

9/30/2019

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From: Parr, Nancy B. <parrnb@westinghouse.com>

Sent: Thursday, September 26, 2019 5:01 PM

To: Kuhn, Kimberly M.; Berresford, James; Taylor, G. Ken; Aazou, Nizar

Cc: logsdocj@westinghouse.com; Joyner, Diana P

Subject: RI Addendum 2_LTR-RAC-19-49-R1_East Lagoon Sludge Characterization Work Plan - FINAL

*** Caution. This is an EXTERNAL email. DO NOT open attachments or click links from unknown senders or unexpected email. ***

Attached is the revised East Lagoon plan, including an enclosure addressing resolution of the comments we discussed.

Will you please forward this electronic copy to the appropriate persons in the Bureau of Water?

Also as discussed, we have lined up sampling for the week of October 7th but will get back with you to make sure the specific days work for split sampling, likely Tuesday or Wednesday.

Thanks,

Nancy

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Westinghouse

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SEP 30 2019

**SITE ASSESSMENT,
REMEDICATION &
REVITALIZATION**

Westinghouse Electric Company LLC
Nuclear Fuel
Columbia Fuel Site
5801 Bluff Road
Hopkins, South Carolina 29061
USA

Ms. Kim Kuhn
Ms. Crystal Rippy
South Carolina Department of Health and
Environmental Control (SCDHEC)
Bureau of Land and Waste Management
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Our ref: LTR-RAC-19-49-R1

**Wastewater Treatment Area Operable Unit
East Lagoon Sludge Characterization Remedial
Investigation Work Plan
Addendum 2, Revision 1**

September 26, 2019

Dear Ms. Kuhn and Ms. Rippy:

Westinghouse has prepared the following work plan to characterize the sludge in the East Lagoon as per Section 3.5.8 of the Final Remedial Investigation (RI) Work Plan. This Final RI Work Plan was approved by the Department on June 19, 2019, under the Consent Agreement signed on February 26, 2019. This Work Plan has been revised to address the Department's comments included in its September 10, 2019, letter to Diana P. Joyner.

Background

The Westinghouse Columbia Fuel Fabrication Facility (Westinghouse) manufactures commercial nuclear fuel near Columbia, South Carolina under Nuclear Regulatory Commission (NRC) Special Nuclear Material (SNM) license SNM-1107. A feature of interest on the site is known as the East Lagoon.

The East Lagoon is a treatment/settling pond that is approximately 160' x 130'. Current East Lagoon operations are regulated under Westinghouse's National Pollutant Discharge Elimination System (NPDES) permit. However, based on past wastewater treatment area operations and the age of the East Lagoon liner, a Wastewater Treatment Area Operable Unit (OU) was established under the SCDHEC Consent Agreement signed on February 26, 2019.

Currently, the East Lagoon receives an average of 20,000 gallons of wastewater per day, primarily from regeneration water from resin beds with lesser amounts from chemical laboratory sinks, LECO machines, tank farm containment dike, UT cleaners and furnaces, and the HERMIE strap washing process. The lagoon has been in service for almost 40 years and historically received other process waste streams containing radiological elements. The lagoon was re-lined with 36-mil Hypalon® in the 1981-1982 timeframe, and the liner is beyond its useful life. The lagoon is expected to contain approximately 4' of chemically and radiologically impacted sludge. There is the possibility of soil impacts under and around the lagoon due to leaching.

The Final RI Work Plan approved by the Department on June 19, 2019, contains the following description of the Wastewater Treatment Area OU:

Two lined settling ponds (North and South Lagoons), one process wastewater pond (East Lagoon), a sodium silicate (Waterglass) wastewater treatment process to treat U-contaminated, ammoniated wastewater from the conversion process, and several storage tanks exist in the Wastewater Treatment Area OU. The North and South Lagoons were relined from January through February 2012 with 80-mil High Density Polyethylene (HDPE). The East Lagoon was last relined in the 1980's when the Waterglass process was installed. The liner is constructed of 36-mil Hypalon®. There is a significant quantity of U-contaminated sludge that has settled in the East Lagoon.

*The North and South Lagoons receive treated wastewater from the West I and West II Lagoons. Operations in the West Lagoons Area OU are described in **Section 2.4**. Treated liquid process waste from the North or South Lagoon is mixed with treated sanitary wastewater in an underground pipe prior to transfer into the facility lift station. The combined waste is then passed through a final aerator, followed by dechlorination and pH adjustment as required and subsequently pumped to the Congaree River via a 6-inch pipeline. The discharge location of this pipeline is shown on Figure 1 (located in the RI Work Plan).*

The Waterglass wastewater treatment process includes removal of residual U from ammoniated wastewater originating in the Chemical Area OU through flocculation and filtration. The filtered wastewater contains less than 0.2 parts per million (PPM) U. Following U removal, lime is added, and the wastewater is processed through a distillation column to remove and recover ammonia and fluoride.

The East Lagoon currently receives non-SNM liquid inputs such as effluent from the Deionized Water Building and rainwater from containment areas such as the chemical tank farm. The East Lagoon is monitored for pH and liquid level and is sampled for fluoride, ammonia and Total Suspended Solids (TSS). Once full, the East Lagoon is pumped to either the North or South Lagoon. Before the North or South Lagoon is discharged, a four corner sample is taken and analyzed for pH, TSS, ammonia, fluoride and activity. The East Lagoon also provides extra capacity for overflow from other lagoons or for containment in the event of a spill or emergency. Past practices associated with East Lagoon operations included the introduction of materials containing low level, radiological contamination. Because of these past practices, sediment in the East Lagoon is contaminated with uranium. Characterization of the East Lagoon sediment is included in this initial work plan.

Historic Data

In 2011, sludge in the East Lagoon was sampled and analyzed. The results indicated that the sludge contained between 70 - 2,540 ppm total Uranium (U) (1,108 ppm average). The East Lagoon is also known to have relatively high levels of fluoride and nitrates. A composite sample in 2016 confirmed these findings and indicated somewhat higher total U levels. The East Lagoon may be a potential source of recent Technetium-99 detections in nearby groundwater samples.

Site Wide CERCLA Process

Under the SCDHEC Consent Agreement, the site has initiated a comprehensive CERCLA RI to evaluate the environmental status of the site as a whole, and to determine what remedial actions are appropriate. The steps of the Consent Agreement include conduct of the RI (likely conducted over multiple phases), Feasibility Study, Record of Decision, Remedial Design, and Remedial Action. Based on past wastewater treatment area operations and the age of the East Lagoon liner, a Wastewater Treatment Area OU was established, and the first phase of the RI Work Plan began June 10, 2019.

Expedited Approach

Given the existing sludge quality data, Westinghouse plans to expedite the process to address the East Lagoon. Reasons include: 1) Westinghouse wants assurance there is no active source of impacts from historic operations, and this requires removal of and sampling underneath the liner. 2) Westinghouse wants to establish improved lagoon leak detection and preventive maintenance practices. 3) Westinghouse is committed to the overall improvement of the site's environmental condition. 4) a condition of the site's draft NPDES permit requires the East Lagoon be closed or relined within 2 years.

In support of the expedited approach, this characterization work plan is designed to gain a better understanding into the conditions of the lagoon. Characterization of the lagoon sludge is needed first, in order for a sludge removal process to be developed and implemented.

Phased Approach

The following Phase 1 sampling work plan has been developed by Westinghouse to characterize sludge in the East Lagoon in order to prepare a Closure Plan for SCDHEC's review and approval. A new treatment system is presently being designed and a NPDES permit modification request will be submitted to SCDHEC for approval as a modification to the existing NPDES permit. After appropriate permits are received, the new system will be constructed after which influents to the East Lagoon will be redirected. Following construction of the new treatment system and SCDHEC's approval of the Closure Plan, sludge will be removed from the lagoon, the lagoon liner will be removed, and the underlying soil will be sampled for Constituents of Potential Concern (COPC) in accordance with specifications included in Closure Plan. Soil sampling results will drive remediation of soil, as applicable, and in consultation with SCDHEC.

Westinghouse – East Lagoon Sludge Characterization Sampling Plan

1. PURPOSE

This plan establishes methods for obtaining sludge samples for radiological and chemical analysis to evaluate subsurface conditions of the East Lagoon. The analytical results will be used to identify COPCs that potentially could have impacted soil and groundwater underlying the East Lagoon as well as sludge characteristics relative to sludge disposal. This plan shall ensure the proper collection, handling, documentation, and evaluation of soil and sludge in support of Westinghouse environmental goals. Additional samples and analytical parameters not specified in this plan may be added as directed by the Environmental Manager.

2. HEALTH AND SAFETY

Westinghouse activities will be conducted in a manner that minimizes potential impact to the health and safety of employees, the public and the environment. Proper safety precautions shall be observed when collecting samples. Refer to the site Health and Safety Plan for relevant health and safety requirements. Any questions, comments or concerns should be directed to the Environmental Manager.

3. SAMPLE EQUIPMENT AND SUPPLIES

- Sludge sample probe or PVC pipe
- Scoop
- Bowl
- Sample Containers (Ziploc bags, or other sealable container)
- Field Logbooks
- Chain of Custody Forms (for specific Laboratory to be used)
- Writing utensils (indelible ink, black preferred)
- Decontamination Supplies
- Personal Protective Equipment (Refer to the site Health and Safety Plan for relevant requirements)

4. QUALITY CONTROL

The objectives of the analytical data are to generate sufficient information to determine the presence or absence of contaminants within the sample media and to evaluate potential remedial actions. To meet these objectives, data acquired during the sample collection phase must be defensible.

To ensure the validity of the data from the characterization sampling, four types of field QC samples will be collected and submitted for analysis. These QC samples will include the following:

- Field Duplicate (FD) samples - A minimum of 1 FD sample will be collected per 20 field samples. FD samples will be identified such that project personnel can identify the duplicates but submitted “blind” to the laboratory with two different sample identifiers (IDs). The FD samples will be analyzed for the same parameters as the primary sample.
- Field Blank (FB) samples – Three FB samples will be collected during sampling for Target Compound List/Target Analyte List (TCL/TAL) samples as specified below. The FB samples will be analyzed for the EPA’s TCL of volatile organic compounds (VOCs). The FB samples will

consist of deionized water poured directly into sample vials contemporaneous with collection of the TCL/TAL samples.

- Rinsate Blank (RB) samples – One RB sample will be collected each day sampling equipment is reused in the field and field cleaned per the specifications in Section 5.2. RB samples will be collected from the final rinse of the sampling equipment after the cleaning procedure has been performed. The RB sample will be analyzed for the list of parameters being tested that day.
- Trip Blanks (TB) samples - A TB packaged in VOC sample vials will be provided by the laboratory. The sample vials will be taken to the site in sample coolers and returned to the laboratory unopened. The TB samples will be tested for TCL VOCs. Thus trip blanks will be included in only the sample coolers used to ship VOCs.

In addition to field QC samples, the laboratory analyzing the samples will conduct its internal QC procedures specific to each analytical method to evaluate analytical accuracy and precision relative to the sample matrices. Examples of laboratory QC samples include Matrix Spike (MS) and Matrix Spike Duplicate (MSD) samples, Laboratory Control Samples (LCS), and internal duplicate samples.

All laboratory data will be evaluated when the analytical data package is received from the laboratory. QC sample results, applicable spike recoveries, and calibration summaries will be evaluated against the method quality criteria and the data will be flagged with data qualifiers as necessary. Acceptance or rejection of the data will depend upon professional judgment and the comparison of outlier values against site remediation criteria. If any data is rejected, a full explanation will be given as to why the data was rejected, as well as any corrective actions that may be necessary.

5. PROCEDURE

A variety of techniques and tools exist for collecting surface and subsurface samples of sludge. The East Lagoon sludge is estimated to be up to approximately 4 feet in depth and covered by a shallow layer of water. Based on this understanding, the preferred method selected to sample the East Lagoon is to use a Sludge Push Probe, with an internal acetate sleeve that is capable of collecting sludge in 0-2 foot or 2-4 foot horizons. These horizons have been selected to be representative of the planned remediation process. It is anticipated that East Lagoon sludge will be removed in approximately 2-foot layers using a track-hoe or similar equipment, which has an excavation bucket that is typically approximately 2 feet in depth. Therefore 2-foot horizons are representative of the anticipated future remediation technique.

Sludge sampling will follow EPA guidance, as advised in EPA Region 4 Operating Procedure SESDPROC-200-R3, *Sediment Sampling*. The following sections detail procedures to be used for this type of sampling. Deviations from the requirements specified in this plan must be authorized by the Environmental Manager and documented in the field logbook to allow recreation of the modified process.

5.1. General

A systematic grid sampling strategy with some biased locations has been selected for sampling. The grid sampling will ensure the sludge is fully and uniformly represented in the collected data. The East Lagoon will be sub-divided into 15 separate grids using east-west and north-south transect lines (Figure 1). In addition to the systematic samples, biased samples will be collected at locations where site processes discharge to the East Lagoon. These biased samples are shown on Figure 1 and are detailed in Table 1. At locations where the biased samples and systematic samples are co-located, a single sample location will be used for representation of that specific grid and the process inlet. All samples will be analyzed for Uranium,

Technesium-99, fluoride, nitrate, and ammonia. In addition, a more extensive parameter list will be analyzed in three samples. The more extensive analyses include the full Toxicity Characteristic Leaching Parameters (TCLP) list and the TCL/TAL except for pesticides and herbicides (in both TCLP and TCL) since these parameters are not potentially present in the sludge. The specific analytical methods and detection limits are shown in Table 2.

Table 1 – Proposed Sample Locations

SAMPLE LOCATION NUMBER	LOCATION TYPE	LOCATION PURPOSE
1	Systematic and biased	Grid 1 and biased for discharge from Sulfuric Acid Dike Drain.
2	Biased	Discharge from Still 1 relief, T-1187. Selected for TCLP and TCL/TAL analysis.
3	Systematic and biased	Grid 2 and biased for discharge from T-1110/1111 dike drain.
4	Systematic and biased	Grid 3 and biased for discharge from Lime silo and nitric acid dike drain.
5	Systematic and biased	Grid 4 and biased for discharge from Process sump, Still 2 relief, and Still 1&2 bottoms. Selected for TCLP and TCL/TAL analysis.
6	Systematic and biased	Grid 5 and biased for location of bleached liner.
7	Systematic only	Grid 6
8	Systematic only	Grid 7
9	Systematic only	Grid 8
10	Systematic only	Grid 9 and selected for TCLP and TCL/TAL analysis.
11	Systematic only	Grid 10
12	Systematic only	Grid 11
13	Systematic only	Grid 12
14	Systematic only	Grid 13
15	Systematic only	Grid 14
16	Systematic only	Grid 15

Up to two depth intervals (horizons) may be sampled at each location. One sample will be collected from the top 2 feet of sludge. The second sample will be collected from any remaining sludge (if present) to the depth of the liner, which is anticipated to be no more than an additional approximately 2 feet (approximately 4 feet total depth). Care will be taken not to puncture the liner. Sludge depths will be recorded in the field logbook for characterization purposes. Each sample will be field screened using beta/gamma sensitive radiological detectors and a Photo Ionization Detector (PID) prior to packaging the sample.

Up to 32 discrete field samples are anticipated to be collected at 16 locations from the East Lagoon. A unique sample ID will be generated and assigned to each individual sample collected. Samples will be sent to offsite analytical laboratories for analysis of radiological (Iso-U, Tc-99) and chemical parameters (Fluoride, Nitrate, Ammonia, TCLP, TCL/TAL as appropriate) by the methods described in Table 2.

Table 2 – Analytical Methods

Analysis	Method	Laboratory Requested Level (RL)*
Iso-U	SW6020A	1.0 pCi/g
Tc-99	DOE HASL 300 Tc-02-RC Mod	5.0 pCi/g
Fluoride	SW 9056A	0.1 mg/L
Nitrate	SW 9056A	0.1 mg/L
Ammonia	EPA 350.1 Mod/ SM 4500-NH3 B Mod	0.25 mg/L
TCL/TAL	SW846 8260B/8270B/6010C/7470A	Lowest achievable
TCLP	SW 1311/8260B/8270D/6010C/7470A	< TCLP Limits

* The contract laboratories will make every effort to achieve the lowest possible detection limits. Please note that detection limits will vary based on the moisture content of the sludge samples as well as the chemical and physical consistency of the sample matrix.

Figure 1 displays the planned sludge sampling locations, but locations may be adjusted in the field based on safety considerations. Efforts will be made to ensure that any location that is moved will still fall within the sample grid to ensure that each grid has a representative sample. Only areas that are safely accessible will be sampled. Approximately 1 liter of sludge will be collected for each sludge sample with individual aliquots shipped to each contract laboratory. It may be necessary to advance the sample probe several times to obtain the necessary volume.

5.2. Decontamination

Care must be employed to avoid cross-contamination between sampling intervals and locations. Decontaminated or new disposable sampling equipment and new, disposable gloves shall be used for each sample collected. New gloves must be donned just prior to sample collection. Equipment that is reused will be cleaned between each sample location as follows:

1. Wash and scrub equipment with a non-phosphoric, laboratory grade detergent and tap water, until the sample equipment is visibly clean.
2. Rinse equipment with distilled or deionized water.
3. Rinse equipment with appropriate solvent rinse, such as isopropanol.
4. Rinse equipment with distilled or deionized water.
5. If immediate reuse is not planned, allow equipment to air dry outside the cleaning area.
6. Wrap the sampling equipment with aluminum foil after cleaning and until next use.

The liquids used in the cleaning procedures, which is one type of Investigation Derives Waste (IDW), will be collected and placed in an appropriate container for proper disposal. Once each day that sampling equipment is cleaned and reused, a Field Rinsate blank sample will be collected from the final rinse of the sampling equipment after the cleaning procedure has been performed.

5.3. Sample Homogenization

With the exception of VOCs, samples from each horizon (approximately 2 feet or less) must be homogenized before being placed into the sample containers so that an aliquot representative of the desired interval is obtained. Samples shall be manually homogenized using a decontaminated stainless steel spoon or scoop and a stainless steel bucket or bowl. A disposable scoop and pan (plastic or aluminum) may also be used. Care will be taken to ensure that the sludge is mixed or blended thoroughly. VOC samples will not be homogenized and will be collected per EPA Method 5035A.

5.4. Sample Collection

Westinghouse's plan is to collect the majority, if not all, of the samples either from the bank of the lagoon, or from a boat using a sludge push probe per Section 5.4.1 below, unless this proves impractical. Guide ropes will be used to navigate the boat to the proper location for sample collection. If necessary, the Sample Technician may don hip-waders to access sample locations immediately next to the banks of the lagoon, but only if the area may be traversed safely.

Note: In addition to the samples specified in Table 1 and Figure 1, Westinghouse intends to collect five separate 5 gallon containers of East Lagoon for potential Waste Acceptance bench scale testing required by the disposal facility and/or geotechnical testing. These containers may be collected and filled at any time during the sampling event.

5.4.1. Sludge Sampling Using a Push Probe

At each designated location listed in Table 1 and Figure 1, perform the following steps:

1. Don clean gloves and assemble new, or decontaminated sample equipment, as required.
Note: If the sludge push probe is not practical, a PVC pipe of appropriate length and diameter may be used to collect the sludge sample by driving the pipe into the sludge and capping it prior to removal to create a vacuum lock and prevent loss of the sample. If this method is used, each PVC pipe will be considered single-use, disposable sample equipment.
2. Place plastic sheeting around the work area, as necessary, to prevent equipment from coming in contact with potentially contaminated surfaces and to prevent the transfer of contaminated materials to uncontaminated areas.
3. At each specified sample location, advance the push probe into the sludge until the depth of the liner is reached.
4. Withdraw the probe carefully from the boring, remove the acetate liner, and visually inspect the contents. If less than 2 feet of sludge are present at the sample location, only one sample will be collected. If more than 2 feet of sludge are present at the sample location, then two samples will be collected: one sample from the upper 2 feet and a second sample from sludge below that depth. In locations where two samples are collected, the sludge core will be cut at the appropriate interval, and each portion will be placed into a new or decontaminated sample bowl or tray. The samples will be collected in accordance with the methods described in Section 5.3, except for TCL VOCs which will be collected in Section 5.4.2.
5. Field screen the samples using a beta/gamma sensitive detector and a PID and record the appropriate information and observations about the sample location in the field logbook. Also note any photographs taken of the area, and the associated sample ID correlating to each photograph location. Note the depth that the sample(s) were collected in the field logbook.

6. Assign a unique sample ID for the sample to be collected, and label all sample containers with the unique ID.
7. If VOC samples are to be collected, these samples will be collected per the methods in Section 5.4.2 and before collection of the other samples.
8. After any necessary VOC samples are collected, thoroughly homogenize the sample in accordance with Section 5.3.
9. Use a new or decontaminated stainless steel scoop or other appropriate utensil to collect the sample from the sample bowl. Fill any additional sample containers as necessary.
10. Log the following information onto the sample container, field logbook, and the Chain of Custody form:
 - Sample ID
 - Time and Date of sample collection
 - Analytical parameters for analysis (Iso-U, Tc-99, Fluoride, Nitrates, Ammonia, TAL/TCL, and TCLP as appropriate)
 - Initial(s) of the Sampler(s)
11. Any remaining sample not collected in a container will be returned to the East Lagoon.
12. All reusable sample equipment will be decontaminated in accordance with Section 5.2 prior to additional sample collection at a new location.

5.4.2. VOC Sample Collection

The following steps are only applicable to VOC sample collection at the specified locations for the TCL/TAL samples. VOC sample collection will be performed in a minimal amount of time, with the least practical physical disruption of the sample. When collecting field duplicates, use two co-located samples in the same manner as the parent sample.

1. Don new gloves and collect clean sample equipment, if not already completed.
2. Obtain an undisturbed sample by pushing the volumetric sampling device with a disposable syringe into freshly exposed surface and remove once filled.
3. Extract the 5 g aliquot plug after surface of the soil has been exposed and transfer to a gas-tight vial to seal.
4. Extract a second 5 g aliquot plug and transfer to a gas-tight vial to seal to be kept on reserve for repeat analysis.
5. Ensure preservation by cooling at $4\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and maintain temperature for a hold time of 48 hours upon laboratory receipt.
6. Collect one 2 oz jar of an adequate soil sample ($> 10\text{g}$) for percent moisture determination.
7. Continue with sample collection as described in Section 5.4.1 above.

5.5. Sample Analysis and Reporting

All samples collected will be logged on the appropriate Chain of Custody form, stored in a sample cooler, and sealed and secured when not under the constant supervision of the sampling crew. The following preservation and hold times must be met for all samples collected:

- Chemical parameters (Fluoride, Nitrates, Ammonia, TCL/TAL and TCLP as necessary), cooled to below 6°C, minimum 48 hour hold time
- Radiological parameters (Iso-U, Tc-99), no preservation requirement, 180 day hold time

The laboratories utilized for this project will have National Environmental Laboratory Accreditation Program (NELAP) certification, as well as any appropriate SCDHEC certifications. The laboratories will be capable of achieving reporting limits appropriate for waste characterization and below applicable remediation goals to the extent achievable. The laboratory data reports will consist of complete data packages that will contain complete documentation of the laboratory data report, and will include the following:

- Case narrative identifying the laboratory analytical batch number
- Matrix and number of samples included
- Analyses performed
- Analytical methods used
- Descriptions of any problems or exceedance of QC criteria and corrective actions taken

All laboratory analytical data will be reviewed and validated by project staff upon receipt to ensure completeness, and to compare the results to remedial guidelines as achievable. A characterization summary report will be prepared documenting field activities, laboratory analytical results, QC sample parameters, and validation of results. The data will also be used to determine appropriate potential means for sludge disposal.

6. RECORDS

Records generated as a result of this procedure shall be submitted to the designated electronic record storage system. Photographs of the sample collection process, copies of the chain of custody forms, and copies of the field logbook pages will be retained onsite for future use.

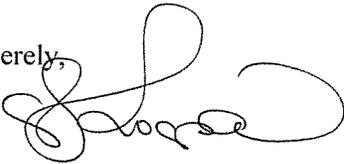
7. REFERENCES

Guidance on Choosing a Sampling Design for Environmental Data Collection, EPA QA/G-5S (December 2002)

Sediment Sampling, Operating Procedure SESDPROC-200-R3, EPA Region 4, Science and Ecosystem Support Division (August 2014)

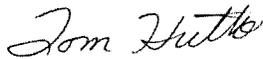
Description and Sampling of Contaminated Soils, EPA/625/12-91/002 (November 1991)

Sincerely,



Cynthia Logsdon
Principal Environmental Engineer
Westinghouse Electric Company LLC
803.312.4171 (m)

Plan reviewed by:



Thomas Hutto, P.G.
GEL Engineering, LLC

Attachments:

Figure 1 – Westinghouse East Lagoon Suggested Sampling Grid

Enclosure:

MEMORANDUM, Response to Comments Dated September 10, 2019, GEL Engineering, LLC

Figure 1 – Westinghouse East Lagoon Suggested Sampling Grid



East Lagoon Proposed Sample Locations

MEMORANDUM

GEL Engineering, LLC
a Member of The GEL GROUP, INC.

To: Kimberly M. Kuhn, SCDHEC
Crystal Rippey, SCDHEC

From: Tom Hutto, P.G., GEL
Cynthia Logsdon, Westinghouse

Date: September 26, 2019

Re: Response to Comments Dated September 10, 2019
Westinghouse Electric - Columbia Fuel Fabrication Facility
Wastewater Treatment Area Operable Unit East Lagoon Sludge Characterization
Remedial Investigation Work Plan, Addendum 2

This memorandum responds to comments received pertaining to the referenced Work Plan in a letter dated September 10, 2019, to Diana P. Joyner of Westinghouse Electric Company (Westinghouse) from Kimberly M. Kuhn and Dustin Leypoldt of the South Carolina Department of Health and Environmental Control (SCDHEC).

Westinghouse desires to initiate the sampling described by the Work Plan since the data to be collected are essential for preparation of a Closure Plan. In accordance with the NPDES permit, the Closure Plan will specify the details necessary to either close the East Lagoon permanently or replace the existing liner (following removal of the sludge, existing liner and conducting soils sampling from below the liner) so it can be used for future service. The "East Lagoon Sludge Characterization Remedial Investigation Work Plan, Addendum 2" is attached and has been revised as necessary to address SCDHEC's comments as described below.

Each comment contained in SCDHEC's letter is shown below in *italics* followed by Westinghouse's response.

- 1. The East Lagoon remedial investigation work plan needs to be separated into a three phase approach.*

Response: Westinghouse concurs. The referenced Work Plan is intended to cover only Phase I activities specific to collecting and analyzing sludge samples. The collected data will be used to prepare a separate Closure Plan (referenced as Phase II in the comment letter) that includes specific details of how the sludge and pond liner will be removed and disposed prior to final closure or relining the lagoon. The Closure Plan will also

include specifications for collecting soil samples below the liner following removal of the liner (referenced as Phase III in the comment letter).

a. Phase I should include specific details about the procedures necessary to collect the sludge samples above the liner at the bottom of the East Lagoon. The location, number, collection methods (including tools and techniques), specific analytical methods including reporting limits, and method for handling investigative derived waste need to be listed.

Response: This information is included in the revised Work Plan beginning on page 4 in the section titled Westinghouse – East Lagoon Sludge Characterization Sampling Plan. Specific information is provided as follows:

- Sample locations – see Table 1 and Figure 1
- Number of samples – The plan specifies collecting up to 32 samples as described in Sections 5 and 5.1 (pages 5-7) and in Table 1 (page 6)
- Sample collection methods (including tools and techniques) – see Section 3, page 4 and Section 5
- Specific analytical methods – see Table 2, page 7
- Method to handle investigation derived waste – see Section 5.2, page 7, and item 11, page 9

i. Discrete samples should be collected from the top of sludge and at the bottom just above the liner as well as one at a middle depth while taking care to not puncture the liner. Samples should not be a composite of multiple horizons.

Response: The sludge is anticipated to be no more than approximately 4 feet thick in the East Lagoon. Along the edges the sludge thickness will be less given the side slopes of the East Lagoon. The purpose of the sampling is to characterize the sludge for removal and disposal. Since Westinghouse's current plan is to excavate the sludge with a track-hoe or similar equipment, which will typically remove material in approximately 2-foot layers, multiple sample depths will not provide potentially actionable data. Therefore, Westinghouse proposes to collect samples from up to two horizons per sample location as described in Section 5: one from the upper 2 feet of sludge (upper horizon) and one from a depth of 2 feet to the top of the liner (lower horizon). At locations where sludge thickness is 2 feet or less, only the upper horizon will be sampled. As requested, samples will not be a composite of multiple horizons.

- ii. *The Department requires the laboratory analytical suite for the samples include Target Compound List (TCL) and Target Analyte List (TAL).*

Response: TCL/TAL samples will be collected from the same three locations as TCLP samples. In addition, analysis of soil samples from below the liner will be proposed in the Closure Plan and will include the TCL/TAL parameters.

- iii. *The field blanks should be taken at the grid locations on the sides of the lagoon and in the center of the lagoon.*

Response: Field Blanks will be collected at the three locations where TCL/TAL samples are collected and analyzed for TCL volatile organic compounds (VOCs).

- iv. *Specify decontamination methods during and after each type of sludge sampling process.*

Response: Decontamination methods are specified in Section 5.2, page 7. A Rinsate Blank will be collected once per day from the final rinse following decontamination. The Rinsate Blank will be analyzed for TCL VOCs.

- b. *Phase II needs to include Westinghouse's standard operating procedures on liner removal and disposal.*

- i. *As specified in Westinghouse's NPDES permit, "sludge generated from the wastewater treatment system will be dewatered and sent to Energy Solutions located in Clive, Utah for final disposal. Alternative sludge disposal at permitted radioactive waste sites are available for use by the permittee provided Departmental approval is granted in writing prior to use and compliance with all applicable federal, state, and local regulations are met."*

Response: Westinghouse concurs that a separate Closure Plan will be prepared to describe the methods for sludge and liner removal and disposal prior to permanent closure or relining. The Closure Plan will be prepared following receipt of the sample data. Please note that there are no "standard operating procedures" for liner removal since each closure is a unique event, and the Closure Plan will be specific to the conditions determined to be present in the East Lagoon.

- c. Phase III needs to include specific details about the procedure for collection of the sediment samples underneath the liner. Specifically, sample locations, number of samples, collection methods, and analytical reporting limits of chemical of concerns. The analyte list must include all TCL and TAL.*

Response: Westinghouse concurs that specific details are appropriate with respect to collection of soil samples beneath the liner. The specifications for this Phase III activity will be included in the Closure Plan and will include analysis for TCL/TAL.

- 2. The Department will collect split samples during Phase I (R61-9 122.41 (i)(4)) The Department requests notification by Westinghouse at least 48-hours prior to conducting the Phase I sampling.*

Response: Westinghouse will notify the Department as requested and provide the Department an opportunity to split samples. At this time, Westinghouse anticipates sampling the week of October 7, 2019.

- 3. Since the approach for Phase II and Phase III will be dependent on the results of Phase I sediment testing, please provide a decision tree detailing how Westinghouse proposes to proceed based on the results. This should clearly define the goals of each phase.*

Response: The Phase I sampling of the sludge will be initiated promptly following approval of this Work Plan. After the receipt of sampling data, the Closure Plan will be developed and submitted to the Department for review and approval. A decision tree will be formulated and included in the Closure Plan.

In closing, we appreciate SCDHEC's attention to this matter. Please contact Cynthia Logsdon and copy Diana Joyner, should you have any questions or further comments.