38 and MW-46 that need to be addressed and have remedial measures planned to address those areas. Additionally, the sparge system was expanded in the Cupboard Creek area to specifically address bedrock concentrations observed in wells such as MW-17B. Furthermore, all bedrock impacts are surrounded by the sparge systems at the site and there are not data to support a widespread concern with bedrock impacts. PPL will continue to evaluate bedrock impacts and the performance of the remedial system as has been consistently done to date.

Comment 17: *During evaluation of PPL's request for changes, it was noted that an updated Monitoring Well Survey that includes former and current wells is needed. It would be helpful if the air sparge system wells were also included on this map in a different color font for easier identification. DHEC requests that the updated well survey map be provided when the AR is submitted.*

Response: Noted. An updated site features survey will be provided under separate cover.

Comment 18: *To evaluate PPL's request to remove RT-2, DHEC conducted an evaluation of all well data in the area of Brown's Creek. It was noted that in addition to the RT-2, groundwater monitoring wells MW-24, MW-38, MW-39, MW-40, MW-41, MW-42 and MW-43 fail to bracket the water table. DHEC requests that PPL provide a strategy to monitor the area immediately up-gradient of Brown's Creek to determine if free phase product (FPP) is present and sample for dissolved phase constituents. According to the site's CAPA, the presence or absence of FPP is necessary to trigger an evaluation of recovery features. Section 5 of the CAPA states that FPP data will determine if the radius of influence of the Browns Creek Recovery Zone (BCRZ) and the Cupboard Creek Recovery Zone (CCRZ) sparge curtains will need to be evaluated. Therefore, the presence or absence of FPP must be known in this critical area immediately up-gradient of Brown's Creek in order to make a decision regarding the removal of RT-2. It is DHEC's position that additional shallow wells installed in the area where the surficial aquifer is not currently being bracketed would provide this information. When it has been demonstrated to DHEC, via the installation of additional water table bracketing wells in the area immediately up-gradient of Brown's Creek, DHEC will be able to make an informed decision on the removal of RT-2.*

Response: See responses to Comments 3 and 4. As agreed to in our May 17, 2019 meeting with DHEC, two hand auger borings, with field screening for VOCs, will be completed between the RT-2 and Brown's Creek. Plantation also plans to complete two additional hand auger borings between monitoring wells MW-34 and MW-40 to evaluate indications of potential presence of free product.

Comment 19: *DHEC also requires that an additional groundwater monitoring well be installed along Brown's Creek southeast of MW-40 near where a seep is shown on Figures 3 in the Third and Fourth Monitoring Reports and that a surface water sampling location is added southeast of SW-12 along*

Brown's Creek. It was also noted that groundwater monitoring well MW-46, in the area of the CCRZ fails to bracket the water table. Therefore, DHEC requires that additional shallow wells be installed in the area where the surficial aquifer is not currently being bracketed. A revised CAPA will need to be provided as a stand-alone document when the AR is submitted. All proposed changes will need to be provided in a different colored font.

Response: An additional well near MW-40 will not be installed. See Plantation's response to DHEC Comments 3 and 18, regarding the feasibility of constructing a well that brackets the water table along Brown's Creek. Regarding DHEC's comment to have monitoring wells installed in the vicinity of MW-46 at the CCRZ, recently installed monitoring wells MW-56 and MW-57 located downgradient from MW-46, bracket the water table.

Comment Untitled: *In summary: items 1-5 and 19 will need to be addressed in a revised CAPA, items 6-10 will need to be provided in a separate appendix within the AR, item 11 will need to be addressed in a revised QAPP, items 9-10 and 12-14 will need to be provided in future reports, item 16 will need to be provided within the AR, and item 17 will need to be provided as a stand alone document. All documents should be submitted along with the AR.*

Response: Noted. Regarding items 1-5, see Comment 1 Response. For item 19, see Comments 3 and 19 Responses. For items 6-10, see individual comment responses. Concur for items 9, 10, 12-14, and 17. Regarding item 16, see Comment 16 Response.

If you have any further questions or concerns, please call me at (919) 859-5789, or Mr. Jerry Aycock/Plantation at (770) 751-4165.

Regards,



William M. Waldron, P.E.
Program Manager

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File

Attachments:

Table 4 - Groundwater Elevation and Product Thickness Data, Revised
Figure 4B - Groundwater Analytical Results in Bedrock Aquifer, September 2018, Revised

Requested Correspondence

Submittal of Well Records for Permit-to-Operate Vertical Air Sparging Wells for Plantation Pipe Line Company, Lewis Drive Remediation Site, March 26, 2019 Letter
Request for Confirmation of Air Permit Exemption for System Expansion Revision, Feb 26, 2019 Letter
Submittal of UIC Permit Revision for Expansion of Biosparging Remediation System, May 16, 2018 Letter

