Enclosure 3 to
LTR-RAC-20-94
Date: December 18, 2020

Enclosure 3

Response to Request for Additional Information

CWW Well Permit and Approval

Westinghouse

Westinghouse Electric Company
Nuclear Fuel
Columbia Fuel Fabrication Facility
5801 Bluff Road
Hopkins, South Carolina 29061
USA

Ms. Kim Kuhn
South Carolina Department of Health and
Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

Direct tel: 803.647.3338
Direct fax: 803.695.4152
e-mail: parrnb@westinghouse.com

Your ref:
Our ref: LTR-RAC-18-59

August 29, 2018

Subject: Monitoring Well Permit Application

Dear Ms. Kuhn,

Please find the enclosed Monitoring Well Permit Application prepared by AECOM Technical Services, Inc. (AECOM) in consultation with the Westinghouse Columbia Fuel Fabrication Facility located at 5801 Bluff Road in Hopkins, SC.

Please call me if you have any questions or require any additional information regarding this application.

Respectfully,

Nancy Blair Parr

Nancy Blair Parr
Licensing Manager

cc: M. Annacone, Columbia Fuel Operations Vice President
E. Wills, Organizational Effectiveness Manager
J. Howell, Environment, Health and Safety Manager
V. Kelmeckis, Corporate Environmental Manager
D. Joyner, Principal Environmental Engineer
J. Grant, Project Manager, AECOM
C. Suddeth, Senior Hydrogeologist, AECOM

AECOM
101 Research Drive
Columbia, SC 29203

803.254.4400 tel
803.771.6676 fax

August 29, 2018

Ms. Kim Kuhn
South Carolina Department of Health and Environmental Control
Bureau of Land and Waste Management
2600 Bull Street
Columbia, SC 29201

RE: **Contaminated Wastewater Line Work Plan**
Westinghouse Columbia Fuel Fabrication Facility
5801 Bluff Road, Hopkins, SC 29061

Dear Ms. Kuhn:

This letter documents the plan to obtain soil samples near the Contaminated Wastewater (CWW) line, install temporary monitoring wells, and collect groundwater samples that are indicative of the groundwater quality in the shallow water table aquifer at the facility in the vicinity of the CWW line.

BACKGROUND

In October 2008, a break was noted in the below ground, gravity drain CWW line (terracotta and PVC) at a joined connection point near Dock 3. During the repair of this break, samples of effluent water from the line and soils near the break were obtained and analyzed for radionuclide concentrations. The soil samples were obtained at a depth interval of 7-8 feet below land surface (bls). Results of the samples taken at the source indicated elevated radionuclide concentration in the process waste water and subsurface soils. The event was documented, and soils that were excavated to allow Westinghouse to repair the break were placed back into the excavated area. Westinghouse continued to monitor the area as per its existing, comprehensive environmental monitoring program, and the monitoring data has continued to show no radionuclide values above or approaching drinking water limits.

In 2011, Westinghouse personnel discovered that there was a loss of integrity at two locations of the CWW line underneath the main manufacturing building and that the rest of the line was highly corroded. Three soil samples and one process waste water sample were collected at one of the areas where integrity of the drainage line was lost. These samples indicated elevated radionuclide concentration in both soil and process waste water at the source of the leak.

As a result of the discovery of the condition of the CWW line, piping within the facility was replaced with above ground piping and the CWW line outside of the facility was replaced using the pipe bursting technique. While the Westinghouse environmental monitoring program has not detected any radionuclide values above or approaching drinking water limits, Westinghouse wishes to understand in greater detail the potential impacts of these releases on soil and/or groundwater at the facility.

Westinghouse initiated an assessment of the CWW line with the Department's approval, No. MW-11571 dated June 11, 2018. This work plan and request to install nine temporary wells is a continuation of that effort.

SOIL SAMPLE COLLECTION

AECOM initially intended to obtain vadose zone soil samples directly adjacent to the CWW line using direct push technology. Due to the number of underground utilities within the study area, the required clearance to safely install a boring using direct push technology near the CWW line was unable to be achieved. Therefore, AECOM proposes to use a hand auger to install borings close to the CWW line. Prior to installation of the hand auger borings, vacuum extraction will be used to verify the depth to and diameter of the CWW line. Should vacuum extraction indicate that the CWW line is at a greater depth than previously reported, soil samples may need to be collected within the capillary fringe or the smear zone of the water table.

Nine hand auger soil borings will be installed in the approximate locations originally planned for the direct push borings. It is believed that the bottom of the CWW line is located approximately seven to eight feet below ground surface (bgs). This depth is close to the historical high water table in this area, particularly in the southern portion of the study area where the water table is shallower. Because the CWW line is a gravity drain line, the line slopes downward to the south at an approximate one degree angle; thereby increasing its depth in the southerly direction.

One soil sample will be collected per borehole. Soil samples will be analyzed for radionuclides by Environmental Protection Agency (EPA) and Department of Energy (DOE) approved methods.

MONITORING WELL INSTALLATION

AECOM will install nine temporary monitoring wells directly adjacent to the boreholes that were installed in July 2018. The purpose of the installation of these wells is to obtain groundwater samples from the CWW line study area. The wells will be installed with hollow stem augers to a total depth of 15 feet bgs, which equals the depths of the previous borings. The wells will be completed with Schedule 40 PVC casing and five feet of 0.010 inch slotted PVC screen. Because these wells are intended to reproduce the screened interval of the previous temporary wells which were screened from 11 to 15 feet, a five foot screen will be used in lieu of the standard ten foot screen typically used for shallow water table monitoring wells.

As the hollow stem augers are removed from the ground, filter pack sand will be installed by washing sand down the inside of the hollow stem augers. That way, the borehole annulus is filled with the sand from the bottom up as the augers are extracted from the ground and collapse of formation material against the screen does not occur. The filter pack will be installed to a minimum of one foot above the top of the well screen. After the filter pack is installed, a minimum of two feet of bentonite pellets or chips will be installed through the augers using the same methodology as the filter pack emplacement. The augers will be pulled up until all of the bentonite has fallen out of their annular space. Once the bentonite is no longer within the annular space of the augers, the bentonite will be hydrated to allow it to swell and seal the borehole prior to the borehole being grouted. After the bentonite has been hydrated, a Portland cement grout will be installed using tremie pipe.

Approximately three feet of casing will extend above ground surface and a locking cap will be used to complete the temporary well. Bentonite will be mounded at the surface to ensure that precipitation does not enter the borehole.

Monitoring well development will occur at least 24 hours after the wells have been completed. The wells will be aggressively surged and pumped to remove disturbed sediment from the well and filter pack. Development will be conducted until the water purged from the wells is free of visible sediment and indicator parameters of pH, temperature, specific conductivity, and turbidity have

stabilized. The development will be documented by AECOM personnel on monitoring well development logs. Purged groundwater will be containerized until it can be treated by the on-site wastewater treatment plant.

GROUNDWATER SAMPLING

Approximately 48 to 72 hours after the well development is completed, groundwater samples will be collected using low flow methodology. Specific conductivity, pH and temperature will be measured during the low flow sampling. Groundwater will be collected after these parameters have stabilized and turbidity is less than 10 Nephelometric Turbidity Units (NTU) or stable within 10 percent if greater than 10 NTU. Stabilization is considered to be attained when pH is within 0.2 standard units and temperature and specific conductivity are within 10 percent of the previous measurement.

Groundwater samples will be collected in laboratory supplied bottles and transported to a SC certified laboratory. A chain of custody will be maintained throughout the transport process to ensure sample integrity. Groundwater samples will be analyzed for radionuclides by EPA and DOE approved methods.

ASSESSMENT REPORT

AECOM will prepare a report documenting the field location of the borings, depth of sample collection and associated analytical results. A hard copy and one electronic copy of the report will be submitted to SCDHEC within four weeks of receipt of laboratory analytical data.

Sincerely,

AECOM Technical Services, Inc.

Jeremy Grant, PG
Project Manager
AECOM Technical Services, Inc.

Monitoring Well Application

1. Proposed Location of Monitoring Well(s):

   Street Address: **5801 Bluff Road**

   City (including Zip): **Hopkins, SC 29061**

   County: **Richland**

   Please attach Scaled Map or Plat

2. Well Owner's Information:

   Name (Last then First):

   Company: **Westinghouse Electric Co.**

   Complete Address: **Same as above**

   Telephone Number:

3. Property Owner's Information:

   ☑ Check if same as Well Owner

   Name (Last then First):

   Company:

   Address:

   Telephone Number:

4. Proposed Drilling Date: **09/18/2018**

5. Intended Purpose of Well(s):

   Pre-Purchase ☐

   Investigation ☑

   NOTE: If this request is for an existing DHEC project, please enter the Program area and ID number below.

   Program Area:
   Project or Site ID #:

6. Proposed number of monitoring wells: **9**

7. Proposed parameters to be analyzed (check all that apply), please specify analytical method beside check box:

VOCs	☐
BTEX	☐
MtBE	☐
Naphthalene	☐
PAHs	☐
Metals	☐
Nitrates	☐
Base, Neutral & Acid Ex.	☐
Pesticides/Herbicides	☐
Phenols	☐
Radionuclides	☑
PCBs	☐
Other (specify below)	☐

8. Proposed construction details (complete and attach proposed monitoring well schematics):

   Temporary wells. Well construction details outlined in the AECOM work plan.

Legend

- Study Area
- Proposed Boring Locations
- Shallow Aquifer Monitoring Well Location
- Intermediate Aquifer Monitoring Well Location
- Black Mingo Aquifer Monitoring Well Location
- Ditch
- EL East Lagoon
- NL North Lagoon
- SL South Lagoon
- SAN Sanitary Lagoon
- WL1 West Lagoon 1
- WL2 West Lagoon 2

300 150 0 300 Feet

1:3,600

Map Projection: NAD 1983, South Carolina State Plane, FIPS 3900, Feet

Datum: North American 1983

AECOM
101 Research Drive
Columbia, SC 29203
T: (803) 254-4400 F: (803) 771-6676

Site Plan

WESTINGHOUSE COLUMBIA FUEL FABRICATION FACILITY
HOPKINS, SOUTH CAROLINA

PROJECT NO.	PREPARED BY:	DATE:	
60528361	JLG	August 2018	FIGURE 1

Path: N:\Public Share\JGeilhard\For Jeremy Grant\Westinghouse Maps\Updated Westinghouse Figure 1.mxd

N

Legend

- Study Area
- Proposed Boring Locations
- Shallow Aquifer Monitoring Well Location
- Intermediate Aquifer Monitoring Well Location
- Black Mingo Aquifer Monitoring Well Location
- Ditch
- EL East Lagoon
- NL North Lagoon
- SL South Lagoon
- SAN Sanitary Lagoon
- WL1 West Lagoon 1
- WL2 West Lagoon 2

50 25 0 50 Feet

1:600

Map Projection: NAD 1983, South Carolina State Plane, FIPS 3900, Feet

Datum: North American 1983

AECOM
101 Research Drive
Columbia, SC 29203
T: (803) 254-4400 F: (803) 771-6676

Study Area

WESTINGHOUSE COLUMBIA FUEL FABRICATION FACILITY
HOPKINS, SOUTH CAROLINA

PROJECT NO.	PREPARED BY	DATE	
60528361	JLG	August 2018	**FIGURE 2**

Path: N:\Public Share\JGeilhard\For Jeremy Grant\Westinghouse Maps\Updated Westinghouse Figure 2.mxd

dhec
Healthy People. Healthy Communities.

August 31, 2018

Ms. Nancy Parr
Licensing Manager
Westinghouse Electric Company
Columbia Fuel Fabrication Facility
5801 Bluff Road
Hopkins, SC 29061

Re: **Contaminated Wastewater Line Work Plan Approval**
Westinghouse Electric/Columbia Plant
Contaminated Wasterwater Line Work Plan received on August 30, 2018
Richland County
File #51377 (Former Site ID# 00456)

Dear Ms. Parr,

The South Carolina Department of Health and Environmental Control (Department) has reviewed and approves the work plan that was submitted on August 31, 2018, based on the following condition. Samples should be analyzed for all the parameters associated with the site, not just radionuclides. The workplan outlines AECOM installing nine temporary wells, in close proximity to the previous temporary wells, at the depth of 15 feet. Please submit assessment report to the Department on or before November 30, 2018. Please feel free to contact me with any questions or comments at (803) 898-0722 or at kuhnkm@dhec.sc.gov.

Sincerely,

Kimberly M. Kuhn
Project Manager
State Voluntary State Cleanup Program
Site Assessment, Remediation & Revitalization Division
Bureau of Land and Waste Management

Enc: Montioring well approval form

Cc: Myra Reece, Director Environmental Affairs
Mike Marcus, Chief, BOW
Lucas Berresford, BLWM
Ken Taylor, BLWM
Veronica Barringer, Midlands EA Office
Jessie Muir Quintero, Project Manager, U.S. NRC,
Chuck Suddeth, P.G., AECOM, 101 Research Drive, Columbia, SC 29203
Jeremy Grant, AECOM, 101 Research Drive, Columbia, SC 29203
file #51377

dhec
Healthy People. Healthy Communities.

Monitoring Well Approval

Date of Issuance: August 31, 2018 **Approval #: MW-11664**

Approval is hereby granted to: AECOM on behalf of Westinghouse Electric
5801 Bluff Road, Hopkins, SC 29061

Facility: Westinghouse Electric/Columbia Plant
Richland County, South Carolina

This approval is for the installation of nine (9) temporary monitoring wells. The monitoring wells are to be installed at the locations identified and per the proposed construction details provided in the August 31, 2018 monitoring well installation permit applications. These monitoring wells are to be installed following all of the applicable requirements of R.61-71.

Please note that R.61-71 requires the following:

1. All wells shall be drilled, constructed, and abandoned by a South Carolina certified well driller per R.61-71.D.1.

2. All wells shall be properly developed per R.61-71.H.2.d. A Water Well Record Form or other form provided or approved by the Department shall be completed and submitted within 30 days after well completion or abandonment unless another schedule has been approved by the Department. The form should contain the "as-built" construction details and all other information required by R.61-71.H.1.f

3. All analytical data and water levels obtained from each monitoring well shall be submitted to the author of this approval within 30 days of receipt of laboratory results unless another schedule has been approved by the Department as required by R.61-71.H.1.d.

4. All monitoring wells shall be labeled as required by R.61-71.H.2.c.

5. If any of the information provided to the Department changes, including the proposed drilling date, Kimberly Kuhn shall be notified by phone, (803) 898-0722, at least twenty-four (24) hours prior to well construction as required by R.61-71.H.1.a.

This approval is pursuant to the provisions of Section 44-55-40 of the 1976 South Carolina Code of Laws and R.61-71 of the South Carolina Well Standards, dated May 27, 2016.

Kimberly Kuhn, Project Manager
State Voluntary Cleanup Program
Bureau of Land and Waste Management