GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

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April 18, 2018

VIA E-MAIL AND REGULAR MAIL

Trust for Benefit of Brenda Heisey and
Rheem Manufacturing
c/o Ms. Hollister Hill
Troutman Sanders, LLP
600 Peachtree Street, NE, Suite 5200
Atlanta, Georgia 30305

Re: Voluntary Remediation Program
Revised VRP Compliance Status Report, November 4, 2016
139 Brampton Road (former Rheem Manufacturing), HSI Site No. 10208
Savannah, Chatham County, Georgia
Tax Parcel ID#1-0720-01-002

Dear Ms. Hill:

The Georgia Environmental Protection Division (EPD) has reviewed the Revised Voluntary Remediation Program Compliance Status Report (CSR) dated November 4, 2016 that was submitted pursuant to the Georgia Voluntary Remediation Program Act (Act) O.C.G.A. §12-8-100 et seq. The Revised CSR was submitted to address comments noted in EPD's June 30, 2016 letter. EPD has the following comments:

1) **Area Averaging for lead on adjacent properties**. Our review has found that Comments 5a and 5b in the comment letter were not addressed for the adjacent Norfolk Southern property. EPD's comment required additional soil testing for lead to support an area averaging approach. The current data set of 8 samples is not adequate for a property of that size. In addition, the current data set cannot provide a 95% upper confidence limit (UCL) of the mean that is below the residential Type 1 or Type 2 Risk Reduction Standards (RRS). EPD has determined that an additional three to five samples are likely needed in order to statistically support a 95% UCL that is below the Type 2 RRS for lead, assuming the samples are similar in concentration to the existing data.

2) **Volatile organic compounds (VOCs) in soil.** EPD is willing to accept the use of the building slab as an engineering control for compliance with Type 5 RRS given that concentrations of tetrachloroethene (PCE) and trichloroethene (TCE) in soil are well below their soil saturation concentrations, the area impacted above default leaching criteria appears to be relatively limited, and the vapor intrusion pathway has been assessed. However, the area subject to Type 5 RRS must be clearly defined with delineation soil samples. Additional soil samples are needed to delineate PCE and TCE to Type 1 or 2 RRS in the vicinity of GP-

5-20E and GP-5-40E. Leaching tests or soil organic carbon measurements could also be used to establish site-specific soil concentrations protective of leaching for Type 2 or 4 RRS.

3) **BIOCHLOR contaminant fate and transport modeling.** The following comments are related to the BIOCHLOR contaminant fate and transport modeling:

   a) Additional information is needed to support the use of biotransformation in the model. Groundwater should be evaluated for natural attenuation parameters at multiple locations within the model area, including EW-7, using methods consistent with the USEPA Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water (1998). The BIOCHLOR software includes interactive score sheets for using this protocol. Completed score sheets should be included along with the sample locations used for the scoring and your conclusions regarding the suitability of the aquifer for biotransformation.

   b) Recent groundwater measurements at EW-7 indicate a detection of PCE and increasing trends of TCE. These measured concentrations exceed the model predicted concentration provided in the Revised CSR. Additional groundwater monitoring at EW-7 is required to confirm the PCE detection and TCE trends to ensure that the POE will not be impacted above acceptable levels.

   c) Table 1 in Appendix D did not include the organic carbon partition (K_{oc}) values for PCE and its breakdown products. K_{oc} values should be consistent with values posted on the USEPA Regional Screening Level (RSL) Tables.

   d) Table 1 in Appendix D did not include the source decay constant (k_s). The k_s values used in the model need supporting documentation. An unlabeled time-series graph was provided plotting PCE concentrations versus time with a trend line. This appears to be a k_s calculation using data from monitoring well W-4. If this calculation corresponds with the intended k_s please label the figure and revise the trend line calculations as the trend line is inappropriate (i.e., should be exponential as opposed to linear fit). As is discussed in the BIOCHLOR User's Manual Addendum (March 2002), the source is assumed to decay via a first order expression (i.e., $C_o\exp(-k_s t)$). Examples of the correct methodology for calculating a k_s can be found in EPA's Groundwater Issue: Calculations and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies. In the event that k_s calculations will be repeated, please note that several groundwater data points are typically necessary to determine source decay constants.

   e) The transverse dispersivity value listed on Table 1 Appendix D is not consistent with the model input value. Please revise the referenced table and/or model input sheets (and rerun the model) as appropriate.

   f) The aquifer hydraulic conductivity (K) value listed on Table 1 Appendix D is not consistent with the model input value. Please revise the referenced table and/or model input sheets and re-run the model as appropriate. The proposed K value on Table 1 Appendix D is 5.6×10^{-4} centimeters per second (cm/sec). This value is the geometric mean of slug tests at GW-4, GW-5, GW-7, GW-11, and GW-12 as shown on Table 9 of the Revised CSR. None of these slug test locations correspond with the model area and the results vary by more than an order of magnitude. When models are submitted with limited or variable data sets, EPD prefers that a conservative K value be used. The

highest historical hydraulic conductivity value is recommended for use in the model (i.e. GW-7 at 2.91 x 10^{-3} cm/sec) unless K values within the model area are obtained. In Section 3.4.2 Hydraulic Conductivity, some monitoring wells are not identified consistently with Table 9 (e.g, MW-4 vs. GW-4). The average hydraulic conductivity of 2.78 ft/day presented in Section 3.4.2 is not an average of 1.41 ft/day and 1.01 ft/day.

g) The value of 0.0005 used for fraction of organic carbon (f_{oc}) is conservative and appears to be derived from one total organic carbon (TOC) sample. While EPD does not necessarily object to the f_{oc} value used in the model, it may be too conservative to represent the site and may affect the results if other input values are revised based on the comments in this letter. The modeler has the option of using a default value of 0.001 for f_{oc} in the future modeling efforts unless other data is available.

h) Source Dimensions: Cross-sections provided in the CSR do not include groundwater analytical results and associated isoconcentration contours to support the source thickness value used in the model. Please revise/update the cross-sections accordingly. Also, please clarify which PCE/TCE isoconcentration figures were used to derive the source width used in the model and superimpose a line representing the modeled source width on the figure.

4) Comment 8 (certification of compliance) from the June 30, 2016 EPD letter has not been addressed.

5) Please submit the laboratory data and chain of custody sheets for the sub-slab and indoor air sampling.

6) A Uniform Environmental Covenant (UEC) will be needed for this and any other impacted properties that are unable to certify to a residential (Type 1 or 2) RRS. Please submit a draft covenant for review based on EPD's current model covenant. The current model covenant and guidance are available at: https://epd.georgia.gov/uniform-environmental-covenants

The above comments must be addressed to EPD's satisfaction in order to demonstrate compliance with the provisions, purposes, standards, and policies of the VRP Act. Please provide a response to comments along with a revised CSR no later than October 18, 2018. If you have any questions, please contact Bill Williams at 404-232-1502.

Sincerely,

David Hayes
Unit Coordinator
Response and Remediation Program

C: Dwight Feemster, Duffy & Feemster, LLC (via email)
Dustin Heizer, Wood (via email)
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