February 17, 2010

MEMORANDUM TO: Wayne Slawinski, Acting Team Leader
Division of Reactor Safety

FROM: Christine Lipa, Chief **/RA/William G. Snell Acting For/**
Materials Control, ISFSI and Decommissioning Branch
Division of Nuclear Materials Safety

SUBJECT: ANALYTICAL RESULTS OF WATER SAMPLES FROM THE VICINITY OF THE BRAIDWOOD NUCLEAR POWER STATION (BATCH BD-2009-02)

By a report received November 21, 2009 (ML100470384), we obtained the results of the analysis of 23 water samples from the NRC's contract laboratory, American Radiation Services, Inc. (ARS). These water samples were collected by Exelon personnel and observed by NRC staff on September 14, 15, and 16, 2009, in the vicinity of the Braidwood Nuclear Power Station and provided to Region III for analysis for tritium. The licensee collected separate samples for their analysis at the same time they collected the samples for the NRC. We received the results of the licensee's analyses on December 30, 2009.

We have reviewed the analyses from ARS and compared the results with the licensee's sample results. The enclosed Table provides the results of the analyses and an assessment of how they compared. The comparison was based on the Confirmatory Measurements Program criteria provided in Inspection Procedure 84750, "Radioactive Waste Treatment, and Effluent and Environmental Monitoring," dated March 15, 1994.

All 23 of the ARS and licensee results were determined to be in "agreement."

Enclosure:
As stated

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61-92

Tritium Sample Results
Braidwood Generating Station

#	Collection Date	NRC Sample ID	Tritium pCi/L ± uncertainty		MDC	Licensee Sample ID	Tritium pCi/L ± uncertainty		Ratio: Licensee to NRC	Result
1	9/16/2009	BD-09-2-01	177	98	158	MW-110	< MDC		n/a	Agreement
2	9/16/2009	BD-09-2-02	< MDC		160	MW-111DR	< MDC		n/a	Agreement
3	9/16/2009	BD-09-2-03	< MDC		159	MW-131D	< MDC		n/a	Agreement
4	9/16/2009	BD-09-2-04	< MDC		159	MW-132D	< MDC		n/a	Agreement
5	9/16/2009	BD-09-2-05	564	118	159	F-5D	485	127	0.86	Agreement
6	9/15/2009	BD-09-2-06	< MDC		159	MW-105	< MDC		n/a	Agreement
7	9/16/2009	BD-09-2-07	< MDC		158	MW-112D	< MDC		n/a	Agreement
8	9/15/2009	BD-09-2-08	< MDC		158	MW-113DR	< MDC		n/a	Agreement
9	9/16/2009	BD-09-2-09	< MDC		158	MW-133D	< MDC		n/a	Agreement
10	9/16/2009	BD-09-2-10	1587	201	160	MW-134D	1640	210	1.03	Agreement
11	9/15/2009	BD-09-2-11	< MDC		159	MW-135D	< MDC		n/a	Agreement
12	9/15/2009	BD-09-2-12	< MDC		158	MW-136D	< MDC		n/a	Agreement
13	9/15/2009	BD-09-2-13	< MDC		160	MW-137D	< MDC		n/a	Agreement
14	9/15/2009	BD-09-2-14	< MDC		159	MW-138D	< MDC		n/a	Agreement
15	9/16/2009	BD-09-2-15	< MDC		161	MW-139D	< MDC		n/a	Agreement
16	9/16/2009	BD-09-2-16	< MDC		159	MW-140D	< MDC		n/a	Agreement
17	9/15/2009	BD-09-2-17	< MDC		160	VB-4-5D	< MDC		n/a	Agreement
18	9/15/2009	BD-09-2-18	3525	389	159	VB-4-6D	3830	440	1.09	Agreement
19	9/15/2009	BD-09-2-19	< MDC		159	MW-145D	< MDC		n/a	Agreement
20	9/15/2009	BD-09-2-20	< MDC		162	MW-157D	< MDC		n/a	Agreement
21	9/14/2009	BD-09-2-21	< MDC		160	DS-2, F Ditch	< MDC		n/a	Agreement
22	9/14/2009	BD-09-2-22	< MDC		161	MW-109D	< MDC		n/a	Agreement
23	9/14/2009	BD-09-2-23	< MDC		160	MW-130D	< MDC		n/a	Agreement

MDC - minimum detectable concentration

REGION III GROUNDWATER TRITIUM SAMPLING PROTOCOL

Applicability: The following sample collection and analysis protocol will be implemented at all seven Exelon nuclear sites. The protocol includes offsite environmental water (e.g., groundwater, drinking water, surface water, etc.) and onsite groundwater samples that are obtained by the licensee for radiological analysis. This protocol may be extended to additional Region III licensees, at Region III management's discretion.

Goals: To verify the accuracy of the licensee's analytical capabilities and to provide an independent verification of any offsite environmental impact.

To implement a comprehensive independent analysis program, which obtains samples from all of the licensee's environmental water and onsite groundwater locations.

1. Priority I

Requests for public drinking water/agricultural water source monitoring.

If appropriate, we will forward requests to the Illinois Emergency Management Agency for the collection and analysis of public drinking water sources. If the State is not providing sample analysis, we will respond to requests from members of the public and public officials to monitor private or municipal water sources used for either drinking water or agricultural watering, this includes known or suspected unaffected sources. We will attempt to consolidate large numbers of requests to monitor drinking water that draws from a common source.

We will attempt to obtain independent samples of any new residential water samples obtained by the licensee and will obtain split samples of all licensee collected residential samples for NRC analysis.

We will communicate the results of such monitoring promptly to the affected individuals upon receipt from the contract laboratory and make ourselves available to explain the results, in plain language. The communication to individuals should be verbal, with consolidated results communicated in the form of an inspection report.

We will avoid the use of individual identifiers in our documents and communications.

2. Priority II

Licensee sampling - We will request that our licensees split all water samples taken from onsite and offsite sources. At each licensee facility, we will observe a selection of the sampling done by our licensees, or their contractors, from offsite wells. During the observations, we will obtain select independent NRC samples to provide additional assurance of the licensee's sample handling practices. We will request that our licensees securely maintain the samples available for our analysis until we confirm that they may be disposed of in accordance with licensee procedures.

Selection - We will collect an aliquot from each composited Radiological Environmental Monitoring Program sampling location for each licensee included in this protocol, once each month or quarter (per the licensee's frequency of analysis as indicated in the licensee's ODCM). We will also collect a split sample from each new groundwater well established by each licensee following implementation of this protocol. We will collect a split sample from each routine offsite and onsite groundwater sampling location once each month or at the frequency sampled by the licensee (whichever greater). The exception to this will be Dresden, with regard to groundwater monitoring implemented to address leakage from the Condensate Storage Tank. Due to ongoing remediation, the collection of split samples from the licensee's frequent groundwater monitoring (125 at a monthly frequency, 132 at a quarterly frequency, and 10 to 20 daily grab samples) would not be practical and would provide little, if any, useful information. Consequently, we will obtain a minimum of one initial sample from each monitoring well and will obtain an additional sample at each well based on a bi-weekly or monthly schedule, as appropriate.

3. Collection/Chain-of-Custody

All water samples collected by Regional personnel will be characterized prior to collection regarding the source, processing and treatment. Consideration of collection of samples before and after treatment/filtration may be considered.

All samples collected by Regional personnel will follow standard laboratory procedures for that activity. To the extent practical, all collection and observation activities will be completed by staff from the Decommissioning Branch, Division of Nuclear Materials Safety. As an alternative, other Regional staff, including Resident Inspectors, may be requested to supplement observation activities.

All NRC personnel who collect samples for analysis or take possession of said samples from licensee or licensee contractor personnel shall complete Form 303, Chain of custody. Each subsequent transfer of the samples between NRC personnel shall be documented on the chain-of-custody, up to and including transfer to the contract laboratory for analysis. Samples shall not be accepted by NRC personnel nor transferred to the contract laboratory for analysis without maintaining properly documented chain-of-custody. Failure to maintain chain-of-custody will result in rejection of the samples for analysis and return of the samples to the licensee for disposal.

All water samples analyzed by the NRC contract laboratory should have a minimum volume of 500 milliliters.

4. Billing

All analysis by the NRC contract laboratory will be fee billable to the licensee. Each shipment of samples to the contract laboratory must include at the docket number for the licensee and the current, open integrated resident inspector report number. For multi-unit sites, only one docket number is necessary.

5. Minimum detectable concentrations

All drinking water and agricultural watering samples will be analyzed using a minimum detectable concentration of 200 picocuries per liter for tritium, and one in ten such samples will be selected for gamma spectroscopy using environmental lower limits of detection. All other water samples will be analyzed using a minimum detectable concentration of 500 picocuries per liter for tritium, and one in five such samples will be selected for gamma spectroscopy using environmental lower limits of detection.

6. Technical review of analysis results

DNMS Decommissioning Branch staff will analyze the results of the licensee's and NRC contract laboratory's analysis of each sample. The analysis will confirm agreement between the results (within 2 sigma). Any discrepancies will be brought to the Branch Chief's attention and a followup plan established to resolve the disparity. All positive results (those greater than three times the reported minimum detectable concentration or lower limit of detection, as applicable) will be reviewed to determine whether further followup sampling and analysis are necessary.

DNMS Decommissioning Branch staff will record all sample results in a tabular manner that indicates the general location and date of the sample, the licensee's results, and the NRC results.

7. Documentation of results

Sampling results may be provided as an input to the quarterly integrated resident inspector report. The input will be formatted for the Radiation Protection "Inspection Scope" section. The licensee and contract laboratory analysis results may be tabulated in an Appendix to the inspection report.

The sample results may also be included on the NRC Tritium WEB site, once the results are appropriately reviewed/approved by Region III management.

8. Program Maintenance and Adjustments

Region III will review the progress of this program on a monthly basis to determine if revisions are necessary. As sample results are assessed, the frequency of collection and quantity of sample locations may be reduced or increased, as determined by Region III supervisory and management staff.