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March 13, 2018

*Delivered via FedEx Overnight Delivery*

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



Subject: **Lewis Drive – Memorandums from Environmental Standards, Inc. certified on January 26, 2018 and March 12, 2018**  
Plantation Pipe Line Company  
Belton, South Carolina  
Site ID #18693, "Kinder Morgan Belton Pipeline Release"

Dear Ms. Coleman,

On behalf of Plantation Pipe Line Company (Plantation), CH2M HILL Engineers, Inc. (CH2M) is submitting the attached certified Memorandums from Environmental Standards, Inc. These memorandums were submitted previously as attachments to reports, but in a meeting with SCDHEC on March 7, 2018 it was requested by SCDHEC they be re-submitted with certification from Environmental Standards, Inc. If you have any questions or concerns, please call me at 919-760-1777, Mr. Scott Powell/CH2M at 678-530-4457, or Mr. Jerry Aycock/Plantation at 770-751-4165.

Regards,  
CH2M HILL Engineers, Inc.

William M. Waldron, P.E.  
Program Manager

Attachments:

- Two memorandums from Environmental Standards, Inc. with associated certification letters

c: Jerry Aycock, Plantation (Digital, Jerry\_Aycock@kindermorgan.com)  
Mary Clair Lyons, Esq., Plantation (Digital, Mary\_Lyons@kindermorgan.com)  
Richard Morton, Esq., Womble Carlyle Sandridge & Rice, PLLC (Digital, rmorton@wcsr.com)  
File



# ENVIRONMENTAL<sup>®</sup> STANDARDS

Setting the Standards for Innovative Environmental Solutions

January 26, 2018

Mr. Scott Powell, PE  
Project Engineer  
Jacobs  
6600 Peachtree Dunwoody Road  
400 Embassy Row, Suite 600  
Atlanta, GA 30328, USA

Dear Mr. Powell:

Please find attached the MEMORANDUM Regarding the Review of Surface Water Data, dated January 17, 2018, addressed to Mr. Jerry Aycock of KM Products Pipelines SE and to you. I hereby certify that the memorandum, watermarked and secured in portable document format. My signature is affixed to this attached version and the document is locked from further editing.

I attest that the statements in the attached memorandum are true to the best of my knowledge and that the opinions therein are offered by myself, with no influence from others.

Please let me know if you have any questions or need further clarifications.

Sincerely,

David I Thal, CEAC, CQA  
Principal Chemist  
Environmental Standards  
8331 East Walker Springs Lane  
Suite 402  
Knoxville TN, 37923

cc: Mr. Jerry Aycock, KM Products Pipelines SE  
Environmental Standards Files



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**MEMORANDUM**

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Date: January 17, 2018

To: Mr. Jerry Aycock – KM Products Pipelines SE  
Mr. Scott Powell – Jacobs

From: Mr. David Thal CEAC, CQA – Environmental Standards, Inc.

Copy to: File – Environmental Standards, Inc.

Subject: Review of Surface Water Data

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**Introduction**

A release of an estimated 8,800 barrels of gasoline and a small amount of diesel fuel was identified and reported on December 8, 2014. The release was from a sleeve of a 26-inch product pipeline near Lewis Drive, Belton, South Carolina.

The site is located in the pipeline right-of-way between Lewis Drive, a rural two-lane undivided asphalt road, to the east and a hayfield to the west. The location on Lewis Drive is approximately 400 feet to the northwest of Lewis Drive's convergence with West Calhoun Road. (Figure 1)

A variety of source control, removal and other remediation actions were taken, including the installation of monitoring wells, recovery sumps, recovery wells, and recovery trenches. These actions included a recovery trench and recovery wells that were put in place to contain and control transport of contamination to Brown's Creek and an unnamed tributary thereto. Additionally, absorbent and impermeable booms were set up in the tributary itself as a backup measure.

Contamination from the release point is characterized by the chemical profile found in surface water from sampling location SW-12. Volatile organic compounds were detected in a surface water sample collected from sampling location SW-02 during a sampling event conducted on December 14, 2017.

**Evaluation**

The samples were analyzed by ESC Laboratory Sciences of Mt. Juliet, Tennessee (ESC). The reported data hydrocarbon data were examined to evaluate whether the contaminants were from the same source.

The instrument data for both samples provided from the ESC analyses were reviewed for data quality, and for mass spectral features to determine whether the contaminants in SW-02 could be from the Plantation Pipeline release.

The samples examined are summarized on Table 1:

Field Sample ID	Location	Date:Time Collected	Laboratory Report	Laboratory Sample ID
SW-02 -121417	SW-02 (Figure 1)	12/14/17:1430	ESC-L957851	L957851-10
SW-12-121417	SW-12 (Figure 1)	12/14/17:1505	ESC-L957851	L957851-13

A review of the quality control for the two analyses was conducted. The positive and negative controls were reviewed in addition to system monitoring recoveries. Spectral match quality was reviewed through review of the instrument data. All method indices were found to be within acceptance criteria, and support high confidence in the data obtained with regard to qualitative identification, accuracy, and precision.

A comparison of all analytes meeting a spectral match index of 80 or higher is presented in tabular form below (Table 2). In order to compare the profiles, each detected compound concentration was normalized to the sum of all compounds for the sample and was calculated as weight percent of detected compounds. The results are displayed in graphic form in the histogram in Figure 2.

Detected Compound	Weight Percent	
	SW-02	SW-12
ACETONE	2.0%	0.0%
DI-ISOPROPYL ETHER	11.0%	3.1%
T-AMYL ALCOHOL	24.5%	12.6%
TERT-AMYL METHYL ETHER	3.0%	0.0%
BENZENE	23.5%	12.2%
TOLUENE	10.5%	11.0%
ETHYLBENZENE	1.7%	3.5%
M&P-XYLENE	10.9%	23.8%
O-XYLENE	8.2%	16.1%
ISOPROPYLBENZENE	0.0%	0.2%
4-ETHYLTOLUENE	1.4%	5.6%
N-PROPYLBENZENE	0.2%	0.5%
1,3,5-TRIMETHYLBENZENE	0.0%	2.0%
1,2,4-TRIMETHYLBENZENE	1.7%	6.2%
1,2,3-TRIMETHYLBENZENE	1.0%	2.6%
NAPHTHALENE	0.4%	0.7%

An examination of all mass spectra for discernable peaks of the ESC mass chromatograms for the samples was performed. The compounds that could be identified with good spectral fit above background were used in the table and referenced histogram (Figure 2). The review

confirmed several features of the chemical profiles that indicate that the contaminants at SW-02 are primarily from a different source than those seen in SW-12.

Feature 1: Certain compounds were observed in SW-02 that were not present in SW-12. These include acetone and tertiary amyl methyl ether.

Feature 2: Significant differences were observed in the benzene/toluene ratios between the samples that do not conform to environmental degradation norms. Because the two samples have essentially the same weight percent of toluene, the significant differences in the benzene concentration cannot be attributed to the same source material being environmentally degraded. Had that been the case, the toluene in SW-02 would have also been reduced (though slightly less dramatically than the benzene).


Feature 3: The SW-12 sample had higher weight percentages of alkylated benzenes.

Finally, the overall "shape" of the profiles differ in a manner that indicates different sources. The dramatically higher percentages of di-isopropyl ether, tertiary amyl alcohol, and benzene in the SW-02 and the relatively high xylenes in the SW-12 location further distinguish the sources of contaminants to these two locations.

## Conclusions

A technical environmental forensic review of the laboratory data and information available regarding the surface waters from locations SW-02 and SW-12 was conducted. Based upon the GC/MS data it is readily apparent that the chemical profiles differ, and in at least one respect (benzene/toluene ratios) cannot be attributed to migration and degradation.

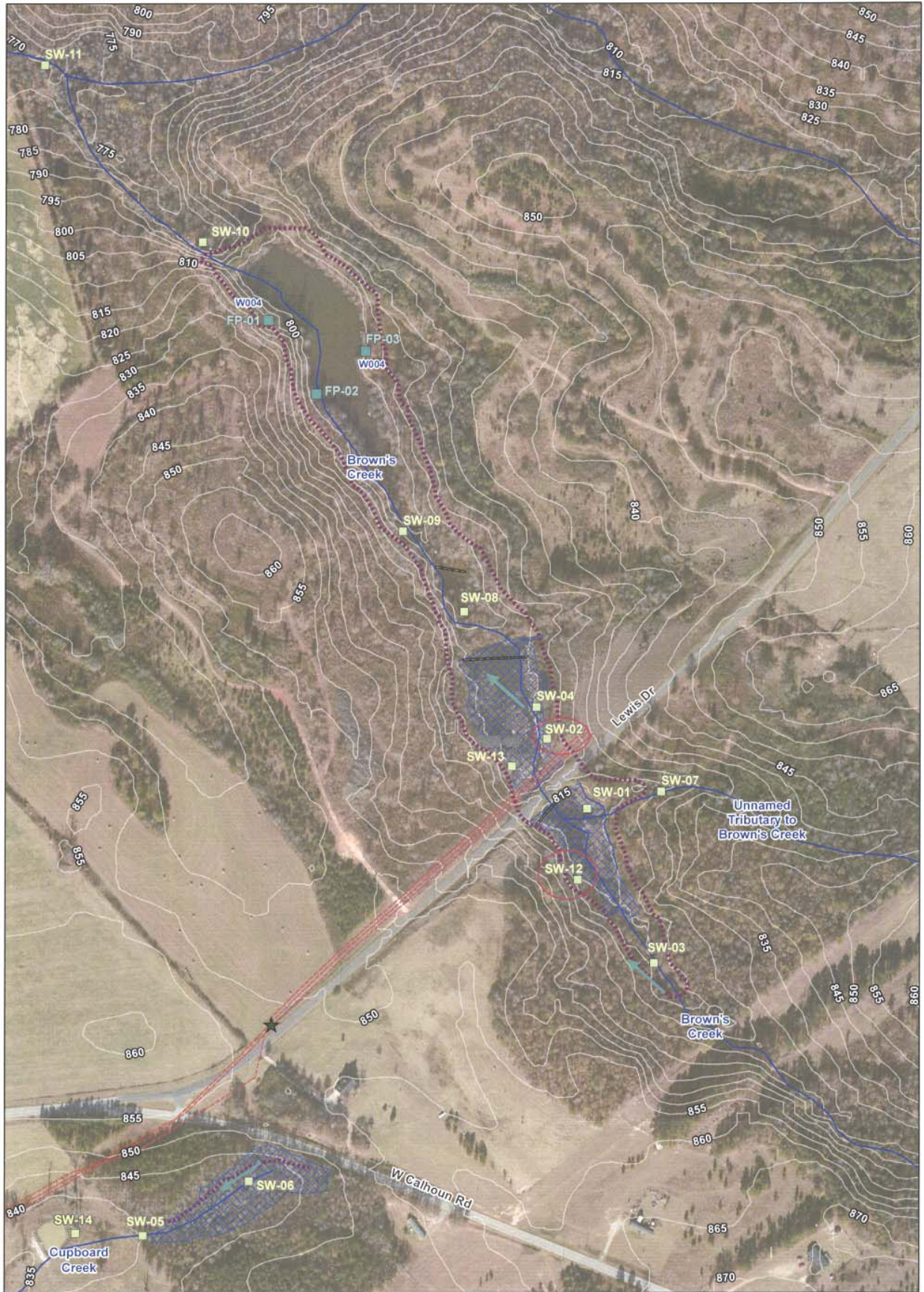
Any questions regarding this review may be directed to David Thal, CEAC, CQA at [dthal@envstd.com](mailto:dthal@envstd.com).

  
Digitally signed by David Thal  
DN: cn=David I Thal,  
o=Environmental Standards/ESA,  
ou=Knoxville Office,  
email=dthal@envstd.com, c=US  
Date: 2018.01.26 14:23:53 -0500

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**END OF MEMORANDUM**

FIGURE 1 - Lewis Drive Surface Water Sampling Locations



**LEGEND**

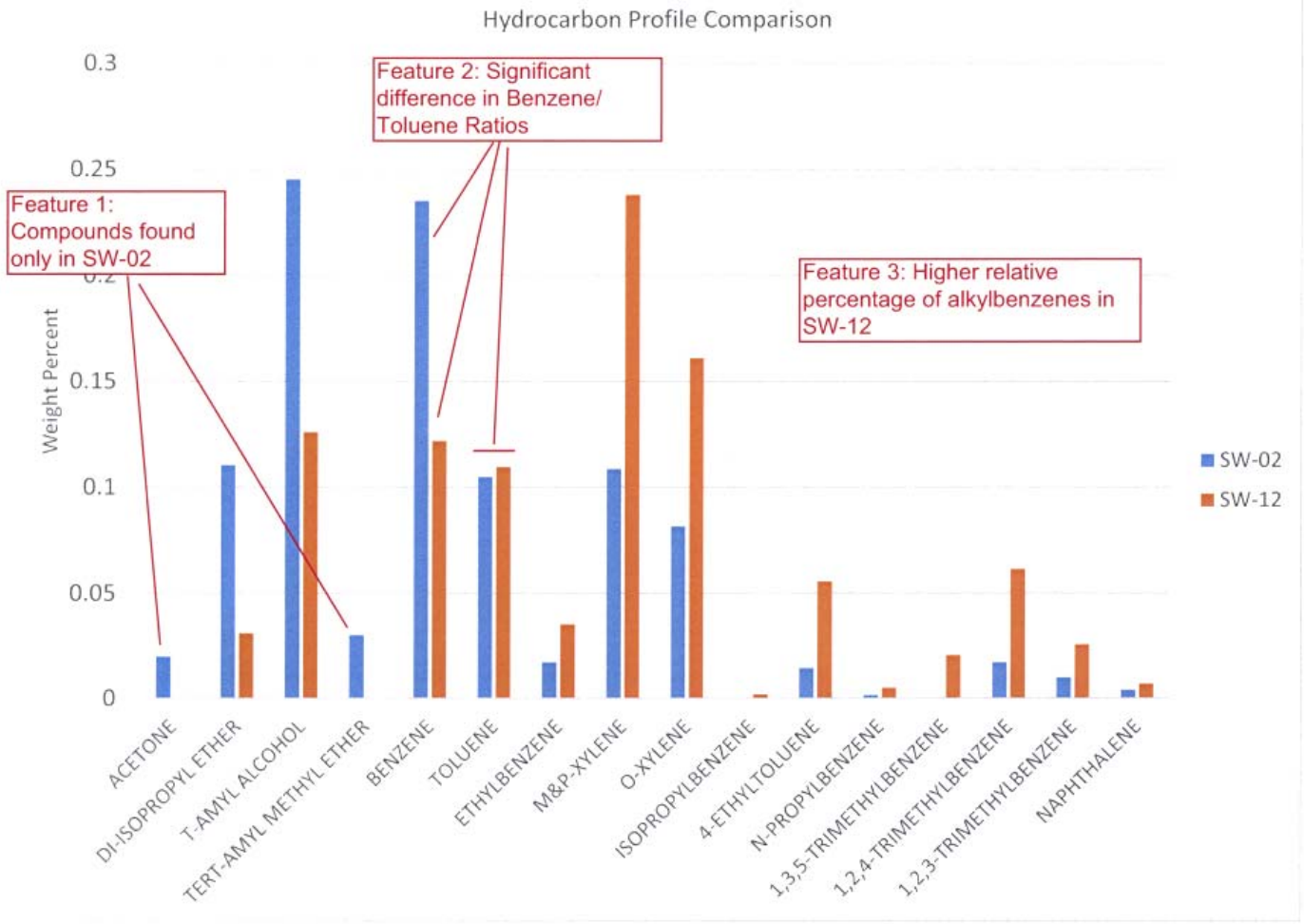
- ★ Release Point
- Surface Water Sampling Location
- Fish Pond Surface Water Sampling Location
- Pipeline
- Inspection Route for Sheen or Distressed Vegetation
- Flow Direction of Creek
- Topographic Contour (5-foot Interval)
- National Hydrography Dataset Stream
- Delineated Wetland
- ⊗ Beaver Dam



Base Map Source:  
 \*Environmental Systems Research Institute (ESRI) ArcMap  
 World Imagery, 2015  
 \*United States Geological Survey (USGS) National  
 Hydrography Dataset (NHD)

**Surface Water Monitoring Plan**  
 Corrective Action Plan Revision 2  
 Lewis Drive Remediation Site  
 Belton, South Carolina  
 Site ID #18693  
 "Kinder Morgan Belton Pipeline Release"

**FIGURE 2**





# ENVIRONMENTAL<sup>®</sup> STANDARDS

Setting the Standards for Innovative Environmental Solutions

March 12, 2018

Mr. Scott Powell, PE  
Project Engineer  
Jacobs  
6600 Peachtree Dunwoody Road  
400 Embassy Row, Suite 600  
Atlanta, GA 30328, USA

Dear Mr. Powell:

Please find attached the Memorandum regarding the Review of Chandler AG Well Data, dated December 4, 2017, addressed to Mr. Jerry Aycock of KM Products Pipelines SE. I hereby certify that the memorandum, watermarked and secured in portable document format. My signature is affixed to this attached version and the document is locked from further editing.

I attest that the statements in the attached memorandum are true to the best of my knowledge and that the opinions therein are offered by myself, with no influence from others.

Please let me know if you have any questions or need further clarifications.

Sincerely,

David I Thal, CEAC, CQA  
Principal Chemist  
Environmental Standards  
8331 East Walker Springs Lane  
Suite 402  
Knoxville TN, 37923

cc: Mr. Jerry Aycock – KM Products Pipelines SE  
Files – Environmental Standards, Inc.