

## **Radioactivity Analysis of Ash Samples**

### **January 7, 2009**

#### **Summary**

Ash samples, as well as a control sample of soil, were taken on December 29 and 30 in the Kingston area and analyzed for radioactivity. The results indicate the ash contains small amounts of naturally occurring radioactive materials found in the earth and coal. Burning of the coal releases heat energy and reduces the amount of material in which the radioactive materials remain. Though this does not increase the amount of radioactive material present, its relative concentration is greater than it is in the earth and coal.

Cesium-137 was also detected at low concentrations in some of the samples. Cesium-137 from historical nuclear weapons programs and testing has been present in most terrestrial samples since 1970s. The concentrations in the samples analyzed from Kingston are consistent with background sample results.

The total radioactivity per gram measured in the ash is less than that found in low sodium salt available to consumers on the shelves of grocery stores. Manufacturers of low sodium salt use potassium chloride as a substitute for some of the sodium chloride in regular salt. Because a portion of potassium is naturally radioactive, the light salt is likewise radioactive. The radioactivity of the light salt is measurably higher than the radioactivity of typical coal ash.

Supplemental information:

#### **Radioactivity**

Radioactivity is expressed in numerous ways and the fundamental measurement is the Curie. Similar to subdivisions of length measurements based on the meter, i.e. centimeter and millimeter, Curie measurements are expressed in smaller units of microcuries ( $\mu\text{Ci}$ ) and picocuries (pCi). A microcurie is one millionth ( $1/1,000,000$ ) of one Curie and a picocurie is trillionth ( $1/1,000,000,000,000$ ) of one Curie.