

Texas Department of State Health Services

Radiation Inspection Branch Environmental Monitoring Summary for 2020

NOTE: Items within these environmental summaries have been removed due to confidential homeland security information under The Texas Public Information Act and House Bill 9, Gov. § code 418.

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Introduction

The document consists of the date collected for each monitoring point at each facility. The data is presented in the same manner as in the past. Limits of detection were not included with the data in an effort to reduce the space required for data entry. A listing of expected limits of detection for various media, geometries, and radionuclides is found in the appendices. Maps of the facilities are included, but some details have been omitted. Specific information about individual facilities can be found in the license files. Redacted copies of this and previous annual reports can be found at: https://www.dshs.state.tx.us/radiation/ram/environmental-monitoring.aspx

All analyses of environmental media, i.e., soil, air, water, vegetation, and sewage are performed by the Texas Department of State Health Services (DSHS), Laboratory Services Section. The Laboratory Services Section operates a highly capable radiochemistry program. Currently, the Environmental Sciences Branch participates in a program sponsored by the United States Department of Energy (USDOE), referred to as Department of Energy Laboratory Accreditation Program. It was developed by the USDOE in order to provide quality assurance and control for USDOE contractors. The most recent results of the Laboratory Services Section's performance in these "cross checks" can be found in the appendices to this document.

Landauer, Inc. performs Optically Stimulated Luminescence (OSL) readings for the facilities that have neutron sources. Approximately 200 OSLs are exchanged and read each calendar quarter. Background is subtracted from all station readings except for Comanche Peak Nuclear Power Plant, South Texas Project, and Pantex. Background is not subtracted from these three locations because the readings identify ambient doses.

Analysis of sample data from the monitored facilities indicated no release of radioactive material to the environment that exceeded the regulatory or license limits of the DSHS or any other agency such as the United States Nuclear Regulatory Commission or the USDOE. Some of the OSL readings at a few of the monitored facilities exceeded to 100mrem for the year. All licensed facilities are required by rule to document that exposures from conducting operations do not cause doses in excess of the regulatory limits to employees or individual members of the general public. The documentation is maintained for inspection by the Radiation Branch. Licensees are allowed to use mitigating factors, such as occupancy times and distance to the nearest occupied areas, in demonstrating compliance with those limits. Taking into account occupancy factors, all facilities monitored during the 2020 calendar year were found to be in compliance with radiation does limits.

Any questions should be directed to Robert E. Free at 737-218-7082 or Robert.free@dshs.texas.gov

Robert E. Free

Fixed Nuclear Facilities

Comanche Peak Nuclear Power Plant

Radiation Branch Site No. 031

Comanche Peak Nuclear Power Plant (CPNPP) is a two-unit nuclear-fueled power plant owned and operated by Luminant Power. The plant is located in Somervell County four and one-half miles northwest of Glen Rose and approximately 80 miles southwest of downtown Dallas.

CPNPP, Luminant Power's sole nuclear power plant, with an operating capacity of 2,500 megawatts [two Westinghouse 1,250 megawatt (electric) pressurized water reactor units], began operation in 1990, although fuel had been received on-site in 1982-1983. The plant has approximately 1,300 employees. The Radiation Branch Surveillance Program consists of OSL monitoring and sampling air, fish, food products, sediment, vegetation, and water.





Shaded area indicates location of Somervell County



Monitoring Station Locations

Note: Sample type not indicated on maps.



Comanche Peak Nuclear Power Plant Monitoring Station Locations









OSL Stations	Q1 Q2 Q3 Q4 Annual Do		Annual Dose	Notes		
	21	20	22	26	100	
1	31	29	23	20	109	
2	33	30	23	2/	113	
3	29	28	21	24	102	
4	33	30	23	28	114	
5	31	30	23	27	111	
0	31	29	22	27	109	
<i>'</i>	29	28	22	20	105	
8	30	28	22	20	106	
9	35	31	23	27	110	
10	31	29	24	27	111	
11	29	26	22	27	104	
12	33	30	23	29	115	
14	31	28	24	28	111	
24	32	28	23	27	110	
28	34	30	26	28	118	
30	32	30	24	27	113	
39	31	30	24	27	112	
46	32	32	23	28	115	
47	30	28	23	27	108	
49	0	31	24	27	82	QTR 1 OSL Missing
60	31	29	22	26	108	
61	30	28	21	24	103	
62	31	30	22	27	110	
63	34	32	25	29	120	
64	32	29	23	27	111	
65	28	27	21	25	101	
66	31	28	22	26	107	
67	29	29	21	25	104	
68	29	28	21	26	104	
69	30	28	22	26	106	
70	32	32	23	26	113	
71	32	32	22	27	113	
72	33	32	23	28	116	
73	31	31	22	26	110	
74	31	30	23	27	111	
75	30	28	22	27	107	
76	31	29	23	26	109	
77	30	29	22	26	107	
78	33	30	24	26	113	
79	32	28	23	27	110	
80	32	30	23	29	114	
81	33	29	25	31	118	
82	31	28	23	27	109	

Optically Stimulated Luminescent Dosimeter (OSL) Monitoring Results (quarterly and annual readings are in mrem)

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Date	Lab	Station	Ba-140	Be-7	Co-58	3 Co-	60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140) Mn-54	Nb-95	Zn-65	Zr-95	Units
Air Comp	osite Sa	mples																
1/16/2020	AE93554	001	< 9.1e-6	4.31e-4	<2.6e-6	(2.7)	e-6	<2.3e-6	< 3.1e-6	<4.7e-6	<2.7e-6	4.2e-5	<2.8e-6	<2.8e-6	<2.5e-6	<5.8e-6	<4.5e-6	uCi/mL
1/16/2020	AE93555	057	<8.7e-6		<2.7e-6	(2.9)	9-6	<2.5e-6	<3.0e-6	<4.2e-6	<2.6e-6		<3.2e-6	<2.6e-6	<2.6e-6	<6.1e-6	<4.8e-6	"Ci/mL
7/14/2020	AF19017	001	<40e-6	6.02e-4	<14e-6	<166	-6	<14e-6	<14e-6	(2.8e-6	<12e-6		<19e-6	<14e-6	<12e-6	<32e-6	<2.0e-6	"Ci/ml
7/14/2020	AF19018	057	<62e-6	5.81e-4	<21e-6	(25)	9-6	<21e-6	<21e-6	(42e-6	<2.0e-6		<2.8e-6	(2.2e-6	<19e-6	<4.7e-6	<37e-6	"Ci/ml
TITALOEO	AF10132	001	76.20-0	2.360.4	/170.8	/24	3.6	/210-6	/2.20-6	24.06-6	/180-6		/260-6	/210-6	/200-6	25.16-6	/216.6	"Cilml
	AF10102	057	/276.6	2.506-4	/140.6	/174	3.6	/150.6	/140.6	/270.6	×1.0e-0	2.20-5	/216-6	/140.6	/120-6	/24a.6	/216-6	"Cilml
	<u> </u>	001	1 10.16-0	2.016-4	1.46-0	1 140	-0	1.00-0	1.100	1 12.16-0	1.26-0	2.06-0	1 12.16-0	11.46-0	1106-0	10.46-0	12.16-0	T pointe
Date		-h 9	Station	I_13	1 6	/_40	D	Hait		Date		L S	tatio	I_131	K-40	Dh.	214	Haite
Air lod		an loc	Juation	-]		<u>-40</u>				ir lodin		n Jor		1-131	<u> N-40</u>		-2 14	Units
1171202		22002	001	4E Co	15 2	41- 12	T -		귀엽	71712020		Meg	057	/E.4.6.1E	2.026.1	2		Cilest
117/202		2333 22995	001	< 0.6e-	15 1	02 12	+	μCirm	╞┥┝╴	71712020		402	007	20.4e-10 20.4a-15	2.038-1	2		"Cilmi
1/14/202		92562	001	25 4 a.	15 2	14 6.12	+	uCi/m	╞┥┝╴	7/14/2020	ΔE19	252	001	< <u>2.4e-10</u> 25.2a.15	2466.1	2		"Cilml
1/14/202		93565	057	2540	15 2	51e-13	+	u Ci/m	H	7/14/2020	AF19	254	057	25 0e-15	2.406-1	1		"Cilml
1/21/202		94518	001	25.2e	15 2	33e-13	+	u Ci/m	H	7/21/2020	AF2	0141	001	25.5e-15	2.01e-1	2		"Ci/ml
1/21/202	0 AE	94520	057	<5.8e	15 2	25e-13	+	u Ci/m		123/2020	AF2	1143	057	<5.5e-15	2.36e-1	3		"Ci/ml
1/28/202	20 AES	95824	001	<37e	15 1	54e-13	\vdash	u Ci/m	- 1	128/2020	AF2	1991	001	<5.6e-15	2.57e-1	3		"Ci/ml
1/28/202	20 AES	95826	057	<4.5e-	15 1	79e-13	+	uCi/m	īΗ	128/2020	AF20	1993	057	<5.3e-15	1.95e-1	3		"Ci/mL
2/4/202	0 AES	96940	001	<5.9e-	15 2	.51e-13		µCi/m		8/4/2020	AF2	1705	001	<5.2e-15	2.61e-1	3		µCi/mL
2/4/202	0 AES	96942	057	<6.9e	15 2.	44e-13		μCi/m		8/4/2020	AF2	1707	057	<5.1e-15	2.05e-1	3		µCi/mL
2/11/202	20 AES	97975	001	<5.3e	-15 2	.61e-13		μCi/m		8/11/2020	AF22	2993	001	<5.3e-15	2.48e-1	3		μCi/mL
2/11/202	20 AES	97977	057	<5.5e	15 2.	24e-13		_µCi/m	L	8/11/2020	AF22	2995	057	<5.4e-15	2.69e-1	3		µCi/mL
2/18/202	20 AES	98870	001	<5.6e-	15 2.	59e-13		_µCi/m	L	8/18/2020	AF24	380	001	<5.8e-15	2.67e-1	3		µCi/mL
2/18/202	20 AES	98872	057	<1.5e-	14 2.	82e-13		μCi/m	L [8	8/18/2020	AF24	1382	057	<5.4e-15	3.12e-13	3		µCi/mL
2/25/20	20 AE:	99871	001	<5.2e-	15 2.	26e-13		μCi/m		25/2020	AF25	5487	001	<7.2e-15	3.44e-1	3		µCi/mL
2/25/20	20 AES	99873	057	<5.8e-	15 2.	<u>53e-13</u>		μCi/m	니브	125/2020	AF25	5489	057	<2.6e-15	2.91e-13	3		µCi/mL
3/3/202	0 AF	00995	001	<3.6e-	15 2.	<u>60e-13</u>	L	_ µCi/m	╘┛┝	9/1/2020	AF26	562	001	<6.0e-15	2.31e-1	3		µCi/mL
3/3/202	0 AF0	00997	057	<7.0e-	15 2.	<u>68e-13</u>	<u> </u>	μCi/m		9/1/2020	AF26	564	057	<5.8e-15	2.59e-1	3		µCi/mL
3/10/202	20 AF	02107	001	<5.6e-	15 2	.01e-13		μCi/m	╘┥┝╴	9/8/2020	AF2	6911	001	<5.5e-15	2.50e-1	3		µCi/mL
3/10/202	20 AF	02109	057	<6.0e-	15 2.	43e-13		μCi/m	╘┥┠┊	9/8/2020	AF2	5913	057	<5.4e-15	2.45e-1	3		<u>µCi/mL</u>
3/1//202		03417	001	<5.5e-	15 2	.16e-13		μCi/m	느냐	9/15/2020	AF2/	1640	001	<5.2e-15	2.1/e-1	<u> </u>		μCi/mL
3/1//20/		03419	007	<0.9e-	10 2.	00e-13			누구	971572020	AFZ	0000	007	<0.0e-10	2.428-1	3		
3124120	20 AF	04131	001	<0.0e-	15 1	00 - 12	+	μCirm	╞┥┠┋	12212020		0011	001	<9.38-10 24 7a 16	2.308-1	3		uCilmL
2/24/20	20 AF	04133	001	< 6.0e-	15 1	00x 10	+	μCirm	╞┥┠╛	u2012020		0111	007	<u>< 4.78-10</u> 25.4 × 15	2.108-1			"Cilmi
3/31/202	20 AF	05140	057	25.76	15 2	456-13	+	- "Ciłm	╞┥┠╛	12912020		9112	057	25.76-15	2.000-1			"Cilml
4/7/202		15977	001	2540	15 2	76e-13	+	u Ci/m	╞┥┝	0/6/2020	AF29	9732	057	25.8e-15	2440.1	2		"Cilml
4/7/202		15979	057	<5.6e	15 2	32e-13	+	u Ci/m		0/6/2020	AF29	1734	001	<5.6e-15	2.57e-1	3		"Ci/ml
4/14/202	20 AF(06753	001	<6.8e-	15 2	02e-13	-	uCi/m		0/13/2020	AF30	0702	001	<5.6e-15	2.26e-1	3		uCi/mL
4/14/202	20 AF(06755	057	<5.3e-	15 2	41e-13	1.3	uCi/m	ī l lī	0/13/2020	AF30	0704	057	<2.4e-15	2.64e-1	3		"Ci/mL
4/21/202	20 AF(07555	001	<5.4e-	15 2.	04e-13		μCi/m	L 10	/20/2020	AF3	1373	001	<5.4e-15	2.55e-1	3		µCi/mL
4/21/202	20 AF()7557	057	<5.7e-	-15 2	.91e-13		μCi/m	L 10	12012020	AF31	1375	057	<5.6e-15	2.69e-1	3		µCi/mL
4/28/20	20 AF(08583	001	<5.7e-	15 2.	30e-13		μCi/m	L 10	127/2020	AF3	2261	057	<5.7e-15	2.35e-1	3		µCi/mL
4/28/20	20 AF(08585	057	<5.8e-	15 2.	66e-13		μCi/m	L [1	1/10/2020	AF3	3851	001	<5.3e-15	2.49e-1	3		µCi/mL
5/5/202	0 AF0	09437	001	<5.0e-	-15 2.	42e-13		_µCi/m	L 1	1/10/2020	AF33	3853	057	<5.4e-15	2.74e-1	3		µCi/mL
5/5/202	0 AF(09439	057	<5.0e-	15 2	.81e-13	1	μCi/m		1/17/2020	AF3	4761	057	<5.1e-15	2.65e-1	3		µCi/mL
5/12/20:	20 AF	11070	001	<5.4e-	15 2.	48e-13	1	μCi/m		1/17/2020	AF34	763	001	<5.2e-15	2.61e-1	3		µCi/mL
5/12/202	20 AF	11072	057	<5.8e-	15 2.	<u>57e-13</u>		µCi/m	ЦĽ	1/24/2020	AF35	5738	001	<7.2e-15	2.47e-1	3		µCi/mL
5/19/202	20 AF	11775	001	<5.0e-	15 2	.21e-13		μCi/m		1/24/2020	AF35	5740	057	<7.5e-15	2.58e-1	3		µCi/mL
5/19/202	20 AF	11777	057	<5.3e-	15 2	.71e-13		μCi/m	\square	2/1/2020	AF36	5079	001	<5.4e-15	2.45e-1	3		<u>µCi/mL</u>
5/26/20 Electron	20 AF	12756	001	< 0.3e-	10 2.	<u>Z3e-13</u>	+	μCi/m	ΗH	2/1/2020	AF3	2020	001	< 0.66-15	2.65e-1	3		LCI/ML
0126120		12758	057	< <u>2.2</u> e-	- <u>10 Z.</u> 45 D	/20-13 4719	+	μCirm	╞┥┠┦	21812020	AF30	238	001	<0.4e-10 /E.0+ 1E	2.048-1	3		u Cilmi
6/2/202		12742	001	< 3.7e-	15 2.	978-13 05a 12	+	L uCile	╞┥┠╬	2/16/2020	AF 30	7757	001	< 0.68-10 25.26-15	2.928-1	2		"Cilest
6/2/202		14699	001	< <u>2.46</u>	10 3.	29a 12	+	L uCile	╞┥┠╬	2115/2020	AF31	7759	057	< 0.38-10 25.66-15	2.308-1	2 100	0.14	"Cilest
6/9/202	0 0F	14700	001	27.0e	15 2	46e-12	+	L uCide		272212020	AF31	8193	001	27.5e-15	2.316-1.	3 1 1.03	/2-14	"Citrol
6/16/202		15685	001	25.1e	15 2	81e-12	+	L uCide		12212020	<u>ΔΕ2</u>	8195	057	27.6e-15	2.1201	1		"Ci/ml
6/16/202	20 AF	15687	057	<5.3e	15 2	58e-13	1			2/29/2020	AF39	3239	001	<5.3e-15	2.51e-1	1		uCi/ml
6/23/20	20 AF	16412	001	<4.9e	15 2	30e-13	1	L LCi/m		2/29/2020	AF3	3241	057	<5.6e-15	2.28e-1	3		uCi/mL
6/23/20	20 AF	16414	057	<4.9e	15 2	87e-13	1	"Ci/m								-		
6/30/20	20 AF	17695	001	<5.6e	15 1.	95e-13		µCi/m	L									
6/30/20	20 AF	17697	057	<5.5e	15 2.	48e-13		μCi/m	L									

Date	Lab	Station	Beta	Units
Air Partic	culate Sa	mples		-
1/7/2020	AE92992	001	3.60e-14	uCi/mL
1/7/2020	AE92994	057	2.91e-14	"Ci/mL
1/14/2020	AE93562	001	2.77e-14	µCi/mL
1/14/2020	AE93564	057	2.21e-14	uCi/mL
1/21/2020	AE94517	001	2.66e-14	uCi/mL
1/21/2020	AE94519	057	1.95e-14	uCi/mL
1/28/2020	AE95823	001	1.97e-14	μCi/mL
1/28/2020	AE95825	057	1.94e-14	μCi/mL
2/4/2020	AE96939	001	2.02e-14	μCi/mL
2/4/2020	AE96941	057	2.22e-14	μCi/mL
2/11/2020	AE97974	001	1.81e-14	μCi/mL
2/11/2020	AE97976	057	1.96e-14	µCi/mL
2/18/2020	AE98869	001	1.96e-14	µCi/mL
2/18/2020	AE98871	057	2.10e-14	µCi/mL
2/25/2020	AE99870	001	2.07e-14	µCi/mL
2/25/2020	AE99872	057	1.98e-14	"Ci/mL
3/3/2020	AF00994	001	1.81e-14	"Ci/mL
3/3/2020	AF00996	057	2.04e-14	µCi/mL
3/10/2020	AF02106	001	1.87e-14	uCi/mL
3/10/2020	AF02108	057	2.01e-14	uCi/mL
3/17/2020	AF03416	001	1.52e-14	uCi/mL
3/17/2020	AF03418	057	1.45e-14	uCi/mL
3/24/2020	AF04190	001	1.25e-14	uCi/mL
3/24/2020	AF04192	057	1.34e-14	uCi/mL
3/31/2020	AF05147	001	1.76e-14	uCi/mL
3/31/2020	AF05149	057	1.82e-14	uCi/mL
41712020	AF05976	001	1.56e-14	uCi/mL
41712020	AF05978	057	1.65e-14	"Ci/mL
4/14/2020	AF06752	001	2.08e-14	µCi/mL
4/14/2020	AF06754	057	2.18e-14	µCi/mL
4/21/2020	AF07554	057	2.06e-14	"Ci/mL
4/21/2020	AF07556	057	2.27e-14	µCi/mL
4/28/2020	AF08582	001	2.03e-14	μCi/mL
4/28/2020	AF08584	057	2.45e-14	μCi/mL
5/5/2020	AF09436	001	1.89e-14	μCi/mL
5/5/2020	AF09438	057	2.00e-14	µCi/mL
5/12/2020	AF11069	001	1.69e-14	μCi/mL
5/12/2020	AF11071	057	1.90e-14	µCi/mL
5/19/2020	AF11774	001	1.72e-14	μCi/mL
5/19/2020	AF11776	057	1.83e-14	μCi/mL
5/26/2020	AF12755	001	1.79e-14	μCi/mL
5/26/2020	AF12757	057	1.84e-14	μCi/mL
6/2/2020	AF13739	057	2.09e-14	μCi/mL
6/2/2020	AF13741	001	1.99e-14	μCi/mL
67972020	AF14697	057	3.04e-14	μCi/mL
61912020	AF14699	001	2.80e-14	μCi/mL
6/16/2020	AF15684	001	3.15e-14	μCiłmL
6/16/2020	AF15686	057	2.39e-14	μCi/mL
6/23/2020	AF16411	001	2.57e-14	μCi/mL
6/23/2020	AF16413	057	2.10e-14	μCi/mL
6/30/2020	AF17694	001	2.60e-14	μCiłmL
6/30/2020	AF17696	057	2.20e-14	μCi/mL

Date	Lab	Station	Beta	Units
Air Partic	culate Sa	mples		
71712020	AF18461	057	2.83e-14	μCi/mL
7/7/2020	AF18463	001	2.60e-14	µCi/mL
7/14/2020	AF19251	001	2.00e-14	µCi/mL
7/14/2020	AF19253	057	2.32e-14	µCi/mL
7/21/2020	AF20140	001	2.34e-14	µCi/mL
7/21/2020	AF20142	057	2.76e-14	µCi/mL
7/28/2020	AF20992	057	1.090e-14	μCi/mL
8/4/2020	AF21704	001	2.26e-14	μCi/mL
8/4/2020	AF21706	057	2.52e-14	μCi/mL
8/11/2020	AF22992	001	2.69e-14	μCi/mL
8/11/2020	AF22994	057	2.82e-14	µCi/mL
8/18/2020	AF24379	001	2.33e-14	μCi/mL
8/18/2020	AF24381	057	2.45e-14	μCi/mL
8/25/2020	AF25486	001	3.34e-14	μCi/mL
8/25/2020	AF25488	057	3.49e-14	µCi/mL
8/28/2020	AF20990	001	1.100e-14	µCi/mL
9/1/2020	AF26561	001	<u>1.60e-14</u>	µCi/mL
9/1/2020	AF26563	057	1.93e-14	μCi/mL
9/8/2020	AF26910	001	1.70e-14	µCi/mL
9/8/2020	AF26912	057	<u>1.86e-14</u>	<u>µCi/mL</u>
9/15/2020	AF27639	001	<u>1.99e-14</u>	μCi/mL
9/15/2020	AF27641	057	2.40e-14	<u>µCi/mL</u>
9/22/2020	AF28008	001	4.24e-14	<u>µCi/mL</u>
9/22/2020	AF28010	057	4.63e-14	<u>µCi/mL</u>
9/29/2020	AF29110	001	<u>1.76e-14</u>	μCi/mL
9/29/2020	AF29112	057	<u>1.92e-14</u>	μCi/mL
10/6/2020	<u>AF29731</u>	057	<u>3.24e-14</u>	μ <u>Ui/mL</u>
107672020	AF29733	001	2.76e-14	μCirmL
10/13/2020	AF30701	001	3.4Ue-14	
10/13/2020	AF30703	057	<u>3.77e-14</u>	
10/20/2020	<u>AF31372</u>	001	3.020-14	
10/20/2020	AF31374	007	3.346-14	
10/27/2020	AF32298	001	1.33e-14	
1072772020	AF32260	007	2.186-14	
11r3r2020	AF32324	001	2.446-14	
11/3/2020	AF32326	007	2.628-14	
11/10/2020	AF33000 AF33050	001	2.208-14	u Cilest
11/10/2020	<u>AF33092</u> AF24700	007	2.008-14	
11/17/2020	AF34700	007	2.028-14	uCideol
11/2/1/2020	AE26727	001	2.206-14	uCideol
11/24/2020	AF35737	001	2.000-14	uCideol
12/1/2020	AF26078	001	4.0Eo.14	uCilml
12/1/2020	AF36080	001	7.00e-14 3.19a.14	uCilml
121112020	AE26027	001	0.10e-14 4.04 o 14	uCideol
12/0/2020	9E36030	001	±.07e-14 2,20⊳.18	ւԸվտե
12/15/2020	AF37756	001	1826-14	սԸն/տե
12/15/2020	ΔF37759	057	3 120-14	ւԸնել
12/22/2020	ΔF32192	001	5 29a.14	սԸն/տե
12/22/2020	ΔF28194	057	3.920-14	ւլԸների
12/29/2020		001	3.254.14	u Cilmi
12/29/2020	AF38240	057	2.99e-14	u Cilmi
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Date	Lab	Station	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Pb-	TI-208	Zn-65	Zr-95	Units
Fish Pro	duct San	ples																
5/5/2020	AF09440	092	<5.0e-8	<1.3e-8	<1.3e-8	<1.4e-8	<1.5e-8	<2.5e-8	<1.8e-8	2.70e-6	<1.5e-8	<1.3e-8	<1.3e-8			<2.8e-8	<2.2e-8	μCi/q
5/5/2020	AF09441	092	<3.4e-8	<9.0e-9	<1.1e-8	< 9.6e-9	<1.1e-8	<2.2e-8	<1.1e-8	2.69e-6	<1.2e-8	<1.0e-8	< 9.9e-9	2.8e-8		<2.5e-8	<1.6e-8	μCi/q
5/5/2020	AF09443	091	<5.2e-8	<1.4e-8	<1.5e-8	<1.5e-8	<1.6e-8	<2.6e-8	<1.8e-8	3.31e-6	<1.4e-8	<1.5e-8	<1.4e-8			<3.0e-8	<2.4e-8	μCi/g
5/6/2020	AF09442	091	<4.8e-8	<1.2e-8	<1.4e-8	<1.3e-8	<1.4e-8	<2.6e-8	<1.6e-8	2.42e-6	<1.5e-8	<1.3e-8	<1.3e-8	3.3e-8	1.7e-8	<2.9e-8	<2.2e-8	μCi / g
11/10/2020	AF33854	091	<2.5e-8	<5.6e-9	<6.8e-9	<5.6e-9	<5.5e-9	<1.3e-8	<8.3e-9	3.16e-6	< 9.0e-9	<5.7e-9	<6.1e-9			<1.4e-8	< 9.8e-9	μCi/g
11/10/2020	AF33855	091	<4.5e-8	<1.2e-8	<1.2e-8	<1.2e-8	<1.3e-8	<2.5e-8	<1.5e-8	2.79e-6	<1.3e-8	<1.2e-8	<1.2e-8			<2.8e-8	<2.1e-8	μCi/g

Date	Lab	Station	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Zn-65	Zr-95	Units
Food Product Samples																
6/9/2020	AF14701	094	<3.2e-8	<7.6e-9	<9.0e-9	<7.5e-9	<8.3e-9	<1.8e-8	< 9.4e-9	3.27e-6	<9.0e-9	<7.8e-9	<8.2e-9	<2.0e-8	<1.4e-8	µCi/q
12/8/2020	AF36941	095	<3.1e-8	<8.1e-9	<9.0e-9	<8.6e-9	<8.9e-9	<1.9e-8	< 9.5e-9	3.02e-6	<8.6e-9	<8.3e-9	<8.3e-9	<2.1e-8	<1.5e-8	μCiłq

Date	Lab	Station	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Pb-	TI-208	Zn-65	Zr-95	Units
Sediment	Samples																	
1/14/2020	AE93566	088	<2.5e-7	<4.8e-8	<4.6e-8	<5.5e-8	<4.9e-8	<9.9e-8	<9.0e-8	1.83e-6	<8.5e-8	<4.2e-8	<6.3e-8	4.00e-7	8.0e-8	<1.5e-7	<8.1e-8	µCi/g

Date	Lab	Station	Ba-140	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Pb-	TI-208	Zn-65	Zr-95	Units
Vegetation	for Milk	Samples																	
1/28/2020	AE95827	014	<5.7e-8	1.97e-6	<1.2e-8	<1.4e-8	<1.3e-8	<1.3e-8	<2.7e-8	<2.1e-8	2.60e-6	<1.9e-8	<1.3e-8	<1.3e-8			<2.7e-8	<2.1e-8	µCi/g
2/25/2020	AE99874	014	<5.6e-8	3.48e-6	<1.1e-8	<1.3e-8	<1.1e-8	<1.2e-8	<2.7e-8	<2.1e-8	6.44e-6	<1.4e-8	<1.2e-8	<1.3e-8			<3.0e-8	<2.1e-8	µCi/g
3/31/2020	AF05153	014	<4.9e-8	1.60e-5	<1.2e-8	<1.5e-8	<1.4e-8	<1.4e-8	<2.8e-8	<2.0e-8	4.24e-6	<1.7e-8	<1.4e-8	<1.3e-8			<3.1e-8	<2.2e-8	µCi/g
3/31/2020	AF05154	090	<7.7e-8	1.235e-	<1.9e-8	<2.1e-8	<2.1e-8	<2.1e-8	<4.0e-8	<2.9e-8	2.23e-6	<2.5e-8	<2.0e-8	<2.0e-8			<4.7e-8	<3.4e-8	µCi/g
4/28/2020	AF08586	014	<4.9e-8	1.31e-6	<1.3e-8	<1.4e-8	<1.2e-8	<1.3e-8	<2.8e-8	<1.5e-8	7.27e-6	<1.4e-8	<1.3e-8	<1.3e-8			<3.2e-8	<2.1e-8	µCi/g
5/26/2020	AF12759	014	<7.3e-8	3.91e-6	<2.0e-8	<2.2e-8	<2.0e-8	<2.1e-8	<3.9e-8	<2.4e-8	3.28e-6	<2.5e-8	<2.0e-8	<2.0e-8			<4.6e-8	<3.4e-8	µCi/g
6/30/2020	AF17698	014	<6.7e-8	1.80e-6	<1.9e-8	<1.8e-8	<1.8e-8	<1.9e-8	<3.2e-8	<2.4e-8	7.0e-7	<2.0e-8	<1.7e-8	<1.8e-8			<3.8e-8	<2.9e-8	µCi/g
6/30/2020	AF17699	090	<1.2e-7	5.02e-6	<2.1e-8	<2.4e-8	<2.2e-8	<2.2e-8	<4.9e-8	<4.2e-8	4.39e-6	<3.9e-8	<2.2e-8	<2.5e-8			<5.1e-8	<3.8e-8	µCi/g
7/28/2020	AF20996	014	<6.8e-8	3.89e-6	<1.5e-8	<1.6e-8	<1.5e-8	<1.5e-8	<3.1e-8	<2.7e-8	2.60e-6	<2.5e-8	<1.4e-8	<1.6e-8			<3.3e-8	<2.6e-8	µCi/g
8/25/2020	AF25492	014	<1.1e-7	3.01e-6	<2.1e-8	<2.3e-8	<2.2e-8	<2.3e-8	<4.7e-8	<3.7e-8	5.63e-6	<2.9e-8	<2.2e-8	<2.4e-8			<5.1e-8	<3.7e-8	µCi/g
9/29/2020	AF29116	014	<8.5e-8	1.96e-6	<2.1e-8	<2.3e-8	<2.2e-8	<2.2e-8	<4.3e-8	<2.5e-8	3.30e-6	<2.7e-8	<2.0e-8	<2.1e-8			<4.9e-8	<3.4e-8	µCi/g
9/29/2020	AF29117	090	<1.5e-7	5.65e-6	<3.8e-8	<4.0e-8	<3.9e-8	<4.1e-8	<7.1e-8	<5.2e-8	3.65e-6	<4.8e-8	<3.8e-8	<3.9e-8			<8.2e-8	<6.3e-8	µCi/g
11/24/2020	AF35743	014	<6.4e-8	8.4e-7	<1.5e-8	<1.5e-8	<1.4e-8	<1.4e-8	<3.1e-8	<2.3e-8	3.56e-6	<1.9e-8	<1.4e-8	<1.4e-8			<3.2e-8	<2.3e-8	µCi/g
12/29/2020	AF38244	014	<1.3e-7	4.15e-6	<2.5e-8	<2.8e-8	<2.7e-8	<2.7e-8	<5.3e-8	<4.6e-8	2.67e-6	<4.2e-8	<2.5e-8	<2.6e-8	1.07e-7	4.4e-8	<5.6e-8	<4.2e-8	µCi/g
12/29/2020	AF38245	090	<1.4e-7	4.99e-6	<2.7e-8	<2.9e-8	<2.8e-8	<2.7e-8	<5.7e-8	<4.9e-8	1.98e-6	<4.6e-8	<2.6e-8	<2.8e-8			<6.4e-8	<4.7e-8	µCi/g

Date	Lab	Station	Ba-140	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-131	K-40	La-140	Mn-54	Nb-95	Pb-212	TI-208	Zn-65	Zr-95	Gross	Units
Water-Sur	face Sam	ples																	
1/28/2020	AE95828	086	<5.9e-9	<1.5e-9	<1.6e-9	<1.6e-9	<1.7e-9	<3.2e-9	<1.9e-9		<2.3e-9	<1.6e-9	<1.6e-9			<3.5e-9	<2.6e-9	6.3e-9	µCi/mL
1/28/2020	AE95829	085	<7.0e-9	<1.7e-9	<1.8e-9	<1.9e-9	<2.1e-9	<3.0e-9	<2.6e-9		<2.3e-9	<1.9e-9	<1.8e-9			<3.5e-9	<3.1e-9	1.16e-8	μCi/mL
2/25/2020	AE99875	085	<7.7e-9	<1.9e-9	<2.1e-9	<2.0e-9	<2.2e-9	<3.6e-9	<2.8e-9		<2.3e-9	<2.0e-9	<2.1e-9			<4.0e-9	<3.5e-9	1.46e-8	µCi/mL
2/25/2020	AE99876	086	<8.1e-9	<2.1e-9	<2.1e-9	<2.2e-9	<2.3e-9	<4.1e-9	<2.8e-9		<2.7e-9	<2.0e-9	<2.1e-9			<4.3e-9	<3.4e-9	5.1e-9	µCi/mL
3/31/2020	AF05151	085	<7.1e-9	<1.8e-9	<1.8e-9	<1.9e-9	<2.1e-9	<3.2e-9	<2.6e-9		<2.3e-9	<1.9e-9	<1.9e-9			<3.8e-9	<3.2e-9	1.02e-8	µCi/mL
3/31/2020	AF05152	086	<8.4e-9	<2.1e-9	<2.0e-9	<2.2e-9	<2.3e-9	<4.0e-9	<2.8e-9		<2.7e-9	<2.1e-9	<2.3e-9			<4.1e-9	<3.8e-9	8.7e-9	µCi/mL
4/28/2020	AF08587	086	<6.0e-9	<1.7e-9	<1.8e-9	<1.7e-9	<1.7e-9	<3.2e-9	<1.9e-9		<2.3e-9	<1.6e-9	<1.7e-9			<3.3e-9	<2.7e-9	7.8e-9	µCi/mL
4/28/2020	AF08588	085	<8.6e-9	<1.9e-9	<2.2e-9	<2.2e-9	<2.3e-9	<4.2e-9	<2.7e-9		<2.7e-9	<2.1e-9	<2.2e-9			<4.2e-9	<3.7e-9	1.50e-8	µCi/mL
5/26/2020	AF12760	085	<6.8e-9	<1.7e-9	<1.9e-9	<2.0e-9	<2.1e-9	<3.4e-9	<2.6e-9		<2.2e-9	<1.8e-9	<1.8e-9			<3.7e-9	<3.2e-9	1.30e-8	µCi/mL
5/26/2020	AF12761	086	<5.9e-9	<1.5e-9	<1.7e-9	<1.6e-9	<1.8e-9	<3.3e-9	<1.9e-9		<2.4e-9	<1.7e-9	<1.6e-9			<3.4e-9	<2.7e-9	6.7e-9	µCi/mL
6/30/2020	AF17700	085	<6.1e-9	<1.6e-9	<1.8e-9	<1.6e-9	<1.8e-9	<3.1e-9	<1.9e-9		<2.3e-9	<1.6e-9	<1.6e-9			<3.3e-9	<2.9e-9	1.39e-8	µCi/mL
6/30/2020	AF17701	086	<7.9e-9	<2.0e-9	<2.0e-9	<2.2e-9	<2.3e-9	<4.0e-9	<2.7e-9		<2.8e-9	<2.0e-9	<2.1e-9			<4.5e-9	<3.6e-9	6.4e-9	µCi/mL
7/7/2020	AF18465	088	<3.1e-7	<6.9e-8	<7.5e-8	<6.8e-8	<1.1e-7	<1.3e-7	<8.4e-8	8.1e-6	<9.2e-8	<7.0e-8	<8.9e-8	5.1e-7	2.21e-7	<1.8e-7	<1.4e-7		µCi/mL
7/28/2020	AF20994	086	<5.8e-9	<1.5e-9	<1.7e-9	<1.6e-9	<1.7e-9	<3.3e-9	<1.9e-9		<2.3e-9	<1.6e-9	<1.6e-9			<3.3e-9	<2.7e-9	5.7e-9	µCi/mL
7/28/2020	AF20995	085	<8.4e-9	<2.2e-9	<2.2e-9	<2.2e-9	<2.3e-9	<3.8e-9	<2.7e-9		<2.7e-9	<2.0e-9	<2.1e-9			<4.3e-9	<3.6e-9	1.42e-8	μCi/mL
8/25/2020	AF25490	086	<6.2e-9	<1.6e-9	<1.8e-9	<1.6e-9	<1.7e-9	<3.2e-9	<2.1e-9		<2.4e-9	<1.6e-9	<1.6e-9			<3.4e-9	<2.6e-9	8.0e-9	μCi/mL
8/25/2020	AF25491	085	<8.8e-9	<2.1e-9	<2.2e-9	<2.2e-9	<2.3e-9	<4.3e-9	<2.9e-9		<2.8e-9	<2.0e-9	<2.2e-9			<4.3e-9	<3.7e-9	1.28e-8	μCi/mL
9/29/2020	AF29114	085	<8.1e-9	<2.1e-9	<2.1e-9	<2.2e-9	<2.4e-9	<4.2e-9	<2.8e-9		<2.6e-9	<2.1e-9	<2.1e-9			<4.2e-9	<3.6e-9	1.57e-8	μCi/mL
9/29/2020	AF29115	086	<6.5e-9	<1.6e-9	<1.7e-9	<1.7e-9	<1.6e-9	<3.2e-9	<2.0e-9		<2.4e-9	<1.6e-9	<1.6e-9			<3.2e-9	<2.7e-9	8.4e-9	µCi/mL
10/27/2020	AF32262	085	<8.1e-9	<2.0e-9	<2.0e-9	<2.0e-9	<2.3e-9	<4.0e-9	<2.8e-9		<2.7e-9	<2.0e-9	<2.2e-9			<4.7e-9	<3.5e-9	1.62e-8	µCi/mL
10/27/2020	AF32263	086	<6.3e-9	<1.6e-9	<1.8e-9	<1.6e-9	<1.8e-9	<3.1e-9	<1.9e-9		<2.3e-9	<1.6e-9	<1.6e-9			<3.6e-9	<2.6e-9	8.3e-9	µCi/mL
11/24/2020	AF35741	085	<7.9e-9	<1.6e-9	<1.7e-9	<1.6e-9	<1.7e-9	<3.4e-9	<2.8e-9		<2.7e-9	<1.6e-9	<1.8e-9			<3.3e-9	<2.8e-9	1.61e-8	µCi/mL
11/24/2020	AF35742	086	<9.0e-9	<1.9e-9	<1.7e-9	<2.1e-9	<2.1e-9	<3.8e-9	<3.6e-9	1.13e-7	<2.7e-9	<1.8e-9	<2.1e-9			<4.0e-9	<3.4e-9	1.04e-8	µCi/mL
12/29/2020	AF38242	085	<6.4e-9	<1.7e-9	<1.8e-9	<1.7e-9	<1.7e-9	<3.1e-9	<2.0e-9		<2.3e-9	<1.8e-9	<1.7e-9			<3.5e-9	<2.7e-9	1.78e-8	µCi/mL
12/29/2020	AF38243	086	<7.8e-9	<1.9e-9	<2.2e-9	<2.0e-9	<2.2e-9	<4.1e-9	<2.4e-9		<2.8e-9	<2.0e-9	<2.1e-9			<4.4e-9	<3.4e-9	7.4e-9	µCi/mL

Date	Lab	Station	H-3	Units
Water Com	posite			
2/4/2020	AE93561	086	<1.0e-6	μCi/mL
7/14/2020	AF19015	085	1.330e-5	μCi łm L
7/14/2020	AF19016	086	<1.0e-6	μCi/mL
	AF10130	085	1.170e-5	μCi /m L
	AF10131	086	<1.0e-6	μCi/mL
10/6/2020	AF29379	085	1.330e-5	μCi/mL
10/6/2020	AF29380	086	<1.0e-6	μCi/mL

NOTE: * *Indicates the analysis was by alpha spectrometry, or Ra-226, analysis by radon emanation.* ***Indicates the tritium (H-3) analysis for food product, sediment, and vegetation is reported in \muCi/mL*

South Texas Project

Radiation Branch Site No. 012

The South Texas Project (STP) is a commercial nuclear power plant operated by STP Nuclear Operating Company and is located 89 miles southwest of Houston and 14 miles south-southwest of Bay City. Two 1250 megawatt (electric) Westinghouse pressurized water nuclear reactors are in operation at the site. Unit 1 became operational in August of 1988 and Unit 2 in June of 1989.

STP Nuclear Operating Company is owned by NRG Energy, Austin Energy, and City Public Service of San Antonio. STP Nuclear Operating Company manages and operates the plant for its owners, who share its energy in proportion to their ownership interest. The Radiation Branch Surveillance Program consists of OSL monitoring and sampling air, fish, food products, sediment, vegetation, and water.



Shaded area indicates location of Matagorda County



South Texas Project Monitoring Station Locations











Note: Sample type not indicated on maps.

OSL						
Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	33	31	24	29	117	
2	33	30	24	28	115	
3	32	28	24	26	110	
4	36	32	24	29	121	
5	33	30	22	28	113	
9	37	30	23	28	118	
10	37	31	24	28	120	
11	33	30	23	28	114	
12	37	29	25	29	120	
13	36	32	23	29	120	
18	31	30	25	26	112	
19	35	28	23	0	86	QTR 4 OSL Missing
20	33	30	25	28	116	-
21	32	30	23	28	113	
22	33	30	25	29	117	
23	31	28	22	26	107	
24	34	31	22	29	116	
26	31	30	23	25	109	
27	34	31	25	29	119	
28	35	33	25	28	121	
29	38	32	24	31	125	
30	36	31	24	30	121	
31	41	32	27	30	130	
33	35	29	23	30	117	
34	35	31	23	30	119	
35	35	31	25	29	120	
37	37	32	24	29	120	
38	32	30	24	26	112	
40	34	30	23	20	114	
42	39	36	0	33	108	QTB 3 OSL Missing
44	30	30	22	25	107	Q1110 COEPIDShig
50	39	35	25	32	131	
51	36	31	24	30	121	
57	33	30	27	26	111	
58	32	30	22	28	113	
50	35	32	25	20	123	
60	34	20	23	29	115	
61	34	29	24	23	110	
62	41	27	23	27	132	
63	35	33	27	31	102	
64	33	32	23	20	117	
64	33	30	20	29	121	
60	30	32	24	29	121	
67	30	32	23	29	120	
0/	35	52	26	30	123	

Optically Stimulated Luminescent Dosimeter (OSL) Monitoring Results (quarterly and annual readings are in mrem)

NOTE: ¹*Background is not subtracted from the data*

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Date	Lab	Stat	tion	<u>Ba-140</u>	Be-7	Co-58	Co-60	Cs-134	Cs-137	Fe-59	I-13	31 K-4	0 La-140	Mn-54	Nb-95	<u>Pb-212</u>	Zn-65	Zr-95	Units
Air Com	posite S	Samp	les																
1/16/2020	AE93556	3 03	30	<3.9e-6	4.22e-4	<1.3e-6	<1.8e-6	<1.4e-6	<1.4e-6	<2.9e-6	<1.1e	-6 3.0e	-5 <1.9e-6	<1.4e-6	<1.3e-6		<3.6e-6	<2.2e-6	µCi/mL
7/14/2020	AF19019	0	30	<8.8e-6	4.90e-4	<2.4e-6	<3.1e-6	<2.6e-6	<2.8e-6	<5.1e-6	<2.6	e-6 3.2e	-5 <3.3e-6	<2.7e-6	<2.3e-6		<5.7e-6	<4.5e-6	µCi/mL
7/14/2020	AF19020		35	<4.1e-6	5.16e-4	<13e-6	<17e-6	<15e-6	<13e-6	<3.0e-6	<11e	-6 4.3e	-5 <18e-6	<14e-6	<13e-6		<3.1e-6	<2.3e-6	uCi/mL
7/14/2020	AF10134		30	(9.90-6	3 410-4	(320-6	(350-6	(3.3e-6	(350-6	(5.50-6	/334	-6	(3.7e-6	(30e-6	(316-6		(640-6	(540-6	
7/14/2020	AF10135		25	<u> </u>	3.30-4	/2.4o-6	/2.90-6	72.8a-6	/2.70-6	24.9o-6	/2.4/	-6	/3.20-6	/2.50-6	(0.1e 0 725a-6	5.66	76 1o-6	74 3a-6	
111412020	AF 10155	0.	55	10.48-0	0.00e-4	\2.4e=0	NZ.3870	N2.0e=0	\2.re=0	14.38-0	12.46	-0	N3.2870	12.0e=0	N2.0870	5.0e-0	10. ie=0	14.38-0	j μοιπε
Date Air Tod	Lā	b	Stat	tion	-131	K-40	Pb-21	.2 Un	its	Date Air To	e dino	Lab	Station	1-131	K-40	PD-3	212 Pb	-214	Units
17/2020		2991	02	30 1	440-13	1440-13	1	C;	Inl	7/7/20	20	5ampi 0E18460		/2.30-19	2446-	13			Cilml
1/7/2020		2989	03	35 (4.90-15	154e-13	<u> </u>			7/7/20	20 1	AF18458	035	<5.2e-15	2 12e-	3			uCi/ml
1/14/202	0 AE9	1165	03		8.7e-15	1.91e-13		uCi	/mL	7/14/20	120	AF19519	030	<6.0e-15	5 2.14e-		-14		uCi/mL
1/14/202	0 AE9	1163	03	35 <	8.2e-15	2.01e-13		μCi	/mL	7/14/20	20	AF19517	035	<6.0e-15	5 1.93e-1	13			µCi/mL
1/21/202	0 AE94	1802	- 03	30 <	6.6e-15	1.80e-13	1.24e-1	14 μCi	/mL	7/21/20	20 /	AF20135	030	<5.1e-15	1.99e-1	13			µCi/mL
1/21/202	0 AE94	1800	- 03	35 <	2.2e-15	2.32e-13		μCi	/mL	7/21/20	20 /	AF20133	035	<5.0e-15	5 1.96e-1	3			µCi/mL
1/29/202	0 AE96	5139	- 03	30 <	1.9e-15	1.94e-13		μCi	/mL	7/27/20	020 /	4F20775	030	<6.3e-15	5 2.35e-	13			µCi/mL
1/29/202	0 AE9	5137	03	35 <	5.0e-15	1.90e-13		<u>μCi</u>	/mL	7/27/20	20 /	4F20773	035	<6.0e-15	5 2.57e-	13			µCi/mL
2/4/202	0 AE96	<u>5938</u>	03	30 <	6.3e-15	2.40e-13				8/4/20	20 /	AF21920	030	<4.8e-15	5 1.64e-	3			µCi/mL
2/4/202		7904	03	30 K	0.1e-15	2.25e-13				8/4/20	20	AF21918	035	<4.3e-15) 1.54e-	13			µCi/mL
2/11/202		1301	03	30 K 35 Z	2.2e-15 5.4a-15	1.7512		μCi	m⊾ /mL	8/11/20	20 1	AF22331	030	< 0. le= 15 25 0a=19	2.10e-	3			աննել
2/18/202		3120	0.	30 2	5.4e-15 6.6e-15	1.15e-13	146-	<u>μο</u> 14Οί	m∟ /ml	8/18/20	20 7	4F22303	030	<6.2a-19	2. ne-	3			uCi/mL
2/18/202	$\frac{10}{10}$ AFS	9118	<u></u>	35 7	6 1e-15	1.96e-13	1.400			8/18/20	120 1	4F24702	035	<6.3e-15	2.64e	13			uCi/ml
2/25/202	0 AE9	9869	03	30 <	5.3e-15	1.91e-13	<u> </u>	L L L	/mL	8/25/20	20 /	AF25250	030	<6.2e-15	5 2.56e-	13			uCi/mL
2/25/202	0 AE93	9867	03	35 <	4.9e-15	1.72e-13		μCi	/mL	8/25/20)20 /	4F25248	035	<5.9e-15	5 2.32e-	13			µCi/mL
3/3/202	0 AF05	5568	- 03	30 <	6.8e-15	1.64e-13		μCi	/mL	9/1/202	20	AF26114	030	<5.1e-15	i 1.36e-1	13			µCi/mL
3/10/202	:0 AF02	2383	- 03	30 <	7.1e-15	2.06e-13		μCi	/mL	9/1/202	20	AF26112	035	<5.0e-15	5 1.95e-1	3			µCi/mL
3/10/202	0 AF0	2381	- 03	35 <	5.6e-15	1.59e-13		μCi	/mL	9/8/20	20	AF26719	030	<5.1e-15	2.08e-	13			µCi/mL
3/17/202	0 AF03	3397	03	30 <	4.9e-15	1.85e-13				9/8/20	20 /	AF26717	035	<4.9e-15	5 <u>1.37e-</u>	13			µCi/mL
3/17/202	0 AF03	3395	03	35 (4.9e-15	1.57e-13				9/15/20	20 /	AF27480	030	< <u>5.1e-15</u>	2.05e-	13			µCi/mL
3/23/202		1162	0.0		6.3e-15 c.c. 15	2.66e-13				9/15/20	120 1	4FZ7478	035	<4.3e-15) Z.U3e-	2			pui/mu Cile I
3/20/202		1984	0.	30 2	0.0e-15 5 4a-15	1.60e-13			m∟ /mL	9/22/20	120 1	AF20313 AF28313	030	X5.5e=10 75.2a=19	190a-1	3			uCi/mL
3/30/202		1982	03	35 2	5 Ne-15	1.66e-13	<u> </u>			9/29/20	120 1	AF28927	030	<5.2e-15	184e-1	3			uCi/ml
3/31/202	0 AF05	5566	03	35 (6.3e-15	2.11e-13			/mL	9/29/20	20 1	4F28925	035	<5.0e-15	5 1.64e-	3			uCi/mL
4/7/202	0 AFO	3205	03	30 <	6.1e-15	2.25e-13		μCi	/mL	10/6/20	20 /	AF29726	030	<4.9e-15	5 2.11e-1	3			µCi/mL
4/7/202	0 AF06	6203	- 03	35 <	5.9e-15	1.82e-13		μCi	/mL	10/6/20	120 /	4F29724	035	<5.1e-15	2.01e-1	13			µCi/mL
4/14/202	:0 AF06	6935	- 03	30 <	4.9e-15	1.85e-13		μCi	/mL	10/13/20)20 i	AF30451	030	<5.2e-15	5 2.21e-1	13			µCi/mL
4/14/202	0 AF06	6933	03	35 <	3.6e-15	1.69e-13		<u>μCi</u>	/mL	10/13/20	20 /	4F30449	035	<5.6e-15	5 1.78e-	13			µCi/mL
4/21/202	0 AF0	7525	03	30 <	5.4e-15	2.14e-13			/mL	10/20/20	020 /	AF31370	030	<5.3e-15	5 2.11e-1	3			µCi/mL
4/21/202		<u>1523</u>	<u> </u>	<u>35 (</u>	5.0e-15	1.97e-13				10/20/20	020 1	AF31368	035	<5.2e-15) 2.11e-1	3	<u>_</u>		μCi/mL
4/28/202		5947 E4E	03		2. le- 15 2.615	2.33e-13				10/2//2	020 7	4532507	030	<2.2e-15	2.07e-	13		(e-15	u CilmL
5/5/202	0 AF00	1141	0.	30 7	9.0e-15	1.01e-13			m∟ /mL	11/10/20	120 1	4F32303 4F34258	035	24.7a-19	2 03e-	13			uCi/mL
5/12/202	0 AF10	777	03	30 (4.8e-15	2.01e-13		uCi	ImL	11/17/20	120	AF35164	030	<3.2e-15	5 2.26e-	13			uCi/mL
5/12/202	0 AF10	0139	03	35 (9.0e-15	2.12e-13		μCi	/mL	11/17/20	20 /	AF35162	035	<5.4e-15	5 2.10e-1	13			µCi/mL
5/12/202	0 AF10	775	- 03	35 <	6.3e-15	1.52e-13		μCi	/mL	11/24/20	020 A	AF35750	030	<3.1e-15	2.44e-	13			µCi/mL
5/19/202	:0 AF11	958	- 03	30 <	5.7e-15	1.90e-13		μCi	/mL	11/24/20	020 <i>i</i>	4F35748	035	<8.1e-15	2.33e-	13			µCi/mL
5/19/202	:0 AF11	956	- 03	35 <	5.6e-15	2.49e-13		μCi	/mL	12/1/20	20 /	AF36331	030	<2.3e-15	5 2.46e-	13			µCi/mL
5/26/202	20 AF12	703	- 03	30 <	5.5e-15	1.97e-13		μCi	/mL	12/1/20	20 /	4F36329	035	<7.0e-15	5 3.89e-	13			µCi/mL
5/26/202	20 AF12	2701	03	35 <	5.5e-15	1.87e-13			/mL	12/8/20	120 /	4F36936	030	<4.8e-15	5 1.99e-1	3			µCi/mL
6/2/202		738	<u> </u>		5.3e-15	1.79e-13				12/8/20	20 1	<u>4F36934</u>	035	<4.8e-15) 2.10e-1				µCi/mL
6/2/202		692	03	20 14	5.3e-15	1.0Ze-13		μΟ		12/15/20	120 1	4F3783/ AF3789F	030	< 7.4e-15 73.945	0 0.3e-1	3 12			uC2-1
6/9/2020	0 AF 19 0 AE 14	690	0.0	30 K	5.4e-15	2.04e-13	+	μυ 	m∟ /mL	12/15/20	120 1	4F38190	035	< 3.0e-15	2.00e-	13			uCilmL
6/16/202	0 AF 19	3418	00	30 12	3 76-15	1.03e-13		μυ 		12/21/20	120 1	AF38188	030	<6 0a-19	1 81a-1	3			uCi/mL
6/16/202	0 AF16	3416	03	35 2	9.6e-15	2.41e-13	1,58e-1	14 "Ci		12/29/20	020 1	4F38274	030	<6.7e-19	5 1.96e-1	ă			uCi/ml
6/23/202	0 AF16	944	03	30 7	5.6e-15	1.65e-13		μCi	ImL	12/29/20	020 1	4F38272	035	<8.9e-15	5 1.48e-	3			µCi/mL
6/23/202	0 AF16	942	03	35 रि	5.8e-15	2.25e-13		μCi	/mL										
6/30/202	0 AF17	923	- 03	30 <	5.9e-15	1.26e-13		μCi	/mL										
6/30/202	20 AF1	7921	- 03	35 <	5.9e-15	1.69e-13		μCi	/mL										

Date	Lab	Station	Gross	Units
Air Parti	culates	Samples	;	
1/7/2020	AE92990	030	2.58e-14	μCi/mL
1/7/2020	AE92988	035	2.43e-14	µCi/mL
1/14/2020	AE94164	030	1.94e-14	μCi/mL
1/14/2020	AE94162	035	2.07e-14	μCi/mL
1/21/2020	AE94801	030	1.57e-14	μCi/mL
1/21/2020	AE94799	035	1.75e-14	µCi/mL
1/29/2020	AE96138	030	2.16e-14	µCi/mL
1/29/2020	AE96136	035	2.18e-14	µCi/mL
2/4/2020	AE96937	030	2.60e-14	µCi/mL
2/4/2020	AE96935	035	2.82e-14	μCi/mL
2/11/2020	AE97980	030	2.09e-14	µCi/mL
2/11/2020	AE97978	035	2.15e-14	µCi/mL
2/18/2020	AE99119	030	1.56e-14	μCi/mL
2/18/2020	AE99117	035	1.54e-14	μCi/mL
2/25/2020	AE99868	030	2.01e-14	μCi/mL
2/25/2020	AE99866	035	1.95e-14	μCi/mL
3/3/2020	AF00983	030	2.01e-14	μCi/mL
3/3/2020	AF00981	035	1.96e-14	μCi/mL
3/10/2020	AF02382	030	1.72e-14	μCi/mL
3/10/2020	AF02380	035	1.75e-14	μCi/mL
3/17/2020	AF03396	030	1.55e-14	µCi/mL
3/17/2020	AF03394	035	1.42e-14	µCi/mL
3/23/2020	AF04163	030	1.41e-14	µCi/mL
3/23/2020	AF04161	035	1.54e-14	µCi/mL
3/31/2020	AF05567	030	1.74e-14	µCi/mL
3/31/2020	AF05565	035	1.73e-14	μCi/mL
4/7/2020	AF06204	030	1.94e-14	µCi/mL
4/7/2020	AF06202	035	1.81e-14	µCi/mL
4/14/2020	AF06934	030	2.30e-14	µCi/mL
4/14/2020	AF06932	035	2.27e-14	µCi/mL
4/21/2020	AF07524	030	2.75e-14	µCi/mL
4/21/2020	AF07522	035	2.67e-14	µCi/mL
4/28/2020	AF08546	030	2.40e-14	µCi/mL
4/28/2020	AF08544	035	2.34e-14	µCi/mL
5/5/2020	AF10140	030	1.93e-14	µCi/mL
5/5/2020	AF10138	035	1.84e-14	µCi/mL
5/12/2020	AF10776	030	2.12e-14	µCi/mL
5/12/2020	AF10774	035	2.14e-14	µCi/mL
5/19/2020	AF11957	030	1.91e-14	µCi/mL
5/19/2020	AF11955	035	1.83e-14	µCi/mL
5/26/2020	AF12702	030	2.20e-14	µCi/mL
5/26/2020	AF12700	035	1.99e-14	µCi/mL
6/2/2020	AF13737	030	2.08e-14	µCi/mL
6/2/2020	AF13735	035	2.11e-14	µCi/mL
6/9/2020	AF14691	030	2.10e-14	µCi/mL
6/9/2020	AF14689	035	2.02e-14	µCi/mL
6/16/2020	AF16417	030	2.18e-14	µCi/mL
6/16/2020	AF16415	035	2.17e-14	µCi/mL
6/23/2020	AF16943	030	1.98e-14	µCi/mL
6/23/2020	AF16941	035	1.87e-14	µCi/mL
6/30/2020	AF17922	030	2.07e-14	µCi/mL
6/30/2020	AF17920	035	1.92e-14	μCi/mL

Air Particulates Samples 7/7/2020 AF18459 030 2.35e-14 μCi/ml 7/7/2020 AF18457 035 2.48e-14 μCi/ml 7/14/2020 AF19518 030 2.49e-14 μCi/ml 7/14/2020 AF19518 030 2.49e-14 μCi/ml 7/14/2020 AF19516 035 2.38e-14 μCi/ml 7/121/2020 AF20134 030 2.17e-14 μCi/ml 7/27/2020 AF20132 035 2.20e-14 μCi/ml 7/27/2020 AF20774 030 1.11e-14 μCi/ml 7/27/2020 AF20772 035 1.20e-14 μCi/ml 8/4/2020 AF21919 030 1.46e-14 μCi/ml
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π/21/2020 AF20714 030 π.me-14 μCilmin 7/27/2020 AF20772 035 1.20e-14 μCilmin 8/4/2020 AF21919 030 1.46e-14 μCilmin 8/4/2020 AF21917 035 1.44e-14 μCilmin
8/4/2020 AF21919 030 1.46e-14 μCi/mi 8/4/2020 AF21919 030 1.46e-14 μCi/mi 8/4/2020 AF21917 035 1.44e-14 μCi/mi
8/4/2020 AF21917 035 1.44e-14 μCimi
01472020 AF21317 035 1.44e-14 μCirmi
OFTI/2020 AF22330 030 2.54e-14 μCi/mi
OFTI/2020 AF22300 035 2.42e-14 μCi/mi
8/18/2020 AF24703 030 1.74e-14 μω/mi
8/18/2020 AF24/01 035 1.80e-14 μCi/mi
8/25/2020 AF25249 030 3.05e-14 μCi/ml
8/25/2020 AF25247 035 2.94e-14 μCi/ml
9/1/2020 AF26113 030 1.51e-14 μCi/ml
<u>9/1/2020</u> AF26111 035 1.62e-14 μCi/ml
9/8/2020 AF267180302.61e-14 μCi/ml
<u>9/8/2020 AF26716 035 2.57e-14 µCi/ml</u>
<u>9/15/2020 AF27479 030 2.18e-14 μCi/ml</u>
<u>9/15/2020 AF27477 035 2.09e-14 μCi/ml</u>
<u>9/22/2020 AF28314 030 2.83e-14 μCi/ml</u>
9/22/2020_AF283120352.91e-14μCi/ml
9/29/2020 AF289260301.67e-14μCi/ml
_9/29/2020_AF289240351.59e-14μCi/ml
_10/6/2020 AF297250302.76e-14µCi/ml
_10/6/2020 AF297233.09e-14μCi/ml
_10/13/2020 AF304500302.68e-14μCi/ml
10/13/2020 AF30448 035 2.59e-14 μCi/ml
10/20/2020 AF31369 030 3.32e-14 μCi/ml
10/20/2020 AF31367 035 3.37e-14 μCi/ml
10/27/2020 AF32506 030 1.87e-14 μCi/ml
10/27/2020 AF32504 035 1.89e-14 μCi/ml
11/2/2020 AF32887 030 3.17e-14 μCi/ml
11/2/2020 AF32885 035 3.27e-14 μCi/ml
11/10/2020 AF34259 030 1.80e-14 μCi/ml
11/10/2020 AF34257 035 1.94e-14 μCi/ml
11/17/2020 AF35163 030 1.69e-14 µCi/ml
11/17/2020 AF35161 035 1.71e-14 uCi/ml
11/24/2020 AF35749 030 1.76e-14 uCi/ml
11/24/2020 AF35747 035 1.72e-14 uCi/ml
12/1/2020 AF36330 030 1.72e-14 uCi/ml
12/1/2020 AF36328 035 1.84e-14 μCi/m
12/8/2020 AF36935 030 3.08e-14Ci/ml
12/8/2020 AF36933 035 3.00e-14Ci/m
12/15/2020 AF37896 030 9 29e-13Ci/m/
12/15/2020 AF37894 035 2 77e-14Cim
12/21/2020 AE38189 030 3.09e-14CVm
12/21/2020 AE38187 035 3 41e-14CVm
12/29/2020 AF38273 030 2.37a-14CVm
12/29/2020 AF38271 035 2 43e-14 UC/ml

Date	Lab	Station	Ba-140	Co-58	Co-60	Cs-1	34 Cs-	137 F	e-59	I-131		(-40 l	.a-140	Mn-54	Nb-9	95 Z	n-65	Zr-95	Units
Fish Sar	nples																		
4/1/2020	AF0597	5 053	<5.2e-8	<1.1e-8	(<1.2e-8) <1.2e	-8 <1.	2e-8 <	2.4e-8	<1.9e-8	3 1.1	09e-6	<1.7e-8	<1.2e-8	<1.3e	-8 <2	2.4e-8	<1.9e-8	μCilg
10/5/2020	AF2972	2 053	<2.3e-8	<6.2e-9	3 <7.0e-9) <6.3e	-9 <6.	1e-9 <	1.3e-8	<6.8e-\$	9 1.	67e-6	<8.7e-9	<6.2e-9	<6.0e	-9 <	1.5e-8	<9.8e-9	μCilg
						·													
Date	Lab S	tation Ba-1	40 Be-7	Bi-212	Co-58	Co-60 (Cs-134 (s-137	Fe-59	[-131	K-40	La-140) Mn-54	Nb-95	Pb212	Ti-208	3 Zn-6!	5 Zr-95	Units
Food Proc	duct Sam	ples		_													_	_	
3/16/2020	AF03104	030 <5.0e	e-8 5.49e-7	'	<1.3e-8	<1.5e-8	<1.2e-8	<1.3e-8	<2.9e-8	(1.7e-8	5.26e-6	3 <1.5e-8	<1.2e-8	<1.3e-8			<3.1e-6	3 <2.2e-8	µCi/g
3/16/2020	AF03103	035 <4.8e	e-8 5.54e-7	1	<1.2e-8	<1.4e-8	<1.2e-8	<1.3e-8	<3.0e-8	(1.5e-8	9.15e-6	i <1.4e-8	<1.2e-8	<1.3e-8			<3.3e-	3 <2.0e-8	μCilg
3/24/2020	AF04424	004 <3.0e	e-8 2.72e-7	'	<8.1e-9	<1.1e-8	<8.0e-9	<8.9e-9	<2.0e-8	(9.1e-9	5.40e-6	} <8.5e-9	<8.2e-9	<8.5e-9		2.14e-8) <2.2e-i	3 <1.4e-8	μCilg
4/28/2020	AF08548	030 <3.8e	e-8 2.88e-7	2.38e-7	<1.0e-8	<1.2e-8	<1.1e-8	<1.1e-8	<2.5e-8	(1.2e-8	5.34e-6	6 <1.2e-8	<1.1e-8	<1.1e-8	2.10e-7	7.72e-8	3 <2.7e-i	3 <1.8e-8	μCilg
6/8/2020	AF14564	004 <3.3e	e-8 7.27e-7	'	<9.0e-9	<1.1e-8	<9.1e-9	<9.4e-9	<2.2e-8	(9.7e-9	3.80e-6) <1.2e-8	<9.7e-9	<9.4e-9	9.3e-8	3.65e-8	3 <2.3e-	3 <1.6e-8	μCilg
6/8/2020	AF14565	035 <5.1e	-8 3.10e-6		<1.3e-8	<1.5e-8	<1.4e-8	<1.5e-8	<2.9e-8	(1.7e-8	1.98e-6	i <1.6e-8	<1.4e-8	<1.4e-8	5.9e-8	1.57e-8	(3.2e-	3 <2.3e-8	μCi/g
8/24/2020	AF24970	030 <4.9e	e-8 1.41e-6		<1.3e-8	<1.5e-8	<1.3e-8	<1.4e-8	<2.7e-8	(1.6e-8	4.18e-6	i <1.4e-8	<1.2e-8	<1.4e-8	3.8e-8		<3.0e-	3 <2.3e-8	uCi/a
8/24/2020	AF24969	035 <3.76	-8 7.64e-7	'	<11e-8	<12e-8	<11e-8	<12e-8	<2.4e-8	(12e-8	5.11e-6	<1.3e-8	<12e-8	<1.1e-8		2.12e-8	(2.7e-	3 <1.9e-8	uCila
10/21/2020	AF31588	030 <6.0e	-8 136e-6		<14e-8	<15e-8	<14e-8	<14e-8	(2.8e-8	(19e-8	3.21e-6	(19e-8	<13e-8	<13e-8			(3.1e-1	3 (2.3e-8	uCila
10/21/2020	AE31587	035 <5.4	-8 3.88e-7	,	(12e-8	<14e-8	<13e-8	(13e-8	(2.7e-8	(19e-8	3.92e-6	(15e-8	<13e-8	<14e-8			(30e-	3 (2.2e-8	uCila
	11 01001				1.22.0	11.100			12.10 0		0.000 0	/ 1800 0	1.000	1.100			10.00		polig
Date	Lab S	tation Ba-	140 Co-5	8 Co-6	0 Cs-134	4 Cs-13	7 Fe-59	I-13	1 K-4() La-1	40 M	n-54 N	b-95 Pb	-212 Pb	-214 T	i-208	Zn-65	Zr-95	Units
Sediment	Sample	S S				05 10													Units
4/20/2020	AE07521	052 (2.5	5e-7 (61e-	-8 <63e-	8 (71e-8	(72e-8	3 (12e-7	(81e-	8 7.05e	6 (86)	-8 (f	64e-8 (7.2e-8 8	3e-7 7	11e-7 3	63e-7	(17e-7	<11e-7	uCila
ILCILCE0	in orocri	002 112.0	A 1 10.10	0 10.00	0 11.100	1 11.66		10.10	0 1.000	0 10.00		0.10 0 1 1		00 1 1 1.		.000 1	1010 1	10.00	polig
Date	Lah	Station	Ba-140	Co. 58	Co-60	Ce-134	Ce-137	Eq.5	0 T-13	1 K.	40	1 3-140	Mn-54	Nh-0	5 7 n	65 3	7=05	Gross	Unite
Watan C	Lub	Camples	Da 140	00.50	00 00	C3 134	C3 157	10.5	113	1 N		Lu 140	1.11.24		5 2"	05		Beta	Units
Water-S	AF94400	Samples	/76- 9	/16- 0	/17- 9	/10- 9	/17- 0	1 /2 E-	0 /20-	-		/2 0- 0	/10- 9	/10-	0 / 2 /		20- 9	E 7- 9	Cil-L
1/27/2020	AE34100	040	<1.0e=3	<1.0e=3 /2.0a=9	<1.re=3 /2.1a=9	<1.0e=3 72.1a=9	<1. re=3	X3.3e ⁻	9 73.04	-3	la-8	<2.0e-3	<1.0e-3	22 lo-	9 74 5	ie-3 (ia-9 /	(3.0e-3 (3.6a-9	2.1e-3	u Cilme
2/11/2020	AE30140	032	25.89	<2.0e-0 /15a-9	/170-9	<2.1e=3 /16a=9	X2.3e-3 716a-9	74.16- 73.16-	9 / 219~	-3 3.1	ie-o	<2.1e=3 /2.4a=9	12.1e-3	/170-	9 734	10-9 V	270-9	6.80-9	ա Ընթե
2/17/2020	AE91302	040	<8.7e-9	<1.3e-3 (2.0a-9	< <u>(20a-9</u>)	(2.0e=0)	<1.0e=0 (2.3a=9	(3.1e)	9 7304	-9 39	ia-8	< <u>2.46-0</u> < <u>3.06-9</u>	<1.1e-3	1 (210-	9 746	ie-0 ((2.1e-5 (3.8e-9	3.096-3	սԸնտե
3/16/2020	AF03102	002	<7.6e-9	(2.08-0	(2.0e-0	(2.1e-0 (2.2e-9	(2.3e-9	(4.0e-	9 (2.6e	-9		<2.6e-9	(2.0e-0	(2.10-	9 (4.3	6-9 ((3.6e-9	6.0e-9	uCi/ml
3/16/2020	AF03101	052	<5.8e-9	<15e-9	<1.8e-9	<1.6e-9	<1.8e-9	<3.2e-	9 (1.8e	-9		<2.3e-9	<1.6e-9	(1.7e-	9 (3.5	ie-9 ((2.6e-9	2.18e-8	սCi/mL
4/13/2020	AF0670	052	<8.4e-9	<2.1e-9	<2.3e-9	<2.2e-9	<2.3e-9	<4.0e-	9 <2.8e	-9 3.8)e-8	<2.8e-9	<1.9e-9	<2.1e-	9 <4.4	e-9 ((3.5e-9	3.95e-8	uCi/mL
4/15/2020	AF07378	046	<8.0e-9	<1.6e-9	<1.7e-9	<1.7e-9	<1.8e-9	<3.5e-	9 <2.9e	-9		<3.3e-9	<1.7e-9	<1.9e-	9 < 3.5	ie-9 <	(3.1e-9	7.4e-9	μCi/mL
5/18/2020	AF11960	046	<8.9e-9	<1.9e-9	<2.2e-9	<2.1e-9	<2.1e-9	<4.1e-	9 <3.0e	-9		<2.9e-9	<2.2e-9) <2.2e-	9 <4.3	3e-9 <	(3.7e-9	5.3e-9	μCi/mL
5/18/2020	AF11959	052	<6.2e-9	<1.6e-9	<1.6e-9	<1.6e-9	<1.8e-9	<3.3e-	9 <2.1e	-9 3.0)e-8	<2.3e-9	<1.7e-9	<1.6e-	9 <3.4	e-9 <	(2.8e-9	3.56e-8	µCi/mL
6/16/2020	AF16419	046	<9.8e-9	<2.0e-9	<1.9e-9	<2.0e-9	<2.2e-9	<3.5e-	·9 <4.2e	-9		<3.3e-9	<1.9e-9	<2.2e-	9 <3.8	3e-9 <	(3.4e-9	4.9e-9	µCi/mL
6/16/2020	AF16420	052	<1.2e-8	<2.2e-9	<2.2e-9	<2.1e-9	<2.3e-9	<4.6e-	·9 <4.6e	-9 2.7	'e-8	<3.8e-9	<2.1e-9	<2.4e-	9 <4.6	ìe-9 <	(3.9e-9	2.36e-8	µCi/mL
7/15/2020	AF20138	046	<7.4e-9	<1.6e-9	<1.7e-9	<1.7e-9	<1.8e-9	<3.4e-	9 <2.9e	-9		<3.1e-9	<1.7e-9	<1.8e-	9 < 3.3	3e-9 <	(2.9e-9	3.8e-9	µCi/mL
7/15/2020	AF20137	052	<1.1e-8	<2.2e-9	<2.2e-9	<2.2e-9	<2.3e-9	<4.6e-	9 <4.2e	-9 4.3	3e-8	<3.6e-9	<2.3e-9) <2.4e-	9 <4.8	8e-9 <	(3.8e-9	4.3e-8	µCi/mL
8/19/2020	AF24706	046	<8.3e-9	<2.0e-9	<2.2e-9	<2.2e-9	<2.4e-9	<4.3e-	9 <2.8e	-9	_	<2.8e-9	<2.2e-9) <2.1e-	9 < 4.7	'e-9 <	(<u>3.7e-9</u>	4.9e-9	µCi/mL
8/19/2020	AF24705	052	<6.0e-9	<1.5e-9	<1.8e-9	<1.7e-9	<1.7e-9	<3.3e-	9 <1.9e	-9 4.5)e-8	<2.3e-9	<1.7e-9	<1.7e-	9 <3.4	e-9 <	(2.7e-9	2.70e-8	µCi/mL
9/9/2020	AF27243		<1.1e-8	<2.1e-9	<2.2e-9	<2.2e-9	<2.3e-9	<4.1e-	<u>9 (3.9e</u>	-9		<u><3.5e-9</u>	<2.1e-9	<2.3e-	9 <4.4	e-9 ((3.9e-9	5.8e-9	µUi/mL
3/3/2020	AF20705	0052	<1.3e-3	<1.8e-3	<1.8e-3	<u><1.7e-3</u>	KI./e-9	< 3.7e-	0 (2.6e	-3 1.52 o	2e-7	<2.3e-9	<1.7e-9	<1.8e-	3 (3.3	e-3 K	(Z.Be-9)	7.be-8	μu/mL Citil
10/14/2020	AF30705		<0.3e-3	<1.re-3	<1.7e-3	<1.7e-3	KI.7e-9	< 3. le-		-J 0 E 0		<2.1e-3	<1.7e-3	(Kilbe-	0 0.0	e-3 <	(2.5e-3	5.3e-3	µUI/mL C:I_I
11/9/2020	AF30700	002	<0.2e-3	<2.0e-3	<2.2e-3 /199	<2.1e-3	<2.3e-9	<4.0e-	9 72.0e	-3 5.3	e-0	<2.0e-3	<2.0e-3	/ <u><2.1e-</u>	0 (4.3 9 /29	e-3 <	0.00-3	0.20-0 6.79	րել Մերլ
11/9/2020	AF33051	040	<r.3e-3< td=""><td><1.0e-3 /169</td><td><1.0e-3 /189</td><td><2.0e-3 /169</td><td><2. le=3 /16=-9</td><td>3.4e⁻</td><td>9 <u>722-</u></td><td>-3 3.3</td><td>10-7</td><td><2.2e-3 /2.49</td><td><1.0e-3</td><td>/1.30-</td><td>0 (0.0 9 / 2 /</td><td>e-3 <</td><td>(J.Je-J (2.80</td><td>0.re-3 719</td><td> Մնել</td></r.3e-3<>	<1.0e-3 /169	<1.0e-3 /189	<2.0e-3 /169	<2. le=3 /16=-9	3.4e ⁻	9 <u>722-</u>	-3 3.3	10-7	<2.2e-3 /2.49	<1.0e-3	/1.30-	0 (0.0 9 / 2 /	e-3 <	(J.Je-J (2.80	0.re-3 719	 Մնել
12/7/2020	AF36933	032	<7.8e-9	<1.0e-3	<1.0e-3	<1.0e-3 /2.1a-9	< 1.0e-3	/3.46-	9 72.28	-3 1.00	Je-r	<2.4e=3 /2.5a=9	1. re=3	1 /2 0o-	0 X0.4 9 Z02		(2.0e-3 (3.4a-9	6.0a-9	_µCim∟ µCi/mL
12/7/2020	Twi 20225	. 040	<1.0e=3	<2.0e=3	<2.0873 L	NZ. 1873	i ∖∠. Ie=J.	- \.108*			I	NZ .1857	1 NZ 11857	i i ∖ ∕ 1185	GEES44.Z	.e-J I S			μorme
	AF36931	052	(6.2e-9	(16e-9	(18-9	(169	(180-9	(3.20-	9 (2.00	-9 9/	la-8	(2 00-9	(170-9	(17a-	9 / 35	ia-9 /	280-9	7.20-8	المانان
	AF36931	052	<6.2e-9	<1.6e-9	<1.8e-9	<1.6e-9	<1.8e-9	<3.2e-	9 <2.0e	-9 9.4	e-8	<2.4e-9	<1.7e-9	<1.7e-	9 <3.5	ie-9 <	(2.8e-9	7.2e-8	µCi/mL

Date	Lab	Station	H-3	Units							
Water Composite Samples											
2/4/2020	AE93558	046	<1.0e-6	µCi/mL							
2/4/2020	AE93559	052	<1.0e-6	µCi/mL							
7/14/2020	AF19013	046	<1.0e-6	µCi/mL							
7/14/2020	AF19014	052	<1.0e-6	µCi/mL							
	AF10128	046	<1.0e-6	µCi/mL							
	AF10129	052	<1.0e-6	µCi/mL							
10/6/2020	AF29377	046	<1.0e-6	µCi/mL							
10/6/2020	AF29378	047	<1.0e-6	µCi/mL							

NOTE: * Indicates the analysis was by alpha spectrometry, or Ra-226, analysis by radon emanation. **Indicates the tritium (H-3) analysis for food product, sediment, and vegetation is reported in UCi/ml

Research Reactors

Texas A & M University Nuclear Science Center

Radiation Branch Site No. 001

Texas A&M Nuclear Science Center (NSC) is located seven miles south of downtown Bryan just south of Easterwood Airport. NSC houses a one-megawatt TRIGA (Testing, Research, Isotope Production, General Atomics) research reactor that came online in 1961. The Radiation Branch Surveillance Program consists of OSL monitoring.







Shaded area indicates location of Brazos County

Texas A & M University Nuclear Science Center Monitoring Station Locations



Texas A & M Nuclear Science Center Optically Stimulated Luminescent Dosimeter (OSL) Monitoring Results¹ (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
2	35	31	24	33	123	
3	34	33	25	30	122	
4	38	37	27	34	136	
5	33	29	24	29	115	
10	35	30	24	31	120	
11	33	30	26	30	119	
*14	35	31	0	27	93	QTR 3 OSL Missing
18	32	30	24	31	117	
19	32	28	22	22	104	
*23	34	29	23	31	117	
24	34	31	25	31	121	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

University of Texas Nuclear Engineering Teaching Laboratory

Radiation Branch Site No. 003

University of Texas Nuclear Engineering Teaching Laboratory (NETL) is located at the J. J. Pickle Research Center, approximately five miles north of the Texas Department of State Health Services main campus. NETL houses an aboveground, fixed-core 1.1 megawatt TRIGA (Testing, Research, Isotope Production, General Atomics) research reactor that came online in 1992. The Radiation Branch Surveillance Program consists of sampling sewage and water and OSL monitoring.







Travis County

PFLUGERVILLE

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University of Texas Nuclear Engineering Teaching Laboratory Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

Homeland Security -Diagram Removed



University of Texas Nuclear Engineering Teaching Laboratory

Optically Stimulated Luminescent Dosimeter (OSL) Monitoring Results¹ (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	26	26	23	26	101	
2	32	28	0	0	60	QTRs 3 and 4 OSLs missing
3	30	27	23	27	107	
4	37	31	25	30	123	
5	35	30	23	27	115	
*20	0	26	22	28	76	QTR 1 OSL missing

NOTE: ¹*Background is not subtracted from the data*

²*An* occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Other Facilities

Gammatron, Inc. Radiation Branch Site No. 018

Gammatron, Inc. is a manufacturer of sealed radioactive sources. The facility is located in an industrial area of Houston approximately four miles northwest of William P. Hobby Airport. The Radiation Branch Surveillance Program consists OSL monitoring.



Shaded area indicates location of Harris County



Gammatron, Inc. Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

CHESMOOD CHE

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Homeland Security -Diagram Removed

Gammatron, Inc.

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
3	148	45	82	116	391	
5	501	315	220	728	1764	
8	452	353	218	325	1348	
*24	0	28	21	27	76	QTR 1 OSL missing
30	69	44	65	109	287	
31	58	135	65	45	303	
34	212	126	149	216	703	
40	211	84	110	276	681	

NOTE: ¹Background is not subtracted from the data ²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

ETHERIDGE

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GeoCo, Inc. Radiation Branch Site No. 051

GeoCo, Inc. is a tracer studies company specializing in oil and gas wells. The facility is located in Midland approximately six miles east of Midland-Odessa International Airport. The Radiation Branch Surveillance Program consists of OSL monitoring





Shaded area indicates location of Midland County



GeoCo, Inc. Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

Homeland Security -Diagram Removed



GeoCo, Inc.

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	46	34	26	33	139	
*8	43	31	28	30	132	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Isotech Laboratories, Inc.

Radiation Branch Site No. 008

Isotech Laboratories, Inc. manufactures tracer material for the oil and gas industry, calibrates radiation detection instruments, and provides radiation safety training for well-logging and tracer services. The facility is located in Midland approximately six miles east of Midland-Odessa International Airport. The Radiation Branch Surveillance Program consists of OSL monitoring.





Shaded area indicates location of Midland County



Isotech Laboratories, Inc. Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

Homeland Security -Diagram Removed



Isotech Laboratories, Inc.

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	44	32	27	34	137	
2	0	37	34	44	115	QTR 1 OSL missing
3	51	33	30	40	154	
4	60	38	33	40	171	
6	59	33	30	38	160	
*8	43	32	26	32	133	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Nuclear Sources and Services, Inc.

Radiation Branch Site No. 023

The Nuclear Sources and Services, Inc. (NSSI) facility occupies approximately five acres in a light industrial area of Southeast Houston approximately four miles northwest of William P. Hobby Airport. The primary activities of NSSI currently are waste treatment, storage, and disposal of radioactive and chemical hazardous materials. NSSI receives wastes from a variety of off-site generators both inside and outside of Texas. At the conclusion of treatment or storage, the residues are shipped to permitted off-site facilities for disposal. The Radiation Branch Surveillance Program consists of soil sampling and OSL monitoring.



Harris County



Shaded area indicated location of Harris County



Nuclear Sources and Services, Inc. Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

Homeland Security -Diagram Removed



Nuclear Sources and Services, Inc.

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

OSL Stations	01	02	03	04	Annual Dose	Notes
	¥-	¥~	1 -	.		
3	316	446	1179	2216	4157	
4	68	38	32	50	188	
6	164	91	101	38	394	
7	114	42	124	1621	1901	
11	38	35	26	31	130	
12	237	42	81	146	506	
16	47	37	33	71	188	
18	87	34	32	44	197	
19	92	38	32	98	260	
20	92	37	30	40	199	
21	1402	390	702	646	3140	QTR 1 OSL over exposure
22	63	31	22	30	146	
23	36	32	25	30	123	
*24	50	28	21	27	126	
25	89	36	27	36	188	
41	86	54	88	144	372	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Pantex

Radiation Branch Site No. 005

The Pantex plant site is located in Carson County in the Texas Panhandle, north of U.S. Highway 60. The plant is located 17 miles (27 kilometers) northeast of downtown Amarillo. It is centered on a 18,000-acre site. The Pantex facility consists of 11,703 acres of United States Department of Energy (USDOE) owned land and 5,800 acres of land leased from Texas Tech University used as a safety and security buffer zone. The buffer area is managed by Texas Tech Research Farm and is used as rangeland and farmland. An additional 1,080 acres northwest of the plant is called Pantex Lake. Pantex Lake was formally used as the receiving area for treated wastewater discharges and is now managed by Texas Tech University. An additional 7,926 acres to the east of the plant is USDOE-owned and is used for agricultural purposes through a cooperative agreement.

The Radiation Branch Surveillance Program consists of OSL monitoring and sampling air, food products, sediment, soil, vegetation, and water. Analysis of samples is performed to determine the presence of any special nuclear material.



Shaded area indicates location of Carson County

Pantex Monitoring Station Locations







Pantex Monitoring Station Locations



Homeland Security -Diagram Removed

Pantex Environmental Sample Results

				-	-	
OSL						
Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
4	40	39	30	42	151	
8	45	38	30	39	152	
14	43	39	32	46	160	
16	42	42	30	43	157	
19	41	42	31	43	157	
20	43	42	31	43	159	
21	41	39	28	41	149	
*24	38	34	30	38	140	
29	70	0	30	41	141	QTR 2 OSL was not exchanged due
27	41	42	24	49	166	to no access to planticovid=15
57	41	43	34	40	100	
38	41	38	30	42	151	
39	41	38	31	41	151	

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Pantex Environmental Air Sample Results

Date	Lab	Station	Be-7	Gross Beta	Plutonium- 239	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Air Particula	ite Sampl	es								
1/23/2020	AE9988	105	7.99e-	<3.6e-14	<5.2e-17	<1.1e-15	<5.2e-16	<5.2e-16	<5.2e-16	µCi/mL
1/31/2020	AE9988	105	6.75e-	<3.7e-14	<5.2e-17	<1.1e-15	<5.2e-16	<5.2e-16	<5.2e-16	µCi/mL

Date	Lab	Station	Be-7	K-40	Pb-212	Pb-214	TI-208	Plutonium- 239	H-3	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Food Produc	t Sample	5												
8/11/2020	AF23643	025	3.01e-6	2.76e-5	1.50e-7	2.45e-7	8.6e-8	<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30983	025	5.7e-7	1.75e-5				<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g

Date	Lab	Station	Cs-137	K-40	Pb-212	Pb-214	TI-208	Plutonium- 239	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Sediment Sa	mples												
1/15/2020	AE9385	022		1.65e-5	1.48e-6		3.77e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/12/2020	AF23649	015		1.54e-5	9.2e-7	7.9e-7	3.97e-7	<4.0e-7	2.2e-6	1.12e-6	<1.0e-6	1.07e-6	µCi/g
8/12/2020	AF23650	040		1.70e-5	9.2e-7	8.6e-7	4.63e-7	<4.0e-7	2.1e-6	<1.0e-6	<1.0e-6	1.15e-6	µCi/g
10/14/2020	AF30976	022	1.11e-7	1.60e-5	8.9e-7	8.34e-7	4.09e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g

Date	Lab	Station	Cs-137	K-40	Pb-212	Pb-214	TI-208	Plutonium- 239	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Soil Sample	5												
1/15/2020	AE9384	014		1.79e-5	1.08e-6		4.91e-7	<4.0e-7	2.30e-6	1.09e-6	<1.0e-6	1.17e-6	µCi/g
1/15/2020	AE9385	018		1.64e-5	1.58e-6		3.30e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	020		1.82e-5	1.57e-6	8.0e-7	4.37e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	037		1.99e-5	1.91e-6	9.9e-7	4.5e-7	<4.0e-7	2.39e-6	1.29e-6	<1.0e-6	1.06e-6	µCi/g
1/15/2020	AE9385	039		1.64e-5	1.04e-6	7.8e-7	4.31e-7	<4.0e-7	2.13e-6	<1.0e-6	<1.0e-6	1.18e-6	µCi/g
8/11/2020	AF23621	004	2.79e-7	1.73e-5	1.10e-6	1.38e-6	4.5e-7	<4.0e-7	2.2e-6	<1.0e-6	<1.0e-6	1.16e-6	µCi/g
8/11/2020	AF23622	008		1.39e-5	1.31e-6	7.6e-7	3.21e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23623	014		1.80e-5	1.37e-6	8.9e-7	3.97e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23624	016		1.62e-5	1.11e-6	1.08e-6	4.5e-7	<4.0e-7	2.2e-6	1.00e-6	<1.0e-6	1.14e-6	µCi/g
8/11/2020	AF23625	018		1.55e-5	1.01e-6	9.6e-7	4.00e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23626	019		1.72e-5	1.17e-6		4.41e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23627	020		1.79e-5	1.02e-6	9.1e-7	4.65e-7	<4.0e-7	2.0e-6	<1.0e-6	<1.0e-6	1.01e-6	µCi/g
8/11/2020	AF23629	037		1.54e-5	1.13e-6	7.5e-7	4.5e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23630	038		1.82e-5	1.29e-6	1.14e-6	5.1e-7	<4.0e-7	2.0e-6	<1.0e-6	<1.0e-6	1.07e-6	µCi/g
8/11/2020	AF23631	039		1.87e-5	1.08e-6	1.11e-6	4.4e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30970	004	1.17e-7	1.81e-5	1.10e-6		4.0e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	1.08e-6	µCi/g
10/14/2020	AF30971	008	7.7e-8	1.55e-5	9.1e-7	8.8e-7	3.63e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30972	016		1.71e-5	1.09e-6	9.9e-7	4.54e-7	<4.0e-7	2.08e-6	<1.0e-6	<1.0e-6	1.06e-6	µCi/g
10/14/2020	AF30973	019		1.64e-5	9.8e-7	8.8e-7	4.26e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30974	021		1.45e-5	1.03e-6	6.9e-7	3.01e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30975	038		1.70e-5	1.73e-6		4.65e-7	<4.0e-7	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g

Pantex Environmental Sample Results

Date	Lab	Station	Be-7	K-40	TI-208	Plutonium- 239	H-3	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Vegetation S	Samples											
1/15/2020	AE9385	014	6.43e-6	3.26e-6				<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	018		4.25e-6		<4.0e-7		<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	020	7.28e-6	7.45e-6	4.5e-8	<4.0e-7		<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	037	6.97e-6	2.63e-6		<4.0e-7		<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
1/15/2020	AE9385	039	7.50e-6	1.90e-6		<4.0e-7		<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23639	021	4.16e-6	5.28e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23640	037	8.89e-6	1.89e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/11/2020	AF23641	038	4.38e-6	5.85e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
8/12/2020	AF23642	039	5.70e-6	2.47e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30978	008	1.67e-6	2.57e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30979	016	1.64e-6	2.68e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30980	019	3.83e-6	2.78e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30981	021	1.92e-6	4.65e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/14/2020	AF30982	038	1.57e-6	2.72e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g
10/19/2020	AF30977	004	4.77e-6	1.60e-5		<4.0e-7	<1.0e-6	<2.0e-6	<1.0e-6	<1.0e-6	<1.0e-6	µCi/g

Date	Lab	Station	H-3	Plutonium- 239	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Water-Surfa	ice Samp	es							
1/15/2020	AE9386	022	<1.0e-6	<4.0e-10	<2.0e-9	<1.0e-9	<1.0e-9	<1.0e-9	µCi/mL
1/15/2020	AE9386	024	<1.0e-6	<4.0e-10	6.2e-9	4.11e-9	<1.0e-9	1.74e-9	µCi/mL
6/9/2020	AF23644	024	<1.0e-6	<4.0e-10	5.6e-9	3.85e-9	<1.0e-9	1.71e-9	µCi/mL
8/12/2020	AF23647	024	<1.0e-6	<4.0e-10	5.9e-9	4.12e-9	<1.0e-9	1.73e-9	µCi/mL
10/14/2020	AF30984	024	<1.0e-6	<4.0e-10	4.0e-9	2.77e-9	<1.0e-9	<1.0e-9	µCi/mL

Date	Lab	Station	Bi-214	Pb-214	Plutoniu m-239	H-3	Total Uranium	Uranium- 234	Uranium- 235	Uranium- 238	Units
Water-Grou	nd Sampl	es									
1/15/2020	AE9386	027	2.14e-8	1.68e-8	<4.0e-10	<1.0e-6	8.4e-9	5.7e-9	<1.0e-9	2.64e-9	µCi/mL
1/15/2020	AE9386	030	1.05e-8	9.9e-9	<4.0e-10	<1.0e-6	6.2e-9	4.04e-9	<1.0e-9	2.06e-9	µCi/mL
6/9/2020	AF23645	027			<4.0e-10	<1.0e-6	5.1e-9	3.44e-9	<1.0e-9	1.50e-9	µCi/mL
6/9/2020	AF23646	030			<4.0e-10	<1.0e-6	7.0e-9	5.0e-9	<1.0e-9	1.87e-9	µCi/mL
8/12/2020	AF23648	027			<4.0e-10	<1.0e-6	6.7e-9	4.48e-9	<1.0e-9	2.23e-9	µCi/mL
10/14/2020	AF30985	027			<4.0e-10	<1.0e-6	6.1e-9	3.77e-9	<1.0e-9	2.26e-9	µCi/mL
10/14/2020	AF30986	030			<4.0e-10	<1.0e-6	7.5e-9	4.5e-9	<1.0e-9	2.90e-9	µCi/mL

NOTE: * indicates the analysis was by alpha spectrometry, or Ra-226, analysis by radon emanation. **Indicates the tritium (H-3) analysis for food product, sediment, and vegetation is reported in UCi/ml

Radiation Technology, Inc.

Radiation Branch Site No. 050

Radiation Technology, Inc. (RTI), located six miles north of downtown Odessa, provides installation, repair, and maintenance of nuclear gauging devices and services for loading and unloading radioactive sources in nuclear gauges. The Radiation Branch Surveillance Program consists of OSL monitoring.



Shaded area indicates location of Ector County



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Radiation Technology, Inc. Monitoring Station Locations

♦ TLD Station ♥ Sample Station ♣ TLD & Sample Station

Homeland Security -Diagram Removed



Radiation Technology, Inc.

Optically Stimulated Luminescence (OSL) Monitoring Results (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	66	45	42	39	192	
2	727	396	480	279	1882	
3	155	72	81	67	375	
4	53	36	33	36	158	
*8	43	31	28	30	132	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Thermo Fisher

Radiation Branch Site No. 054

Thermo Fisher, located in Sugarland Texas, southwest of Houston Texas, formerly provides installation, repair, and maintenance of nuclear gauging devices and services for loading and unloading radioactive sources in nuclear gauges. The facility is being decommissioned at this time. The Radiation Branch Surveillance Program consists of OSL monitoring that ended December 31, 2020.





Shaded area indicates Fort Bend County



Thermo Fisher Monitoring Station Locations

◆ TLD Station ♥ Sample Station ♣ TLD & Sample Station



Thermo Fisher

Optically Stimulated Luminescence (OSL) Monitoring Results and Environmental Sampling Results (quarterly and annual readings are in mrem)

OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	32	28	23	26	109	
2	32	29	0	27	88	Q3 OSL missing
3	0	29	0	0	29	Q1,Q3 and Q4 OSL missing
4	34	30	24	27	115	
*6	35	31	25	33	124	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Trace Life Sciences

Radiation Branch Site No. 055 & 056

U.S. Radiopharmaceuticals, formerly Trace Life Sciences, has two sites located in Denton Texas, which consists of a medical radioisotope production facility which also stores contaminated accelerator parts. The Radiation Branch surveillance program consists of OSL monitoring.



Shaded area indicates Denton County



Trace Life Sciences Monitoring Station Locations



Trace Life Sciences

Optically Stimulated Luminescence (OSL) Monitoring Results
and Environmental Sampling Results
(quarterly and annual readings are in mrem)

Site 55 OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	31	27	24	28	110	
2	31	26	22	29	108	
3	32	27	22	28	109	
4	32	27	24	30	113	
*6	36	30	25	30	121	
Site 56 OSL Stations	Q1	Q2	Q3	Q4	Annual Dose	Notes
1	32	28	23	30	113	
2	34	29	25	31	119	
3	31	27	23	28	109	

NOTE: ¹Background is not subtracted from the data

²An occupancy factor of 1/16 may be applied to this number to obtain radiation dose to members of the public.

Appendices



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP Series 26 (TDHL01) Texas Department of State Health Services Laboratory 1100 W 49th Street Austin, TX 78756

MAPEP-12-MaS26: Radiological and inorganic combined soil standard

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		Ref		Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag Notes	(%)	Range	Value	Flag
Arsenic	NR	48.2			33.7 - 62.7		
Barium	NR	655	i		459-852		
Beryllium	NR	47.5	;		33.3-61.8		
Cadmium	NR	10.6			7.4 - 13.8		
Chromium	NR	89.3	1		62.5 - 116.1		
Cobalt	NR	113			79-147		
Copper	NR	206	;		144 - 268		
Lead	NR	74.4			52.1 - 96.7		
Mercury	NR	0.0733	1		0.0513-0.0953		
Nickel	NR	186			130-242		
Selenium	NR	14.2			9.9 - 18.5		
Silver	NR	85.5	;		59.9-111.2		
Technetium-99	NR	0.000596	;		0.000417-0.000775		
Thallium	NR	14.4			10.1 - 18.7		
Uranium-235	NR	0.0653	1		0.0457 - 0.0849		
Uranium-238	NR	26.5	;		18.6 - 34.5		
Uranium-Total	NR	26.5	;		18.6-34.5		
Vanadium	NR	104			73 - 135		
Zinc	NR	286	;		200-372		

Radiological						I	Units: (Bq/	'kg)
		Ref	E1	N	Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag	Notes	(%)	Kange	value	Flag
Americium-241	145	159	Α		-8.8	111-207	ę)
Cesium-134	748	828	Α		-9.7	580 - 1076	10) L
Cesium-137	2.15		Α			False Positive Test	2.15	5
Cobalt-57	1160	1179	Α		-1.6	825 - 1533	20) L
Cobalt-60	0.93	1.56	Α	(17)		Sensitivity Evaluation	0.93	3
Iron-55	NR	1370				959 - 1781		
Manganese-54	578	558	Α		3.6	391 - 725	14	4 L
Nickel-63	NR	862				603 - 1121		
Plutonium-238	128	136	Α		-5.9	95 - 177	1:	2
Plutonium-239/240	59.0	65.8	Α		-10.3	46.1 - 85.5	6.	5
Potassium-40	1520	1491	Α		1.9	1044 - 1938	4	0 L
Strontium-90	414	392	Α		5.6	274-510	2	0
Technetium-99	NR	374				262 - 486		
Issued 7/26/2012		Page 1	of 4				Printed 7/2	6/2012

Radiological						Units: (Bq/kg)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Uranium-234/233	61.8	68.1	A	-9.3	47.7 - 88.5	5.2
Uranium-238	326	329	A	-0.9	230-428	23
Zinc-65	682	642	A	6.2	449-835	17 L

Radiological Reference Date: February 1, 2012

MAPEP-12-MaW26: Radiological and inorganic combined water standard

Inorganic							Units: (m	g/L)
		Ref			Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag 1	Notes	(%)	Range	Value	Flag
Antimony	NR	2.71				1.90 - 3.52		
Arsenic	NR	< 0.01				False Positive Test		
Barium	NR	0.808				0.566 - 1.050		
Beryllium	NR	0.808				0.566 - 1.050		
Cadmium	NR	0.418				0.293-0.543		
Chromium	NR	1.73				1.21 - 2.25		
Cobalt	NR	1.45				1.02 - 1.89		
Copper	NR	0.929				0.650 - 1.208		
Lead	NR	0.779				0.545 - 1.013		
Mercury	NR	3.75E-3				0.00263-0.00488		
Nickel	NR	< 0.01				False Positive Test		
Selenium	NR	0.223				0.156 - 0.290		
Technetium-99	NR	4.45E-5				0.00003 - 0.00006		
Thallium	NR	0.846				0.592 - 1.100		
Uranium-235	NR	4.50E-4				0.00032 - 0.00059		
Uranium-238	NR	0.222				0.155 - 0.289		
Uranium-Total	NR	0.222				0.155-0.289		
Vanadium	NR	1.44				1.01 - 1.87		
Zinc	NR	2.28				1.60 - 2.96		

Radiological						Units: (Bo	q/L)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	1.62	1.63	A	-0.6	1.14-2.12	0.10)
Cesium-134	-0.20		A		False Positive Test	0.20)
Cesium-137	42.0	39.9	A	5.3	27.9-51.9	1.2	2 L
Cobalt-57	33.8	32.9	А	2.7	23.0-42.8	0.8	L
Cobalt-60	24.9	23.72	А	5.0	16.60 - 30.84	0.5	i L
Hydrogen-3	441	437	A	0.9	306 - 568	11	L
Iron-55	NR	81.9			57.3 - 106.5		
Manganese-54	33.4	31.8	А	5.0	22.3-41.3	0.9	L
Nickel-63	NR	60.0			42.0 - 78.0		
Plutonium-238	0.581	0.629	А	-7.6	0.440 - 0.818	0.058	3
Plutonium-239/240	1.14	1.34	А	-14.9	0.94 - 1.74	0.10)
Potassium-40	151	142	A	6.3	99 - 185	5	5
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Radiological		I HERONA				Units: (Bq/L)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Strontium-90	-0.012		A		False Positive Test	0.036
Technetium-99	NR	27.9			19.5 - 36.3	
Uranium-234/233	0.371	0.392	A	-5.4	0.274-0.510	.039
Uranium-238	2.95	2.76	А	6.9	1.93 - 3.59	0.21
Zinc-65	-0.170		А		False Positive Test	0.170

Radiological Reference Date: February 1, 2012

MAPEP-12-GrW26: G	ross alpha/beta wa	iter				
Radiological						Units: (Bq/L)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Gross alpha	1.70	2.14	A	-20.6	0.64 - 3.64	0.07
Gross beta	6.12	6.36	A	-3.8	3.18-9.54	0.12 L

Radiological Reference Date: February 1, 2012

MAPEP-12-RdF26: R	adiological air filte	r					
Inorganic					U	nits: (ug/san	ple)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Uranium-235	NR	0.0187	7		0.0131-0.0243		
Uranium-238	NR	10.0)		7.0 - 13.0		
Uranium-Total	NR	10.0)		7.0-13.0		

Radiological					13 13 14	Units: (Bq/sample)				
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag		
Americium-241	0.073	0.073	A		0.0	0.051 - 0.095	0.007			
Cesium-134	2.14	2.38	Α		-10.1	1.67 - 3.09	0.04	L		
Cesium-137	1.94	1.79	Α		8.4	1.25-2.33	0.08			
Cobalt-57	0.027		Α			False Positive Test	0.027			
Cobalt-60	2.25	2.182	Α		3.1	1.527 - 2.837	0.06	L		
Manganese-54	3.51	3.24	Α		8.3	2.27 - 4.21	0.10	L		
Plutonium-238	0.001	0.0015	Α	(17)		Sensitivity Evaluation	0.001			
Plutonium-239/240	0.104	0.097	Α		7.2	0.068-0.126	0.012			
Strontium-90	0.013		Α			False Positive Test	0.008			
Uranium-234/233	0.019	0.0188	Α		1.1	0.0132 - 0.0244	0.004	н		
Uranium-238	0.131	0.124	Α		5.6	0.087-0.161	0.013			
Zinc-65	3.19	2.99	A		6.7	2.09-3.89	0.13			

Radiological Reference Date: February 1, 2012

MAPEP-12-GrF26: Gr	oss alpha/beta air	filter		State State		
Radiological					Uni	its: (Bq/sample)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Gross alpha	0.759	1.2	2 A	-36.8	0.4-2.0	0.024
Gross beta	2.25	2.4	A	-6.3	1.2-3.6	0.03 L

Radiological Reference Date: February 1, 2012

MAPEP-12-RdV26: Radiological vegetation

Inorganic					Un	its: (ug/san	nple)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Uranium-235	NR	0.0434	4		0.0304 - 0.0564	TR. Series	
Uranium-238	NR	22.4	4		15.7 - 29.1		
Uranium-Total	NR	22.4	4		15.7 - 29.1		

Radiological						Units	: (Bq/samj	ple)
		Ref			Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag	Notes	(%)	Range	Value	Flag
Americium-241	0.007		N	(1)		False Positive Test	0.002	
Cesium-134	9.84	8.43	A	1000	16.7	5.90 - 10.96	0.17	L
Cesium-137	-0.064		Α			False Positive Test	0.064	
Cobalt-57	15.4	12.0	W		28.3	8.4 - 15.6	0.4	L
Cobalt-60	6.69	6.05	Α		10.6	4.24 - 7.87	0.17	L
Manganese-54	0.009		Α			False Positive Test	0.009	
Plutonium-238	0.179	0.219	Α		-18.3	0.153-0.285	0.021	
Plutonium-239/240	0.148	0.152	Α		-2.6	0.106-0.198	0.018	
Strontium-90	1.98	2.11	Α		-6.2	1.48-2.74	0.04	L
Uranium-234/233	0.086	0.0411	N		109.2	0.0288-0.0534	0.011	
Uranium-238	0.307	0.278	A		10.4	0.195-0.361	0.026	
Zinc-65	9.60	8.90	A		7.9	6.23 - 11.57	0.42	

Radiological Reference Date: February 1, 2012

Notes:

(1) = False Positive(17) = NOT DETECTED - reported a statistically zero result



Department of Energy RESL - 1955 Fremont Ave, MS4149 - Idaho Falls, ID 83415

Laboratory Results For MAPEP Series 27 (TDHL01) Texas Department of State Health Services Laboratory 1100 W 49th Street Austin, TX 78756

MAPEP-12-MaS27: Radiological and inorganic combined soil standard

Inorganic							Units: (mg	g/kg)
		Ref			Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag N	lotes	(%)	Range	Value	Flag
Antimony	NR	111.5	i			78.1 - 145.0		
Arsenic	NR	55.7	•			39.0-72.4		
Barium	NR	896				627 - 1165		
Beryllium	NR	47.0	1			32.9-61.1		
Cadmium	NR	15.4				10.8-20.0		
Chromium	NR	99.0				69.3 - 128.7		
Cobalt	NR	127				89 - 165		
Copper	NR	204				143-265		
Lead	NR	97.6				68.3 - 126.9		
Mercury	NR	0.172				0.120-0.224		
Nickel	NR	300				210-390		
Selenium	NR	17.7				12.4-23.0		
Silver	NR	95.5				66.9-124.2		
Technetium-99	NR	0.000748				0.000524 - 0.000972		
Thallium	NR	91.0				63.7 - 118.3		
Uranium-235	NR	0.0533				0.0373-0.0693		
Uranium-238	NR	21.1				14.8-27.4		
Uranium-Total	NR	21.2				14.8-27.6		
Vanadium	NR	271				190-352		
Zinc	NR	549				384 - 714		

Radiological

				and the second		Units. (Dq/kg)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Americium-241	106	111	A	-4.5	78-144	8
Cesium-134	896	939	A	-4.6	657 - 1221	11 1
Cesium-137	1106	1150	A	-3.8	805 - 1495	31 1
Cobalt-57	1246	1316	A	-5.3	921 - 1711	26 1
Cobalt-60	520	531	A	-2.1	372-690	91
Iron-55	NR	508			356-660	
Manganese-54	911	920	A	-1.0	644 - 1196	22 1
Nickel-63	NR	406			284-528	22 L
Plutonium-238	91.3	105.8	A	-13.7	74.1-137.5	87
Plutonium-239/240	117	134	А	-12.7	94 - 174	11
Potassium-40	625	632	A	-1.1	442 - 822	10
Strontium-90	565	508	А	11.2	356-660	21
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Radiological						Units: (Bo	q/kg)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Technetium-99	NR	469			328-610		
Uranium-234/233	59	60.3	A	-2.2	42.2 - 78.4	:	5
Uranium-238	248	263	A	-5.7	184 - 342	1	7
Zinc-65	625	606	A	3.1	424 - 788	1:	5 L

Radiological Reference Date: August 1, 2012

MAPEP-12-MaW27: Radiological and inorganic combined water standard Unc Unc Bias Ref Acceptance Analyte Result Value Flag Notes (%) Value Flag Range Antimony NR 3.38 2.37-4.39 Arsenic NR 1.13 0.79-1.47 Barium NR 4.00 2.80-5.20 Beryllium NR **False Positive Test** Cadmium NR 0.506 0.354 - 0.658 Chromium 0.561 NR 0.393-0.729 Cobalt NR 3.11 2.18-4.04 Copper NR **False Positive Test** Lead NR 2.06 1.44 - 2.68 Mercury NR 0.00349 0.00244 - 0.00454 Nickel NR 3.99 2.79-5.19 Selenium NR **False Positive Test** Technetium-99 NR 7.30E-06 0.000005-0.000009 Thallium NR 2.47 1.73-3.21 Uranium-235 NR 0.00052 0.00036 - 0.00068 Uranium-238 NR 0.268 0.188-0.348 Uranium-Total NR 0.268 0.188-0.348 Vanadium NR 1.59 1.11-2.07 Zinc NR 3.27 2.29-4.25

Radiological							Units: (B	q/L)
		Ref			Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag	Notes	(%)	Range	Value	Flag
Americium-241	1.02	1.06	A		-3.8	0.74 - 1.38	0.08	3
Cesium-134	22.5	23.2	. A		-3.0	16.2 - 30.2	0.3	L
Cesium-137	17.9	16.7	A		7.2	11.7 - 21.7	0.5	5 L
Cobalt-57	31.2	29.3	A		6.5	20.5 - 38.1	0.7	L
Cobalt-60	0.21		А			False Positive Test	0.10)
Hydrogen-3	333	334	A		-0.3	234 - 434	5	5 L
Iron-55	NR	89.3				62.5 - 116.1		
Manganese-54	19.3	17.8	A		8.4	12.5-23.1	0.5	5 L
Nickel-63	NR	66.3				46.4 - 86.2		
Plutonium-238	0.024	0.013	A	(17)		Sensitivity Evaluation	0.009)
Plutonium-239/240	1.30	1.61	А		-19.3	1.13-2.09	0.12	2

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Radiological						Units: (Be	q/L)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Potassium-40	146	134	A	9.0	94 - 174	5	5
Strontium-90	11.8	12.2	A	-3.3	8.5 - 15.9	0.2	2 L
Technetium-99	NR	4.58			3.21 - 5.95		
Uranium-234/233	0.426	0.451	A	-5.5	0.316-0.586	0.041	
Uranium-238	2.99	3.33	A	-10.2	2.33-4.33	0.21	
Zinc-65	29.2	25.9	A	12.7	18.1 - 33.7	0.8	L

Radiological Reference Date: August 1, 2012

MAPEP-12-GrW27: G	ross alpha/beta wa	iter					
Radiological						Units: (B	q/L)
		Ref		Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag Notes	(%)	Range	Value	Flag
Gross alpha	1.94	1.79	A	8.4	0.54 - 3.04	0.07	7
Gross beta	9.40	9.1	А	3.3	4.6 - 13.7	0.14	4 L
			n	1. 1 .	IDC DI	4 7 .	2012

Radiological Reference Date: August 1, 2012

MAPEP-12-RdF27: R	adiological air filter						
Inorganic					Uni	ts: (ug/san	nple)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Uranium-235	NR	0.014	8		0.0104 - 0.0192	1.1.1.1.2	
Uranium-238	NR	8.	0		5.6 - 10.4		
Uranium-Total	NR	8.	1		5.7 - 10.5		

Radiological						Units:	(Bq/sam	ple)
Analyte	Result	Ref Value	Flag	Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Americium-241	0.080	0.0780	A		2.6	0.0546 - 0.1014	0.008	
Cesium-134	2.44	2.74	А		-10.9	1.92 - 3.56	0.05	L
Cesium-137	0.023		Α			False Positive Test	0.012	
Cobalt-57	1.98	1.91	Α		3.7	1.34 - 2.48	0.06	
Cobalt-60	1.79	1.728	Α		3.6	1.210-2.246	0.05	L
Manganese-54	2.56	2.36	Α		8.5	1.65 - 3.07	0.08	
Plutonium-238	0.053	0.0625	Α		-15.2	0.0438-0.0813	0.007	
Plutonium-239/240	0.001	0.00081	Α	(17)		Sensitivity Evaluation	0.001	
Strontium-90	1.11	1.03	Α		7.8	0.72 - 1.34	0.03	L
Uranium-234/233	0.014	0.0141	Α		-0.7	0.0099-0.0183	0.003	Н
Uranium-238	0.093	0.100	Α		-7.0	0.070-0.130	0.010	
Zinc-65	-0.006		A			False Positive Test	0.003	

Radiological Reference Date: August 1, 2012

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MAPEP-12-GrF27: Gross alpha/beta air filter

Radiological						Unit	ts: (Bq/sample)
Analyte	Result	Ref Value	Flag No	otes	Bias (%)	Acceptance Range	Unc Unc Value Flag
Gross alpha	0.873	0.97	A		-10.0	0.29 - 1.65	0.026 L
Gross beta	1.88	1.92	А		-2.1	0.96 - 2.88	0.03 L

Radiological Reference Date: August 1, 2012

MAPEP-12-RdV27: R	adiological vegetati	ion					
Inorganic					Uni	ts: (ug/sam	ple)
Analyte	Result	Ref Value	Flag Notes	Bias (%)	Acceptance Range	Unc Value	Unc Flag
Uranium-235	NR	0.0240)		0.0168-0.0312		
Uranium-238	NR	12.7	7		8.9 - 16.5		
Uranium-Total	NR	12.7	7		8.9 - 16.5		

Radiological						Units	: (Bq/samp	ole)
		Ref			Bias	Acceptance	Unc	Unc
Analyte	Result	Value	Flag	Notes	(%)	Range	Value	Flag
Americium-241	0.168	0.163	A	The second	3.1	0.114-0.212	0.017	
Cesium-134	6.79	6.51	Α		4.3	4.56 - 8.46	0.17	L
Cesium-137	4.85	4.38	Α		10.7	3.07 - 5.69	0.20	
Cobalt-57	6.71	5.66	Α		18.6	3.96 - 7.36	0.21	
Cobalt-60	5.34	5.12	А		4.3	3.58-6.66	0.15	L
Manganese-54	3.43	3.27	Α		4.9	2.29-4.25	0.15	
Plutonium-238	0.201	0.187	Α		7.5	0.131-0.243	0.025	
Plutonium-239/240	0.149	0.123	W		21.1	0.086 - 0.160	0.020	
Strontium-90	0.064		N	(1)		False Positive Test	0.014	
Uranium-234/233	0.093	0.0257	N		261.9	0.0180-0.0334	0.013	
Uranium-238	0.256	0.158	N		62.0	0.111-0.205	0.026	
Zinc-65	0.456		A			False Positive Test	0.228	
				n	7. 7 .	ID C D		

Radiological Reference Date: August 1, 2012

Notes:

(1) = False Positive(17) = NOT DETECTED - reported a statistically zero result

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Laboratory Services Section Environmental Sciences Branch

Each laboratory procedure is performed under unique analysis conditions. Variations occur in volumes, counting efficiencies, detector backgrounds, count times, decay factors, chemical recoveries, and other analysis parameters which affect the sensitivity of the measurement. The detection limits listed in the following tables were derived using standard analysis conditions and are routinely achievable on normal samples. If greater sensitivity is required, it is usually possible to adjust detection limits by changing one or more of these parameters.

Detection	Limits for Ga	mma	Spectroscopy
	Sample	Туре	

Isotope	Soil - Sediment		Air Filter		Water - Milk		Vegetation - Fish	
	µCi/g	pCi/kg	µCi/filter	pCi/filter	µCi/ml	pCi/l	µCi/g	pCi/kg
Ac-228	2.0E-07	2.0E+02	2.0E-05	2.0E+01	2.0E-08	2.0E+01	1.0E-07	1.0E+02
Ag-110m	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Am-241	1.0E-07	1.0E+02	5.0E-06	5.0E+00	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Ba-140	4.0E-07	4.0E+02	2.0E-05	2.0E+01	2.0E-08	2.0E+01	1.0E-07	1.0E+02
Be-7	1.0E-06	1.0E+03	3.0E-05	3.0E+01	3.0E-08	3.0E+01	1.0E-07	1.0E+02
Bi-212	5.0E-07	5.0E+02	3.0E-05	3.0E+01	1.0E-07	1.0E+02	1.0E-07	1.0E+02
Bi-214	2.0E-07	2.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Co-57	1.0E-07	1.0E+02	2.0E-06	2.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Co-58	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Co-60	1.0E-07	1.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Cr-51	1.0E-06	1.0E+03	3.0E-05	3.0E+01	3.0E-08	3.0E+01	1.0E-07	1.0E+02
Cs-134	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Cs-137	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Fe-59	1.0E-07	1.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02
I-125	1.0E-06	1.0E+03	1.0E-05	1.0E+01	2.0E-08	2.0E+01	1.0E-07	1.0E+02
I-131*	1.0E-07	1.0E+02	5.0E-06	5.0E+00	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Ir-192	1.0E-07	1.0E+02	5.0E-06	5.0E+00	1.0E-08	1.0E+01	1.0E-07	1.0E+02
K-40	2.0E-06	2.0E+03	1.0E-04	1.0E+02	4.0E-08	4.0E+01	1.0E-07	1.0E+02
La-140	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Mn-54	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Nb-95	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Pb-210	4.0E-07	4.0E+02	2.0E-05	2.0E+01	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Pb-212	2.0E-07	2.0E+02	1.0E-05	1.0E+01	3.0E-08	3.0E+01	1.0E-07	1.0E+02
Pb-214	2.0E-07	2.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Ra-226	2.0E-06	2.0E+03	1.0E-04	1.0E+02	1.0E-07	1.0E+02	2.0E-07	2.0E+02
Sb-124	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Sc-46	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
Th-230	1.0E-05	1.0E+04	3.0E-04	3.0E+02	1.0E-06	1.0E+03	2.0E-06	2.0E+03
Th-234	1.0E-06	1.0E+03	4.0E-05	4.0E+01	1.0E-07	1.0E+02	2.0E-07	2.0E+02
TI-208	1.0E-07	1.0E+02	5.0E-06	5.0E+00	5.0E-09	5.0E+00	1.0E-07	1.0E+02
U-235	4.0E-07	4.0E+02	2.0E-05	2.0E+01	3.0E-08	3.0E+01	1.0E-07	1.0E+02
U-238	1.0E-06	1.0E+03	3.0E-05	3.0E+01	6.0E-08	6.0E+01	2.0E-07	2.0E+02
Zn-65	2.0E-07	2.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02
Zr-95	1.0E-07	1.0E+02	1.0E-05	1.0E+01	1.0E-08	1.0E+01	1.0E-07	1.0E+02

*Air iodine can be determined by using cartridges. Detection limits are 2.0E-14µCi/ml or 2.0E-02 pCi/m³.

Laboratory Services Section Environmental Sciences Branch

Detection Limits for Chemical Analysis Procedures Sample Type

Isotope	Soil - Sediment		Air Filter		Water	Water - Milk		Vegetation - Fish	
	µCi/g	pCi/kg	µCi/filter	pCi/filter	µCi/ml	pCi/l	μCi/g	pCi/kg	
Alpha	6.1E-06	6.1E+03	7.0E-07	7.0E-01	3.3E-09	3.3E+00	3.3E-06	3.3E+03	
Beta	1.2E-05	1.2E+04	1.3E-06	1.3E+00	6.6E-09	6.6E+00	6.6E-06	6.6E+03	
C-14					3.0E-07	3.0E+02			
H-3			2.0E-06	2.0E+00	1.0E-06	1.0E+03			
Ra-226	4.0E-07	4.0E+02	8.0E-07	8.0E-01	8.0E-10	8.0E-01	4.0E-07	4.0E+02	
Ra-228	1.9E-06	1.9E+03	3.9E-06	3.9E+00	3.9E-09	3.9E+00	1.9E-06	1.9E+03	
Sr-89	9.0E-07	9.0E+02	1.7E-06	1.7E+00	1.7E-09	1.7E+00	9.0E-07	9.0E+02	
Sr-90	1.3E-06	1.3E+03	2.7E-06	2.7E+00	2.7E-09	2.7E+00	1.3E-06	1.3E+03	

Detection Limits for Alpha Spectroscopy Sample Type

Isotope	Soil - Sediment		Air Filter		Water - Milk		Vegetation - Fish	
	µCi/g	pCi/kg	µCi/filter	pCi/filter	µCi/ml	pCi/l	µCi/g	pCi/kg
Am-241	1.0E-06	1.0E+03	1.0E-06	1.0E+00	. 1.0E-09	1.0E+00	1.0E-06	1.0E+03
Pu-239	2.0E-07	2.0E+02	2.0E-07	2.0E-01	2.0E-10	2.0E-01	2.0E-07	2.0E+02
Th-228	1.0E-06	1.0E+03	1.0E-06	1.0E+00	1.0E-09	1.0E+00	1.0E-06	1.0E+03
Th-230	1.0E-06	1.0E+03	1.0E-06	1.0E+00	1.0E-09	1.0E+00	1.0E-06	1.0E+03
Th-232	1.0E-06	1.0E+03	1.0E-06	1.0E+00	1.0E-09	1.0E+00	1.0E-06	1.0E+03
U-234	1.0E-06	1.0E+03	1.0E-06	1.0E+00	1.0E-09	1.0E+00	1.0E-06	1.0E+03
U-238	1.0E-06	1.0E+03	1.0E-06	1.0E+00	1.0E-09	1.0E+00	1.0E-06	1.0E+03

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