

Georgia Department of Natural Resources

Environmental Protection Division-Land Protection Branch

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Judson H. Turner, Director

May 11, 2016

VIA U.S. MAIL and EMAIL

Hercules Incorporated
c/o Timothy D. Hassett, Project Manager
500 Hercules Road
Wilmington, DE 19808-1599

Subject: Voluntary Remediation Program (VRP)
Semi-Annual Progress Reports #4 through #6 (March 30, 2015 through April 6, 2016)
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 submittals for the two properties known as the Hercules Inc. Savannah Plant Site, HSI No. 10696/VRP Site 1332420701. Prior to completion of the EPD review, Hercules Incorporated (Hercules, the VRP participant) and Arcadis U.S., Inc. (Arcadis, the site consulting firm) requested a meeting between their representatives and EPD representatives to discuss outstanding environmental issues at the site and a path forward for completion and submittal of a final VRP Compliance Status Report (CSR). The meeting was held on April 6, 2016 during which several topics were discussed, including:

- Criteria necessary for demonstrating achievement of contaminant delineation and/or compliance with applicable cleanup standards in soil and groundwater;
- Determination of contaminants of concern and establishing delineation and cleanup standards as necessary;
- Remaining areas requiring further investigation;
- Requirements for a complete CSR, including tables, figures, and cross-sections, *etc.*; and
- Potential remediation options including, implementation of engineering and/or institutional controls used to demonstrate compliance with cleanup standards.

In addition to those topics discussed during the referenced meeting, EPD has the following comments regarding the subject submittals that were not fully addressed:

RISK ASSESSMENT (Section 5.0 of the Fourth VRP Progress Report)

1. Section 5.6 (*Results*): EPD does not concur with the statement, "no further evaluation of sediment is warranted." Based on Comment # 3.a. of this letter regarding 2,3,7,8-TCDD, EPD recommends that potential risk from 2,3,7,8-TCDD in sediments be further evaluated in Step 3a of the Ecological Risk Assessment (ERA) process.
2. Figure 7 (*Regulated Substances Detected in Surface Water/Sediment Samples*): There appears to be a discrepancy in the reporting of sediment analytical results for TEQ of dioxins and furans in Figure 7 and Table G-3. For instance, the maximum detections for dioxin/furans TEQs for SED-1, SED-2, and SED-3 were reported in Figure 7 as 8E-5, 5E-4, and 2E-04 mg/kg, respectively. However, Table G-3 lists 9E-06, 7E-5 and 3E-05 mg/kg, respectively. Please explain this discrepancy.
3. Table G-14 (*Selection of Constituents of Potential Ecological Concern (COPEC) for Sediment*):

- a. When selecting an alternate screening value (ASV) for 2,3,7,8-TCDD, it is pertinent that the selection on which the toxicity value is based is representative of what is typically observed in the sediments at the site. Therefore, the ASV selected from Canadian Council of Ministers of the Environment (CCME) should not take precedence over other United States Environmental Protection Agency (USEPA) and non-USEPA sources that better represent the study area. Based on this recommendation, the ASV selected for 2,3,7,8-TCDD should be the higher of the USEPA Regions 3, 4, or 5 sediment screening benchmarks. Furthermore, this revision will have an impact on the results and conclusions of the preliminary risk evaluation for sediments. Please revise accordingly.
 - b. EPD could not replicate the ASV for acetone (*i.e.*, Region 5). Please provide the equation parameters and a sample calculation to support the value presented in the table.
4. Table G-15 (*Selection of Constituents of Potential Ecological Concern (COPEC) for Surface Water*): The USEPA Region 3 surface water screening value shown for fluoride is incorrect due to a typographical error. The correct value should be 2.119 mg/L. Please note that this change does not result in the selection of fluoride as a surface water COPEC.

RISK REDUCTION STANDARDS

5. EPD cannot concur with the Risk Reduction Standards (RRS) for *bis* (2-chloroethyl) ether and phenol in groundwater as referenced in tables summarizing groundwater analytical results in the three subject submittals. EPD can concur with the following values as the Type 1 through Type 4 RRS for said substances in groundwater without further discussion (see Footnote at the bottom of the page):

Substances	Type 1 (mg/L)	Type 2 (mg/L)	Type 3 (mg/L)	Type 4 (mg/L)
<i>Bis</i> (2-chloroethyl) ether	0.00003(a) ¹	2E-04	0.00003(a)	2.3E-04
Phenol	4	5	4	31

Please notify EPD of your intent to use the above values as the applicable Type 1 through 4 RRS for the referenced substances in groundwater in writing, or provide alternative values along with the calculations and justification for their review by EPD. EPD will defer further comments regarding applicable soil and groundwater RRS until tables summarizing: 1) proposed contaminant delineation and cleanup standards and 2) soil, groundwater, and surface water analytical results have been revised and submitted to EPD as discussed during the April 6, 2016 meeting referenced above.

ADDITIONAL GENERAL COMMENTS

6. Field sampling records provided in Appendix B of the Sixth Progress Report indicate groundwater purging and sampling conducted in November 2015 were generally consistent with current USEPA Science and Ecosystem Support Division (SESD) standard operation procedures (SOPs) as outlined in SESDPROC-301-R3 (*Groundwater Sampling*), effective March 6, 2013. However, EPD notes the following:
- a. When using the "Tubing-in-Screened-Interval" purge method, the drawdown should be minimal. EPD prefers that water level measurements be maintained within 0.3 ft during this

¹ *Bis* (2-chloroethyl) ether is "a-flagged" in Appendix III, Table 1 of the Rules, which represents the following condition: "The health-based drinking water criterion for this substance/analyte is lower than the lowest currently achievable and available detection limit. According to Rule 391-3-19-.07(4)(e), the detection limit or background will be the Type 1 groundwater concentration criterion for this substance/analyte." Future submittals should propose a value equal to background levels or the standard analytical detection limit (as defined in §391-3-19-.06(3)(b)3. and §391-3-19-.02(2)(d), respectively, of the Georgia Hazardous Site Response Rules) for the Type 1 RRS for this substance in groundwater.

type of purging. Water level drawdown during purging exceeded 0.3 ft for monitoring wells MW-F21 and MWD-30. In the future, if water levels cannot be maintained within 0.3 ft or less during purging, the sampler should pull the pump up to within a foot or two below the top of water and purge at least 3 times the standing well volume and up to a maximum of 5 times the standing well volume prior to collection of groundwater samples based on purge stabilization criteria outlined in the referenced USEPA SESD SOPs. The pump intake may be lowered as necessary if purging by this method. If the monitoring well is purged dry, it should be noted in the field sampling logs.

- b. The last three pH measurements recorded while purging MW-29 were not within ± 0.1 Standard Units (SUs) as defined for purge stabilization in the referenced USEPA SESD SOPs.
 - c. Although it is still advised to record temperature during purging, temperature stabilization is no longer used by the USEPA SESD SOPs for demonstrating purge stabilization.
7. With the exception of temperature readings, purge stabilization criteria listed at the bottom of the field sampling records for the November 2015 groundwater sampling event are consistent with USEPA SESD SOPs. However, several of the criteria listed at the bottom of the field sampling records provided in Progress Reports #4 and #5 were not consistent with the SOPs. Please ensure that samplers are provided with the correct criteria during future groundwater sampling events.
 8. Collection of groundwater samples for Volatile Organic Compound (VOC) analyses is acceptable when using a peristaltic pump. However, pursuant to Section 4.3.1.2 of SESDPROC-301-R3, groundwater samples collected for Semi-Volatile Organic Compound (SVOC) analyses using a peristaltic pump should be collected using an in-line vacuum jug assembly unit and should be documented accordingly in field sampling records. Note: The vacuum jug assembly unit is not required for collection of SVOC samples when using a submersible or bladder pump, nor should it be used to collect VOC samples regardless of the type of pump used.

EPD will defer additional comments, including those related to conclusions regarding soil, groundwater, and surface water contaminant delineation and/or compliance with applicable cleanup standards, until such time as the appropriate tables, figures, and other documentation discussed during the April 6, 2016 meeting have been submitted to EPD. EPD will expect to receive the next scheduled VRP Progress Report (Report #7) by no later than September 15, 2016. A separate written response to the above comments is not required; however, they should be addressed in an appropriate future submittal prior to submittal of the final CSR due no later than March 15, 2018. If you have any questions, please contact Carolyn L. Daniels, P.G. of the Response and Remediation Program at (404) 657-8646 or *via* email at carolyn.daniels@dnr.ga.gov.

Sincerely,



David Hayes
Acting Unit Coordinator
Response and Remediation Program

c: Ms. Johnnie M. Quiller, Solenis LLP (*via* email)
Mr. David M. Wilderman, P.G., Arcadis U.S., Inc. (*via* email)

File: 242-0236 (VRP1332420701/HSI No. 10696)

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