September 14, 2023

L-2023-113
10 CFR 50.4
10 CFR 50.36

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Correction to the 2020 Annual Radiological Environmental Operating Report

Reference: FPL letter L-2021-083 dated April 16, 2021: Annual Radiological Environmental Operating Report for Calendar Year 2020

By letter dated April 16, 2021 (Reference), Florida Power & Light submitted the 2020 Annual Radiological Environmental Operating Report (AREOR) for St. Lucie Units 1 and 2 pursuant to Technical Specification (TS) 6.9.1.8. The 2020 report provided information for the 12-month period beginning January 1, 2020 and ending December 31, 2020.

It was discovered that a Radiological Environmental Monitoring Program (REMP) equipment deviation was not reported in Section 5. This item was corrected and is provided in this submittal. This corrected report replaces the St. Lucie 2020 AREOR report in its entirety.

If you have any questions regarding this submittal, please contact Kenneth Mack at 561-904-3635.

Sincerely,

for

Dianne Strand
General Manager, Regulatory Affairs
Florida Power & Light Company

Enclosure: 2020 Annual Radiological Environmental Operating Report

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, St. Lucie Nuclear Plant
USNRC Resident Inspector, St. Lucie Nuclear Plant

2020

ANNUAL

RADIOLOGICAL ENVIRONMENTAL

OPERATING REPORT

ST. LUCIE PLANT

UNITS 1 & 2

LICENSE NOS. DPR-67, NPF-16

DOCKET NOS. 50-335, 50-389

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1. Introduction

This report is submitted pursuant to Specification 6.9.1.8 of St. Lucie Unit 1 and St. Lucie Unit 2 Technical Specifications. The Annual Radiological Environmental Operating Report (AREOR) provides information, summaries, and analytical results pertaining to the radiological environmental monitoring program for the calendar year indicated. This report covers surveillance activities meeting the requirements of Unit 1 and Unit 2 Technical Specifications.

2. Radiological Environmental Monitoring Program

A. Purpose

The purpose of the Radiological Environmental Monitoring Program (REMP) is to provide representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which lead to the highest potential radiation exposures to members of the public resulting from station operation. The REMP also supplements the radiological effluents monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected based on the effluent measurements and the modeling of the environmental exposure pathways.

B. Program Description

The Radiological Environmental Monitoring Program for the St. Lucie Plant (PSL) is conducted pursuant to the St. Lucie Units 1 and 2 Offsite Dose Calculation Manual (ODCM) Section 3/4.12.1 Monitoring Program.

1. Sample Locations, Types, and Frequencies

    a. Direct radiation gamma exposure rate is monitored continuously at 27 locations by thermoluminescent dosimeters (TLDs). TLDs are collected and analyzed quarterly.

    b. Airborne radioiodine and particulate samplers are operated continuously at five locations. Samples are collected and analyzed weekly. Analyses include Iodine-131, gross beta, and gamma isotopic measurements.

    c. Surface water samples are collected from two locations. Samples are collected and analyzed weekly and monthly, respectively. Analyses include gamma isotopic and tritium measurements.

    d. Shoreline sediment samples are collected from two locations coinciding with the locations for surface water samples. Samples are collected and analyzed semi-annually. Sediment samples are analyzed by gamma isotopic measurements.

e. Fish and invertebrate samples are collected from two locations. Samples are collected and analyzed semi-annually. Fish and invertebrate samples are analyzed by gamma isotopic measurements.

f. Broad leaf vegetation samples are collected from three locations. Samples are collected and analyzed monthly. Broad leaf vegetation samples are analyzed by gamma isotopic measurements.

2. Analytical Responsibility

Radiological environmental monitoring for the St. Lucie Plant is conducted by the State of Florida, Department of Health (DOH), Bureau of Radiation Control (BRC). Samples are collected and analyzed by DOH personnel.

Samples are analyzed at the DOH BRC Environmental Radiation Control Laboratory in Orlando, Florida.

C. Analytical Results

Environmental Radiological Monitoring Program Annual Summary provides a summary for all specified samples collected during the referenced surveillance period. Analysis data for all specified samples analyzed during the surveillance period is provided in Section 4. Deviations from the sample schedule or missing data, if any, are noted and explained in Section 5 – Deviations/Missing Data. Samples not meeting the specified "a priori" LLD, if any, are noted and explained in Section 6 – Analyses with LLDs Above Required Detection Capabilities.

D. Land Use Census

A Land Use Census survey out to a five-mile radius from the St. Lucie Plant is conducted annually to determine the location of the nearest milk animal, residence, and garden producing broad leaf vegetation in each of the 16 meteorological sectors. A summary of the Land Use Census for the surveillance year is provided in Section 4.

E. Interlaboratory Comparison Program

The interlaboratory comparison program consists of participating in the DOE Mixed Analyte Performance Evaluation Program (MAPEP) and the Environmental Resources Associates (ERA) RadChem Study proficiency testing.

The samples are analyzed using the methods applicable to the REMP (Gamma Spectroscopy, Gross Beta, and Tritium for Water).

The results for nuclides associated with the REMP are listed in Section 10.

3. Discussion and Interpretation of Results

A. Reporting of Results

The Annual Radiological Environmental Operating Report contains the summaries, interpretations, and information required by St. Lucie Plant ODCM. The following tables provide a summary of the measurements made for the nuclides required by ODCM Table 4.12-1 for all samples specified by Table 3.12-1. In addition, summaries are provided for other nuclides identified in the specified samples, including those not related to station operation. These include nuclides such as K-40, Th-232, Ra-226, and Be-7, which are common and naturally occurring in the Florida environment.

B. Interpretation of Results

1. Direct Radiation

   The results of direct radiation monitoring are consistent with past measurements for the specified locations. The exposure rate data showed no indication of any adverse trends attributed to effluents from the plant. The measured exposure rates were consistent with exposure rates that were observed during the pre-operational surveillance program.

2. Air Particulates/Radioiodine

   The results for radioactive air particulate and radioiodine attributed to plant effluents were consistent with past measurements and indicated no trends attributable to plant effluents. No detectable I-131 was present in any of the radioiodine samples. Gamma isotopic measurements yielded no indication of any nuclides attributed to station operation. The results for air particulate/radioiodine samples were consistent with measurements that were made during the pre-operational surveillance program.

3. Waterborne, Surface Water

   The results for radioactivity measurements in surface water were consistent with past measurements and with measurements made during the pre-operational surveillance program. Tritium was reported as present in 1 of the 52 ODCM required samples for the indicator location and none of the 12 samples of the control location surface water samples collected. The single tritium value reported was 2.5% of the required lower limit of detection listed in ODCM Table 4.12-1 and 0.25% of the reporting level listed in ODCM Table 3.12-2. There was no indication of any other nuclides attributable to plant effluents.

4. Waterborne, Sediment and Food Products

   The results for radioactivity measurements in waterborne sediment, fish, and crustacean samples were consistent with past measurements and with measurements made during the pre-operational surveillance program. For the Fish Ingestion Pathway, Cs-137 was not reported for the two indicator samples or the 2 control samples. There was no indication of any other nuclides attributable to plant effluents.

5. Broad Leaf Vegetation

   The results for radioactivity measurements in broad leaf vegetation were consistent with past measurements and with measurements made during the pre-operational surveillance program. Cs-137 was not present in any of the 24 ODCM required samples or in any of the 12 Control locations. There were no indications of any other nuclides that could be attributed to plant effluents.

6. Land Use Census

   One change was identified as compared to the 2019 Land Use Census results; an additional residence was included in the NNW sector. No locations were identified with potential milk-producing animals (cows or goats).

   No locations yielding a calculated dose or dose commitment greater than the values currently being calculated were identified by the Land Use Census.

   No locations yielding a calculated dose or dose commitment (via the same exposure pathway) 20 percent greater than locations currently being sampled in the radiological environmental monitoring program were identified by the Land Use Census.

7. Interlaboratory Comparison Program

   The State of Florida laboratory participated in MAPEP Series 42 and 43 and the ERA RadCheM Study 121 and 123. These satisfied the requirements as directed in the PSL Offsite Dose Calculation Manual (ODCM) for the Interlaboratory Comparison Program.

C. Conclusions

The data obtained through the St. Lucie Plant REMP verifies that the levels of radiation and concentrations of radioactive materials in environmental samples, representing the highest potential exposure pathways to members of the public, are not increasing. Measured exposure rates are consistent with the exposure rates observed during the pre-operational surveillance program.

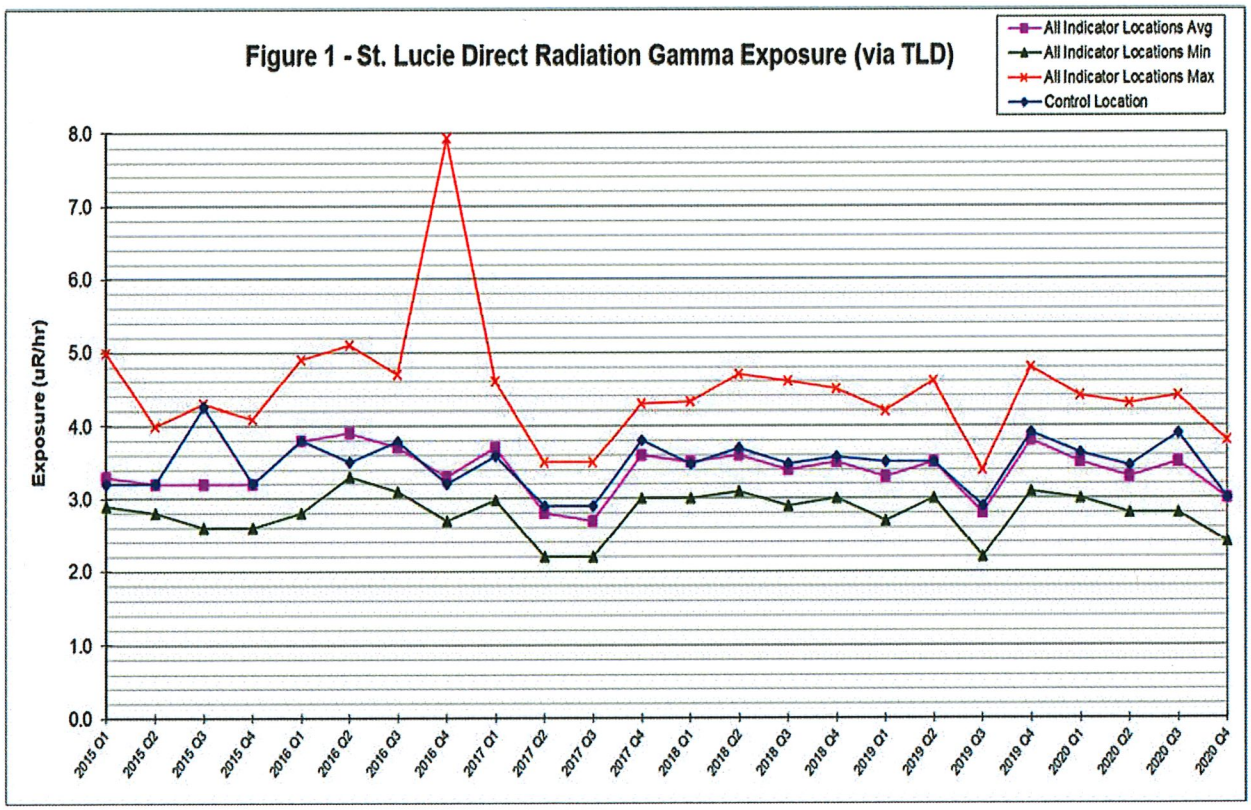
- Results for air particulate/radioiodine samples are consistent with measurements that were made during the pre-operational surveillance program.
- The single value for tritium in surface water was 2.5% of the required lower limit of detection listed in ODCM Table 4.12-1 and 0.25% of the reporting level listed in ODCM Table 3.12-1. There was no indication of any other nuclides attributable to plant effluents.
- There was no indication of any nuclides in the waterborne sediment or food products that could be attributed to plant effluents.
- No indications of any nuclides that could be attributed to plant effluents in the broad leaf vegetation samples were present.

REMP sample analysis results verify that the dose or dose commitment to members of the public, attributable to the operation of St. Lucie Units 1 and 2 during the surveillance year, are well within "as low as reasonably achievable" (ALARA) criteria established by 10 CFR 50, Appendix I.

4. Environmental Radiological Monitoring Program Annual Summary

I. Direct Radiation

PATHWAY: DIRECT RADIATION SAMPLES COLLECTED: TLD UNITS: micro-R/hr						
			All Indicator Locations	Location with Highest Annual Mean		Control Location
Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	Mean (f)[b] Range	Name Distance & Direction	Mean (f)[b] Range	Mean (f)[b] Range
Exposure[d]	105	---	3.27 (101/101) 2.41-4.39	NW-10 9.6 mi., NW	4.23 (4/4) 3.83-4.39	3.49 (4/4) 2.98-3.89
Number of Non-Routine Reported Measurements = 0.						

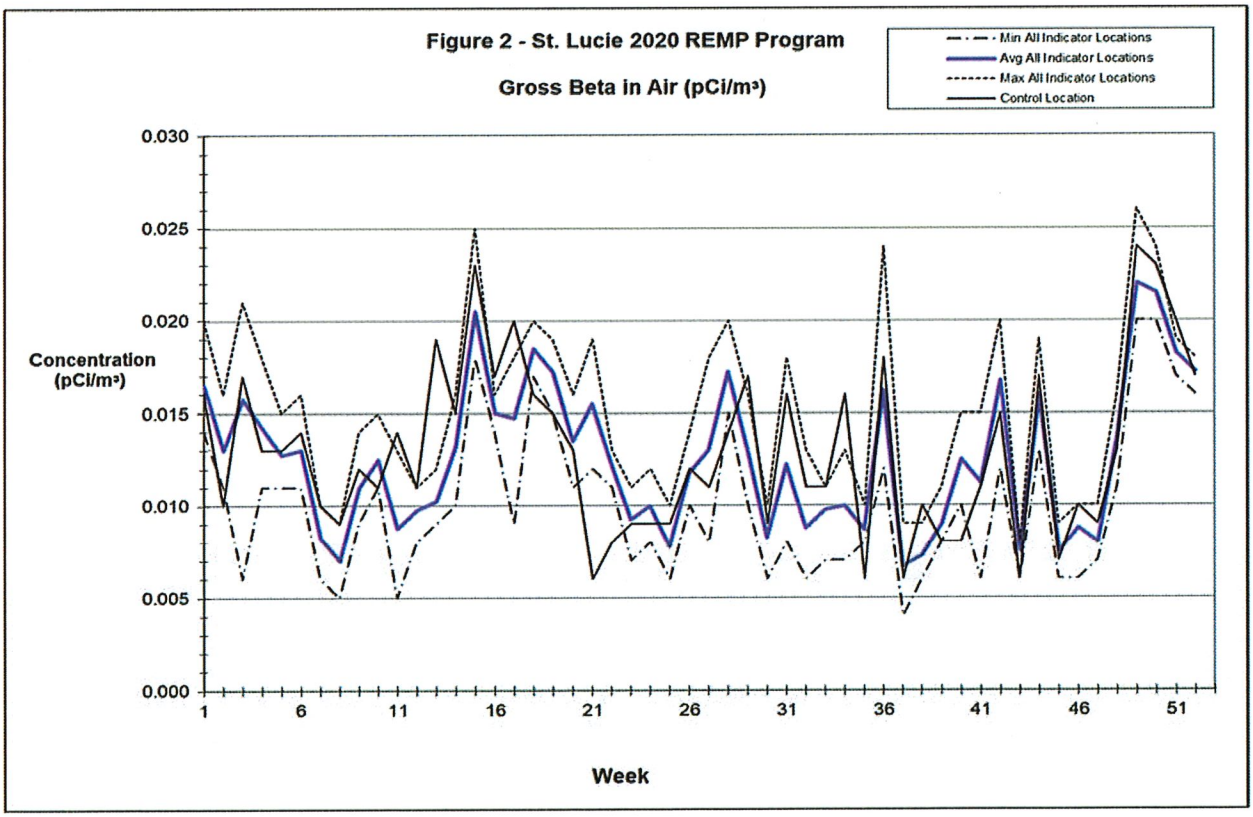


II. Air Particulates/Radioiodine

PATHWAY: AIRBORNE
SAMPLES COLLECTED: RADIOIODINE AND PARTICULATES
UNITS: pico-Ci/M^3

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Location Mean (f)[b] Range
^{131}I	260	0.012	<MDA (208/208)		<MDA	<MDA
Gross Beta	260	0.0064	0.0126 (202/208)	H30	0.013 (52/52)	0.013 (51/52)
			0.004-0.026	2 mi., W	0.006-0.026	0.006-0.024
Composite Gamma	80					
^{7}Be	16	0.0006	0.1303 (16/16)	H14	0.1408 (4/4)	0.1350 (4/4)
			0.0893-0.1620	1 mi., SE	0.1030-0.1620	0.1100-0.1580
^{134}Cs	16	0.0008	<MDA		<MDA	<MDA
^{137}Cs	16	0.0008	<MDA		<MDA	<MDA
^{210}Pb	16	----------	0.0123 (5/16)	H34	0.0207 (1/4)	0.0072 (1/4)
			0.0095-0.0207	0.5 mi., N		

Be-7 and Pb-210 are naturally occurring.
Number of Non-Routine Reported Measurements = 0.



III. Waterborne, Surface Water

PATHWAY: WATERBORNE
SAMPLES COLLECTED: SURFACE WATER
UNITS: pico-Ci/LITER

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Tritium	64	172	75 (1/52)	H15 <1mi., ENE/E/ESE	75 (1/52)	<MDA
Gamma Isotopic	64					
^{40}K		58	354 (52/52) 266-431	H15 <1mi., ENE/E/ESE	354 (52/52) 266-431	355 (12/12) 323-378
^{54}Mn		3	<MDA		<MDA	<MDA
^{59}Fe		6	<MDA		<MDA	<MDA
^{58}Co		3	<MDA		<MDA	<MDA
^{60}Co		4	<MDA		<MDA	<MDA
^{65}Zn		7	<MDA		<MDA	<MDA
^{95}Zr-Nb		6-3	<MDA		<MDA	<MDA
^{131}I		4	<MDA		<MDA	<MDA
^{134}Cs		4	<MDA		<MDA	<MDA
^{137}Cs		4	<MDA		<MDA	<MDA
^{140}Ba-La		9-3	<MDA		<MDA	<MDA

K-40 is naturally occurring.
Number of Non-Routine Reported Measurements = 0.

IV. Waterborne, Sediment and Food Products

PATHWAY: WATERBORNE
SAMPLES COLLECTED: SHORELINE SEDIMENT
UNITS: pico-Ci/kg DRY

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic	4					
^{7}Be		56	<MDA		<MDA	<MDA
^{40}K		100	192 (2/2) 110-274	H15 <1mi, ENE/E/ESE	192 (2/2) 110-274	210 (1/2)
^{58}Co		6	<MDA		<MDA	<MDA
^{60}Co		7	<MDA		<MDA	<MDA
^{134}Cs		7	<MDA		<MDA	<MDA
^{137}Cs		7	<MDA		<MDA	<MDA
^{210}Pb			322 (1/2)	H15 <1mi, ENE/E/ESE	322 (1/2)	<MDA
^{226}Ra		15	227 (1/2)	H15 <1mi, ENE/E/ESE	227 (1/2)	143 (1/2)
^{232}Th		25	83 (1/2)	H15 <1mi, ENE/E/ESE	83 (1/2)	<MDA
^{235}U			28 (1/2)	H15 <1mi, ENE/E/ESE	28 (1/2)	25 (1/2)
^{238}U			173 (2/2) 105-240	H15 <1mi, ENE/E/ESE	173 (2/2) 105-240	102 (2/2) 93-110

Be-7, K-40, Pb-210, Ra-226, Th-232, U-235, and U-238 are naturally occurring.
Number of Non-Routine Reported Measurements = 0.

PATHWAY: INGESTION
SAMPLES COLLECTED: CRUSTACEA
UNITS: pico-Ci/kg WET

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic	4					
^{40}K		270	2035 (2/2) 1820-2250	H-15 <1mi, ENE/E/ESE	2035 (2/2) 1820-2250	1445 (2/2) 1200-1690
^{54}Mn		16	<MDA		<MDA	<MDA
^{58}Co		15	<MDA		<MDA	<MDA
^{60}Co		16	<MDA		<MDA	<MDA
^{134}Cs		16	<MDA		<MDA	<MDA
^{137}Cs		18	<MDA		<MDA	<MDA
^{226}Ra		300	<MDA		<MDA	<MDA
^{228}Ra		58	<MDA		<MDA	554 (2/2) 285-822
^{59}Fe		28	<MDA		<MDA	<MDA
^{65}Zn		32	<MDA		<MDA	<MDA

K-40, Ra-226, and Ra-228 are naturally occurring.
Number of Non-Routine Reported Measurements = 0.

PATHWAY: INGESTION
SAMPLES COLLECTED: FISH
UNITS: pico-Ci/kg WET

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic	4					
^{40}K		270	2830 (2/2) 2600-3060	H15 <1mi., ENE/E/ESE	2830 (2/2) 2600-3060	2825 (2/2) 2660-2990
^{54}Mn		16	<MDA		<MDA	<MDA
^{58}Co		15	<MDA		<MDA	<MDA
^{60}Co		16	<MDA		<MDA	<MDA
^{134}Cs		16	<MDA		<MDA	<MDA
^{137}Cs		18	<MDA		<MDA	<MDA
^{226}Ra		300	<MDA		<MDA	<MDA
^{228}Ra		58	<MDA		<MDA	<MDA
^{59}Fe		28	<MDA		<MDA	<MDA
^{65}Zn		32	<MDA		<MDA	<MDA

K-40, Ra-226, and Ra-228 are naturally occurring.
Number of Non-Routine Reported Measurements = 0.

V. Broad Leaf Vegetation

PATHWAY: INGESTION
SAMPLES COLLECTED: BROADLEAF VEGETATION
UNITS: pico-Ci/kg WET

Type of Analyses	Number of Analyses Performed	Lower Limit of Detection[a] (LLD)	All Indicator Locations Mean (f)[b] Range	Location with Highest Annual Mean Name Distance & Direction	Location with Highest Annual Mean Mean (f)[b] Range	Control Locations Mean (f)[b] Range
Gamma Isotopic	36					
^{7}Be		64	1229 (24/24)	H52	1278 (12/12)	1197 (12/12)
			814-2310	1mi., S/SSE	814-1820	867-1530
^{40}K		120	3804 (24/24)	H51	4012 (12/12)	2546 (12/12)
			2490-4880	1mi., N/NNW	3140-4850	1780-3880
^{58}Co		6	<MDA		<MDA	<MDA
^{60}Co		8	<MDA		<MDA	<MDA
^{131}I		8	<MDA		<MDA	<MDA
^{134}Cs		8	<MDA		<MDA	<MDA
^{137}Cs		8	<MDA		<MDA	<MDA
^{210}Pb			563 (5/24)	H52	785 (3/12)	250 (4/12)
			165-1140	1mi., S/SSE	165-1140	116-616
^{212}Pb			25 (7/24)	H51	26 (4/12)	22 (4/12)
			15-41	1mi., N/NNW	15-41	13-35
^{226}Ra		189	<MDA		<MDA	<MDA
^{228}Ra		58	<MDA		<MDA	<MDA

Be-7, K-40, Pb-210, Pb-212, Ra-226, and Ra-228 are naturally occurring.
Number of Non-Routine Reported Measurements = 0.

NOTES

a. The LLD is an "a priori" lower limit of detection which establishes the smallest concentration of radioactive material in a sample that will yield a net count above system background that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a real signal.

LLDs in this column are at time of measurement. The MDAs reported in the Quarterly Reports for the individual samples have been corrected to the time of sample collection.

b. Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (f).

c. Specific identifying information for each sample location is provided in Section 7.

d. Results were based upon the average net response of three elements in a TLD (thermoluminescent dosimeter).

Note: MDA refers to minimum detectable activity.

VI. Land Use Census

The St. Lucie Annual Land Use Census Survey was performed during the months of August and September 2020. One change was identified as compared to the 2019 Land Use Census results; an additional residence was included in the NNW sector. No locations were identified with potential milk-producing animals (cows or goats).

2020 St. Lucie Land Use Census: Distance to Nearest Location[a, b]			
Sector	**Residence**	**Garden[d]**	**Milk Animal[c]**
N	O[e]	O	O
NNE	O	O	O
NE	O	O	O
ENE	O	O	O
E	O	O	O
ESE	O	O	O
SE	A: 1.5/142° B: 1.6/145°	O	O
SSE	A: 1.8/147°[g] B: 2.0/149°	L[f]	L
S	3.3/190°	L	L
SSW	2.2/212°	4.4/207°	L
SW	1.9/234°	L	L
WSW	1.9/240°	2.0/250°	L
W	1.9/260°	L	L
WNW	2.3/281°	L	L
NW	3.4/304°	L	L
NNW	A: 2.7/344° B: 2.8/343°	L	L

NOTES

a. All categories surveyed out to a 5-mile radius from the St. Lucie Plant.

b. The following format is used to denote the location:

distance (miles) / bearing (degrees)

Ex: A residence located in the southeast sector at 1.5 miles bearing 142 degrees is recorded as 1.5/142°.

c. Potential milk animal locations.

d. Only gardens with an estimated total area of 500 square feet, or more, and producing green leafy vegetables are considered.

e. "O" denotes that the sector area is predominantly an ocean area.

f. "L" denotes that the sector area is predominantly a land area unoccupied by the category type.

g. Non-residential occupied buildings in this sector include the following:

Sector	Distance	Description
SSE (A)	1.8/147°	Fire Station

5. Deviations / Missing Data

Several instances of missing data and air sampler partial run times are as follows:

A. Pathway: Direct Radiation Exposure
Location: TLD SSE-5 (North of Entrance to Miramar; 5.1 miles)
Dates: 3/10/20 – 6/16/20
Deviation: Failure to Perform Continuous Monitoring
Description: TLD was missing during Quarter 2 sampling by the State of Florida Bureau of Radiation Control (BRC) at the ODCM required REMP Program sampling location SSE-5.
Corrective Action: Replaced TLD.

B. Pathway: Direct Radiation Exposure
Location: TLD WNW-10 (SR 70, Just West of I-95; 10 miles)
Dates: 6/16/20 – 9/22/20
Deviation: Failure to Perform Continuous Monitoring
Description: TLD was missing during Quarter 3 sampling by the State of Florida Bureau of Radiation Control (BRC) at the ODCM required REMP Program sampling location WNW-10.
Corrective Action: Replaced TLD.

C. Pathway: Direct Radiation Exposure
Location: TLD SSE-10 (Elliot Museum; 10.2 miles)
Dates: 6/16/20 – 9/22/20
Deviation: Failure to Perform Continuous Monitoring
Description: TLD was missing during Quarter 3 sampling by the State of Florida Bureau of Radiation Control (BRC) at the ODCM required REMP Program sampling location SSE-10.
Corrective Action: Replaced TLD.

D. Pathway: Airborne: Radioiodine and Particulates
Location: H12 (FPL Substation – SR-76 Stuart)
Dates: 12/15/20-12/22/20
Deviation: Failure to perform continuous monitoring
Description: Loss of Power probably due to construction power loss. Estimated run time for the week was 20 out of 168 hours.
Corrective Action: Replaced the pump.

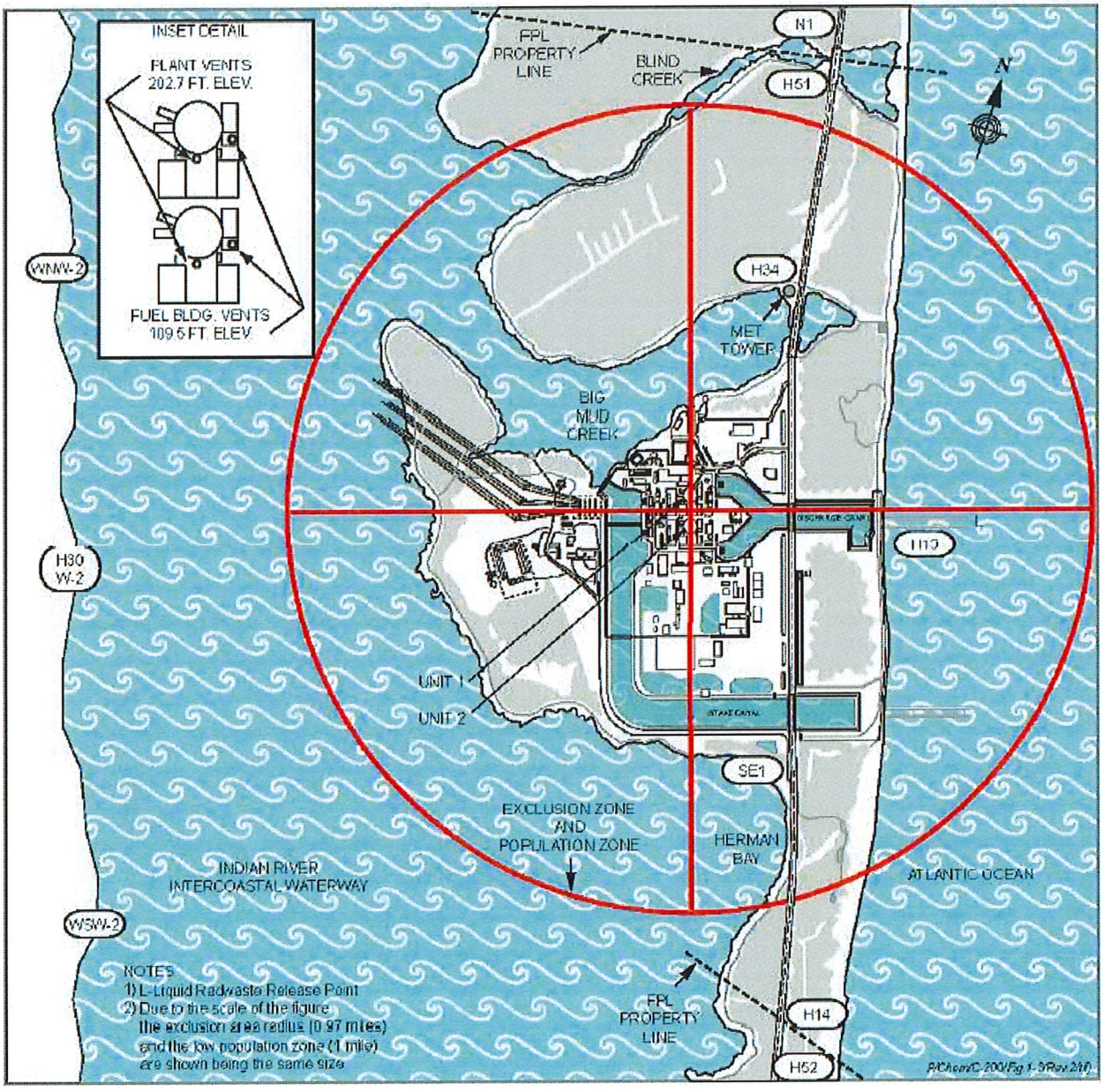
E. Pathway: Airborne: Radioiodine and Particulates
Location: H08 (FPL Substation – Weatherbee Road; 6 miles)
Dates: 10/27/20-11/03/20
Deviation: Failure to perform continuous monitoring
Description: Pump failure during the sampling week. Estimated run time for the week was 27 hours out of 169 (142 hours down time).
Corrective Action: Replaced the pump.

6. Analyses with LLDs Above Required Detection Capabilities

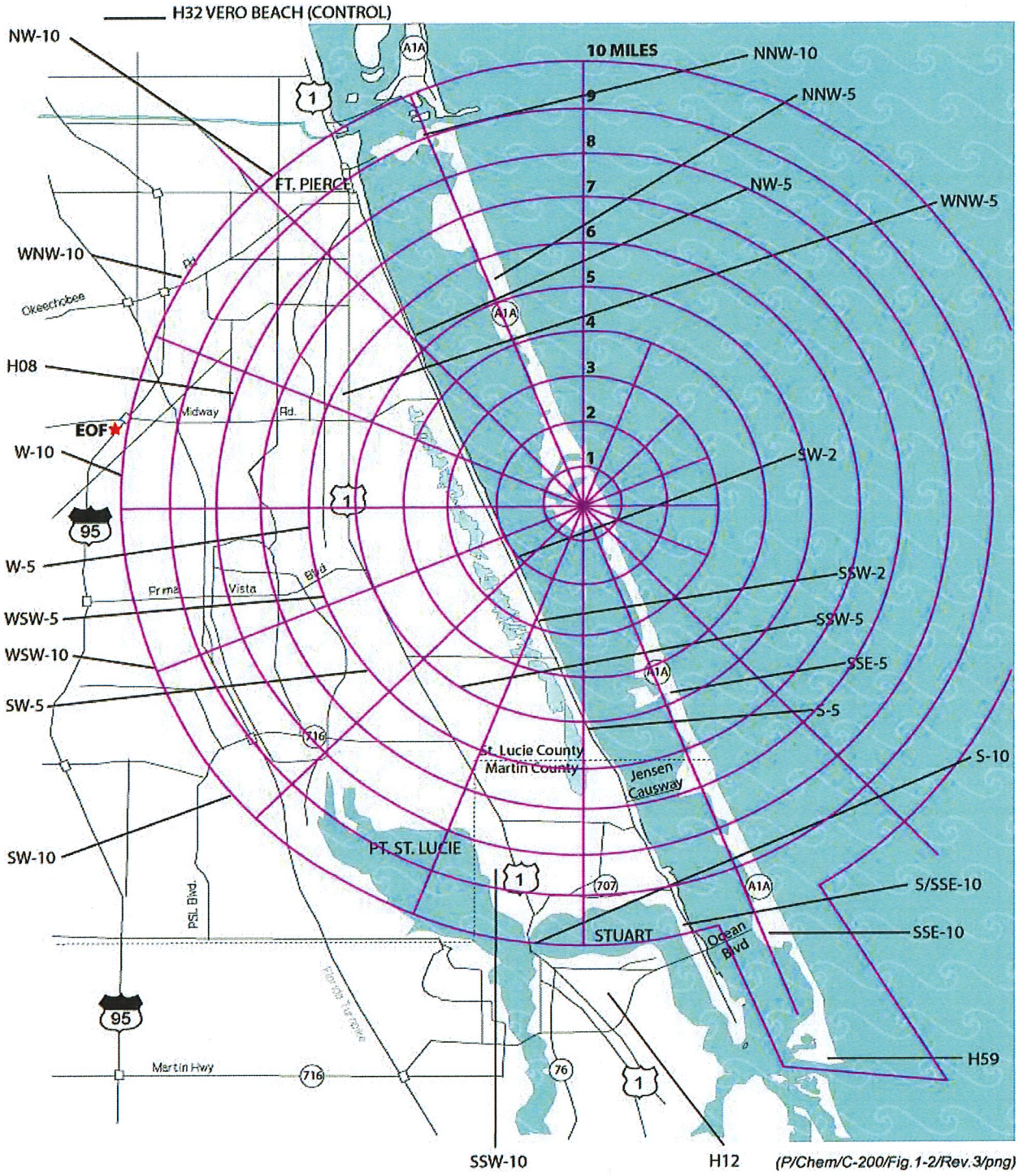
The values specified in the ODCM 4.12-1 Detection Capabilities were achieved for all samples. REMP sampling deviations and missing data are listed in Section 5.

7. Key to Sample Locations

Site Area Map & Environmental Sample Locations



Environmental Sample Locations (10 Miles)



(P/Chem/C-200/Fig.1-2/Rev.3/png)

PATHWAY: Direct Radiation
SAMPLES COLLECTED: TLD
SAMPLE FREQUENCY: Quarterly

Location Name	Direction Sector	Approximate Distance (Miles)	Description
N-1	N	1	North of Blind Creek (A1A)
NNW-5	NNW	4.8	Frederick Douglas Beach Entrance
NNW-10	NNW	8.7	Coast Guard Station
NW-5	NW	5.4	Indian River Drive at Rio Vista Drive
NW-10	NW	9.6	Intersection of SR 68 and 33rd St (FPL Facility)
WNW-2	WNW	2.3	Cemetery South of 7107 Indian River Drive
WNW-5	WNW	5.1	US-1 at SR 712
WNW-10	WNW	10	SR 70, Just West of I-95
W-2	W	2	Power Line - 77609 Indian River Drive
W-5	W	5.4	Oleander and Sager Streets
W-10	W	10.3	I-95 and SR 709
WSW-2	WSW	1.8	8503 Indian River Drive
WSW-5	WSW	5.6	Prima Vista Blvd. at Yacht Club
WSW-10	WSW	10	Del Rio and Davis Streets
SW-2	SW	2	9205 Indian River Drive
SW-5	SW	4.5	FPL Walton Service Center
SW-10	SW	10.2	Port St. Lucie Blvd. and Cairo Road
SSW-2	SSW	2.6	10307 Indian River Drive
SSW-5	SSW	6	Port St. Lucie Blvd. and US-1
SSW-10	SSW	8	Pine Valley and Westmoreland Roads
S-5	S	5.2	13189 Indian River Drive
S-10	S	10.8	US 1 and Palm City Ave
S/SSE-10	SSE	9.9	Indian River Drive and Quail Run Lane
SSE-5	SSE	5.1	North of Entrance to Miramar
SSE-10	SSE	10.2	Elliot Museum
SE-1	SE	1	South of Cooling Canal
H32 (Control)	NNW	18.1	U. of Florida - IFAS Entomology Lab Vero Beach

PATHWAY: Airborne
SAMPLES COLLECTED: Radioiodine and Particulates
SAMPLE FREQUENCY: Weekly

Location Name	Direction Sector	Approximate Distance (Miles)	Description
H08	WNW	6	FPL Substation – Weatherbee Road
H14	SE	1	On-Site - Near South Property Line
H30	W	2	Power Line - 7609 Indian River Drive
H34	N	0.5	On-Site - At Meteorological Tower
H12 (Control)	S	12	FPL Substation, SR-76 Stuart

PATHWAY: Waterborne
SAMPLES COLLECTED: Surface Water (Ocean)
SAMPLE FREQUENCY: H-15 Weekly; H-59 Monthly

Location Name	Direction Sector	Approximate Distance (Miles)	Description
H15	ENE/E/ESE	<1	Atlantic Ocean Public Beaches, East Side A1A
H59 (Control)	S/SSE	10-20	Near South End of Hutchinson Island

SAMPLES COLLECTED: Shoreline Sediment
SAMPLE FREQUENCY: Semi-Annually

Location Name	Direction Sector	Approximate Distance (Miles)	Description
H15	ENE/E/ESE	<1	Atlantic Ocean Public Beaches, East Side A1A
H59 (Control)	S/SSE	10-20	Near South End of Hutchinson Island

PATHWAY: Ingestion – Food Products
SAMPLES COLLECTED: Crustacea and Fish
SAMPLE FREQUENCY: Semi-Annually

Location Name	Direction Sector	Approximate Distance (Miles)	Description
H15	ENE/E/ESE	<1	Ocean Side, Vicinity of St. Lucie Plant
H59 (Control)	S/SSE	10-20	Near South End of Hutchinson Island

SAMPLES COLLECTED: Broad Leaf Vegetation – Food Products
SAMPLE FREQUENCY: Monthly

Location Name	Direction Sector	Approximate Distance (Miles)	Description
H51	N/NNW	1	Off-Site Near North Property Line
H52	S/SSE	1	Off-Site Near South Property Line
H59 (Control)	S/SSE	10-20	Near South End of Hutchinson Island

8. Ground Water Protection, Industry Initiative

A. Description of Program

Quarterly sampling and analysis for tritium and principle gamma emitters was performed by the State of Florida Department of Health (DOH) and Bureau of Radiation Control (BRC), pursuant to an Agreement between FPL and DOH, as part of the ODCM REMP sampling program.

The wells identified for radiological environmental sampling in support of the industry initiative are listed below and in Appendix B-2 of the ODCM. The 10 wells are on the outside perimeter of the Protected Area. The two St. Lucie Plant ID locations ending in "S" are shallower wells adjacent (within a few feet) of a deeper well at the same location.

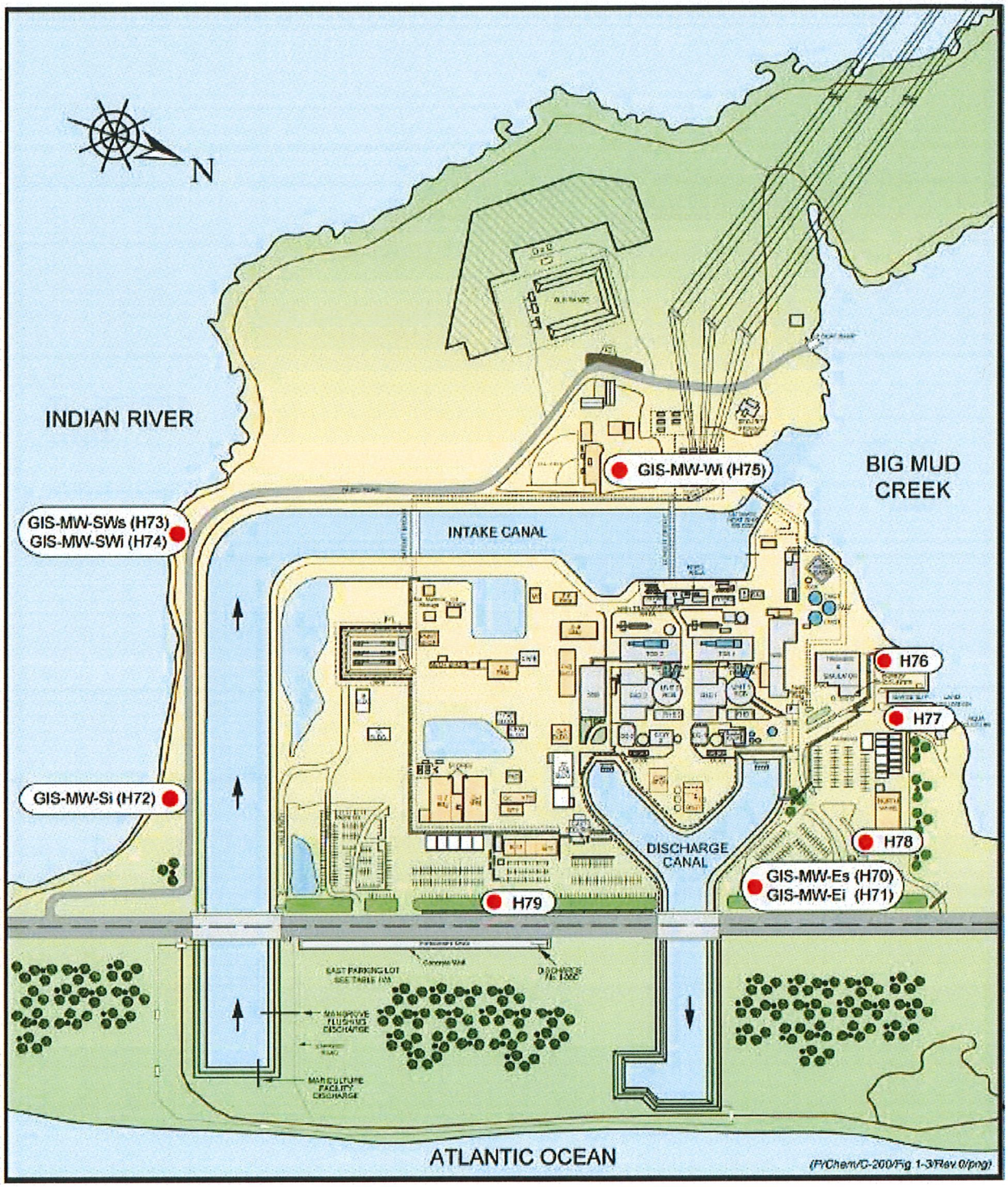
Samples were analyzed for tritium and principle gamma emitters. Tritium was the only fission product identified. Naturally occurring potassium (K-40) was identified occasionally.

State ID	St. Lucie Plant ID	Location Description
H70	GIS-MW-ES	West of A1A; Between the Discharge Canal and Gate "B"
H71	GIS-MW-EI	West of A1A; Between the Discharge Canal and Gate "B"
H72	GIS-MW-SI	South of Intake Canal and the adjacent access road
H73	GIS-MW-SWS	S/W corner of Intake Canal and the adjacent access road
H74	GIS-MW-SWI	S/W corner of Intake Canal and the adjacent access road
H75	GIS-MW-WI	West of plant site and Intake Canal; South of switchyard
H76	H76	North of Simulator; South of Big Mud Creek
H77	H77	East of Barge Slip; By Land Utilization Building
H78	H78	South of North Warehouse
H79	H79	West of A1A and East of Parking Lot

B. St. Lucie 2020 Tritium Results Summary (pCi/L)

Well Number	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
H70	135	<137	<137	<139
H71	477	648	946	776
H72	<139	<137	<137	<139
H73	<138	<137	<137	<139
H74	<138	<145	<137	<139
H75	<138	<145	<137	<139
H76	<146	<145	<137	<139
H77	<136	<145	<137	<139
H78	<138	<145	<137	<139
H79	<146	<145	<137	<139

C. Map of Groundwater Water Protection – Industry Initiative Wells



9. Radiological Surveillance of Florida Power & Light Company St. Lucie Site

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FIRST QUARTER 2020

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

First Quarter, 2020

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	2
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	2
4.b. Broadleaf Vegetation	Monthly	3	9
			Total: 188

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

1. DIRECT RADIATION - TLD's - (μR/hour)

Sample Site	Deployment 17-Dec-19 Collection 10-Mar-20	Sample Site	Deployment 17-Dec-19 Collection 10-Mar-20
N-1	3.20 ± 0.09	SW-2	3.13 ± 0.11
NNW-5	3.24 ± 0.33	SW-5	3.95 ± 0.21
NNW-10	3.97 ± 0.10	SW-10	3.16 ± 0.24
NW-5	3.08 ± 0.27	SSW-2	3.29 ± 0.23
NW-10	4.39 ± 0.48	SSW-5	3.97 ± 0.21
WNW-2	3.31 ± 0.31	SSW-10	3.21 ± 0.20
WNW-5	3.55 ± 0.02	S-5	3.52 ± 0.65
WNW-10	3.42 ± 0.22	S-10	3.36 ± 0.26
W-2	3.15 ± 0.17	S/SSE-10	3.87 ± 0.26
W-5	3.53 ± 0.31	SSE-5	3.22 ± 0.35
W-10	3.08 ± 0.16	SSE-10	3.25 ± 0.24
WSW-2	3.50 ± 0.32	SE-1	3.14 ± 0.26
WSW-5	3.32 ± 0.26	H-32	3.62 ± 0.12
WSW-10	3.00 ± 0.18		

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m^3)

Collection Date	H08	H12	H14	H30	H34
07-Jan-20	<0.02	<0.02	<0.02	<0.02	<0.02
16-Jan-20	<0.02	<0.02	<0.02	<0.02	<0.02
21-Jan-20	<0.03	<0.03	<0.03	<0.03	<0.03
28-Jan-20	<0.02	<0.02	<0.02	<0.03	<0.03
04-Feb-20	<0.02	<0.02	<0.02	<0.02	<0.02
12-Feb-20	<0.01	<0.01	<0.01	<0.01	<0.01
18-Feb-20	<0.02	<0.02	<0.02	<0.02	<0.02
25-Feb-20	<0.02	<0.02	<0.02	<0.02	<0.02
03-Mar-20	<0.02	<0.02	<0.02	<0.02	<0.02
10-Mar-20	<0.02	<0.02	<0.02	<0.02	<0.02
17-Mar-20	<0.02	<0.02	<0.02	<0.02	<0.02
24-Mar-20	<0.03	<0.03	<0.03	<0.03	<0.03
31-Mar-20	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H08	H12	H14	H30	H34
07-Jan-20	0.020 ± 0.002	0.016 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.014 ± 0.002
16-Jan-20	0.013 ± 0.002	0.010 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.016 ± 0.002
21-Jan-20	0.021 ± 0.003	0.017 ± 0.003	0.019 ± 0.003	0.017 ± 0.003	0.006 ± 0.002
28-Jan-20	0.018 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.011 ± 0.002
04-Feb-20	0.012 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.011 ± 0.002
12-Feb-20	0.011 ± 0.002	0.014 ± 0.002	0.013 ± 0.002	0.016 ± 0.002	0.012 ± 0.002
18-Feb-20	0.010 ± 0.002	0.010 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.009 ± 0.002
25-Feb-20	0.009 ± 0.002	0.009 ± 0.002	<0.008	0.007 ± 0.002	0.005 ± 0.002
03-Mar-20	0.011 ± 0.002	0.012 ± 0.002	0.010 ± 0.002	0.014 ± 0.002	0.009 ± 0.002
10-Mar-20	0.012 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
17-Mar-20	0.005 ± 0.002	0.014 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.006 ± 0.002
24-Mar-20	0.011 ± 0.002	0.011 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
31-Mar-20	0.012 ± 0.002	0.019 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.010 ± 0.002
Average:	0.013 ± 0.002	0.013 ± 0.002	<0.011	0.013 ± 0.002	0.010 ± 0.002

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1360 ± 0.0092	<0.0141	<0.0012	<0.0009	<0.0151
H12	0.1360 ± 0.0090	<0.0146	<0.0012	<0.0010	<0.0135
H14	0.1360 ± 0.0095	<0.0219	<0.0012	<0.0010	<0.0322
H30	0.1250 ± 0.0088	<0.0120	<0.0012	<0.0010	<0.0153
H34	0.1110 ± 0.0086	<0.0251	<0.0011	<0.0009	0.0207 ± 0.0083

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H15	07-Jan-20	<140	355 ± 26	<4	<3	<6	<4	<8	<5	<3	<3	<3	<12
	16-Jan-20	<140	361 ± 26	<4	<3	<7	<3	<8	<5	<3	<3	<3	<10
	21-Jan-20	<146	400 ± 27	<4	<3	<6	<4	<8	<5	<4	<3	<4	<11
	28-Jan-20	<138	393 ± 27	<3	<3	<7	<3	<8	<5	<4	<3	<4	<6
	04-Feb-20	<146	402 ± 27	<3	<3	<7	<3	<8	<5	<3	<3	<4	<13
	13-Feb-20	<135	342 ± 25	<3	<3	<7	<4	<6	<6	<4	<3	<3	<9
	18-Feb-20	<139	386 ± 27	<3	<3	<7	<3	<7	<6	<4	<3	<3	<12
	25-Feb-20	<139	383 ± 27	<3	<3	<7	<3	<8	<5	<3	<4	<4	<10
	03-Mar-20	<139	375 ± 26	<3	<3	<7	<4	<8	<5	<4	<3	<4	<12
	10-Mar-20	<141	431 ± 28	<3	<3	<7	<4	<7	<5	<3	<3	<4	<11
	17-Mar-20	<141	369 ± 27	<3	<3	<7	<4	<7	<5	<4	<3	<3	<12
	24-Mar-20	<145	374 ± 27	<3	<3	<7	<3	<8	<6	<3	<3	<3	<11
	31-Mar-20	<145	391 ± 27	<3	<3	<7	<4	<7	<6	<4	<3	<4	<11
H59	23-Jan-20	<139	376 ± 27	<3	<3	<7	<3	<7	<6	<4	<3	<3	<10
	13-Feb-20	<135	378 ± 27	<4	<3	<7	<4	<8	<6	<6	<3	<4	<5
	13-Mar-20	<141	331 ± 25	<3	<3	<7	<4	<8	<5	<4	<3	<4	<5

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.
(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.
* Analysis of these two samples did not meet the required 15 pCi/L limit of detection for Ba-140/La-140 due to an oversight of lab processes. Additional processes and training have been put in place to fix this oversight.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	13-Feb-20	<63	274 ± 27	<6	<5	<7	<7	322 ± 61	227 ± 8	83 ± 7	28 ± 3	240 ± 17
H59	13-Feb-20	<86	210 ± 38	<10	<8	<9	<10	<791	143 ± 9	<46	25 ± 5	110 ± 44

4.a.1. CRUSTACEA - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	16-Jan-20	1820 ± 199	<24	<22	<44	<25	<58	<17	<23	<50	<104
H59	19-Feb-20	1200 ± 93	<18	<15	<32	<16	<39	<19	<21	285 ± 15	<85

4.a.2. FISH - Mixed Species - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	20-Feb-20	3060 ± 210	<22	<24	<56	<24	<57	<18	<20	<51	<119
H59	21-Feb-20	2660 ± 177	<20	<20	<39	<20	<42	<22	<20	<45	<95

4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Pb-210	Pb-212	Ra-226	Ra-228
H51	23-Jan-20	1200 ± 68	3660 ± 180	<13	<14	<14	<1120	<33	<28	<54
	13-Feb-20	1100 ± 63	4850 ± 211	<13	<11	<15	<928	15 ± 7	<29	<65
	13-Mar-20	1260 ± 73	4000 ± 198	<20	<13	<18	<997	<25	<31	<61
H52	23-Jan-20	1320 ± 66	3270 ± 161	<10	<11	<12	<907	<22	<28	<54
	13-Feb-20	1140 ± 60	3230 ± 160	<11	<10	<13	1140 ± 344	<22	<26	<56
	13-Mar-20	1370 ± 69	3640 ± 173	<16	<11	<13	<1090	<21	<25	<57
H59	23-Jan-20	1140 ± 63	2020 ± 126	<12	<11	<13	<777	24 ± 7	<20	<48
	13-Feb-20	1020 ± 60	2370 ± 137	<10	<11	<13	<846	<21	<26	<49
	13-Mar-20	982 ± 54	2450 ± 130	<13	<9	<12	616 ± 238	<19	<16	<41

ST. LUCIE SITE

Supplemental Sampling

First Quarter, 2020

Sample Type	Collection Frequency	Locations Sampled	Number of Samples
1. Direct Radiation	Quarterly	9	9
2. Airborne			
2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	4
3.c. Beach Sand	Semiannually	3	3
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crops	Annually	1	0
4.b. Citrus	Annually	1	1
			Total: 111

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

1. DIRECT RADIATION - TLD's - (μR/hour)

Sample Site	Deployment 17-Dec-19 Collection 10-Mar-20
H08	3.66 ± 0.25
H09	3.80 ± 0.28
H12	7.79 ± 0.56
H14	3.70 ± 0.21
H33	3.58 ± 0.43
H34	3.50 ± 0.38
H60	3.64 ± 0.44
H61	4.52 ± 0.39
H62	3.97 ± 0.06

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m³)

Collection Date	H09	H32	H33
07-Jan-20	<0.02	<0.02	<0.03
16-Jan-20	<0.02	<0.02	<0.03
21-Jan-20	<0.03	<0.03	<0.03
28-Jan-20	<0.02	<0.02	<0.03
04-Feb-20	<0.02	<0.02	<0.02
12-Feb-20	<0.01	<0.01	<0.01
18-Feb-20	<0.02	<0.02	<0.02
25-Feb-20	<0.02	<0.02	<0.02
03-Mar-20	<0.02	<0.02	<0.02
10-Mar-20	<0.02	<0.02	<0.02
17-Mar-20	<0.02	<0.02	<0.02
24-Mar-20	<0.03	<0.03	<0.03
31-Mar-20	<0.02	<0.02	<0.02

2.b. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H09	H32	H33
07-Jan-20	0.016 ± 0.002	0.017 ± 0.002	0.015 ± 0.003
16-Jan-20	0.012 ± 0.002	0.012 ± 0.002	0.009 ± 0.002
21-Jan-20	0.022 ± 0.003	0.013 ± 0.003	0.018 ± 0.003
28-Jan-20	0.017 ± 0.002	0.018 ± 0.002	0.010 ± 0.002
04-Feb-20	0.017 ± 0.002	0.015 ± 0.002	0.014 ± 0.002
12-Feb-20	0.013 ± 0.002	0.016 ± 0.002	0.011 ± 0.002
18-Feb-20	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
25-Feb-20	<0.007	0.008 ± 0.002	0.005 ± 0.002
03-Mar-20	0.008 ± 0.002	0.008 ± 0.002	0.011 ± 0.002
10-Mar-20	0.011 ± 0.002	0.009 ± 0.002	0.010 ± 0.002
17-Mar-20	0.007 ± 0.002	0.008 ± 0.002	0.013 ± 0.002
24-Mar-20	0.008 ± 0.002	0.010 ± 0.002	0.013 ± 0.002
31-Mar-20	0.011 ± 0.002	0.017 ± 0.002	0.011 ± 0.002
Average:	<0.012	0.012 ± 0.002	0.011 ± 0.002

2.b. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1190 ± 0.0087	<0.0180	<0.0012	<0.0010	<0.0296
H32	0.1520 ± 0.0098	<0.0212	<0.0012	<0.0009	0.0272 ± 0.0091
H33	0.1300 ± 0.0091	<0.0143	<0.0014	<0.0010	<0.0159

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H13	23-Jan-20	<138	328 ± 25	<3	<3	<7	<3	<7	<6	<4	<3	<3	<12
	13-Feb-20	<135	336 ± 25	<3	<3	<7	<4	<8	<5	<4	<3	<3	<10
	13-Mar-20	<141	309 ± 24	<3	<3	<8	<4	<8	<6	<5	<3	<3	<5
H36	23-Jan-20	2723 ± 84	309 ± 25	<3	<3	<7	<4	<7	<6	<3	<3	<3	<10
	13-Feb-20	6514 ± 119	360 ± 26	<3	<3	<7	<4	<8	<7	<5	<3	<3	<5
	13-Mar-20	<141	366 ± 26	<3	<3	<8	<3	<7	<6	<5	<3	<4	<5

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H13	13-Feb-20	<85	660 ± 54	<9	<9	<9	<10	<742	265 ± 10	109 ± 12	42 ± 5	163 ± 53
H16	13-Feb-20	<86	190 ± 37	<9	<8	<8	<10	<831	240 ± 10	68 ± 10	41 ± 5	189 ± 34
H19	13-Feb-20	<65	173 ± 22	<6	<6	<7	<6	186 ± 56	174 ± 7	59 ± 6	18 ± 3	132 ± 18
H36	13-Feb-20	575 ± 103	4770 ± 224	<44	<27	<29	33 ± 10	4800 ± 1230	593 ± 26	311 ± 47	74 ± 12	1420 ± 91

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	13-Feb-20	<87	198 ± 34	<8	<8	<8	<8	<670	221 ± 10	89 ± 12	<13	171 ± 47
H16	13-Feb-20	41 ± 14	158 ± 21	<6	<5	<7	<7	157 ± 54	262 ± 8	84 ± 7	35 ± 3	269 ± 18
H19	13-Feb-20	<100	192 ± 33	<11	<8	<9	<9	<744	296 ± 11	88 ± 12	48 ± 5	283 ± 36

3.d. GROUND WATER (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H70	24-Jan-20	135 ± 45	<103	<4	<6	<11	<6	<13	<10	<8	<6	<7	<11
H71	24-Jan-20	477 ± 52	312 ± 25	<3	<3	<8	<4	<8	<6	<6	<3	<4	<5
H72	24-Jan-20	<139	317 ± 24	<3	<3	<7	<4	<10	<6	<6	<4	<4	<6
H73	24-Jan-20	<138	<64	<3	<3	<7	<4	<8	<7	<6	<3	<3	<5
H74	24-Jan-20	<138	283 ± 23	<3	<3	<7	<4	<7	<6	<6	<4	<4	<6
H75	24-Jan-20	<138	402 ± 42	<5	<6	<14	<7	<15	<10	<9	<5	<6	<8
H76	24-Jan-20	<146	<97	<7	<6	<9	<6	<13	<11	<9	<5	<6	<10
H77	24-Jan-20	<136	<92	<6	<6	<13	<5	<12	<10	<10	<5	<7	<9
H78	24-Jan-20	<138	<110	<5	<7	<14	<7	<14	<10	<10	<5	<6	<13
H79	24-Jan-20	<146	<78	<6	<7	<11	<5	<14	<9	<9	<5	<6	<10

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

* Analysis of these three samples did not meet the required 15 pCi/L limit of detection for Ba-140/La-140 due to an oversight of lab processes. Additional processes and training have been put in place to fix this oversight.

4.a. GARDEN CROPS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample not yet collected.					

4.b. CITRUS - Oranges - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	21-Jan-20	<29	1870 ± 70	<4	<3	<4

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

SECOND QUARTER 2020

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Second Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	27	26
2. Airborne 2.a. Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne 3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	0
4. Ingestion 4.a. Fish and Invertebrates 4.a.1. Crustacea	Semiannually	2	0
4.a.2. Fish	Semiannually	2	0
4.b. Broadleaf Vegetation	Monthly	3	9

Total: 181

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

1. DIRECT RADIATION - DUAL DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 10-Mar-20 Collection 16-Jun-20	Sample Site	Deployment 10-Mar-20 Collection 16-Jun-20
N-1	3.19 ± 0.31	SW-2	3.17 ± 0.12
NNW-5	3.23 ± 0.39	SW-5	3.78 ± 0.11
NNW-10	3.67 ± 0.12	SW-10	3.19 ± 0.34
NW-5	3.22 ± 0.48	SSW-2	3.09 ± 0.33
NW-10	4.32 ± 0.06	SSW-5	3.50 ± 0.19
WNW-2	3.19 ± 0.16	SSW-10	2.81 ± 0.33
WNW-5	3.36 ± 0.29	S-5	3.15 ± 0.06
WNW-10	3.26 ± 0.24	S-10	3.24 ± 0.05
W-2	2.93 ± 0.33	S/SSE-10	3.70 ± 0.30
W-5	3.42 ± 0.19	SSE-5	(A)
W-10	2.82 ± 0.55	SSE-10	3.17 ± 0.30
WSW-2	3.29 ± 0.12	SE-1	2.92 ± 0.04
WSW-5	3.31 ± 0.08	H-32	3.45 ± 0.22
WSW-10	2.95 ± 0.14		

(A) TLD could not be located at time of collection.

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m^3)

Collection Date	H08	H12	H14	H30	H34
07-Apr-20	<0.04	<0.04	<0.04	<0.04	<0.04
14-Apr-20	<0.02	<0.02	<0.02	<0.02	<0.02
21-Apr-20	<0.04	<0.04	<0.04	<0.04	<0.04
28-Apr-20	<0.02	<0.02	<0.02	<0.02	<0.02
05-May-20	<0.03	<0.03	<0.03	<0.03	<0.03
12-May-20	<0.03	<0.03	<0.03	<0.03	<0.03
19-May-20	<0.02	<0.02	<0.02	<0.02	<0.02
26-May-20	<0.02	<0.02	<0.02	<0.02	<0.02
02-Jun-20	<0.03	<0.03	<0.03	<0.03	<0.03
09-Jun-20	<0.03	<0.03	<0.03	<0.03	<0.03
16-Jun-20	<0.02	<0.02	<0.02	<0.02	<0.02
24-Jun-20	<0.01	<0.01	<0.01	<0.01	<0.01
30-Jun-20	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1.AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H08	H12	H14	H30	H34
07-Apr-20	0.016 ± 0.002	0.015 ± 0.002	0.010 ± 0.002	0.015 ± 0.002	0.012 ± 0.002
14-Apr-20	0.019 ± 0.002	0.023 ± 0.002	0.025 ± 0.002	0.018 ± 0.002	0.020 ± 0.002
21-Apr-20	0.016 ± 0.002	0.017 ± 0.002	0.014 ± 0.002	0.015 ± 0.002	0.015 ± 0.002
28-Apr-20	0.018 ± 0.002	0.020 ± 0.002	0.015 ± 0.002	0.017 ± 0.002	0.009 ± 0.002
05-May-20	0.017 ± 0.002	0.016 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.020 ± 0.002
12-May-20	0.015 ± 0.002	0.015 ± 0.002	0.019 ± 0.002	0.018 ± 0.002	0.017 ± 0.002
19-May-20	0.011 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.012 ± 0.002	0.016 ± 0.002
26-May-20	0.013 ± 0.002	0.006 ± 0.002	0.019 ± 0.002	0.012 ± 0.002	0.018 ± 0.002
02-Jun-20	0.011 ± 0.002	0.008 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.012 ± 0.002
09-Jun-20	0.011 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.009 ± 0.002	0.007 ± 0.002
16-Jun-20	0.009 ± 0.002	0.009 ± 0.002	0.012 ± 0.002	0.011 ± 0.002	0.008 ± 0.002
24-Jun-20	0.006 ± 0.001	0.009 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.006 ± 0.002
30-Jun-20	0.011 ± 0.002	0.012 ± 0.002	0.014 ± 0.002	0.012 ± 0.002	0.010 ± 0.002
Average:	0.013 ± 0.001	0.013 ± 0.001	0.015 ± 0.001	0.014 ± 0.001	0.013 ± 0.001

2.b.2.AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1330 ± 0.0092	<0.0152	<0.0012	<0.0008	<0.0151
H12	0.1360 ± 0.0082	<0.0191	<0.0008	<0.0009	0.0072 ± 0.0022
H14	0.1620 ± 0.0098	<0.0119	<0.0012	<0.0010	0.0096 ± 0.0027
H30	0.1440 ± 0.0099	<0.0206	<0.0010	<0.0009	<0.0311
H34	0.1090 ± 0.0085	<0.0207	<0.0010	<0.0010	<0.0367

3.a.SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H15	07-Apr-20	75 ± 25	414 ± 27	<3	<3	<6	<3	<7	<5	<3	<3	<4	<10
	14-Apr-20	<137	377 ± 27	<3	<3	<7	<4	<7	<6	<3	<3	<3	<6
	21-Apr-20	<145	341 ± 26	<3	<3	<8	<3	<7	<6	<4	<3	<3	<7
	28-Apr-20	<145	343 ± 26	<3	<4	<7	<4	<7	<5	<4	<3	<4	<7
	05-May-20	<136	348 ± 26	<3	<3	<6	<3	<7	<5	<4	<3	<4	<10
	12-May-20	<136	400 ± 27	<3	<4	<7	<4	<8	<6	<3	<3	<3	<11
	19-May-20	<144	352 ± 26	<4	<4	<7	<4	<8	<6	<4	<3	<4	<4
	26-May-20	<151	339 ± 27	<4	<3	<5	<4	<8	<6	<3	<4	<4	<4
	02-Jun-20	<151	268 ± 23	<3	<4	<7	<3	<9	<6	<4	<4	<3	<4
	09-Jun-20	<150	405 ± 27	<3	<3	<6	<3	<7	<6	<3	<3	<3	<9
	16-Jun-20	<150	345 ± 26	<3	<3	<6	<4	<8	<5	<4	<3	<4	<4
	24-Jun-20	<137	386 ± 28	<3	<4	<7	<3	<8	<6	<4	<3	<4	<4
	30-Jun-20	<150	367 ± 27	<3	<3	<6	<3	<6	<6	<4	<4	<3	<4
H59	14-Apr-20	<137	374 ± 27	<3	<3	<7	<4	<7	<6	<4	<3	<4	<5
	12-May-20	<151	359 ± 26	<3	<3	<6	<3	<7	<6	<3	<3	<3	<10
	25-Jun-20	<150	354 ± 27	<3	<3	<6	<4	<7	<6	<4	<3	<3	<4

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b.SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232
	These samples previously collected.									

4.a.1. CRUSTACEA - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample previously collected.										
H59	This sample previously collected.										

4.a.2. FISH - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample previously collected.										
H59	This sample previously collected.										

4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Pb-210	Pb-212	Ra-226	Ra-228
H51	14-Apr-20	902 ± 61	3590 ± 178	<14	<11	<14	<988	<24	<278	<64
	12-May-20	1010 ± 60	4820 ± 208	<11	<11	<14	<1180	18 ± 7	<294	<59
	25-Jun-20	815 ± 42	4410 ± 173	<8	<8	<9	179 ± 72	41 ± 4	<197	<38
H52	14-Apr-20	822 ± 57	4880 ± 212	<13	<11	<9	<972	<24	<332	<53
	12-May-20	1150 ± 63	3890 ± 179	<12	<10	<13	1050 ± 390	24 ± 7	<242	<48
	25-Jun-20	1150 ± 67	3850 ± 194	<13	<12	<13	<842	30 ± 8	<260	<60
H59	14-Apr-20	1140 ± 68	2940 ± 159	<15	<12	<14	<1020	<23	<355	<58
	12-May-20	1460 ± 83	3880 ± 203	<16	<14	<18	<1440	35 ± 10	<397	<71
	25-Jun-20	1330 ± 67	3750 ± 185	<11	<10	<14	<885	17 ± 8	<266	<55

ST. LUCIE SITE

Supplemental

Sampling Second

Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	9	9
2. Airborne			
2.a Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	0
3.c. Beach Sand	Semiannually	3	0
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crop	Annually	1	0
4.b. Citrus	Annually	1	0

Total: 103

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

1. DIRECT RADIATION - DUAL DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 10-Mar-20 Collection 16-Jun-20
H08	3.61 ± 0.17
H09	3.70 ± 0.46
H12	7.52 ± 0.13
H14	3.60 ± 0.38
H33	3.54 ± 0.12
H34	3.35 ± 0.15
H60	3.43 ± 0.14
H61	4.34 ± 0.08
H62	3.76 ± 0.46

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m³)

Collection Date	H09	H32	H33
07-Apr-20	<0.04	<0.04	<0.04
14-Apr-20	<0.02	<0.02	<0.02
21-Apr-20	<0.04	<0.04	<0.04
28-Apr-20	<0.02	<0.02	<0.02
05-May-20	<0.03	<0.03	<0.03
12-May-20	<0.03	<0.03	<0.03
19-May-20	<0.02	<0.02	<0.02
26-May-20	<0.02	<0.02	<0.02
02-Jun-20	<0.03	<0.03	<0.03
09-Jun-20	<0.03	<0.03	<0.15(A)
16-Jun-20	<0.02	<0.02	<0.02
24-Jun-20	<0.01	<0.01	<0.01
30-Jun-20	<0.02	<0.02	<0.02

(A) No power. Estimated run time 33 out of 167 hours.

2.b. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H09	H32	H33
07-Apr-20	0.014 ± 0.002	0.015 ± 0.002	0.017 ± 0.002
14-Apr-20	0.018 ± 0.002	0.023 ± 0.002	0.014 ± 0.002
21-Apr-20	0.019 ± 0.002	0.016 ± 0.002	0.014 ± 0.002
28-Apr-20	0.014 ± 0.002	0.018 ± 0.002	0.013 ± 0.002
05-May-20	0.016 ± 0.002	0.020 ± 0.002	0.015 ± 0.002
12-May-20	0.021 ± 0.002	0.014 ± 0.002	0.014 ± 0.002
19-May-20	0.013 ± 0.002	0.012 ± 0.002	0.009 ± 0.002
26-May-20	0.013 ± 0.002	0.014 ± 0.002	0.013 ± 0.002
02-Jun-20	0.011 ± 0.002	0.015 ± 0.002	0.008 ± 0.002
09-Jun-20	0.008 ± 0.002	0.009 ± 0.002	<0.034(A)
16-Jun-20	0.011 ± 0.002	0.011 ± 0.002	0.009 ± 0.002
24-Jun-20	0.011 ± 0.002	0.008 ± 0.002	0.008 ± 0.001
30-Jun-20	0.009 ± 0.002	0.013 ± 0.002	0.012 ± 0.002
Average:	0.014 ± 0.001	0.015 ± 0.001	<0.014

(A) No power. Estimated run time 33 out of 167 hours.

2.b. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1240 ± 0.0093	<0.0221	<0.0011	<0.0009	<0.0325
H32	0.1240 ± 0.0082	<0.0196	<0.0007	<0.0007	0.0145 ± 0.0029
H33	0.1420 ± 0.0095	<0.0115	<0.0012	<0.0010	<0.0155

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H13	14-Apr-20	<137	316 ± 25	<3	<3	<7	<4	<5	<7	<4	<3	<3	<7
	12-May-20	<151	291 ± 24	<3	<4	<6	<4	<7	<5	<4	<3	<3	<12
	25-Jun-20	<137	246 ± 21	<3	<4	<6	<4	<8	<6	<4	<3	<4	<4
H36	14-Apr-20	<137	401 ± 28	<3	<4	<7	<4	<7	<5	<4	<3	<3	<5
	12-May-20	<145	434 ± 29	<3	<3	<7	<4	<7	<6	<4	<3	<4	<11
	25-Jun-20	<137	313 ± 25	<3	<3	<6	<3	<7	<6	<4	<3	<3	<4

(A)- These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	Others
These samples previously collected.											

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	Others
These samples previously collected.											

3.d.GROUND WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H70	21-Apr-20	<137	<52	<4	<4	<7	<4	<9	<6	<4	<4	<4	<14
H71	21-Apr-20	648 ± 54	339 ± 25	<3	<3	<7	<4	<8	<6	<4	<4	<4	<12
H72	21-Apr-20	<137	334 ± 26	<4	<4	<7	<4	<9	<6	<5	<4	<4	<15
H73	21-Apr-20	<137	99 ± 15	<3	<3	<7	<4	<8	<5	<4	<4	<4	<12
H74	21-Apr-20	<145	294 ± 24	<3	<4	<6	<3	<7	<5	<4	<3	<3	<11
H75	21-Apr-20	<145	283 ± 23	<3	<4	<7	<3	<8	<6	<4	<4	<4	<7
H76	21-Apr-20	<145	<90	<6	<6	<13	<7	<14	<9	<7	<5	<6	<10
H77	21-Apr-20	<145	<42	<4	<4	<7	<3	<9	<6	<4	<4	<3	<8
H78	21-Apr-20	<145	<52	<4	<3	<7	<4	<10	<6	<4	<4	<4	<10
H79	21-Apr-20	<145	<50	<3	<4	<6	<3	<7	<5	<4	<4	<3	<8

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

4.a GARDEN CROP - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample not yet collected.					

4.b CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample previously collected.					

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

THIRD QUARTER 2020

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual

Sampling Third Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	27	25
2. Airborne 2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne 3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	2
4. Ingestion 4.a. Fish and Invertebrates 4.a.1. Crustacea	Semiannually	2	0
4.a.2. Fish	Semiannually	2	0
4.b. Broadleaf Vegetation	Monthly	3	9

Total: 182

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard- deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

1. DIRECT RADIATION - DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 16-Jun-20 Collection 22-Sep-20	Sample Site	Deployment 16-Jun-20 Collection 22-Sep-20
N-1	3.15 ± 0.17	SW-2	3.28 ± 0.05
NNW-5	3.07 ± 0.58	SW-5	4.04 ± 0.30
NNW-10	3.99 ± 0.47	SW-10	3.24 ± 0.41
NW-5	2.98 ± 0.66	SSW-2	3.37 ± 0.05
NW-10	4.36 ± 0.41	SSW-5	3.80 ± 0.15
WNW-2	3.37 ± 0.40	SSW-10	2.83 ± 0.61
WNW-5	3.44 ± 1.15	S-5	3.28 ± 0.55
WNW-10	(A)	S-10	3.38 ± 0.25
W-2	3.28 ± 0.15	S/SSE-10	3.86 ± 0.25
W-5	3.64 ± 0.49	SSE-5	3.38 ± 0.46
W-10	2.98 ± 0.36	SSE-10	(A)
WSW-2	3.29 ± 0.58	SE-1	3.26 ± 0.38
WSW-5	3.36 ± 0.13	H-32	3.89 ± 0.27
WSW-10	3.16 ± 0.42		

(A) TLD could not be located at time of collection.

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m^3)

Collection Date	H08	H12	H14	H30	H34
06-Jul-20	<0.03	<0.03	<0.03	<0.03	<0.03
14-Jul-20	<0.01	<0.01	<0.01	<0.01	<0.01
21-Jul-20	<0.02	<0.02	<0.02	<0.02	<0.02
28-Jul-20	<0.02	<0.02	<0.02	<0.02	<0.02
04-Aug-20	<0.02	<0.02	<0.02	<0.02	<0.02
11-Aug-20	<0.02	<0.02	<0.02	<0.02	<0.02
18-Aug-20	<0.02	<0.02	<0.02	<0.02	<0.02
25-Aug-20	<0.02	<0.02	<0.02	<0.02	<0.02
01-Sep-20	<0.02	<0.02	<0.02	<0.02	<0.02
09-Sep-20	<0.02	<0.02	<0.02	<0.02	<0.02
15-Sep-20	<0.02	<0.02	<0.02	<0.02	<0.02
22-Sep-20	<0.02	<0.02	<0.02	<0.02	<0.02
30-Sep-20	<0.02	<0.02	<0.02	<0.02	<0.02

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H08	H12	H14	H30	H34
06-Jul-20	0.013 ± 0.002	0.011 ± 0.002	0.018 ± 0.002	0.013 ± 0.002	0.008 ± 0.002
14-Jul-20	0.017 ± 0.002	0.014 ± 0.002	0.017 ± 0.002	0.020 ± 0.002	0.015 ± 0.002
21-Jul-20	0.014 ± 0.002	0.017 ± 0.002	0.016 ± 0.002	0.012 ± 0.002	0.010 ± 0.002
28-Jul-20	0.010 ± 0.002	0.009 ± 0.002	0.009 ± 0.002	0.006 ± 0.002	0.008 ± 0.002
04-Aug-20	0.011 ± 0.002	0.016 ± 0.002	0.018 ± 0.002	0.012 ± 0.002	0.008 ± 0.002
11-Aug-20	0.013 ± 0.002	0.011 ± 0.002	0.007 ± 0.002	0.009 ± 0.002	0.006 ± 0.002
18-Aug-20	0.011 ± 0.002	0.011 ± 0.002	0.011 ± 0.002	0.010 ± 0.002	0.007 ± 0.002
25-Aug-20	0.007 ± 0.002	0.016 ± 0.002	0.013 ± 0.002	0.013 ± 0.002	0.007 ± 0.002
01-Sep-20	0.008 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.010 ± 0.002	<0.007
09-Sep-20	0.013 ± 0.002	0.018 ± 0.002	0.016 ± 0.002	0.024 ± 0.002	0.012 ± 0.002
15-Sep-20	<0.009	0.006 ± 0.002	0.009 ± 0.002	0.007 ± 0.002	0.004 ± 0.002
22-Sep-20	0.008 ± 0.002	0.010 ± 0.002	0.006 ± 0.002	0.009 ± 0.002	0.006 ± 0.002
30-Sep-20	0.008 ± 0.002	0.008 ± 0.002	0.011 ± 0.002	0.009 ± 0.002	0.008 ± 0.002
Average:	<0.011	0.012 ± 0.001	0.012 ± 0.001	0.012 ± 0.001	<0.008

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210

H08	0.0893 ± 0.0069	<0.0197	<0.0008	<0.0007	0.0116 ± 0.0024
H12	0.1100 ± 0.0085	<0.0133	<0.0013	<0.0008	<0.0145
H14	0.1030 ± 0.0072	<0.0198	<0.0008	<0.0008	0.0095 ± 0.0029
H30	0.1340 ± 0.0097	<0.0250	<0.0013	<0.0011	<0.0094
H34	0.0899 ± 0.0088	<0.0241	<0.0013	<0.0010	<0.0087

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H15	06-Jul-20	<142	365 ± 27	<3	<4	<7	<3	<8	<5	<4	<4	<4	<4
	14-Jul-20	<139	377 ± 27	<3	<3	<7	<3	<7	<6	<4	<4	<4	<4
	21-Jul-20	<137	328 ± 25	<4	<3	<7	<4	<7	<6	<5	<3	<4	<5
	28-Jul-20	<137	319 ± 26	<3	<4	<7	<4	<7	<6	<4	<3	<3	<4
	04-Aug-20	<139	354 ± 27	<3	<3	<8	<3	<7	<6	<4	<4	<4	<4
	11-Aug-20	<139	356 ± 26	<3	<3	<8	<4	<7	<7	<4	<3	<4	<4
	18-Aug-20	<141	338 ± 27	<4	<4	<8	<4	<8	<6	<4	<3	<4	<4
	25-Aug-20	<141	346 ± 26	<4	<3	<6	<3	<7	<5	<4	<3	<4	<4
	01-Sep-20	<139	332 ± 25	<4	<3	<7	<3	<7	<6	<4	<3	<4	<4
	09-Sep-20	<139	334 ± 25	<3	<3	<7	<4	<8	<6	<4	<3	<4	<4
	15-Sep-20	<139	273 ± 25	<3	<3	<7	<3	<8	<6	<3	<3	<4	<4
	22-Sep-20	<140	377 ± 27	<4	<4	<6	<3	<7	<6	<4	<3	<4	<4
	30-Sep-20	<140	300 ± 25	<3	<3	<7	<3	<6	<5	<3	<3	<4	<4
H59	14-Jul-20	<139	323 ± 25	<3	<4	<6	<4	<8	<7	<4	<3	<3	<4
	11-Aug-20	<139	345 ± 26	<3	<3	<7	<3	<7	<6	<4	<3	<4	<4
	15-Sep-20	<139	351 ± 26	<3	<4	<6	<4	<8	<6	<4	<3	<4	<4

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	24-Aug-20	<76	110 ± 46	<8	<7	<8	<8	<379	<200	<69	<13	105 ± 22
H59	24-Aug-20	<88	<125	<7	<6	<7	<7	<306	<172	<63	<11	

4.a.1. CRUSTACEA - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample not yet collected.										
H59	This sample not yet collected.										

4.a.2. FISH - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	This sample not yet collected.										
H59	This sample not yet collected.										

4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Pb-210	Pb-212	Ra-226	Ra-228
H51	14-Jul-20	898 ± 43	4460 ± 171	<10	<7	<9	<62	<16	<189	<36
	11-Aug-20	912 ± 50	4530 ± 189	<10	<11	<11	<641	29 ± 7	<223	<52
	15-Sep-20	1060 ± 47	3530 ± 148	<8	<8	<9	<208	<16	<188	<36
H52	14-Jul-20	1140 ± 54	4380 ± 181	<12	<9	<11	<277	<19	<220	<42
	11-Aug-20	814 ± 41	3680 ± 156	<8	<9	<8	165 ± 58	17 ± 5	<201	<41
	15-Sep-20	1270 ± 62	3840 ± 167	<12	<11	<10	<621	<20	<228	<45
H59	14-Jul-20	1360 ± 71	2490 ± 138	<13	<10	<14	<852	<22	<249	<54
	11-Aug-20	1200 ± 58	2900 ± 145	<10	<11	<11	<261	<23	<237	<43
	15-Sep-20	867 ± 47	2190 ± 116	<10	<9	<11	116 ± 56	<16	<195	<35

ST. LUCIE SITE

Supplemental

Sampling Third

Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	9	9
2. Airborne			
2.a. Air Iodines	Weekly	3	39
2.b. Air Particulates	Weekly	3	39
3.Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	4
3.c. Beach Sand	Semiannually	3	3
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crop	Annually	1	0
4.b. Citrus	Annually	1	0

Total: 110

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

1. DIRECT RADIATION - DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 16-Jun-20 Collection 22-Sep-20
H08	3.96 ± 0.43
H09	4.15 ± 0.43
H12	7.51 ± 1.00
H14	4.03 ± 0.23
H33	3.90 ± 0.42
H34	3.48 ± 0.27
H60	3.47 ± 0.51
H61	4.38 ± 0.78
H62	3.73 ± 0.55

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m^3)

Collection Date	H09	H32	H33
06-Jul-20	<0.03	<0.03	<0.03
14-Jul-20	<0.01	<0.01	<0.01
21-Jul-20	<0.02	<0.02	<0.02
28-Jul-20	<0.02	<0.02	<0.02
04-Aug-20	<0.02	<0.02	<0.02
11-Aug-20	<0.02	<0.02	<0.02
18-Aug-20	<0.02	<0.02	<0.02
25-Aug-20	<0.02	<0.02	<0.02
01-Sep-20	<0.02	<0.02	<0.02
09-Sep-20	<0.02	<0.02	<0.02(A)
15-Sep-20	<0.02	<0.02	<0.03(B)
22-Sep-20	<0.02	<0.02	<0.01
30-Sep-20	<0.02	<0.02	<0.02

(A) No power. Estimated run time 173 out of 191 hours.

(B) Power restored 11-Sept-20 at 11:00.

2.b. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H09	H32	H33
06-Jul-20	0.010 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
14-Jul-20	0.019 ± 0.002	0.017 ± 0.002	0.015 ± 0.002
21-Jul-20	0.013 ± 0.002	0.008 ± 0.002	0.010 ± 0.002
28-Jul-20	0.009 ± 0.002	0.008 ± 0.002	0.005 ± 0.002
04-Aug-20	0.009 ± 0.002	0.014 ± 0.002	0.012 ± 0.002
11-Aug-20	0.010 ± 0.002	0.008 ± 0.002	0.006 ± 0.002
18-Aug-20	0.008 ± 0.002	0.009 ± 0.002	0.006 ± 0.002
25-Aug-20	0.015 ± 0.002	0.013 ± 0.002	0.008 ± 0.002
01-Sep-20	0.005 ± 0.002	0.011 ± 0.002	0.005 ± 0.002
09-Sep-20	0.014 ± 0.002	0.016 ± 0.002	0.021 ± 0.002(A)
15-Sep-20	<0.008	0.005 ± 0.002	0.011 ± 0.003(B)
22-Sep-20	0.009 ± 0.002	0.008 ± 0.002	0.007 ± 0.001
30-Sep-20	0.007 ± 0.002	0.010 ± 0.002	0.009 ± 0.002
Average:	<0.011	0.011 ± 0.001	0.010 ± 0.001

(A) No power. Estimated run time 173 out of 191 hours.

(B) Power restored 11-Sept-20 at 11:00.

2.b. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1070 ± 0.0096	<0.0255	<0.0014	<0.0010	<0.0095
H32	0.1130 ± 0.0083	<0.0136	<0.0010	<0.0009	<0.0149
H33	0.0857 ± 0.0066	<0.0183	<0.0009	<0.0007	0.0102 ± 0.0026

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H13	14-Jul-20	<139	268 ± 23	<3	<3	<7	<3	<7	<6	<4	<3	<3	<4
	11-Aug-20	<139	304 ± 25	<3	<3	<7	<4	<7	<6	<3	<3	<3	<4
	15-Sep-20	<139	277 ± 24	<4	<3	<6	<4	<9	<5	<4	<3	<4	<4
H36	14-Jul-20	<139	305 ± 24	<3	<3	<6	<3	<9	<6	<4	<3	<3	<4
	11-Aug-20	<139	344 ± 26	<3	<4	<7	<4	<7	<5	<3	<3	<4	<4
	15-Sep-20	<139	367 ± 27	<4	<3	<8	<4	<8	<6	<4	<3	<4	<4

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.
(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H13	24-Aug-20	225 ± 27	524 ± 49	<8	<7	<7	<7	<274	<278	23 ± 10	<18	<184
H16	24-Aug-20	<77	132 ± 29	<7	<6	<7	<7	<343	<229	<48	<14	<113
H19	24-Aug-20	<77	101 ± 27	<7	<6	<8	<7	<345	187 ± 72	<47	12 ± 5	60 ± 23
H36	24-Aug-20	<139	3570 ± 143	<19	1030 ± 19	<15	25 ± 5	3730 ± 288	625 ± 93	67 ± 21	39 ± 6	41927

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
H15	24-Aug-20	56 ± 24	242 ± 42	<8	<8	<8	<8	<339	199 ± 94	150 ± 20	13 ± 6	195 ± 49
H16	24-Aug-20	254 ± 28	270 ± 40	<7	<8	<7	<7	<278	<286	80 ± 15	<18	<192
H19	24-Aug-20	65 ± 30	<135	<8	<8	<7	<7	<351	<206	<65	<13	214 ± 47

3.d. GROUND WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H70	27-Jul-20	<137	<79	<4	<4	<8	<4	<10	<7	<5	<4	<5	<8
H71	27-Jul-20	946 ± 60	340 ± 34	<4	<4	<8	<4	<9	<6	<5	<4	<4	<8
H72	27-Jul-20	<137	315 ± 34	<4	<4	<9	<4	<10	<8	<5	<3	<4	<7
H73	27-Jul-20	<137	82 ± 13	<3	<3	<8	<4	<7	<7	<5	<4	<4	<5
H74	27-Jul-20	<137	258 ± 23	<3	<4	<7	<4	<9	<6	<5	<4	<4	<5
H75	27-Jul-20	<137	304 ± 24	<3	<3	<7	<3	<9	<6	<4	<4	<4	<4
H76	27-Jul-20	<137	<80	<4	<4	<8	<4	<9	<6	<5	<4	<4	<10
H77	27-Jul-20	<137	<75	<4	<4	<8	<4	<9	<7	<6	<4	<4	<7
H78	27-Jul-20	<137	<56	<3	<4	<8	<4	<8	<6	<6	<4	<4	<5
H79	27-Jul-20	<137	<41	<3	<3	<6	<3	<7	<6	<5	<3	<4	<5

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

4.a. GARDEN CROP - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample has not been available.					

4.b. CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample previously collected.					

RADIOLOGICAL SURVEILLANCE

OF

FLORIDA POWER AND LIGHT COMPANY

ST. LUCIE PLANT

FOURTH QUARTER 2020

BUREAU OF RADIATION CONTROL

ST. LUCIE SITE

Offsite Dose Calculation Manual Sampling

Fourth Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	27	27
2. Airborne			
2.a. Air Iodines	Weekly	5	65
2.b. Air Particulates	Weekly	5	65
3. Waterborne			
3.a. Surface Water	Weekly	1	13
	Monthly	1	3
3.b. Shoreline Sediment	Semiannually	2	0
4. Ingestion			
4.a. Fish and Invertebrates			
4.a.1. Crustacea	Semiannually	2	2
4.a.2. Fish	Semiannually	2	2
4.b. Broadleaf Vegetation	Monthly	3	9

Total: 186

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

The marine fauna listed in this report were collected in part, under Florida FWC SAL030.

1. DIRECT RADIATION - DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 22-Sep-20 Collection 15-Dec-20	Sample Site	Deployment 22-Sep-20 Collection 15-Dec-20
N-1	2.86 ± 0.37	SW-2	2.76 ± 0.64
NNW-5	3.13 ± 0.37	SW-5	3.47 ± 0.16
NNW-10	3.57 ± 0.78	SW-10	2.87 ± 0.23
NW-5	2.70 ± 0.34	SSW-2	2.91 ± 0.25
NW-10	3.83 ± 0.07	SSW-5	3.21 ± 0.39
WNW-2	2.73 ± 0.21	SSW-10	2.66 ± 0.36
WNW-5	3.21 ± 0.17	S-5	3.00 ± 0.23
WNW-10	2.79 ± 0.18	S-10	2.65 ± 0.31
W-2	2.71 ± 0.30	S/SSE-10	3.32 ± 0.74
W-5	3.28 ± 0.48	SSE-5	2.88 ± 0.21
W-10	2.58 ± 0.46	SSE-10	2.90 ± 0.66
WSW-2	3.01 ± 0.12	SE-1	2.85 ± 0.33
WSW-5	3.03 ± 0.81	H-32	2.98 ± 0.47
WSW-10	2.41 ± 0.05		

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/ m^3)

Collection Date	H08	H12	H14	H30	H34
07-Oct-20	<0.02	<0.02	<0.02	<0.02	<0.02
13-Oct-20	<0.02	<0.02	<0.02	<0.02	<0.02
20-Oct-20	<0.02	<0.02	<0.02	<0.02	<0.02
27-Oct-20	<0.02	<0.02	<0.02	<0.02	<0.02
03-Nov-20	<0.11 (A)	<0.02	<0.02	<0.02	<0.02
10-Nov-20	<0.04	<0.03	<0.03	<0.03	<0.03
17-Nov-20	<0.03	<0.03	<0.03	<0.03	<0.02
25-Nov-20	<0.02	<0.02	<0.02	<0.02	<0.02
01-Dec-20	<0.02	<0.02	<0.02	<0.02	<0.02
08-Dec-20	<0.02	<0.02	<0.02	<0.02	<0.02
15-Dec-20	<0.02	<0.02	<0.02	<0.02	<0.02
22-Dec-20	<0.02	<0.17 (B)	<0.02	<0.02	<0.02
29-Dec-20	<0.03	<0.04	<0.04	<0.04	<0.04

(A) Due to a loss of power, run time was estimated at 27 hours out of 169.
(B) Due to a loss of power, run time was estimated at 20 hours out of 168.

2.b.1. AIR PARTICULATES - GROSS BETA - (pCi/m³)

Collection Date	H08	H12	H14	H30	H34
07-Oct-20	0.010 ± 0.002	0.008 ± 0.002	0.013 ± 0.002	0.012 ± 0.002	0.015 ± 0.002
13-Oct-20	0.011 ± 0.002	0.011 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.006 ± 0.002
20-Oct-20	0.017 ± 0.002	0.015 ± 0.002	0.018 ± 0.002	0.020 ± 0.002	0.012 ± 0.002
27-Oct-20	0.006 ± 0.002	0.006 ± 0.002	0.008 ± 0.002	0.008 ± 0.002	0.008 ± 0.002
03-Nov-20	0.046 ± 0.011 (A)	0.017 ± 0.002	0.019 ± 0.002	0.016 ± 0.002	0.013 ± 0.002
10-Nov-20	<0.011	0.007 ± 0.002	<0.008	0.006 ± 0.002	0.009 ± 0.002
17-Nov-20	0.010 ± 0.002	0.010 ± 0.002	0.009 ± 0.002	0.010 ± 0.002	0.006 ± 0.002
25-Nov-20	0.010 ± 0.002	0.009 ± 0.002	0.008 ± 0.002	0.007 ± 0.001	0.007 ± 0.001
01-Dec-20	0.016 ± 0.002	0.013 ± 0.002	0.015 ± 0.002	0.013 ± 0.002	0.011 ± 0.002
08-Dec-20	0.020 ± 0.002	0.024 ± 0.002	0.021 ± 0.002	0.026 ± 0.002	0.021 ± 0.002
15-Dec-20	0.020 ± 0.002	0.023 ± 0.002	0.022 ± 0.002	0.024 ± 0.002	0.020 ± 0.002
22-Dec-20	0.019 ± 0.002	0.161 ± 0.018 (B)	0.017 ± 0.002	0.019 ± 0.002	0.018 ± 0.002
29-Dec-20	0.016 ± 0.002	0.017 ± 0.002	0.018 ± 0.002	0.017 ± 0.002	0.018 ± 0.002
Average:	<0.016	0.025 ± 0.001	<0.015	0.015 ± 0.001	0.013 ± 0.001

(A) Due to a loss of power, run time was estimated at 27 hours out of 169.
(B) Due to a loss of power, run time was estimated at 20 hours out of 168.

2.b.2. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m³)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H08	0.1530 ± 0.0105	<0.0140	<0.0012	<0.0011	<0.0170
H12	0.1580 ± 0.0108	<0.0138	<0.0014	<0.0011	<0.0165
H14	0.1620 ± 0.0093	<0.0160	<0.0010	<0.0008	0.0101 ± 0.0027
H30	0.1480 ± 0.0096	<0.0145	<0.0014	<0.0010	<0.0159
H34	0.1490 ± 0.0101	<0.0156	<0.0013	<0.0009	<0.0146

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H15	07-Oct-20	<137	274 ± 24	<3	<3	<7	<3	<8	<6	<4	<3	<3	<4
	13-Oct-20	<134	307 ± 25	<3	<3	<7	<3	<8	<6	<4	<4	<3	<4
	20-Oct-20	<137	391 ± 28	<4	<4	<8	<4	<7	<5	<3	<3	<4	<4
	27-Oct-20	<137	332 ± 26	<3	<4	<7	<3	<7	<5	<4	<3	<4	<4
	03-Nov-20	<137	313 ± 25	<3	<4	<7	<4	<8	<6	<4	<3	<3	<4
	10-Nov-20	<137	303 ± 24	<3	<3	<8	<3	<7	<6	<4	<3	<4	<4
	17-Nov-20	<137	266 ± 24	<3	<3	<6	<3	<7	<6	<4	<3	<4	<4
	25-Nov-20	<139	363 ± 29	<4	<4	<9	<5	<9	<7	<7	<4	<4	<5
	01-Dec-20	<138	284 ± 24	<3	<3	<7	<3	<8	<6	<4	<4	<3	<4
	08-Dec-20	<139	405 ± 28	<3	<4	<8	<4	<8	<5	<4	<3	<3	<4
	15-Dec-20	<139	394 ± 28	<4	<3	<7	<3	<8	<6	<4	<4	<4	<4
	22-Dec-20	<137	370 ± 27	<3	<3	<8	<4	<8	<5	<4	<4	<3	<4
	29-Dec-20	<137	373 ± 27	<3	<4	<6	<3	<9	<6	<4	<4	<4	<4
H59	20-Oct-20	<137	338 ± 26	<4	<4	<7	<4	<7	<5	<4	<3	<4	<4
	10-Nov-20	<137	365 ± 34	<4	<4	<8	<4	<9	<7	<5	<4	<4	<7
	22-Dec-20	<137	365 ± 27	<3	<3	<7	<4	<8	<6	<4	<4	<3	<4

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
	These samples previously collected.											

4.a.1. CRUSTACEA - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	15-Dec-20	2250 ± 127	<17	<18	<33	<17	<39	<19	<20	<371	<70
H59	08-Dec-20	1690 ± 186	<23	<23	<39	<24	<57	<27	17 ± 8	822 ± 188	<118

4.a.2. FISH - Mixed Species - (pCi/kg, wet weight)

Sample Site	Collection Date	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226	Ra-228
H15	03-Nov-20	2600 ± 191	<24	<22	<47	<23	<53	<25	<28	<395	<101
H59	04-Nov-20	2990 ± 218	<22	<20	<35	<25	<53	<22	<25	<427	<93

4.b. BROADLEAF VEGETATION - Brazilian Pepper - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137	Pb-210	Pb-212	Ra-226	Ra-228
H51	20-Oct-20	2310 ± 81	3140 ± 148	<10	<10	<10	279 ± 94	<21	<246	<40
	10-Nov-20	1180 ± 51	3720 ± 156	<9	<8	<9	<545	<16	<189	<39
	22-Dec-20	1520 ± 59	3430 ± 148	<9	<9	<10	<574	<18	<199	<35
H52	20-Oct-20	1720 ± 64	2490 ± 120	<10	<9	<10	<576	<20	<203	<40
	10-Nov-20	1620 ± 63	2830 ± 125	<10	<8	<10	<593	<16	<188	<36
	22-Dec-20	1820 ± 70	3180 ± 146	<10	<11	<10	<668	<20	<235	<46
H59	20-Oct-20	1530 ± 58	1810 ± 99	<8	<8	<10	<202	13 ± 6	<193	<32
	10-Nov-20	911 ± 47	1970 ± 106	<9	<8	<8	120 ± 59	<18	<188	<35
	22-Dec-20	1420 ± 64	1780 ± 103	<10	<10	<10	147 ± 65	<23	<239	<36

ST. LUCIE SITE

Supplemental Sampling

Fourth Quarter, 2020

Sample Type	Collection Frequency	Number of Sample Locations	Number of Samples
1. Direct Radiation	Quarterly	9	9
2. Airborne			
2.a. Air Iodines	Weekly	3	38
2.b. Air Particulates	Weekly	3	38
3. Waterborne			
3.a. Surface Water	Monthly	2	6
3.b. Shoreline Sediment	Semiannually	4	0
3.c. Beach Sand	Semiannually	3	0
3.d. Ground Water	Quarterly	10	10
4. Ingestion			
4.a. Garden Crop	Annually	1	0
4.b. Citrus	Annually	1	0

Total: 101

NOTE: Measurement results having magnitudes that are significantly above the background of the measurement system are reported as net values plus or minus a one-standard-deviation error term. Measurement results that are not significantly above background are reported as less than a Lower Limit of Detection (<LLD), which is an estimated upper limit (with at least 95% confidence) for the true activity in the sample.

1. DIRECT RADIATION - DEPLOYED TLD's - (μR/hour)

Sample Site	Deployment 22-Sep-20 Collection 15-Dec-20
H08	3.39 ± 0.21
H09	3.40 ± 0.06
H12	6.71 ± 0.88
H14	3.21 ± 0.58
H33	2.98 ± 0.46
H34	2.91 ± 0.37
H60	2.89 ± 0.27
H61	3.82 ± 0.41
H62	3.49 ± 0.23

2.a. IODINE-131 IN WEEKLY AIR CARTRIDGES - (pCi/m^3)

Collection Date	H09	H32	H33
07-Oct-20	<0.02	<0.02	<0.02
13-Oct-20	<0.02	<0.02	<0.02
20-Oct-20	<0.02	<0.02	<0.02
27-Oct-20	<0.02	<0.02	<0.03
03-Nov-20	<0.02	<0.02	<0.01
10-Nov-20	<0.03	<0.03	<0.02
17-Nov-20	<0.03	<0.03	<0.02
25-Nov-20	<0.02	<0.02	<0.02
01-Dec-20	<0.02	<0.02	<0.02
08-Dec-20	<0.02	<0.02	<0.02
15-Dec-20	<0.02	<0.02	(A)
22-Dec-20	<0.02	<0.02	<0.02
29-Dec-20	<0.04	<0.04	<0.03

(A) Not collected due to loss of power during the sample run time.

2.b. AIR PARTICULATES - GROSS BETA - (pCi/m^3)

Collection Date	H09	H32	H33
07-Oct-20	0.010 ± 0.002	0.011 ± 0.002	0.012 ± 0.002
13-Oct-20	0.012 ± 0.002	0.015 ± 0.002	0.008 ± 0.002
20-Oct-20	0.014 ± 0.002	0.019 ± 0.002	0.012 ± 0.002
27-Oct-20	0.007 ± 0.002	0.005 ± 0.002	0.005 ± 0.002
03-Nov-20	0.019 ± 0.002	0.017 ± 0.002	0.017 ± 0.002
10-Nov-20	<0.007	<0.007	0.009 ± 0.002
17-Nov-20	0.007 ± 0.002	0.010 ± 0.002	0.008 ± 0.002
25-Nov-20	0.007 ± 0.001	0.009 ± 0.002	0.009 ± 0.002
01-Dec-20	0.012 ± 0.002	0.013 ± 0.002	0.009 ± 0.002
08-Dec-20	0.021 ± 0.002	0.018 ± 0.002	0.017 ± 0.002
15-Dec-20	0.020 ± 0.002	0.025 ± 0.002	(A)
22-Dec-20	0.016 ± 0.002	0.011 ± 0.002	0.019 ± 0.002
29-Dec-20	0.018 ± 0.002	0.016 ± 0.002	0.020 ± 0.002
Average:	<0.013	<0.014	0.012 ± 0.001

(B) Not collected due to loss of power during the sample run time.

2.b. AIR PARTICULATES - GAMMA ANALYSIS OF QUARTERLY COMPOSITES - (pCi/m^3)

Sample Site	Be-7	K-40	Cs-134	Cs-137	Pb-210
H09	0.1460 ± 0.0087	<0.0145	<0.0011	<0.0008	0.0137 ± 0.0028
H32	0.1420 ± 0.0090	<0.0146	<0.0008	<0.0006	0.0157 ± 0.0028
H33	0.1670 ± 0.0098	<0.0215	<0.0010	<0.0008	<0.0100

3.a. SURFACE WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H13	20-Oct-20	<137	201 ± 21	<4	<4	<6	<3	<8	<6	<4	<3	<4	<4
	10-Nov-20	<137	198 ± 20	<4	<3	<6	<4	<7	<5	<4	<3	<4	<4
	22-Dec-20	<137	<35	<3	<3	<6	<4	<7	<6	<4	<3	<4	<4
H36	20-Oct-20	<137	308 ± 25	<4	<4	<7	<3	<8	<6	<4	<4	<4	<4
	10-Nov-20	94 ± 44	311 ± 25	<3	<4	<7	<4	<7	<6	<5	<3	<4	<4
	22-Dec-20	<137	353 ± 26	<3	<3	<7	<3	<8	<6	<4	<3	<3	<4

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

3.b. SHORELINE SEDIMENT - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
	These samples previously collected.											

3.c. BEACH SAND - (pCi/kg, dry weight)

Sample Site	Collection Date	Be-7	K-40	Co-58	Co-60	Cs-134	Cs-137	Pb-210	Ra-226	Th-232	U-235	U-238
	These samples previously collected.											

3.d. GROUND WATER - (pCi/L)

Sample Site	Collection Date	H-3	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Zr-95 Nb-95 (A)	I-131	Cs-134	Cs-137	Ba-140 La-140 (B)
H70	09-Dec-20	<139	<56	<4	<4	<8	<4	<9	<6	<4	<4	<4	<4
H71	09-Dec-20	776 ± 57	384 ± 27	<4	<4	<8	<4	<9	<7	<4	<3	<4	<4
H72	09-Dec-20	<139	319 ± 26	<5	<4	<9	<5	<11	<7	<5	<5	<4	<5
H73	09-Dec-20	<139	91 ± 13	<4	<4	<8	<4	<10	<7	<5	<5	<4	<5
H74	09-Dec-20	<139	308 ± 24	<4	<3	<8	<4	<8	<6	<4	<4	<4	<4
H75	09-Dec-20	<139	294 ± 24	<3	<4	<7	<4	<10	<5	<4	<4	<4	<4
H76	09-Dec-20	<139	<42	<4	<4	<8	<3	<10	<7	<5	<4	<4	<5
H77	09-Dec-20	<139	<87	<6	<6	<11	<6	<15	<10	<9	<5	<9	<7
H78	09-Dec-20	<139	<53	<3	<4	<7	<4	<8	<6	<5	<4	<4	<4
H79	09-Dec-20	<139	<87	<4	<4	<6	<4	<10	<7	<5	<4	<4	<7

(A) - These tabulated LLD values for Zr/Nb-95 are the higher of the individual parent or daughter LLD's.

(B) - These tabulated LLD values are for Ba-140, either based on direct measurement of Ba-140 or based on ingrowth of La-140, whichever method yields the greater sensitivity for a given sample.

4.a. GARDEN CROP - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H41	This sample has not been available.					

4.b. CITRUS - (pCi/kg, wet weight)

Sample Site	Collection Date	Be-7	K-40	I-131	Cs-134	Cs-137
H23	This sample previously collected.					

10. Results from the 2020 BRC Interlaboratory Comparison Program

DOE MAPEP Series 42 and ERA RAD-121 BRC Results

Matrix: RdF Air Filter (Bq/filter)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
Mn-54	0.001	----	A	False Positive
Co-57	1.523	1.50	A	1.05-1.95
Co-60	1.270	1.23	A	0.86-1.60
Zn-65	1.380	1.18	A	0.83-1.53
Cs-134	0.585	0.600	A	0.420-0.780
Cs-137	0.766	0.735	A	0.515-0.956
Gross Alpha	1.71	1.24	A	0.37-2.11
Gross Beta	2.13	2.00	A	1.00-3.00

Matrix: MaS Soil (Bq/kg)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
K-40	652.00	625	A	438-813
Mn-54	980.20	945	A	662-1229
Co-57	994.20	1071	A	750-1392
Zn-65	804.80	751	A	526-976
Cs-134	1166.54	1114	A	780-1448
Cs-137	1054.0	1020	A	714-1326

Matrix: MaW Water (Bq/L)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
H-3 (pCi/L)	14511	14100	A	12300-15500
Mn-54	19.95	19.6	A	13.7-25.5
Co-57	19.08	19.7	A	13.8-25.6
Zn-65	22.120	22.2	A	15.5-28.9
Cs-134	17.547	18.5	A	13.0-24.1
Cs-137	11.68	11.3	A	7.9-14.7
Gross Alpha	0.891	1.03	A	0.31-1.75
Gross Beta	4.548	4.24	A	2.12-6.36

DOE MAPEP Series 43 and ERA RAD-123 BRC Results

Matrix: RdF Air Filter (Bq/filter)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
Mn-54	1.433	1.40	A	0.98-1.82
Co-57	0.005	----	A	False Positive
Co-60	1.632	1.73	A	1.21-2.25
Zn-65	2.117	2.00	A	1.40-2.60
Cs-134	1.561	1.83	A	1.28-2.38
Cs-137	0.944	0.996	A	0.697-1.295
Gross Alpha	0.549	0.528	A	0.158-0.898
Gross Beta	1.022	0.915	A	0.458-1.373

Matrix: MaS Soil (Bq/kg)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
K-40	573.94	622	A	435-809
Mn-54	579.44	610	A	427-793
Co-57	936.42	1100	A	770-1430
Zn-65	448.06	470	A	329-611
Cs-134	682.26	710	A	497-923
Cs-137	0.80	----	A	False Positive

Matrix: MaW Water (Bq/L)				
Radionuclide	**Result**	**Ref. Value**	**Flag (Evaluation)**	**Acceptance Range**
H-3 (pCi/L)	23997	23200	A	20300-25500
Mn-54	0.010	----	A	False Positive
Co-57	-0.015	----	A	False Positive
Zn-65	17.212	16.9	A	11.8-22.0
Cs-134	13.549	15.2	A	10.6-19.8
Cs-137	14.268	14.3	A	10.0-18.6
Gross Alpha	0.847	0.62	A	0.19-1.05
Gross Beta	0.998	0.83	A	0.42-1.25