January 10, 2014

VIA E-MAIL AND U.S. MAIL
HERCULES INCORPORATED
c/o Timothy D. Hassett, Project Manager
500 Hercules Road
Wilmington, DE 19808-1599

Subject: April 9, 2012 Voluntary Investigation and Remediation Plan (VIRP) and Application;
Revised Tables 3, 3a, 4, 7, and 8 and Appendix C Submitted (First Revisions) of VIRP;
Revised Table 8 (Second Revision) of VIRP, April 24, 2013 Revised Milestone Schedule; and
May 22, 2013 Deed Notice
Hercules Incorporated, Savannah Plant, HSI Site No. 10696/VRP Site 1332420701
3000 Louisville Road, Savannah, Chatham County, Georgia 31415
(Tax Parcel Nos. 2-0734-01-001 and 2-0734-03-001)

Dear Mr. Hassett:

The Georgia Environmental Protection Division (EPD) has reviewed the subject documents for the two properties known as the Hercules Inc. Site, HSI 10696. Those submittals were submitted in lieu of a revised Corrective Action Plan (CAP) required under the Georgia Hazardous Site Response Rules (the Rules). EPD has the following comments that may assist you in achieving specific investigation and cleanup milestones, including submittal of a final Compliance Status Report (CSR) by March 15, 2018. A separate response-to-comments is not required for the comments in this letter. However, EPD recommends that the participant re-evaluate the investigation and corrective action plans proposed in the VIRP to ensure that sufficient data (i.e., analytical parameters are sufficient, etc.) are acquired during implementation of the proposed investigations to adequately address the comments below.

APPLICATION
1. Qualifying/Participating Voluntary Remediation Properties:
   a. The warranty deed information provided in Appendix A of the VIRP indicates a total of four parcels (Parcel 2, Parcel 4, Parcel 5, and Parcel 9) with a total acreage of 28.067. On the VRP Application Form, the qualifying properties have a total acreage of 21.1 acres. Please clarify.
   b. The tax plat provided in Appendix A of the VIRP should identify the tax parcel identification numbers for the small parcels immediately north of the northeastern corner of tax parcel 2-0734-01-001.
   c. Portions of several Hercules plant operational/contaminant source areas (e.g., the initial acrolein release area located over the culverted portion of the Dundee Canal, etc.) are located within properties apparently owned by entities other than the participant and are not included within the boundaries of the qualifying properties. The participant should apply to include the affected property(ies) as a qualifying property(ies) under the Act.

VOLUNTARY INVESTIGATION AND REMEDIATION PLAN (VIRP)
Conceptual Site Model (CSM)
2. General: The CSM should be updated in each VRP semiannual progress report as necessary to accurately represent site conditions. The CSM should include all figures, cross sections, and tables provided in the VIRP, the revised tables provided in the supplemental submittals, and additional figures or tables required by these comments, not solely the figure labeled, "Conceptual Site Model" (Figure 8) in the VIRP.
3. Site Description and Setting:
   a. In future submittals, narratives, and figures, must clearly distinguish between the two property tax parcels that are currently considered to be the participating properties and the rest of the properties associated with the Hercules facility.
b. EPD noted that the terms "site", "property(ies)", and plant or facility are inconsistently and/or inaccurately applied throughout the VIRP with the Hercules plant or facility frequently referred to as the "site". It also appears that the term "property" is used interchangeably to denote both current participating properties and adjacent properties owned and used by Hercules to support manufacturing activities. For future reference, please note the following when using the terms "site", "VPR properties/participating properties", and/or "plant/facility" in future submittals:

4. **Release, Response, and Remedial Action History:** To expedite EPD review in the future, please include a brief summary in bulleted format, by date, of: 1) release notifications, 2) investigative and/or cleanup response to release discovery prior to notification, 3) listing of the site/areas of the site on the HSI and the basis for said listing, 4) other major site operational and environmental investigation and/or remedial actions (i.e., release discovery, source removal activities, etc.) conducted at the site since release discovery, and 5) and major findings issued by EPD (i.e., removal of cyanide and metals as COCs at the site) as part of the narrative description of site history.

5. **Regulated Substances Released:**
   a. Regulated caustic substances (sodium hydroxide and/or potassium hydroxide) are regulated based on their physical impacts to the environment, (e.g., elevated pH) which are subject to characterization, delineation, and cleanup requirements pursuant to the Rules and the Act.
   b. Fluoride in groundwater (and potentially surface water) at concentrations greater than background levels must be determined.
   c. PCBs are regulated by the Rules as specific individual Aroclor mixtures, the individual dioxin-like PCB congeners, and as "total PCBs" with corresponding delineation and cleanup standards. Evaluation of the nature and extent of and determination of delineation and cleanup standards for PCBs must be based on analysis of Aroclors, "total" PCBs, and the 12 individual dioxin-like PCB congeners in all environmental media of concern (soil, sediment, surface water, and groundwater) at the site. The VIRP addresses PCBs only as Aroclor mixtures and congener analysis may not have been conducted for environmental media of concern at the site. Note that the non-detection of Aroclors in a sample does not necessarily correlate with the absence of all PCB congeners.
   i. The 12 dioxin-like PCB congeners [PCB 77 (CAS 32598-13-3), PCB 81 (CAS 70362-50-4), PCB 105 (CAS 32598-147-4), PCB 114 (CAS 74472-37-0), PCB-118 (CAS 31508-00-6), PCB-123 (65541-44-33), PCB-126 (57465-28-8), PCB-156 (CAS 38380-08-4), PCB 157 (69782-90-7), PCB-167 (52663-72-6), PCB-169 (CAS 59291-65-5), and PCB-189 (CAS 39635-31-9)] must be considered individually as potential COCs for human and ecological exposure pathways and in determining delineation and cleanup values. Delineation and cleanup standards for said substances, if detected, may be addressed along with the detected dioxins and chlorinated dibenzofurans using the Toxicity Equivalency Factor (TEF) approach.
   ii. The 197 non-dioxin-like PCB congeners must be addressed as "total PCBs" where the detected concentrations of said congeners are summed together in each individual environmental sample for comparison to "total PCB" delineation and cleanup standards. Summation of Aroclor analytical results as total PCBs is not acceptable as the resultant concentrations are likely to under or overestimate total PCB concentrations. Total PCB results must be summarized on tables summarizing soil analytical results where individual PCBS have been detected and reported. Please see below regarding additional investigation requirements.

At a minimum, soil and groundwater must be assessed in areas where known or potentially PCB-containing oils were used or stored (including those areas where Dowtherm units were located) for the presence of PCB congeners using appropriate EPA-promulgated methods. Please refer to the February 28, 2013 EPA Region 4 Technical Services Section Issue Paper for Polychlorinated Biphenyl Characterization at Region 4 Superfund and RCRA Sites for recommended acceptable sampling and analysis procedures.¹

6. **Contaminant Sources:** In addition to the information provided in Sections 2, 4.8, 4.9.1.1.1, and 6.5 of the VIRP, descriptions of each source area, or suspected source area, must include all of the information required pursuant to

§391-3-19-06(3)(b)1 of the Rules. Specifically, the following information must be provided in addition to that provided in the VIRP:

a. A summary of the specific substances considered to be COCs associated with each source area.

b. A complete description of the current conditions at each source area, specifically existing surface cover and/or containment structures in addition to the descriptions of former features. Note that observations made by EPD personnel during an April 14, 2011 site inspection revealed that surface cover consisted of grass, gravel, or bare earth in the Former Dry Size Tank, Tall Oil Plant, and Crude Tall Oil Tank Areas.

c. The source of the fluoride detected in surface water and groundwater must be identified and characterized.

7. Soil, Groundwater, Sediment and Surface Water Conditions

a. Tables: Tables summarizing analytical results (for regulated substances detected above background levels) must be revised based on the following comments:

i. Soil samples must be clearly identified as grab or composited samples. For example: The sample identified as SB-F6/ FW/15/F27 was not specifically identified as a composite sample. Analytical results from composited samples may not be used to confirm the absence or maximum concentrations present of a substance or to document achievement of contamination delineation or compliance with cleanup goals.

ii. Xylenes and cresols, are regulated both as individual isomers and mixtures of their individual isomers (total xylenes). Revised Tables 3a and 4 (soil and groundwater analytical results respectively) should be revised to correctly report the total and isomer results for said substances in future submittals. Note:

• Several total substance results were reported as “not analyzed” although results for one or more isomers. If the laboratory does not report total results for these substances, detected concentrations for said total substances must be reported as the sum of the reported individual isomer results.

• To the best of EPD’s knowledge, it does not appear that analytical results for the individual m- and p-isomers of xylenes and cresols have ever been reported separately in laboratory analytical data reports issued for the site. Therefore, for clarity purposes, columns for said individual isomers should be removed in future versions of tables summarizing environmental sample analytical results.

• Analytical results for the combined m- and p-isomers of xylene and cresols were incorrectly summarized as results for m-xylene or p-cresol for several samples on revised Tables 3a and 4 of the VIRP.

b. Figures:

i. All soil and groundwater analytical results for site COCs in soil must be depicted on figures for EPD evaluation of source characterization, delineation, and cleanup efforts. Individual constituents or groups of like constituents may be combined, as appropriate as long as legibility is retained.

ii. Isoconcentration contour lines must be used to depict the extent of soil and groundwater contamination greater than delineation and cleanup standards (if established).

iii. Cross-Sections: The following comments are specific to the two cross-sections and associated cross section location map provided as Figures 5 through 6 in the VIRP:

• Conditions in all source areas and areas subject to site-specific cleanup standards must be depicted on cross sections. Several current and suspected source areas identified in the VIRP are not depicted on either of the two cross sections and EPD recommends additional cross sections be generated to depict said areas. EPD also recommends that cross section lines of profiles be adjusted to include as many soil and groundwater sampling locations as feasible while maintaining as straight a line as practicable.

• The following additional features are to be depicted on future cross sections: 1) Property boundaries, 2) Extent of the identified current and suspected "operational/source" areas identified in the VIRP and several figures, 3) Surface and subsurface features that may have or are acting as preferential migration pathways (i.e., Dundee Canal, etc.), 4) Points of exposure (POEs) extents of exposure domains for identified contaminant receptors, 5) Surface cover (e.g., concrete secondary containment units, paved
areas, etc.) and engineering controls used or proposed to be used to comply with site-specific cleanup standards or limit receptor exposure, 6) Isoconcentration contour lines depicting the extent of groundwater contamination greater than delineation standards and cleanup standards, 7) Surface water and sediment sampling locations and current analytical results as appropriate based on cross section line of profile, 8) Proposed Point of Demonstration (POD) wells, 9) Features known or suspected to inhibit or prevent migration (i.e., aquitards, etc.) of contaminants.

8. Potential Receptors/Exposure Pathways/Exposure Domains:
   a. Specific source areas and COCs associated with each complete exposure pathway must be clearly identified in narratives and associated referenced figures. Figure 10 of the VIRP should be modified accordingly.
   b. EPD recommends that both current and planned future (if known) property usage on all abutting properties (at a minimum) be depicted on a site figure to support conclusions regarding potential receptors, complete exposure pathways, and exposure domains.
   c. Human Risk Assessment (Sections 4.9 and 4.9.1.1.4 of the VIRP):
      i. Contaminated Groundwater:
         • Drinking Water: EPD cannot concur with the VIRP’s conclusion that drinking water wells should not be considered as POEs for contamination at the participating properties at this time as defined by O.C.G.A. §12-8-102(b)(11) based on the following:
           - EPD has confirmed existence of at least one nearby public drinking water supply well operating under Permit #GA0510171 as of April 14, 2011 on an adjacent property at the Rodger Wood Packing Company (RWC) facility. In addition, the subject Hercules facility is maintaining a public water supply permit for one or more water wells located at the subject plant under Permit #GA0510063. Therefore, EPD considers said wells to be active drinking water wells.
           - Further investigation, including an on-the-ground reconnaissance, to determine the presence and status of nearby "private" drinking water wells is also necessary.
         All confirmed drinking water and irrigation wells within 1,000 ft of the site must be identified based on the additional information required above and accurately depicted on figures showing POEs, receptor locations, and exposure domains in future submittals.
         • Other: Human exposure to groundwater other than via drinking water use (i.e., irrigation, etc.) must also be considered as a potential exposure pathway at the site. Note:
           - An on-the-ground reconnaissance must be conducted to establish the presence and current status/use of nearby water wells.
           - Due to the shallow depth of groundwater at the site, the direct human contact with contaminated groundwater exposure pathway for utility and construction workers must be evaluated.
      ii. Contaminated Soil: EPD cannot concur at this time that direct exposure to contaminated soil for current industrial workers is an incomplete pathway (current and future) at the participating property.
   d. Ecological Risk Assessment:
      i. The “wetlands” located downstream of the Hercules plant referenced on 4.9.1.2 (and other sections) of the VIRP must be identified on figures depicting receptors and exposure domains.
      ii. Random sediment samples must be collected within the wetlands, up to the high tide mark if tidally influenced, and analyzed in addition to those samples proposed in within Dundee Canal. Said sample results must be included in the proposed Screening Level Ecological Risk Assessment (SLERA).
      iii. If the Dundee Canal exhibits tidal flow upstream of the site, sediment samples should be extended upstream of the upstream culvert entrance a sufficient distance, based on tidal flow and period of flow, to assess any constituents which might be suspended in upstream flow and deposited at dead tide prior to the beginning of the ebb tide.
   e. Exposure Domains:
      i. The aerial and vertical extents of current and projected future exposure domains must be depicted on a figure(s). EPD recommends that said domains be superimposed on figures, including cross sections, depicting current concentrations and delineated boundaries of COCs in soil, groundwater, surface water, and sediments, as appropriate based on the receptor and exposure pathway, including vapor intrusion.
ii. Exposure domains must be identified separately for each specific COC having a complete exposure pathway, current and/or future. Said domains may not necessarily coincide with each other. Please note the following when determining and depicting exposure domains:
   - Exposure domains represent contaminated areas and should not extend beyond the delineated extent of the specific COC evaluated in the affected media evaluated for a specific receptor and pathway when using area averaging for exposure concentrations,
   - Soil exposure domains are specifically defined for several specific human receptors in O.C.G.A §12-8-108(3) of the Acl.
   - Current surface conditions must be considered when defining exposure domains for current direct exposure pathways and must be clearly identified and depicted on the above-referenced figures. Areas where engineering controls are to be installed or maintained to prevent exposure pathways from becoming complete in the future, must also be clearly identified and depicted on said figures.

9. Groundwater Contaminant Fate and Transport Modeling: Please justify the use of BIOCHLOR v2.2, which was developed to simulate biodegradation and fate and transport of chlorinated solvents in groundwater, as the modeling software of choice for modeling the fate and transport of benzene and naphthalene rather than other modeling software that has been developed to specifically model the fate and transport of petroleum-associated hydrocarbons in groundwater (e.g., BioScreen, etc.).

10. Groundwater Monitoring Program:
   a. The proposed groundwater network in Section 7.2 of the VIRP does not address the former 50's and 60's tank/landfill area where site-specific soil cleanup standards (Type 5 RRS) are likely to be proposed. At a minimum, groundwater must be monitored downgradient of said area for benzene and asbestos.
   b. All groundwater flow pathways in the areas to be monitored should be considered when selecting locations to be included in the groundwater monitoring network (POD wells). Groundwater flow appears to diverge to the west, west/southwest, and southwest in the above-referenced former landfill area, potentially requiring up to three POD wells for monitoring purposes in said area.
   c. POD wells should be monitored for the protection of all potential receptors (human and ecological) and to confirm that non-participating properties are not and will not be impacted above Type 1 RRS.
   d. Groundwater compliance with applicable cleanup standards requires a minimum of two consecutive monitoring events demonstrating COCs were not detected above cleanup standards and the proposed monitoring network must be revised as necessary. Note that non-detections based on detection limits greater than cleanup standards may not be used to demonstrate compliance with said standards.

11. Delineation Criteria and Standards: EPD concurs with the use of Type 1 Risk Reduction Standards (Type 1 RRS) as the delineation criteria for contaminants detected in soil and groundwater. Acceptable soil and groundwater Type 1 RRS values are summarized on Table I attached to this letter, which may be used as delineation standards for those substances specifically listed on revised Tables 7 and 8 of the VIRP without further comment from EPD. Please notify EPD in writing of your intent to use those values as applicable cleanup standards for soil and groundwater or provide EPD with alternate values, with justification, for further EPD evaluation. Also see Comment 13e below regarding corrosivity (pH) for soil and groundwater.

12. Cleanup Criteria and Standards: Section 6.6.1.2 of the VIRP indicates Type 3 RRS (default non-residential RRS) will be used as the criteria for soil at the site with Type 5 site-specific cleanup standards, including implementation of institutional or engineering controls, to be proposed as cleanup criteria for those areas of the site where impacted soil is demonstrated not to be in compliance with Type 3 RRS. Said approach is acceptable to EPD based on current and future anticipated usage of the voluntary remediation properties. However, it is unclear why the participant has elected to compare soil analytical results to Type 3 RRS for determination of those areas where Type 5 site-specific cleanup standards will be applied at the site. EPD recommends that the participant evaluate soil compliance based on a comparison of detected maximum concentrations with applicable Non-Residential RRS (the highest of Type 3 and Type 4 RRS) before considering the development and implementation of Type 5 RRS for soil.

13. Risk Reduction Standards: EPD evaluated the RRS for soil and groundwater as summarized on revised Tables 7 and 8 (second revision) of the VIRP. The RRS deemed acceptable by EPD for are summarized on Tables I through
Ill attached to this letter. Please note the following general comments regarding the attached tables and values provided therein:

a. The acceptable RRS provided may not include all potential COCs for the site (see Comment 5) that are subject to delineation and remediation requirements pursuant to the Act.

b. US EPA Soil Screening Level (SSL) Partitioning Equation Calculations: EPD cannot evaluate the applicability of using a DAF value greater than 1 in said calculations until source characterization investigations have been completed and it has been demonstrated that the extent of source material does not exceed 0.5 acres. EPD-approved RRS for soil are based on the use of a DAF of 1 for said calculations.

c. The proposed Type 2 and Type 4 RRS on revised Table 8 (second revision) of the VIRP appear to represent the highest values of the calculated Type 1 and 2 RRS and the Type 3 and 4 RRS, respectively evaluated. Please note that Type 1 through Type 4 RRS must be determined separately. The participant may then choose to select the higher of the Type 1 and 2 RRS for a substance as the general "residential" RRS to be applied at a property and the higher of the Type 3 or 4 RRS for a substance as the "non-residential" RRS to be applied at a property. Accordingly, attached Tables II and III summarize acceptable general "residential" and "non-residential" RRS that may be applied as cleanup standards at site properties based on usage. EPD did not necessarily evaluate individual Type 3 RRS as proposed by the participant.

d. Non-residential RRS (the highest value of the Type 3 and Type 4 RRS) for soil must be determined for both surface (≤ 2 ft bgs) and subsurface (>2 ft bgs) vadose zone soil. The participant may choose to apply the separate RRS based on depth of impacted soil or may apply a single standard for each detected contaminant to the entire vadose zone by defaulting to the lowest of the calculated non-residential RRS for the two soil zones.

e. Pursuant to §391-3-18.07(4)(b) soil (and groundwater) left in place at the site must not exhibit the hazardous waste characteristic of corrosivity as defined in 40 CFR 261 Subpart C for those areas where Type 1 through Type 4 RRS are applied. Therefore, attached Tables II and III include a "cleanup" standard for corrosivity as measured in pH standard units (SU).

f. PCBs: The EPD-approved RRS for total PCBs and specific Aroclor mixtures summarized on the attached tables may not be as stringent as those mandated by the US EPA-administered Toxic Substance Control Act (TSCA). It is the participant’s responsibility to ensure that EPA is notified of any confirmed release of PCBs to the environment and that TSCA requirements are met at the site as necessary.

14. Revised Milestone Schedule: EPD concur with the revised milestone schedule submitted April 24, 2013 with the exception that semi-annual reports are to be submitted beginning six months from the date of the EPD approval of the VRP application until a CSR with certifications is submitted. The proposed submittal dates for Semi-Annual Progress Reports #1 through #4 are one month greater than 6, 12, 18, and 24 months after than the March 15, 2013 VRP approval letter. In addition, the revised milestone schedule does not include submittal of semi-annual progress reports between April 16, 2015 and submittal of the final CSR on 15, 2018. The milestone schedule must be revised accordingly.

15. Miscellaneous

a. Laboratory Certification: Pursuant to §391-3-26 of the Rules for Commercial Environmental Laboratories, analytical data submitted for regulatory purposes, must have the following required documentation: 1) name of accrediting agency, 2) scope of accreditation relevant to the data submitted, 3) accreditation number or identifier, 4) effective date of accreditation, and 5) expiration date of accreditation. The Certification Summaries provided in the laboratory analytical data reports issued by TestAmerica for groundwater samples collected in July 2011 do not provide all of the required certification documentation listed above; specifically, items #2, 4, and 5 are missing.

b. Figures and Tables: Notation descriptions are incomplete on several tables, including those contained in Appendix C, within the VIRP and the subsequently submitted revised tables. Every abbreviation, acronym, and/or symbol used on each figure and table in future submittals must be clearly defined/described on the figures or tables on which they are used.

c. Discrepancies, Inconsistencies, Errors, and Omissions: EPD noted a few apparent discrepancies, errors, inconsistencies, and/or omissions within the subject submittals in addition to those mentioned in comments above. Some examples that EPD noted are listed below:
i. It appears that all historical soil sample analytical results for site COCs may not have been included on revised Table 3a. For example, analytical results for soil sample locations SS-64 through SS-73 shown on Figure 9 (Sampling Locations) are not summarized on revised Table 3a of the VIRP.

ii. It appears that monitoring well MWF-13 may have been incorrectly referenced as MW-13 in the last paragraph on page 2 of the VIRP as there is no MW-13 referenced on Table 1 summarizing monitoring well construction data.

iii. Monitoring well MW-F10 is identified as having been abandoned or destroyed on Table 1 of the VIRP. However, Figure 9 (Sampling Locations) identifies the same well as an existing shallow monitoring well.

iv. The units for proposed RRS and PQLs for asbestos in soil and groundwater are shown as mg/kg and mg/L, respectively, on Revised Table 8 (second revision) of the VIRP, which are incorrect. Associated laboratory analytical data reports indicate asbestos concentrations were reported as million fibers greater than 10 μm in length per liter (MFL) in groundwater samples and percentage (%) of the total sample in soil samples. In addition, the MCL for asbestos is based on MFL. Please ensure that all references to asbestos concentrations are reported accordingly in future submittals.

16. DEED NOTICE: The deed notice for the participating properties filed on May 22, 2013 does not include all of the language required pursuant to §391-3-19.08(1)(a) of the Rules.

If you have any questions regarding the comments contained herein, please contact Carolyn L. Daniels, P.G. of the Response and Remediation Program at (404) 657-8600.

Sincerely,

Charles D. Williams
Program Manager
Response and Remediation Program

Attachments: Tables I through III

File: HSI No. 10696

c: David M. Wilderman, P.G., Arcadis U.S., Inc. (via mail and email)
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