



May 4, 2020

Ms. Nancy Parr
Environmental Protection Manager
Environmental, Health & Safety Operations
Columbia Fuel Fabrication Facility
5801 Bluff Road
Hopkins, SC 29061

Re: Response to Interim Remedial Investigation Data Summary
Westinghouse Electric/Columbia Plant
Interim Remedial Investigation Data Summary Report dated
Richland County
File # 51377

Dear Ms. Parr:

The South Carolina Department of Health and Environmental Control (Department) has reviewed the Remedial Investigation Data Summary (RI). The following comments were generated during this review:

A. FLOOD PLAIN / MILL CREEK / UPPER and LOWER SUNSET LAKES

1. The RI has documented that the surface water levels in Upper and Lower Sunset Lakes in October 2019 were 2 to 3 feet higher than the groundwater adjacent to them in flood plain wells and higher than the surface water level in Mill Creek immediately below Lower Sunset Lake. The RI offers no discussion on this hydrologic condition, how the water levels in the lakes influence groundwater, whether temporal changes are significant. Changes in the surface water levels data need to be established over time to see if the lakes are gaining or losing streams (or both) to groundwater. Also, the Department is requesting two additional staff gauges to be installed better document this surface water feature - one at the upstream end of the by-pass canal and the other one in Mill Creek just before it enters Upper Sunset Lake. The role of the by-pass canal we believe is critical to establish.
2. Based on the sediment samples from the Mill Creek/Upper Sunset Lake/Lower Sunset Lake surface water complex, Uranium 233/234 was detected in sediment samples SED-19 (32.5 pCi/g) and SED-20 (62.5 pCi/g) in Upper Sunset Lake and in Lower Sunset Lake in sediment sample SED-22 (117 pCi/g). No explanation was given for the presence of elevated Uranium in the Upper and Lower Sunset Lake sediments other than a general statement on page 9 of Appendix B "Technical Basis Document" by

Leidos that says of these impacted sediments, "Transport of impacted soils and sediments from historical event are the likely source of the radiological impacts." Any known "historical events" need to be documented and discussed as part of the RI as should be the mode of transport and resulting distribution of impacted sediments in a revised Report. Additional assessment will be needed to delineate the impacted sediment distribution to Upper and Lower Sunset Lakes, and adjoining segments of Mill Creek including both shallow and deeper sampling intervals.

3. Appendix B states that 2 sediment sample transects 51-52-53 and 54-55-56 must represent background radiological levels based on the flow direction of Mill Creek. However, as noted in comment #1 above, the by-pass canal may make the inferred Mill Creek flow direction between the head of the canal and the Entry dike at the top of Upper Sunset Lake (where these transects are located) be the opposite of what is expected if enough runoff from the site fills the lakes when Mill Creek levels are lower. The Uranium-234 activities for the samples in these two transect are approximately 2 times greater than those documented in locations SED-11 and SED-12 near Bluff Rd. Again, this supports the need in comment #1 to establish staff gauges in these 2 other areas to document the relative water levels throughout this portion of the Flood Plain.
4. Floodplain wells need to be utilized in the Surficial potentiometric maps. These wells may be in a different geologic formation, but hydrogeologically, they are in the Surficial Aquifer.
5. Lithologic Boring L-1, located in the Congaree River flood Plain, documented a very thick sand interval down to a depth of 80 ft. (elevation = 31 ft. msl) where it finally encountered a stiff gray clay inferred to be the Black Mingo clay. This suggests a deep incisement of a stream channel within the Congaree River floodplain into the confining Black Mingo Clay unit. In fact, only four wells at the site have penetrated this clay and all showed shallower elevations for the bottom of this clay (W-50 at 58.8 ft., W-3A at 44.6 ft., W-49 at 44.8 ft., and W-71 at 63.7 ft.) Groundwater samples collected from the bottom of L-1 at the time it was drilled were non-detect for volatile organic compounds (VOCs). However, the well logs for L-1 noted elevated PID readings and a "chemical odor" at this bottom (80 ft.) depth interval. Monitoring well W-95 was subsequently completed at this location but was screened above a shallower silt layer (at a depth of 34'). A deep well needs to be installed at this location to document groundwater quality data from this zone.
6. The fact that VOC's are detected at all in wells W-94 and W-95, wells that are both on the other side of Sunset Lakes from the plant itself, requires that a more thorough understanding of the floodplain hydrogeology is warranted as is an understanding of how groundwater contaminants in the shallow aquifer under the plant site transition into the flood plain groundwater units and beneath the surface water bodies (Upper and Lower Sunset Lakes.)

B. COMMENTS ON THE INVESTIGATION OF AREAS OUTSIDE THE FLOOD PLAIN

Groundwater and Hydrogeology Comments:

1. The surface of the top of the Black Mingo Clay needs to be depicted in a structural contour map of the top of the Black Mingo Clay. This surface, in part, dictates the thickness of the surficial aquifer outside of the flood plain and may influence contamination migration pathways. Please include in a revised report.
2. In general, DHEC questions the need to make a distinction between an "Upper Surficial aquifer" and a "Lower Surficial aquifer" for purposes of groundwater flow. The distribution of contaminants clearly shows that there is connectivity between the different depths of the surficial aquifer, so mapping them as 2 different groundwater flow units does not support the data. For example, wells W-11 and W-15, which are about 150 feet apart from each other, are screened at nearly identical elevations and in the same sand/gravel unit. However, W-11 is designated and mapped as in the "Lower Surficial Aquifer" while W-15 is designated and mapped as being in the Upper Surficial Aquifer. Why? For purposes of contaminant distribution (plume maps) it is useful to show the distributions at different depths.
3. Potentiometric data provided in the RI suggest a more westerly component of groundwater on the west side of the sanitary lagoon. Installation of shallow and deep wells west of the sanitary lagoon is needed to further delineate plumes in this area.
4. Topography should be depicted on the potentiometric maps. This is important in being able to compare relative elevations of the site drainage ditches to the surficial groundwater elevations to see if locally groundwater is being intercepted by the ditch system. It also is useful to show drainage patterns on site. Were the elevations of the sediment sample locations recorded?
5. Appendix D - Conceptual Site Model (CSM). Cross section G – G' shows well W-3A as being screened in the middle of the Black Mingo Clay instead of in the aquifer below. Cross Section F – F'; what is the basis for showing the top of the Black Mingo so close to the bottom of well W-11? Showing the Lithologic Borings on some of these cross sections would be more accurate (example L-1 has more data than W-95).
6. Well W-91 will have to be replaced as it screened above the water table and cannot provide groundwater samples.
7. Please provide explanations for why W-85, W-86 and W-4 are not used for the potentiometric maps.
8. Please explain why well W-92 and possibly W-4, are not considered Flood Plain wells?

Soils, sediments, source areas, and other comments:

9. Additional assessment is needed along the ditch, located on the western side of the facility, near monitoring wells W-39, W-65 & W-66, between West Lagoons 1 & 2, around the intersection of ditches, and near W-46 to further define the plumes. Included in the additional assessment is installation of monitoring wells, soil sampling, soil gas survey (could be utilized for VOCs source location), and other useful tools.

10. Mapping the extent of Gross Beta detections is needed to help evaluate the extent of the Technetium-99 (Tc-99) plume as Gross Beta seems to be only associated with Tc-99 based on previous reports. Additional investigation is needed south of the sanitary lagoon and the east lagoon for Tc-99. While the TC-99 900 pCi/L activity level is helpful to include on the iso-activity maps, Tc-99 should be illustrated in figures all the way down to the detection limit. We understand from Westinghouse that the Tc-99 analytical method will be changed for all future water samples to be able to achieve a detection limit close to 1 pCi/L and not the 50 pCi/L used in all previous laboratory analyses to date. Please revise the report to include a distribution map of Gross Beta in groundwater and revise the Tc-99 plume map to contour down to the detection limit.
11. The Department noted that Uranium 233/234 was detected, 14.9 pCi/g, in sediment SED-16, which is located west of the sanitary lagoon. More assessment is needed in this area.
12. The Department noted that Sediment samples SED-23 & SED-24 in the Gator Pond had Tc-99 detects at 50.8 pCi/g and 35.8 pCi/g. Additional sediment assessment is needed to evaluate vertical and horizontal extent of contamination in Gator Pond.
13. The sediment samples in the Sanitary Lagoon had detects of Uranium 233/234 at 907 pCi/g (SED-25) and 222 pCi/g (SED-26). Further assessment of other site COC's in the unlined Sanitary Lagoon should be collected in the next phase of investigation.
14. In the text on page 11, there is a statement that says, "No Tc-99 was detected in the soil samples." Even though that is true for the industrial screening level, soil sample SS-13 Dup was slightly above the residential screening level (21.6 pCi/L) and that statement needs to be corrected in the report. The Department concurs that a Tc-99 source was not determined in the soil samples.
15. The Department has noted that in Table 6 the soil analytical units of measurement are in inches below ground surface, this need to be changed to feet below ground surface.
16. In future reports field sampling notes need to be included.
17. Iso-concentration maps need to include all detects of each chemical of concern, not just the ones that are at maximum contaminant level (MCL) or higher. An MCL- or dose-equivalent iso-concentration line can be included for reference.
18. The new monitoring well W-93 had VOC detections greater than the MCL, which suggests a source area is further upgradient has made it into the lower portion of the surficial aquifer.

Westinghouse has requested that once the Department sends comments on the Interim Remedial Investigation Report they would like to hold a meeting to discuss the comments, Conceptual Site Model and next steps. Please provide the Department some potential dates for this meeting.

Please submit a revised Report to the Department by on or before July 15, 2020. After the CSM meeting the Department will determine the timeframe for submittal of the Phase II Work Plan. If you have any questions, please don't hesitate to contact me at (803) 898-0722 or through email kuhnkm@dhec.sc.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kimberly M. Kuhn'.

Kimberly M. Kuhn, Project Manager
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