Georgia Department of Natural Resources
Environmental Protection Division-Land Protection Branch
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(404) 657-8600; Fax (404) 657-0807
Judson H. Turner, Director

March 11, 2016

VIA E-MAIL AND REGULAR MAIL

Mercer University
c/o Dr. James S. Netherton
Executive VP for Administration & Finance
1400 Coleman Avenue
Macon, Georgia 31207

Re: Second VIRP Semi-Annual Progress Report – August 20, 2015
Mercer University Triangle Site, HSI No. 10779
1535 Montpelier Avenue, Macon, Bibb County, Georgia

Dear Dr. Netherton:

The Georgia Environmental Protection Division (EPD) has reviewed the Second Voluntary Investigation and Remediation Plan (VIRP) Semi-Annual Progress Report dated August 20, 2015. EPD offers the following comments which should be addressed in subsequent progress reporting:

1. **Vapor Intrusion Modelling -** EPD was able to replicate Mercer University's vapor intrusion (VI) calculations in the vapor intrusion screening level (VISL) worksheets submitted. However, due to the increasing concentrations of PCE and TCE in groundwater, a potential complete risk pathway for VI exists and should be assessed. As a result EPD concurs with Mercer University's plans to include soil gas sampling in the next monitoring event. EPD would like four (4) soil gas samples collected in the locations shown on the provided figure. These samples should be collected at two intervals: 5-feet below ground surface and directly above the water table. The probes should consist of approximately 1.0-inch diameter aquarium grade sandstone used as screen and attached to Teflon-lined tubing that extends to the surface. Sand pack should be placed in the annulus approximately 0.5 foot above the top of the screen to surround the screened zone and the rest of the borehole up to ground surface should be sealed with hydrated granular bentonite. The analytical method for the soil gas samples should be method TO-15. In the next report further data and analyses related to the potential VI pathway should be provided including revised VISL worksheets.

2. **Conceptual Site Model -** There was no discussion of the conceptual site model (CSM) or updated cross-sections presented in this document. The CSM was incomplete in the VIRP and should be updated and discussed in each future VIRP progress report. Please see comment 6 in EPD's 2/24/14 letter for more details on developing a CSM.

3. **BIOCHLOR Model -** Evaluation of the BIOCHLOR model will not occur until further detail on the model inputs and assumptions are provided. In addition, one slug test is inadequate to calculate a site-specific hydraulic conductivity. As previously detailed in comment # 5 of EPD's 2/24/14 letter, EPD requires the following items, which are required for all modeling reports at a minimum: a general description of the model, demonstration that the model is appropriate, description of the scope of the model, description of the site environmental history, description of current groundwater conditions, list/table of ALL model input values and their source/justification (if a literature value, then we need a bibliographic reference so

that we can look it up), any input values that are neither site-specific values nor reference values must be proven to be conservative, description of model calibration procedures, description and results of a sensitivity analysis, and a discussion of model results including, but not limited to:

a. A discussion on how the plume will change through time and what to expect.
b. Output data should be presented in both tabular form and a printout of the output pages should be provided. Supporting maps showing site details and output may provide a means of confirming the stated model objectives have been met, such as:
   - Isopleth map showing anticipated maximum extent of contaminant plume.
   - Isopleth maps indicating predicted incremental changes in plume configuration through time. Time increments should be based on the modeling objectives and correspond with proposed performance monitoring requirements. Isopleth maps based on field data should be provided for those monitoring events used to calibrate and/or validate modeled results for comparison.
   - Conclusions and recommendations for confirming the adequacy of the modeling effort or the need for revisions to the model in the future.

4. **Sampling Techniques** – Please ensure that the USEPA SESD Standard Operating Procedure, Groundwater Sampling (SESDPROC-301-R3) guidance is followed in ALL sampling activities. The following deficiencies were noted, have been commented on in previous correspondence, and should be corrected in subsequent sampling events:
   a. The low-flow purge method requires that the water level in the well be monitored so that it can be confirmed that drawdown is "slight and stable" to ensure that the water being produced from the well is from the formation. Many of the wells showed recorded drawdowns greater than 0.33 feet. Please reduce pump speed to limit drawdown to less than 0.33 feet in future sampling events.
   b. For the low-flow purging method, the pump intake should be placed near the mid-point of the screened interval. This information was not provided for any of the wells sampled.
   c. The groundwater samples collected for VOCs were retrieved using a disposable PVC bailer. Per the SESDPROC-301-R3 guidance, the use of bailers for purging and sampling monitoring wells is specifically discouraged in Section 3.3.1.2. During future groundwater sampling events at the site, please use low-flow purging methods with submersible pumps on all wells.
   d. The turbidity readings for most of the wells exceeded 10 NTUs when the groundwater samples were collected. Purging stability criteria require that turbidity be less than 10 NTUs. Please continue purging until stability is achieved before taking the sample, in accordance with SESDPROC-301-R3. If the wells need to be redeveloped to lower turbidity readings please redevelop them.

5. **Tables and Figures** -
   a. Please ensure that risk reduction standards (RRS) for each respective constituent are indicated on the isoconcentration figures and that the Type 1 RRS are shown as the regulatory standard in the groundwater data tables.
   b. In figure 2, the groundwater flow direction was not drawn perpendicular to the potentiometric contours. Please draw this correctly in subsequent potentiometric maps.
   c. Trend graphs should be developed showing PCE and TEC for select wells at the site. These trend graphs should include all historical data, the applicable risk reduction standard, and should demark when the various soil remedial events including ICSO/EFR, etc. were conducted.

d. All figures should be legible and printed in black ink or in a readable font size in a larger format, e.g., 11 x 17. These figures should contain legends that explain the date of the sample results shown, the applicable Type 1 RRS, and the units of the concentration data shown.
e. In addition, as noted in comment 6b of EPD's 2/14/14 letter, inferred correlations of stratigraphic/hydrogeologic unit contacts and/or the extent of contamination in groundwater not supported by information acquired from boring logs and/or soil or groundwater sample analytical results should be clearly identified with dashed lines.

6. EPD agrees, based on the July sampling event results, that an increase in the concentrations of tetrachloroethylene (PCE) and trichloroethylene (TCE) has occurred in most of the wells even though the concentrations remain below the risk reduction standards (RRS). In Table 2A, the groundwater analytical result for PCE (8.8 ug/L in the July sampling event) in MW-9 is not highlighted indicating exceedances of Type 1 RRS. Please highlight all Type 1 RRS exceedances in future reporting.

7. As the Report presents interpretations and conclusions concerning geologic conditions at the site, the following statement is required as a signature page, to be signed and sealed by the preparer of the report:

> "I certify that I am a qualified ground-water scientist who has received a baccalaureate or post-graduate degree in the natural sciences or engineering, and have sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound professional judgments regarding groundwater monitoring and contaminant fate and transport. I further certify that this report was prepared by myself or by a subordinate working under my direction."

8. The boring log for MW-16 was not provided and no details on well development were provided. Please provide this log and these details in the next report.

Mercer must address these comments to EPD's satisfaction in order to demonstrate compliance with the provisions, purposes, standards and policies of the Act. EPD may, at its sole discretion, review and comment on documents submitted by Mercer. However, failure of EPD to respond to a submittal within any timeframe does not relieve Mercer from complying with the provisions, purposes, standards and policies of the Act.

Please address the above comments in your next VIRP Progress Report which should be submitted by August 26, 2016 in accordance with the VIRP-Semi-Annual reporting schedule. If you have any questions, please contact Montague M^{c}Pherson of the Response and Remediation Program at (404) 657-8600.

Sincerely,

Robin Futch

Robin Futch, P.G.
Acting Unit Coordinator
Response and Remediation Program

c: Jason A. Cooper - Geotechnical & Environmental Consultants, Inc.
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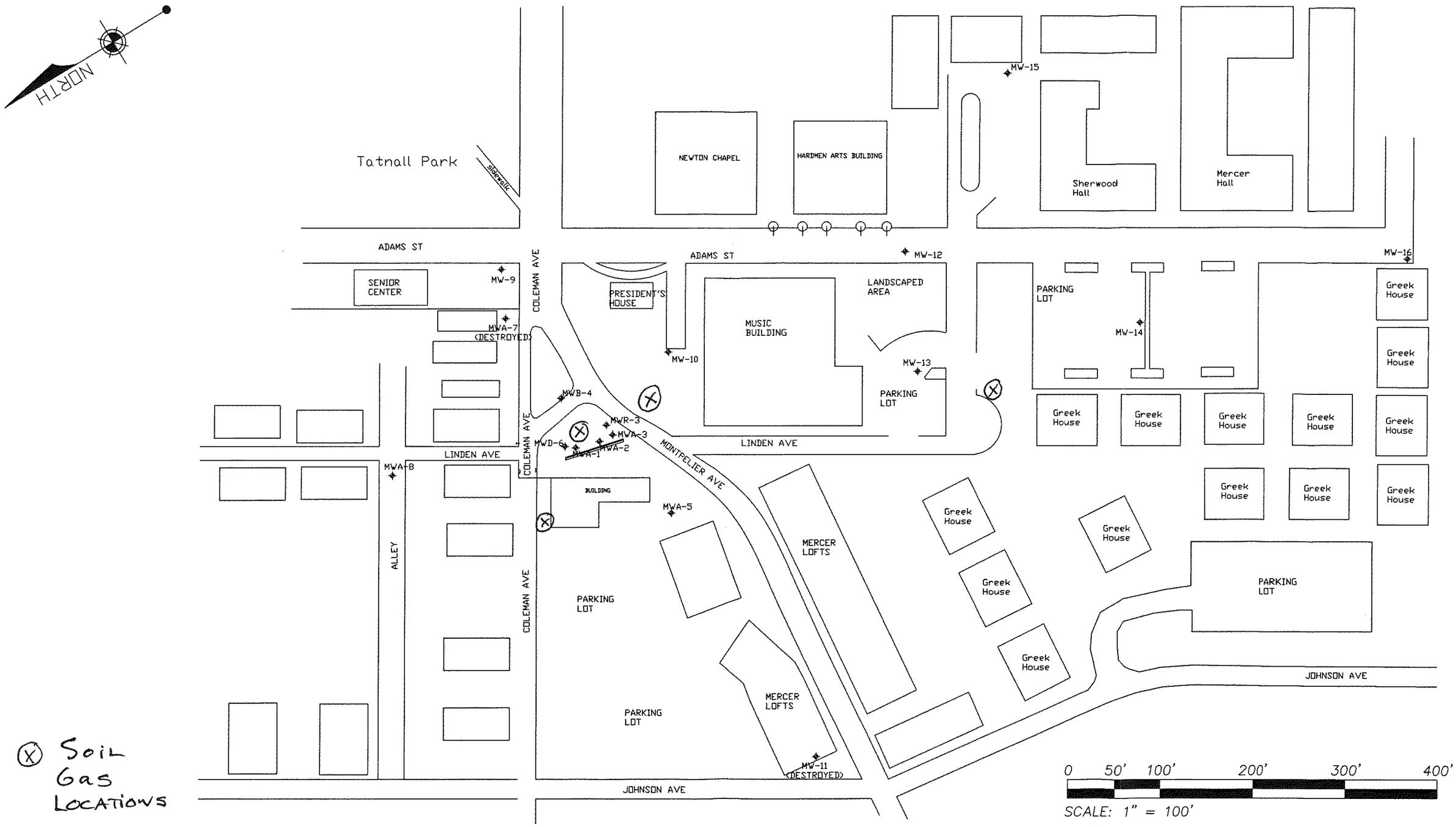

⊗ Soil Gas Locations

GEC
GEOTECHNICAL & ENVIRONMENTAL
CONSULTANTS

FIGURE 1
SITE MAP
MERCER UNIVERSITY TRIANGLE, HSRA #10779
MACON, BIBB COUNTY, GEORGIA
GEC JOB #090698.210