



FINAL REPORT
 to

FIRSTENERGY CORPORATION
AKRON, OHIO

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
 for
DAVIS-BESSE NUCLEAR POWER STATION
OAK HARBOR, OHIO

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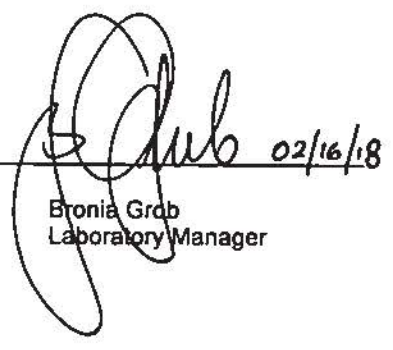
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1.0 INTRODUCTION

The following constitutes the final 2017 Monthly Progress Report for the Radiological Environmental Monitoring Program conducted at the Davis-Besse Nuclear Power Station in Oak Harbor, Ohio. Results of completed analyses are presented in the attached tables.

All activities, except gross alpha and gross beta, are decay corrected to the time of collection.

All samples were collected within the scheduled period unless noted otherwise in the Listing of Missed Samples.

2.0 LISTING OF MISSED SAMPLES

Sample Type	Location	Expected Collection Date	Reason
WW	T-226	03-29-17	Sample not received.
WW	T-226	05-17-17	Sample not received.
TLD	T-49	2nd Qtr 2017	TLD missing in field.
TLD	T-222	2nd Qtr 2017	TLD missing in field.
WW	T-226	07-19-17	Sample not received.
WW	T-226	10-17-17	Sample not received.
TLD	T-49	Annual	TLD missing in field.
TLD	T-222	Annual	TLD missing in field.

3.0 DATA TABULATIONS

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-1

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	282	0.020 ± 0.004	07-05-17	336	0.022 ± 0.003
01-17-17	284	0.033 ± 0.004	07-11-17	243	0.022 ± 0.004
01-24-17	283	0.016 ± 0.003	07-18-17	289	0.022 ± 0.003
01-31-17	283	0.026 ± 0.004	07-25-17	284	0.025 ± 0.004
			08-01-17	293	0.021 ± 0.003
02-07-17	283	0.027 ± 0.004			
02-14-17	284	0.026 ± 0.004	08-08-17	288	0.034 ± 0.004
02-21-17	283	0.026 ± 0.004 ^b	08-15-17	291	0.030 ± 0.004
02-28-17	283	0.025 ± 0.004	08-22-17	291	0.036 ± 0.004
			08-29-17	290	0.023 ± 0.003
03-07-17	284	0.020 ± 0.004			
03-14-17	282	0.020 ± 0.003	09-05-17	280	0.033 ± 0.004
03-21-17	283	0.027 ± 0.004	09-12-17	283	0.018 ± 0.003
03-28-17	283	0.022 ± 0.004	09-19-17	282	0.034 ± 0.004
			09-26-17	282	0.056 ± 0.005
			10-03-17	282	0.038 ± 0.004
1st Quarter Mean ± s.d.		0.024 ± 0.005	3rd Quarter Mean ± s.d.		0.030 ± 0.010
04-04-17	284	0.012 ± 0.003	10-03-17	282	0.038 ± 0.004
04-11-17	283	0.014 ± 0.003	10-10-17	282	0.033 ± 0.004
04-18-17	284	0.023 ± 0.004	10-17-17	284	0.028 ± 0.004
04-25-17	284	0.019 ± 0.003	10-24-17	284	0.041 ± 0.004
05-02-17	284	0.014 ± 0.003	10-31-17	280	0.016 ± 0.003
05-09-17	282	0.014 ± 0.003	11-07-17	282	0.028 ± 0.004
05-16-17	285	0.013 ± 0.003	11-14-17	282	0.030 ± 0.004
05-23-17	283	0.021 ± 0.003	11-21-17	282	0.035 ± 0.004
05-30-17	283	0.016 ± 0.003	11-28-17	282	0.031 ± 0.004
06-07-17	324	0.018 ± 0.003	12-05-17	282	0.036 ± 0.004
06-13-17	243	0.023 ± 0.004	12-12-17	282	0.040 ± 0.004
06-20-17	284	0.025 ± 0.004	12-19-17	282	0.032 ± 0.004
06-27-17	290	0.014 ± 0.003	12-26-17	282	0.035 ± 0.004
			01-02-18	282	0.042 ± 0.004
2nd Quarter Mean ± s.d.		0.017 ± 0.004	4th Quarter Mean ± s.d.		0.033 ± 0.007
Cumulative Average					0.026

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.^b Two air samples labeled T-11; none labeled T-1. Beta results are similar.

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-2

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	280	0.022 ± 0.004	07-05-17	321	0.022 ± 0.003
01-17-17	281	0.036 ± 0.004	07-11-17	246	0.019 ± 0.004
01-24-17	280	0.016 ± 0.003	07-18-17	281	0.020 ± 0.003
01-31-17	280	0.023 ± 0.004	07-25-17	281	0.030 ± 0.004
			08-01-17	278	0.020 ± 0.003
02-07-17	280	0.026 ± 0.004			
02-14-17	281	0.023 ± 0.004	08-08-17	287	0.030 ± 0.004
02-21-17	280	0.021 ± 0.004	08-15-17	284	0.032 ± 0.004
02-28-17	280	0.025 ± 0.004	08-22-17	284	0.037 ± 0.004
			08-29-17	287	0.024 ± 0.004
03-07-17	289	0.022 ± 0.004			
03-14-17	288	0.016 ± 0.003	09-05-17	277	0.025 ± 0.004
03-21-17	289	0.026 ± 0.004	09-12-17	284	0.015 ± 0.003
03-28-17	289	0.022 ± 0.003	09-19-17	284	0.032 ± 0.004
			09-26-17	283	0.047 ± 0.005
			10-03-17	286	0.034 ± 0.004
1st Quarter Mean ± s.d.		0.023 ± 0.005	3rd Quarter Mean ± s.d.		0.028 ± 0.009
04-04-17	290	0.018 ± 0.003	10-03-17	286	0.034 ± 0.004
04-11-17	289	0.015 ± 0.003	10-10-17	296	0.034 ± 0.004
04-18-17	289	0.020 ± 0.004	10-17-17	294	0.028 ± 0.004
04-25-17	289	0.016 ± 0.003	10-24-17	292	0.039 ± 0.004
05-02-17	289	0.020 ± 0.003	10-31-17	287	0.016 ± 0.003
05-09-17	288	0.019 ± 0.003	11-07-17	295	0.026 ± 0.004
05-16-17	291	0.018 ± 0.003	11-14-17	292	0.030 ± 0.004
05-23-17	288	0.029 ± 0.004	11-21-17	285	0.036 ± 0.004
05-30-17	289	0.019 ± 0.003	11-28-17	286	0.033 ± 0.004
06-07-17	331	0.022 ± 0.003	12-05-17	286	0.038 ± 0.004
06-13-17	247	0.029 ± 0.004	12-12-17	286	0.034 ± 0.004
06-20-17	290	0.028 ± 0.004	12-19-17	286	0.032 ± 0.004
06-27-17	289	0.023 ± 0.004	12-26-17	286	0.036 ± 0.004
			01-02-18	286	0.047 ± 0.004
2nd Quarter Mean ± s.d.		0.021 ± 0.005	4th Quarter Mean ± s.d.		0.033 ± 0.007
Cumulative Average					0.026

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 3. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131*.

Location: T-3

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	287	0.028 ± 0.004	07-05-17	323	0.022 ± 0.003
01-17-17	281	0.038 ± 0.004	07-11-17	251	0.020 ± 0.004
01-24-17	287	0.019 ± 0.003	07-18-17	287	0.026 ± 0.004
01-31-17	287	0.028 ± 0.004	07-25-17	287	0.027 ± 0.004
			08-01-17	280	0.019 ± 0.003
02-07-17	287	0.032 ± 0.004			
02-14-17	288	0.027 ± 0.004	08-08-17	289	0.028 ± 0.004
02-21-17	287	0.025 ± 0.004	08-15-17	290	0.035 ± 0.004
02-28-17	287	0.029 ± 0.004	08-22-17	289	0.035 ± 0.004
			08-29-17	292	0.026 ± 0.004
03-07-17	286	0.024 ± 0.004			
03-14-17	284	0.022 ± 0.004	09-05-17	286	0.031 ± 0.004
03-21-17	285	0.022 ± 0.004	09-12-17	289	0.012 ± 0.003
03-28-17	286	0.024 ± 0.004	09-19-17	289	0.035 ± 0.004
			09-26-17	289	0.059 ± 0.005
			10-03-17	289	0.036 ± 0.004
1st Quarter Mean ± s.d.		0.027 ± 0.005	3rd Quarter Mean ± s.d.		0.029 ± 0.011
04-04-17	286	0.015 ± 0.003	10-03-17	289	0.036 ± 0.004
04-11-17	285	0.017 ± 0.003	10-10-17	289	0.031 ± 0.004
04-18-17	286	0.021 ± 0.004	10-17-17	289	0.029 ± 0.004
04-25-17	286	0.018 ± 0.003	10-24-17	291	0.039 ± 0.004
05-02-17	286	0.015 ± 0.003	10-31-17	286	0.016 ± 0.003
05-09-17	285	0.016 ± 0.003	11-07-17	289	0.025 ± 0.004
05-16-17	288	0.015 ± 0.003	11-14-17	291	0.033 ± 0.004
05-23-17	285	0.020 ± 0.003	11-21-17	288	0.027 ± 0.004
05-30-17	285	0.018 ± 0.003	11-28-17	290	0.032 ± 0.004
06-07-17	327	0.022 ± 0.003	12-05-17	289	0.038 ± 0.004
06-13-17	244	0.025 ± 0.004	12-12-17	290	0.034 ± 0.004
06-20-17	286	0.024 ± 0.004	12-19-17	289	0.032 ± 0.004
06-27-17	285	0.015 ± 0.003	12-26-17	290	0.039 ± 0.004
			01-02-18	289	0.040 ± 0.004
2nd Quarter Mean ± s.d.		0.019 ± 0.004	4th Quarter Mean ± s.d.		0.032 ± 0.007
Cumulative Average					0.027

* Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 4. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-4

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	289	0.020 ± 0.004	07-05-17	325	0.023 ± 0.003
01-17-17	290	0.033 ± 0.004	07-11-17	252	0.024 ± 0.004
01-24-17	289	0.019 ± 0.003	07-18-17	286	0.024 ± 0.004
01-31-17	289	0.023 ± 0.004	07-25-17	295	0.025 ± 0.004
			08-01-17	284	0.020 ± 0.003
02-07-17	289	0.027 ± 0.004			
02-14-17	286	0.027 ± 0.004	08-08-17	291	0.027 ± 0.004
02-21-17	287	0.024 ± 0.004	08-15-17	288	0.033 ± 0.004
02-28-17	289	0.033 ± 0.004	08-22-17	287	0.037 ± 0.004
			08-29-17	273	0.022 ± 0.004
03-07-17	188	0.040 ± 0.006			
03-14-17	272	0.024 ± 0.004	09-05-17	276	0.031 ± 0.004
03-21-17	286	0.029 ± 0.004	09-12-17	279	0.014 ± 0.003
03-28-17	287	0.024 ± 0.004	09-19-17	279	0.037 ± 0.004
			09-26-17	279	0.056 ± 0.005
			10-03-17	279	0.035 ± 0.004
1st Quarter Mean ± s.d.		0.027 ± 0.006	3rd Quarter Mean ± s.d.		0.029 ± 0.010
04-04-17	288	0.015 ± 0.003	10-03-17	279	0.035 ± 0.004
04-11-17	287	0.017 ± 0.003	10-10-17	279	0.034 ± 0.004
04-18-17	287	0.020 ± 0.004	10-17-17	288	0.027 ± 0.004
04-25-17	287	0.020 ± 0.003	10-24-17	285	0.040 ± 0.004
05-02-17	287	0.014 ± 0.003	10-31-17	277	0.015 ± 0.003
05-09-17	286	0.016 ± 0.003	11-07-17	279	0.026 ± 0.004
05-16-17	289	0.015 ± 0.003	11-14-17	280	0.032 ± 0.004
05-23-17	286	0.022 ± 0.003	11-21-17	287	0.030 ± 0.004
05-30-17	286	0.017 ± 0.003	11-28-17	289	0.036 ± 0.004
06-07-17	329	0.021 ± 0.003	12-05-17	279	0.035 ± 0.004
06-13-17	245	0.027 ± 0.004	12-12-17	279	0.032 ± 0.004
06-20-17	288	0.023 ± 0.004	12-19-17	278	0.030 ± 0.004
06-27-17	287	0.015 ± 0.003	12-26-17	280	0.034 ± 0.004
			01-02-18	279	0.042 ± 0.004
2nd Quarter Mean ± s.d.		0.019 ± 0.004	4th Quarter Mean ± s.d.		0.032 ± 0.007
Cumulative Average					0.027

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 5. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-7
Units: pCi/m³
Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	286	0.020 ± 0.004	07-05-17	326	0.024 ± 0.003
01-17-17	287	0.029 ± 0.004	07-11-17	236	0.025 ± 0.004
01-24-17	285	0.018 ± 0.003	07-18-17	281	0.025 ± 0.004
01-31-17	286	0.022 ± 0.004	07-25-17	286	0.023 ± 0.004
			08-01-17	296	0.022 ± 0.003
02-07-17	287	0.022 ± 0.004			
02-14-17	286	0.023 ± 0.004	08-08-17	288	0.031 ± 0.004
02-21-17	283	0.022 ± 0.004	08-15-17	286	0.033 ± 0.004
02-28-17	284	0.025 ± 0.004	08-22-17	286	0.036 ± 0.004
			08-29-17	290	0.024 ± 0.004
03-07-17	284	0.021 ± 0.004			
03-14-17	274	0.023 ± 0.004	09-05-17	285	0.032 ± 0.004
03-21-17	278	0.027 ± 0.004	09-12-17	287	0.014 ± 0.003
03-28-17	284	0.025 ± 0.004	09-19-17	285	0.036 ± 0.004
			09-26-17	286	0.058 ± 0.005
			10-03-17	287	0.038 ± 0.004
1st Quarter Mean ± s.d.		0.023 ± 0.003	3rd Quarter Mean ± s.d.		0.030 ± 0.010
04-04-17	284	0.015 ± 0.003	10-03-17	287	0.038 ± 0.004
04-11-17	283	0.017 ± 0.003	10-10-17	291	0.038 ± 0.004
04-18-17	291	0.023 ± 0.004	10-17-17	284	0.030 ± 0.004
04-25-17	278	0.017 ± 0.003	10-24-17	285	0.045 ± 0.005
05-02-17	283	0.015 ± 0.003	10-31-17	285	0.019 ± 0.003
05-09-17	284	0.014 ± 0.003	11-07-17	286	0.028 ± 0.004
05-16-17	284	0.013 ± 0.003	11-14-17	285	0.036 ± 0.004
05-23-17	284	0.026 ± 0.004	11-21-17	286	0.030 ± 0.004
05-30-17	283	0.021 ± 0.003	11-28-17	286	0.033 ± 0.004
06-07-17	324	0.024 ± 0.003	12-05-17	286	0.039 ± 0.004
06-13-17	244	0.026 ± 0.004	12-12-17	364	0.024 ± 0.003
06-20-17	283	0.026 ± 0.004	12-19-17	286	0.029 ± 0.004
06-27-17	284	0.016 ± 0.003	12-26-17	289	0.034 ± 0.004
			01-02-18	289	0.040 ± 0.004
2nd Quarter Mean ± s.d.		0.019 ± 0.005	4th Quarter Mean ± s.d.		0.033 ± 0.007
Cumulative Average					0.027

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 6. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-8

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	291	0.025 ± 0.004	07-05-17	348	0.021 ± 0.003
01-17-17	291	0.032 ± 0.004	07-11-17	233	0.025 ± 0.004
01-24-17	289	0.016 ± 0.003	07-18-17	285	0.022 ± 0.003
01-31-17	291	0.019 ± 0.003	07-25-17	293	0.028 ± 0.004
			08-01-17	293	0.017 ± 0.003
02-07-17	291	0.025 ± 0.004			
02-14-17	296	0.026 ± 0.004	08-08-17	285	0.032 ± 0.004
02-21-17	284	0.025 ± 0.004	08-15-17	286	0.030 ± 0.004
02-28-17	304	0.024 ± 0.004	08-22-17	286	0.038 ± 0.004
			08-29-17	297	0.026 ± 0.004
03-07-17	304	0.022 ± 0.003			
03-14-17	293	0.021 ± 0.003	09-05-17	273	0.033 ± 0.004
03-21-17	297	0.026 ± 0.004	09-12-17	287	0.013 ± 0.003
03-28-17	303	0.020 ± 0.003	09-19-17	285	0.037 ± 0.004
			09-26-17	286	0.052 ± 0.005
			10-03-17	295	0.036 ± 0.004
1st Quarter Mean ± s.d.		0.023 ± 0.004	3rd Quarter Mean ± s.d.		0.029 ± 0.010
04-04-17	304	0.014 ± 0.003	10-03-17	295	0.036 ± 0.004
04-11-17	302	0.014 ± 0.003	10-10-17	290	0.029 ± 0.004
04-18-17	310	0.017 ± 0.003	10-17-17	288	0.025 ± 0.004
04-25-17	303	0.019 ± 0.003	10-24-17	284	0.044 ± 0.005
05-02-17	297	0.015 ± 0.003	10-31-17	293	0.016 ± 0.003
05-09-17	304	0.016 ± 0.003	11-07-17	292	0.026 ± 0.004
05-16-17	304	0.014 ± 0.003	11-14-17	283	0.032 ± 0.004
05-23-17	303	0.019 ± 0.003	11-21-17	284	0.030 ± 0.004
05-30-17	302	0.017 ± 0.003	11-28-17	284	0.036 ± 0.004
06-07-17	346	0.020 ± 0.003	12-05-17	289	0.035 ± 0.004
06-13-17	261	0.033 ± 0.004	12-12-17	279	0.038 ± 0.004
06-20-17	303	0.023 ± 0.003	12-19-17	285	0.032 ± 0.004
06-27-17	304	0.015 ± 0.003	12-26-17	284	0.038 ± 0.004
			01-02-18	284	0.045 ± 0.004
2nd Quarter Mean ± s.d.		0.018 ± 0.005	4th Quarter Mean ± s.d.		0.033 ± 0.008
Cumulative Average					0.026

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 7. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-9 (C)

Units: $\mu\text{Ci}/\text{m}^3$

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	287	0.008 ± 0.003 ^b	07-05-17	321	0.020 ± 0.003
01-17-17	287	0.034 ± 0.004	07-11-17	246	0.021 ± 0.004
01-24-17	285	0.019 ± 0.003	07-18-17	286	0.022 ± 0.003
01-31-17	277	0.025 ± 0.004	07-25-17	286	0.024 ± 0.004
			08-01-17	286	0.019 ± 0.003
02-07-17	297	0.025 ± 0.004			
02-14-17	277	0.027 ± 0.004	08-08-17	296	0.027 ± 0.004
02-21-17	289	0.024 ± 0.004	08-15-17	287	0.027 ± 0.004
02-28-17	275	0.022 ± 0.004	08-22-17	289	0.033 ± 0.004
			08-29-17	281	0.024 ± 0.004
03-07-17	287	0.023 ± 0.004			
03-14-17	295	0.017 ± 0.003	09-05-17	282	0.028 ± 0.004
03-21-17	287	0.025 ± 0.004	09-12-17	298	0.014 ± 0.003
03-28-17	287	0.022 ± 0.004	09-19-17	277	0.027 ± 0.004
			09-26-17	288	0.049 ± 0.005
			10-03-17	294	0.033 ± 0.004
1st Quarter Mean ± s.d.		0.023 ± 0.006	3rd Quarter Mean ± s.d.		0.026 ± 0.008
04-04-17	287	0.016 ± 0.003	10-03-17	294	0.033 ± 0.004
04-11-17	277	0.017 ± 0.003	10-10-17	291	0.031 ± 0.004
04-18-17	297	0.022 ± 0.004	10-17-17	284	0.031 ± 0.004
04-25-17	285	0.019 ± 0.003	10-24-17	281	0.044 ± 0.005
05-02-17	279	0.018 ± 0.003	10-31-17	287	0.014 ± 0.003
05-09-17	298	0.015 ± 0.003	11-07-17	297	0.029 ± 0.004
05-16-17	288	0.015 ± 0.003	11-14-17	277	0.034 ± 0.004
05-23-17	286	0.023 ± 0.004	11-21-17	286	0.034 ± 0.004
05-30-17	277	0.018 ± 0.003	11-28-17	286	0.034 ± 0.004
06-07-17	328	0.015 ± 0.003	12-05-17	293	0.037 ± 0.004
06-13-17	257	0.025 ± 0.004	12-12-17	279	0.037 ± 0.004
06-20-17	277	0.029 ± 0.004	12-19-17	296	0.035 ± 0.004
06-27-17	298	0.014 ± 0.003	12-26-17	287	0.036 ± 0.004
			01-02-18	284	0.041 ± 0.004
2nd Quarter Mean ± s.d.		0.019 ± 0.005	4th Quarter Mean ± s.d.		0.034 ± 0.007
Cumulative Average					0.026

^a Iodine-131 concentrations are < 0.07 $\mu\text{Ci}/\text{m}^3$ unless noted otherwise.^b Filter light.

Table 8. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-11 (C)

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	292	0.021 ± 0.004	07-05-17	324	0.023 ± 0.003
01-17-17	293	0.037 ± 0.004	07-11-17	237	0.022 ± 0.004
01-24-17	291	0.018 ± 0.003	07-18-17	277	0.025 ± 0.004
01-31-17	292	0.026 ± 0.004	07-25-17	278	0.028 ± 0.004
			08-01-17	283	0.021 ± 0.003
02-07-17	292	0.024 ± 0.004			
02-14-17	292	0.028 ± 0.004	08-08-17	285	0.034 ± 0.004
02-21-17	292	0.025 ± 0.004 ^b	08-15-17	287	0.033 ± 0.004
02-28-17	292	0.029 ± 0.004	08-22-17	287	0.038 ± 0.004
			08-29-17	287	0.026 ± 0.004
03-07-17	292	0.023 ± 0.004			
03-14-17	291	0.017 ± 0.003	09-05-17	287	0.028 ± 0.004
03-21-17	291	0.029 ± 0.004	09-12-17	287	0.017 ± 0.003
03-28-17	280	0.020 ± 0.003	09-19-17	287	0.039 ± 0.004
			09-26-17	287	0.055 ± 0.005
			10-03-17	287	0.034 ± 0.004
1st Quarter Mean ± s.d.		0.025 ± 0.006	3rd Quarter Mean ± s.d.		0.030 ± 0.010
04-04-17	281	0.014 ± 0.003	10-03-17	287	0.034 ± 0.004
04-11-17	280	0.016 ± 0.003	10-10-17	287	0.033 ± 0.004
04-18-17	281	0.024 ± 0.004	10-17-17	287	0.030 ± 0.004
04-25-17	280	0.016 ± 0.003	10-24-17	287	0.042 ± 0.004
05-02-17	280	0.012 ± 0.003	10-31-17	287	0.019 ± 0.003
05-09-17	280	0.010 ± 0.003	11-07-17	287	0.028 ± 0.004
05-16-17	281	0.016 ± 0.003	11-14-17	287	0.034 ± 0.004
05-23-17	280	0.022 ± 0.004	11-21-17	287	0.033 ± 0.004
05-30-17	280	0.016 ± 0.003	11-28-17	287	0.040 ± 0.004
06-07-17	320	0.019 ± 0.003	12-05-17	287	0.036 ± 0.004
06-13-17	240	0.029 ± 0.004	12-12-17	287	0.037 ± 0.004
06-20-17	280	0.023 ± 0.004	12-19-17	287	0.033 ± 0.004
06-27-17	280	0.018 ± 0.003	12-26-17	287	0.039 ± 0.004
			01-02-18	235	0.043 ± 0.005
2nd Quarter Mean ± s.d.		0.018 ± 0.005	4th Quarter Mean ± s.d.		0.034 ± 0.006
			Cumulative Average		0.027

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.^b Two air samples labeled T-11; none labeled T-1. Beta results are similar.

Table 9. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-12 (C)

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	281	0.017 ± 0.004	07-05-17	330	0.027 ± 0.003
01-17-17	283	0.036 ± 0.004	07-11-17	246	0.018 ± 0.004
01-24-17	281	0.021 ± 0.004	07-18-17	284	0.023 ± 0.004
01-31-17	281	0.023 ± 0.004	07-25-17	287	0.022 ± 0.003
			08-01-17	297	0.021 ± 0.003
02-07-17	281	0.027 ± 0.004			
02-14-17	283	0.027 ± 0.004	08-08-17	291	0.030 ± 0.004
02-21-17	281	0.022 ± 0.004	08-15-17	297	0.031 ± 0.004
02-28-17	282	0.027 ± 0.004	08-22-17	276	0.026 ± 0.004
			08-29-17	284	0.025 ± 0.004
03-07-17	281	0.022 ± 0.004			
03-14-17	280	0.025 ± 0.004	09-05-17	280	0.033 ± 0.004
03-21-17	281	0.022 ± 0.004	09-12-17	276	0.016 ± 0.003
03-28-17	285	0.021 ± 0.003	09-19-17	277	0.031 ± 0.004
			09-26-17	276	0.056 ± 0.005
			10-03-17	278	0.028 ± 0.004
<hr/> 1st Quarter Mean ± s.d.		0.024 ± 0.005	<hr/> 3rd Quarter Mean ± s.d.		0.028 ± 0.010
04-04-17	288	0.014 ± 0.003	10-03-17	278	0.026 ± 0.004
04-11-17	286	0.017 ± 0.003	10-10-17	285	0.029 ± 0.004
04-18-17	286	0.019 ± 0.004	10-17-17	285	0.028 ± 0.004
04-25-17	288	0.013 ± 0.003	10-24-17	287	0.042 ± 0.004
05-02-17	284	0.014 ± 0.003	10-31-17	276	0.017 ± 0.003
05-09-17	284	0.013 ± 0.003	11-07-17	286	0.025 ± 0.004
05-16-17	289	0.019 ± 0.003	11-14-17	276	0.034 ± 0.004
05-23-17	285	0.023 ± 0.004	11-21-17	276	0.034 ± 0.004
05-30-17	285	0.014 ± 0.003	11-28-17	277	0.037 ± 0.004
06-07-17	328	0.020 ± 0.003	12-05-17	279	0.032 ± 0.004
06-13-17	244	0.025 ± 0.004	12-12-17	284	0.030 ± 0.004
06-20-17	287	0.025 ± 0.004	12-19-17	285	0.029 ± 0.004
06-27-17	285	0.016 ± 0.003	12-26-17	287	0.032 ± 0.004
			01-02-18	286	0.033 ± 0.004
<hr/> 2nd Quarter Mean ± s.d.		0.018 ± 0.004	<hr/> 4th Quarter Mean ± s.d.		0.031 ± 0.006
<hr/> Cumulative Average					0.025

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 10. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: T-27 (C)

Units: $\mu\text{Ci}/\text{m}^3$

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>			<u>0.010</u>
01-10-17	286	0.022 ± 0.004	07-05-17	328	0.023 ± 0.003
01-17-17	287	0.036 ± 0.004	07-11-17	252	0.028 ± 0.004
01-24-17	286	0.017 ± 0.003	07-18-17	288	0.021 ± 0.003
01-31-17	285	0.025 ± 0.004	07-25-17	292	0.024 ± 0.004
			08-01-17	303	0.022 ± 0.003
02-07-17	285	0.032 ± 0.004			
02-14-17	287	0.028 ± 0.004	08-08-17	285	0.032 ± 0.004
02-21-17	285	0.025 ± 0.004	08-15-17	290	0.031 ± 0.004
02-28-17	286	0.029 ± 0.004	08-22-17	289	0.033 ± 0.004
			08-29-17	46	0.001 ± 0.012 ^b
03-07-17	285	0.024 ± 0.004			
03-14-17	271	0.021 ± 0.004	09-05-17	289	0.026 ± 0.004
03-21-17	285	0.027 ± 0.004	09-12-17	283	0.017 ± 0.003
03-28-17	285	0.026 ± 0.004	09-19-17	284	0.037 ± 0.004
			09-26-17	283	0.052 ± 0.005
			10-03-17	285	0.037 ± 0.004
1st Quarter Mean ± s.d.		0.026 ± 0.005	3rd Quarter Mean ± s.d.		0.027 ± 0.012
04-04-17	287	0.015 ± 0.003	10-03-17	285	0.037 ± 0.004
04-11-17	286	0.017 ± 0.003	10-10-17	282	0.030 ± 0.004
04-18-17	289	0.023 ± 0.004	10-17-17	278	0.028 ± 0.004
04-25-17	291	0.017 ± 0.003	10-24-17	294	0.036 ± 0.004
05-02-17	286	0.012 ± 0.003	10-31-17	282	0.015 ± 0.003
05-09-17	288	0.016 ± 0.003	11-07-17	283	0.031 ± 0.004
05-16-17	292	0.017 ± 0.003	11-14-17	284	0.035 ± 0.004
05-23-17	288	0.021 ± 0.003	11-21-17	283	0.031 ± 0.004
05-30-17	288	0.018 ± 0.003	11-28-17	284	0.033 ± 0.004
06-07-17	331	0.023 ± 0.003	12-05-17	286	0.038 ± 0.004
06-13-17	247	0.027 ± 0.004	12-12-17	282	0.034 ± 0.004
06-20-17	290	0.024 ± 0.004	12-19-17	282	0.034 ± 0.004
06-27-17	288	0.016 ± 0.003	12-26-17	284	0.042 ± 0.004
			01-02-18	284	0.045 ± 0.004
2nd Quarter Mean ± s.d.		0.019 ± 0.004	4th Quarter Mean ± s.d.		0.034 ± 0.007
Cumulative Average					0.027

^a Iodine-131 concentrations are < 0.07 $\mu\text{Ci}/\text{m}^3$ unless noted otherwise.^b Low volume due to blown fuse; I-131 result = 0.08 $\mu\text{Ci}/\text{m}^3$ due to low volume.

Table 11-1. Airborne particulate data, gross beta analyses, monthly averages, minima and maxima.

January				April			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.022	0.008	0.034	T-9	0.018	0.016	0.022
T-11	0.026	0.018	0.037	T-11	0.016	0.012	0.024
T-12	0.024	0.017	0.036	T-12	0.015	0.013	0.019
T-27	0.025	0.017	0.036	T-27	0.017	0.012	0.023
Controls	0.024	0.008	0.037	Controls	0.017	0.012	0.024
T-1	0.024	0.016	0.033	T-1	0.016	0.012	0.023
T-2	0.024	0.016	0.036	T-2	0.018	0.015	0.020
T-3	0.028	0.019	0.038	T-3	0.017	0.015	0.021
T-4	0.024	0.019	0.033	T-4	0.017	0.014	0.020
T-7	0.022	0.018	0.029	T-7	0.017	0.015	0.023
T-8	0.023	0.016	0.032	T-8	0.016	0.014	0.019
Indicators	0.024	0.016	0.038	Indicators	0.017	0.012	0.023

February				May			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.025	0.022	0.027	T-9	0.018	0.015	0.023
T-11	0.027	0.024	0.029	T-11	0.016	0.010	0.022
T-12	0.026	0.022	0.027	T-12	0.017	0.013	0.023
T-27	0.029	0.025	0.032	T-27	0.018	0.016	0.021
Controls	0.027	0.022	0.032	Controls	0.017	0.010	0.023
T-1	0.026	0.025	0.027	T-1	0.016	0.013	0.021
T-2	0.024	0.021	0.026	T-2	0.021	0.018	0.029
T-3	0.028	0.025	0.032	T-3	0.017	0.015	0.020
T-4	0.028	0.024	0.033	T-4	0.018	0.015	0.022
T-7	0.023	0.022	0.025	T-7	0.019	0.013	0.026
T-8	0.025	0.024	0.026	T-8	0.017	0.014	0.019
Indicators	0.026	0.021	0.033	Indicators	0.018	0.013	0.029

March				June			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.022	0.017	0.025	T-9	0.021	0.014	0.029
T-11	0.022	0.017	0.029	T-11	0.022	0.018	0.029
T-12	0.023	0.021	0.025	T-12	0.022	0.016	0.025
T-27	0.025	0.021	0.027	T-27	0.023	0.016	0.027
Controls	0.023	0.017	0.029	Controls	0.022	0.014	0.029
T-1	0.022	0.020	0.027	T-1	0.020	0.014	0.025
T-2	0.022	0.016	0.026	T-2	0.026	0.022	0.029
T-3	0.023	0.022	0.024	T-3	0.022	0.015	0.025
T-4	0.029	0.024	0.040	T-4	0.022	0.015	0.027
T-7	0.024	0.021	0.027	T-7	0.023	0.016	0.026
T-8	0.022	0.020	0.026	T-8	0.023	0.015	0.033
Indicators	0.024	0.016	0.040	Indicators	0.023	0.014	0.033

Note: Unless otherwise specified, samples collected on the first, second or third day of the month are grouped with data from the previous month.

Table 11-1. Airborne particulate data, gross beta analyses, monthly averages, minima and maxima.

July				October			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.021	0.019	0.024	T-9	0.031	0.014	0.044
T-11	0.024	0.021	0.028	T-11	0.032	0.019	0.042
T-12	0.022	0.018	0.027	T-12	0.028	0.017	0.042
T-27	0.024	0.021	0.028	T-27	0.029	0.015	0.037
Controls	0.023	0.018	0.028	Controls	0.030	0.014	0.044
T-1	0.022	0.021	0.025	T-1	0.031	0.016	0.041
T-2	0.022	0.019	0.030	T-2	0.030	0.016	0.039
T-3	0.023	0.019	0.027	T-3	0.030	0.016	0.039
T-4	0.023	0.020	0.025	T-4	0.030	0.015	0.040
T-7	0.024	0.022	0.025	T-7	0.034	0.019	0.045
T-8	0.023	0.017	0.028	T-8	0.030	0.016	0.044
Indicators	0.023	0.017	0.030	Indicators	0.031	0.015	0.045

August				November			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.028	0.024	0.033	T-9	0.033	0.029	0.034
T-11	0.033	0.026	0.038	T-11	0.034	0.028	0.040
T-12	0.028	0.025	0.031	T-12	0.033	0.025	0.037
T-27	0.024	0.001	0.033	T-27	0.033	0.031	0.036
Controls	0.028	0.001	0.038	Controls	0.033	0.025	0.040
T-1	0.031	0.023	0.036	T-1	0.031	0.028	0.035
T-2	0.031	0.024	0.037	T-2	0.031	0.026	0.036
T-3	0.031	0.026	0.035	T-3	0.029	0.025	0.033
T-4	0.030	0.022	0.037	T-4	0.031	0.026	0.036
T-7	0.031	0.024	0.036	T-7	0.032	0.028	0.036
T-8	0.032	0.026	0.038	T-8	0.031	0.026	0.036
Indicators	0.031	0.022	0.038	Indicators	0.031	0.025	0.036

September				December			
Location	Average	Minima	Maxima	Location	Average	Minima	Maxima
T-9	0.030	0.014	0.049	T-9	0.037	0.035	0.041
T-11	0.035	0.017	0.055	T-11	0.038	0.033	0.043
T-12	0.032	0.016	0.056	T-12	0.031	0.029	0.033
T-27	0.034	0.017	0.052	T-27	0.039	0.034	0.045
Controls	0.033	0.014	0.056	Controls	0.036	0.029	0.045
T-1	0.036	0.018	0.056	T-1	0.037	0.032	0.042
T-2	0.031	0.015	0.047	T-2	0.037	0.032	0.047
T-3	0.035	0.012	0.059	T-3	0.037	0.032	0.040
T-4	0.035	0.014	0.056	T-4	0.035	0.030	0.042
T-7	0.036	0.014	0.058	T-7	0.033	0.024	0.040
T-8	0.034	0.013	0.052	T-8	0.038	0.032	0.045
Indicators	0.035	0.012	0.059	Indicators	0.036	0.024	0.047

Note: Unless otherwise specified, samples collected on the first, second or third day of the month are grouped with data from the previous month.

Table 12. Airborne particulates, analyses for strontium-89, strontium-90 and gamma-emitting isotopes.
Collection: Quarterly Composite
Units: $\mu\text{Ci}/\text{m}^3$

Location		T-1			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1586	TAP- 3612	TAP- 5535	TAP- 6770	
Volume (m^3)	3397	3693	4014	3950	
Sr-89	< 0.0013	< 0.0011	< 0.0006	< 0.0007	
Sr-90	< 0.0009	< 0.0009	< 0.0003	< 0.0005	
Be-7	0.094 ± 0.018	0.082 ± 0.014	0.084 ± 0.016	0.065 ± 0.012	
K-40	< 0.027	< 0.023	< 0.018	< 0.020	
Nb-95	< 0.0016	< 0.0008	< 0.0012	< 0.0009	
Zr-95	< 0.0024	< 0.0013	< 0.0017	< 0.0009	
Ru-103	< 0.0012	< 0.0006	< 0.0011	< 0.0010	
Ru-106	< 0.0098	< 0.0051	< 0.0083	< 0.0039	
Cs-134	< 0.0010	< 0.0010	< 0.0009	< 0.0007	
Cs-137	< 0.0011	< 0.0007	< 0.0008	< 0.0008	
Ce-141	< 0.0023	< 0.0013	< 0.0020	< 0.0011	
Ce-144	< 0.0060	< 0.0035	< 0.0038	< 0.0030	

Location		T-2			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1587	TAP- 3613	TAP- 5536	TAP- 6771	
Volume (m^3)	3397	3759	3963	4043	
Sr-89	< 0.0013	< 0.0014	< 0.0007	< 0.0005	
Sr-90	< 0.0009	< 0.0011	< 0.0003	< 0.0004	
Be-7	0.083 ± 0.015	0.093 ± 0.014	0.096 ± 0.016	0.073 ± 0.012	
K-40	< 0.025	< 0.023	< 0.023	< 0.016	
Nb-95	< 0.0012	< 0.0008	< 0.0013	< 0.0011	
Zr-95	< 0.0016	< 0.0014	< 0.0014	< 0.0010	
Ru-103	< 0.0009	< 0.0009	< 0.0008	< 0.0005	
Ru-106	< 0.0076	< 0.0071	< 0.0062	< 0.0057	
Cs-134	< 0.0009	< 0.0011	< 0.0010	< 0.0007	
Cs-137	< 0.0006	< 0.0005	< 0.0006	< 0.0007	
Ce-141	< 0.0017	< 0.0013	< 0.0020	< 0.0010	
Ce-144	< 0.0043	< 0.0030	< 0.0034	< 0.0024	

Table 12. Airborne particulates, analyses for strontium-89, strontium-90 and gamma-emitting isotopes.
 Collection: Quarterly Composite
 Units: pCi/m³

Location				
T-3				
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Lab Code	TAP- 1588	TAP- 3614	TAP- 5537	TAP- 6772
Volume (m ³)	3432	3714	4030	4049
Sr-89	< 0.0015	< 0.0011	< 0.0005	< 0.0005
Sr-90	< 0.0008	< 0.0009	< 0.0003	< 0.0004
Be-7	0.096 ± 0.020	0.093 ± 0.016	0.083 ± 0.014	0.073 ± 0.019
K-40	< 0.021	< 0.023	< 0.023	< 0.024
Nb-95	< 0.0013	< 0.0011	< 0.0008	< 0.0027
Zr-95	< 0.0013	< 0.0017	< 0.0012	< 0.0023
Ru-103	< 0.0014	< 0.0010	< 0.0006	< 0.0014
Ru-106	< 0.0074	< 0.0069	< 0.0063	< 0.0105
Cs-134	< 0.0010	< 0.0011	< 0.0010	< 0.0013
Cs-137	< 0.0008	< 0.0006	< 0.0009	< 0.0013
Ce-141	< 0.0020	< 0.0013	< 0.0011	< 0.0021
Ce-144	< 0.0039	< 0.0038	< 0.0029	< 0.0056

Location				
T-4				
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Lab Code	TAP- 1589	TAP- 3615	TAP- 5538	TAP- 6773
Volume (m ³)	3341	3732	3973	3938
Sr-89	< 0.0010	< 0.0011	< 0.0005	< 0.0004
Sr-90	< 0.0007	< 0.0008	< 0.0003	< 0.0003
Be-7	0.081 ± 0.016	0.094 ± 0.016	0.096 ± 0.018	0.070 ± 0.016
K-40	< 0.024	< 0.024	< 0.018	< 0.023
Nb-95	< 0.0010	< 0.0014	< 0.0009	< 0.0009
Zr-95	< 0.0009	< 0.0019	< 0.0022	< 0.0010
Ru-103	< 0.0013	< 0.0009	< 0.0008	< 0.0013
Ru-106	< 0.0072	< 0.0072	< 0.0047	< 0.0090
Cs-134	< 0.0010	< 0.0010	< 0.0008	< 0.0012
Cs-137	< 0.0006	< 0.0007	< 0.0009	< 0.0009
Ce-141	< 0.0024	< 0.0013	< 0.0011	< 0.0014
Ce-144	< 0.0060	< 0.0037	< 0.0030	< 0.0049

Table 12. Airborne particulates, analyses for strontium-89, strontium-90 and gamma-emitting isotopes.
 Collection: Quarterly Composite
 Units: pCi/m³

Location		T-7			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1590	TAP- 3616	TAP- 5539	TAP- 6774	
Volume (m ³)	3404	3689	4005	4089	
Sr-89	< 0.0010	< 0.0009	< 0.0005	< 0.0005	
Sr-90	< 0.0008	< 0.0008	< 0.0003	< 0.0004	
Be-7	0.079 ± 0.016	0.10 ± 0.016	0.090 ± 0.014	0.062 ± 0.025	
K-40	< 0.023	< 0.023	< 0.022	< 0.037	
Nb-95	< 0.0010	< 0.0009	< 0.0014	< 0.0031	
Zr-95	< 0.0023	< 0.0017	< 0.0019	< 0.0025	
Ru-103	< 0.0009	< 0.0009	< 0.0014	< 0.0024	
Ru-106	< 0.0076	< 0.0065	< 0.0073	< 0.0166	
Cs-134	< 0.0009	< 0.0008	< 0.0008	< 0.0016	
Cs-137	< 0.0008	< 0.0007	< 0.0008	< 0.0021	
Ce-141	< 0.0021	< 0.0013	< 0.0015	< 0.0045	
Ce-144	< 0.0050	< 0.0034	< 0.0064	< 0.0096	

Location		T-8			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1591	TAP- 3617	TAP- 5540	TAP- 6775	
Volume (m ³)	3534	3943	4032	4014	
Sr-89	< 0.0012	< 0.0011	< 0.0005	< 0.0004	
Sr-90	< 0.0009	< 0.0009	< 0.0003	< 0.0003	
Be-7	0.085 ± 0.015	0.079 ± 0.015	0.092 ± 0.016	0.060 ± 0.011	
K-40	< 0.020	< 0.023	< 0.020	< 0.016	
Nb-95	< 0.0014	< 0.0011	< 0.0012	< 0.0008	
Zr-95	< 0.0012	< 0.0015	< 0.0022	< 0.0012	
Ru-103	< 0.0013	< 0.0008	< 0.0013	< 0.0008	
Ru-106	< 0.0063	< 0.0048	< 0.0054	< 0.0073	
Cs-134	< 0.0008	< 0.0010	< 0.0011	< 0.0007	
Cs-137	< 0.0009	< 0.0006	< 0.0006	< 0.0005	
Ce-141	< 0.0012	< 0.0013	< 0.0016	< 0.0007	
Ce-144	< 0.0048	< 0.0030	< 0.0036	< 0.0032	

Table 12. Airborne particulates, analyses for strontium-89, strontium-90 and gamma-emitting isotopes.
 Collection: Quarterly Composite
 Units: pCi/m³

Location		T-9 (C)			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1592	TAP- 3618	TAP- 5541	TAP- 6776	
Volume (m ³)	3430	3734	4017	4022	
Sr-89	< 0.0014	< 0.0011	< 0.0006	< 0.0005	
Sr-90	< 0.0010	< 0.0008	< 0.0004	< 0.0003	
Be-7	0.073 ± 0.013	0.098 ± 0.017	0.085 ± 0.017	0.074 ± 0.014	
K-40	< 0.017	< 0.024	< 0.020	< 0.022	
Nb-95	< 0.0007	< 0.0009	< 0.0008	< 0.0009	
Zr-95	< 0.0018	< 0.0012	< 0.0009	< 0.0010	
Ru-103	< 0.0006	< 0.0010	< 0.0011	< 0.0013	
Ru-106	< 0.0049	< 0.0064	< 0.0071	< 0.0073	
Cs-134	< 0.0006	< 0.0011	< 0.0008	< 0.0010	
Cs-137	< 0.0006	< 0.0005	< 0.0009	< 0.0012	
Ce-141	< 0.0015	< 0.0014	< 0.0019	< 0.0023	
Ce-144	< 0.0041	< 0.0039	< 0.0033	< 0.0054	

Location		T-11 (C)			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1593	TAP- 3619	TAP- 5542	TAP- 6777	
Volume (m ³)	3490	3643	3980	3966	
Sr-89	< 0.0011	< 0.0012	< 0.0005	< 0.0004	
Sr-90	< 0.0008	< 0.0010	< 0.0003	< 0.0004	
Be-7	0.078 ± 0.011	0.076 ± 0.016	0.090 ± 0.015	0.084 ± 0.014	
K-40	< 0.021	< 0.024	< 0.018	< 0.026	
Nb-95	< 0.0009	< 0.0007	< 0.0009	< 0.0007	
Zr-95	< 0.0011	< 0.0016	< 0.0016	< 0.0009	
Ru-103	< 0.0012	< 0.0006	< 0.0006	< 0.0011	
Ru-106	< 0.0068	< 0.0040	< 0.0079	< 0.0032	
Cs-134	< 0.0008	< 0.0009	< 0.0010	< 0.0010	
Cs-137	< 0.0010	< 0.0008	< 0.0008	< 0.0004	
Ce-141	< 0.0013	< 0.0013	< 0.0017	< 0.0009	
Ce-144	< 0.0041	< 0.0037	< 0.0058	< 0.0052	

Table 12. Airborne particulates, analyses for strontium-89, strontium-90 and gamma-emitting isotopes.
 Collection: Quarterly Composite
 Units: pCi/m³

Location		T-12 (C)			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1594	TAP- 3620	TAP- 5543	TAP- 6778	
Volume (m ³)	3380	3719	3979	3947	
Sr-89	< 0.0011	< 0.0011	< 0.0005	< 0.0004	
Sr-90	< 0.0008	< 0.0009	< 0.0002	< 0.0003	
Be-7	0.085 ± 0.013	0.090 ± 0.016	0.074 ± 0.010	0.068 ± 0.014	
K-40	< 0.017	< 0.023	< 0.016	< 0.019	
Nb-95	< 0.0008	< 0.0011	< 0.0007	< 0.0007	
Zr-95	< 0.0017	< 0.0018	< 0.0009	< 0.0007	
Ru-103	< 0.0008	< 0.0007	< 0.0004	< 0.0010	
Ru-106	< 0.0075	< 0.0086	< 0.0054	< 0.0045	
Cs-134	< 0.0008	< 0.0009	< 0.0006	< 0.0007	
Cs-137	< 0.0006	< 0.0006	< 0.0007	< 0.0005	
Ce-141	< 0.0018	< 0.0014	< 0.0013	< 0.0014	
Ce-144	< 0.0042	< 0.0038	< 0.0035	< 0.0039	

Location		T-27 (C)			
Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	
Lab Code	TAP- 1595	TAP- 3621	TAP- 5544	TAP- 6779	
Volume (m ³)	3413	3751	3797	3973	
Sr-89	< 0.0009	< 0.0010	< 0.0005	< 0.0004	
Sr-90	< 0.0007	< 0.0008	< 0.0003	< 0.0004	
Be-7	0.082 ± 0.013	0.10 ± 0.016	0.084 ± 0.014	0.069 ± 0.012	
K-40	< 0.021	< 0.024	< 0.019	< 0.014	
Nb-95	< 0.0014	< 0.0013	< 0.0012	< 0.0009	
Zr-95	< 0.0019	< 0.0010	< 0.0015	< 0.0011	
Ru-103	< 0.0012	< 0.0008	< 0.0009	< 0.0010	
Ru-106	< 0.0043	< 0.0064	< 0.0060	< 0.0063	
Cs-134	< 0.0008	< 0.0009	< 0.0009	< 0.0006	
Cs-137	< 0.0007	< 0.0007	< 0.0007	< 0.0006	
Ce-141	< 0.0020	< 0.0011	< 0.0016	< 0.0012	
Ce-144	< 0.0042	< 0.0036	< 0.0030	< 0.0027	

Table 13. Area monitors (TLD), Quarterly.
Units: mR/91 days

<u>Indicator</u>	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>
T-1	12.8 ± 1.3	9.6 ± 1.2	12.0 ± 1.0	11.4 ± 1.2
T-2	12.4 ± 0.5	11.3 ± 1.1	12.1 ± 0.5	12.6 ± 0.9
T-3	11.0 ± 0.8	9.5 ± 1.3	11.5 ± 1.0	11.0 ± 1.1
T-4	12.9 ± 0.8	12.1 ± 1.0	13.0 ± 0.9	13.6 ± 1.1
T-5	13.3 ± 0.9	11.7 ± 1.3	13.5 ± 0.7	13.0 ± 0.8
T-6	9.7 ± 0.8	9.4 ± 1.0	10.6 ± 0.7	10.7 ± 0.8
T-7	15.9 ± 0.8	14.5 ± 1.0	15.7 ± 0.7	15.7 ± 0.9
T-8	19.7 ± 0.6	20.7 ± 1.9	22.8 ± 0.8	22.4 ± 1.8
T-10	13.4 ± 0.8	15.0 ± 1.3	14.0 ± 0.7	15.6 ± 0.8
T-38	10.7 ± 0.6	10.9 ± 1.3	12.0 ± 0.5	11.7 ± 1.5
T-39	10.3 ± 1.2	9.0 ± 1.0	11.8 ± 1.2	9.5 ± 0.8
T-40	14.1 ± 0.7	12.6 ± 1.6	14.7 ± 0.6	12.7 ± 1.0
T-41	10.7 ± 0.7	8.4 ± 1.0	11.6 ± 0.7	8.9 ± 1.0
T-42	9.4 ± 0.6	9.6 ± 1.2	10.7 ± 0.5	9.5 ± 0.9
T-43	13.6 ± 1.0	14.1 ± 1.1	15.4 ± 1.5	14.3 ± 1.3
T-44	16.9 ± 0.8	19.5 ± 2.2	18.5 ± 0.9	18.5 ± 1.5
T-45	15.9 ± 0.5	16.6 ± 1.6	17.3 ± 0.5	16.1 ± 1.6
T-46	10.3 ± 0.7	11.1 ± 1.2	11.5 ± 0.6	11.0 ± 1.0
T-47	8.9 ± 0.6	11.4 ± 1.5	10.0 ± 0.6	8.7 ± 1.1
T-48	10.2 ± 0.4	10.3 ± 1.2	11.6 ± 0.4	10.0 ± 1.0
T-49	9.6 ± 0.5	ND ^a	10.2 ± 0.5	9.4 ± 1.0
T-50	14.7 ± 0.7	17.2 ± 1.6	14.9 ± 0.5	15.0 ± 1.0
T-51	14.9 ± 1.0	14.0 ± 1.6	16.7 ± 1.6	13.9 ± 1.3
T-52	17.8 ± 1.3	19.3 ± 1.3	18.2 ± 1.7	17.9 ± 1.0
T-53	16.3 ± 0.5	20.1 ± 1.2	19.4 ± 0.6	19.4 ± 1.0
T-54	16.3 ± 0.7	16.7 ± 1.8	18.3 ± 0.8	16.0 ± 1.4
T-55	12.9 ± 1.2	13.9 ± 1.8	15.0 ± 1.4	14.1 ± 1.0
T-60	13.1 ± 1.1	11.6 ± 1.6	12.7 ± 1.5	13.0 ± 1.5
T-62	11.8 ± 0.5	9.0 ± 0.8	11.3 ± 0.7	10.1 ± 1.0
T-65	12.5 ± 0.7	11.2 ± 0.9	11.2 ± 1.3	12.0 ± 1.4
T-66	18.6 ± 0.9	17.6 ± 1.2	18.8 ± 0.7	18.1 ± 1.3
T-67	19.0 ± 1.0	17.9 ± 1.0	19.1 ± 0.9	18.6 ± 1.1
T-68	15.9 ± 1.4	14.4 ± 0.8	15.9 ± 1.2	14.6 ± 0.9
T-69	16.8 ± 0.8	16.2 ± 0.8	16.1 ± 0.7	16.9 ± 1.0
T-71	16.3 ± 0.4	16.6 ± 1.0	15.4 ± 0.5	18.4 ± 1.0
T-73	13.6 ± 0.8	12.4 ± 1.3	12.8 ± 0.9	13.2 ± 1.3
T-74	14.8 ± 0.8	13.5 ± 1.5	14.3 ± 0.9	14.3 ± 1.6
T-75	13.6 ± 0.7	12.0 ± 1.0	12.6 ± 0.7	13.0 ± 1.0
T-76	11.7 ± 0.7	11.2 ± 1.2	10.8 ± 0.7	11.8 ± 1.1
T-91	17.2 ± 0.7	16.8 ± 1.5	18.8 ± 1.1	16.6 ± 1.5
T-92	12.2 ± 0.4	11.5 ± 0.8	12.7 ± 0.5	11.8 ± 0.9

^aND = No Data, TLD lost in the field.

Table 13. Area monitors (TLD), Quarterly.
Units: mR/91 days

<u>Indicator</u>	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>
T-93	15.1 ± 0.9	13.3 ± 1.1	15.1 ± 0.8	12.7 ± 1.1
T-94	15.9 ± 1.1	16.1 ± 1.6	17.2 ± 0.8	17.5 ± 1.7
T-112	13.3 ± 0.6	15.0 ± 1.2	14.0 ± 0.6	14.9 ± 1.2
T-121	18.0 ± 1.2	19.6 ± 1.4	18.7 ± 1.2	19.1 ± 1.2
T-122	14.3 ± 1.1	14.4 ± 1.5	14.9 ± 1.0	14.0 ± 1.0
T-123	17.5 ± 0.5	17.2 ± 0.9	18.1 ± 0.9	16.8 ± 1.0
T-125	16.6 ± 0.7	16.9 ± 0.9	18.9 ± 1.2	15.1 ± 1.0
T-126	13.8 ± 0.5	13.7 ± 1.4	14.7 ± 1.1	13.5 ± 1.4
T-127	17.4 ± 0.6	17.5 ± 1.6	18.4 ± 0.9	18.1 ± 1.4
T-128	17.9 ± 1.1	17.4 ± 1.1	18.6 ± 1.3	17.4 ± 1.1
T-142	10.4 ± 0.5	10.5 ± 1.0	11.0 ± 0.7	11.2 ± 1.2
T-150	13.7 ± 0.8	13.3 ± 1.2	14.5 ± 1.1	13.4 ± 1.4
T-151	18.9 ± 1.6	18.1 ± 1.6	20.6 ± 1.7	18.8 ± 1.3
T-153	18.1 ± 0.7	20.6 ± 0.9	22.2 ± 0.9	17.5 ± 1.1
T-154	20.6 ± 0.4	18.2 ± 1.2	22.1 ± 0.8	19.2 ± 1.4
T-201	13.0 ± 0.6	13.1 ± 0.5	13.5 ± 0.8	13.0 ± 0.4
T-202	14.4 ± 1.0	12.3 ± 0.8	13.7 ± 1.0	12.3 ± 0.7
T-203	14.9 ± 0.6	14.3 ± 1.0	16.0 ± 1.5	14.8 ± 1.4
T-204	13.3 ± 0.7	14.1 ± 1.6	14.1 ± 1.0	13.7 ± 0.9
T-205	12.0 ± 1.2	9.6 ± 0.7	12.0 ± 0.8	10.1 ± 0.8
T-206	9.8 ± 0.6	10.5 ± 0.6	10.6 ± 0.9	10.6 ± 0.7
T-207	9.3 ± 0.9	10.1 ± 0.7	10.2 ± 0.9	10.0 ± 0.6
T-208	10.8 ± 1.0	9.6 ± 0.6	11.5 ± 1.2	10.1 ± 0.5
T-211	10.1 ± 0.6	8.5 ± 0.9	10.3 ± 0.8	8.5 ± 0.9
T-212	8.6 ± 0.5	8.9 ± 0.9	9.1 ± 0.7	9.1 ± 0.9
T-213	15.1 ± 0.9	16.0 ± 1.2	15.2 ± 0.5	16.1 ± 0.9
T-214	16.3 ± 0.6	15.2 ± 0.9	17.0 ± 0.5	15.1 ± 0.9
T-215	16.1 ± 0.6	18.2 ± 1.5	17.1 ± 0.7	18.5 ± 1.2
T-216	15.4 ± 0.9	13.3 ± 1.0	16.5 ± 1.1	12.7 ± 1.1
T-217	19.8 ± 0.9	19.2 ± 1.7	21.4 ± 1.1	16.5 ± 1.5
T-218	19.2 ± 0.6	20.5 ± 1.6	20.6 ± 0.7	19.2 ± 1.3
T-219	14.7 ± 0.9	13.5 ± 1.2	15.3 ± 1.0	12.8 ± 1.2
T-220	17.2 ± 0.8	18.6 ± 1.2	18.2 ± 0.9	17.9 ± 1.1
T-222	14.2 ± 1.1	ND ^a	14.0 ± 1.0	13.1 ± 1.1
T-223	14.2 ± 0.8	13.7 ± 1.3	14.4 ± 0.8	14.3 ± 1.1
T-224	11.7 ± 0.6	12.1 ± 0.9	11.6 ± 0.7	11.5 ± 0.8
Mean ± s.d.	14.2 ± 3.0	14.0 ± 3.5	14.9 ± 3.4	14.1 ± 3.2

ND = No Data; TLD lost in the field.

Table 13. Area monitors (TLD), Quarterly.
Units: mR/91 days

	<u>1st Qtr.</u>	<u>2nd Qtr.</u>	<u>3rd Qtr.</u>	<u>4th Qtr.</u>
<u>Control</u>				
T-9	13.2 ± 0.8	13.9 ± 1.2	14.2 ± 0.8	13.1 ± 0.9
T-11	12.3 ± 0.8	13.3 ± 1.1	13.4 ± 0.8	12.5 ± 1.0
T-12	15.9 ± 0.7	16.0 ± 1.2	16.7 ± 0.6	16.0 ± 1.6
T-24	16.7 ± 1.2	15.8 ± 1.0	18.4 ± 1.0	16.8 ± 0.8
T-27	17.7 ± 1.2	18.5 ± 1.4	18.4 ± 1.3	18.0 ± 1.4
Mean ± s.d.	15.2 ± 2.3	15.5 ± 2.0	16.2 ± 2.3	15.3 ± 2.4
T-95	15.7 ± 0.9	16.0 ± 1.0	16.9 ± 1.2	13.6 ± 1.0
T-100	15.0 ± 1.2	15.1 ± 1.2	15.9 ± 1.2	14.8 ± 1.1
T-111	15.9 ± 1.5	16.6 ± 1.1	15.9 ± 1.2	16.8 ± 1.2
T-124	19.1 ± 1.0	18.7 ± 0.9	20.1 ± 1.4	18.3 ± 1.2
T-155	16.4 ± 0.6	14.6 ± 1.7	17.1 ± 0.9	15.5 ± 1.7
T-221	14.7 ± 0.6	17.0 ± 1.3	17.1 ± 0.8	17.0 ± 1.1
Mean ± s.d.	16.1 ± 1.6	16.3 ± 1.5	17.2 ± 1.5	16.0 ± 1.7
<u>QC</u>				
T-80	11.3 ± 1.1	9.9 ± 0.9	11.5 ± 1.1	10.7 ± 1.0
T-81	18.1 ± 0.7	17.0 ± 0.9	17.8 ± 0.9	17.8 ± 1.0
T-82	11.4 ± 0.7	10.2 ± 1.2	11.8 ± 0.6	11.0 ± 1.3
T-83	11.1 ± 0.7	9.7 ± 1.5	11.2 ± 0.8	10.4 ± 1.5
T-84	11.5 ± 0.8	10.3 ± 0.8	12.4 ± 0.8	10.8 ± 0.9
T-85	12.7 ± 1.0	12.5 ± 1.2	12.7 ± 0.9	12.7 ± 1.2
T-86	17.5 ± 0.7	16.2 ± 0.9	18.3 ± 0.9	16.0 ± 1.0
T-88	15.6 ± 1.1	14.2 ± 0.9	16.1 ± 1.0	14.0 ± 0.9
T-89	15.2 ± 1.0	14.5 ± 1.0	14.6 ± 0.6	14.3 ± 1.0
T-113	13.5 ± 0.6	14.2 ± 1.0	14.4 ± 0.6	14.0 ± 1.2
T-114	19.1 ± 0.7	17.6 ± 1.1	20.9 ± 0.8	17.9 ± 1.0
T-115	19.3 ± 0.7	17.8 ± 1.2	20.1 ± 0.8	17.9 ± 1.3
T-116	17.5 ± 0.8	17.3 ± 1.0	19.5 ± 0.9	17.9 ± 1.4
T-117	13.0 ± 0.7	14.8 ± 1.8	13.7 ± 0.7	16.3 ± 1.1
T-118	15.3 ± 0.6	14.8 ± 0.7	16.6 ± 0.9	14.4 ± 0.9
T-119	13.4 ± 0.6	14.2 ± 1.2	13.5 ± 0.7	13.4 ± 1.1
T-120	11.9 ± 0.7	10.8 ± 1.1	13.5 ± 0.6	9.4 ± 1.1
T-200	11.6 ± 0.7	12.4 ± 0.7	12.9 ± 0.8	12.2 ± 0.8
Mean ± s.d.	14.4 ± 2.9	13.8 ± 2.8	15.1 ± 3.1	14.0 ± 2.9
<u>Shield</u>				
T-87	5.9 ± 0.6	6.1 ± 1.1	6.8 ± 0.9	5.8 ± 1.1

Table 14. Area monitors (TLD), Annual.
Units: mR/365 days

<u>Indicator</u>	<u>2017</u>
T-1	44.0 ± 1.8
T-2	48.5 ± 1.3
T-3	44.7 ± 2.3
T-4	47.6 ± 2.2
T-5	57.1 ± 2.0
T-6	43.0 ± 1.3
T-7	62.7 ± 4.7
T-8	79.2 ± 1.5
T-10	58.4 ± 3.2
T-38	46.0 ± 1.6
T-39	44.7 ± 1.5
T-40	55.6 ± 3.3
T-41	45.5 ± 1.0
T-42	44.4 ± 2.8
T-43	55.6 ± 2.6
T-44	75.5 ± 3.5
T-45	68.8 ± 2.6
T-46	49.3 ± 1.9
T-47	40.9 ± 1.0
T-48	48.0 ± 2.3
T-49	ND ^a
T-50	67.2 ± 3.4
T-51	67.8 ± 1.8
T-52	77.3 ± 3.2
T-53	69.3 ± 1.5
T-54	76.5 ± 2.6
T-55	55.3 ± 4.9
T-60	42.1 ± 2.8
T-62	41.2 ± 3.5
T-65	45.1 ± 3.3
T-66	61.9 ± 2.7
T-67	67.3 ± 2.4
T-68	52.6 ± 2.5
T-69	60.7 ± 2.7
T-71	59.1 ± 1.9
T-73	45.2 ± 2.0
T-74	56.6 ± 2.6
T-75	47.7 ± 3.5
T-76	44.0 ± 2.3
T-91	69.2 ± 2.0
T-92	51.1 ± 2.7

^aND = No Data, TLD lost in the field.

Table 14. Area monitors (TLD), Annual.
Units: mR/365 days

Indicator	2017
T-93	56.8 ± 2.9
T-94	66.8 ± 3.0
T-112	53.2 ± 3.0
T-121	74.2 ± 5.2
T-122	58.7 ± 3.0
T-123	68.2 ± 3.3
T-125	62.9 ± 2.3
T-126	56.2 ± 2.7
T-127	74.6 ± 3.9
T-128	70.7 ± 6.2
T-142	43.6 ± 2.0
T-150	50.4 ± 2.6
T-151	77.0 ± 2.7
T-153	77.6 ± 4.7
T-154	74.8 ± 2.3
T-201	50.9 ± 2.4
T-202	61.3 ± 2.2
T-203	66.4 ± 3.4
T-204	51.1 ± 2.7
T-205	46.7 ± 2.3
T-206	42.2 ± 2.1
T-207	40.0 ± 2.4
T-208	41.6 ± 2.2
T-211	38.2 ± 2.8
T-212	37.4 ± 2.6
T-213	62.5 ± 3.5
T-214	73.1 ± 2.1
T-215	71.0 ± 1.6
T-216	61.6 ± 3.1
T-217	72.2 ± 2.3
T-218	76.9 ± 2.1
T-219	58.7 ± 2.3
T-220	71.1 ± 2.6
T-222	ND ^a
T-223	58.3 ± 1.6
T-224	48.0 ± 2.8
Mean ± s.d.	57.5 ± 12.1

^a ND = No Data, TLD lost in the field.

Table 14. Area monitors (TLD), Annual.

Units: mR/365 days

<u>Control</u>	<u>2017</u>
T-9	52.3 ± 1.9
T-11	49.8 ± 1.2
T-12	70.1 ± 2.0
T-24	70.0 ± 3.3
T-27	75.7 ± 2.3
Mean ± s.d.	63.6 ± 11.7
T-95	61.5 ± 4.3
T-100	62.1 ± 2.2
T-111	65.2 ± 4.0
T-124	78.2 ± 3.9
T-155	57.8 ± 3.2
T-221	66.1 ± 2.6
Mean ± s.d.	65.2 ± 7.0
<u>QC</u>	
T-80	37.7 ± 1.8
T-81	73.9 ± 2.3
T-82	41.4 ± 1.8
T-83	40.8 ± 2.4
T-84	43.2 ± 1.9
T-85	46.1 ± 2.7
T-86	67.6 ± 2.5
T-88	63.0 ± 2.8
T-89	60.4 ± 4.9
T-113	60.7 ± 2.7
T-114	66.4 ± 2.2
T-115	73.5 ± 3.4
T-116	64.3 ± 2.1
T-117	51.0 ± 2.4
T-118	56.9 ± 2.1
T-119	51.1 ± 3.8
T-120	40.7 ± 1.8
T-200	45.2 ± 2.6
Mean ± s.d.	54.7 ± 12.0
<u>Shield</u>	
T-87	25.3 ± 1.8

Table 15. Milk, analyses for strontium-89, strontium-90, iodine-131, gamma emitting isotopes, calcium and stable potassium. Monthly collections, location T-24

Units: pCi/L

Date Collected	01-31-17	02-28-17	03-29-17	05-03-17
Lab Code	TMI- 356	TMI- 795	TMI- 1216	TMI- 1943
I-131	< 0.2	< 0.3	< 0.1	< 0.5
Sr-89	< 0.5	< 0.6	< 0.5	< 0.5
Sr-90	< 0.5	< 0.5	< 0.6	< 0.6
K-40	1440 ± 97	1401 ± 97	1341 ± 106	1383 ± 117
Cs-134	< 2.7	< 3.6	< 3.5	< 4.3
Cs-137	< 3.3	< 3.1	< 3.3	< 4.2
Ba-La-140	< 1.5	< 3.0	< 3.5	< 3.0
Ca (g/L)	0.99	1.00	1.12	0.91
Sr-90/g Ca	< 0.51	< 0.50	< 0.54	< 0.66
K (g/L)	1.76 ± 0.12	1.71 ± 0.12	1.64 ± 0.13	1.69 ± 0.14
Cs-137/g K	< 1.88	< 1.81	< 2.01	< 2.49
Date Collected	05-30-17	07-06-17	08-02-17	08-30-17
Lab Code	TMI- 2510	TMI- 3245	TMI- 3906	TMI- 4403
I-131	< 0.4	< 0.3	< 0.3	< 0.2
Sr-89	< 0.6	< 0.5	< 0.6	< 0.5
Sr-90	< 0.6	0.9 ± 0.3	< 0.5	< 0.5
K-40	1325 ± 138	1387 ± 96	1433 ± 136	1441 ± 113
Cs-134	< 4.4	< 2.9	< 4.0	< 4.2
Cs-137	< 5.5	< 3.3	< 6.0	< 4.3
Ba-La-140	< 2.9	< 3.8	< 2.2	< 2.7
Ca (g/L)	1.00	0.98	0.95	0.93
Sr-90/g Ca	< 0.60	0.92	< 0.53	< 0.54
K (g/L)	1.62 ± 0.17	1.69 ± 0.12	1.75 ± 0.17	1.76 ± 0.14
Cs-137/g K	< 3.40	< 1.95	< 3.43	< 2.44
Date Collected	10-04-17	11-01-17	11-29-17	01-03-18
Lab Code	TMI- 5108	TMI- 5756	TMI- 6224	TMI- 6603
I-131	< 0.3	< 0.3	< 0.4	< 0.4
Sr-89	< 0.6	< 0.6	< 0.6	< 0.6
Sr-90	< 0.6	< 0.5	0.8 ± 0.3	< 0.5
K-40	1369 ± 119	1362 ± 119	1414 ± 102	1308 ± 103
Cs-134	< 3.8	< 4.0	< 3.2	< 3.3
Cs-137	< 3.8	< 2.9	< 3.0	< 3.6
Ba-La-140	< 2.1	< 6.7	< 2.6	< 3.0
Ca (g/L)	1.17	0.91	1.07	0.90
Sr-90/g Ca	< 0.51	< 0.55	0.75	< 0.56
K (g/L)	1.67 ± 0.15	1.66 ± 0.15	1.72 ± 0.12	1.60 ± 0.13
Cs-137/g K	< 2.28	< 1.75	< 1.74	< 2.25

Table 16. Ground water samples, analyses for gross beta, tritium, strontium-89, strontium-90 and gamma-emitting isotopes.

Collection: Quarterly

Units: pCi/L

Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Location	T-27A (C)				
Lab Code	TWW- 1259	TWW- 2574	TWW- 3929	TWW- 5818	Req. LLD
Date Collected	03-29-17	05-17-17	07-19-17	10-17-17	
Gross beta	< 1.7	< 3.7	1.3 ± 0.7	< 3.5	4.0
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.5	< 0.7	< 1.5	< 0.7	
Sr-90	< 0.5	< 0.4	< 0.7	< 0.4	
Mn-54	< 3.0	< 2.0	< 1.3	< 1.2	15
Fe-59	< 4.8	< 5.0	< 3.1	< 7.1	30
Co-58	< 2.5	< 1.8	< 0.8	< 2.0	15
Co-60	< 1.7	< 2.1	< 0.9	< 0.7	15
Zn-65	< 4.2	< 2.4	< 2.1	< 3.9	30
Zr-Nb-95	< 2.2	< 3.8	< 2.4	< 2.7	15
Cs-134	< 3.3	< 2.8	< 1.1	< 2.3	15
Cs-137	< 3.3	< 2.5	< 0.8	< 2.1	18
Ba-La-140	< 3.4	< 4.8	< 4.6	< 4.3	15
Location	T-225 (I)				
Lab Code	TWW- 1261	TWW- 2575	TWW- 3931	TWW- 5820	Req. LLD
Date Collected	03-29-17	05-17-17	07-19-17	10-17-17	
Gross beta	2.8 ± 0.8	1.6 ± 0.6	1.8 ± 0.6	5.7 ± 0.9	4.0
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.6	< 0.7	< 1.0	< 0.7	
Sr-90	< 0.5	< 0.4	< 0.5	< 0.4	
Mn-54	< 1.8	< 2.3	< 1.1	< 1.0	15
Fe-59	< 3.8	< 5.2	< 1.5	< 5.2	30
Co-58	< 2.1	< 2.4	< 1.0	< 2.1	15
Co-60	< 1.7	< 1.1	< 0.9	< 1.7	15
Zn-65	< 3.0	< 4.5	< 2.0	< 3.0	30
Zr-Nb-95	< 2.4	< 3.0	< 2.4	< 3.3	15
Cs-134	< 2.5	< 2.2	< 1.1	< 2.3	15
Cs-137	< 2.9	< 1.9	< 1.2	< 2.6	18
Ba-La-140	< 2.9	< 6.4	< 5.7	< 7.2	15

Table 16. Ground water samples, analyses for gross beta, tritium, strontium-89, strontium-90 and gamma-emitting isotopes.

Collection: Quarterly

Units: pCi/L

Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Location	T-226 (I)				
Lab Code	ND ^a	ND ^a	ND ^a	ND ^a	Req. LLD
Date Collected					
Gross beta					4.0
H-3					330
Sr-89					
Sr-90					
Mn-54					15
Fe-59					30
Co-58					15
Co-60					15
Zn-65					30
Zr-Nb-95					15
Cs-134					15
Cs-137					18
Ba-La-140					15
Location	T-141 (QC)				
Lab Code	TWW- 1260	TWW- 2576	TWW- 3930	TWW- 5819	Req. LLD
Date Collected	03-29-17	05-17-17	07-19-17	10-17-17	
Gross beta	3.1 ± 0.8	2.2 ± 0.6	2.2 ± 0.6	3.3 ± 0.8	4.0
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.6	< 0.8	< 0.9	< 0.8	
Sr-90	< 0.5	< 0.6	< 0.5	< 0.4	
Mn-54	< 2.3	< 1.8	< 1.3	< 1.5	15
Fe-59	< 4.1	< 4.4	< 2.4	< 3.3	30
Co-58	< 2.5	< 1.6	< 1.1	< 2.5	15
Co-60	< 2.1	< 1.8	< 1.0	< 1.2	15
Zn-65	< 4.3	< 3.0	< 2.3	< 4.0	30
Zr-Nb-95	< 3.6	< 2.9	< 2.3	< 3.6	15
Cs-134	< 3.1	< 2.7	< 1.1	< 2.1	15
Cs-137	< 1.5	< 1.9	< 1.2	< 2.1	18
Ba-La-140	< 2.1	< 6.3	< 6.7	< 8.1	15

^a "ND" = No data; see Table 2.0, Listing of Missed Samples.

Table 19. Green leafy vegetables, analyses for strontium-89, strontium-90, iodine-131 and other gamma-emitting isotopes.

Collection: Monthly, in season

Units: pCi/g wet

Location	T-19 (I)			
	19C	19K		
Lab Code	TVE- 3908	TVE- 3909	TVE- 4428	TVE- 4429
Date Collected	08-01-17	08-01-17	08-29-17	08-29-17
Sample Type	Cabbage	Kale	Cabbage	Kale
Sr-89	< 0.003	< 0.008	< 0.002	< 0.005
Sr-90	< 0.001	< 0.005	< 0.001	< 0.003
I-131	< 0.014	< 0.019	< 0.013	< 0.023
K-40	2.20 ± 0.17	4.58 ± 0.28	1.98 ± 0.19	3.63 ± 0.30
Nb-95	< 0.006	< 0.008	< 0.009	< 0.011
Zr-95	< 0.009	< 0.014	< 0.010	< 0.017
Cs-134	< 0.005	< 0.008	< 0.007	< 0.010
Cs-137	< 0.005	< 0.006	< 0.008	< 0.006
Ce-141	< 0.010	< 0.012	< 0.015	< 0.012
Ce-144	< 0.037	< 0.038	< 0.038	< 0.062

Location	T-19 (I)			
Lab Code	TVE- 4966	TVE- 4967	TVE- 5769	TVE- 5770
Date Collected	09-27-17	09-27-17	11-01-17	11-01-17
Sample Type	Kale	Cabbage	Cabbage	Kale
Sr-89	< 0.015	< 0.008	< 0.005	< 0.016
Sr-90	< 0.010	< 0.005	< 0.003	< 0.011
I-131	< 0.022	< 0.022	< 0.014	< 0.013
K-40	4.19 ± 0.29	1.91 ± 0.19	1.94 ± 0.21	4.55 ± 0.35
Nb-95	< 0.014	< 0.009	< 0.009	< 0.007
Zr-95	< 0.015	< 0.011	< 0.012	< 0.015
Cs-134	< 0.008	< 0.006	< 0.010	< 0.009
Cs-137	< 0.009	< 0.007	< 0.007	< 0.013
Ce-141	< 0.021	< 0.016	< 0.016	< 0.017
Ce-144	< 0.043	< 0.048	< 0.087	< 0.094

Location	T-30	T-37 (C)		
Lab Code	TVE- 4675	TVE- 4969	TVE- 3910	TVE- 4430
Date Collected	09-13-17	09-27-17	08-01-17	08-29-17
Sample Type	Kale	Kale	Cabbage	Cabbage
Sr-89	< 0.007	< 0.016	< 0.003	< 0.001
Sr-90	< 0.005	< 0.011	< 0.001	< 0.001
I-131	< 0.013	< 0.029	< 0.019	< 0.014
K-40	4.32 ± 0.28	5.32 ± 0.35	2.27 ± 0.18	1.67 ± 0.18
Nb-95	< 0.006	< 0.012	< 0.005	< 0.009
Zr-95	< 0.013	< 0.019	< 0.009	< 0.008
Cs-134	< 0.009	< 0.011	< 0.005	< 0.007
Cs-137	< 0.009	< 0.008	< 0.005	< 0.006
Ce-141	< 0.010	< 0.021	< 0.009	< 0.016
Ce-144	< 0.054	< 0.063	< 0.033	< 0.039

Table 19. Green leafy vegetables, analyses for strontium-89, strontium-90, iodine-131 and other gamma-emitting isotopes.
Collection: Monthly, in season Units: pCi/g wet

Location	T-37 (C)		T-227 (I)	
Lab Code	TVE- 4968	TVE- 4431	TVE- 4970	TVE- 5771
Date Collected	09-27-17	08-29-17	09-27-17	11-01-17
Sample Type	Cabbage	Cabbage	Cabbage	Cabbage
Sr-89	< 0.005	< 0.002	< 0.006	< 0.009
Sr-90	< 0.003	< 0.001	< 0.005	< 0.006
I-131	< 0.015	< 0.016	< 0.019	< 0.010
K-40	2.08 ± 0.18	2.15 ± 0.19	2.27 ± 0.21	2.77 ± 0.24
Nb-95	< 0.007	< 0.008	< 0.009	< 0.007
Zr-95	< 0.007	< 0.010	< 0.008	< 0.009
Cs-134	< 0.006	< 0.006	< 0.007	< 0.007
Cs-137	< 0.007	< 0.007	< 0.006	< 0.006
Ce-141	< 0.012	< 0.016	< 0.012	< 0.011
Ce-144	< 0.046	< 0.055	< 0.051	< 0.066

Table 20. Fruit, analyses for strontium-89, strontium-90, iodine-131 and other gamma-emitting isotopes.
 Collection: Monthly, in season
 Units: pCi/g wet

Location	T-8 (I)	T-25 (I)
Lab Code	TVE- 4971	TVE- 4972
Date Collected	09-27-17	09-27-17
Sample Type	Apples	Apples
Sr-89	< 0.003	< 0.003
Sr-90	< 0.002	< 0.002
I-131	< 0.019	< 0.022
K-40	0.93 ± 0.12	1.03 ± 0.13
Nb-95	< 0.004	< 0.004
Zr-95	< 0.012	< 0.010
Cs-134	< 0.005	< 0.005
Cs-137	< 0.006	< 0.004
Ce-141	< 0.011	< 0.011
Ce-144	< 0.042	< 0.038

Location	T-209 (C)
Lab Code	TVE- 4973
Date Collected	09-27-17
Sample Type	Apples
Sr-89	< 0.004
Sr-90	< 0.003
I-131	< 0.014
K-40	1.17 ± 0.13
Nb-95	< 0.006
Zr-95	< 0.010
Cs-134	< 0.005
Cs-137	< 0.003
Ce-141	< 0.009
Ce-144	< 0.044

Table 22. Soil samples, analyses for gamma-emitting isotopes.

Collection: Annual

Units: pCi/g dry

Location	T-1	T-2	T-3	T-4
Lab Code	TSO- 2564	TSO- 2565	TSO- 2566	TSO- 2567
Date Collected	06-16-17	05-16-17	05-16-17	05-16-17
Be-7	0.64 ± 0.19	1.05 ± 0.29	< 0.28	1.26 ± 0.53
K-40	9.11 ± 0.64	3.81 ± 0.47	6.03 ± 0.50	17.13 ± 0.99
Mn-54	< 0.019	< 0.017	< 0.019	< 0.029
Nb-95	< 0.030	< 0.036	< 0.046	< 0.052
Zr-95	< 0.040	< 0.033	< 0.033	< 0.093
Ru-103	< 0.014	< 0.026	< 0.028	< 0.032
Ru-106	< 0.188	< 0.201	< 0.129	< 0.174
Cs-134	< 0.017	< 0.017	< 0.016	< 0.021
Cs-137	0.067 ± 0.022	0.054 ± 0.021	< 0.023	0.066 ± 0.030
Ce-141	< 0.040	< 0.064	< 0.076	< 0.123
Ce-144	< 0.138	< 0.103	< 0.121	< 0.199

Location	T-7	T-8
Lab Code	TSO- 2568	TSO- 2569
Date Collected	05-16-17	05-16-17
Be-7	1.88 ± 0.35	0.79 ± 0.34
K-40	11.61 ± 0.68	18.28 ± 0.78
Mn-54	< 0.014	< 0.030
Nb-95	< 0.038	< 0.046
Zr-95	< 0.042	< 0.064
Ru-103	< 0.022	< 0.039
Ru-106	< 0.116	< 0.137
Cs-134	< 0.017	< 0.018
Cs-137	0.036 ± 0.020	0.052 ± 0.018
Ce-141	< 0.050	< 0.070
Ce-144	< 0.109	< 0.104

Location	T-9	T-11	T-12	T-27
Lab Code	TSO- 2570	TSO- 2571	TSO- 2572	TSO- 2573
Date Collected	05-16-17	05-16-17	05-16-17	05-16-17
Be-7	0.78 ± 0.36	< 0.32	0.36 ± 0.21	< 0.34
K-40	16.60 ± 0.88	11.01 ± 0.67	14.65 ± 0.79	20.33 ± 0.85
Mn-54	< 0.031	< 0.023	< 0.020	< 0.028
Nb-95	< 0.059	< 0.040	< 0.055	< 0.057
Zr-95	< 0.078	< 0.057	< 0.046	< 0.063
Ru-103	< 0.042	< 0.034	< 0.023	< 0.046
Ru-106	< 0.227	< 0.129	< 0.176	< 0.157
Cs-134	< 0.027	< 0.019	< 0.016	< 0.017
Cs-137	0.18 ± 0.055	< 0.029	0.040 ± 0.021	0.13 ± 0.026
Ce-141	< 0.117	< 0.073	< 0.076	< 0.077
Ce-144	< 0.136	< 0.160	< 0.115	< 0.172

Table 23. Treated surface water samples, analyses for gross beta.
 Collection: Monthly composites of weekly grab samples
 Units: pCi/L

T-11 (C)			T-12 (C)		
Lab Code	Date Collected	Gross Beta	Lab Code	Date Collected	Gross Beta
TSWT- 388	01-31-17	1.6 ± 0.6	TSWT- 389	01-31-17	1.5 ± 0.6
TSWT- 805	02-28-17	1.5 ± 0.6	TSWT- 806	02-28-17	1.1 ± 0.5
TSWT- 1233	03-28-17	2.3 ± 0.7	TSWT- 1234	03-28-17	2.4 ± 0.8
TSWT- 1975	05-02-17	1.1 ± 0.5	TSWT- 1976	05-02-17	1.4 ± 0.5
TSWT- 2622	05-30-17	1.0 ± 0.5	TSWT- 2623	05-30-17	1.3 ± 0.6
TSWT- 3258	07-05-17	1.0 ± 0.5	TSWT- 3259	07-05-17	1.2 ± 0.5
TSWT- 3918	08-01-17	1.2 ± 0.5	TSWT- 3919	08-01-17	< 0.9
TSWT- 4404	08-29-17	1.1 ± 0.5	TSWT- 4405	08-29-17	< 0.9
TSWT- 5151	10-03-17	2.4 ± 1.1	TSWT- 5152	10-03-17	1.8 ± 0.6
TSWT- 5806	10-31-17	1.1 ± 0.5	TSWT- 5807	10-31-17	< 0.9
TSWT- 6212	11-28-17	1.2 ± 0.5	TSWT- 6213	11-28-17	1.0 ± 0.5
TSWT- 6635	12-26-17	1.4 ± 0.5	TSWT- 6636	12-26-17	0.9 ± 0.5

T-22			T-143 (QC)		
Lab Code	Date Collected	Gross Beta	Lab Code	Date Collected	Gross Beta
TSWT- 390	01-31-17	1.2 ± 0.6	TSWT- 391	01-31-17	1.4 ± 0.6
TSWT- 807	02-28-17	1.3 ± 0.5	TSWT- 808	02-28-17	< 0.9
TSWT- 1235	03-28-17	2.2 ± 0.7	TSWT- 1236	03-28-17	2.5 ± 0.8
TSWT- 1977	05-02-17	1.2 ± 0.5	TSWT- 1978	05-02-17	< 0.9
TSWT- 2624	05-30-17	1.3 ± 0.6	TSWT- 2625	05-30-17	1.1 ± 0.5
TSWT- 3260	07-05-17	< 0.8	TSWT- 3261	07-05-17	< 0.9
TSWT- 3920	08-01-17	1.8 ± 0.7	TSWT- 3921	08-01-17	< 1.8
TSWT- 4406	08-29-17	1.7 ± 0.6	TSWT- 4407	08-29-17	1.9 ± 0.6
TSWT- 5153	10-03-17	1.1 ± 0.5	TSWT- 5154	10-03-17	1.3 ± 0.6
TSWT- 5808	10-31-17	1.1 ± 0.5	TSWT- 5809	10-31-17	1.5 ± 0.6
TSWT- 6214	11-28-17	1.1 ± 0.5	TSWT- 6215	11-28-17	1.2 ± 0.6
TSWT- 6638	12-26-17	1.3 ± 0.6	TSWT- 6639	12-26-17	1.1 ± 0.5

Table 24. Treated surface water samples, analyses for tritium, strontium-89, strontium-90 and gamma-emitting isotopes.

Collection: Quarterly composites of weekly grab samples

Units: pCi/L

Location					
T-11 (C)					
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	TSWT- 1355	TSWT- 3364	TSWT- 5234	TSWT- 6725	<u>Req. LLD</u>
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.5	< 0.6	< 0.6	< 0.7	
Sr-90	< 0.5	< 0.5	< 0.5	< 0.5	
Mn-54	< 1.8	< 2.1	< 3.3	< 2.2	15
Fe-59	< 3.7	< 4.5	< 7.8	< 5.5	30
Co-58	< 1.4	< 2.3	< 2.9	< 1.8	15
Co-60	< 2.0	< 1.6	< 3.9	< 2.4	15
Zn-65	< 2.4	< 5.3	< 3.6	< 3.4	30
Zr-Nb-95	< 3.1	< 2.5	< 2.8	< 3.8	15
Cs-134	< 1.8	< 2.3	< 4.1	< 3.7	10
Cs-137	< 2.0	< 2.0	< 3.9	< 1.6	18
Ba-La-140	< 4.7	< 2.2	< 5.3	< 5.5	15

Location					
T-12 (C)					
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	
Lab Code	TSWT- 1357	TSWT- 3365	TSWT- 5235	TSWT- 6726	<u>Req. LLD</u>
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.7	< 0.8	< 0.7	< 0.6	
Sr-90	< 0.7	< 0.6	< 0.6	< 0.5	
Mn-54	< 1.7	< 2.7	< 3.4	< 3.3	15
Fe-59	< 4.2	< 3.9	< 9.0	< 5.2	30
Co-58	< 1.8	< 2.2	< 4.0	< 2.4	15
Co-60	< 1.1	< 1.8	< 3.8	< 2.2	15
Zn-65	< 2.9	< 4.2	< 3.3	< 3.7	30
Zr-Nb-95	< 2.5	< 3.0	< 2.5	< 3.9	15
Cs-134	< 1.6	< 2.5	< 4.2	< 2.9	10
Cs-137	< 1.3	< 3.0	< 4.2	< 3.2	18
Ba-La-140	< 6.5	< 2.6	< 3.3	< 6.9	15

Table 24. Treated surface water samples, analyses for tritium, strontium-89, strontium-90 and gamma-emitting isotopes.
 Collection: Quarterly composites of weekly grab samples.
 Units: pCi/L

Location	T-22				
Period Lab Code	1st Qtr. TSWT- 1358	2nd Qtr. TSWT- 3366	3rd Qtr. TSWT- 5236	4th Qtr. TSWT- 6727	Req. LLD
H-3	< 330	< 330	< 330	< 330	330
Sr-89	< 0.8	< 0.6	< 0.5	< 0.6	
Sr-90	< 1.0	< 0.5	< 0.5	< 0.5	
Mn-54	< 1.3	< 1.7	< 3.1	< 2.9	15
Fe-59	< 3.8	< 4.1	< 9.3	< 5.9	30
Co-58	< 1.3	< 1.5	< 2.7	< 1.8	15
Co-60	< 1.5	< 1.6	< 2.8	< 2.9	15
Zn-65	< 3.1	< 2.5	< 8.3	< 3.4	30
Zr-Nb-95	< 2.3	< 1.9	< 4.2	< 5.0	15
Cs-134	< 1.6	< 2.8	< 3.9	< 2.4	10
Cs-137	< 1.8	< 2.4	< 4.6	< 1.8	18
Ba-La-140	< 6.2	< 2.9	< 4.4	< 5.5	15

Table 25. Untreated surface water, analyses for gross beta, tritium and gamma emitting isotopes.

Location: T-3

Collection: Monthly composites of weekly grab samples

Units: pCi/L

Lab Code	TSWU- 393	TSWU- 809	TSWU- 1237	TSWU- 1979	
Date Collected	01-31-17	02-28-17	03-28-17	05-02-17	Req. LLD
Gross beta	3.6 ± 0.8	2.3 ± 0.6	3.4 ± 0.8	2.4 ± 0.7	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.2	< 3.4	< 3.3	< 2.6	15
Fe-59	< 3.9	< 5.1	< 5.4	< 7.2	30
Co-58	< 2.4	< 3.3	< 4.7	< 2.2	15
Co-60	< 1.8	< 3.4	< 2.5	< 2.4	15
Zn-65	< 3.1	< 7.4	< 7.1	< 4.2	30
Zr-Nb-95	< 3.5	< 5.2	< 4.0	< 4.5	15
Cs-134	< 3.3	< 4.0	< 4.0	< 3.2	10
Cs-137	< 4.5	< 2.5	< 4.5	< 2.7	18
Ba-La-140	< 4.8	< 3.0	< 3.5	< 6.5	15
Lab Code	TSWU- 2627	TSWU- 3262	TSWU- 3922	TSWU- 4408	
Date Collected	05-30-17	07-05-17	08-01-17	08-29-17	Req. LLD
Gross beta	2.3 ± 0.6	1.3 ± 0.6	1.7 ± 0.6	1.9 ± 0.6	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.2	< 1.9	< 3.3	< 3.8	15
Fe-59	< 4.8	< 3.9	< 10.5	< 10.2	30
Co-58	< 1.6	< 1.6	< 2.3	< 4.8	15
Co-60	< 2.2	< 1.9	< 2.8	< 5.3	15
Zn-65	< 3.3	< 5.2	< 3.7	< 7.1	30
Zr-Nb-95	< 3.6	< 3.3	< 4.3	< 5.5	15
Cs-134	< 3.3	< 2.5	< 3.9	< 4.8	10
Cs-137	< 3.4	< 2.1	< 2.6	< 2.9	18
Ba-La-140	< 2.4	< 2.4	< 7.4	< 5.6	15
Lab Code	TSWU- 5155	TSWU- 5810	TSWU- 6216	TSWU- 6640	
Date Collected	10-03-17	10-31-17	11-28-17	12-26-17	Req. LLD
Gross beta	1.0 ± 0.5	3.4 ± 0.7	2.7 ± 1.1	1.9 ± 0.6	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.1	< 1.9	< 2.3	< 1.8	15
Fe-59	< 5.1	< 3.8	< 2.7	< 7.1	30
Co-58	< 3.5	< 2.3	< 1.5	< 2.7	15
Co-60	< 2.8	< 1.9	< 1.9	< 2.6	15
Zn-65	< 3.4	< 3.9	< 6.2	< 3.7	30
Zr-Nb-95	< 3.2	< 2.8	< 3.0	< 3.4	15
Cs-134	< 3.6	< 2.8	< 2.8	< 3.3	10
Cs-137	< 3.2	< 3.7	< 2.7	< 3.5	18
Ba-La-140	< 1.6	< 4.0	< 1.5	< 3.7	15

Table 25. Untreated surface water, analyses for gross beta, tritium and gamma emitting isotopes.

Location: T-11 (C)

Collection: Monthly composites of weekly grab samples

Units: $\mu\text{Ci/L}$

Lab Code	TSWU- 395	TSWU- 811	TSWU- 1239	TSWU- 1981	Req. LLD
Date Collected	01-31-17	02-28-17	03-28-17	05-02-17	
Gross beta	< 1.7	2.1 \pm 0.6	< 2.3	< 1.7	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 2.5	< 2.0	< 2.8	< 2.1	15
Fe-59	< 5.1	< 1.8	< 5.1	< 3.9	30
Co-58	< 2.4	< 1.9	< 2.6	< 2.3	15
Co-60	< 2.5	< 2.6	< 2.3	< 2.0	15
Zn-65	< 4.3	< 5.2	< 4.2	< 1.3	30
Zr-Nb-95	< 3.4	< 2.7	< 3.8	< 2.4	15
Cs-134	< 3.4	< 2.8	< 3.4	< 2.3	10
Cs-137	< 3.3	< 2.4	< 2.6	< 2.6	18
Ba-La-140	< 3.5	< 1.2	< 2.2	< 6.9	15
Lab Code	TSWU- 2629	TSWU- 3264	TSWU- 3924	TSWU- 4410	Req. LLD
Date Collected	05-30-17	07-05-17	08-01-17	08-29-17	
Gross beta	< 1.7	< 1.6	1.0 \pm 0.5	< 1.7	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 1.6	< 3.1	< 2.5	< 2.9	15
Fe-59	< 4.1	< 5.2	< 6.1	< 5.2	30
Co-58	< 1.5	< 3.0	< 2.3	< 4.1	15
Co-60	< 1.5	< 3.2	< 1.3	< 4.9	15
Zn-65	< 4.7	< 5.4	< 3.4	< 11.2	30
Zr-Nb-95	< 1.7	< 3.8	< 3.8	< 5.2	15
Cs-134	< 2.7	< 3.5	< 3.0	< 5.6	10
Cs-137	< 3.3	< 2.3	< 2.5	< 5.0	18
Ba-La-140	< 1.3	< 4.2	< 4.4	< 5.9	15
Lab Code	TSWU- 5157	TSWU- 5812	TSWU- 6218	TSWU- 6642	Req. LLD
Date Collected	10-03-17	10-31-17	11-28-17	12-26-17	
Gross beta	< 1.8	2.4 \pm 1.1	< 1.7	1.7 \pm 0.6	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 2.2	< 1.7	< 2.6	< 3.0	15
Fe-59	< 3.0	< 5.3	< 3.9	< 3.3	30
Co-58	< 3.1	< 2.5	< 1.9	< 2.8	15
Co-60	< 1.4	< 1.5	< 2.3	< 1.5	15
Zn-65	< 2.8	< 2.4	< 3.7	< 4.4	30
Zr-Nb-95	< 3.0	< 3.3	< 1.3	< 3.8	15
Cs-134	< 3.0	< 2.8	< 2.9	< 2.9	10
Cs-137	< 1.6	< 3.4	< 2.9	< 2.7	18
Ba-La-140	< 2.3	< 4.1	< 1.5	< 2.6	15

Table 25. Untreated surface water, analyses for gross beta, tritium and gamma emitting isotopes.
 Location: T-12 (C)
 Collection: Monthly composites of weekly grab samples
 Units: pCi/L

Lab Code	TSWU- 396	TSWU- 812	TSWU- 1240	TSWU- 1982	
Date Collected	01-31-17	02-28-17	03-28-17	05-02-17	Req. LLD
Gross beta	1.9 ± 0.6	1.7 ± 0.6	1.8 ± 0.8	1.8 ± 0.6	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 4.0	< 2.9	< 2.5	< 3.2	15
Fe-59	< 4.9	< 5.7	< 5.3	< 8.8	30
Co-58	< 2.7	< 3.0	< 2.6	< 2.1	15
Co-60	< 3.1	< 1.3	< 2.6	< 3.2	15
Zn-65	< 6.4	< 4.8	< 4.4	< 5.4	30
Zr-Nb-95	< 3.5	< 2.3	< 2.1	< 3.6	15
Cs-134	< 4.3	< 4.0	< 1.9	< 4.0	10
Cs-137	< 3.3	< 2.2	< 2.7	< 3.0	18
Ba-La-140	< 5.3	< 3.5	< 2.6	< 5.7	15
Lab Code	TSWU- 2630	TSWU- 3266	TSWU- 3925	TSWU- 4411	
Date Collected	05-30-17	07-05-17	08-01-17	08-29-17	Req. LLD
Gross beta	2.2 ± 0.6	1.3 ± 0.6	< 0.8	1.0 ± 0.5	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.3	< 6.1	< 3.1	< 3.4	15
Fe-59	< 5.9	< 9.3	< 5.4	< 7.5	30
Co-58	< 1.9	< 4.1	< 2.3	< 2.1	15
Co-60	< 2.0	< 6.2	< 1.5	< 3.0	15
Zn-65	< 3.8	< 16.8	< 2.7	< 7.4	30
Zr-Nb-95	< 2.3	< 8.7	< 4.5	< 3.5	15
Cs-134	< 3.2	< 6.3	< 3.2	< 3.6	10
Cs-137	< 3.1	< 4.2	< 2.2	< 3.5	18
Ba-La-140	< 2.5	< 10.7	< 5.7	< 5.1	15
Lab Code	TSWU- 5158	TSWU- 5813	TSWU- 6219	TSWU- 6643	
Date Collected	10-03-17	10-31-17	11-28-17	12-26-17	Req. LLD
Gross beta	1.5 ± 0.6	1.6 ± 0.6	1.7 ± 0.6	1.2 ± 0.5	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.8	< 3.8	< 3.3	< 2.2	15
Fe-59	< 6.8	< 2.7	< 5.3	< 8.7	30
Co-58	< 3.6	< 2.4	< 1.9	< 1.9	15
Co-60	< 3.1	< 1.9	< 2.3	< 2.2	15
Zn-65	< 5.5	< 1.9	< 3.6	< 5.1	30
Zr-Nb-95	< 5.7	< 2.9	< 1.8	< 4.0	15
Cs-134	< 4.4	< 3.0	< 3.6	< 3.4	10
Cs-137	< 3.5	< 3.1	< 3.5	< 1.8	18
Ba-La-140	< 4.0	< 4.0	< 3.5	< 5.1	15

Table 25. Untreated surface water, analyses for gross beta, tritium and gamma emitting isotopes.
 Location: T-22
 Collection: Monthly composites of weekly grab samples
 Units: pCi/L

Lab Code	TSWU- 398	TSWU- 814	TSWU- 1242	TSWU- 1984	
Date Collected	01-31-17	02-28-17	03-28-17	05-02-17	Req. LLD
Gross beta	2.1 ± 0.6	3.1 ± 0.7	2.5 ± 0.7	1.7 ± 0.6	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 3.5	< 3.0	< 3.9	< 2.5	15
Fe-59	< 3.8	< 4.1	< 6.7	< 3.9	30
Co-58	< 2.8	< 2.0	< 4.2	< 2.7	15
Co-60	< 2.0	< 2.6	< 4.0	< 2.3	15
Zn-65	< 4.9	< 3.9	< 5.5	< 2.9	30
Zr-Nb-95	< 1.7	< 2.7	< 2.3	< 1.9	15
Cs-134	< 3.6	< 3.5	< 4.4	< 2.8	10
Cs-137	< 3.1	< 2.5	< 4.5	< 1.8	18
Ba-La-140	< 2.9	< 2.5	< 2.8	< 3.2	15
Lab Code	TSWU- 2632	TSWU- 3268	TSWU- 3927	TSWU- 4413	
Date Collected	05-30-17	07-05-17	08-01-17	08-29-17	Req. LLD
Gross beta	1.3 ± 0.6	1.5 ± 0.6	1.8 ± 0.6	< 1.0	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 1.9	< 3.7	< 3.1	< 3.4	15
Fe-59	< 5.7	< 9.1	< 6.6	< 5.6	30
Co-58	< 2.3	< 2.0	< 2.2	< 3.5	15
Co-60	< 2.2	< 3.2	< 1.9	< 2.6	15
Zn-65	< 3.6	< 5.0	< 3.1	< 11.1	30
Zr-Nb-95	< 1.7	< 3.6	< 5.3	< 5.0	15
Cs-134	< 2.7	< 3.5	< 3.5	< 5.1	10
Cs-137	< 2.9	< 4.0	< 2.8	< 4.1	18
Ba-La-140	< 1.3	< 1.5	< 6.3	< 6.3	15
Lab Code	TSWU- 5160	TSWU- 5815	TSWU- 6222	TSWU- 6645	
Date Collected	10-03-17	10-31-17	11-28-17	12-26-17	Req. LLD
Gross beta	1.2 ± 0.6	2.8 ± 0.7	1.7 ± 0.6	1.5 ± 0.6	4.0
H-3	< 330	< 330	791 ± 109	< 330	330
Mn-54	< 2.9	< 1.5	< 3.0	< 2.7	15
Fe-59	< 5.2	< 4.4	< 4.4	< 6.5	30
Co-58	< 1.9	< 1.3	< 2.4	< 2.8	15
Co-60	< 2.0	< 1.0	< 2.6	< 2.2	15
Zn-65	< 3.3	< 2.4	< 5.3	< 2.5	30
Zr-Nb-95	< 3.3	< 3.3	< 2.4	< 3.8	15
Cs-134	< 3.4	< 2.8	< 2.5	< 2.9	10
Cs-137	< 3.1	< 3.1	< 3.8	< 3.4	18
Ba-La-140	< 2.0	< 3.7	< 1.9	< 5.3	15

* Tritium reanalyzed with a result of 792±122 pCi/L.

Table 25. Untreated surface water, analyses for gross beta, tritium and gamma emitting isotopes.
 Location: T-145 (QC)
 Collection: Monthly composites of weekly grab samples
 Units: pCi/L

Lab Code	TSWU- 399	TSWU- 815	TSWU- 1244	TSWU- 1985	Req. LLD
Date Collected	01-31-17	02-28-17	03-28-17	05-02-17	
Gross beta	< 1.9	2.1 ± 1.1	< 2.2	< 1.7	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 5.0	< 3.9	< 1.4	< 2.5	15
Fe-59	< 8.7	< 6.9	< 4.5	< 5.9	30
Co-58	< 4.1	< 3.6	< 1.7	< 2.3	15
Co-60	< 6.0	< 2.0	< 1.9	< 2.0	15
Zn-65	< 12.4	< 5.2	< 3.2	< 4.2	30
Zr-Nb-95	< 6.0	< 2.6	< 2.7	< 2.6	15
Cs-134	< 5.9	< 3.9	< 3.0	< 2.5	10
Cs-137	< 5.5	< 2.6	< 2.7	< 3.7	18
Ba-La-140	< 6.8	< 2.9	< 1.8	< 5.2	15
Lab Code	TSWU- 2633	TSWU- 3269	TSWU- 3928	TSWU- 4414	Req. LLD
Date Collected	05-30-17	07-05-17	08-01-17	08-29-17	
Gross beta	< 1.7	< 1.9	2.8 ± 1.4	< 1.7	4.0
H-3	< 330	< 330	< 330	< 330	330
Mn-54	< 1.9	< 2.2	< 2.8	< 3.3	15
Fe-59	< 4.6	< 4.1	< 3.7	< 5.1	30
Co-58	< 2.9	< 1.6	< 2.5	< 2.8	15
Co-60	< 3.2	< 2.3	< 1.7	< 3.6	15
Zn-65	< 1.9	< 4.2	< 3.9	< 4.8	30
Zr-Nb-95	< 3.3	< 3.0	< 3.5	< 4.0	15
Cs-134	< 2.9	< 2.5	< 3.2	< 4.3	10
Cs-137	< 2.3	< 2.8	< 2.7	< 4.7	18
Ba-La-140	< 2.7	< 3.2	< 4.2	< 3.2	15
Lab Code	TSWU- 5161	TSWU- 5816	TSWU- 6223	TSWU- 6646	Req. LLD
Date Collected	10-03-17	10-31-17	11-28-17	12-26-17	
Gross beta	2.2 ± 1.0	2.0 ± 1.0	1.4 ± 0.6	1.0 ± 0.5	4.0
H-3	< 330	< 330	889 ± 113	< 330	330
Mn-54	< 3.0	< 2.4	< 2.9	< 1.9	15
Fe-59	< 5.1	< 3.8	< 3.6	< 4.5	30
Co-58	< 2.9	< 3.2	< 2.6	< 3.8	15
Co-60	< 3.3	< 2.1	< 2.3	< 2.6	15
Zn-65	< 4.8	< 4.6	< 4.5	< 4.2	30
Zr-Nb-95	< 3.7	< 2.5	< 2.4	< 4.1	15
Cs-134	< 3.8	< 3.6	< 3.3	< 3.9	10
Cs-137	< 3.7	< 3.7	< 3.2	< 3.4	18
Ba-La-140	< 2.4	< 3.8	< 2.7	< 7.0	15

* Tritium reanalyzed with a result of 780±111 pCi/L.

Table 26. Untreated surface water samples, analyses for strontium-89 and strontium-90.
 Collection: Quarterly composites of weekly grab samples
 Units: pCi/L

Location T-3				
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	TSWU- 1403	TSWU- 3552	TSWU- 5237	TSWU- 6728
Sr-89	< 0.5	< 0.7	< 0.6	< 0.7
Sr-90	< 0.5	< 0.6	< 0.5	< 0.5

Location T-11 (C)				
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	TSWU- 1404	TSWU- 3553	TSWU- 5238	TSWU- 6729
Sr-89	< 0.6	< 0.6	< 0.5	< 0.7
Sr-90	< 0.6	< 0.5	< 0.4	< 0.5

Location T-12 (C)				
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	TSWU- 1406	TSWU- 3554	TSWU- 5239	TSWU- 6730
Sr-89	< 0.6	< 0.7	< 0.5	< 0.6
Sr-90	< 0.6	< 0.5	< 0.5	< 0.5

Location T-22				
Period	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	TSWU- 1407	TSWU- 3555	TSWU- 5240	TSWU- 6731
Sr-89	< 0.7	< 0.7	< 0.6	< 0.6
Sr-90	< 0.7	< 0.6	< 0.5	< 0.5

Table 27. Fish samples, analyses for gross beta and gamma-emitting isotopes.

Collection: Annually

Units: pCi/g wet

Location		T-33 (Lake Erie, 1.5 mi. NE of Station)	
Lab Code	TF- 4506	TF- 4507	
Date Collected	07-26-17	08-30-17	
Sample Type	Walleye	White Bass/ White Perch	
Gross Beta	3.40 ± 0.07	2.84 ± 0.06	
K-40	2.95 ± 0.44	2.29 ± 0.35	
Mn-54	< 0.012	< 0.011	
Fe-59	< 0.064	< 0.021	
Co-58	< 0.022	< 0.011	
Co-60	< 0.019	< 0.013	
Zn-65	< 0.024	< 0.025	
Cs-134	< 0.013	< 0.014	
Cs-137	< 0.013	< 0.011	

Location		T-35	
Lab Code	TF- 4508	TF- 4509	
Date Collected	07-26-17	07-26-17	
Sample Type	Walleye	White Bass/ White Perch	
Gross Beta	3.49 ± 0.07	1.18 ± 0.03	
K-40	2.48 ± 0.31	1.00 ± 0.25	
Mn-54	< 0.010	< 0.009	
Fe-59	< 0.024	< 0.045	
Co-58	< 0.016	< 0.014	
Co-60	< 0.006	< 0.008	
Zn-65	< 0.037	< 0.018	
Cs-134	< 0.015	< 0.016	
Cs-137	< 0.011	< 0.013	

Table 28. Shoreline sediment samples, analyses for gamma-emitting isotopes.
 Collection: Semiannually
 Units: pCi/g dry

Location	T-3	T-4	T-4P	T-27B	T-132
Lab Code	TSS- 2558	TSS- 2559	TSS- 2560	TSS- 2561	TSS- 2562
Date Collected	05-24-17	05-24-17	05-24-17	05-24-17	05-24-17
K-40	9.75 ± 0.53	18.70 ± 1.00	23.00 ± 1.21	8.77 ± 0.52	8.64 ± 0.49
Mn-54	< 0.015	< 0.038	< 0.032	< 0.017	< 0.010
Co-58	< 0.017	< 0.039	< 0.054	< 0.020	< 0.014
Co-60	< 0.018	< 0.022	< 0.031	< 0.014	< 0.009
Cs-134	< 0.011	< 0.028	< 0.028	< 0.010	< 0.009
Cs-137	< 0.013	< 0.034	0.15 ± 0.066	< 0.012	< 0.009
Lab Code	TSS- 6240	TSS- 6241	TSS- 6242	TSS- 6244	TSS- 6245
Date Collected	11-29-17	11-29-17	11-29-17	11-28-17	11-28-17
K-40	10.08 ± 0.53	11.62 ± 0.65	21.61 ± 1.00	12.64 ± 0.63	10.06 ± 0.56
Mn-54	< 0.018	< 0.022	< 0.032	< 0.017	< 0.018
Co-58	< 0.013	< 0.020	< 0.032	< 0.021	< 0.020
Co-60	< 0.012	< 0.016	< 0.016	< 0.012	< 0.012
Cs-134	< 0.014	< 0.013	< 0.026	< 0.012	< 0.013
Cs-137	< 0.014	< 0.020	0.085 ± 0.026	< 0.015	< 0.016



APPENDIX A

**INTERLABORATORY COMPARISON PROGRAM RESULTS
AND INTRALABORATORY COMPARISON PROGRAM RESULTS**

NOTE: Appendix A is updated four times a year. The complete appendix is included in March, June, September and December monthly progress reports only.

January, 2017 through December, 2017

Appendix A

Interlaboratory/ Intralaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental type samples containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

Results in Table A-1 were obtained through participation in the RAD PT Study Proficiency Testing Program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

Table A-2 lists results for thermoluminescent dosimeters (TLDs), via irradiation and evaluation by the University of Wisconsin-Madison Radiation Calibration Laboratory at the University of Wisconsin Medical Radiation Research Center.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 lists analytical results from the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Complete analytical data for duplicate analyses is available upon request.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

Results in Table A-7 were obtained through participation in the MRAD PT Study Proficiency Testing Program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurement Laboratory Quality Assessment Program (EML).

Attachment A lists the laboratory precision at the 1 sigma level for various analyses. The acceptance criteria in Table A-3 is set at ± 2 sigma.

Out-of-limit results are explained directly below the result.

Attachment A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES^a

Analysis	Level	One standard deviation for single determination
Gamma Emitters	5 to 100 pCi/liter or kg > 100 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-89 ^b	5 to 50 pCi/liter or kg > 50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90 ^b	2 to 30 pCi/liter or kg > 30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium-40	≥ 0.1 g/liter or kg	10% of known value
Gross alpha	≤ 20 pCi/liter > 20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	≤ 100 pCi/liter > 100 pCi/liter	5.0 pCi/liter 10% of known value
Tritium	≤ 4,000 pCi/liter > 4,000 pCi/liter	± 1σ = 169.85 x (known) ^{0.0933} 10% of known value
Radium-226,-228	≥ 0.1 pCi/liter	15% of known value
Plutonium	≥ 0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129 ^b	≤ 55 pCi/liter > 55 pCi/liter	6 pCi/liter 10% of known value
Uranium-238, Nickel-63 ^b Technetium-99 ^b	≤ 35 pCi/liter > 35 pCi/liter	6 pCi/liter 15% of known value
Iron-55 ^b	50 to 100 pCi/liter > 100 pCi/liter	10 pCi/liter 10% of known value
Other Analyses ^b	—	20% of known value

^a From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies Program", Fiscal Year, 1981-1982, EPA-600/4-81-004.

^b Laboratory limit.

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.
RAD study

Lab Code	Date	Analysis	Concentration (pCi/L)			Acceptance
			Laboratory Result	ERA Result	Control Limits	
ERW-95	1/9/2017	Sr-89	51.9 ± 4.6	55.5	44.3 - 63.2	Pass
ERW-95	1/9/2017	Sr-90	43.6 ± 2.4	43.1	31.8 - 49.5	Pass
ERW-97	1/9/2017	Ba-133	78.2 ± 4.1	85.6	72.0 - 94.2	Pass
ERW-97	1/9/2017	Cs-134	53.9 ± 3.8	52.6	42.4 - 57.9	Pass
ERW-97	1/9/2017	Cs-137	122 ± 6	112	101 - 126	Pass
ERW-97	1/9/2017	Co-60	117 ± 4	113	102 - 126	Pass
ERW-97	1/9/2017	Zn-65	208 ± 13	189	170 - 222	Pass
ERW-99	1/9/2017	Gr. Alpha	48.9 ± 2.4	52.3	27.3 - 65.5	Pass
ERW-99	1/9/2017	Gr. Beta	37.1 ± 1.3	41.6	27.7 - 49.0	Pass
ERW-101	1/9/2017	I-131	22.3 ± 0.6	24.3	20.2 - 28.8	Pass
ERW-103	1/9/2017	Ra-226	11.3 ± 0.4	12.7	9.5 - 14.7	Pass
ERW-103	1/9/2017	Ra-228	6.10 ± 0.90	6.20	3.8 - 8.1	Pass
ERW-103	1/9/2017	Uranium	11.8 ± 0.8	12.6	9.9 - 14.4	Pass
ERW-106	1/9/2017	H-3	12,600 ± 300	12,500	10,900 - 13,800	Pass
ERW-3344	7/10/2017	Sr-89	29.0 ± 10.0	26.4	18.4 - 32.9	Pass
ERW-3344	7/10/2017	Sr-90	33.8 ± 3.3	36.0	26.4 - 41.5	Pass
ERW-3346	7/10/2017	Ba-133	66.4 ± 4.1	66.3	55.2 - 72.9	Pass
ERW-3346	7/10/2017	Cs-134	27.0 ± 4.3	24.4	18.7 - 27.2	Pass
ERW-3346	7/10/2017	Cs-137	57.4 ± 4.5	51.6	46.4 - 59.6	Pass
ERW-3346	7/10/2017	Co-60	92.6 ± 4.4	88.6	79.7 - 99.8	Pass
ERW-3346	7/10/2017	Zn-65	32.4 ± 6.0	32.7	27.3 - 41.6	Pass
ERW-3348	7/10/2017	Gr. Alpha	23.7 ± 1.9	25.7	13.0 - 34.1	Pass
ERW-3348	7/10/2017	Gr. Beta	54.6 ± 1.6	63.0	43.5 - 69.6	Pass
ERW-3350	7/10/2017	I-131	25.4 ± 1.3	25.5	21.2 - 30.1	Pass
ERW-3352	7/10/2017	Ra-226	1.38 ± 0.15	1.29	1.07 - 1.95	Pass
ERW-3352	7/10/2017	Ra-228	6.70 ± 0.93	5.66	3.45 - 7.47	Pass
ERW-3352	7/10/2017	Uranium	58.4 ± 0.9	66.7	54.3 - 73.9	Pass
ERW-3354	7/10/2017	H-3	5,254 ± 224	5,060	4,340 - 5,570	Pass

^a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).

TABLE A-2. Thermoluminescent Dosimetry, (TLD, CaSO₄: Dy Cards). *

Lab Code	Irradiation Date	Description	mrem		Performance ^c Quotient (P)	
			Delivered Dose	Reported ^b Dose		
<u>Environmental, Inc.</u>		Group 1				
2017-1	10/16/2017	Spike 1	59.0	49.3	-0.16	
2017-1	10/16/2017	Spike 2	59.0	53.2	-0.10	
2017-1	10/16/2017	Spike 3	59.0	52.7	-0.11	
2017-1	10/16/2017	Spike 4	59.0	53.4	-0.09	
2017-1	10/16/2017	Spike 5	59.0	51.8	-0.12	
2017-1	10/16/2017	Spike 6	59.0	54.0	-0.08	
2017-1	10/16/2017	Spike 7	59.0	52.0	-0.12	
2017-1	10/16/2017	Spike 8	59.0	52.6	-0.11	
2017-1	10/16/2017	Spike 9	59.0	54.6	-0.07	
2017-1	10/16/2017	Spike 10	59.0	50.4	-0.15	
2017-1	10/16/2017	Spike 11	59.0	53.9	-0.09	
2017-1	10/16/2017	Spike 12	59.0	55.7	-0.06	
2017-1	10/16/2017	Spike 13	59.0	50.2	-0.15	
2017-1	10/16/2017	Spike 14	59.0	52.4	-0.11	
2017-1	10/16/2017	Spike 15	59.0	54.3	-0.08	
2017-1	10/16/2017	Spike 16	59.0	53.2	-0.10	
2017-1	10/16/2017	Spike 17	59.0	50.1	-0.15	
2017-1	10/16/2017	Spike 18	59.0	52.3	-0.11	
2017-1	10/16/2017	Spike 19	59.0	50.3	-0.15	
2017-1	10/16/2017	Spike 20	59.0	50.7	-0.14	
2017-1	10/16/2017	Spike 21	59.0	53.1	-0.10	
2017-1	10/16/2017	Spike 22	59.0	51.5	-0.13	
2017-1	10/16/2017	Spike 23	59.0	54.4	-0.08	
2017-1	10/16/2017	Spike 24	59.0	53.3	-0.10	
2017-1	10/16/2017	Spike 25	59.0	53.7	-0.09	
2017-1	10/16/2017	Spike 26	59.0	51.6	-0.13	
2017-1	10/16/2017	Spike 27	59.0	51.5	-0.13	
2017-1	10/16/2017	Spike 28	59.0	51.6	-0.13	
2017-1	10/16/2017	Spike 29	59.0	49.9	-0.15	
2017-1	10/16/2017	Spike 30	59.0	55.3	-0.06	
Mean (Spike 1-30)				52.4	-0.11	Pass ^d
Standard Deviation (Spike 1-30)				1.7	0.03	Pass ^d

a TLD's were irradiated by the University of Wisconsin-Madison Radiation Calibration Laboratory following ANSI N13.37 protocol from a known air kerma rate. TLD's were read and the results were submitted by Environmental Inc. to the University of Wisconsin-Madison Radiation Calibration Laboratory for comparison to the delivered dose.

b Reported dose was converted from exposure (R) to Air Kerma (cGy) using a conversion of 0.876. Conversion from air kerma to ambient dose equivalent for Cs-137 at the reference dose point $H^*(10)K_a = 1.20$. mrem/cGy = 1000.

c Performance Quotient (P) is calculated as $((\text{reported dose} - \text{conventionally true value}) / \text{conventionally true value})$ where the conventionally true value is the delivered dose.

d Acceptance is achieved when neither the absolute value of mean of the P values, nor the standard deviation of the P values exceed 0.15.

TABLE A-2. Thermoluminescent Dosimetry, (TLD, CaSO₄: Dy Cards). ^a

Lab Code	Irradiation Date	Description	mrem		Performance ^c Quotient (P)	
			Delivered Dose	Reported ^b Dose		
<u>Environmental, Inc.</u>		Group 2				
2017-2	10/16/2017	Spike 31	186.0	184.7	-0.11	
2017-2	10/16/2017	Spike 32	186.0	172.0	-0.08	
2017-2	10/16/2017	Spike 33	186.0	167.3	-0.10	
2017-2	10/16/2017	Spike 34	186.0	160.6	-0.14	
2017-2	10/16/2017	Spike 35	186.0	171.7	-0.08	
2017-2	10/16/2017	Spike 36	186.0	177.0	-0.05	
2017-2	10/16/2017	Spike 37	186.0	176.7	-0.05	
2017-2	10/16/2017	Spike 38	186.0	165.5	-0.11	
2017-2	10/16/2017	Spike 39	186.0	174.6	-0.06	
2017-2	10/16/2017	Spike 40	186.0	172.7	-0.07	
2017-2	10/16/2017	Spike 41	186.0	167.8	-0.10	
2017-2	10/16/2017	Spike 42	186.0	161.0	-0.13	
2017-2	10/16/2017	Spike 43	186.0	166.3	-0.11	
2017-2	10/16/2017	Spike 44	186.0	172.4	-0.07	
2017-2	10/16/2017	Spike 45	186.0	173.0	-0.07	
2017-2	10/16/2017	Spike 46	186.0	169.5	-0.09	
2017-2	10/16/2017	Spike 47	186.0	169.0	-0.09	
2017-2	10/16/2017	Spike 48	186.0	166.9	-0.10	
2017-2	10/16/2017	Spike 49	186.0	165.9	-0.11	
2017-2	10/16/2017	Spike 50	186.0	166.7	-0.10	
2017-2	10/16/2017	Spike 51	186.0	161.1	-0.13	
2017-2	10/16/2017	Spike 52	186.0	173.4	-0.07	
2017-2	10/16/2017	Spike 53	186.0	173.1	-0.07	
2017-2	10/16/2017	Spike 54	186.0	160.0	-0.14	
2017-2	10/16/2017	Spike 55	186.0	166.1	-0.11	
2017-2	10/16/2017	Spike 56	186.0	164.5	-0.12	
2017-2	10/16/2017	Spike 57	186.0	163.8	-0.12	
2017-2	10/16/2017	Spike 58	186.0	159.9	-0.14	
2017-2	10/16/2017	Spike 59	186.0	165.6	-0.11	
2017-2	10/16/2017	Spike 60	186.0	165.0	-0.11	
Mean (Spike 31-60)				167.8	-0.10	Pass ^d
Standard Deviation (Spike 31-60)				5.0	0.03	Pass ^d

a TLD's were irradiated by the University of Wisconsin-Madison Radiation Calibration Laboratory following ANSI N13.37 protocol from a known air kerma rate. TLD's were read and the results were submitted by Environmental Inc. to the University of Wisconsin-Madison Radiation Calibration Laboratory for comparison to the delivered dose.

b Reported dose was converted from exposure (R) to Air Kerma (cGy) using a conversion of 0.876. Conversion from air kerma to ambient dose equivalent for Cs-137 at the reference dose point $H^*(10)K_a = 1.20$. mrem/cGy = 1000.

c Performance Quotient (P) is calculated as ((reported dose - conventionally true value) ÷ conventionally true value) where the conventionally true value is the delivered dose.

d Acceptance is achieved when neither the absolute value of mean of the P values, nor the standard deviation of the P values exceed 0.15.

TABLE A-3. In-House "Spiked" Samples

Lab Code ^b	Date	Analysis	Concentration ^a			Acceptance
			Laboratory results 2s, n=1 ^c	Known Activity	Control Limits ^d	
W-010417	4/29/2016	Cs-134	36.2 ± 8.1	36.2	29.0 - 43.4	Pass
W-010417	4/29/2016	Cs-137	78.0 ± 8.8	71.9	57.5 - 86.3	Pass
SPW-306	1/4/2017	Ra-226	18.1 ± 0.4	16.7	13.4 - 20.1	Pass
SPW-32	1/6/2017	H-3	17,849 ± 393	17,243	10,346 - 24,140	Pass
SPW-46	1/9/2017	Gr. Alpha	20.0 ± 0.4	20.1	16.1 - 24.1	Pass
SPW-46	1/9/2017	Gr. Beta	29.0 ± 0.3	28.9	23.1 - 34.6	Pass
SPW-92	1/11/2017	H-3	18,095 ± 397	17,243	10,346 - 24,140	Pass
SPW-142	1/12/2017	Sr-90	39.4 ± 2.3	36.6	29.3 - 43.9	Pass
SPW-155	1/19/2017	H-3	17,974 ± 400	17,243	10,346 - 24,140	Pass
SPW-186	1/23/2017	H-3	17,383 ± 366	17,243	10,346 - 24,140	Pass
SPW-232	1/19/2017	H-3	17,542 ± 368	17,243	10,346 - 24,140	Pass
SPW-304	1/26/2017	H-3	17,782 ± 400	17,243	10,346 - 24,140	Pass
SPW-333	1/30/2017	H-3	17,910 ± 406	17,243	10,346 - 24,140	Pass
SPW-353	2/2/2017	U-234	47.8 ± 2.3	41.7	33.4 - 50.0	Pass
SPW-353	2/2/2017	U-238	50.4 ± 2.4	41.7	33.4 - 50.0	Pass
W-020217	4/29/2016	Cs-134	33.7 ± 6.1	36.2	29.0 - 43.4	Pass
W-020217	4/29/2016	Cs-137	78.4 ± 7.3	71.9	57.5 - 86.3	Pass
SPW-412	2/6/2017	Sr-90	36.2 ± 2.4	36.6	29.3 - 43.9	Pass
SPW-465	2/8/2017	H-3	17,573 ± 396	17,243	10,346 - 24,140	Pass
SPW-561	2/15/2017	H-3	17,358 ± 395	17,243	10,346 - 24,140	Pass
SPW-605	2/16/2017	H-3	17,820 ± 401	17,243	10,346 - 24,140	Pass
SPW-657	2/17/2017	H-3	17,614 ± 376	17,243	10,346 - 24,140	Pass
SPW-714	2/23/2017	H-3	17,662 ± 400	17,243	10,346 - 24,140	Pass
SPW-737	2/28/2017	H-3	17,196 ± 395	17,243	10,346 - 24,140	Pass
SPAP-740	2/28/2017	Gr. Beta	38.9 ± 0.1	41.5	33.2 - 49.8	Pass
SPAP-742	2/24/2017	Cs-134	1.05 ± 0.60	0.98	0.78 - 1.18	Pass
SPAP-742	2/24/2017	Cs-137	90.4 ± 2.5	92.9	74.3 - 111.5	Pass
SPW-746	2/28/2017	Sr-90	42.8 ± 2.5	36.6	29.3 - 43.9	Pass
SPW-748	2/28/2017	C-14	4270 ± 17	4735	3788 - 5682	Pass
SPW-750	2/28/2017	Ni-63	463 ± 4	400	240 - 560	Pass
SPF-752	2/28/2017	Cs-134	1033 ± 38	1090	870 - 1300	Pass
SPF-752	2/28/2017	Cs-137	3071 ± 61	2820	2250 - 3380	Pass
SPW-781	3/1/2017	Ra-226	18.1 ± 0.4	16.7	13.4 - 20.1	Pass
SPW-783	3/1/2017	H-3	17,653 ± 400	17,243	13,794 - 20,692	Pass
W-030517	4/29/2016	Cs-134	38.0 ± 9.0	36.2	29.0 - 43.4	Pass
W-030517	4/29/2016	Cs-137	80.9 ± 9.2	71.9	57.5 - 86.3	Pass
SPW-1010	3/14/2017	H-3	17,312 ± 395	17,243	13,794 - 20,692	Pass
SPW-1026	3/16/2017	Gr. Alpha	22.4 ± 0.5	20.1	12.0 - 28.1	Pass
SPW-1026	3/16/2017	Gr. Beta	29.2 ± 0.3	28.9	17.3 - 40.4	Pass
SPW-1092	3/21/2017	H-3	17,252 ± 390	17,243	13,794 - 20,692	Pass
SPW-1151	3/24/2017	H-3	17,009 ± 388	17,243	13,794 - 20,692	Pass
SPW-1163	3/28/2017	Sr-90	39.0 ± 2.3	36.3	29.0 - 43.5	Pass
SPW-1178	3/29/2017	Ra-228	15.1 ± 1.9	16.0	9.6 - 22.4	Pass

TABLE A-3. In-House "Spiked" Samples

Lab Code ^b	Date	Analysis	Concentration ^a			Acceptance
			Laboratory results 2s, n=1 ^c	Known Activity	Control Limits ^d	
SPW-1232	3/30/2017	H-3	17,150 ± 390	17,243	13,794 - 20,692	Pass
SPW-1246	3/31/2017	I-131(G)	33.0 ± 7.3	36.6	29.3 - 43.9	Pass
SPW-1246	3/31/2017	Cs-134	28.9 ± 4.6	26.6	21.3 - 31.9	Pass
SPW-1246	3/31/2017	Cs-137	80.6 ± 8.2	70.4	56.3 - 84.5	Pass
SPMI-1248	3/31/2017	I-131(G)	39.8 ± 7.0	36.6	29.3 - 43.9	Pass
SPMI-1248	3/31/2017	Cs-134	26.9 ± 5.9	26.6	21.3 - 31.9	Pass
SPMI-1248	3/31/2017	Cs-137	70.4 ± 6.9	70.4	56.3 - 84.5	Pass
SPMI-1248	3/31/2017	I-131	36.2 ± 0.6	36.6	29.3 - 43.9	Pass
SPW-1295	3/31/2017	Ra-226	17.9 ± 0.4	16.7	13.4 - 20.1	Pass
SPW-1304	4/4/2017	H-3	17,741 ± 398	17,243	13,794 - 20,692	Pass
SPW-1359	4/5/2017	I-131	44.3 ± 0.5	47.6	38.1 - 57.1	Pass
SPW-1378	4/7/2017	H-3	17,528 ± 395	17,243	13,794 - 20,692	Pass
SPW-1391	4/7/2017	Gr. Alpha	21.1 ± 0.4	20.1	12.0 - 28.1	Pass
SPW-1391	4/7/2017	Gr. Beta	27.8 ± 0.3	28.2	17.3 - 40.4	Pass
SPW-1480	4/12/2017	H-3	17,399 ± 392	17,243	13,794 - 20,692	Pass
W-041317	4/29/2016	Cs-134	34.6 ± 5.6	36.2	29.0 - 43.4	Pass
W-041317	4/29/2016	Cs-137	81.9 ± 8.0	71.9	57.5 - 86.3	Pass
SPW-1480	4/12/2017	H-3	17,399 ± 392	17,243	13,794 - 20,692	Pass
SPW-1575	4/18/2017	H-3	17,419 ± 393	17,243	13,794 - 20,692	Pass
SPW-1626	4/20/2017	Sr-90	37.2 ± 2.4	36.3	29.0 - 43.5	Pass
SPW-1658	4/21/2017	H-3	17,194 ± 391	17,243	13,794 - 20,692	Pass
SPW-1776	4/26/2017	H-3	16,609 ± 386	17,243	13,794 - 20,692	Pass
SPW-1806	4/27/2017	H-3	17,203 ± 390	17,243	13,794 - 20,692	Pass
SPW-1937	5/3/2017	H-3	16,690 ± 385	17,243	13,794 - 20,692	Pass
SPW-1971	5/5/2017	Sr-90	41.5 ± 2.2	36.3	29.0 - 43.5	Pass
SPW-2033	5/8/2017	H-3	16,780 ± 386	17,243	13,794 - 20,692	Pass
SPW-2420	5/9/2017	Ra-226	16.3 ± 0.5	16.7	13.4 - 20.1	Pass
W-051517	4/29/2016	Cs-134	36.3 ± 5.0	36.2	29.0 - 43.4	Pass
W-051517	4/29/2016	Cs-137	68.9 ± 6.6	71.9	57.5 - 86.3	Pass
SPW-2284	5/22/2017	H-3	16,935 ± 389	16,703	13,362 - 20,043	Pass
SPW-2354	5/23/2017	H-3	17,006 ± 390	16,700	13,360 - 20,040	Pass
SPW-2891	5/23/2017	Ra-226	17.5 ± 0.4	16.7	13.4 - 20.1	Pass
SPW-2418	5/23/2017	Ra-228	14.0 ± 1.8	16.0	11.2 - 20.8	Pass
SPW-2439	5/25/2017	Ra-228	13.0 ± 1.8	16.0	11.2 - 20.8	Pass
SPMI-2378	5/24/2017	Sr-89	83.7 ± 4.9	98.4	78.7 - 118.1	Pass
SPMI-2378	5/24/2017	Sr-90	39.5 ± 1.5	36.1	28.9 - 43.4	Pass
SPW-2468	5/26/2017	H-3	17,065 ± 391	16,692	13,354 - 20,031	Pass
SPW-2848	5/26/2017	I-131	56.4 ± 0.6	58.3	46.6 - 70.0	Pass
SPW-2502	6/1/2017	H-3	17,596 ± 396	16,677	13,342 - 20,012	Pass
SPW-2659	6/5/2017	H-3	17,027 ± 390	16,677	13,342 - 20,012	Pass
SPW-2790	6/9/2017	H-3	17,101 ± 392	17,101	13,325 - 19,988	Pass

TABLE A-3. In-House "Spiked" Samples

Lab Code ^D	Date	Analysis	Concentration ^a			Acceptance
			Laboratory results 2s, n=1 ^c	Known Activity	Control Limits ^d	
SPW-2798	6/12/2017	H-3	16,683 ± 364	16,649	13,319 - 19,978	Pass
SPW-2943	6/19/2017	Sr-90	39.2 ± 2.3	36.1	28.9 - 43.4	Pass
SPW-3509	6/15/2017	Ra-226	17.6 ± 0.5	16.7	13.4 - 20.1	Pass
W-061317	4/29/2016	Cs-134	35.0 ± 6.2	36.2	29.0 - 43.4	Pass
W-061317	4/29/2016	Cs-137	77.4 ± 7.8	71.9	57.5 - 86.3	Pass
SPW-3041	6/23/2017	H-3	16,419 ± 378	16,620	13,296 - 19,945	Pass
SPW-3511	6/23/2017	Ra-226	15.5 ± 0.6	16.7	13.4 - 20.1	Pass
SPW-3103	6/28/2017	H-3	16,507 ± 380	16,507	13,286 - 19,929	Pass
SPW-3117	6/29/2017	Tc-99	112.7 ± 1.9	107.8	86.2 - 129.4	Pass
SPW-3513	6/29/2017	Ra-226	17.8 ± 0.5	16.7	13.4 - 20.1	Pass
SPW-3188	7/3/2017	Sr-90	38.1 ± 2.2	36.1	28.9 - 43.4	Pass
SPW-3283	7/11/2017	H-3	16,057 ± 347	16,649	13,319 - 19,978	Pass
SPW-4054	7/11/2017	Ra-226	17.7 ± 0.4	16.0	11.2 - 20.8	Pass
SPW-3467	7/14/2017	Gr. Alpha	22.3 ± 0.5	20.1	12.0 - 28.1	Pass
SPW-3467	7/14/2017	Gr. Beta	29.1 ± 0.3	28.2	17.3 - 40.4	Pass
SPW-3449	7/15/2017	H-3	17,196 ± 393	16,507	13,286 - 19,929	Pass
SPW-3548	7/19/2017	H-3	16,764 ± 386	16,507	13,286 - 19,929	Pass
SPW-3728	7/24/2017	H-3	16,117 ± 354	16,507	13,286 - 19,929	Pass
SPW-3794	7/28/2017	H-3	16,645 ± 384	16,507	13,286 - 19,929	Pass
W-072817	4/29/2016	Cs-134	38.6 ± 5.6	36.2	29.0 - 43.4	Pass
W-072817	4/29/2016	Cs-137	76.5 ± 7.6	71.9	57.5 - 86.3	Pass
SPW-3905	8/3/2017	Gr. Alpha	22.3 ± 0.5	20.1	12.0 - 28.1	Pass
SPW-3905	8/3/2017	Gr. Beta	27.6 ± 0.3	28.2	17.3 - 40.4	Pass
SPW-4030	8/9/2017	H-3	17,636 ± 403	16,507	13,286 - 19,929	Pass
SPW-4086	8/14/2017	H-3	17,472 ± 401	16,507	13,286 - 19,929	Pass
SPW-4207	8/17/2017	H-3	17,013 ± 393	16,507	13,286 - 19,929	Pass
W-083017	4/29/2016	Cs-134	34.7 ± 6.4	36.2	29.0 - 43.4	Pass
W-083017	4/29/2016	Cs-137	78.2 ± 6.7	71.9	57.5 - 86.3	Pass
SPW-4241	8/19/2017	H-3	17,222 ± 371	16,507	13,286 - 19,929	Pass
SPW-4458	9/1/2017	Ra-226	14.1 ± 1.8	16.7	13.4 - 20.1	Pass
SPW-4466	9/6/2017	Sr-89	22.8 ± 8.5	26.4	21.1 - 31.7	Pass
SPW-4466	9/6/2017	Sr-90	32.5 ± 2.1	33.8	27.0 - 40.6	Pass
SPW-4512	9/8/2017	Gr. Alpha	19.2 ± 0.4	20.1	10.1 - 30.2	Pass
SPW-4512	9/8/2017	Gr. Beta	27.8 ± 0.3	27.9	22.3 - 33.5	Pass
SPW-4586	9/9/2017	H-3	16,586 ± 362	16,507	13,286 - 19,929	Pass
SPW-4720	9/16/2017	H-3	16,439 ± 362	16,507	13,286 - 19,929	Pass
SPW-4834	9/22/2017	H-3	16,238 ± 378	16,507	13,286 - 19,929	Pass
SPW-4935	9/27/2017	H-3	16,595 ± 381	16,507	13,286 - 19,929	Pass
SPW-4937	9/27/2017	Ra-228	5.7 ± 0.9	5.8	4.1 - 7.5	Pass
W-092717	4/29/2016	Cs-134	36.0 ± 5.9	36.2	29.0 - 43.4	Pass
W-092717	4/29/2016	Cs-137	82.6 ± 8.5	71.9	57.5 - 86.3	Pass
SPW-5001	9/29/2017	H-3	16,446 ± 358	16,507	13,286 - 19,929	Pass

TABLE A-3. In-House "Spiked" Samples

Lab Code ^b	Date	Analysis	Concentration ^a			Acceptance
			Laboratory results 2s, n=1 ^c	Known Activity	Control Limits ^d	
SPW-5134	10/6/2017	H-3	16,128 ± 373	16,507	13,286 - 19,929	Pass
SPW-5274	10/12/2017	H-3	16,108 ± 374	16,507	13,286 - 19,929	Pass
W-101217S	10/12/2017	Fe-55	1,491 ± 77	1,482	1,186 - 01,778	Pass
SPW-5408	10/18/2017	Ni-63	203 ± 3	199	159 - 238	Pass
SPW-5430	10/19/2017	H-3	16,453 ± 380	16,507	13,286 - 19,929	Pass
W-102017	4/29/2016	Cs-134	31.3 ± 4.9	36.2	29.0 - 43.4	Pass
W-102017	4/29/2016	Cs-137	80.4 ± 6.9	71.9	57.5 - 86.3	Pass
SPW-5674	10/25/2017	H-3	16,313 ± 380	16,507	13,286 - 19,929	Pass
SPW-5719	10/27/2017	H-3	16,113 ± 350	16,507	13,286 - 19,929	Pass
SPW-5730	10/31/2017	H-3	16,776 ± 387	16,507	13,286 - 19,929	Pass
SPW-5944	10/27/2017	Ra-226	16.4 ± 0.5	16.7	13.4 - 20.1	Pass
SPW-5915	11/9/2017	H-3	16,930 ± 390	16,507	13,286 - 19,929	Pass
SPW-5989	11/11/2017	H-3	16,084 ± 352	16,507	13,286 - 19,929	Pass
W-111417	4/29/2016	Cs-134	38.1 ± 6.2	36.2	29.0 - 43.4	Pass
W-111417	4/29/2016	Cs-137	74.0 ± 7.5	71.9	57.5 - 86.3	Pass
SPW-6121	11/16/2017	H-3	16,276 ± 378	16,507	13,286 - 19,929	Pass
SPW-6132	11/20/2017	H-3	15,897 ± 374	16,507	13,286 - 19,929	Pass
SPW-6249	11/30/2017	Ra-226	12.2 ± 0.4	12.3	9.8 - 14.8	Pass
SPW-6226	12/1/2017	H-3	16,164 ± 378	16,507	13,286 - 19,929	Pass
SPW-6318	12/7/2017	H-3	15,779 ± 372	16,507	13,286 - 19,929	Pass
W-120817	4/29/2016	Cs-134	29.5 ± 5.6	36.2	29.0 - 43.4	Pass
W-120817	4/29/2016	Cs-137	78.8 ± 9.6	71.9	57.5 - 86.3	Pass
SPW-65	12/11/2017	Ra-226	12.5 ± 0.4	12.3	9.8 - 14.8	Pass
SPW-6437	12/13/2017	Gr. Alpha	19.6 ± 0.4	20.1	10.1 - 30.2	Pass
SPW-6437	12/13/2017	Gr. Beta	28.2 ± 0.3	27.9	22.3 - 33.5	Pass
SPW-6463	12/15/2017	H-3	15,560 ± 372	16,507	13,286 - 19,929	Pass

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

^b Laboratory codes : W (Water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish), U (urine).

^c Results are based on single determinations.

^d Control limits are established from the precision values listed in Attachment A of this report, adjusted to ± 2s.

NOTE: For fish, gelatin is used for the spike matrix. For vegetation, cabbage is used for the spike matrix.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66 σ)		
				LLD	Activity ^c	
SPW-31	Water	1/6/2017	H-3	143	71 \pm 75	200
SPW-45	Water	1/9/2017	Gr. Alpha	0.41	0.09 \pm 0.30	2
SPW-45	Water	1/9/2017	Gr. Beta	0.74	-0.56 \pm 0.50	4
SPW-91	Water	1/11/2017	H-3	151	-23 \pm 71	200
SPW-141	Water	1/12/2017	Sr-89	0.55	0.29 \pm 0.47	5
SPW-141	Water	1/12/2017	Sr-90	0.67	-0.02 \pm 0.31	1
SPW-154	Water	1/19/2017	H-3	155	-17 \pm 73	200
SPW-185	Water	1/23/2017	H-3	176	44 \pm 94	200
SPW-231	Water	1/19/2017	H-3	179	26 \pm 87	200
SPW-303	Water	1/26/2017	H-3	160	8 \pm 77	200
SPW-305	Water	1/4/2017	Ra-226	0.02	0.02 \pm 0.01	2
SPW-307	Water	1/27/2017	I-131	0.21	0.01 \pm 0.11	1.00
SPW-332	Water	1/30/2017	H-3	169	-52 \pm 86	200
SPW-352	Water	2/2/2017	U-234	0.14	0.00 \pm 0.08	1
SPW-352	Water	2/2/2017	U-238	0.14	0.12 \pm 0.15	1
SPW-411	Water	2/6/2017	Sr-89	0.49	0.30 \pm 0.35	5
SPW-411	Water	2/6/2017	Sr-90	0.52	-0.22 \pm 0.21	1
SPW-464	Water	2/8/2017	H-3	155	2 \pm 74	200
SPW-560	Water	2/15/2017	H-3	156	38 \pm 77	200
SPW-604	Water	2/16/2017	H-3	154	59 \pm 77	200
SPW-656	Water	2/17/2017	H-3	187	28 \pm 94	200
SPW-713	Water	2/23/2017	H-3	161	20 \pm 81	200
SPW-736	Water	2/28/2017	H-3	161	-75 \pm 76	200
SPAP-739	AP	2/28/2017	Gr. Beta	0.002	0.004 \pm 0.001	0.01
SPAP-741	AP	2/24/2017	Cs-134	2.27	-0.95 \pm 1.29	100
SPAP-741	AP	2/24/2017	Cs-137	2.65	0.17 \pm 1.67	100
SPW-747	Water	2/28/2017	C-14	161	-28 \pm 97	200
SPW-749	Water	2/28/2017	Ni-63	17	-3 \pm 10	200
SPF-751	Fish	2/28/2017	Cs-134	0.008	0.002 \pm 0.004	100
SPF-751	Fish	2/28/2017	Cs-137	0.008	0.000 \pm 0.005	100
SPW-780	Water	3/1/2017	Ra-226	0.02	0.02 \pm 0.01	2
SPW-782	Water	3/1/2017	H-3	154	35 \pm 78	200
SPW-3506	Water	3/1/2017	Ra-226	0.03	0.02 \pm 0.02	2
SPW-836	Water	3/3/2017	I-131	0.38	0.04 \pm 0.18	1
SPW-1009	Water	3/14/2017	H-3	154	-31 \pm 72	200
SPW-1025	Water	3/16/2017	Gr. Alpha	0.43	-0.16 \pm 0.28	2
SPW-1025	Water	3/16/2017	Gr. Beta	0.75	-0.24 \pm 0.52	4
SPW-1091	Water	3/21/2017	H-3	145	60 \pm 73	200
SPW-1150	Water	3/24/2017	H-3	152	-31 \pm 71	200
SPW-1162	Water	3/28/2017	Sr-89	0.61	-0.39 \pm 0.45	5
SPW-1162	Water	3/28/2017	Sr-90	0.52	0.18 \pm 0.27	1

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^c Activity reported is a net activity result.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66 σ)		
				LLD	Activity ^c	
SPW-1177	Water	3/29/2017	Ra-228	0.83	-0.14 \pm 0.36	2
SPW-1231	Water	3/30/2017	H-3	150	24 \pm 73	200
SPW-1245	Water	3/31/2017	Cs-134	3.73	0.43 \pm 2.18	100
SPW-1245	Water	3/31/2017	Cs-137	3.01	-1.23 \pm 2.12	100
SPW-1245	Water	3/31/2017	I-131(G)	5.39	0.92 \pm 2.15	100
SPW-1245	Water	3/31/2017	I-131	0.32	0.03 \pm 0.18	1
SPMI-1247	Milk	3/31/2017	Cs-134	3.70	1.23 \pm 1.96	100
SPMI-1247	Milk	3/31/2017	Cs-137	3.62	-0.84 \pm 2.15	100
SPMI-1247	Milk	3/31/2017	I-131(G)	4.42	0.39 \pm 2.14	100
SPW-1294	Water	3/31/2017	Ra-226	0.02	0.18 \pm 0.02	2
SPW-1303	Water	4/4/2017	H-3	151	8 \pm 75	200
SPW-1377	Water	4/7/2017	H-3	150	29 \pm 72	200
SPW-1390	Water	4/7/2017	Gr. Alpha	0.42	0.15 \pm 0.31	2
SPW-1390	Water	4/7/2017	Gr. Beta	0.73	-0.17 \pm 0.51	4
SPW-1479	Water	4/12/2017	H-3	151	89 \pm 77	200
SPW-1574	Water	4/18/2017	H-3	144	55 \pm 79	200
SPW-1625	Water	4/20/2017	Sr-89	0.59	-0.01 \pm 0.50	5
SPW-1625	Water	4/20/2017	Sr-90	0.71	0.16 \pm 0.35	1
SPW-1657	Water	4/21/2017	H-3	147	34 \pm 73	200
SPW-1775	Water	4/26/2017	H-3	155	67 \pm 80	200
SPW-1805	Water	4/27/2017	H-3	153	15 \pm 74	200
SPW-1936	Water	5/3/2017	H-3	148	33 \pm 71	200
SPW-1970	Water	5/5/2017	Sr-89	0.66	0.34 \pm 0.54	5
SPW-1970	Water	5/5/2017	Sr-90	0.62	-0.08 \pm 0.28	1
SPW-2032	Water	5/8/2017	H-3	147	66 \pm 73	200
SPW-2419	Water	5/9/2017	Ra-226	0.03	0.01 \pm 0.03	2
SPW-2283	Water	5/22/2017	H-3	155	24 \pm 78	200
SPW-2353	Water	5/23/2017	H-3	151	56 \pm 76	200
SPW-2890	Water	5/23/2017	Ra-226	0.03	-0.01 \pm 0.02	2
SPMI-2377	Milk	5/24/2017	Sr-89	0.78	0.86 \pm 0.93	5
SPMI-2377	Milk	5/24/2017	Sr-90	0.49	0.95 \pm 0.33	1
SPW-2438	Water	5/25/2017	Ra-228	0.90	-0.28 \pm 0.38	2
SPW-2467	Water	5/26/2017	H-3	152	27 \pm 77	200
SPW-2417	Water	5/26/2017	Ra-228	0.80	1.58 \pm 0.54	2
SPW-2447	Water	5/26/2017	I-131	0.21	-0.05 \pm 0.12	1
SPW-2501	Water	6/1/2017	H-3	151	-23 \pm 70	200
SPW-2658	Water	6/5/2017	H-3	152	107 \pm 78	200
SPW-2789	Water	6/9/2017	H-3	150	52 \pm 77	200
SPW-2797	Water	6/12/2017	H-3	177	7 \pm 93	200
SPW-2847	Water	6/14/2017	I-131	0.18	0.03 \pm 0.10	1

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b I-131(G); Iodine-131 as analyzed by gamma spectroscopy.

^c Activity reported is a net activity result.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66 σ)		
				LLD	Activity ^c	
SPW-3508	Water	6/15/2017	Ra-226	0.03	0.00 \pm 0.02	2
SPW-2942	Water	6/19/2017	Sr-89	0.58	0.80 \pm 0.53	5
SPW-2942	Water	6/19/2017	Sr-90	0.50	0.15 \pm 0.25	1
SPW-3042	Water	6/23/2017	H-3	146	25 \pm 74	200
SPW-3510	Water	6/23/2017	Ra-226	0.02	0.03 \pm 0.02	2
SPW-3102	Water	6/28/2017	H-3	148	-7 \pm 73	200
SPW-3116	Water	6/29/2017	Tc-99	5.91	-0.39 \pm 3.58	10
SPW-3512	Water	6/29/2017	Ra-226	0.02	-0.01 \pm 0.02	2
SPW-3187	Water	7/3/2017	Sr-89	0.62	0.00 \pm 0.48	5
SPW-3187	Water	7/3/2017	Sr-90	0.48	0.07 \pm 0.23	1
SPW-3282	Water	7/11/2017	H-3	178	-37 \pm 84	200
SPW-4053	Water	7/11/2017	Ra-226	0.03	0.02 \pm 0.02	2
SPW-3466	Water	7/14/2017	Gr. Alpha	0.42	-0.09 \pm 0.28	2
SPW-3466	Water	7/14/2017	Gr. Beta	0.76	-0.18 \pm 0.53	4
SPW-3448	Water	7/15/2017	H-3	150	54 \pm 77	200
SPW-3727	Water	7/27/2017	Ni-63	90	18 \pm 55	200
SPW-3793	Water	7/28/2017	H-3	151	47 \pm 82	200
SPW-3904	Water	8/3/2017	Gr. Alpha	0.47	-0.02 \pm 0.33	2
SPW-3904	Water	8/3/2017	Gr. Beta	0.75	-0.11 \pm 0.52	4
SPW-4029	Water	8/9/2017	H-3	159	11 \pm 79	200
SPW-4206	Water	8/17/2017	H-3	157	55 \pm 76	200
SPW-4241	Water	8/19/2017	H-3	190	61 \pm 96	200
SPW-4085	Water	8/14/2017	H-3	159	-28 \pm 77	200
SPW-4206	Water	8/17/2017	H-3	157	55 \pm 76	200
SPW-4241	Water	8/19/2017	H-3	190	61 \pm 96	200
SPW-4457	Water	9/1/2017	Ra-228	0.78	-0.02 \pm 0.36	2
SPW-4465	Water	9/6/2017	Sr-89	0.51	0.30 \pm 0.37	5
SPW-4465	Water	9/6/2017	Sr-90	0.46	-0.09 \pm 0.20	1
SPW-4585	Water	9/9/2017	H-3	187	-86 \pm 83	200
SPW-5720	Water	9/13/2017	Ra-226	0.02	0.13 \pm 0.02	2
SPW-4703	Water	9/15/2017	I-131	0.17	0.10 \pm 0.10	1
SPW-4719	Water	9/16/2017	H-3	184	-86 \pm 93	200
SPW-4833	Water	9/22/2017	H-3	150	5 \pm 72	200
SPW-4934	Water	9/27/2017	H-3	148	5 \pm 70	200
SPW-4936	Water	9/27/2017	Ra-228	0.80	0.55 \pm 0.44	2
SPW-5000	Water	9/29/2017	H-3	183	-13 \pm 90	200
SPW-5133	Water	10/6/2017	H-3	144	64 \pm 71	200
SPW-5273	Water	10/12/2017	H-3	142	106 \pm 72	200

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^c Activity reported is a net activity result.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration ^a		
				Laboratory results (4.66 σ)		Acceptance Criteria (4.66 σ)
				LLD	Activity ^c	
SPW-5407	Water	10/18/2017	Ni-63	69	43 \pm 43	200
SPW-5429	Water	10/19/2017	H-3	148	54 \pm 72	200
SPW-5603	Water	10/23/2017	Sr-89	0.57	0.16 \pm 0.47	5
SPW-5603	Water	10/23/2017	Sr-90	0.70	-0.12 \pm 0.31	1
SPW-5673	Water	10/25/2017	H-3	156	-36 \pm 71	200
SPW-5718	Water	10/27/2017	H-3	182	45 \pm 92	200
SPW-5943	Water	10/27/2017	Ra-226	0.02	0.08 \pm 0.02	2
SPW-5723	Water	10/30/2017	I-131	0.10	0.03 \pm 0.07	1
SPW-5914	Water	11/09/17	H-3	149	-39 \pm 68	200
SPW-5988	Water	11/11/2017	H-3	183	-8 \pm 88	200
SPW-6120	Water	11/16/2017	H-3	146	83 \pm 75	200
SPW-6131	Water	11/20/2017	H-3	151	16 \pm 72	200
SPW-6197	Water	11/29/2017	I-131	0.38	0.01 \pm 0.18	1
SPW-6248	Water	11/30/2017	Ra-226	0.03	0.15 \pm 0.03	2
SPW-6225	Water	12/1/2017	H-3	154	-10 \pm 72	200
SPW-6317	Water	12/7/2017	H-3	148	44 \pm 74	200
SPW-64	Water	12/11/2017	Ra-226	0.03	0.18 \pm 0.03	2
SPW-6436	Water	12/13/2017	Gr. Alpha	0.54	-0.17 \pm 0.37	2
SPW-6436	Water	12/13/2017	Gr. Beta	0.74	0.12 \pm 0.52	4
SPW-6464	Water	12/15/2017	H-3	148	31 \pm 75	200

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^c Activity reported is a net activity result.

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
AP-7178,7179	1/3/2017	Be-7	0.047 ± 0.015	0.062 ± 0.017	0.054 ± 0.012	Pass
SW-6986,6987	1/3/2017	Gr. Beta	1.39 ± 0.41	0.77 ± 0.41	1.08 ± 0.29	Pass
E-66,67	1/3/2017	Gr. Beta	1.62 ± 0.05	1.45 ± 0.04	1.54 ± 0.11	Pass
E-66,67	1/3/2017	K-40	1.26 ± 0.14	1.39 ± 0.16	1.32 ± 0.11	Pass
CF-87,88	1/3/2017	Be-7	0.25 ± 0.11	0.30 ± 0.12	0.28 ± 0.08	Pass
CF-87,88	1/3/2017	K-40	7.77 ± 0.39	6.84 ± 0.37	7.31 ± 0.27	Pass
AP-011217	1/12/2017	Be-7	0.137 ± 0.078	0.139 ± 0.082	0.138 ± 0.056	Pass
MI-212,213	1/16/2017	K-40	1,515 ± 98	1,347 ± 107	1,431 ± 73	Pass
WW-321,322	1/19/2017	H-3	675 ± 118	506 ± 133	590 ± 89	Pass
WW-674,675	1/20/2017	H-3	7,326 ± 254	7,717 ± 259	7,522 ± 181	Pass
AP-012317	1/23/2017	Gr. Beta	0.034 ± 0.005	0.038 ± 0.005	0.036 ± 0.004	Pass
WW-298,299	1/24/2017	H-3	5,916 ± 239	5764 ± 237	5840 ± 168	Pass
AP-013117	1/30/2017	Gr. Beta	0.027 ± 0.004	0.028 ± 0.004	0.028 ± 0.003	Pass
WW-500,501	1/31/2017	H-3	1,058 ± 122	1,054 ± 121	1,056 ± 86	Pass
SW-391,392	1/31/2017	Gr. Beta	1.40 ± 0.56	1.62 ± 0.61	1.51 ± 0.41	Pass
SPS-370,371	2/1/2017	K-40	23.47 ± 0.66	23.11 ± 0.72	23.29 ± 0.49	Pass
AP-456,457	2/2/2017	Be-7	0.129 ± 0.076	0.167 ± 0.092	0.148 ± 0.060	Pass
AP-020217	2/2/2017	Gr. Beta	0.021 ± 0.004	0.027 ± 0.004	0.024 ± 0.003	Pass
SPS-414,415	2/3/2017	K-40	19.45 ± 1.85	21.58 ± 1.99	20.52 ± 1.36	Pass
AP-020617	2/6/2017	Gr. Beta	0.023 ± 0.004	0.023 ± 0.004	0.023 ± 0.003	Pass
AP-021417A	2/14/2017	Gr. Beta	0.031 ± 0.004	0.030 ± 0.004	0.030 ± 0.003	Pass
SPW-543	2/14/2017	Gr. Beta	7.99 ± 0.82	9.45 ± 0.88	8.72 ± 0.60	Pass
AP-021417B	2/14/2017	Gr. Beta	0.024 ± 0.004	0.028 ± 0.004	0.026 ± 0.003	Pass
WW-718,719	2/14/2017	H-3	737 ± 113	643 ± 110	690 ± 79	Pass
AP-022017	2/20/2017	Gr. Beta	0.018 ± 0.005	0.021 ± 0.005	0.020 ± 0.004	Pass
WW-755,756	2/22/2017	H-3	3,709 ± 196	3,823 ± 198	3,766 ± 139	Pass
AP-022717	2/27/2017	Gr. Beta	0.021 ± 0.004	0.019 ± 0.004	0.020 ± 0.003	Pass
SPDW-80011,2	3/2/2017	Ra-226	7.29 ± 0.32	6.76 ± 0.30	7.03 ± 0.22	Pass
SPDW-80011,2	3/2/2017	Ra-228	4.68 ± 0.82	6.29 ± 1.03	5.49 ± 0.66	Pass
SPDW-80013,4	3/2/2017	Gr. Alpha	13.57 ± 1.43	12.44 ± 1.37	13.01 ± 0.99	Pass
WW-845,846	3/2/2017	H-3	314 ± 93	249 ± 90	281 ± 65	Pass
AP-030617	3/6/2017	Gr. Beta	0.022 ± 0.004	0.019 ± 0.004	0.020 ± 0.003	Pass
WW-1050,1051	3/8/2017	H-3	14,994 ± 364	14,745 ± 362	14,870 ± 257	Pass
SPS-920,921	3/9/2017	K-40	23.30 ± 1.76	23.13 ± 1.64	23.21 ± 1.20	Pass
WW-1004,1005	3/13/2017	H-3	182 ± 80	158 ± 79	170 ± 56	Pass
SPS-1029,1030	3/15/2017	K-40	11.82 ± 0.68	12.01 ± 0.68	11.92 ± 0.48	Pass
AP-031517	3/15/2017	Gr. Beta	0.020 ± 0.003	0.020 ± 0.003	0.020 ± 0.002	Pass
SPDW-80037,8	3/20/2017	Gr. Alpha	4.54 ± 0.82	5.29 ± 0.91	4.91 ± 0.61	Pass
AP-032017	3/20/2017	Gr. Beta	0.021 ± 0.006	0.021 ± 0.006	0.021 ± 0.005	Pass
WW-1094,1095	3/20/2017	H-3	1,571 ± 137	1,595 ± 138	1,583 ± 175	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
WW-1175,1176	3/20/2017	H-3	218 ± 84	211 ± 84	214 ± 59	Pass
WW-1129,1130	3/21/2017	Gr. Beta	3.51 ± 1.24	2.99 ± 1.17	3.25 ± 0.85	Pass
WW-1219,1220	3/22/2017	H-3	11,467 ± 322	11,516 ± 323	11,492 ± 200	Pass
SPS-1152,1153	3/27/2017	Ac-228	20.39 ± 0.75	20.43 ± 0.88	20.41 ± 0.58	Pass
SPS-1152,1153	3/27/2017	Pb-214	17.22 ± 0.50	16.44 ± 0.52	16.83 ± 0.36	Pass
SPDW-80047,8	3/28/2017	Ra-226	2.06 ± 0.23	1.60 ± 0.32	1.83 ± 0.20	Pass
SPDW-80047,8	3/28/2017	Ra-228	0.53 ± 0.48	0.78 ± 0.49	0.66 ± 0.34	Pass
SWU-1242,1243	3/28/2017	Gr. Beta	2.04 ± 0.81	2.47 ± 0.69	2.26 ± 0.53	Pass
SPS-1198,1199	3/29/2017	K-40	16.95 ± 1.85	18.33 ± 1.71	17.64 ± 1.26	Pass
SPDW-80050,1	3/29/2017	Gr. Alpha	3.19 ± 0.80	3.39 ± 0.78	3.29 ± 0.56	Pass
SPDW-80050,1	3/29/2017	Gr. Beta	1.58 ± 0.60	2.08 ± 0.63	1.83 ± 0.44	Pass
AP-1706,1707	3/30/2017	Be-7	0.068 ± 0.018	0.072 ± 0.017	0.070 ± 0.012	Pass
SW-1381,1382	4/5/2017	H-3	402 ± 92	309 ± 88	356 ± 64	Pass
WW-1446,1447	4/6/2017	H-3	305 ± 89	358 ± 91	332 ± 64	Pass
WW-1532,1533	4/10/2017	H-3	19,124 ± 412	18,991 ± 410	19,058 ± 291	Pass
WW-1618,1619	4/12/2017	H-3	4,187 ± 203	4,305 ± 205	4,246 ± 144	Pass
SS-1553,1554	4/13/2017	Gr. Beta	7.16 ± 0.99	6.09 ± 0.91	6.63 ± 0.67	Pass
SS-1553,1554	4/13/2017	K-40	4.60 ± 0.32	4.84 ± 0.34	4.72 ± 0.23	Pass
SS-1553,1554	4/13/2017	Tl-208	0.038 ± 0.016	0.032 ± 0.011	0.035 ± 0.010	Pass
SS-1553,1554	4/13/2017	Pb-212	0.101 ± 0.015	0.096 ± 0.015	0.098 ± 0.010	Pass
SS-1553,1554	4/13/2017	Bi-214	0.094 ± 0.032	0.109 ± 0.022	0.101 ± 0.019	Pass
SS-1553,1554	4/13/2017	Ac-228	0.089 ± 0.042	0.111 ± 0.046	0.100 ± 0.031	Pass
P-2015,2016	5/4/2017	H-3	189 ± 80	212 ± 81	200 ± 57	Pass
WW-2336,2337	5/8/2017	H-3	422 ± 97	298 ± 91	360 ± 66	Pass
AP-051117	5/11/2017	Gr. Beta	0.018 ± 0.003	0.025 ± 0.004	0.021 ± 0.002	Pass
WW-2497,2498	5/23/2017	H-3	1,268 ± 127	1,247 ± 126	1,257 ± 89	Pass
WW-2583,2584	5/23/2017	H-3	5,159 ± 224	5,223 ± 126	5,191 ± 129	Pass
WW-2732,2733	5/23/2017	H-3	8,559 ± 282	8,570 ± 283	8,564 ± 200	Pass
XW-1218,1219	5/23/2017	H-3	11,467 ± 282	11,516 ± 283	11,492 ± 200	Pass
MI-2428,2429	5/24/2017	K-40	1,752 ± 137	1,805 ± 132	1,778 ± 95	Pass
SO-2562,2563	5/24/2017	K-40	7.87 ± 0.50	8.64 ± 0.49	8.25 ± 0.35	Pass
WW-3023,3024	5/24/2017	H-3	27,398 ± 486	27,733 ± 489	27,565 ± 344	Pass
SO-2453,2454	5/25/2017	Gr. Beta	14.38 ± 0.93	15.70 ± 1.06	15.04 ± 0.70	Pass
SO-2453,2454	5/25/2017	Cs-137	0.17 ± 0.03	0.18 ± 0.03	0.17 ± 0.02	Pass
SO-2453,2454	5/25/2017	K-40	9.80 ± 0.50	9.19 ± 0.57	9.50 ± 0.38	Pass
SO-2453,2454	5/25/2017	Tl-208	0.09 ± 0.02	0.10 ± 0.03	0.09 ± 0.02	Pass
SO-2453,2454	5/25/2017	Pb-212	0.29 ± 0.03	0.30 ± 0.03	0.29 ± 0.02	Pass
SO-2453,2454	5/25/2017	Bi-214	0.24 ± 0.03	0.18 ± 0.04	0.21 ± 0.03	Pass
SO-2453,2454	5/25/2017	Ra-226	0.82 ± 0.22	0.62 ± 0.27	0.72 ± 0.17	Pass
SO-2453,2454	5/25/2017	Ac-228	0.32 ± 0.07	0.28 ± 0.08	0.30 ± 0.05	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
SWT-2625,2626	5/30/2017	Gr. Beta	0.64 ± 0.53	1.08 ± 0.55	0.86 ± 0.38	Pass
AP-053117	5/31/2017	Gr. Beta	0.013 ± 0.003	0.011 ± 0.003	0.012 ± 0.002	Pass
G-2646,2647	6/1/2017	Be-7	1.02 ± 0.17	1.06 ± 0.26	1.04 ± 0.15	Pass
G-2646,2647	6/1/2017	K-40	7.51 ± 0.49	6.55 ± 0.51	7.03 ± 0.36	Pass
SL-2669,70	6/1/2017	Be-7	0.34 ± 0.06	0.30 ± 0.06	0.32 ± 0.04	Pass
SL-2669,70	6/1/2017	K-40	4.35 ± 0.14	4.39 ± 0.15	4.37 ± 0.10	Pass
F-2711,2712	6/2/2017	K-40	2.56 ± 0.32	2.77 ± 0.44	2.66 ± 0.27	Pass
AP-060617	6/6/2017	Gr. Beta	0.026 ± 0.005	0.027 ± 0.005	0.027 ± 0.004	Pass
SW-2849,50	6/8/2017	H-3	8,178 ± 273	8,563 ± 279	8,371 ± 195	Pass
AP-061217	6/12/2017	Gr. Beta	0.027 ± 0.005	0.027 ± 0.005	0.027 ± 0.004	Pass
BS-3446,3447	6/12/2017	K-40	8.30 ± 0.47	8.57 ± 0.47	8.44 ± 0.33	Pass
VE-2870,2871	6/13/2017	K-40	3.65 ± 0.25	3.90 ± 0.26	3.77 ± 0.18	Pass
AP-2914,5	6/15/2017	Be-7	0.269 ± 0.146	0.212 ± 0.123	0.240 ± 0.095	Pass
AP-3067,8	6/15/2017	Be-7	0.204 ± 0.113	0.328 ± 0.126	0.266 ± 0.085	Pass
AP-061917	6/19/2017	Gr. Beta	0.020 ± 0.004	0.019 ± 0.004	0.020 ± 0.003	Pass
AP-3610,1	6/26/2017	Be-7	0.107 ± 0.015	0.116 ± 0.021	0.111 ± 0.013	Pass
AP-062617	6/26/2017	Gr. Beta	0.017 ± 0.004	0.021 ± 0.004	0.019 ± 0.003	Pass
AP-3673,3674	7/3/2017	Be-7	0.087 ± 0.008	0.078 ± 0.008	0.083 ± 0.006	Pass
AP-3287,3288	7/6/2017	Be-7	0.207 ± 0.112	0.244 ± 0.096	0.226 ± 0.074	Pass
WW-3308,3309	7/7/2017	H-3	549 ± 108	501 ± 107	525 ± 76	Pass
VE-3362,3363	7/12/2017	K-40	2.32 ± 0.17	2.40 ± 0.16	2.36 ± 0.12	Pass
VE-3589,3590	7/18/2017	K-40	5.25 ± 0.33	4.64 ± 0.33	4.94 ± 0.23	Pass
SG-3631,3632	7/18/2017	Pb-214	3.03 ± 0.11	2.97 ± 0.11	3.00 ± 0.08	Pass
SG-3631,3632	7/18/2017	Ac-228	2.47 ± 0.22	2.56 ± 0.23	2.52 ± 0.16	Pass
WW-3846,3847	7/25/2017	H-3	505 ± 101	446 ± 98	475 ± 70	Pass
F-4509,4510	7/26/2017	K-40	0.85 ± 0.25	1.00 ± 0.25	0.93 ± 0.18	Pass
F-4509,4510	7/26/2017	Gr. Beta	1.19 ± 0.03	1.18 ± 0.03	1.18 ± 0.02	Pass
G-3804,3805	7/27/2017	Be-7	3.72 ± 0.39	3.47 ± 0.40	3.59 ± 0.28	Pass
G-3804,3805	7/27/2017	K-40	4.21 ± 0.52	4.46 ± 0.52	4.34 ± 0.33	Pass
SL-3888,3889	8/1/2017	Be-7	0.77 ± 0.04	0.73 ± 0.07	0.75 ± 0.04	Pass
SL-3888,3889	8/1/2017	K-40	0.94 ± 0.04	0.87 ± 0.08	0.90 ± 0.23	Pass
WW-4158,4159	8/8/2017	H-3	321 ± 90	270 ± 88	295 ± 63	Pass
VE-4179,4180	8/14/2017	K-40	1.84 ± 0.18	1.90 ± 0.21	1.87 ± 0.14	Pass
AP-4289,4290	8/17/2017	Be-7	0.212 ± 0.095	0.162 ± 0.080	0.187 ± 0.062	Pass
F-4333,4334	8/18/2017	K-40	3.22 ± 0.41	3.62 ± 0.42	3.42 ± 0.29	Pass
CF-4310,4311	8/21/2017	K-40	10.94 ± 0.74	11.48 ± 0.50	11.21 ± 0.45	Pass
DW-80161,80162	8/22/2017	Ra-226	1.22 ± 0.15	1.19 ± 0.17	1.21 ± 0.11	Pass
DW-80161,80162	8/22/2017	Ra-228	1.99 ± 0.63	0.70 ± 0.49	1.35 ± 0.40	Pass
VE-4398,4399	8/28/2017	Be-7	0.13 ± 0.07	0.13 ± 0.08	0.13 ± 0.05	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration ^a			Acceptance
			First Result	Second Result	Averaged Result	
VE-4398,4399	8/28/2017	K-40	3.32 ± 0.22	3.48 ± 0.25	3.40 ± 0.17	Pass
SW-4463,4464	8/29/2017	H-3	495 ± 106	491 ± 106	493 ± 75	Pass
LW-4486,4487	8/31/2017	Gr. Beta	0.425 ± 0.471	1.358 ± 0.571	0.892 ± 0.370	Pass
VE-4561,4562	9/6/2017	Be-7	5.89 ± 0.29	5.76 ± 0.25	5.83 ± 0.19	Pass
VE-4561,4562	9/6/2017	K-40	3.73 ± 0.34	3.77 ± 0.29	3.75 ± 0.22	Pass
BO-5122,5123	9/8/2017	K-40	4.50 ± 0.36	4.50 ± 0.36	4.50 ± 0.25	Pass
VE-4692,4693	9/12/2017	K-40	5.16 ± 0.13	5.31 ± 0.36	5.24 ± 0.19	Pass
SS-4650,4651	9/12/2017	K-40	10.55 ± 0.51	10.41 ± 0.54	10.48 ± 0.37	Pass
MI-4671,4672	9/13/2017	K-40	1,347 ± 115	1,283 ± 118	1,315 ± 82	Pass
MI-4671,4672	9/13/2017	Sr-90	0.7 ± 0.3	0.5 ± 0.3	0.6 ± 0.2	Pass
VE-4973,4974	9/17/2017	K-40	1.11 ± 0.15	1.17 ± 0.13	1.14 ± 0.10	Pass
F-4928,4929	9/19/2017	K-40	1.84 ± 0.31	1.68 ± 0.34	1.76 ± 0.23	Pass
S-4865,4866	9/20/2017	K-40	21.07 ± 2.39	19.09 ± 2.51	20.08 ± 1.73	Pass
VE-4907,4908	9/20/2017	K-40	3.83 ± 0.44	4.28 ± 0.31	4.05 ± 0.27	Pass
VE-4844,4845	9/21/2017	K-40	1.81 ± 0.22	1.88 ± 0.21	1.84 ± 0.15	Pass
AP-5572,5573	9/27/2017	Be-7	0.082 ± 0.015	0.075 ± 0.014	0.078 ± 0.010	Pass
LW-5145,5146	9/28/2017	Gr. Beta	0.84 ± 0.49	1.47 ± 0.57	1.16 ± 0.38	Pass
AP-092917	9/29/2017	Gr. Beta	0.038 ± 0.004	0.031 ± 0.004	0.035 ± 0.003	Pass
WW-5080,5081	10/2/2017	H-3	208 ± 79	223 ± 80	215 ± 56	Pass
AP-100217	10/2/2017	Gr. Beta	0.025 ± 0.005	0.028 ± 0.005	0.026 ± 0.003	Pass
AP-100317	10/3/2017	Gr. Beta	0.037 ± 0.004	0.033 ± 0.004	0.035 ± 0.003	Pass
S-5165,5166	10/4/2017	K-40	15.93 ± 2.30	20.34 ± 3.15	18.14 ± 1.95	Pass
VE-5228,5229	10/5/2017	K-40	3.25 ± 0.25	2.82 ± 0.24	3.04 ± 0.17	Pass
AP-100917	10/9/2017	Gr. Beta	0.021 ± 0.004	0.025 ± 0.004	0.023 ± 0.003	Pass
VE-5293,5294	10/10/2017	K-40	3.89 ± 0.30	4.08 ± 0.34	3.99 ± 0.22	Pass
DW-80184,80185	10/11/2017	Gr. Alpha	2.17 ± 0.81	2.50 ± 0.81	2.34 ± 0.57	Pass
DW-80184,80185	10/11/2017	Gr. Beta	9.45 ± 0.79	10.20 ± 0.83	9.83 ± 0.57	Pass
S-5421,5422	10/12/2017	K-40	8.82 ± 1.94	7.97 ± 0.72	8.40 ± 1.03	Pass
AP-101617	10/16/2017	Gr. Beta	0.025 ± 0.005	0.022 ± 0.004	0.024 ± 0.003	Pass
F-5658,5659	10/19/2017	K-40	2.44 ± 0.41	2.57 ± 0.39	2.51 ± 0.28	Pass
SO-5704,5705	10/25/2017	Cs-137	0.05 ± 0.02	0.04 ± 0.02	0.04 ± 0.01	Pass
SO-5704,5705	10/25/2017	K-40	10.08 ± 0.51	9.57 ± 0.56	9.83 ± 0.38	Pass
SO-5704,5705	10/25/2017	Tl-208	0.10 ± 0.02	0.09 ± 0.02	0.10 ± 0.01	Pass
SO-5704,5705	10/25/2017	Bi-214	0.34 ± 0.04	0.27 ± 0.04	0.30 ± 0.03	Pass
SO-5704,5705	10/25/2017	Pb-212	0.28 ± 0.03	0.27 ± 0.03	0.27 ± 0.02	Pass
SO-5704,5705	10/25/2017	Ra-226	1.15 ± 0.52	0.59 ± 0.22	0.87 ± 0.28	Pass
SO-5704,5705	10/25/2017	Ac-228	0.33 ± 0.05	0.31 ± 0.07	0.32 ± 0.04	Pass
SO-5704,5705	10/25/2017	Gr. Beta	18.34 ± 1.80	16.50 ± 1.03	17.42 ± 1.04	Pass
AP-5732,5733	10/26/2017	Be-7	0.139 ± 0.064	0.175 ± 0.075	0.157 ± 0.049	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
SW-5753,5754	10/31/2017	H-3	220 ± 83	279 ± 86	249 ± 60	Pass
SWU-5816,5817	10/31/2017	Gr. Beta	1.51 ± 1.00	2.02 ± 1.02	1.76 ± 0.71	Pass
AP-103117	10/31/2017	Gr. Beta	0.015 ± 0.004	0.014 ± 0.004	0.015 ± 0.003	Pass
SO-5923,5924	11/1/2017	Cs-137	0.30 ± 0.04	0.31 ± 0.04	0.31 ± 0.03	Pass
SO-5923,5924	11/1/2017	K-40	10.52 ± 0.61	10.56 ± 0.67	10.54 ± 0.45	Pass
AP-5858,5859	11/2/2017	Be-7	0.145 ± 0.075	0.146 ± 0.084	0.145 ± 0.056	Pass
AP-110717	11/7/2017	Be-7	0.026 ± 0.004	0.030 ± 0.004	0.028 ± 0.003	Pass
WW-6032,6033	11/7/2017	H-3	204 ± 86	298 ± 80	251 ± 59	Pass
WW-6074,6075	11/8/2017	H-3	72,247 ± 786	73,062 ± 791	72,655 ± 558	Pass
BS-6053,6054	11/13/2017	K-40	7.99 ± 0.62	9.20 ± 0.68	8.60 ± 0.46	Pass
BS-6053,6054	11/13/2017	Cs-137	0.07 ± 0.03	0.08 ± 0.03	0.07 ± 0.02	Pass
DW-80211,80212	11/14/2017	Gr. Alpha	2.30 ± 0.80	3.60 ± 1.00	2.95 ± 0.64	Pass
DW-80211,80212	11/14/2017	Gr. Beta	9.32 ± 0.81	8.99 ± 0.81	9.16 ± 0.57	Pass
DW-80214,80215	11/14/2017	Ra-226	1.36 ± 0.22	1.35 ± 0.15	1.355 ± 0.13	Pass
DW-80214,80215	11/14/2017	Ra-228	1.41 ± 0.51	0.90 ± 0.45	1.16 ± 0.34	Pass
WW-6152,6153	11/15/2017	H-3	416 ± 94	328 ± 90	372 ± 65	Pass
SWU-6219,6220	11/28/2017	Gr. Beta	1.04 ± 0.54	1.75 ± 0.58	1.39 ± 0.39	Pass
SS-6242,6243	11/29/2017	K-40	24.17 ± 1.05	22.31 ± 1.03	23.24 ± 0.74	Pass
SS-6242,6243	11/29/2017	Cs-137	0.11 ± 0.03	0.08 ± 0.03	0.10 ± 0.02	Pass
SG-6938,6939	11/28/2017	Pb-214	15.28 ± 0.34	14.96 ± 0.43	15.12 ± 0.27	Pass
SG-6938,6939	11/28/2017	Ac-228	18.99 ± 0.59	19.92 ± 0.79	19.46 ± 0.49	Pass
AP-112817	11/28/2017	Gr. Beta	0.026 ± 0.004	0.030 ± 0.004	0.028 ± 0.003	Pass
SQ-6286,6287	12/1/2017	Gr. Alpha	70.6 ± 6.2	60.9 ± 6.0	65.8 ± 4.3	Pass
SQ-6286,6287	12/1/2017	Gr. Beta	48.9 ± 2.7	53.7 ± 2.8	51.3 ± 1.9	Pass
SQ-6286,6287	12/1/2017	Ra-226	11.3 ± 0.4	10.7 ± 0.5	11.0 ± 0.3	Pass
SQ-6286,6287	12/1/2017	Ra-228	13.5 ± 0.9	13.2 ± 1.0	13.4 ± 0.7	Pass
SG-6286,6287	12/1/2017	K-40	5.10 ± 1.82	6.65 ± 1.53	5.88 ± 1.19	Pass
AP-120417	12/4/2017	Gr. Beta	0.037 ± 0.006	0.035 ± 0.005	0.036 ± 0.004	Pass
WW-6548,6549	12/19/2017	H-3	8,428 ± 280	8,604 ± 282	8,516 ± 199	Pass
AP-122717	12/27/2017	Gr. Beta	0.047 ± 0.004	0.043 ± 0.004	0.045 ± 0.003	Pass
XAP-6762,6763	12/31/2017	Co-60	2.43 ± 1.30	2.24 ± 0.82	2.34 ± 0.77	Pass
XAP-6762,6763	12/31/2017	Cs-137	4.21 ± 1.11	4.05 ± 0.96	4.14 ± 0.73	Pass

Note: Duplicate analyses are performed on every twentieth sample received in-house. Results are not listed for those analyses with activities that measure below the LLD.

^a Results are reported in units of pCi/L, except for air filters (pCi/Filter or pCi/m³), food products, vegetation, soil and sediment (pCi/g).

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Laboratory result	Concentration ^a		Acceptance
				Known Activity	Control Limits ^c	
MASO-903	2/1/2017	Am-241	60.9 ± 6.9	67.0	46.9 - 87.1	Pass
MASO-903	2/1/2017	Cs-134	1360 ± 14	1550	1085 - 2015	Pass
MASO-903	2/1/2017	Cs-137	678 ± 13	611	428 - 794	Pass
MASO-903	2/1/2017	Co-57	1.63 ± 1.69	0.00	NA ^c	Pass
MASO-903	2/1/2017	Co-60	909 ± 12	891	624 - 1158	Pass
MASO-903	2/1/2017	Mn-54	1052 ± 17	967	677 - 1257	Pass
MASO-903	2/1/2017	K-40	657 ± 68	607	425 - 789	Pass
MASO-903	2/1/2017	Zn-65	-0.52 ± 7.40	0.00	NA ^c	Pass
MASO-903	2/1/2017	Ni-63	3.25 ± 7.17	0.00	NA ^c	Pass
MASO-903	2/1/2017	Pu-238	0.46 ± 0.69	0.41	NA ^a	Pass
MASO-903	2/1/2017	Pu-239/240	56.8 ± 5.9	59.8	41.9 - 77.7	Pass
MASO-903	2/1/2017	Sr-90	501 ± 17	624	437 - 811	Pass
MASO-903	2/1/2017	Tc-99	748 ± 16	656	459 - 853	Pass
MAW-849	2/1/2017	I-129	-0.05 ± 0.12	0.00	NA ^c	Pass
MAVE-905	2/1/2017	Cs-134	6.61 ± 0.16	6.95	4.87 - 9.04	Pass
MAVE-905	2/1/2017	Cs-137	4.97 ± 0.18	4.60	3.22 - 5.98	Pass
MAVE-905	2/1/2017	Co-57	-0.01 ± 0.03	0.00	NA ^c	Pass
MAVE-905	2/1/2017	Co-60	9.51 ± 0.17	8.75	6.13 - 11.38	Pass
MAVE-905	2/1/2017	Mn-54	3.67 ± 0.17	3.28	2.30 - 4.26	Pass
MAVE-905	2/1/2017	Zn-65	6.12 ± 0.44	5.39	3.77 - 7.01	Pass
MAW-847	2/1/2017	Am-241	0.679 ± 0.079	0.846	0.592 - 1.100	Pass
MAW-847	2/1/2017	Cs-134	0.03 ± 0.10	0.00	NA ^c	Pass
MAW-847	2/1/2017	Cs-137	12.7 ± 0.4	11.1	7.8 - 14.4	Pass
MAW-847 ^d	2/1/2017	Co-57	2.7 ± 0.3	28.5	20.0 - 37.1	Fail
MAW-847	2/1/2017	Co-60	13.5 ± 0.3	12.3	8.6 - 16.0	Pass
MAW-847	2/1/2017	Mn-54	16.5 ± 0.4	14.9	10.4 - 19.4	Pass
MAW-847	2/1/2017	K-40	287 ± 6	254	178 - 330	Pass
MAW-847	2/1/2017	Zn-65	-0.15 ± 0.23	0.00	NA ^c	Pass
MAW-847	2/1/2017	H-3	275 ± 10	249	174 - 324	Pass
MAW-847	2/1/2017	Fe-55	2.4 ± 13.6	1.7	NA ^a	Pass
MAW-847	2/1/2017	Ni-63	10.1 ± 2.8	12.2	8.5 - 15.9	Pass
MAW-847	2/1/2017	Pu-238	0.729 ± 0.097	0.703	0.492 - 0.914	Pass
MAW-847	2/1/2017	Pu-239/240	0.866 ± 0.102	0.934	0.654 - 1.214	Pass
MAW-847	2/1/2017	Ra-226	0.506 ± 0.053	0.504	0.353 - 0.655	Pass
MAW-847	2/1/2017	Sr-90	10.0 ± 0.8	10.1	7.1 - 13.1	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Concentration ^a			Acceptance
			Laboratory result	Known Activity	Control Limits ^c	
MAW-847	2/1/2017	Tc-99	4.77 ± 0.62	6.25	4.38 - 8.13	Pass
MAW-847	2/1/2017	U-234/233	1.19 ± 0.10	1.16	0.81 - 1.51	Pass
MAW-847	2/1/2017	U-238	1.15 ± 0.10	1.20	0.84 - 1.56	Pass
MAAP-907 ^d	2/1/2017	Am-241	0.0540 ± 0.0140	0.0376	0.0263 - 0.0489	Fail
MAAP-907	2/1/2017	Cs-134	1.31 ± 0.06	1.42	0.99 - 1.85	Pass
MAAP-907	2/1/2017	Cs-137	0.797 ± 0.080	0.685	0.480 - 0.891	Pass
MAAP-907	2/1/2017	Co-57	1.86 ± 0.06	1.70	1.19 - 2.21	Pass
MAAP-907	2/1/2017	Co-60	0.86 ± 0.05	0.78	0.55 - 1.01	Pass
MAAP-907	2/1/2017	Mn-54	0.01 ± 0.03	0.00	NA ^c	Pass
MAAP-907	2/1/2017	Zn-65	1.62 ± 0.13	1.29	0.90 - 1.68	Pass
MAAP-907	2/1/2017	Pu-238	0.0530 ± 0.0190	0.0598	0.0419 - 0.0777	Pass
MAAP-907	2/1/2017	Pu-239/240	0.0490 ± 0.0160	0.0460	0.0322 - 0.0598	Pass
MAAP-907	2/1/2017	Sr-90	0.648 ± 0.120	0.651	0.456 - 0.846	Pass
MAAP-907	2/1/2017	U-234/233	0.086 ± 0.024	0.104	0.073 - 0.135	Pass
MAAP-907	2/1/2017	U-238	0.097 ± 0.024	0.107	0.075 - 0.139	Pass
MASO-4515	8/1/2017	Am-241	45.9 ± 7.0	58.8	41.2 - 76.4	Pass ^g
MASO-4515	8/1/2017	Cs-134	409 ± 7	448	314 - 582	Pass ^g
MASO-4515	8/1/2017	Cs-137	798 ± 12	722	505 - 939	Pass ^g
MASO-4515	8/1/2017	Co-57	1572 ± 10	1458	1021 - 1895	Pass ^g
MASO-4515	8/1/2017	Co-60	0.2 ± 1.4	0.00	NA ^c	Pass ^g
MASO-4515	8/1/2017	Mn-54	934 ± 13	825	578 - 1073	Pass ^g
MASO-4515	8/1/2017	K-40	704 ± 53	592	414 - 770	Pass ^g
MASO-4515	8/1/2017	Zn-65	667 ± 17	559	391 - 727	Pass ^g
MASO-4515	8/1/2017	Pu-238	101 ± 9	92	64 - 120	Pass ^g
MASO-4515	8/1/2017	Pu-239/240	74.8 ± 7.7	68.8	48.2 - 89.4	Pass ^g
MASO-4515	8/1/2017	Sr-90	252 ± 7	289	202 - 376	Pass ^g
MAW-4494	8/1/2017	I-129	2.31 ± 0.10	2.31	1.62 - 3.00	Pass
MAVE-4517	8/1/2017	Cs-134	2.40 ± 0.10	2.32	1.62 - 3.02	Pass
MAVE-4517	8/1/2017	Cs-137	-0.002 ± 0.048	0.000	NA ^c	Pass
MAVE-4517	8/1/2017	Co-57	3.3 ± 0.1	2.8	2.0 - 3.6	Pass
MAVE-4517	8/1/2017	Co-60	2.10 ± 0.10	2.07	1.45 - 2.69	Pass
MAVE-4517	8/1/2017	Mn-54	3.00 ± 0.20	2.62	1.83 - 3.41	Pass
MAVE-4517	8/1/2017	Zn-65	5.90 ± 0.30	5.37	3.76 - 6.98	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Concentration ^a			Acceptance
			Laboratory result	Known Activity	Control Limits ^c	
MAW-4513	8/1/2017	Am-241	0.820 ± 0.220	0.892	0.624 - 1.160	Pass
MAW-4513	8/1/2017	Cs-134	10.3 ± 0.3	11.5	8.1 - 15.0	Pass
MAW-4513	8/1/2017	Cs-137	17.2 ± 0.5	16.3	11.4 - 21.2	Pass
MAW-4513	8/1/2017	Co-57	12.7 ± 0.4	12.1	8.5 - 15.7	Pass
MAW-4513	8/1/2017	Co-60	10.6 ± 0.3	10.7	7.5 - 13.9	Pass
MAW-4513	8/1/2017	Mn-54	15.6 ± 0.4	14.9	10.4 - 19.4	Pass
MAW-4513	8/1/2017	Zn-65	15.9 ± 0.7	15.5	10.9 - 20.2	Pass
MAW-4513	8/1/2017	H-3	255 ± 9	258	181 - 335	Pass
MAW-4513	8/1/2017	Fe-55	21.6 ± 6.6	19.4	13.6 - 25.2	Pass
MAW-4513	8/1/2017	Ni-63	-0.1 ± 2.0	0.0	NA ^c	Pass
MAW-4513	8/1/2017	Pu-238	0.590 ± 0.080	0.603	0.422 - 0.784	Pass
MAW-4513	8/1/2017	Pu-239/240	0.740 ± 0.090	0.781	0.547 - 1.015	Pass
MAW-4513	8/1/2017	Ra-226	1.000 ± 0.100	0.858	0.601 - 1.115	Pass
MAW-4513	8/1/2017	Sr-90	7.80 ± 0.60	7.77	5.44 - 10.10	Pass
MAW-4513	8/1/2017	Tc-99	6.70 ± 0.40	6.73	4.71 - 8.75	Pass
MAW-4513	8/1/2017	U-2344/233	0.94 ± 0.06	1.01	0.71 - 1.31	Pass
MAW-4513	8/1/2017	U-238	0.97 ± 0.07	1.04	0.73 - 1.35	Pass
MAAP-4519 ^h	8/1/2017	Am-241	0.0400 ± 0.0100	0.0612	0.0428 - 0.0796	Fail
MAAP-4519	8/1/2017	Cs-134	0.90 ± 0.10	1.00	0.70 - 1.30	Pass
MAAP-4519	8/1/2017	Cs-137	0.90 ± 0.10	0.82	0.57 - 1.07	Pass
MAAP-4519	8/1/2017	Co-57	0.01 ± 0.01	0.00	NA ^c	Pass
MAAP-4519	8/1/2017	Co-60	0.70 ± 0.10	0.68	0.48 - 0.88	Pass
MAAP-4519	8/1/2017	Mn-54	1.50 ± 0.10	1.30	0.91 - 1.69	Pass
MAAP-4519	8/1/2017	Zn-65	1.30 ± 0.10	1.08	0.76 - 1.40	Pass
MAAP-4519	8/1/2017	Pu-238	0.0300 ± 0.0100	0.0298	0.0209 - 0.0387	Pass
MAAP-4519	8/1/2017	Pu-239/240	0.0400 ± 0.0200	0.0468	0.0328 - 0.0608	Pass
MAAP-4519	8/1/2017	Sr-90	0.800 ± 0.100	0.801	0.561 - 1.041	Pass
MAAP-4519	8/1/2017	U-234/233	0.070 ± 0.010	0.084	0.059 - 0.109	Pass
MAAP-4519	8/1/2017	U-238	0.090 ± 0.010	0.087	0.061 - 0.113	Pass

^a Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

^b Laboratory codes as follows: MAW (water), MAAP (air filter), MASO (soil), MAVE (vegetation).

^c MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP. A known value of "zero" indicates an analysis was included in the testing series as a "false positive". MAPEP does not provide control limits.

^d Decimal point was misplaced while performing a unit conversion. The result is within control limits when the proper unit conversion is performed.

^e Provided in the series for "sensitivity evaluation". MAPEP does not provide control limits.

^f Sample was reanalyzed in duplicate with acceptable results. Original plating was inferior to platings obtained during reanalysis. It is believed that isotopic tracer was not accurately quantified due to poor resolution of its peak.

^g Data were erroneously submitted in units of Bq/g. All results pass MAPEP criteria when evaluated in units of Bq/Kg.

^h Laboratory is not currently offering analysis for Am-241 in Air Particulate samples.

TABLE A-7. Interlaboratory Comparison Crosscheck Program, Environmental Resource Associates (ERA)^a.

MRAD Study						
Lab Code ^b	Date	Analysis	Concentration ^a		Control Limits ^c	Acceptance
			Laboratory Result	ERA Result		
ERAP-1112	3/20/2017	Am-241	55.3 ± 2.8	76.4	47.1 - 103.0	Pass
ERAP-1112	3/20/2017	Co-60	1,230 ± 8	1030	797 - 1290	Pass
ERAP-1112	3/20/2017	Cs-134	1,110 ± 9	1100	700 - 1360	Pass
ERAP-1112	3/20/2017	Cs-137	1,810 ± 12	1,390	1,040 - 1,830	Pass
ERAP-1112 ^d	3/20/2017	Fe-55	590 ± 385	256	79.4 - 500	Fail
ERAP-1112	3/20/2017	Mn-54	< 5.14	< 50.0	0.00 - 50.0	Pass
ERAP-1112	3/20/2017	Pu-238	54.6 ± 2.8	54.3	37.2 - 71.4	Pass
ERAP-1112	3/20/2017	Pu-239/240	63.6 ± 3.0	62.0	44.9 - 81.0	Pass
ERAP-1112	3/20/2017	Sr-90	55.3 ± 8.3	52.4	25.6 - 78.5	Pass
ERAP-1112	3/20/2017	U-233/234	65.7 ± 3.0	73.1	45.3 - 110	Pass
ERAP-1112	3/20/2017	U-238	67.3 ± 3.0	72.4	46.8 - 100	Pass
ERAP-1112	3/20/2017	Zn-65	1,355 ± 16	984	705 - 1,360	Pass
ERAP-1114	3/20/2017	Gr. Alpha	106 ± 5	85.5	28.6 - 133	Pass
ERAP-1114 ^e	3/20/2017	Gr. Beta	67.6 ± 3.0	45.2	28.6 - 65.9	Fail
ERSO-1116	3/20/2017	Am-241	418 ± 98	448	262 - 582	Pass
ERSO-1116	3/20/2017	Ac-228	1,540 ± 260	1,240	795 - 1,720	Pass
ERSO-1116	3/20/2017	Bi-212	1,550 ± 90	1,240	330 - 1,820	Pass
ERSO-1116	3/20/2017	Bi-214	2,560 ± 20	2,750	1,660 - 3,960	Pass
ERSO-1116	3/20/2017	Co-60	4,620 ± 100	4,430	3,000 - 6,100	Pass
ERSO-1116	3/20/2017	Cs-134	8,340 ± 100	8,860	5,790 - 10,600	Pass
ERSO-1116	3/20/2017	Cs-137	8,420 ± 100	7,500	5,750 - 9,650	Pass
ERSO-1116	3/20/2017	K-40	13,600 ± 900	10,600	7,740 - 14,200	Pass
ERSO-1116	3/20/2017	Mn-54	< 68.1	< 1000	0.00 - 1,000	Pass
ERSO-1116	3/20/2017	Pb-212	1,060 ± 70	1,240	812 - 1,730	Pass
ERSO-1116	3/20/2017	Pb-214	2,620 ± 160	2,890	1,690 - 4,310	Pass
ERSO-1116	3/20/2017	Pu-238	424 ± 154	648	390 - 894	Pass
ERSO-1116 ^f	3/20/2017	Pu-239/240	252 ± 112	484	316 - 669	Fail
ERSO-1116 ^g	3/20/2017	Pu-239/240	436 ± 106	484	316 - 669	Pass
ERSO-1116	3/20/2017	Sr-90	7,930 ± 250	9,150	3,490 - 14,500	Pass
ERSO-1116	3/20/2017	Th-234	1,820 ± 200	1,940	614 - 3,650	Pass
ERSO-1116 ^h	3/20/2017	U-233/234	1,030 ± 130	1,950	1,190 - 2,500	Fail
ERSO-1116 ⁱ	3/20/2017	U-233/234	1,820 ± 200	1,950	1,190 - 2,500	Pass
ERSO-1116	3/20/2017	U-238	1,240 ± 140	1,940	1,200 - 2,460	Pass
ERSO-1116 ^j	3/20/2017	U-238	1,930 ± 200	1,940	1,200 - 2,460	Pass
ERSO-1116	3/20/2017	Zn-65	7,190 ± 240	6,090	4,850 - 8,090	Pass
ERW-1122	3/20/2017	Gr. Alpha	65.3 ± 2.4	89.5	31.8 - 139	Pass
ERW-1122	3/20/2017	Gr. Beta	54.8 ± 1.5	61.0	34.9 - 90.4	Pass
ERW-1124	3/20/2017	H-3	19,000 ± 410	19,400	13,000 - 27,700	Pass

TABLE A-7. Interlaboratory Comparison Crosscheck Program, Environmental Resource Associates (ERA)^a.

MRAD Study						
Lab Code ^b	Date	Analysis	Concentration ^a		Control Limits ^c	Acceptance
			Laboratory Result	ERA Result		
ERVE-1118	3/20/2017	Am-241	1,560 ± 140	1,860	1,140 - 2,470	Pass
ERVE-1118	3/20/2017	Cm-244	530 ± 80	734	360 - 1,140	Pass
ERVE-1118	3/20/2017	Co-60	1,400 ± 350	1,390	959 - 1,940	Pass
ERVE-1118	3/20/2017	Cs-134	1,650 ± 460	1,830	1,180 - 2,380	Pass
ERVE-1118	3/20/2017	Cs-137	2,580 ± 540	2,500	1,810 - 3,480	Pass
ERVE-1118	3/20/2017	K-40	32,100 ± 700	30,900	22,300 - 43,400	Pass
ERVE-1118	3/20/2017	Mn-54	< 27.3	< 300	0.00 - 300	Pass
ERVE-1118	3/20/2017	Zn-65	889 ± 64	853	615 - 1,200	Pass
ERVE-1118	3/20/2017	Pu-238	3,250 ± 210	3,250	1,940 - 4,450	Pass
ERVE-1118	3/20/2017	Pu-239/240	2,180 ± 170	2,150	1,320 - 2,960	Pass
ERVE-1118	3/20/2017	Sr-90	665 ± 135	726	414 - 963	Pass
ERVE-1118	3/20/2017	U-233/234	2,840 ± 200	3,090	2,030 - 3,970	Pass
ERVE-1118	3/20/2017	U-238	2,990 ± 200	3,060	2,040 - 3,890	Pass
ERW-1120	3/20/2017	Am-241	108 ± 7	140	94.3 - 188	Pass
ERW-1120	3/20/2017	Co-60	2,600 ± 198	2,540	2,210 - 2,970	Pass
ERW-1120	3/20/2017	Cs-134	2,380 ± 250	2,510	1,840 - 2880	Pass
ERW-1120	3/20/2017	Cs-137	1,470 ± 243	1,400	1,190 - 1,680	Pass
ERW-1120	3/20/2017	Mn-54	< 12.3	< 100	0.00 - 100	Pass
ERW-1120	3/20/2017	Pu-238	117 ± 4	128	94.7 - 159	Pass
ERW-1120	3/20/2017	Pu-239/240	74.8 ± 3.3	85.8	66.6 - 108	Pass
ERW-1120	3/20/2017	U-233/234	75.3 ± 3.2	90.3	67.8 - 116	Pass
ERW-1120	3/20/2017	U-238	76.4 ± 3.2	89.5	68.2 - 110	Pass
ERW-1120	3/20/2017	Zn-65	2,130 ± 378	1,960	1630 - 2,470	Pass
ERW-1120 ^l	3/20/2017	Fe-55	1,400 ± 403	984	587 - 1,340	Fail
ERW-1120 ^k	3/20/2017	Fe-55	1,081 ± 383	984	587 - 1,340	Pass
ERW-1120	3/20/2017	Sr-90	652 ± 12	714	465 - 944	Pass

^a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurements Laboratory Quality Assessment Program (EML).

^b Laboratory codes as follows: ERW (water), ERAP (air filter), ERSO (soil), ERVE (vegetation). Results are reported in units of pCi/L, except for air filters (pCi/Filter), vegetation and soil (pCi/kg).

^c Results are presented as the known values, expected laboratory precision (2 sigma, 1 determination) and control limits as provided by ERA.

^d Fe-55 analysis result was outside the acceptable range. Recounting the sample disk for 1000 minutes resulted in 254 ± 364 with an LLD calculation of < 342. Insufficient sample was available after performing other required analyses on the sample to quantify the activity with an uncertainty less than the activity.

^e ERA appears to have applied the standard material to the filter in a pattern closer to the center of the filter compared to previous studies and different from the filter efficiency utilized by the laboratory. This likely caused the efficiency used the calculation to be understated and the result obtained by the laboratory to be overstated. For comparison the in-house spike for gross beta in AP (table A-3 SPAP-740 2/28/17) was acceptable with a ratio of 0.94 of lab result to known.

^f Analysis result for Plutonium-239/240 was below the lower limit of acceptance.

^g Samples were reanalyzed in duplicate with acceptable results for each. Original analysis had poor resolution possibly due to a poor electroplating and is suspected in contributing to poor results.

^h Analysis result for U-233/234 was below the lower limit of acceptance.

ⁱ The reanalysis result for U-233/234 was within the acceptance limits and U-238 reanalysis result was closer to the known value. Original analysis had poor resolution possibly due to a poor electroplating and is suspected in contributing to poor results.

^j Fe-55 analysis result was outside acceptable range.

^k Result of recounting was acceptable. Using available aliquot after dividing sample for other analyses leaves insufficient sample to reliably determine the activity present in sample.

APPENDIX B

DATA REPORTING CONVENTIONS

Data Reporting Conventions

1.0. All activities, except gross alpha and gross beta, are decay corrected to collection time or the end of the collection period.

2.0. Single Measurements

Each single measurement is reported as follows: $x \pm s$
 where: x = value of the measurement;
 s = 2σ counting uncertainty (corresponding to the 95% confidence level).

In cases where the activity is less than the lower limit of detection L , it is reported as: $< L$,
 where L = the lower limit of detection based on 4.66σ uncertainty for a background sample.

3.0. Duplicate analyses

If duplicate analyses are reported, the convention is as follows. :

- 3.1. Individual results: For two analysis results; $x_1 \pm s_1$ and $x_2 \pm s_2$
Reported result: $x \pm s$; where $x = (1/2)(x_1 + x_2)$ and $s = (1/2)\sqrt{s_1^2 + s_2^2}$
- 3.2. Individual results: $< L_1, < L_2$ Reported result: $< L$, where L = lower of L_1 and L_2
- 3.3. Individual results: $x \pm s, < L$ Reported result: $x \pm s$ if $x \geq L$; $< L$ otherwise.

4.0. Computation of Averages and Standard Deviations

4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average \bar{x} and standard deviation "s" of a set of n numbers x_1, x_2, \dots, x_n are defined as follows:

$$\bar{x} = \frac{1}{n} \sum x \qquad s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

- 4.2 Values below the highest lower limit of detection are not included in the average.
- 4.3 If all values in the averaging group are less than the highest LLD, the highest LLD is reported.
- 4.4 If all but one of the values are less than the highest LLD, the single value x and associated two sigma error is reported.
- 4.5 In rounding off, the following rules are followed:
- 4.5.1. If the number following those to be retained is less than 5, the number is dropped, and the retained numbers are kept unchanged. As an example, 11.443 is rounded off to 11.44.
- 4.5.2. If the number following those to be retained is equal to or greater than 5, the number is dropped and the last retained number is raised by 1. As an example, 11.445 is rounded off to 11.45.