

From: [Pater, Paul](#)
To: [Doell, Marlayna](#)
Subject: [External_Sender] RE: RE: Preliminary NRC Musings on the GA FSSR
Date: Friday, February 26, 2021 10:46:17 AM
Attachments: [Attachment L page 1.pdf](#)
[GA-12-CONC-33-2.pdf](#)

Hi Marlayna,

Happy Friday! As mentioned below in my previous email, this week GA collected concrete sample #33 for Survey Unit 12 and counted it on our gamma spectroscopy system. Please find the attached gamma spectroscopy report. Also, we updated the first page of Attached L to show that sample #33 was concrete and the new page is also attached to this email. Keep in mind the values did not change since no Cs-137 was found in the sample and therefore the Cs-137 MDA is reported.

Please let me know if there are additional questions or concerns.

Best Regards,

Paul

From: Doell, Marlayna <marlayna.doell@nrc.gov>
Sent: Friday, February 19, 2021 8:11 AM
To: Pater, Paul <paul.pater@ga.com>
Subject: -EXT-RE: RE: Preliminary NRC Musings on the GA FSSR

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Thanks Paul!

Confirming receipt of the below and its attachments. I have passed everything along to the team and will let you know if there are any additional questions. Thanks as always and have a great weekend...we are finally warming up consistently above freezing so hopefully through the worst of it!

Cheers,
Marlayna
301.415.3178

From: Pater, Paul <paul.pater@ga.com>
Sent: Friday, February 19, 2021 7:56 AM
To: Doell, Marlayna <marlayna.doell@nrc.gov>
Cc: Evans, Robert <Robert.Evans@nrc.gov>; Grogan, Michael <Michael.Grogan@ga.com>
Subject: [External_Sender] RE: Preliminary NRC Musings on the GA FSSR

Hi Marlayna,

These last two weeks have looked bitterly cold in the mid-west and Texas, I hope both of you are doing okay!

I wanted to thank you for your time last week to discuss the four items identified during the acceptance review by the NRC review team. The TRIGA and Health Physics staff have reviewed the four bullet items below and are providing the following information:

- Section 5.3.13, "Survey Unit 12", states that "Soil samples were collected from the land area and concrete samples were collected from the concrete pad where the make-up tank was located". However, the data in Appendix L for SU12 does not appear to include any concrete samples for that Survey Unit. Is that correct or is the data captured elsewhere?

For Survey Unit 12, all sample locations were in soil except for #33 which was located on the concrete pad. After collecting all the soil samples, we decided to collect the concrete sample when future concrete samples were being taken in other survey units. Unfortunately, we did not go back to Survey Unit 12 and missed that location. GA will go back this week and collect enough material for two samples in case the NRC wants to split them. The sample will be prepared and counted on our gamma spec system. The results will be sent via email.

- It is not clear at what depth the soil samples in Attachment L for Survey Units 1, 5A, and 12 were taken (i.e., surface or subsurface). Could that information be clarified or the approach explained?

Using a soil auger, the soil samples in Survey Units 1 and 5A were taken at a depth of six inches. The soil in Survey Unit 12 was taken at a depth of 12 inches. In all cases the soil was composited and turned into a homogeneous mixture.

- The RESRAD files in Attachment K only include the pages with the results. Could we also get copies of the remaining pages in the RESRAD summary output files for the calculations? In particular, having the pages with the input parameter summary would improve the efficiency of our review.

The entire RESRAD report for the buried pipe scenarios 1 and 2 is attached to this email in two separate files, one for each scenario.

- Section 7.2.4 states that "Therefore, the scaling factor of 0.803, provided by the TRIGA Decommissioning Project Manager in a memorandum dated April 18, 2019". Could we get a copy of the April 18, 2019 memo? Also, the NRC would be interested in additional information on the range of ratios observed for Cs-137 and Sr-90 in site samples and any analyses done to develop and justify the assumed scaling factor (if this is not already included in the April 2019 memo).

The referenced scaling factor memo "Update to 06/30/2019 and Application of Radionuclide Scaling Factors for Bldg. 21", GA Memo DDI:001:JSG:19, April 2019 is attached to this email for your review. Additionally, GA offers the following information regarding site specific decommissioning Sr-90/Cs-137 scaling factors. After a portion of the floor was removed in the TRIGA Mark F reactor room, 11 soil samples were taken

and sent to TestAmerica for analysis prior to any remediation work. The analysis results are shown in the table below. Although the average result appears appropriate, the standard deviation is very large. During the buried pipe cleanout, two pipe scale samples were sent to TestAmerica for analysis. No conclusion could be obtained because of the wide variance between those two samples. After considering the two attempts in determining a site specific Sr-90/Cs-137 ratio, it was decided to use the established Sr-90/Cs-137 ratio called out in the attached memorandum. Finally, GA also ran several RESRAD cases with ratios between 0.81 and 1.17 with the Total Dose result change less than 0.1 mrem.

Sample	Cs-137	Sr-90	Ratio Sr-90/Cs-137
1	0.266	0.400	1.504
2	1.320	0.729	0.552
3	5.370	2.050	0.382
4	0.608	1.470	2.418
5	0.837	0.997	1.191
6	0.939	6.640	7.071
7	0.336	0.268	0.798
8	-0.059	0.310	-5.272
9	0.401	1.180	2.943
10	8.270	2.020	0.244
11	1.070	1.110	1.037
Average			1.170
Std Dev			2.884

Please contact me if you need any additional information or clarification.

Best Regards,
Paul

From: Doell, Marlayna <marlayna.doell@nrc.gov>
Sent: Monday, February 8, 2021 11:30 AM
To: Pater, Paul <paul.pater@ga.com>
Cc: Evans, Robert <Robert.Evans@nrc.gov>
Subject: -EXT-Preliminary NRC Musings on the GA FSSR

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Hi Paul!

I hope that you and the General Atomics gang are safe and well and had a great weekend (it was -15 here this morning so I am VERY jealous of southern California right now!). We are nearing

completion of the acceptance review for the GA FSSR, and while there are definitely no show stoppers that will impact our acceptance of the FSSR for formal/full technical review, there are a couple of items/areas the staff have identified where additional information or clarification may be needed as the review moves forward.

Some of these can be handled formally in RAI space down the road if that is needed, but I figured I would pass along our early musings now just so that your folks can be thinking on these topics and/or provide some of the information early and possibly allay the need for a formal RAI. We are also happy to set up a chat on any or all of the below if it is easier for everyone to chat about the technical details and make sure we are all on the same page.

So, in no particular order, the things we are wondering about are:

- Section 5.3.13, "Survey Unit 12", states that "Soil samples were collected from the land area and concrete samples were collected from the concrete pad where the make-up tank was located". However, the data in Appendix L for SU12 does not appear to include any concrete samples for that Survey Unit. Is that correct or is the data captured elsewhere?
- It is not clear at what depth the soil samples in Attachment L for Survey Units 1, 5A, and 12 were taken (i.e., surface or subsurface). Could that information be clarified or the approach explained?
- The RESRAD files in Attachment K only include the pages with the results. Could we also get copies of the remaining pages in the RESRAD summary output files for the calculations? In particular, having the pages with the input parameter summary would improve the efficiency of our review.
- Section 7.2.4 states that "Therefore, the scaling factor of 0.803, provided by the TRIGA Decommissioning Project Manager in a memorandum dated April 18, 2019". Could we get a copy of the April 18, 2019 memo? Also, the NRC would be interested in additional information on the range of ratios observed for Cs-137 and Sr-90 in site samples and any analyses done to develop and justify the assumed scaling factor (if this is not already included in the April 2019 memo).

Again, none of these are precluding the review moving forward, but may need some clarification as we look toward putting together our safety evaluation, so if you have "easy" answers now we are happy to hear them and/or chat with everyone soon to work out any confusion.

Thanks as always for your time and attention to these exciting topics, I hope all is well, and I look forward to talking to you soon!

Marlayna

Marlayna Vaaler Doell

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Decommissioning Project Manager

U.S. Nuclear Regulatory Commission  
NMSS/DUWP//RDB

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