

July 11, 2006

Mr. Jamnes L. Cameron  
United States Nuclear Regulatory Commission  
Region III  
2443 Warrenville Road, Suite 210  
Lisle, IL 60532-4352

Re: Notice of Sampling Activities  
Breckenridge Disposal Site, St. Louis, Michigan

Dear Mr. Cameron:

ENVIRON International Corporation (ENVIRON) is hereby notifying the Nuclear Regulatory Commission (NRC) of our intention to conduct a limited sampling event at the Breckenridge Disposal Site (the "Site") on July 14, 2006 to further assess the level of equilibrium between Ra-226 and U-238 at the Site. As discussed during the June 22, 2006 meeting, ENVIRON agreed to resample one filter cake composite sample that yielded results that are not consistent with other Site data.

The sample, BR-COMP-3, was originally sampled on November 28, 2001, and the results were submitted to the NRC on March 5, 2002 in the *Buried Filtercake Waste Characterization Report* prepared by Sciencetech Inc. The sample was composited from two borings located in CWA-3. The location of the waste pit and the individual samples are shown on Figure 1. ENVIRON will, to the extent practical, return to the same boring locations to recollect this sample.

Below is a brief work plan that outlines the sampling and health and safety procedures that will be followed in the field.

#### **SAMPLING TEAM RESPONSIBILITIES**

A team consisting of an ENVIRON Engineer, an IEM Inc. Site Supervisor (SS), and a two-person Geoprobe crew will conduct the CWA-3 supplemental characterization sampling. The roles and responsibilities of the sampling crew members are as follows:

- ENVIRON Engineer – will collect filter cake waste samples, and collect and package samples for analysis.
- IEM SS – will serve as the Site-Safety Officer, provide radiological screening and survey monitoring, assist with the packaging of samples for shipment to the laboratory, and conduct personnel and equipment release survey. The IEM SS will be responsible for ensuring that borings, with elevated measurements, will be buried beneath grade level and flagged for later removal.
- Geoprobe crew – will conduct two Geoprobe soil borings to a depth of 10 feet to 12 feet, collect continuous soil samples in acetate liners, and steam clean the Geoprobe rig at the end of drilling operations.

**FILTER CAKE WASTE CHARACTERIZATION HEALTH AND SAFETY****Geoprobe Activities**

The soil borings will be completed using a direct-push drilling apparatus (e.g., Geoprobe) equipped with 4-foot long, 2-inch outside-diameter, macro-core samplers with dedicated acetate liners.

Once the sample is retrieved from the borehole and the sampling liner (acetate liner) is removed from the outer casing, it will be placed on either a sheet of plastic, tarp, or other appropriate material. The filled acetate liner will then be surveyed using a 2-inch by 2-inch sodium iodide (NaI) detector. After surveying is complete the acetate liner will be slit open and the sample exposed.

Personnel protective equipment (PPE) will be used during Geoprobe activities to avoid against radiological contamination. PPE will also be worn during activities that could cause personnel to become contaminated. The following types of PPE shall be made readily available as necessary.

- Work gloves
- Rubber and/or disposable shoe covers
- Rubber and/or surgeon's gloves
- Eye protective gear
- Hearing protective gear
- Steel toed boots

**Personnel Contamination Control**

After activities that involve entry into the sampling area, personnel will perform a full body frisk of outer clothing using a pancake Geiger-Mueller (GM) detector. Personnel contamination surveys will be done by or under the supervision of the Site-Safety Officer. If site-personnel PPEs are torn during activities, the workers personal clothing will also be frisked using a GM detector.

The method for full-body frisk will be conducted in accordance with the following procedures:

General Requirements:

- Verify that the instrument is in service, set the proper scale, and the audio output can be heard during frisking.
- Hold the probe less than 0.5 inches from the surface for beta and gamma contamination, approximately 0.25 inches for alpha contamination.
- Move the probe slowly over the surface, approximately 2 inches per second.
- If the count rate increases during frisking, pause for 5 to 10 seconds over the area to provide adequate time for instrument response.
- If the count rate increases to a value greater than the background or the instrument alarms, remain in the area and notify the Health Physics Personnel.
- The whole body frisk should take 2 to 3 minutes.

Performance of Monitoring:

- Frisk the hands before picking up the probe.
  
- Perform the frisk in the following order:
  - Head (pause at the mouth and nose for approximately 5 seconds)
  - Neck and shoulders
  - Arms (pause at each elbow)
  - Chest and abdomen
  - Back, hips, and seat of pants
  - Legs (pause at each knee)
  - Shoe bottoms (pause at sole and heel)
  - Personal and supplemental dosimeter (if required)
  
- Return the probe to its holder and leave the area. The probe should be placed on the side or face up to allow the next person to monitor their hands before handling the probe.

Radiological instruments checks will be made such as daily inspection, background check, and source checks at a minimum in accordance with the manufactures recommendations. Documentation will be provided to the NRC in the results memorandum.

**Emergency Actions**

Emergency actions will be conducted in accordance with the following procedures:

- If any person receives a minor injury in a radiologically controlled area, he/she shall leave the immediate work area following normal health protection procedures, if possible, and notify Health Physics (HPs) personnel. HP personnel will survey and document the injury, decontaminate as practicable, and release the individual for appropriate medical treatment.
  
- For serious injuries in a radiologically controlled area, the major consideration shall be the immediate health and safety of the individual injured. In the instance, responding personnel shall first secure the area or equipment to ensure that no further injuries occur and then attend to the injured party. Monitoring the individual for contamination or removing personnel are not to perform any first aid beyond their capabilities or beyond the formal training that they have received.
  
- Responding personnel shall call or have someone else call emergency medical personnel. The person making the emergency call shall inform the emergency medical personnel (or dispatcher) that the situation involves radiological hazards. Emergency response numbers shall be listed in the Site Health and Safety Plan (SHASP). This will be provided to all personnel present at the Site during sampling.
  
- Refer to the SHASP for further information concerning health and safety during activities at the Site. It is expected that there will be no radiological contamination during the sampling activities, and that any equipment brought onto the Site will be free released under appropriate surveying procedures.

### **FILTER CAKE WASTE CHARACTERIZATION SAMPLE ANALYSIS**

Two continuously sampled Geoprobe soil borings will be conducted in the area of CWA-3. The boring locations are shown on Figure 1 and will be as close as possible to the previous boring locations. The material from the filter cake horizon from each boring will be homogenized and equal aliquots will be composited into a single sample. The composite sample will be placed in a sealable plastic bag for submittal to Outreach Laboratory in Broken Arrow, Oklahoma. A sample of filter cake from the individual borings will also be collected and archived at the laboratory pending the analysis of composite sample. The composite analyzed for gamma spectroscopy using United States Environmental Protection Agency (USEPA) Method 901. Additionally, isotopic thorium and uranium will be analysis will be conducted using Los Alamos National Laboratory (LANL) Method ER200 and LANL ER290, respectively.

All equipment will be decontaminated by either steam cleaning with a high-pressure washer or washing in a low phosphate detergent such as Alconox™ followed by a clean water rinse. The Geoprobe sampling liners will be surveyed for contamination and released as clean waste and placed into garbage bags. PPEs and acetate liners will be disposed of as clean waste after being radiologically released. The two waste characterization soil borings will not be backfilled. All decontamination water will not be containerized, but will be allowed to drain out on the ground in the vicinity of the work area. All material brought to the Site will be surveyed and radiologically released. Surveyed waste will be disposed of at a trash repository. If any equipment does not meet the release criteria, the equipment will be decontaminated again. If the equipment fails a second time, it will be left on Site.

#### **Equipment Release Survey**

Following appropriate decontamination, equipment that is to be released from the Site must be surveyed. This equipment will include hand tools, Geoprobe, survey instruments, and personnel protective clothing. These surveys will consist of scanning with a GM detector and collecting and counting smears. The GM pancake probe will be used to “frisk” equipment, personnel, waste containers, etc., to ensure that contamination is not being tracked off site. Removable contamination samples (smears) will also be collected and analyzed to assess the level of removable contamination on equipment. Release limits for personnel and equipment are presented in the table below. These values are traditional values originally presented in the NRC Regulatory Guide 1.86. Since the natural thorium limit is more restrictive than the natural uranium limit and field-screening techniques cannot distinguish between the two, the natural thorium limit will be used.

#### **ACCEPTABLE SURFACE CONTAMINATION LEVELS**

<b>Nuclide</b>	<b>Average<sup>1</sup></b>	<b>Maximum</b>	<b>Removable</b>
Natural Thorium	1,000 dpm/100cm <sup>2</sup>	3,000 dpm/100cm <sup>2</sup>	200 dpm/100cm <sup>2</sup>

Note:

<sup>1</sup> Should not be averaged over an area greater than 1 m<sup>2</sup>.

The environmental technicians will also use dose rate or exposure rate meters to ensure that general area dose rates are maintained at acceptable levels.

The results of this sampling will be used to confirm the assumed level of equilibrium between Ra-226 and U-238 used in the Revised Dose Assessment is appropriate. ENVIRON will submit a brief memorandum summarizing the results of this sampling on receipt of the analytical results from the laboratory. ENVIRON hopes that this additional sampling meets the NRC's

expectations that were discussed during the June 22, 2006 meeting, and satisfies any questions regarding the level of equilibrium between Ra-226 and U-238 at the Site.

ENVIRON appreciates your time and effort to review this submittal. If for any reason, the NRC does not agree with the approach outlined above, please do not hesitate to contact us at (312) 853-9430.

Sincerely,

ENVIRON International Corporation



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*Senior Manager*



Christopher J. Greco, P.E.  
*Associate*

DH:rms

cc: Mike McCann – NRC  
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Bruce Berson -NRC  
Bill Thomas – IEM, Inc.  
Mark Travers – ENVIRON International Corporation  
The Custodial Trust