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Mr. Lester Posada
Project Officer, Nuclear Processing Facilities Division
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
Ottawa, Ontario
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Subject: SRBT Response to CNSC Staff Review of 2018 Annual Compliance Report

Dear Mr. Posada,

Thank you for your recent letter [1] summarizing CNSC staff comments on SRBT's 2018 Annual Compliance Report (ACR).

Each CNSC staff comment is repeated below, followed by our response.

Comment:

CNSC staff note that one area (Disassembly Table) in Zone 1 performed significantly worse than all other areas (72.7% vs average of 97%). There is no discussion provided nor is this area identified as an area for improvement within the report.

Requested Action:

Although not of regulatory concern, SRBT should identify and discuss variances in data such as this in future reports.

SRBT acknowledges this comment, and future reports will include discussion of significant variations or trends in the presented contamination control data.

It is important to note that the highlighted example had been tracked and trended throughout the year during focused quarterly meetings of the Health Physics Team. As well, the subject was discussed at the level of Senior Management as part of the 2018 Management Review process, during meetings of the Executive Committee between March 25-27, 2019.

As a result of this augmented management oversight, corrective measures have been implemented to improve the rate of this area meeting our administrative limits for the area. We are pleased to report that since the beginning of the current calendar year, the pass rate has improved to 87%, indicating an effective improvement of the condition.

The Health Physics Team continues to track and trend all facility contamination control data throughout the year, as part of SRBT's Radiation Safety Program.

Comment:

The report did not provide any discussion or information on airborne concentrations within the facility.

Requested Action:

SRBT should consider providing a discussion on the results of airborne concentrations (tritium in air monitors) within the facility, in future reports.

SRBT acknowledges this comment, and future reports will include discussion on airborne concentrations of tritium within key areas of the facility.

The Radiation Safety Program includes several processes that measure and control airborne tritium hazards in our facility:

- Stationary tritium-in-air monitors are strategically located throughout the facility, with audible alarms triggered at conservative tritium concentrations.
- All staff are trained in the use of portable tritium-in-air monitors for self-protection purposes; these are also strategically located in the facility for quick use when needed.
- A series of passive air samplers are distributed throughout the facility, allowing for weekly averaging of tritium concentrations in key areas.
- The Health Physics Team logs all stationary tritium-in-air monitor alarm events, in order to track and trend frequency of occurrence, to facilitate radiological assessments and/or investigations, and to drive improvements in process safety.

Important and significant components of the above set of data will be discussed as part of future ACRs.

Comment:

While SRBT's plots of annual average tritium concentrations in groundwater provide good indication of the overall trend, they do not reveal the seasonal changes.

According to Clause 7.7.2.1 of N288.7-15, site conditions which may result in changes to COPC conditions (i.e. groundwater velocity, seasonal variability, or groundwater recharge rate) should be considered.

Requested Action:

SRBT should consider plotting all sampled tritium concentration data to see the seasonal variations in addition to the annual averages in future reports.

Traditionally, SRBT has highlighted plotted trends in certain groundwater monitoring wells in the main body of the report, as they are of particular interest in helping to draw attention to the longer-term response of the nearby groundwater resources to SRBT's process changes in the late-2000s.

As well, our ACR also includes the complete set of groundwater monitoring data from each year in past reports in an Appendix to the report.

SRBT acknowledges this comment, and future reports will include an expanded Appendix that will incorporate plots of groundwater monitoring data over the course of the reporting year, in order to shed light on any seasonal variations that may be present.

Comment:

In 2018, SRBT collected cucumber sample from a residential garden (611 Moss Dr.), where the free water tritium concentration was 210 Bq/kg fresh weight. The concentration of free water tritium was 6.5 times higher than the 2017 concentration 32 Bq/kg fresh weight.

Requested Action:

CNSC staff will continue to monitor this trend in future annual compliance reports.

CNSC staff comments on this subject are acknowledged. SRBT is also interested in future measurements at this location.

The elevated result is not entirely unexpected, as gaseous tritium releases over the summer months were somewhat elevated in 2018 due to production increases, as discussed in the ACR on page 97. In particular, a high rate of production took place during the summer months where meteorological conditions can often lead to increased levels of HTO releases.

As well, it is understood that HTO retention in plants is dynamic and affected by many environmental factors, and that the activity concentrations of HTO in plants and soil are influenced by the HTO in the air and soil pore water at the time of sampling [2]. As such, there can be significant variations in measured tritium when sampling fresh produce year-to-year, depending on time of day sampled, humidity levels, recent precipitation events, hydrological characteristics of soil, and other factors.

It is also important to note that the 2018 measured value of this particular sample (210 Bq/kg fresh weight) is less than one quarter of one percent of the benchmark value of 100,000 Bq/kg, as outlined in SRBT procedure EMP-013, *Acceptance Criteria for EMP*. Although the measured sample was higher relative to previous samples at this location, the risk / dose consequence associated with this measurement is extremely low.

We trust that this additional information is helpful, and look forward to incorporating the noted adjustments into our future ACRs.

Should you require any additional information, please do not hesitate to contact me at any time.

Best Regards,



Stéphane Levesque
President
SRB Technologies (Canada) Inc.

cc: R. Rashapov, CNSC
R. van Hoof, CNSC
R. Fitzpatrick, SRBT
J. MacDonald, SRBT

References:

- [1] Letter from L. Posada (CNSC) to S. Levesque (SRBT), *CNSC Staff's Review of SRB Technologies (Canada) Inc.'s 2018 Annual Compliance Report*, dated August 1, 2019. (e-Doc 5909275)
- [2] Thompson, P.A., Kwamena, N.-O.A., Ilin, M, Wilk, M, Clark, I.D., 2015, *Levels of tritium in soils and vegetation near Canadian nuclear facilities releasing tritium to the atmosphere: implications for environmental models*, J. Environ. Radioact. 140, 105-113.