

# Evaluation of Data from 700C Test

TE 21-009, Rev. 2

## Introduction

On January 31, 2021 an operational test was performed on the 700C fan. Radiological monitoring and measurements were performed and collected in accordance with TBD 20-003 *Sampling Plan for the 700C Fan Startup and Testing*. The purpose of this report is to evaluate the radiological monitoring results and samples that were specified by TBD 20-003 and obtained during the 700C fan test. This Technical Evaluation presents the results of those sampling evolutions for surface (ground deposition) and airborne radioactive material concentration measurements near ground level, and compares the data collected against those limits established at WIPP, and in compliance with 10 CFR 835, *Occupational Radiation Protection Program*. The surface contamination limits established in the WIPP program are also in compliance with DOE O 458.1, *Radiation Protection of the Public and the Environment*. The basic data and principal information regarding airborne radioactivity concentration and ground deposition results are presented in Tables 1 through 7 of Attachment 1 and Tables 1 through 6 of Attachment 2. The Stop Level Set Points which were enforced for radiological safety during the time of the test are presented in Table 8 of Attachment 1.

Note that the term “near ground level” within this document refers to monitoring that takes place from the ground surface to several feet above the ground surface, depending upon the type of monitoring. For example, for the collection of air samples “near ground level” will typically be several feet above the ground surface. For monitoring for total and removable contamination, “near ground level” is at the approximate level of the ground surface for monitoring of the pan surfaces set up at locations defined by TBD 20-003.

## Conclusion

All radioactivity results from swipe samples collected during the test on the pans were below removable radioactivity limits imposed for the test (see Tables 3, 4, and 8 of Attachment 1).<sup>1</sup> The radiological “Stop Level Set Points” are given in Attachment 4 of TBD 20-003, and are repeated in this document in Table 8 of Attachment 1. In no instance were these stop level set points exceeded, *for each category listed*. The measured total (fixed plus removable) surface contamination results are listed in Tables 1 and 2 of Attachment 1 (valid ONLY during the period of the 700C test, and were used for personnel safety considerations, because of high radon daughter contribution to direct survey meter readings).<sup>2</sup> A

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<sup>1</sup> Swipe results in tables 3 and 4 were decayed 72 hours to compensate for radon daughter contribution. Such results are needed to estimate any program material deposition. These values will yield substantially more accurate results than the results in Tables 1 and 2 of Attachment 1, which are likely to have radon daughter contributions.

<sup>2</sup> Tables 1 and 2 of Attachment 1 list the results of direct survey meter readings (for total contamination which includes fixed plus removable values) and are expected to be highly variable (with many values significantly above zero dpm/100 cm<sup>2</sup>). Typical MDAs for such survey meters are around 60 dpm/100 cm<sup>2</sup> alpha and 160 dpm/100 cm<sup>2</sup> beta. These readings typically include radon daughter interference—which contributes to a high statistical variability. In Table 1 of Attachment 1, the net values in each case were required to be less than or equal 55 dpm/100 cm<sup>2</sup> alpha. In Table 2 of Attachment 1, the net values in each case were required to be less than or equal

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control pan positioned well outside the projected plume path (see Figure 1 of Attachment 1) was utilized to establish values from radon daughter activity. The radon daughter activity was then subtracted from all the results from the one minute fixed surveys. Additionally a swipe survey was performed on the control pan and was used for radon daughter subtraction of all initial swipe samples (for the same time frames) from all the other pans to provide the results in Tables 1 and 2 of Attachment 1, and achieve better estimates of the contamination levels of potential WIPP program material. The radon daughter subtraction was only used for initial swipe data. The results presented in Tables 3 and 4 do not have radon daughter subtraction applied because the samples had been decayed for 72 hours prior to recount. Table 7 shows nuclide specific data for the swipe samples from Side B of each of the pans, as reported by WIPP Laboratory; and since the reported activity is nuclide specific, correction by radon daughter subtraction does not apply to these results.<sup>3</sup> The dpm/100 cm<sup>2</sup> alpha values calculated in Tables 1 and 2 are similar to or below the MDAs of the portable survey meters taking the measurements. However, for both Tables 1 and 2, if the values in succeeding columns from one column to the other are observed, in a number of cases they are less than in the previous column, indicating that the results are quite likely from radon daughter activity.

Air samples were collected at specific locations deemed appropriate to detect airborne contamination for the test, as defined by TBD 20-003. The air sampling results were all less than 0.02 Derived Air Concentration (DAC), which is the maximum concentration of airborne contamination in which non-radiological workers are generally allowed to work for an entire year without consideration for respiratory protection at the WIPP site. Continuous air monitors (CAMs) were also required to be located and operated at specified locations (sampling points are shown in Figure 1 of Attachment 1).

The approximate locations of the pans (where the swipe samples were collected) and the locations of specific air samplers are indicated on Attachment 1 of TBD 20-003; and these locations are also depicted in Figure 1 of Attachment 1 of this document.

Stop Level Set Points (see Table 8 of Attachment 1) were established prior to the test for radiological protection, pertaining to near ground level measurements. All radiological results were within the Stop Level Set Points (see Tables 1 through 7 of Attachment 1, and Tables 1 through 6 of Attachment 2) during the test,<sup>4</sup> and all near ground level radiological results were within WIPP surface contamination and airborne radioactivity limits.

## Important Points to Note Regarding the Monitoring

- The Minimum Detectable Activities (MDAs) of the survey instrumentation (Ludlum model 2360) were well below the limits stated in 10 CFR 835 and in the applicable WIPP procedures for total

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to 325 dpm/100 cm<sup>2</sup> beta. These limits are below the WIPP program limits of 100 dpm/100 cm<sup>2</sup> alpha and 1000 dpm/100 cm<sup>2</sup> beta.

<sup>3</sup> Side B of each the pans (which were undisturbed during the whole test) represents cumulative deposition results.

<sup>4</sup> The results listed in these tables are compensated for radon daughter interference.

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contamination (fixed plus removable). The WIPP program limits are 100 dpm/100 cm<sup>2</sup> alpha and 1000 dpm/100 cm<sup>2</sup> beta.

- All ground deposition results from swipe samples collected from the pans during the test<sup>5</sup> were far below the applicable removable contamination limits established in 10 CFR 835 of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta and close to zero dpm/100 cm<sup>2</sup> (see Tables 3, 4, and 7 of Attachment 1).<sup>6</sup>

## Technical Discussion

### ***Monitoring Near Ground Level***

TBD 20-003 *Sampling Plan for the 700C Fan Startup and Testing* specified that swipes be taken on metal pans placed in specified locations<sup>7</sup> during the test to assess whether or not contamination was accumulating on surfaces beyond the maximum that was expected (see Table 8 of Attachment 1)—so that it could be determined if the 700C fan operation might have to be stopped for radiological safety considerations. All the radioactivity results from swipe samples collected from the pans during the test were below the removable radioactivity limits and close to zero dpm/100 cm<sup>2</sup> (see Tables 3, 4, and 7 of Attachment 1), with the highest observed value being 1.38 dpm/100cm<sup>2</sup> alpha and 1.83 dpm/100cm<sup>2</sup> beta.<sup>8</sup> Continuous air monitors (CAMs) were also required to be located and operated at specified locations (see Figure 1 of Attachment 1). The radiological “Stop Level Set Points” are presented in Attachment 4 of TBD 20-003, and are repeated in this document in Table 8 of Attachment 1. In no instance were these stop level set points exceeded, for each of the categories listed. The surface contamination results that were measured *during the* 226 minute test period of the 700C fan are listed in Tables 1 through 4 of Attachment 1 and Tables 1 through 6 of Attachment 2.<sup>9</sup> Maximum CAM readings are also provided in Tables 1 through 6 of Attachment 2, one CAM reading per table. Additionally, the maximum CAM readings were all in conformance to the limit provided in Table 8 of Attachment 1, that is, less than 8 DAC-hours.

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<sup>5</sup> Tables 3 and 4 of Attachment 1 show decayed results analyzed by Tennelec sample counters. The WIPP Laboratory results are listed in Table 7 of Attachment 1. The near real-time data is listed in Tables 1 through 6 of Attachment 2—which demonstrates conformance to the limits established in Table 8 of Attachment 1, and was used for radiological protection during the time of the test. Tables 1 through 6 of Attachment 1 list direct (total contamination values from portable survey meters) and swipe data (from samples counted by Tennelec units).

<sup>6</sup> In the case of Tables 3 and 4, radon daughter products were allowed to decay so that any WIPP program material activity could be more accurately estimated. Direct isotopic results (from WIPP Laboratory) are listed in Table 7 of Attachment 1, and in that case, radon daughter decay compensation was not necessary.

<sup>7</sup> See TBD 20-003 *Sampling Plan for the 700C Fan Startup and Testing* for a more complete discussion.

<sup>8</sup> Each of these tables list the values with the samples processed so that there was no significant radon daughter interference, and therefore, provide a much better estimate of any program material activity.

<sup>9</sup> Tables 1 through 6 of Attachment 2 are of secondary importance to those tables listed in Attachment 1, and are therefore, listed in Attachment 2. The primary purpose for the tables in Attachment 2 is to list more detail for the near real-time data (for those interested in seeing that data), showing conformance to the Stop Level Set Points listed in Table 8 of Attachment 1.

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Although no interruptions in the 700C operation<sup>10</sup> occurred due to exceedance of Stop Level Set Points, the fan was secured multiple times because wind direction and/or speed would temporarily change so that it was outside the test parameters established in TBD 20-003. In such case, the 700C fan was shut down until the wind direction and/or speed was again within the test parameters.

The air samples were collected at specific locations deemed appropriate to detect airborne contamination for the test, as defined by TBD 20-003. The total run time of the 700C fan was about 226 minutes.

### ***Analyses Processes for Monitoring Performed Near Ground Level***

Radon daughter subtraction was done to support the determination of radiological safety precautions during the time of the test. The *total* dpm/100 cm<sup>2</sup> results (from fixed one minute surveys) listed in Tables 1 and 2 of Attachment 1 (except those for the Control Pan itself) were calculated by subtracting the dpm/100 cm<sup>2</sup> results of the Control Pan from the individual dpm/100 cm<sup>2</sup> results from each other pan, for the applicable time periods, to provide a better understanding of whether the contamination levels measured were due to WIPP program material. Tables 1 through 6 of Attachment 2 list near real-time swipe data for the 700C fan test period. These results were also subtracted from the individual swipe results from the other pans to compensate for radon daughter activity during the test period.<sup>11</sup>

The results from decayed samples are analyzed in this report (see Tables 3 through 5 of Attachment 1) to much more accurately estimate the activities of possible WIPP program material, both on surfaces and possible airborne radioactivity that may have existed during the test due to that material. Tables 6 and 7 of Attachment 1 show pertinent results from the WIPP Laboratory.

The swipe samples and the airborne radioactivity samples are of primary importance with regard to detection of radioactivity from program material expelled by the 700C fan. Both of these sample types were analyzed after a 72 hour decay period to compensate for radon daughter activity. The swipe samples were collected once on Side A of each pan for roughly each one hour of 700C fan run time. After termination of the test, Side B of each the pans (which was undisturbed during the whole test

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<sup>10</sup> All interruptions of the 700C fan operation were due to weather conditions not being within the criteria defined in TBD 20-003. The times of operation were from 3:35 am to 5:03 am, from 5:15 am to 5:20 am, and from 8:11 am to 10:24 am, totaling 226 minutes.

<sup>11</sup> Tables 1 through 6 of Attachment 2 are of secondary importance to those tables listed in Attachment 1, and are therefore, listed in Attachment 2. The primary purpose for the tables in Attachment 2 is to list more detail for the near real-time data (for those interested in seeing that data), showing conformance to the Stop Level Set Points listed in Table 8 of Attachment 1. The data in Attachment 1 show the final results after radon decay for Tables 3 and 4. The direct survey results listed in Tables 1 and 2 of Attachment 1 cannot be precisely corrected through the process of radon daughter decay, rather a less precise compensation was performed by subtracting the Control Pan results. Therefore, the swipe sample results listed in Tables 3, 4, and 7 of Attachment 1 are presented to show that the direct results for total contamination is likely very small.

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period) was surveyed and sampled.<sup>12, 13</sup> The results from decayed samples are listed in this report to much more accurately estimate the activities of possible WIPP program material, both on surfaces and possible airborne radioactivity that may have existed during the test. These results (the ones specifically located at the pan locations) are listed in Tables 3 through 7 of Attachment 1. Table 7 lists the nuclide specific results for Side B of each of the pans, as reported by WIPP Laboratory.

### ***Predicted Maximum Results and Actual Measured Results for Monitoring Near Ground Level***

TE 20-002 *Radiological Assessment of the Startup and Testing of the 700C Fan*, predicted that no more than 7.6 dpm alpha/100 cm<sup>2</sup> re-dispersible contamination would accumulate on surfaces near ground level or the ground itself, and no more than 0.04 total DAC fraction would be dispersed into the air near ground level during the 700C test *if no pieces or slabs of radioactive salt became dislodged from the ventilation system during the test*. The surface survey results (through analysis of swipe data) support values less than the predicted maximum of 7.6 dpm alpha/100 cm<sup>2</sup> re-dispersible activity on surfaces near ground level. A better understanding of the total contamination levels may be obtained through observation of the swipe sample data. Maximum results from the related swipe data from the decay corrected Tables 3 and 4 are 1.31 dpm/100 cm<sup>2</sup> alpha and 1.83 dpm/100 cm<sup>2</sup> beta. Since the deposition period of any contamination and the points in time that the swipe samples were collected were approximately concurrent within the test period, the contamination deposited on surfaces is likely to be predominantly removable contamination that could be sampled with heightened precision (as a result of low MDAs on Tennelec sample counters) through the use of swipe samples.

Total contamination levels using handheld radiation detection instruments cannot be measured to such low levels as 7.6 dpm/100 cm<sup>2</sup>, but can be measured to the levels required by 10 CFR 835. Therefore, data from decayed swipe results were used to estimate the contamination levels for WIPP program material. Because the swipe sample results are so close to zero dpm/100 cm<sup>2</sup> and because of the very limited time between possible deposition of activity and sampling time, it is likely that the total dpm/100 cm<sup>2</sup> at each sampling point for the pans is also very small, perhaps close to zero dpm/100 cm<sup>2</sup>. Total results, as listed in Tables 1 and 2, have far less accuracy than the results in Tables 3 and 4 for swipe data because of a variety of causes, including much greater MDAs for the total contamination surveys (as listed in Tables 1 and 2), and radon daughter interference (applying to Tables 1 and 2, but not to Tables 3 and 4, which list decayed results).

The total alpha and beta limits in this context for total surface contamination at WIPP are 100 dpm/100 cm<sup>2</sup> alpha and 1000 dpm/100 cm<sup>2</sup> beta, and the maximum total surface contamination levels detected during the test were within these limits. Airborne radioactive contamination concentrations near ground level were less than a total DAC fraction of 0.02 DAC (see Table 5 of Attachment 1, from on-site

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<sup>12</sup> For a more detailed description of the sampling protocol, see TBD 20-003 *Sampling Plan for the 700C Fan Startup and Testing*.

<sup>13</sup> Because of the limited time between possible radioactivity deposition and swipe sampling time, it is expected that most of any total activity deposition was actually also removable contamination that could be sampled adequately via swipe samples.

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Tennelec sample counting results). Table 6 of Attachment 1 (the WIPP Laboratory results for the air samples)<sup>14</sup> shows how that all air sample results are exceedingly small (much smaller than 0.02 DAC and smaller than the values reported in Table 5 of Attachment 1) because the WIPP Laboratory MDCs (dpm/sample) for alpha activity were much smaller than the MDAs achievable by the Tennelec sample counters; and all nuclide results from WIPP Laboratory were reported as non-detect. A total DAC fraction less than or equal to 0.02 DAC is advisable for areas in which non-radiological workers may work.<sup>15</sup>

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<sup>14</sup> The WIPP Laboratory results are nuclide specific, and the MDAs (MDCs/sample in the terminology of WIPP Laboratory) achieved for alpha activity are much lower than those obtained using Tennelec counting equipment.

<sup>15</sup> This corresponds to an individual breathing (at a rate of 20 liters per minute) within an atmosphere in which there is a DAC concentration of 0.02 total DAC fraction for a work year (generally considered to be about 2000 hours), to result in the worker accumulating  $(0.02 \text{ DAC}) \times (2000 \text{ hours}) = 40 \text{ DAC-hrs}$ . For each DAC-hr there is a calculated internal dose of about 2.5 mrem committed effective dose (CED) for the default 5  $\mu\text{m}$  AMAD particle size, resulting in that worker receiving about 100 mrem CED, which is the 10 CFR 835 limit for a non-radiological worker. For the nuclides of primary interest, this conservatively corresponds to non-stochastic dose, which in this case, means that the worker would accumulate *less than* 100 mrem CED stochastic dose. For such small doses, stochastic dose is of primary interest.

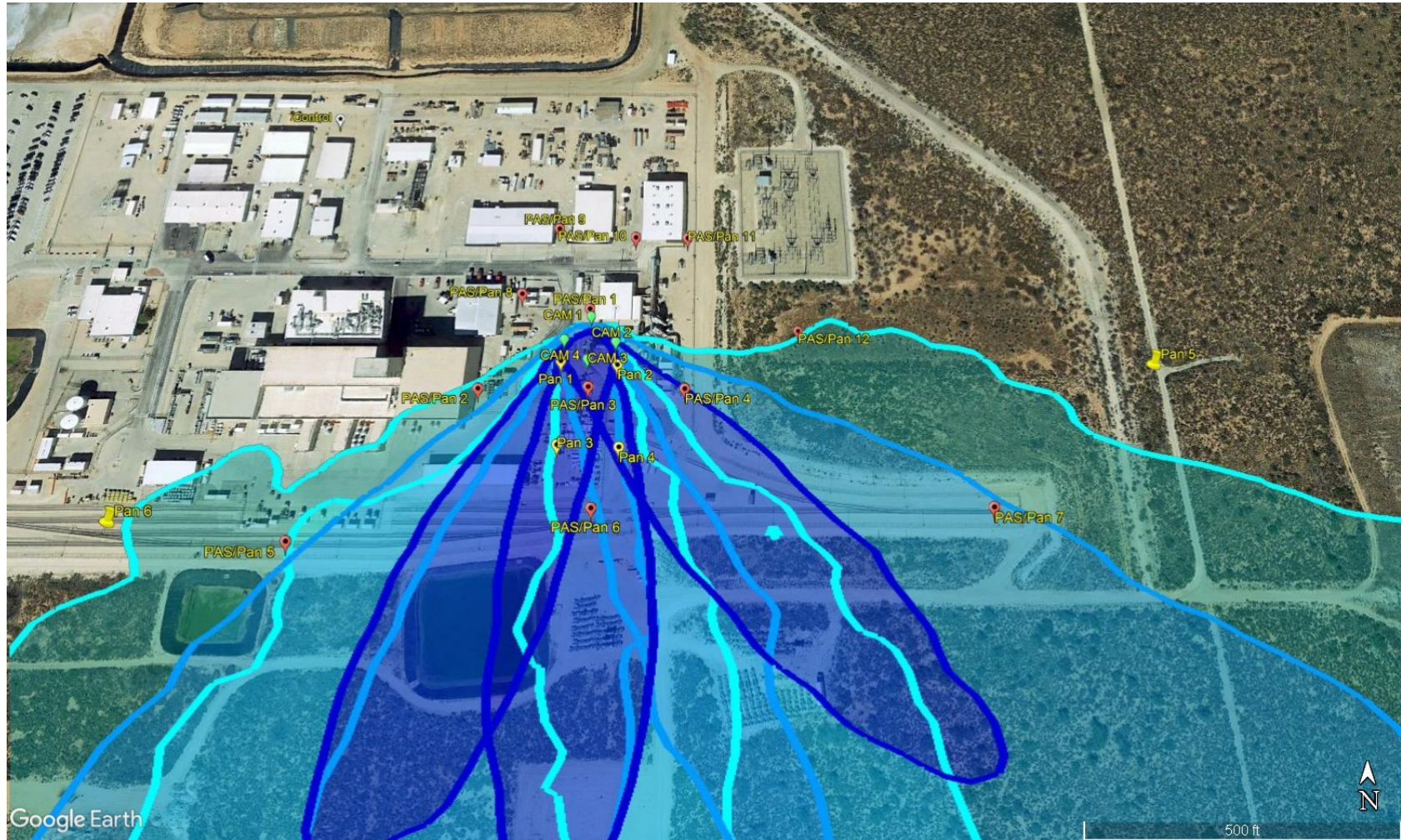


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## Figure 1

Sampling Locations (taken from TBD 20-003)



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**Table 1**

**Direct (Total)<sup>16</sup> Survey Results on Pan Surfaces for Alpha During the 700C Fan Test Period (Integrated Over One Minute)**

(These results were valid ONLY during the test period because of high radon daughter contributions, and were used for radiological safety DURING the test. The term “background” as used in this table means all sources of background, including radon daughter interference. From Table 8 of Attachment 1, the net values must be less than 55 dpm/100 cm<sup>2</sup>.)

	700C Run Time ≈ 1 Hr	700C Run Time ≈ 2 Hrs	700C Run Time ≈ 3 Hrs	700C Run Time ≈ 4 Hrs	Final	
	Initial 3:50 AM	4:50 AM	8:21 AM	9:21 AM	10:11 AM	B Side of Pans
Location	Direct dpm Alpha/100 cm <sup>2</sup>	Direct dpm Alpha/100 cm <sup>2</sup>	Direct dpm Alpha/100 cm <sup>2</sup>	Direct dpm Alpha/100 cm <sup>2</sup>	Direct dpm Alpha/100 cm <sup>2</sup>	Direct dpm Alpha/100 cm <sup>2</sup>
Control Pan <sup>17</sup>	18 background	28 background	37 background	60 background	46 background	60 background
PAS/Pan 1	0 net	29 net	33 net	0 net	0 net	0 net
PAS/Pan 2	35 net	41 net	33 net	0 net	7 net	45 net
PAS/Pan 3	11 net	41 net	52 net	15 net	2 net	17 net
PAS/Pan 4	11 net	16 net	18 net	0 net	28 net	45 net
PAS/Pan 5	0 net	0 net	14 net	0 net	0 net	0 net
PAS/Pan 6	45 net	21 net	33 net	0 net	19 net	12 net
PAS/Pan 7	29 net	0 net	25 net	0 net	0 net	0 net
PAS/Pan 8	32 net	23 net	0 net	0 net	0 net	0 net
PAS/Pan 9	9 net	5 net	0 net	0 net	5 net	0 net
PAS/Pan 10	9 net	28 net	14 net	0 net	0 net	0 net
PAS/Pan 11	18 net	0 net	0 net	0 net	18 net	0 net
PAS/Pan 12	19 net	15 net	20 net	0 net	0 net	0 net
Pan 1	25 net	33 net	42 net	29 net	10 net	0 net
Pan 2	16 net	38 net	53 net	10 net	33 net	0 net
Pan 3	30 net	11 net	52 net	0 net	26 net	13 net
Pan 4	11 net	11 net	38 net	0 net	14 net	41 net
Pan 5	15 net	0 net	11 net	0 net	0 net	0 net
Pan 6	14 net	0 net	28 net	0 net	0 net	0 net

Note that the dpm/100 cm<sup>2</sup> values listed above (except those for the Control Pan itself) were calculated by subtracting the dpm/100 cm<sup>2</sup> results of the Control Pan (assumed to be mostly attributable to radon daughter activity) from the individual dpm/100 cm<sup>2</sup> results from the other pans, for the applicable time periods, in effort to provide an estimate of the contamination due to program activity that *might have existed* during the time of the test, for the determination of any changing radiological safety precautions during the test.

<sup>16</sup> These survey results are for total contamination (fixed plus removable) using a portable survey meter, in this case a Ludlum model 2360.

<sup>17</sup> The background values in each case are total background values, which includes the contribution of radon daughters.



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**Table 2**

**Direct (Total)<sup>18</sup> Survey Results on Pan Surfaces for Beta During the 700C Fan Test Period (Integrated Over One Minute)**

(These results were valid ONLY during the test period because of high radon daughter contributions and were used for radiological safety DURING the test. The term "background" as used in this table means all sources of background, including radon daughter interference. From Table 8 of Attachment 1, the net values must be less than 325 dpm/100 cm<sup>2</sup>.)

	Initial 3:50 AM	700C Run Time ≈ 1 Hr 4:50 AM	700C Run Time ≈ 2 Hrs 8:21 AM	700C Run Time ≈ 3 Hrs 9:21 AM	700C Run Time ≈ 4 Hrs 10:11 AM	Final B Side of Pans
Location	Direct dpm Beta/100 cm <sup>2</sup>	Direct dpm Beta/100 cm <sup>2</sup>	Direct dpm Beta/100 cm <sup>2</sup>	Direct dpm Beta/100 cm <sup>2</sup>	Direct dpm Beta/100 cm <sup>2</sup>	Direct dpm Beta/100 cm <sup>2</sup>
Control Pan	632 background	610 background	555 background	666 background	610 background	570 background
PAS/Pan 1	0 net	0 net	54 net	9 net	5 net	57 net
PAS/Pan 2	2 net	52 net	75 net	0 net	0 net	131 net
PAS/Pan 3	2 net	78 net	72 net	62 net	0 net	46 net
PAS/Pan 4	2 net	0 net	123 net	15 net	0 net	115 net
PAS/Pan 5	0 net	40 net	46 net	0 net	94 net	52 net
PAS/Pan 6	8 net	7 net	52 net	0 net	19 net	98 net
PAS/Pan 7	0 net	0 net	114 net	0 net	19 net	72 net
PAS/Pan 8	0 net	0 net	31 net	0 net	96 net	43 net
PAS/Pan 9	0 net	0 net	151 net	0 net	0 net	3 net
PAS/Pan 10	0 net	0 net	49 net	0 net	15 net	0 net
PAS/Pan 11	0 net	0 net	37 net	18 net	59 net	40 net
PAS/Pan 12	7 net	15 net	74 net	3 net	15 net	0 net
Pan 1	0 net	0 net	154 net	40 net	0 net	0 net
Pan 2	0 net	71 net	173 net	59 net	35 net	7 net
Pan 3	0 net	0 net	106 net	5 net	19 net	79 net
Pan 4	2 net	137 net	91 net	15 net	51 net	131 net
Pan 5	0 net	0 net	67 net	0 net	0 net	32 net
Pan 6	0 net	0 net	89 net	0 net	0 net	53 net

Note that the dpm/100 cm<sup>2</sup> values listed above (except those for the Control Pan itself) were calculated by subtracting the dpm/100 cm<sup>2</sup> results of the Control Pan (assumed to be mostly attributable to radon daughter activity) from the individual dpm/100 cm<sup>2</sup> results from the other pans, for the applicable time periods, in effort to provide an estimate of the contamination due to program activity that *might have existed* during the time of the test, for the determination of any changing radiological safety precautions during the test.

<sup>18</sup> These survey results are for total contamination (fixed plus removable) using a portable survey meter.

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**Table 3**

**Swipe Results from Tennelec Sample Counters for Alpha, after 72 hour (or more) Decay**

(From Table 8 of Attachment 1, these values must be less than 14 dpm/100 cm<sup>2</sup>. See also Tables 1 through 5 of Attachment 2.)

Location	Initial 3:50 AM	700C Run Time ≈ 1 Hr 4:50 AM	700C Run Time ≈ 2 Hrs 8:21 AM	700C Run Time ≈ 3 Hrs 9:21 AM	700C Run Time ≈ 4 Hrs 10:11 AM	Final <sup>19</sup> B Side of Pans
	Swipe dpm Alpha/100 cm <sup>2</sup>	Swipe dpm Alpha/100 cm <sup>2</sup>	Swipe dpm Alpha/100 cm <sup>2</sup>	Swipe dpm Alpha/100 cm <sup>2</sup>	Swipe dpm Alpha/100 cm <sup>2</sup>	Swipe dpm Alpha/100 cm <sup>2</sup>
Control Pan	0	0.2	0	0	0	0
PAS/Pan 1	0.8	0	0	0.3	0.3	0
PAS/Pan 2	0.1	0.3	1.38	0.2	0	0
PAS/Pan 3	0	0	1.18	0	0	0
PAS/Pan 4	0	0	0	0.1	0.1	0
PAS/Pan 5	0	0.3	0.7	0	0	0
PAS/Pan 6	0	0	0	0	0	0
PAS/Pan 7	0	0.5	0	0	0	0.7
PAS/Pan 8	0	0	0	0	0	0
PAS/Pan 9	0	0.1	0	1	0	0
PAS/Pan 10	0.6	1.3	0	0.2	0	0
PAS/Pan 11	0.2	0	0	0	0	0
PAS/Pan 12	0.1	0	0	0.1	1.31	0.1
Pan 1	0	0	0	0.2	0.2	0
Pan 2	0	0.5	0	0.6	0.1	0
Pan 3	0	0	0	0	0	0
Pan 4	0	0	0	0	0	0.2
Pan 5	0.3	0.1	0	0	0	0
Pan 6	0	0	0	0	0	0

<sup>19</sup> Additional results for side B of each of the pans are provided from isotopic analyses of those 18 swipe samples by WIPP Laboratory (see Table 7). The highest ones were swipe C16343 (P-3 B 1) with 1.55E-01 dpm/sample U-238, and C16339 (Blue #9 B 4 Hr) with 1.48E-01 dpm/sample U-233/234. Only U-233/234 or U-238 were detected on any of the only four samples in which there was detection of activity.

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**Table 4**  
**Swipe Results from Tennelec Sample Counters for Beta, after 72 hour (or more) Decay**  
(From Table 8 of Attachment 1, the values must be less than 325 dpm/100 cm<sup>2</sup>. See also Tables 1 through 5 of Attachment 2.)

	Initial 3:50 AM	Run Time ≈ 1 Hr 4:50 AM	Run Time ≈ 2 Hrs 8:21 AM	Run Time ≈ 3 Hrs 9:21 AM	Run Time ≈ 4 Hrs 10:11 AM	Final <sup>20</sup> B Side of Pans
Location	Swipe dpm Beta/100 cm <sup>2</sup>	Swipe dpm Beta/100 cm <sup>2</sup>	Swipe dpm Beta/100 cm <sup>2</sup>	Swipe dpm Beta/100 cm <sup>2</sup>	Swipe dpm Beta/100 cm <sup>2</sup>	Swipe dpm Beta/100 cm <sup>2</sup>
Control Pan	0	0	0	0	0	0
PAS/Pan 1	0	0	0	0	1.83	0
PAS/Pan 2	0.16	0.71	0.55	1.65	0	0.24
PAS/Pan 3	0	0	0	0	0	0.08
PAS/Pan 4	0.08	0.16	0.39	0.94	0.31	0.78
PAS/Pan 5	0.39	0.08	1.17	0	0	0
PAS/Pan 6	0.47	0	0.86	0	0	0
PAS/Pan 7	0	0	0	0	0	0
PAS/Pan 8	0.16	0	0	0	0	0
PAS/Pan 9	0	0	0	1.71	0	0
PAS/Pan 10	0.23	0.7	0	0	0	0
PAS/Pan 11	0.31	0	0	0	0	0
PAS/Pan 12	0.48	0	0	0	0.32	0.32
Pan 1	0	0	0	0	0	0
Pan 2	0	0.32	0	0	0.24	0
Pan 3	0	0	0	0.08	0	0
Pan 4	0	0.08	0	0	0.94	0
Pan 5	0.32	0	0	0	0	0
Pan 6	0	0	0	0	0	0

<sup>20</sup> Additional results for side B of each of the pans are provided from isotopic analyses of those 18 swipe samples by WIPP Laboratory (see Table 7). The highest ones were swipe C16343 (P-3 B 1) with 1.55E-01 dpm/sample U-238, and C16339 (Blue #9 B 4 Hr) with 1.48E-01 dpm/sample U-233/234. Only U-233/234 or U-238 were detected on any of the only four samples in which there was detection of activity.

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**Table 5**  
**Airborne Radioactivity Results from Tennelec Sample Counters for 72 hour Decayed PAS Air Samples at the Pan Locations during the Test Period (226 Minutes)<sup>21</sup>**

Location	Alpha MDC μCi/ml	Beta MDC μCi/ml	MDC in Terms of Total DAC Fraction <sup>22</sup>	Alpha Airborne Concentration μCi/ml	Beta Airborne Concentration μCi/ml	Total DAC Fraction <sup>23</sup>
PAS/Pan 1	6.724E-14	9.490E-14	0.0135	7.083E-14	1.041E-13	0.014
PAS/Pan 2	5.983E-14	1.010E-13	0.012	4.003E-14	3.853E-14	0.008
PAS/Pan 3	5.983E-14	1.010E-13	0.012	3.080E-14	5.298E-14	0.006
PAS/Pan 4	5.983E-14	1.010E-13	0.012	1.320E-14	3.260E-14	0.003
PAS/Pan 5	5.983E-14	1.010E-13	0.012	4.443E-14	3.112E-14	0.009
PAS/Pan 6	5.983E-14	1.010E-13	0.012	2.640E-14	3.853E-14	0.005
PAS/Pan 7	5.983E-14	1.010E-13	0.012	1.760E-14	4.409E-14	0.004
PAS/Pan 8	5.983E-14	1.010E-13	0.012	0.000E-00	2.371E-14	0.00
PAS/Pan 9	5.983E-14	1.010E-13	0.012	7.523E-14	1.152E-13	0.015
PAS/Pan 10	5.983E-14	1.010E-13	0.012	4.443E-14	4.409E-14	0.009
PAS/Pan 11	5.983E-14	1.010E-13	0.012	4.883E-14	7.076E-14	0.010
PAS/Pan 12	5.983E-14	1.010E-13	0.012	4.883E-14	3.853E-14	0.010

The "Total DAC Fraction" in each case was less than 0.02 DAC, based upon the Tennelec count results, and also *indistinguishable from typical background values*. All WIPP Laboratory isotopic results for these samples utilized the "U" qualifier code (or other code indicating no detection to be reported) for the following nuclides: U-233/234, U-235, U-238, Pu-238, Pu-239/240, Am-241, Sr-90, Co-60, and Cs-137. (Analysis was not always performed for U-235.) (See Table 6.)

<sup>21</sup> The total run time of the 700C fan was about 226 minutes—causing the appropriate run time to also be 226 minutes for the air samples (for use in calculating the appropriate volumes for calculations) from sampling pumps that ran nonstop the entire time of the exercise.

<sup>22</sup> The MDC Total DAC Fraction is nearly 100 percent dominated by alpha, with the DAC value used for alpha being 5E-12 μCi/ml and the DAC value for beta being 7E-09 μCi/ml. Also, nearly all the activity from the presently existing contamination is from transuranics.

<sup>23</sup> Please note that whether or not the value listed is greater than the listed MDC, in all cases detection is negative, because in all cases after the samples were isotopically analyzed by WIPP Laboratory (see Table 6) with very low MDCs (in this case, dpm/sample), there was no reported detection of activity for any nuclide. Also the sameness of MDCs results is because of identical air sample volumes used with only two Tennelec counters. "PAS/Pan1" air filter was counted on a different Tennelec counter than were the other air filters.

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**Table 6**

## WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity	MDC	Qualifier
					dpm/sample	dpm/sample	
2021-047	C16291	1695013121	PAS/Pan 1	U-233/234	3.36E-02	1.40E+01	U
2021-047	C16291	1695013121	PAS/Pan 1	U-238	-1.76E-03	1.00E-01	U
2021-047	C16291	1695013121	PAS/Pan 1	Pu-238	1.57E-03	4.44E-02	U
2021-047	C16291	1695013121	PAS/Pan 1	Pu-239/240	4.86E-03	5.10E-02	U
2021-047	C16291	1695013121	PAS/Pan 1	Am-241	-1.26E-02	7.60E-02	U
2021-047	C16291	1695013121	PAS/Pan 1	Sr-90	2.41E-01	1.94E+00	UJ
2021-047	C16291	1695013121	PAS/Pan 1	Co-60	1.73E+00	1.21E+01	U
2021-047	C16291	1695013121	PAS/Pan 1	Cs-137	-2.24E+00	1.32E+01	U
2021-048	C16301	0862013121	PAS/Pan 2	U-233/234	-4.25E-02	1.25E-01	U
2021-048	C16301	0862013121	PAS/Pan 2	U-235	-8.69E-03	5.29E-02	U
2021-048	C16301	0862013121	PAS/Pan 2	U-238	-2.12E-02	8.71E-02	U
2021-048	C16301	0862013121	PAS/Pan 2	Pu-238	7.83E-03	4.95E-02	U

<sup>24</sup> For Table 6, observe the following notes from the WIPP Laboratory Gamma Analyses Summary:

Co-60 was not detected in any of these samples with activity greater than 2 sigma TPU and MDC, as the ID confidence is 0.000.

Cs-137 was not detected in any of these samples with activity greater than 2 sigma TPU and MDC, as the ID confidence is 0.000.

In gamma spectroscopy, the nuclide identification algorithms take into account all energy lines of a nuclide entered into the analysis library with their proper branching ratios, as well as the half-life of the nuclide. Nuclides that pass these tests with a confidence index greater than 0.9 will be classified as identified. Nuclides with ID Confidences less than 0.9 and are not greater than the 2 sigma TPU and MDC are not considered identified and are reported as non-detects.

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**Table 6**

## WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity dpm/sample	MDC dpm/sample	Qualifier
2021-048	C16301	0862013121	PAS/Pan 2	Pu-239/240	3.64E-03	5.19E-02	U
2021-048	C16301	0862013121	PAS/Pan 2	Am-241	-7.10E-03	6.75E-02	U
2021-048	C16301	0862013121	PAS/Pan 2	Sr-90	1.02E+00	1.80E+00	U
2021-048	C16301	0862013121	PAS/Pan 2	Co-60	3.19E+00	1.29E+01	U
2021-048	C16301	0862013121	PAS/Pan 2	Cs-137	-9.80E-01	1.23E+01	U
2021-048	C16299	1689013121	PAS/Pan 3	U-233/234	1.57E-02	1.26E-01	U
2021-048	C16299	1689013121	PAS/Pan 3	U-235	-1.04E-02	5.72E-02	U
2021-048	C16299	1689013121	PAS/Pan 3	U-238	-1.98E-02	8.86E-02	U
2021-048	C16299	1689013121	PAS/Pan 3	Pu-238	-1.06E-02	5.49E-02	U
2021-048	C16299	1689013121	PAS/Pan 3	Pu-239/240	-8.49E-03	5.80E-02	U
2021-048	C16299	1689013121	PAS/Pan 3	Am-241	-3.87E-03	6.91E-02	U
2021-048	C16299	1689013121	PAS/Pan 3	Sr-90	1.93E-01	1.80E+00	U
2021-048	C16299	1689013121	PAS/Pan 3	Co-60	3.67E+00	1.33E+01	U
2021-048	C16299	1689013121	PAS/Pan 3	Cs-137	-6.95E-01	1.43E+01	U
2021-048	C16297	1690013121	PAS/Pan 4	U-233/234	-3.27E-02	1.28E-01	U
2021-048	C16297	1690013121	PAS/Pan 4	U-235	-5.55E-04	6.04E-02	U
2021-048	C16297	1690013121	PAS/Pan 4	U-238	-2.68E-02	9.11E-02	U
2021-048	C16297	1690013121	PAS/Pan 4	Pu-238	-6.79E-03	4.87E-02	U
2021-048	C16297	1690013121	PAS/Pan 4	Pu-239/240	-6.41E-03	5.31E-02	U



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## Table 6

### WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity dpm/sample	MDC dpm/sample	Qualifier
2021-048	C16297	1690013121	PAS/Pan 4	Am-241	2.04E-03	6.68E-02	U
2021-048	C16297	1690013121	PAS/Pan 4	Sr-90	3.08E-02	1.80E+00	U
2021-048	C16297	1690013121	PAS/Pan 4	Co-60	3.43E-01	1.21E+01	U
2021-048	C16297	1690013121	PAS/Pan 4	Cs-137	-4.53E+00	1.35E+01	U
2021-046	C16290	1694013121	PAS/Pan 5	U-233/234	3.14E-02	1.63E-01	U
2021-046	C16290	1694013121	PAS/Pan 5	U-238	-4.40E-02	1.30E-01	U
2021-046	C16290	1694013121	PAS/Pan 5	Pu-238	-7.37E-03	4.85E-02	U
2021-046	C16290	1694013121	PAS/Pan 5	Pu-239/240	-3.22E-03	6.06E-02	U
2021-046	C16290	1694013121	PAS/Pan 5	Am-241	-7.52E-03	6.87E-02	U
2021-046	C16290	1694013121	PAS/Pan 5	Sr-90	-2.25E-01	1.87E+00	UJ
2021-046	C16290	1694013121	PAS/Pan 5	Co-60	-4.45E-01	1.18E+01	U
2021-046	C16290	1694013121	PAS/Pan 5	Cs-137	-2.94E+00	1.11E+01	U
2021-048	C16298	1698013121	PAS/Pan 6	U-233/234	-1.83E-02	1.23E-01	U
2021-048	C16298	1698013121	PAS/Pan 6	U-235	-1.07E-02	5.32E-02	U
2021-048	C16298	1698013121	PAS/Pan 6	U-238	2.60E-02	8.66E-02	U
2021-048	C16298	1698013121	PAS/Pan 6	Pu-238	-6.81E-03	4.68E-02	U
2021-048	C16298	1698013121	PAS/Pan 6	Pu-239/240	-8.07E-03	5.58E-02	U
2021-048	C16298	1698013121	PAS/Pan 6	Am-241	3.43E-02	7.07E-02	U
2021-048	C16298	1698013121	PAS/Pan 6	Sr-90	5.91E-01	1.79E+00	U

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## Table 6

### WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity dpm/sample	MDC dpm/sample	Qualifier
2021-048	C16298	1698013121	PAS/Pan 6	Co-60	-4.35E+00	1.08E+01	U
2021-048	C16298	1698013121	PAS/Pan 6	Cs-137	1.98E+00	1.42E+01	U
2021-046	C16288	1692013121	PAS/Pan 7	U-233/234	-3.25E-02	1.85E-01	U
2021-046	C16288	1692013121	PAS/Pan 7	U-238	-6.37E-02	1.42E-01	U
2021-046	C16288	1692013121	PAS/Pan 7	Pu-238	-9.55E-03	4.83E-02	U
2021-046	C16288	1692013121	PAS/Pan 7	Pu-239/240	-4.26E-03	6.21E-02	U
2021-046	C16288	1692013121	PAS/Pan 7	Am-241	-1.34E-02	6.27E-02	U
2021-046	C16288	1692013121	PAS/Pan 7	Sr-90	-5.86E-01	1.84E+00	UJ
2021-046	C16288	1692013121	PAS/Pan 7	Co-60	-4.09E+00	1.20E+01	U
2021-046	C16288	1692013121	PAS/Pan 7	Cs-137	-4.05E+00	1.34E+01	U
2021-047	C16293	1699013121	PAS/Pan 8	U-233/234	4.28E-03	1.34E-01	U
2021-047	C16293	1699013121	PAS/Pan 8	U-238	1.87E-02	9.68E-02	U
2021-047	C16293	1699013121	PAS/Pan 8	Pu-238	-6.16E-03	4.55E-02	U
2021-047	C16293	1699013121	PAS/Pan 8	Pu-239/240	-9.29E-03	5.14E-02	U
2021-047	C16293	1699013121	PAS/Pan 8	Am-241	-1.61E-03	6.70E-02	U
2021-047	C16293	1699013121	PAS/Pan 8	Sr-90	1.33E+00	1.93E+00	UJ
2021-047	C16293	1699013121	PAS/Pan 8	Co-60	-1.54E+00	1.09E+01	U
2021-047	C16293	1699013121	PAS/Pan 8	Cs-137	-2.66E+00	1.10E+01	U
2021-047	C16294	1702013121	PAS/Pan 9	U-233/234	3.36E-02	1.40E-01	U

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## Table 6

### WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity dpm/sample	MDC dpm/sample	Qualifier
2021-047	C16294	1702013121	PAS/Pan 9	U-238	-8.66E-03	9.97E-02	U
2021-047	C16294	1702013121	PAS/Pan 9	Pu-238	-2.57E-03	4.93E-02	U
2021-047	C16294	1702013121	PAS/Pan 9	Pu-239/240	-1.64E-03	5.23E-02	U
2021-047	C16294	1702013121	PAS/Pan 9	Am-241	3.49E-02	7.13E-02	U
2021-047	C16294	1702013121	PAS/Pan 9	Sr-90	-5.32E-02	1.93E+00	UJ
2021-047	C16294	1702013121	PAS/Pan 9	Co-60	-6.69E+00	1.22E+01	U
2021-047	C16294	1702013121	PAS/Pan 9	Cs-137	-1.06E+00	1.43E+01	U
2021-047	C16296	1703013121	PAS/Pan 10	U-233/234	1.27E-02	1.43E-01	U
2021-047	C16296	1703013121	PAS/Pan 10	U-238	1.20E-02	1.05E-01	U
2021-047	C16296	1703013121	PAS/Pan 10	Pu-238	1.83E-03	4.63E-02	U
2021-047	C16296	1703013121	PAS/Pan 10	Pu-239/240	-8.88E-03	5.98E-02	U
2021-047	C16296	1703013121	PAS/Pan 10	Am-241	-1.02E-03	6.70E-02	U
2021-047	C16296	1703013121	PAS/Pan 10	Sr-90	-3.66E-01	1.93E+00	UJ
2021-047	C16296	1703013121	PAS/Pan 10	Co-60	3.12E-01	1.14E+01	U
2021-047	C16296	1703013121	PAS/Pan 10	Cs-137	-3.61E+00	1.16E+01	U
2021-046	C16287	1691013121	PAS/Pan 11	U-233/234	-3.49E-02	1.66E-01	U
2021-046	C16287	1691013121	PAS/Pan 11	U-238	-8.19E-02	1.27E-01	U
2021-046	C16287	1691013121	PAS/Pan 11	Pu-238	2.34E-04	4.59E-02	U
2021-046	C16287	1691013121	PAS/Pan 11	Pu-239/240	-8.70E-03	5.42E-02	U

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## Table 6

### WIPP Laboratory Air Filter Sample Results for the Pan Locations during the Test Period (226 Minutes)

**Qualifiers:**<sup>24</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain. This happened for a number of Sr-90 results, which are of little consequence compared to the transuranics.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis were very low and much less than that obtained by Tennelec sample counters, and there was no detection of any nuclides according to the laboratory protocol.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location	Nuclides	Activity dpm/sample	MDC dpm/sample	Qualifier
2021-046	C16287	1691013121	PAS/Pan 11	Am-241	1.28E-02	6.58E-02	U
2021-046	C16287	1691013121	PAS/Pan 11	Sr-90	7.11E-01	1.83E+00	UJ
2021-046	C16287	1691013121	PAS/Pan 11	Co-60	-1.32E-01	1.12E+01	U
2021-046	C16287	1691013121	PAS/Pan 11	Cs-137	-4.19E-01	1.15E+01	U
2021-047	C16292	1696013121	PAS/Pan 12	U-233/234	7.18E-02	1.33E-01	U
2021-047	C16292	1696013121	PAS/Pan 12	U-238	1.96E-03	9.38E-02	U
2021-047	C16292	1696013121	PAS/Pan 12	Pu-238	3.32E-03	5.29E-02	U
2021-047	C16292	1696013121	PAS/Pan 12	Pu-239/240	-3.06E-03	5.40E-02	U
2021-047	C16292	1696013121	PAS/Pan 12	Am-241	8.83E-03	7.07E-02	U
2021-047	C16292	1696013121	PAS/Pan 12	Sr-90	2.58E-01	1.94E+00	UJ
2021-047	C16292	1696013121	PAS/Pan 12	Co-60	9.12E-01	1.12E+01	U
2021-047	C16292	1696013121	PAS/Pan 12	Cs-137	3.63E+00	1.33E+01	U

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**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain.

"=" indicates detection of the nuclide, and with no qualifiers necessary.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-053	C16326	Green 12 B	Pan B Sides	U-233/234	7.83E-02	8.08E-02	U
2021-053	C16326	Green 12 B	Pan B Sides	U-238	2.31E-02	7.41E-02	U
2021-053	C16326	Green 12 B	Pan B Sides	Pu-238	3.51E-03	3.93E-02	U
2021-053	C16326	Green 12 B	Pan B Sides	Pu-239/240	2.25E-03	4.90E-02	U
2021-053	C16326	Green 12 B	Pan B Sides	Am-241	2.83E-02	5.61E-02	U
2021-053	C16326	Green 12 B	Pan B Sides	Sr-90	-7.32E-01	1.16E+00	U
2021-053	C16326	Green 12 B	Pan B Sides	Co-60	2.29E+00	1.25E+01	U

<sup>25</sup> The number of swipe samples analyzed by WIPP Laboratory was 18, and the swipe results were from side B on the pans. Even though a 30 minute count on each of these swipes via Tennelec counters revealed no activity, the more sensitive analyses performed at WIPP Laboratory was more effective for detecting the presence of any WIPP program material. The highest sample results were from swipe C16343 (P-3 B 1) with 1.55E-01 dpm/sample U-238, and C16339 (Blue #9 B 4 Hr) with 1.48E-01 dpm/sample U-233/234. Only U-233/234 or U-238 were detected for any of the only four samples in which there was detection of activity. It is considered that the sample results listed are so small as to be considered indistinguishable from background for the purposes of this report. The small levels of U-233/234 and U-238 may have been from naturally occurring radionuclides.

<sup>26</sup> For Table 7, observe the following notes from the WIPP Laboratory Gamma Analyses Summary:

Co-60 was not detected in any of these samples with activity greater than 2 sigma TPU and MDC, as the ID confidence is 0.000.

Cs-137 was not detected in any of these samples with activity greater than 2 sigma TPU and MDC, as the ID confidence is 0.000.

In gamma spectroscopy, the nuclide identification algorithms take into account all energy lines of a nuclide entered into the analysis library with their proper branching ratios, as well as the half-life of the nuclide. Nuclides that pass these tests with a confidence index greater than 0.9 will be classified as identified. Nuclides with ID Confidences less than 0.9 and are not greater than the 2 sigma TPU and MDC are not considered identified and are reported as non-detects.

<sup>27</sup> Side B of each of the pans was not disturbed during the 700C fan test, but sampled after the test. Therefore, side B of each of the pans represents any cumulative contamination that might have occurred during the test.

# Evaluation of Data from 700C Test Attachment 1

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**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain.

"=" indicates detection of the nuclide, and with no qualifiers necessary.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-053	C16326	Green 12 B	Pan B Sides	Cs-137	1.86E+00	1.40E+01	U
2021-053	C16327	Green 5 B	Pan B Sides	U-233/234	5.03E-02	8.39E-02	U
2021-053	C16327	Green 5 B	Pan B Sides	U-238	5.79E-02	8.05E-02	U
2021-053	C16327	Green 5 B	Pan B Sides	Pu-238	1.75E-02	5.08E-02	U
2021-053	C16327	Green 5 B	Pan B Sides	Pu-239/240	1.03E-03	6.33E-02	U
2021-053	C16327	Green 5 B	Pan B Sides	Am-241	-1.43E-02	5.21E-02	U
2021-053	C16327	Green 5 B	Pan B Sides	Sr-90	-7.59E-01	1.16E+00	U
2021-053	C16327	Green 5 B	Pan B Sides	Co-60	-4.01E+00	1.30E+01	U
2021-053	C16327	Green 5 B	Pan B Sides	Cs-137	-2.61E-01	1.50E+01	U
2021-053	C16328	Green 7 B	Pan B Sides	U-233/234	6.30E-02	8.97E-02	U
2021-053	C16328	Green 7 B	Pan B Sides	U-238	1.83E-02	8.26E-02	U
2021-053	C16328	Green 7 B	Pan B Sides	Pu-238	-1.54E-03	3.72E-02	U
2021-053	C16328	Green 7 B	Pan B Sides	Pu-239/240	-5.14E-03	4.69E-02	U
2021-053	C16328	Green 7 B	Pan B Sides	Am-241	4.92E-03	5.15E-02	U
2021-053	C16328	Green 7 B	Pan B Sides	Sr-90	2.91E-01	1.16E+00	U
2021-053	C16328	Green 7 B	Pan B Sides	Co-60	-4.05E+00	1.27E+01	U
2021-053	C16328	Green 7 B	Pan B Sides	Cs-137	9.20E+00	3.75E+00	U <sup>28</sup>
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	U-233/234	5.75E-02	9.19E-02	U

<sup>28</sup> Note that the activity reported is greater than the MDC, and yet the qualifier designation is "U." The ID confidence for Cs-137 was 0.000, and therefore, it was reported as not detected above the reported MDC and 2 sigma counting uncertainty.



# Evaluation of Data from 700C Test Attachment 1

TE 21-009, Rev. 2

**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain.

"=" indicates detection of the nuclide, and with no qualifiers necessary.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	U-238	3.09E-02	8.92E-02	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Pu-238	5.01E-04	4.35E-02	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Pu-239/240	-4.76E-03	4.69E-02	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Am-241	5.43E-03	6.29E-02	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Sr-90	-9.26E-02	1.16E+00	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Co-60	6.48E+00	1.26E+01	U
2021-053	C16329	Blue #12 B 4 hr	Pan B Sides	Cs-137	5.26E-01	1.22E+01	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	U-233/234	2.13E-02	9.64E-02	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	U-238	6.55E-02	9.44E-02	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Pu-238	2.29E-03	4.43E-02	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Pu-239/240	-5.60E-03	4.70E-02	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Am-241	3.03E-02	5.42E-02	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Sr-90	-5.13E-02	1.19E+00	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Co-60	1.43E+00	1.19E+01	U
2021-053	C16330	Blue #10 B 4 hr	Pan B Sides	Cs-137	1.98E+00	1.39E+01	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	U-233/234	5.62E-02	9.58E-02	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	U-238	2.10E-02	8.79E-02	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Pu-238	-4.40E-03	4.25E-02	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Pu-239/240	1.09E-02	4.98E-02	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Am-241	2.53E-02	5.03E-02	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Sr-90	-1.88E-01	1.18E+00	U

# Evaluation of Data from 700C Test Attachment 1

TE 21-009, Rev. 2

**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

"UJ" means that nuclide was not detected above the reported MDC and 2 sigma counting uncertainty, and a quality deficiency affects the data, making the reported data more uncertain.

"=" indicates detection of the nuclide, and with no qualifiers necessary.

The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Co-60	-6.36E+00	1.12E+01	U
2021-053	C16331	Blue #1 B 4 hr	Pan B Sides	Cs-137	1.79E+00	1.35E+01	U
2021-053	C16332	7 B Yellow	Pan B Sides	U-233/234	7.38E-02	1.04E-01	U
2021-053	C16332	7 B Yellow	Pan B Sides	U-238	2.50E-02	9.76E-02	U
2021-053	C16332	7 B Yellow	Pan B Sides	Pu-238	-4.82E-03	4.58E-02	U
2021-053	C16332	7 B Yellow	Pan B Sides	Pu-239/240	-5.10E-03	5.39E-02	U
2021-053	C16332	7 B Yellow	Pan B Sides	Am-241	2.34E-02	5.51E-02	U
2021-053	C16332	7 B Yellow	Pan B Sides	Sr-90	-3.44E-01	1.17E+00	U
2021-053	C16332	7 B Yellow	Pan B Sides	Co-60	-1.72E+00	1.30E+01	U
2021-053	C16332	7 B Yellow	Pan B Sides	Cs-137	-3.28E-01	1.38E+01	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	U-233/234	7.95E-02	9.03E-02	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	U-238	4.19E-02	8.30E-02	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Pu-238	-3.32E-03	4.20E-02	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Pu-239/240	-4.86E-03	4.76E-02	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Am-241	2.96E-02	5.79E-02	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Sr-90	-4.34E-01	1.16E+00	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Co-60	3.05E+00	1.25E+01	U
2021-053	C16333	Blue #6 B 4 hr	Pan B Sides	Cs-137	-2.57E+00	1.20E+01	U
2021-053	C16334	3 B Yellow	Pan B Sides	U-233/234	5.40E-02	8.85E-02	U
2021-053	C16334	3 B Yellow	Pan B Sides	U-238	5.37E-02	8.22E-02	U
2021-053	C16334	3 B Yellow	Pan B Sides	Pu-238	-7.02E-03	4.77E-02	U

# Evaluation of Data from 700C Test Attachment 1

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**Table 7**

## WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)

Qualifiers:<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

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The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-053	C16334	3 B Yellow	Pan B Sides	Pu-239/240	-3.26E-03	5.01E-02	U
2021-053	C16334	3 B Yellow	Pan B Sides	Am-241	2.85E-02	6.35E-02	U
2021-053	C16334	3 B Yellow	Pan B Sides	Sr-90	1.14E-01	1.19E+00	U
2021-053	C16334	3 B Yellow	Pan B Sides	Co-60	5.75E-01	1.13E+01	U
2021-053	C16334	3 B Yellow	Pan B Sides	Cs-137	6.19E+00	1.37E+01	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	U-233/234	1.35E-01	1.39E-01	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	U-238	1.06E-01	1.38E-01	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Pu-238	-4.54E-03	4.41E-02	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Pu-239/240	-5.95E-03	5.46E-02	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Am-241	1.52E-02	5.21E-02	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Sr-90	-1.14E+00	1.18E+00	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Co-60	-1.69E+00	1.15E+01	U
2021-054	C16335	Blue #19 B 4 hr	Pan B Sides	Cs-137	-4.34E+00	1.34E+01	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	U-233/234	6.60E-03	1.17E-01	UJ
2021-054	C16336	4 Bravo Yellow	Pan B Sides	U-238	1.14E-02	1.09E-01	UJ
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Pu-238	6.64E-03	4.76E-02	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Pu-239/240	9.48E-04	5.97E-02	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Am-241	2.24E-02	5.18E-02	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Sr-90	-7.82E-01	1.18E+00	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Co-60	-5.25E+00	1.24E+01	U
2021-054	C16336	4 Bravo Yellow	Pan B Sides	Cs-137	-3.06E+00	1.32E+01	U

# Evaluation of Data from 700C Test Attachment 1

TE 21-009, Rev. 2

**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

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The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-054	C16337	B22 B211	Pan B Sides	U-233/234	6.13E-02	1.18E-01	U
2021-054	C16337	B22 B211	Pan B Sides	U-238	8.12E-02	1.03E-01	U
2021-054	C16337	B22 B211	Pan B Sides	Pu-238	-1.82E-03	4.33E-02	U
2021-054	C16337	B22 B211	Pan B Sides	Pu-239/240	3.04E-03	5.38E-02	U
2021-054	C16337	B22 B211	Pan B Sides	Am-241	-2.20E-03	4.48E-02	U
2021-054	C16337	B22 B211	Pan B Sides	Sr-90	-4.25E-01	1.16E+00	U
2021-054	C16337	B22 B211	Pan B Sides	Co-60	-7.05E-01	1.23E+01	U
2021-054	C16337	B22 B211	Pan B Sides	Cs-137	1.42E-01	1.23E+01	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	U-233/234	5.90E-02	1.14E-01	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	U-238	1.59E-01	1.06E-01	=
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Pu-238	4.36E-03	3.81E-02	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Pu-239/240	1.10E-02	5.10E-02	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Am-241	1.99E-02	4.56E-02	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Sr-90	-8.22E-01	1.19E+00	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Co-60	-2.45E+00	1.31E+01	U
2021-054	C16338	Blue #11 B 4 hr	Pan B Sides	Cs-137	-3.12E+00	1.33E+01	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	U-233/234	1.48E-01	1.11E-01	=
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	U-238	2.93E-02	9.89E-02	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Pu-238	2.49E-03	5.51E-02	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Pu-239/240	3.59E-03	5.15E-02	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Am-241	2.35E-02	5.11E-02	U

# Evaluation of Data from 700C Test Attachment 1

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**Table 7**

**WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)**

**Qualifiers:**<sup>26</sup>

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The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Sr-90	-2.39E-01	1.18E+00	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Co-60	3.93E-01	1.13E+01	U
2021-054	C16339	Blue #9 B 4 hr	Pan B Sides	Cs-137	3.82E+00	1.29E+01	U
2021-054	C16340	17 B Yellow	Pan B Sides	U-233/234	9.21E-02	1.11E-01	U
2021-054	C16340	17 B Yellow	Pan B Sides	U-238	1.07E-01	1.09E-01	U
2021-054	C16340	17 B Yellow	Pan B Sides	Pu-238	2.29E-03	4.94E-02	U
2021-054	C16340	17 B Yellow	Pan B Sides	Pu-239/240	-5.72E-03	5.52E-02	U
2021-054	C16340	17 B Yellow	Pan B Sides	Am-241	4.76E-03	6.16E-02	U
2021-054	C16340	17 B Yellow	Pan B Sides	Sr-90	-1.41E-01	1.19E+00	U
2021-054	C16340	17 B Yellow	Pan B Sides	Co-60	4.57E+00	1.29E+01	U
2021-054	C16340	17 B Yellow	Pan B Sides	Cs-137	4.51E+00	1.39E+01	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	U-233/234	6.20E-02	1.32E-01	UJ
2021-054	C16341	16 Bravo Yellow	Pan B Sides	U-238	3.66E-02	1.27E-01	UJ
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Pu-238	3.09E-04	5.86E-02	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Pu-239/240	2.78E-03	5.20E-02	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Am-241	1.39E-02	4.58E-02	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Sr-90	-3.24E-01	1.16E+00	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Co-60	5.27E+00	1.27E+01	U
2021-054	C16341	16 Bravo Yellow	Pan B Sides	Cs-137	-5.81E+00	1.34E+01	U
2021-054	C16342	5 B Yellow	Pan B Sides	U-233/234	-5.51E-03	1.22E-01	U
2021-054	C16342	5 B Yellow	Pan B Sides	U-238	1.38E-01	1.14E-01	=

# Evaluation of Data from 700C Test Attachment 1

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## Table 7

### WIPP Laboratory Swipe Sample Results<sup>25</sup> for the Pan Locations during the Test Period (226 Minutes)

Qualifiers:<sup>26</sup>

"U" means that nuclide was considered not detected above the reported MDC and 2 sigma counting uncertainty.

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The MDCs for alpha activity obtained by the WIPP Laboratory for this analysis was much less than that of the Tennelec sample counters. Any presence of program activity is shown to be very low compared to the limits of 20 dpm/100 cm<sup>2</sup> alpha and 200 dpm/100 cm<sup>2</sup> beta.

WIPP Lab SDG #	WIPP Lab Sample ID	WIPP Site Sample ID	Location <sup>27</sup>	Nuclides	Activity dpm/swipe	MDC dpm/swipe	Qualifier
2021-054	C16342	5 B Yellow	Pan B Sides	Pu-238	-9.49E-03	5.78E-02	U
2021-054	C16342	5 B Yellow	Pan B Sides	Pu-239/240	-8.59E-03	5.77E-02	U
2021-054	C16342	5 B Yellow	Pan B Sides	Am-241	2.95E-02	6.44E-02	U
2021-054	C16342	5 B Yellow	Pan B Sides	Sr-90	-6.97E-02	1.18E+00	U
2021-054	C16342	5 B Yellow	Pan B Sides	Co-60	5.76E+00	1.24E+01	U
2021-054	C16342	5 B Yellow	Pan B Sides	Cs-137	-2.49E+00	1.32E+01	U
2021-054	C16343	P-3 B 1	Pan B Sides	U-233/234	1.33E-01	1.37E-01	U
2021-054	C16343	P-3 B 1	Pan B Sides	U-238	1.55E-01	1.31E-01	=
2021-054	C16343	P-3 B 1	Pan B Sides	Pu-238	-3.85E-03	4.57E-02	U
2021-054	C16343	P-3 B 1	Pan B Sides	Pu-239/240	1.78E-03	5.18E-02	U
2021-054	C16343	P-3 B 1	Pan B Sides	Am-241	1.58E-02	6.14E-02	U
2021-054	C16343	P-3 B 1	Pan B Sides	Sr-90	-5.38E-01	1.16E+00	U
2021-054	C16343	P-3 B 1	Pan B Sides	Co-60	3.61E+00	1.22E+01	U
2021-054	C16343	P-3 B 1	Pan B Sides	Cs-137	2.11E+00	1.26E+01	U



# Evaluation of Data from 700C Test Attachment 1

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**Table 8**

## Stop Level Set Points

*(from TBD 20-003 Sampling Plan for the 700C Fan Startup and Testing)*

<b>Instrument</b>	<b>Stop Level</b>	<b>10 CFR 835 Level</b>
Ludlum 2360	> 55 dpm/100 cm <sup>2</sup> alpha *	100 dpm/100 cm <sup>2</sup> alpha
Ludlum 2360	> 325 dpm/100 cm <sup>2</sup> beta *	1000 dpm/100 cm <sup>2</sup> beta
Tennelec	> 14 dpm/100 cm <sup>2</sup> alpha *	20 dpm/100 cm <sup>2</sup> alpha
Tennelec	> 20 dpm/100 cm <sup>2</sup> beta *	200 dpm/100 cm <sup>2</sup> beta
CAM	> 8 DAC-HR	No Applicable Limit

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All stop level readings are based on typical MDAs of instrument. In no instance was a stop level set point exceeded.

\* The stop level is the value above what was determined to be background on the control pan (applying to the rows in Table 8 above which have dpm values listed), which is located outside of the projected plume area. This provided a background value for radon progeny or background.

## Evaluation of Data from 700C Test Attachment 2

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For the tables in this attachment, the direct readings are from Ludlum model 2360 survey meters. The swipe results are from Tennelec sample counters. The net values indicated are the ones to compare with the values from Table 8 of Attachment 1, *Stop Level Set Points*. *These Stop Level Set Points do not apply to the Control Pan.*

Instrument	Stop Level
Ludlum 2360	> 55 dpm/100 cm <sup>2</sup> alpha
Ludlum 2360	> 325 dpm/100 cm <sup>2</sup> beta
Tennelec	> 14 dpm/100 cm <sup>2</sup> alpha
Tennelec	> 20 dpm/100 cm <sup>2</sup> beta
CAM	> 8 DAC-HR

**Table 1**  
**First Round at 3:50 AM**  
**(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)**

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6	
Instrument Number	1765	1682	1392	1392	1392	1765	1392	1757	1765	1765	1757	1682	1392	1392	1392	1757	1765		
Gross Alpha Direct	4 cpm	4 cpm	11 cpm	6 cpm	6 cpm	4 cpm	13 cpm	10 cpm	11 cpm	6 cpm	6 cpm	8 cpm	8 cpm	10 cpm	8 cpm	10 cpm	6 cpm	7 cpm	7 cpm
Gross Beta Direct	205 cpm	182 cpm	195 cpm	195 cpm	195 cpm	203 cpm	197 cpm	171 cpm	202 cpm	197 cpm	203 cpm	205 cpm	193 cpm	197 cpm	164 cpm	181 cpm	195 cpm	173 cpm	189 cpm
Gross Alpha Swipe	2.92 dpm	3.14 dpm	0 dpm	0 dpm	3.14 dpm	2.92 dpm	0 dpm	0 dpm	2.92 dpm	5.94 dpm	2.92 dpm	0 dpm	0 dpm	7.23 dpm	0 dpm	3.14 dpm	0 dpm	0 dpm	2.92 dpm
Gross Beta Swipe	9.7 dpm	2.53 dpm	0.16 dpm	0 dpm	0.16 dpm	2.54 dpm	0 dpm	1.57 dpm	4.93 dpm	0.16 dpm	2.54 dpm	0 dpm	0 dpm	12 dpm	0.16 dpm	4.9 dpm	2.53 dpm	3.92 dpm	4.93 dpm
Results																			
Net Alpha Direct	18.36 dpm	0 dpm	35.14 dpm	10.82 dpm	10.82 dpm	0 dpm	44.87 dpm	28.85 dpm	32.12 dpm	9.18 dpm	9.18 dpm	18.35 dpm	19.41 dpm	25.13 dpm	16.44 dpm	30.28 dpm	10.82 dpm	14.69 dpm	13.77 dpm
Net Beta Direct	631.7 dpm	0 dpm	1.63 dpm	1.62 dpm	1.62 dpm	0 dpm	8.12 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	6.95 dpm	0 dpm	0 dpm	0 dpm	1.62 dpm	0 dpm	0 dpm
Net Alpha Swipe	2.92 dpm	0 dpm	0 dpm	0 dpm	0.22 dpm	0 dpm	0 dpm	0 dpm	0 dpm	3.02 dpm	0 dpm	0 dpm	0 dpm	4.31 dpm	0 dpm	0.22 dpm	0 dpm	0 dpm	0 dpm
Net Beta Swipe	9.7 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.3 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm
CAM activity	1.24 dac/hr																		
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											

# Evaluation of Data from 700C Test Attachment 2

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## Table 2

Second Round at 4:50 AM

(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6
Instrument Number	1765	1682	1392	1392	1392	1765	1392	1757	1765	1765	1765	1765	1757	1682	1682	1392	1392	1757	1765
Gross Alpha Direct	6 cpm	13 cpm	14 cpm	14 cpm	9 cpm	5 cpm	10 cpm	4 cpm	11 cpm	7 cpm	12 cpm	5 cpm	9 cpm	14 cpm	15 cpm	8 cpm	8 cpm	4 cpm	5 cpm
Gross Beta Direct	198 cpm	184 cpm	204 cpm	212 cpm	186 cpm	211 cpm	190 cpm	184 cpm	198 cpm	187 cpm	186 cpm	194 cpm	189 cpm	186 cpm	215 cpm	188 cpm	230 cpm	166 cpm	173 cpm
Gross Alpha Swipe	0 dpm	0 dpm	0 dpm	8.76 dpm	0 dpm	2.92 dpm	2.72 dpm	8.95 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm	7.23 dpm	2.92 dpm	0 dpm	8.76 dpm	5.94 dpm	5.94 dpm
Gross Beta Swipe	0.16 dpm	0.16 dpm	10.04 dpm	0.48 dpm	7.68 dpm	0.16 dpm	5.26 dpm	0 dpm	14.47 dpm	0.16 dpm	2.54 dpm	0.16 dpm	0.16 dpm	12 dpm	2.54 dpm	0 dpm	2.87 dpm	0 dpm	16.85 dpm
Results																			
Net Alpha Direct	27.54 dpm	29.01 dpm	40.55 dpm	40.55 dpm	16.23 dpm	0 dpm	21.1 dpm	0 dpm	22.94 dpm	4.58 dpm	27.53 dpm	0 dpm	14.95 dpm	33.36 dpm	37.71 dpm	11.37 dpm	11.37 dpm	0 dpm	0 dpm
Net Beta Direct	610.17 dpm	0 dpm	52.38 dpm	78.36 dpm	0 dpm	40.06 dpm	6.91 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	15.24 dpm	0 dpm	71.07 dpm	0.42 dpm	136.83 dpm	0 dpm	0 dpm
Net Alpha Swipe	0 dpm	0 dpm	0 dpm	8.76 dpm	0 dpm	2.92 dpm	2.72 dpm	8.95 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm	7.23 dpm	2.92 dpm	0 dpm	8.76 dpm	5.94 dpm	5.94 dpm
Net Beta Swipe	0.16 dpm	0 dpm	9.88 dpm	0.32 dpm	7.52 dpm	0 dpm	5.1 dpm	0 dpm	14.31 dpm	0 dpm	2.38 dpm	0 dpm	0 dpm	11.84 dpm	2.38 dpm	0 dpm	2.71 dpm	0 dpm	16.69 dpm
CAM activity																			
	2.8 dac hr																		
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											

# Evaluation of Data from 700C Test Attachment 2

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## Table 3

Third Round at 8:21 AM

(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6
Instrument Number	1765	1682	1773	1773	1376	1765	1376	1757	1765	1765	1765	1765	1757	1773	1376	1773	1376	1757	1765
Gross Alpha Direct	8 cpm	16 cpm	14 cpm	18 cpm	11 cpm	11 cpm	14 cpm	13 cpm	4 cpm	7 cpm	11 cpm	6 cpm	12 cpm	16 cpm	18 cpm	18 cpm	15 cpm	10 cpm	14 cpm
Gross Beta Direct	180 cpm	192 cpm	207 cpm	206 cpm	191 cpm	195 cpm	171 cpm	202 cpm	190 cpm	229 cpm	196 cpm	192 cpm	190 cpm	233 cpm	205 cpm	233 cpm	182 cpm	188 cpm	209 cpm
Gross Alpha Swipe	2.92 dpm	5.74 dpm	5.94 dpm	5.94 dpm	2.92 dpm	5.94 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm	0 dpm	5.94 dpm	2.72 dpm	2.72 dpm	2.72 dpm	5.94 dpm	0 dpm	0 dpm	8.95 dpm
Gross Beta Swipe	0 dpm	0.48 dpm	16.85 dpm	14.47 dpm	4.93 dpm	9.7 dpm	2.54 dpm	2.87 dpm	4.93 dpm	7.31 dpm	0 dpm	4.93 dpm	7.65 dpm	12.43 dpm	0.48 dpm	7.31 dpm	2.54 dpm	2.87 dpm	19.24 dpm
Results																			
Net Alpha Direct	36.71 dpm	32.89 dpm	32.52 dpm	52.35 dpm	18.10 dpm	13.77 dpm	33.05 dpm	24.67 dpm	0 dpm	0 dpm	13.77 dpm	0 dpm	19.95 dpm	42.46 dpm	52.98 dpm	52.35 dpm	38.03 dpm	10.5 dpm	27.54 dpm
Net Beta Direct	554.7 dpm	53.67 dpm	75.25 dpm	72.20 dpm	123.09 dpm	46.22 dpm	52.11 dpm	113.71 dpm	30.82 dpm	151 dpm	49.31 dpm	36.98 dpm	74.02 dpm	154.37 dpm	172.77 dpm	105.68 dpm	91.15 dpm	67.40 dpm	89.37 dpm
Net Alpha Swipe	2.92 dpm	2.48 dpm	3.02 dpm	3.02 dpm	0 dpm	2.92 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	3.02 dpm	0 dpm	0 dpm	0 dpm	3.02 dpm	0 dpm	0 dpm	6.03 dpm
Net Beta Swipe	0 dpm	0.48 dpm	16.85 dpm	14.47 dpm	4.93 dpm	9.7 dpm	2.54 dpm	2.87 dpm	4.93 dpm	7.31 dpm	0 dpm	4.93 dpm	7.65 dpm	12.43 dpm	0.48 dpm	7.31 dpm	2.54 dpm	2.87 dpm	19.24 dpm
CAM activity	4.59 DAC-Hr																		
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											

# Evaluation of Data from 700C Test Attachment 2

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## Table 4

Fourth Round at 9:21 AM

(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6
Instrument Number	1765	1682	1773	1773	1753	1765	1753	1757	1765	1765	1765	1765	1757	1753	1376	1773	1753	1757	1765
Gross Alpha Direct	13 cpm	11 cpm	9 cpm	15 cpm	11 cpm	5 cpm	2 cpm	7 cpm	9 cpm	7 cpm	3 cpm	6 cpm	8 cpm	19 cpm	14 cpm	10 cpm	9 cpm	12 cpm	5 cpm
Gross Beta Direct	216 cpm	213 cpm	176 cpm	239 cpm	212 cpm	210 cpm	198 cpm	184 cpm	189 cpm	176 cpm	186 cpm	222 cpm	202 cpm	220 cpm	204 cpm	200 cpm	212 cpm	172 cpm	196 cpm
Gross Alpha Swipe	8.95 dpm	2.72 dpm	5.74 dpm	0 dpm	0 dpm	2.92 dpm	0 dpm	0 dpm	2.92 dpm	0 dpm	0 dpm	5.94 dpm	0 dpm	11.78 dpm	2.72 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm
Gross Beta Swipe	9.70 dpm	14.82 dpm	7.65 dpm	12.43 dpm	0.48 dpm	0.16 dpm	0 dpm	2.54 dpm	9.70 dpm	9.70 dpm	7.31 dpm	9.70 dpm	0 dpm	2.87 dpm	11.78 dpm	0.48 dpm	0.48 dpm	2.54 dpm	7.31 dpm
Results																			
Net Alpha Direct	59.66 dpm	0 dpm	0 dpm	14.56 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	28.51 dpm	10.1 dpm	0 dpm	0 dpm	0 dpm	0 dpm
Net Beta Direct	665.64 dpm	9.26 dpm	0 dpm	61.69 dpm	14.72 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	18.49 dpm	2.79 dpm	40.39 dpm	58.78 dpm	5.09 dpm	14.72 dpm	0 dpm	0 dpm
Net Alpha Swipe	8.95 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.83 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm
Net Beta Swipe	9.70 dpm	5.12 dpm	0 dpm	2.73 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.08 dpm	0 dpm	0 dpm	0 dpm	0 dpm
CAM activity	4.59 dac hr																		
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											

# Evaluation of Data from 700C Test Attachment 2

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## Table 5

Fifth Round at 10:11 AM

(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6
Instrument Number	1765	1682	1336	1336	1753	1765	1753	1757	1765	1765	1765	1765	1757	1753	1753	1336	1753	1757	1765
Gross Alpha Direct	10 cpm	10 cpm	11 cpm	10 cpm	16 cpm	9 cpm	14 cpm	4 cpm	9 cpm	11 cpm	7 cpm	14 cpm	7 cpm	12 cpm	17 cpm	15 cpm	13 cpm	8 cpm	9 cpm
Gross Beta Direct	198 cpm	194 cpm	171 cpm	185 cpm	189 cpm	228 cpm	196 cpm	190 cpm	229 cpm	198 cpm	203 cpm	217 cpm	189 cpm	176 cpm	201 cpm	194 cpm	206 cpm	183 cpm	197 cpm
Gross Alpha Swipe	2.92 dpm	0 dpm	11.78 dpm	2.72 dpm	0 dpm	0 dpm	0 dpm	0 dpm	5.94 dpm	2.92 dpm	0 dpm	0 dpm	2.92 dpm	11.78 dpm	2.72 dpm	0 dpm	0 dpm	0 dpm	11.97 dpm
Gross Beta Swipe	4.93 dpm	2.87 dpm	12.43 dpm	2.87 dpm	2.87 dpm	12.08 dpm	0 dpm	0.16 dpm	21.62 dpm	7.31 dpm	12.08 dpm	2.54 dpm	2.54 dpm	2.87 dpm	2.87 dpm	7.65 dpm	0.48 dpm	2.54 dpm	21.62 dpm
Results																			
Net Alpha Direct	45.89 dpm	0 dpm	6.64 dpm	1.87 dpm	28.36 dpm	0 dpm	19.08 dpm	0 dpm	0 dpm	4.59 dpm	0 dpm	18.36 dpm	0 dpm	9.79 dpm	33 dpm	25.74 dpm	14.43 dpm	0 dpm	0 dpm
Net Beta Direct	610.17 dpm	4.53 dpm	0 dpm	0 dpm	0 dpm	94.45 dpm	18.84 dpm	18.55 dpm	95.53 dpm	0 dpm	15.41 dpm	58.55 dpm	15.24 dpm	0 dpm	34.89 dpm	19.29 dpm	50.93 dpm	0 dpm	0 dpm
Net Alpha Swipe	2.92 dpm	0 dpm	8.86 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	3.02 dpm	0 dpm	0 dpm	0 dpm	0 dpm	8.86 dpm	0 dpm	0 dpm	0 dpm	0 dpm	9.05 dpm
Net Beta Swipe	4.93 dpm	0 dpm	7.5 dpm	0 dpm	0 dpm	7.15 dpm	0 dpm	0 dpm	16.69 dpm	2.38 dpm	7.15 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.72 dpm	0 dpm	0 dpm	16.69 dpm
CAM activity	1.33 dac hr																		
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											

# Evaluation of Data from 700C Test Attachment 2

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## Table 6

### Final B-Side of Pans

(All cpm and dpm units in table below are per 100 cm<sup>2</sup>)

location	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Control Pan	PAS/Pan 1	PAS/Pan 2	PAS/Pan 3	PAS/Pan 4	PAS/Pan 5	PAS/Pan 6	PAS/Pan 7	PAS/Pan 8	PAS/Pan 9	PAS/Pan 10	PAS/Pan 11	PAS/Pan 12	Pan 1	Pan 2	Pan 3	Pan 4	Pan 5	Pan 6
Instrument Number	1765	1682	1336	1336	1336	1765	1336	1757	1765	1765	1765	1765	1757	1909	1909	1909	1336	1757	1765
Gross Alpha Direct	13 cpm	10 cpm	22 cpm	16 cpm	22 cpm	12 cpm	15 cpm	6 cpm	9 cpm	7 cpm	12 cpm	7 cpm	8 cpm	6 cpm	8 cpm	16 cpm	21 cpm	4 cpm	12 cpm
Gross Beta Direct	185 cpm	198 cpm	216 cpm	190 cpm	211 cpm	202 cpm	206 cpm	194 cpm	199 cpm	186 cpm	183 cpm	198 cpm	158 cpm	173 cpm	201 cpm	226 cpm	216 cpm	182 cpm	202 cpm
Gross Alpha Swipe	0 dpm	5.74 dpm	0 dpm	0 dpm	2.72 dpm	0 dpm	0 dpm	5.94 dpm	2.92 dpm	5.94 dpm	2.92 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm
Gross Beta Swipe	7.31 dpm	10.04 dpm	0.48 dpm	5.26 dpm	5.26 dpm	2.54 dpm	0 dpm	2.54 dpm	9.7 dpm	9.7 dpm	12.08 dpm	14.47 dpm	0.16 dpm	2.87 dpm	0 dpm	0 dpm	2.87 dpm	0.16 dpm	7.31 dpm
Results																			
Net Alpha Direct	59.66 dpm	0 dpm	45.4 dpm	16.75 dpm	45.4 dpm	0 dpm	11.97 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	12.57 dpm	40.62 dpm	0 dpm	0 dpm
Net Beta Direct	570.11 dpm	57.27 dpm	130.73 dpm	46.37 dpm	114.51 dpm	52.39 dpm	98.29 dpm	71.84 dpm	43.14 dpm	3.08 dpm	0 dpm	40.06 dpm	0 dpm	0 dpm	7.31 dpm	79.13 dpm	130.73 dpm	32.14 dpm	52.86 dpm
Net Alpha Swipe	0 dpm	5.74 dpm	0 dpm	0 dpm	2.72 dpm	0 dpm	0 dpm	5.94 dpm	2.92 dpm	5.94 dpm	2.92 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.92 dpm
Net Beta Swipe	7.31 dpm	2.73 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	2.39 dpm	2.39 dpm	4.77 dpm	7.16 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm	0 dpm
Instruments used section																			
Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date		Instrument #	Alpha Eff.	Beta Eff	cal due date						
1765	0.2179	0.3245	9/9/2021		1392	0.2056	0.3079	11/12/2021		1773	0.2021	0.3286	12/7/2021						
1376	0.2007	0.2818	8/26/2021		1336	0.2094	0.3082	12/7/2021		1909	0.2215	0.3481	4/28/2021						
1753	0.2155	0.3116	11/12/2021		1761	0.2032	0.2864	9/23/2021		1682	0.2299	0.3156	10/26/2021						
1757	0.2118	0.3022	2/10/2021		1772	0.2018	0.2638	4/20/2021											