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Mr. Jeffery E. Mendenhall
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: **Potential Air Sparge System Expansion Concepts**
Plantation Pipe Line Company
Lewis Drive Remediation Site
Belton, South Carolina
Site ID #18693, "Kinder Morgan Belton Pipeline Release"

Dear Mr. Mendenhall,

On behalf of Plantation Pipe Line Company (Plantation), Jacobs has prepared this letter summarizing concepts for the potential expansion of the air sparging system. Expansion scenarios were previously presented during the November 8, 2019 meeting in Columbia.

Refer to the *Third Quarter 2019 Monitoring Report* (January 20, 2019) for an overview of the current air sparge system operating parameters and performance, including the most recent groundwater sample analytical results (September 2019). The system includes three (3) horizontal air sparge (HAS) wells in the Hayfield Zone, 35 vertical air sparge (VAS) wells in the Brown's Creek Protection Zone (BCPZ) and 24 VAS wells in the Cupboard Creek Protection Zone (CCPZ).

The *Third Quarter 2019 Monitoring Report* also summarizes recent (August 2019) oxidant injections, including 42 injection locations in the MW-46 area (CCPZ) and 23 injection locations in the MW-38 area (BCPZ). These injections were outside the direct influence of the BCPZ and CCPZ AS systems, and decreased benzene concentrations substantially (i.e., at MW-38 and MW-46 by 95.8 and 45.8 percent, respectively, and by almost 95 percent at MW-56 and MW-57 from July 2019 to September 2019). Increases in oxidation-reduction potential (ORP), dissolved oxygen, sulfate, and persulfate were also observed. Plantation will continue to monitor the areas where the injections occurred to evaluate oxidant performance and potential contaminant rebound. Should contaminant levels rebound sufficiently, Plantation would initiate design of the air sparge system expansion presented herein shortly thereafter. It is anticipated that any potential rebound effects that might trigger expansion of the system would likely not be realized until sometime in the second quarter of 2020.

Conceptual locations of the expansion of the system are provided in Figures 1 and 2A. Currently, Plantation favors the VAS expansion concept (12 wells in the BCPZ and 24 wells in the CCPZ) but has not eliminated the HAS option. This is due to additional assessment that is being performed in the CCPZ, which could cancel or alter the concepts presented. Any changes to the concepts being presented will likely be a reconfiguration or addition of VAS wells and/or realignment or positioning of the HAS wells.

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Note, the HAS layout (three HAS wells) has been revised slightly since the meeting (hence the "2A" designation), although the VAS layout is unchanged.

As more data is collected, Plantation will discuss expansion needs with DHEC and refine the conceptual layouts as needed prior to initiating any detailed design activities.

If you have specific questions about this letter, please call Mark Strong/Jacobs at (704) 543-3289, or Mr. Jerry Aycock/Plantation at (770) 751-4165.

Regards,

William M. Waldron, P.E.
Program Manager

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Attachments:

Figure 1 – Conceptual Vertical Sparge Well Expansion
Figure 2A – Conceptual Horizontal Sparge Well Expansion

LEGEND

- Release Point
- Residuum Monitoring Well
- Proposed Vertical Sparging Well
- Vertical Bedrock Sparging Well
- Vertical Saprolite Sparging Well
- Seep Location
- Piezometer
- Recovery Well (4" diameter)
- Recovery Sump
- Recovery Trench Point
- Recovery Trench
- Horizontal Sparging Well Riser
- Horizontal Sparging Well Screen
- Pipeline
- Surface Water Flow Direction
- Dissolved Benzene Plume Extent as of June 2019 (µg/L) (Dashed where inferred)
- National Hydrography Dataset Stream
- Delineated Wetland
- Parcel Boundary

Base Map Sources:
*Environmental Systems Research Institute (Esri) ArcMap World Imagery, 2018. Basemap features are approximate.
*United States Geological Survey (USGS) National Hydrography Dataset (NHD)

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0 175 350

Approximate scale in feet

Figure 1. Conceptual Vertical Sparge Well Expansion
Lewis Drive Remediation Site
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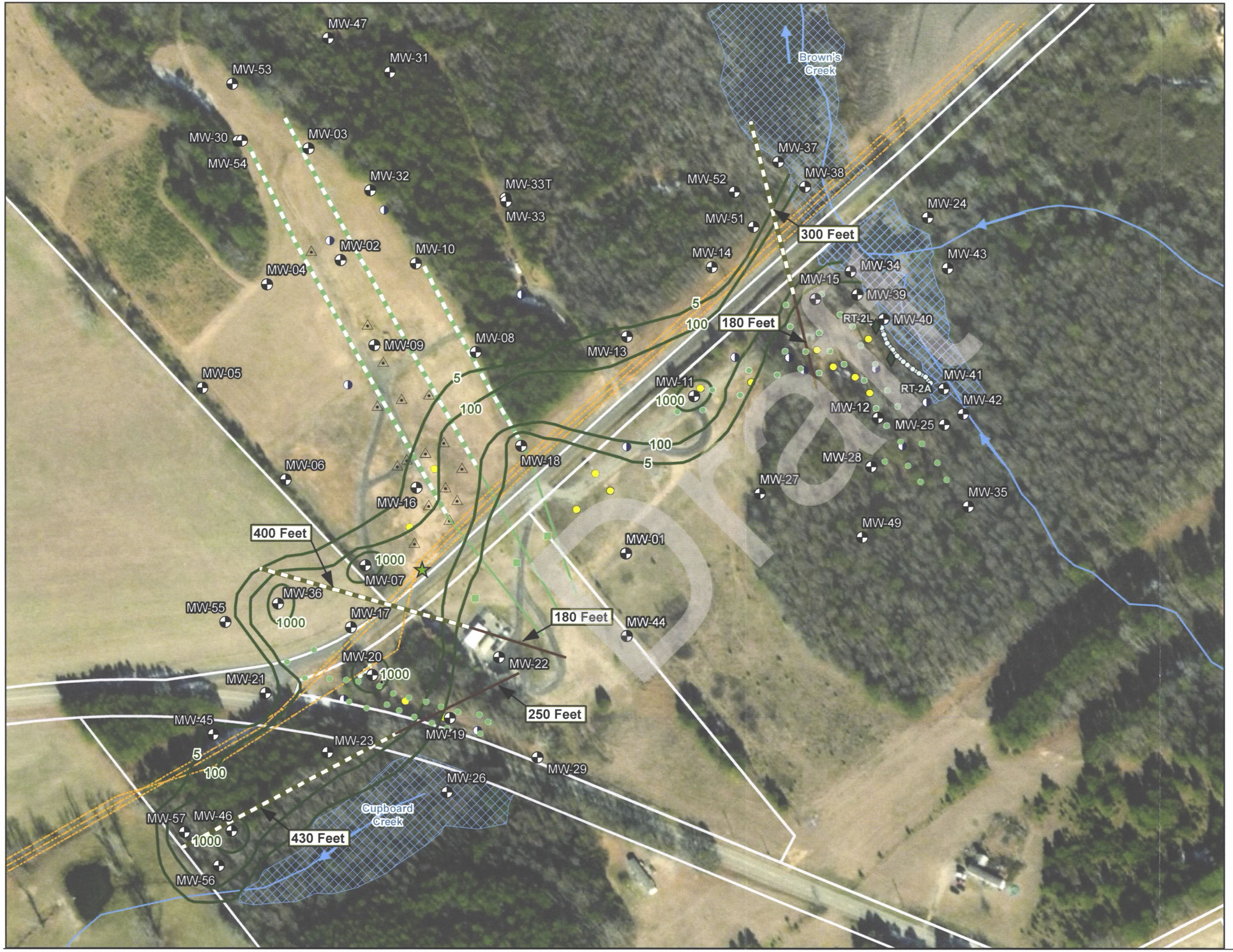

LEGEND

- Release Point
- Residuum Monitoring Well
- Vertical Bedrock Sparging Well
- Vertical Saprolite Sparging Well
- Seep Location
- Piezometer
- Recovery Well (4" diameter)
- Recovery Sump
- Recovery Trench Point
- Recovery Trench
- Proposed Horizontal Sparging Well Riser
- Proposed Horizontal Sparging Well Screen
- Horizontal Sparging Well Riser
- Horizontal Sparging Well Screen
- Pipeline
- Surface Water Flow Direction
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Figure 2A. Conceptual Horizontal Sparge Well Expansion
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