UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
2443 WARRENVILLE ROAD, SUITE 210
LISLE, IL 60532-4352

August 6, 2013

Mr. Anthony Vitale
Vice-President, Operations
Entergy Nuclear Operations, Inc.
Palisades Nuclear Plant
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: RESULTS OF INDEPENDENT SAMPLES COLLECTED BY THE NRC AT PALISADES NUCLEAR PLANT STORM DRAIN OUTFALL

Dear Mr. Vitale:

On May 4, 2013, your staff recognized that the Safety Injection Refueling Water Tank was leaking onto one of the facility's roofs. Further investigation showed that some of the leakage onto a roof washed into the storm drain system, which terminated via a pipe outlet onto the beach along Lake Michigan and inside of Entergy property. This was not a normal discharge path. As part of its mission to protect the public, workers, and the environment, the U.S. Nuclear Regulatory Commission (NRC) conducts routine and special inspections. Occasionally, during the NRC inspection process, circumstances warrant that independent measurements be made by the NRC, including the taking of samples and the analysis of various media to confirm the quality of a licensee's analytical performance, or to independently determine the presence of radioactivity in the environment. The NRC decided to collect independent sand samples in the vicinity of the pipe outlet during the time you were collecting samples and at the same locations you obtained samples.

This letter provides the results of analysis of the four sand samples independently collected by the NRC on May 30, 2013. The NRC had instructed a private third party laboratory to analyze the samples for gamma emitting radionuclides and the beta emitting radionuclides of tritium (H-3), nickel (Ni-63) iron, (Fe-55), and strontium (Sr-89/Sr-90). Three of the samples were taken on the beach along the storm drain flow path on licensee property. One sample was taken several yards south of the others, away from the storm drain flow path (control sample). It should be noted that these samples were obtained after rain events. Therefore, the results can only quantify the amount of activity present in the sand at the time of sampling. The analysis results do not represent the radiological content of the storm drain following the recent leak of the Safety Injection Refueling Water Tank on May 4, 2013. Your staff performed an assessment to address the contents of the storm drain.

The sample analysis results indicated the presence and quantities of some radionuclides associated with naturally occurring sources of radiation. In addition, a small amount of tritium was detected in the samples that were likely a result of the recent leak from the Safety Injection Refueling Water Tank on May 4, 2013. These results and amounts:

- were expected given the dose calculation/evaluations performed by the Palisades' staff and rainfall that occurred before the samples were collected;
- were below the EPA's safe drinking water standard;
- did not exceed any NRC limit or design objective;
- were too small to be expected to have any health impact to the individuals located at the pipe outlet and other members of the licensee's workforce or the public.

A summary of NRC's evaluation of the laboratory analysis of the samples is included as Enclosure 1. The independent laboratory results of the samples are included as Enclosure 2. We are providing the laboratory analysis results and the NRC's evaluation of the results so that you may determine the corrective actions necessary.

When licensed radioactive material is inadvertently released into the environment, the NRC's regulations require that licensees do surveys of the affected area that are reasonable and necessary to assess the hazard. The presence of licensed radioactive material should be evaluated to determine whether additional corrective actions, including remediation should be performed by your staff. Please keep the NRC Resident Inspectors and the NRC Regional Health Physics inspector, assigned to your site, informed of the results of this evaluation. The NRC will assess the results of your evaluation of this information during a baseline inspection of this program later this year.

If you have any questions regarding this correspondence, please contact me at (630) 829-9827.

Sincerely,

/RA/

Billy C. Dickson, Chief
Health Physics and Incident Response Branch
Division of Reactor Safety

Docket No. 50-255
License No. DPR-20

Enclosures:
1. NRC Analysis of Independent Laboratory Results
2. American Radiation Services, LLC. Laboratory Results

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NRC Analysis of Independent Laboratory Results

Radionuclides Not Attributed to Activities at Palisades

All of the samples contained naturally occurring or background radioactive materials commonly found in soils worldwide. This was expected, and the radioactivity content totaled about 10,000 pico-Curie per kilogram (pCi/kg).

Some radionuclides that could be attributable to operation of Palisades were also preliminarily identified in the raw analysis results of some samples. However, the NRC's independent evaluation of the analysis results concluded that these radionuclides were either not present (Ni-63 and Fe-55) or were not attributable to this event or plant operations. A summary of the NRC's evaluation for each of these radionuclides is detailed below.

Ni-63

No positive values were identified by the NRC. Although the independent laboratory's analysis indicated the highest reported result was 300 pCi/kg, the NRC determined the result was not valid. This decision was based on several factors: (1) the QA/QC control sample results showed a significant positive bias that indicated the analysis was at the limit of the acceptance range, (2) the QA/QC blank result showed a significant positive bias that was similar in magnitude to the sample results, and (3) the knowledge of the source term indicated Ni-63 would not be expected to occur in the absence of other radionuclides. In summary, the analysis results did not have sufficient strength to conclude Ni-63 was present, and Ni-63 result was classified as a false-positive result.

Fe-55

No positive values were identified by the NRC. Although the independent laboratory's analysis indicated the activity for one sample was reported greater than the minimum detectable concentration, the analysis did not meet the quality control criteria. The third party laboratory prepared another sample from the same material provided by the NRC. The second analysis also did not meet quality control criteria. The cause of the laboratory's failure to meet quality control criteria is unknown, but might be attributed to the sample matrix (sand) which was much different than the normal liquid matrix processed by the facility.

Sr-90

The NRC's evaluation indicated no Sr-90 was attributable to this event or to plant operations. The independent laboratory values reported (125 pCi/kg and 148 pCi/kg) were similar to the levels to be expected as background radiation. The amount of this specific radionuclide may be found in the environment as a result of historic above ground nuclear testing in the 1950's through 1970's. The Environmental Surveillance, Education, and Research Program at the Idaho National Laboratory Site, indicated that the average strontium-90 concentrations in surface soil are about 100 pCi/kg.

Cs-137

The NRC's evaluation did not indicate any Cs-137 that were concentrations in the samples attributable to this event or to plant operations. The values reported by the independent laboratory (7 to 13 pCi/kg) were similar to the levels to be expected as background radiation. The amount of this specific radionuclide may be found in the environment as a result of historic

above ground nuclear testing in the 1950's through 1970's. The Environmental Surveillance, Education, and Research Program at the Idaho National Laboratory Site, indicated that the concentration of cesium-137 in surface soil from fallout ranges from about 100 to 1000 pCi/kg, averaging less than 400 pCi/kg.

Radionuclide Attributed to Activities at Palisades or Likely a Result of the Recent Leak of the Safety Injection Refueling Water Tank on May 4, 2013

Tritium (H-3)

Three of the four samples were collected within the storm drain flow path. The samples were collected to survey for radioactive materials in effluents potentially released to unrestricted and controlled areas from the recent leak of the Safety Injection Refueling Water Tank. The fourth sample was taken several yards south of the storm drain (outside of the flow path). The inspectors collected sand from the beach as a surrogate for a direct water sample from the storm drain pipe which was not possible due to heavy rains that occurred before sample collection. Of the three samples taken within the storm drain flow path, only the sample closest to the storm drain pipe outlet showed positive tritium result. The tritium concentration was measured 1160 pico-Curies (pCi) per kilogram (kg) of sand. Based on the measured tritium concentration of 1160 pCi H-3 per kg of sand, the NRC calculated the tritium concentration in the moisture (i.e., the liquid fraction of the sand) was about 4000 to 6000 pCi/liter of water. These results and amounts:

- were expected given the dose calculation/evaluations performed by the Palisades' staff and rainfall that occurred before the samples were collected;
- were below the EPA's safe drinking water standard;
- did not exceed any NRC limit or design objective;
- were too small to be expected to have any health impact to the individuals located at the pipe outlet and other members of the licensee's workforce or the public.

The remaining fourth sample, taken several yards south of the storm drain (outside of the flow path), showed detectable tritium at 358 pCi/kg, which was slightly above background but less than the Lower Limit of Detection required by the NRC for H-3 in water (2000 pCi/l).

2609 North River Road, Port Allen, Louisiana 70767

(800) 401-4277 -- FAX (225) 381-2996

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American Radiation Services, LLC

Laboratory Analysis Report

ARS1-13-01107

Prepared for:

Nuclear Regulatory Commission (NRC)

Richard Conatser
11555 Rockville Pike
Rockville, MD 20852

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Phone: 301-415-4039

Project Manager Review

Management Review

Contact Person: Questions regarding this analytical report should be addressed to:

Project Manager

ProjectManagers@amrad.com

Phone: 225.381.2991
Fax: 225.381.2996

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LELAP Cert# 01949

AMRAD
AMERICAN RADIATION SERVICES, LLC

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-13-01107
Client Sample ID: PAL-01
Sample Collection Date: 05/30/20
Sample Matrix: Soil/Solid/Sludge

Request or PO Number: NA
ARS Sample ID: ARS1-13-01107-001
Date Received: 06/04/13
Report Date: 06/10/13

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	2.812	2.171	3.530	1.765	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
CO-58	-0.074	1.931	3.230	1.615	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
FE-59	-0.182	7.418	8.000	4.000	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
CO-60	-1.006	3.134	5.300	2.650	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
ZN-65	-0.702	9.018	9.130	4.565	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
NB-95	-0.341	1.970	3.320	1.660	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
ZR-95	-0.236	2.999	5.020	2.510	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
I-131	0.570	1.733	2.880	1.440	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
CS-134	2.086	2.383	3.630	1.815	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
CS-137	7.878	1.831	2.730	1.365		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
BA-140	-0.984	7.995	13.500	6.750	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
LA-140	3.686	1.157	4.170	2.085	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
BE-7	237.790	32.715	25.700	12.850		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
K-40	7372.800	488.130	35.300	17.650		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
SC-46	0.578	2.051	3.420	1.710	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
TL-208	61.283	5.354	2.920	1.460		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
PB-210	237.920	61.697	69.100	34.550		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
BI-212	122.420	20.508	21.500	10.750		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
BI-214	150.680	11.858	6.150	3.075		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
PB-214	178.020	16.509	6.990	3.495		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
RA-226	370.880	59.102	62.000	31.000		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
RA-228	184.460	14.066	12.400	6.200		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
TH-228	206.950	14.218	4.610	2.305		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
U-235	0.994	11.702	19.500	9.750	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:18	BZF	NA
Total Gamma	12572.345	NA	NA	NA		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
H-3	357.588	137.205	218.976	108.828		pCi/kg	ARS-055/EPA 906.0M	06/11/13 17:00	BJS	NA
NI-63	-130.060	124.490	204.560	101.910	U	pCi/kg	ARS-022/Eichrom NiW01	06/14/13 21:17	BJS	94%
FE-55	329.080	40.548	286.932	143.466		pCi/kg	ARS-131	07/04/13 03:51	BJS	95%
SR-89	-19.727	23.167	NA	NA	U	pCi/kg	ARS-032/Eichrom SRW-01	06/14/13 15:02	BJS	94%
SR-90	-20.193	35.117	61.907	30.950	U	pCi/kg	ARS-032/Eichrom SRW-01	06/20/13 19:27	BJS	94%

NOTES: LCS recovery for Fe-55 is biased high and Fe-55 method blank did not pass QC criteria; after management review, data is being released as qualified.

Project Manager Review

LELAP Certificate# 01949

AMRAD
AMERICAN RADIATION SERVICES, LLC

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-13-01107
Client Sample ID: PAL-02
Sample Collection Date: 05/30/20
Sample Matrix: Soil/Solid/Sludge

Request or PO Number: NA
ARS Sample ID: ARS1-13-01107-002
Date Received: 06/04/13
Report Date: 06/10/13

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	2.375	2.625	4.310	2.155	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
CO-58	1.111	2.363	3.920	1.960	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
FE-59	0.423	5.693	9.540	4.770	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
CO-60	-0.053	3.685	5.720	2.860	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
ZN-65	-13.293	9.257	12.600	6.300	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
NB-95	-0.790	27.020	4.260	2.130	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
ZR-95	-0.379	4.186	7.010	3.505	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
I-131	-1.342	3.755	3.520	1.760	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
CS-134	5.148	2.961	15.786	8.054	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
CS-137	10.239	2.337	2.940	1.470		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
BA-140	-5.660	25.184	15.600	7.800	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
LA-140	-1.239	1.452	4.750	2.375	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
BE-7	86.109	22.195	24.500	12.250		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
K-40	7354.200	487.520	42.100	21.050		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
SC-46	0.753	2.362	3.940	1.970	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
TL-208	68.472	5.874	3.820	1.910		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
PB-210	216.390	65.684	80.300	40.150		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
BI-212	122.090	24.833	27.900	13.950		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
BI-214	201.340	14.896	8.170	4.085		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
PB-214	219.090	20.093	8.270	4.135		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
RA-226	414.630	70.618	76.800	38.400		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
RA-228	221.580	20.727	14.800	7.400		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
Th-228	228.580	15.959	5.620	2.810		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
U-235	13.838	13.577	22.400	11.200	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
Total Gamma	13344.54	NA	NA	NA		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
H-3	68.932	160.001	269.099	133.739	U	pCi/kg	ARS-055/EPA 906.0M	06/14/13 19:25	BJS	NA
NI-63	235.120	131.350	200.060	99.668		pCi/kg	ARS-022/Eichrom NiW01	06/14/13 21:17	BJS	96%
FE-55	-303.621	37.455	299.264	149.632	U	pCi/kg	ARS-131	07/05/13 04:39	BJS	95%
SR-89	36.898	28.071	NA	NA	U	pCi/kg	ARS-032/Eichrom SRW-01	06/14/13 15:02	BJS	94%
SR-90	-30.599	43.576	76.693	38.347	U	pCi/kg	ARS-032/Eichrom SRW-01	06/20/13 19:27	BJS	94%

NOTES: LCS recovery for Fe-55 is biased high and Fe-55 method blank did not pass QC criteria; after management review, data is being released as qualified.

Project Manager Review

LELAP Certificate# 01949

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AMERICAN RADIATION SERVICES, LLC

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group: ARS1-13-01107
Client Sample ID: PAL-03
Sample Collection Date: 05/30/20
Sample Matrix: Soil/Solid/Sludge

Request or PO Number: NA
ARS Sample ID: ARS1-13-01107-003
Date Received: 06/04/13
Report Date: 06/10/13

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	-0.662	2.295	3.820	1.910	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
CO-58	0.186	2.222	3.730	1.865	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
FE-59	2.085	5.006	8.320	4.160	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
CO-60	2.400	3.288	5.440	2.720	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
ZN-65	-6.053	6.140	10.100	5.050	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
NB-95	-0.030	2.378	3.980	1.990	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
ZR-95	3.911	3.803	6.230	3.115	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
I-131	0.600	2.483	3.310	1.655	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
CS-134	1.845	2.677	4.140	2.070	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
CS-137	13.211	2.612	2.750	1.375		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
BA-140	1.216	9.218	15.400	7.700	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
LA-140	-1.125	1.412	4.180	2.090	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
BE-7	155.550	22.475	23.200	11.600		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
K-40	6004.700	401.650	31.900	15.950		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
SC-46	0.010	2.227	3.740	1.870	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
TL-208	63.566	5.633	3.740	1.870		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
PB-210	240.760	66.726	76.400	38.200		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
BI-212	128.700	18.359	23.100	11.550		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
BI-214	170.230	13.521	7.820	3.910		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
PB-214	196.170	17.975	7.380	3.690		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
RA-226	455.050	69.472	71.500	35.750		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
RA-228	196.780	17.250	13.700	6.850		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
TH-228	219.500	15.198	5.480	2.740		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
U-235	21.674	13.712	22.200	11.100	U	pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:20	BZF	NA
Total Gamma	11399.353	NA	NA	NA		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
H-3	1161.157	220.510	299.702	148.948		pCi/kg	ARS-055/EPA 906.0M	06/14/13 19:25	BJS	NA
NI-63	-145.520	131.760	215.790	107.510	U	pCi/kg	ARS-022/Eichrom NiW01	06/14/13 21:17	BJS	90%
FE-55	-1171.324	143.491	323.827	161.914	U	pCi/kg	ARS-131	07/06/13 05:27	BJS	95%
SR-89	-171.895	29.974	NA	NA	U	pCi/kg	ARS-032/Eichrom SRW-01	06/14/13 15:02	BJS	100%
SR-90	125.704	46.867	67.304	33.652		pCi/kg	ARS-032/Eichrom SRW-01	06/20/13 19:27	BJS	100%

NOTES: LCS recovery for Fe-55 is biased high and Fe-55 method blank did not pass QC criteria; after management review, data is being released as qualified.

Project Manager Review

LELAP Certificate# 01949

Enclosure 2

AMRAD
AMERICAN RADIATION SERVICES, LLC

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-13-01107	**Request or PO Number:**	NA
Client Sample ID:	PAL-04	**ARS Sample ID:**	ARS1-13-01107-004
Sample Collection Date:	05/30/20	**Date Received:**	06/04/13
Sample Matrix:	Soil/Solid/Sludge	**Report Date:**	06/10/13

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	0.479	2.805	4.680	2.340	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
CO-58	0.027	2.397	4.020	2.010	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
FE-59	-2.876	6.750	10.100	5.050	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
CO-60	1.064	3.711	6.220	3.110	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
ZN-65	0.140	14.565	24.200	12.100	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
NB-95	-3.326	4.304	4.820	2.410	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
ZR-95	3.495	1.550	7.350	3.675	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
I-131	-0.972	4.506	3.400	1.700	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
CS-134	3.127	2.946	4.430	2.215	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
CS-137	10.574	3.421	3.950	1.975		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
BA-140	-2.917	9.899	16.700	8.350	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
LA-140	4.559	1.203	5.050	2.525	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
BE-7	119.890	26.550	27.200	13.600		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
K-40	7807.800	516.390	38.200	19.100		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
SC-46	-0.968	2.560	4.260	2.130	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
TL-208	85.909	6.993	3.590	1.795		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
PB-210	248.280	59.971	74.500	37.250		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
BI-212	184.920	26.745	25.100	12.550		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
BI-214	226.940	16.266	8.230	4.115		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
PB-214	251.750	22.238	8.070	4.035		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
RA-226	473.160	70.190	76.600	38.300		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
RA-228	253.150	21.221	13.300	6.650		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
TH-228	283.300	19.452	5.650	2.825		pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
U-235	17.046	14.211	23.300	11.650	U	pCi/kg	ARS-007/EPA 901.1M	06/06/13 14:49	BZF	NA
Total Gamma	13928.169	NA	NA	NA		pCi/kg	ARS-007/EPA 901.1M	06/05/13 15:19	BZF	NA
H-3	337.806	228.179	376.784	187.257	U	pCi/kg	ARS-055/EPA 906.0M	06/14/13 19:25	BJS	NA
NI-63	300.150	145.310	213.410	106.320		pCi/kg	ARS-022/Eichrom NIW01	06/14/13 21:17	BJS	94%
FE-55	-1071.566	131.265	285.792	142.896	U	pCi/kg	ARS-131	07/07/13 06:15	BJS	95%
SR-89	-158.249	29.306	NA	NA	U	pCi/kg	ARS-032/Eichrom SRW-01	06/14/13 15:02	BJS	100%
SR-90	148.446	46.167	62.139	31.069		pCi/kg	ARS-032/Eichrom SRW-01	06/20/13 19:27	BJS	100%

NOTES: LCS recovery for Fe-55 is biased high and Fe-55 method blank did not pass QC criteria; after management review, data is being released as qualified.

Project Manager Review

LELAP Certificate# 01949

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

QC Results Report

Sample Delivery Group: ARS1-13-01107
Date Received: 6/4/2013

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B13-01308	LCS	Fe-55	9936.000	1217.000	540.000	7013.000		pCi/kg	ARS-022	7/1/13 1:27	BJS	142	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B13-01308	MBL	Fe-55	5008.000	613.000	582.000	NA		pCi/kg	ARS-022	7/1/13 1:27	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2 s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER AcceptanceRange
AR51-B13-01308	LCSD	Fe-55	9936.000	1217.000	12811.000	1569.000		pCi/kg	ARS-022	7/1/13 1:27	BJS	1.03	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2 s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER AcceptanceRange
ARS1-B13-01308	LCSD	Fe-55	9936.000	1217.000	12811.000	1569.000		pCi/kg	ARS-022	7/1/13 1:27	BJS	2.90	< 3

Project Manager Review

LELAP Certificate# 01949 NELAP Certificate # E87558

Enclosure 2

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

QC Results Report

Sample Delivery Group: ARS1-13-01107
Date Received: 6/4/2013

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B13-01118	LCS	H3	12134	1281	392	13171		pCi/kg	ARS-055	6/8/13 14:35	BJS	92	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B13-01118	MBL	H3	-315	242	410	N/A	U	pCi/kg	ARS-055	6/8/13 14:35	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER AcceptanceRange
ARS1-B13-01118	DUP	H3	12134	1281	12960	1363		pCi/kg	ARS-055	6/8/13 14:35	BJS	0.31	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER AcceptanceRange
ARS1-B13-01118	DUP	H3	12134	1281	12960	1363		pCi/kg	ARS-055	6/8/13 14:35	BJS	0.88	< 3

Project Manager Review

LELAP Certificate# 01949 NELAP Certificate # E87558

Enclosure 2

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

QC Results Report

Sample Delivery Group: ARS1-13-01107
Date Received: 06/04/13

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B13-01119	LCS	Sr-90	19740.438	2919.361	274.864	20172		pCi/kg	ARS-032/EPA 905.0	6/14/13 19:32	BJS	98	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B13-01119	MBL	Sr-90	-30.562	134.041	233.357	NA	U	pCi/kg	ARS-032/EPA 905.0	6/14/13 19:32	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER AcceptanceRange
ARS1-B13-01119	LCSD	Sr-90	19740.438	2919.361	20628.329	3045.373		pCi/kg	ARS-032/EPA 905.0	6/14/13 19:32	BJS	0.15	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER AcceptanceRange
ARS1-B13-01119	LCSD	Sr-90	19740.438	2919.361	20628.329	3045.373		pCi/kg	ARS-032/EPA 905.0	6/14/13 19:32	BJS	0.42	< 3

Project Manager Review

LELAP Certificate# 30658 NELAP Certificate # E87558

Enclosure 2

ARS INTERNATIONAL
2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

QC Results Report

Sample Delivery Group: ARS1-13-01107
Date Received: 6/4/2013

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B13-01120	LCS	Ni-63	24909	5722	404	19976		pCi/kg	ARS-022	6/19/13 9:49	BJS	125	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (2s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B13-01120	MBL	Ni-63	237	243	397	NA	U	pCi/kg	ARS-022	6/19/13 9:49	BJS

RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2 s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER AcceptanceRange
ARS1-B13-01120	LCSD	Ni-63	24909	5722	24502	5629		pCi/kg	ARS-022	6/19/13 9:49	BJS	0.04	< 1

DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (2s)	Result 2	CSU 2 (2s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER AcceptanceRange
ARS1-B13-01120	LCSD	Ni-63	24909	5722	24502	5629		pCi/kg	ARS-022	6/19/13 9:49	BJS	0.10	< 3

Project Manager Review

LELAP Certificate# 01949 NELAP Certificate # E87558

Enclosure 2

AMRAD
AMERICAN RADIATION SERVICES, LLC

QC Results per Analytical Batch

Analytical Batch	ARS1-B13-01130
SDG	ARS1-13-01107
Analysis	Gamma Spec (Solid)
Analysis Test Method	ARS-007/EPA 901.1M
Analysis Code	GAM-A-020
Report Units	pCi/kg

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 75	< 125
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):		< 1
	Duplicate Error Ratio (DER):		< 3
	Relative Percent Difference (RPD %):		≤ 25

Laboratory Control Sample

Analysis Date: 06/05/13 14:44 — Analysis Technician: BZF

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	Expected Value	LCS Rec (%)	MDC
ARS1-B13-01130-01	LCS	AM-241	42600.0	3200.0	40378.4	106	560.00
ARS1-B13-01130-01	LCS	CO-60	68200.0	2700.0	68486.5	100	540.00
ARS1-B13-01130-01	LCS	CS-137	59100.0	2500.0	58378.4	101	290.00

Duplicate RER/DER/RPD

Analysis Date: 06/05/13 14:59 — Analysis Technician: BZF

Analyte	Result LCS	CSU LCS (2s)	Results LCSD	CSU LCSD (2s)	RER	DER	RPD
AM-241	42600.0	3232.6	40700.0	2995.5	0.31	0.87	4.6
CO-60	68200.0	2659.0	67900.0	2573.7	0.06	0.16	0.4
CS-137	59100.0	2492.1	58800.0	2409.4	0.06	0.17	0.5

Method Blank

Analysis Date: 06/05/13 15:16 — Analysis Technician: BZF

Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (2s)	MDC	Qual
ARS1-B13-01130-03	MBL	AM-241	-900.0000	8700.0000	2900.0000	U
ARS1-B13-01130-03	MBL	CO-60	60.00000	960.00000	1700.0000	U
ARS1-B13-01130-03	MBL	CS-137	100.0000	1000.0000	1800.0000	U

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

LELAP Certificate# 01949

Enclosure 2

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

Notes:

Comments:

1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.

2.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.

3.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).

4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.

5.0) **Total activity** is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.

6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).

7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).

8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (**HPGe**).

9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).

10.0) Gamma spectroscopy results are calculated values based on the **ORTEC**® GammaVision ENV32 Analysis Engine.

Method References:

1.0) **EPA 600/4-80-032**; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.

2.0) Standard Methods for Examination of Water and Waste Water, 18th, 1992.

3.0) **EPA SW-846**; Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).

4.0) **EPA 600/4/79-020**; Methods for Chemical Analysis of Water and Waste, March 1983.

5.0) HASL 300

6.0) **ARS-040**; An LCSD is not reported with this process. The criteria for the LCS/LCSD analysis for reproducibility have not been established for Low Level Tritium analysis. A prepared standard for Low Level Tritium has not been developed. As a result, the standard we use is based on the dilution of a verified conventional tritium standard. The volume required for Low Level Tritium analysis, in addition to the lack of an available Low Level Tritium standard, introduce variability into the LCS/LCSD analysis that does not represent the actual sample analysis. The preferred measure for reproducibility is to run a duplicate analysis of a sample.

Definitions:

1.0)	**ND**	Not detected above the detection limit (non-detect).
2.0)	**MDC**	(Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis
3.0)	**MBL**	Method Blank
4.0)	**DO**	Duplicate Original
5.0)	**DUP**	Method Duplicate
6.0)	**MS/MSD**	Matrix Spike/Matrix Spike Duplicate
7.0)	**S**	Spike
8.0)	**RS**	Reference Spike
9.0)	***SC**	Subcontracted out to another qualified laboratory
10.0)	**NR**	Not Referenced
11.0)	**N/A**	Not Applicable
12.0)	**	False Positive due to interference from _____
13.0)	**U**	Activity is below the MDC
14.0)	**LCS/LCSD**	Laboratory Control Standard/Laboratory Control Standard Duplicate
15.0)	**DLC**	Decision Level Concentration (ANSI N42.23) or critical level

Notes: ARS International assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the client.

LELAP Cert# 01949

NRC FORM 303
(4-2004)

U.S. NUCLEAR REGULATORY COMMISSION

REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY

LABORATORY -- ORISE

LABORATORY USE ONLY

CONTROL NUMBER

SAMPLE LOCATION (LICENSEE)
Palisades Nuclear Plant

LICENSE NO.	DOCKET NO.
DPR-20	50-255

SAMPLE SUBMITTED

# TOTAL	TYPE	VOLUME	WEIGHT
4	Sand		

DATE SAMPLES SUBMITTED: 06/03/2013

PRIORITY: ☐ ROUTINE ☒ URGENT

SAMPLE COLLECTION INTERVAL

	MONTH	DAY	YEAR	TIME
START				
STOP				

INSPECTOR RESPONSIBLE: Valerie Myers

TELEPHONE NUMBER: 630-829-9736

ANALYSIS TO BE PERFORMED	LIST DESIRED LLD *(Optional)*	OTHER TYPE OF ANALYSIS *(Specify)*	LIST DESIRED LLD *(Optional)*
☐ GROSS ALPHA (GA)		☒ Sr-89/90	50 pCi/kg
☐ GROSS BETA (GB)		☒ Fe-55	150 pCi/kg
☒ GAMMA SPEC (GS)	See Note 1	☒ Ni-63	150 pCi/kg
☒ TRITIUM (H3)	100 pCi/kg	☐	
☐ CARBON-14 (C14)		☐	
☐ IODINE-125 (I125)		☐	

RELINQUISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY
Valerie Myers	Susan Leese	06/03/2013		Mailed to Lab 06/03 via overnight delivery
	Susan Leese	6-4-13 10:30		

FEE RECOVERABLE ☒ NO ☐ YES IF YES TAC NUMBER _____

REMARKS

Note 1: LLD of 150 pCi/kg for Cs-134, 180 pCi/kg for Cs-137, report all other nuclides

Please send results to Richard Conatser (richard.conatser@nrc.gov) and Valerie Myers (valerie.myers@nrc.gov).

Return shipping label is included for return of empty shipping case.

NOTE: SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS REASONS ARE NOTED IN REMARKS ABOVE.

NRC FORM 303
(4-2004)

U.S. NUCLEAR REGULATORY COMMISSION

LABORATORY USE ONLY

CONTROL NUMBER

SAMPLE RECORD -- (Continued)
LABORATORY -- ORISE

SAMPLE NUMBER	SAMPLE NAME AND DESCRIPTION	COLLECTION DATE/TIME	REMARKS, PRESERVATIVE ANALYSIS REQUESTED, ETC.
PAL-01	Background sand sample taken outside of outfall flow path.	05/30/2013 2:40 PM	Times are EST
PAL-02	Sand sample at midpoint of flow path from pipe	05/30/2013 2:47 PM	
PAL-03	Sand sample at pipe outlet	05/30/2013 3:05 PM	
PAL-04	Sand sample furthest from pipe outlet	05/30/2013 3:10 PM	

The sample analysis results indicated the presence and quantities of some radionuclides associated with naturally occurring sources of radiation. In addition, a small amount of tritium was detected in the samples, that was likely a result of the recent leak from the Safety Injection Refueling Water Tank on May 4, 2013. These results and amounts:

- were expected given the dose calculation/evaluations performed by the Palisades' staff and rainfall that occurred before the samples were collected;
- were low; compared to the EPA's safe drinking water standard;
- did not exceed any NRC limit or design objective;
- were too small to be expected to have any health impact to the individuals located at the pipe outlet and other members of the licensee's workforce or the public.

A summary of NRC's evaluation of the laboratory analysis of the samples is included as Enclosure 1. The independent laboratory results of the samples are included as Enclosure 2. We are providing the laboratory analysis results and the NRC's evaluation of the results so that you may determine the corrective actions necessary.

When licensed radioactive material is inadvertently released into the environment, the NRC's regulations require that licensees do surveys of the affected area that are reasonable and necessary to assess the hazard. The presence of licensed radioactive material should be evaluated to determine whether additional corrective actions, including remediation should be performed by your staff. Please keep the NRC Resident Inspectors and the NRC Regional Health Physics inspector, assigned to your site, informed of the results of this evaluation. The NRC will assess the results of your evaluation of this information during a baseline inspection of this program later this year.

If you have any questions regarding this correspondence, please contact me at (630) 829-9827.

Sincerely,
/RA/
Billy C. Dickson, Chief
Health Physics and Incident Response Branch
Division of Reactor Safety

Docket No. 50-255
License No. DPR-20

Enclosures:
1. NRC Analysis of Independent Laboratory Results
2. American Radiation Services, LLC. Laboratory Results

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NAME	JCassidy:cs		JGiessner		BDickson			
DATE	08/06/13		08/06/13		08/06/13			

OFFICIAL RECORD COPY

Letter to Mr. Anthony Vitale from Mr. Billy C. Dickson dated August 6, 2013.

SUBJECT: RESULTS OF INDEPENDENT SAMPLES COLLECTED BY THE NRC AT PALISADES NUCLEAR PLANT STORM DRAIN OUTFALL

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