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RA-19-0210

May 14, 2019

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Subject: Duke Energy Carolinas, LLC
Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
2018 Annual Radiological Environmental Operating Report

Pursuant to Catawba Nuclear Station Technical Specification 5.6.2 and Selected Licensee Commitment 16.11-16, please find enclosed the 2018 Annual Radiological Environmental Operating Report. This report covers operation of Catawba Units 1 and 2 during the 2018 calendar year.

Any questions concerning this report should be directed to Sherry Andrews, Nuclear Support Services, at (803) 701-3424.

Sincerely,

Tom Simril
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A handwritten signature in black ink that reads "Tom Simril". The signature is written in a cursive, flowing style.

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ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

**DUKE ENERGY CORPORATION
CATAWBA NUCLEAR STATION
Units 1 and 2**

2018



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LIST OF ACRONYMS USED IN THIS TEXT *(in alphabetical order)*

AREOR	Annual Radiological Environmental Operating Report
ARERR	Annual Radiological Effluent Release Report
BW	BiWeekly
C	Control
CNS	Catawba Nuclear Station
EZA	Eckert & Ziegler Analytics
GEL	General Engineering Laboratory, LLC
GI-LLI	Gastrointestinal – Lower Large Intestine
GPS	Global Positioning System
I	Indicator
IR	Inner Ring
ISFSI	Independent Spent Fuel Storage Installation
LLD	Lower Limit of Detection
LLI	Low Level Iodine
LUC	Land Use Census
M	Monthly
MAPEP	Department of Energy Mixed Analyte Performance Evaluation Program
MDA	Minimum Detectable Activity
mrem	Millirem
MWe	Megawatt (electrical)
NIST	National Institute of Standards and Technology
NCR	Nuclear Condition Report – Corrective Action Program
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OR	Outer Ring
pCi/kg	picocurie per kilogram
pCi/l	picocurie per liter
pCi/m ³	picocurie per cubic meter
Q	Quarterly
REMP	Radiological Environmental Monitoring Program
SA	Semiannually
SI	Special Interest
SLCs	Selected Licensee Commitments
SM	Semimonthly
T. Body	Total Body
TECH SPECS	Technical Specifications
TLD	Thermoluminescent Dosimeter
μCi/ml	microcurie per milliliter
UFSAR	Updated Final Safety Analysis Report
W	Weekly

1.0 EXECUTIVE SUMMARY

This Annual Radiological Environmental Operating Report describes the Catawba Nuclear Station Radiological Environmental Monitoring Program (REMP), and the program results for the calendar year 2018.

Included are the identification of sampling locations, descriptions of environmental sampling and analysis procedures, comparisons of present environmental radioactivity levels and pre-operational environmental data, comparisons of doses calculated from environmental measurements and effluent data, analysis of trends in environmental radiological data as potentially affected by station operations, and a summary of environmental radiological sampling results. Quality assurance practices, sampling deviations, unavailable samples, and program changes are also discussed.

Sampling activities were conducted as prescribed by Selected Licensee Commitments (SLCs). One-thousand and four samples were analyzed comprising 1,056 test results in order to compile data for the 2018 report. Based on the annual land use census, the current number of sampling sites for Catawba Nuclear Station is sufficient.

Concentrations observed in the environment in 2018 for station related radionuclides were generally within the ranges of concentrations observed in the past. Inspection of data showed that radioactivity concentrations in drinking water, surface water, and broad leaf vegetation are higher than the activities reported for samples collected prior to the operation of the station. Measured concentrations were not higher than expected and all positively identified measurements attributable to station operation were within limits as specified in SLCs.

Additionally, environmental radiological monitoring data is consistent with effluents introduced into the environment by plant operations. The total body dose estimated to the maximum exposed member of the public as calculated by environmental sampling data, excluding TLD results, was $2.36E-1$ mrem for 2018. Background radiation dose in the United States is approximately 620 mrem per year (approximately half from naturally occurring sources such as radon and half from man-made sources such as medical processes).¹ It is therefore concluded that station operations has had no significant radiological impact on the health and safety of the public or the environment.

¹NCRP (2009). National Council on Radiation Protection and Measurements. *Ionizing Radiation Exposure of the Population of the United States*, NCRP Report No. 160 (National Council on Radiation Protection and Measurements, Bethesda, Maryland).

2.0 INTRODUCTION

2.1 SITE DESCRIPTION AND SAMPLE LOCATIONS

Duke Energy Corporation's Catawba Nuclear Station is a two-unit facility located on the shore of Lake Wylie in York County, South Carolina. Each of the two essentially identical units employs a pressurized water reactor nuclear steam supply system furnished by Westinghouse Electric Corporation. Unit one produces a net electrical output of 1165 MWe, while Unit 2 produces a net electrical output of 1145 MWe. Units 1 and 2 achieved initial criticality on January 7, 1985, and May 8, 1986, respectively.

Condenser cooling is accomplished utilizing a closed system incorporating cooling towers, instead of using lake water directly. Liquid effluents are released into Lake Wylie via the station discharge canal and are not accompanied by the large additional dilution water flow associated with “once-through” condenser cooling. This design results in greater radionuclide concentrations in the discharge canal given comparable liquid effluent source terms.

Sampling locations are chosen based upon meteorological factors, preoperational monitoring, and results of the land use surveys. Figures 2.1-1 and 2.1-2 are maps depicting the Thermoluminescent Dosimeter (TLD) monitoring locations and the sampling locations. The location numbers shown on these maps correspond to those listed in Tables 2.1-A and 2.1-B. Figure 2.1-1 comprises all sample locations within a one mile radius of CNS. Figure 2.1-2 comprises all sample locations within a 10 mile radius of CNS.

2.2 SCOPE AND REQUIREMENTS OF THE REMP

An environmental monitoring program has been in effect at Catawba Nuclear Station since 1981, four years prior to operation of Unit 1 in 1985. The preoperational program provides data on the existing environmental radioactivity levels for the site and vicinity which may be used to determine whether increases in environmental levels are attributable to the station. The operational program provides surveillance and backup support of detailed effluent monitoring which is necessary to evaluate the significance, if any, of the contributions to the existing environmental radioactivity levels that result from station operation.

This monitoring program is based on NRC guidance as reflected in the Selected Licensee Commitments Manual, with regard to sample media, sampling locations, sampling frequency and analytical sensitivity requirements. Indicator and control locations were established for comparison purposes to distinguish radioactivity of station origin from natural or other “man-made” environmental radioactivity. The environmental monitoring program also verifies projected and anticipated radionuclide concentrations in the environment and related exposures from releases of radionuclides from Catawba Nuclear Station. This program satisfies the requirements of Section IV.B.2 of Appendix I to 10CFR50 and provides surveillance of all appropriate critical exposure pathways to man and protects vital interests of the company, public and state and federal

agencies concerned with the environment. Reporting levels for activity found in environmental samples are listed in Table 2.2-A. Table 2.2-B lists the REMP analysis and frequency schedule. The Annual Land Use Census, required by Selected Licensee Commitments, is performed to ensure that changes in the use of areas at or beyond the site boundary are identified and that modifications to the REMP are made if required by changes in land use. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10CFR50. Results are shown in Table 3.10.

Participation in an interlaboratory comparison program as required by Selected Licensee Commitments provides for independent checks on the precision and accuracy of measurements of radioactive material in REMP sample matrices. Such checks are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of Section IV.B.2 of Appendix I to 10CFR50. A summary of the results obtained as part of this comparison program are in Section 5 of this annual report.

2.3 STATISTICAL AND CALCULATIONAL METHODOLOGY

2.3.1 ESTIMATION OF THE MEAN VALUE

There was one (1) basic statistical calculation performed on the raw data resulting from the environmental sample analysis program. The calculation involved the determination of the mean value for the indicator and the control samples for each sample medium. The mean is a widely used statistic. This value was used in the reduction of the data generated by the sampling and analysis of the various media in the Radiological Environmental Monitoring Program. "Net activity (or concentration)" is the activity (or concentration) determined to be present in the sample. No "Minimum Detectable Activity", "Lower Limit of Detection", "Less Than Level", or negative activities or concentrations are included in the calculation of the mean. The following equation was used to estimate the mean:

$$\bar{x} = \frac{\sum_{i=1}^N x_i}{N}$$

Where:

\bar{x} = estimate of the mean,

i = individual sample,

N = total number of samples with a net activity (or concentration),

x_i = net activity (or concentration) for sample i.

2.3.2 LOWER LIMIT OF DETECTION AND MINIMUM DETECTABLE ACTIVITY

The Lower Limit of Detection (LLD), and Minimum Detectable Activity (MDA) are used throughout the REMP.

LLD - The LLD, as defined in the Selected Licensee Commitments Manual is the smallest concentration of radioactive material in a sample that will yield a net count, above the system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD is an *a priori* (before the fact) lower limit of detection. The actual LLD is dependent upon the standard deviation of the background counting rate, the counting efficiency, the sample size (mass or volume), the radiochemical yield and the radioactive decay of the sample between sample collection and counting. The "required" LLDs for each sample medium and selected radionuclides are given in the Selected Licensee Commitments and are listed in Table 2.2-C.

MDA - The MDA is the net counting rate (sample after subtraction of background) that must be surpassed before a sample is considered to contain a scientifically measurable amount of a radioactive material exceeding background amounts. The MDA is calculated using a sample background and may be thought of as an "actual" LLD for a particular sample measurement. Certain gross counting measurements display a calculated negative value, indicating background is greater than sample activity.

2.3.3 TREND IDENTIFICATION

One of the purposes of an environmental monitoring program is to determine if there is a buildup of radionuclides in the environment due to the operation of the nuclear station. Visual inspection of tabular or graphical presentations of data (including preoperational) is used to determine if a trend exists. A decrease in a particular radionuclide's concentration in an environmental medium does not indicate that reactor operations are removing radioactivity from the environment but that reactor operations are not adding that radionuclide to the environment in quantities exceeding the preoperational level and that the normal removal processes (radioactive decay, deposition, resuspension, etc.) are influencing the concentration.

Substantial increases or decreases in the amount of a particular radionuclide's release from the nuclear plant will greatly affect the resulting environmental levels; therefore, a knowledge of the release of a radionuclide from the nuclear plant is necessary to completely interpret the trends, or lack of trends, determined from the environmental data. Factors that may affect environmental levels of radionuclides include prevailing weather conditions (periods of drought, solar cycles or heavier than normal precipitation), construction in or around either the nuclear plant or the sampling location, and addition or deletion of other sources of radioactive materials (such as the Chernobyl accident and the Japan earthquake and tsunami, which triggered the Fukushima Dai-ichi Nuclear Power Plant incident). Some of these factors may be obvious while others are sometimes

unknown. Therefore, how trends are identified will include some judgment by plant personnel.

Figure 2.1-1

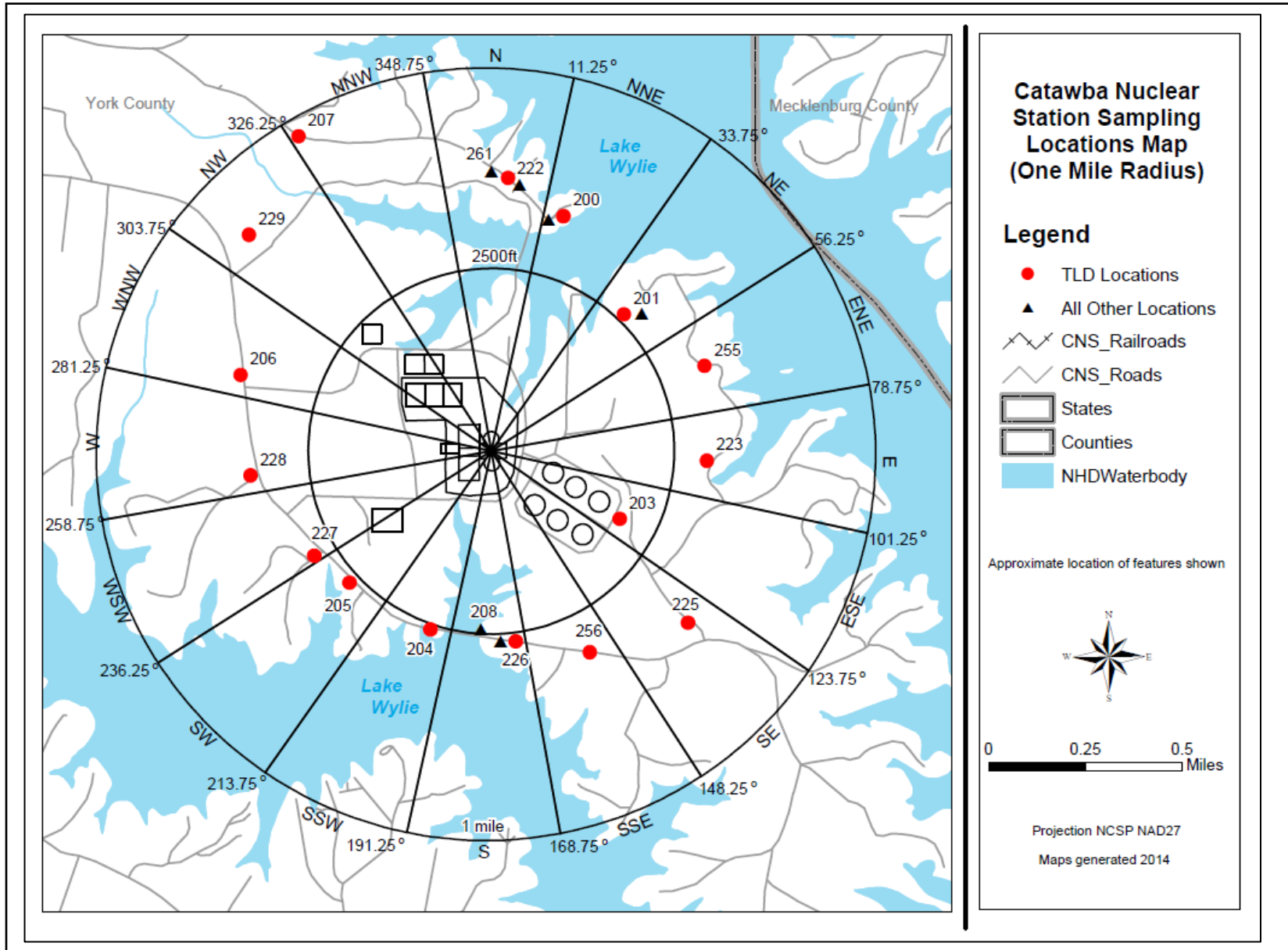


Figure 2.1-2

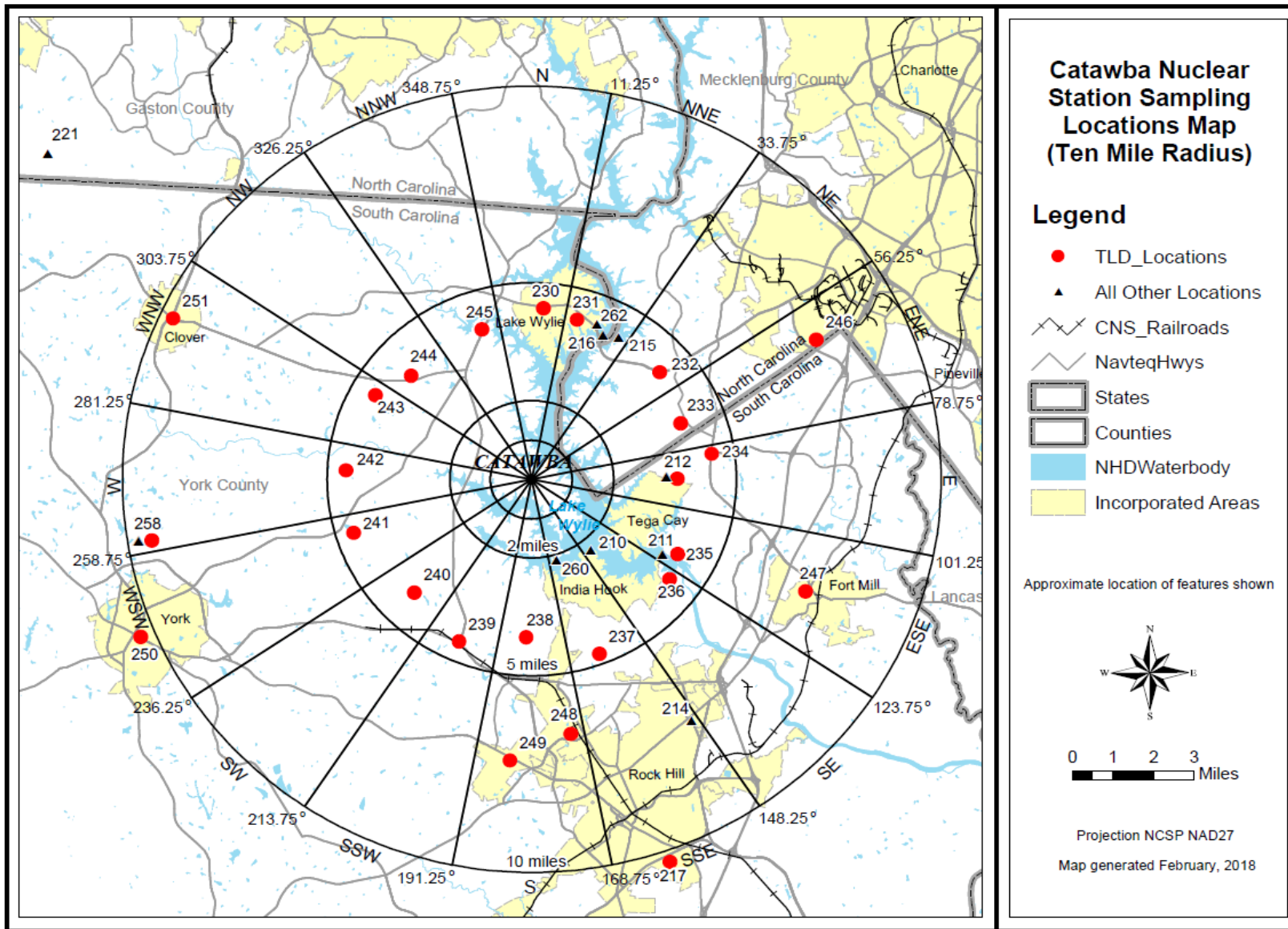


TABLE 2.1-A

**CATAWBA RADIOLOGICAL MONITORING PROGRAM
SAMPLING LOCATIONS**

Table 2.1-A Codes			
W	Weekly	SM	Semimonthly
BW	BiWeekly	Q	Quarterly
M	Monthly	SA	Semiannually
C	Control	I	Indicator

Site #	Measure Type	Location Description*	Air Rad. & Part.	Surface Water	Drinking Water	Shoreline Sediment	Food Products (a)	Fish	Milk	Broad Leaf Veg. (b)
200	I	Site Boundary (0.63 mi NNE)	W							M
201	I	Site Boundary (0.53 mi NE)	W							M
208	I	Discharge Canal (0.45 mi S)	W	M		SA		SA		
210	I	Ebenezer Access (2.31 mi SE)				SA				
211	I	Wylie Dam (4.06 mi ESE)		M						
212	I	Tega Cay (3.32 mi E)	W							
214	I	Rock Hill Water Supply (7.30 mi SSE)			M					
215	C	River Pointe - Hwy 49 (4.21 mi NNE)		M						
216	C	Hwy 49 Bridge (4.19 mi NNE)						SA		
218	C	Belmont Water Supply (13.5 mi NNE)			M					
221	C	Dairy (14.5 mi NW)							SM	
222	I	Site Boundary (0.70 mi N)								M
226	I	Site Boundary (0.48 mi S)								M
258	C	Fairhope Road (9.84 mi W)	W							M
260	I	Irrigated Gardens (2.00 mi SSE)					M(a)			
261	I	Firing Range-Site Boundary (0.72 mi N)	W							
262	C	T-Bones Restaurant/Lake Wylie Marina-Hwy 49 (4.19 mi NNE)				SA				

(a) During Harvest Season

(b) When Available

* GPS data reflect approximate accuracy to within 2-5 meters. GPS field measurements were taken as close as possible to the item of interest.

TABLE 2.1-B

**CATAWBA RADIOLOGICAL MONITORING PROGRAM
SAMPLING LOCATIONS (TLD SITES)**

Table 2.1-B Codes			
IR	Inner Ring	OR	Outer Ring
C	Control	SI	Special Interest

Site #	Measure Type	Location*	Distance (miles)	Sector	Site #	Measure Type	Location*	Distance (miles)	Sector
200	IR	SITE BOUNDARY	0.63	NNE	234	OR	WELLS FARGO BANK	4.50	E
201	IR	SITE BOUNDARY	0.53	NE	235	OR	LAKE WYLIE DAM	4.07	ESE
203	IR	SITE BOUNDARY	0.38	ESE	236	OR	SC WILDLIFE FEDERATION OFFICE	4.25	SE
204	IR	SITE BOUNDARY	0.48	SSW	237	OR	TWIN LAKES ROAD AND HOMESTEAD ROAD	4.75	SSE
205	IR	SITE BOUNDARY	0.25	SW	238	OR	PENNINGTON ROAD AND WEST OAK ROAD	4.02	S
206	IR	SITE BOUNDARY	0.67	WNW	239	OR	CARTER LUMBER COMPANY	4.49	SSW
207	IR	SITE BOUNDARY	0.95	NNW	240	OR	PARAHAM ROAD	4.07	SW
212	SI	TEGA CAY AIR SITE	3.32	E	241	OR	CAMPBELL ROAD	4.58	WSW
217	C	BLACKMON ROAD	10.3	SSE	242	OR	TRANSMISSION TOWER ON PARAHAM ROAD	4.56	W
222	IR	SITE BOUNDARY	0.71	N	243	OR	KINGSBURRY ROAD	4.39	WNW
223	IR	SITE BOUNDARY	0.57	E	244	OR	BETHEL ELEMENTARY SCHOOL	4.02	NW
225	IR	SITE BOUNDARY	0.68	SE	245	OR	CROWDERS CREEK BOAT LANDING	4.01	NNW
226	IR	SITE BOUNDARY	0.48	S	246	SI	CAROWINDS GUARD HOUSE	7.87	ENE
227	IR	SITE BOUNDARY	0.52	WSW	247	C	FORT MILL	7.33	ESE
228	IR	SITE BOUNDARY	0.61	W	248	SI	PIEDMONT MEDICAL CENTER	6.54	S
229	IR	SITE BOUNDARY	0.84	NW	249	SI	YORK COUNTY OPERATIONS CENTER	7.17	S
230	OR	RIVER HILLS CHURCH	4.37	N	250	SI	YORK DUKE ENERGY OFFICE	10.4	WSW
231	OR	RIVER HILLS FRONT ENTRANCE	4.21	NNE	251	C	CLOVER	9.72	WNW
232	OR	PLEASANT HILL ROAD	4.18	NE	255	IR	SITE BOUNDARY	0.61	ENE
233	OR	ZOAR ROAD AND THOMAS DRIVE	3.95	ENE	256	IR	SITE BOUNDARY	0.58	SSE
					258	SI	FAIRHOPE ROAD	9.84	W

* GPS data reflect approximate accuracy to within 2-5 meters. GPS field measurements were taken as close as possible to the item of interest.

TABLE 2.2-A

**REPORTING LEVELS FOR RADIOACTIVITY
CONCENTRATIONS IN ENVIRONMENTAL SAMPLES**

Analysis	Water (pCi/liter)	Air Particulates or Gases (pCi/m ³)	Fish (pCi/kg-wet)	Milk (pCi/liter)	Food Products (pCi/kg-wet)
H-3	20,000 ^{(a),(b)}	---	---	---	---
Mn-54	1,000	---	30,000	---	---
Fe-59	400	---	10,000	---	---
Co-58	1,000	---	30,000	---	---
Co-60	300	---	10,000	---	---
Zn-65	300	---	20,000	---	---
Zr-Nb-95	400	---	---	---	---
I-131	2	0.9	---	3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200	---	---	300	---

(a) If no drinking water pathway exists, a value of 30,000 pCi/liter may be used.

(b) H-3 Reporting level not applicable to surface water

TABLE 2.2-B

REMP ANALYSIS FREQUENCY

Sample Medium	Analysis Schedule	Gamma Isotopic	Tritium	Low Level I-131	Gross Beta	TLD
Air Radioiodine	Weekly	X	---	---	---	---
Air Particulate	Weekly	X	---	---	X	---
	Quarterly Composite	X	---	---	---	---
Direct Radiation	Quarterly	---	---	---	---	X
Surface Water	Monthly Composite	X	---	---	---	---
	Quarterly Composite	---	X	---	---	---
Drinking Water	Monthly Composite	X	---	(a)	X	---
	Quarterly Composite	---	X	---	---	---
Ground Water	Quarterly	X	X	---	---	---
Shoreline Sediment	Semiannually	X	---	---	---	---
Milk	Semimonthly	X	---	X	---	---
Fish	Semiannually	X	---	---	---	---
Broadleaf Vegetation	Monthly ^(b)	X	---	---	---	---
Food Products	Monthly ^(b)	X	---	---	---	---

(a) Low-level I-131 analysis will be performed if the dose calculated for the consumption of drinking water is > 1 mrem per year. An LLD of 1 pCi/liter will be required for this analysis.

(b) When Available

TABLE 2.2-C

MAXIMUM VALUES FOR THE *A PRIORI* LOWER LIMIT OF DETECTION

Analysis	Water (pCi/liter)	Air Particulates or Gases (pCi/m ³)	Fish (pCi/kg-wet)	Milk (pCi/liter)	Food Products (pCi/kg-wet)	Sediment (pCi/kg-dry)
Gross Beta	4	0.01	---	---	---	---
H-3	2000 ^(a)	---	---	---	---	---
Mn-54	15	---	130	---	---	---
Fe-59	30	---	260	---	---	---
Co-58, 60	15	---	130	---	---	---
Zn-65	30	---	260	---	---	---
Zr-Nb-95	15	---	---	---	---	---
I-131	1 ^(b)	0.07	---	1	60	---
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140	15	---	---	15	---	---

(a) If no drinking water pathway exists, a value of 3,000 pCi/liter may be used.

(b) If no drinking water pathway exists, the LLD of gamma isotopic analysis may be used.

3.0 INTERPRETATION OF RESULTS

Review of all 2018 REMP analysis results was performed to identify changes in environmental levels as a result of station operations. The following section depicts and explains the review of these results. Sample data for 2018 was compared to preoperational and historical data. Over the years of operation, analysis and collection changes have taken place that do not allow direct comparisons for some data collected from 1984 (preoperational) through 2018. Summary tables containing 2018 information required by Technical Specification Administrative Control 5.6.2 are located in Appendix B. REMP results for 2018 are located in Appendix E.

Evaluation for significant trends was performed for radionuclides that are listed as required within Selected Licensee Commitments 16.11-13. The radionuclides include: H-3, Mn-54, Fe-59, Co-58, Co-60, Zn-65, Zr-95, Nb-95, I-131, Cs-134, Cs-137, Ba-140 and La-140. Gross beta analysis results were trended for drinking water. Other radionuclides detected that are the result of plant operation, but not required for reporting, are trended.

A comparison of annual mean concentrations of effluent-based detected radionuclides to historical results provided trending bases. Frequency of detection and concentrations related to SLC reporting levels (Table 2.2-A) were used as criteria for trending conclusions. All 2018 maximum percentages of reporting levels attributed to CNS operation were well below the 100% action level.

Selected Licensee Commitment section 16.11-13 addresses actions to be taken if radionuclides other than those required are detected in samples collected. The occurrences of these radionuclides are the result of CNS liquid effluents which contained the radionuclides.

During 1984-1986, all net activity results (sample minus background), both positive and negative were included in calculation of sample mean. A change in the EnRad gamma spectroscopy system on September 1, 1987, decreased the number of measurements yielding detectable low-level activity for indicator and control location samples. It was thought that the method used by the previous system was vulnerable to false-positive results.

All 2018 sample analysis results were reviewed to detect and identify any significant trends. Tables and graphs are used throughout this section to display data from effluent-based radionuclides identified since the system change in late 1987. All negative concentration values were replaced with zero for calculation purposes. Any zero concentrations used in tables or graphs represent activity measurements less than detectable levels.

Review of all 2018 data presented in this section supports the conclusion that there were no significant changes in environmental sample radionuclide concentrations of samples collected and analyzed from CNS site and surrounding areas that were attributable to plant operations. Inspection of the data showed that radioactivity concentrations were as expected and all positively identified measurements attributed to plant operations were within CNS Offsite Dose

Calculation Manual (ODCM) and SLC regulatory limits; thus presenting no significant impact to the environment or public health and safety.

Data presented in Sections 3.1 through 3.9 support the conclusion that there was no significant increase in radioactivity in the environment around Catawba Nuclear Station due to station operations in 2018. Similarly, there was no significant increase in ambient background radiation levels in the surrounding areas. The 2018 land use census data, shown in Section 3.10, indicates that no program changes are required as a result of the census.

3.1 AIRBORNE RADIOIODINE AND PARTICULATES

In 2018, 312 radioiodine and particulate samples were analyzed, 260 from five indicator locations and 52 at the control location. Particulate samples were analyzed weekly for gross beta. A quarterly gamma analysis was performed on the quarterly filter composite (by location). Radioiodine samples received a weekly gamma analysis.

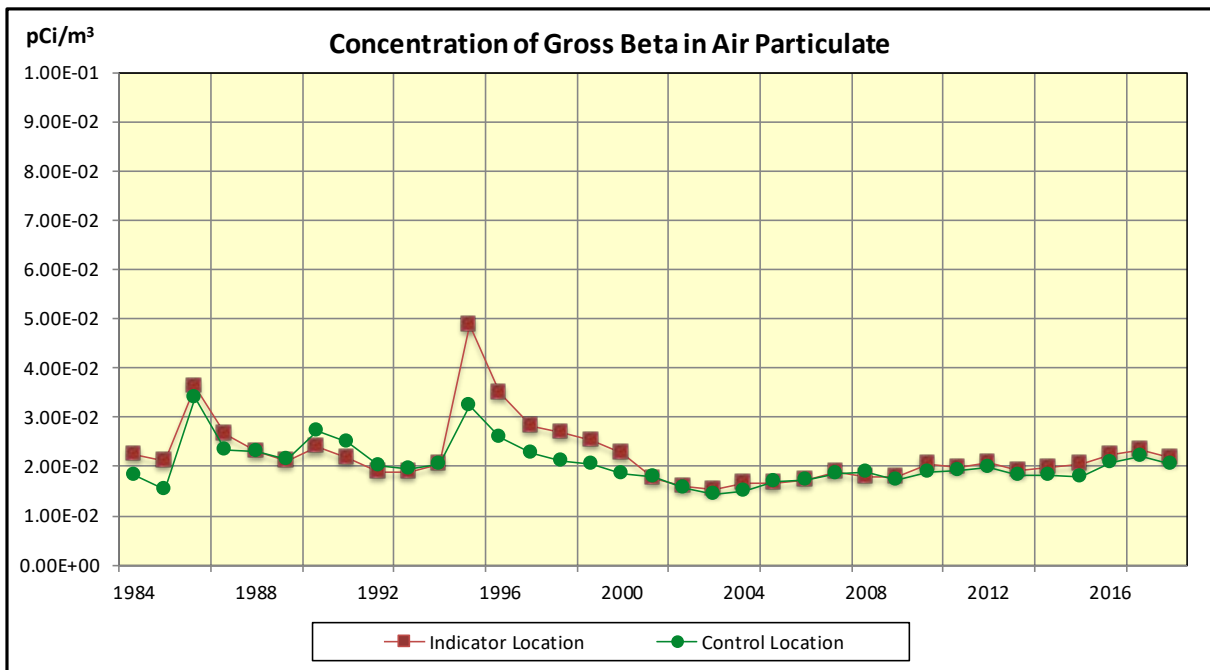
Figure 3.1 shows individual sample gross beta results for the indicator location with highest annual mean and the control location samples during 2018. The two sample locations' results are similar in concentration and have varied negligibly since preoperational periods.

There were no detectable gamma emitters attributable to plant operations identified for particulate filters analyzed during 2018. Table 3.1-A shows the highest indicator annual mean and control location annual mean for gross beta in air particulate.

There was no detectable I-131 in air radioiodine samples analyzed in 2018. Table 3.1-B shows the highest indicator annual mean and control location annual mean for I-131 since 1984 (preoperational period). The table shows similar concentrations for both the indicator and control locations and the activities decreasing from early in the operational history of the plant. No I-131 activity due to CNS plant operations has been detected since 1987.

K-40 and Be-7 that occur naturally were routinely detected in charcoal cartridges collected during the year.

Figure 3.1



There is no reporting level for gross beta in air particulate

Table 3.1-A Mean Concentration of Gross Beta in Air Particulate

Year	Indicator Location (pCi/m³)	Control Location (pCi/m³)
1984	2.25E-2	1.82E-2
1985	2.12E-2	1.53E-2
1986	3.62E-2	3.41E-2
1987	2.67E-2	2.32E-2
1988	2.29E-2	2.30E-2
1989	2.11E-2	2.13E-2
1990	2.39E-2	2.72E-2
1991	2.19E-2	2.51E-2
1992	1.90E-2	2.01E-2
1993	1.87E-2	1.94E-2
1994	2.03E-2	2.03E-2
1995	4.88E-2	3.23E-2
1996	3.49E-2	2.60E-2
1997	2.83E-2	2.28E-2
1998	2.69E-2	2.12E-2
1999	2.53E-2	2.04E-2
2000	2.28E-2	1.86E-2
2001	1.76E-2	1.78E-2
2002	1.60E-2	1.57E-2
2003	1.54E-2	1.42E-2
2004	1.65E-2	1.49E-2
2005	1.66E-2	1.68E-2
2006	1.74E-2	1.74E-2
2007	1.88E-2	1.86E-2
2008	1.80E-2	1.90E-2
2009	1.78E-2	1.72E-2
2010	2.03E-2	1.90E-2
2011	1.98E-2	1.92E-2
2012	2.09E-2	1.97E-2
2013	1.92E-2	1.82E-2
2014	1.99E-2	1.81E-2
2015	2.06E-2	1.80E-2
2016	2.24E-2	2.07E-2
2017	2.35E-2	2.21E-2
2018	2.17E-2	2.03E-2

Table 3.1-B Mean Concentration of Air Radioiodine (I-131)

Year	Indicator Location (pCi/m ³)	Control Location (pCi/m ³)
1984	1.30E-3	1.46E-2
1985	4.75E-3	2.38E-2
1986	1.43E-2	1.02E-2
1987	1.38E-2	0.00E0
1988	0.00E0	0.00E0
1989	0.00E0	0.00E0
1990	0.00E0	0.00E0
1991	0.00E0	0.00E0
1992	0.00E0	0.00E0
1993	0.00E0	0.00E0
1994	0.00E0	0.00E0
1995	0.00E0	0.00E0
1996	0.00E0	0.00E0
1997	0.00E0	0.00E0
1998	0.00E0	0.00E0
1999	0.00E0	0.00E0
2000	0.00E0	0.00E0
2001	0.00E0	0.00E0
2002	0.00E0	0.00E0
2003	0.00E0	0.00E0
2004	0.00E0	0.00E0
2005	0.00E0	0.00E0
2006	0.00E0	0.00E0
2007	0.00E0	0.00E0
2008	0.00E0	0.00E0
2009	0.00E0	0.00E0
2010	0.00E0	0.00E0
2011 ⁽¹⁾	5.53E-2	5.65E-2
2012	0.00E0	0.00E0
2013	0.00E0	0.00E0
2014 ⁽²⁾	0.00E0	0.00E0
2015	0.00E0	0.00E0
2016	0.00E0	0.00E0
2017	0.00E0	0.00E0
2018	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

(1) 2011 concentration affected by Fukushima Daiichi

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

3.2 DRINKING WATER

Gross beta analysis and gamma spectroscopy were performed on 26 drinking water samples. These samples were composited to create 8 quarterly composite period samples for tritium analysis. One indicator location was sampled, along with one control location.

No gamma emitting radionuclides attributable to plant operations were identified in 2018 drinking water samples.

Figure 3.2-1 and Table 3.2 shows highest annual mean gross beta concentrations for the indicator location and control location since preoperation. The indicator location (downstream of the plant effluent release point) average concentration was 2.06 pCi/l in 2018 and the control location concentration was 1.86 pCi/l. The table shows that current gross beta levels are not statistically different from preoperational concentrations.

Tritium was detected in the four indicator samples and in the four control samples during 2018. The mean indicator tritium concentration for 2018 was 471 pCi/l, 2.36% of reporting level. The mean control tritium concentration for 2018 was 326 pCi/l, 1.63% of reporting level. Figure 3.2-2 and Table 3.2 display the highest indicator and control location annual mean concentrations for tritium since 1984.

The concentration of tritium in drinking water is affected by releases from the Catawba plant and the McGuire Nuclear Station, located approximately 40 miles upstream of the Catawba plant on the Catawba River.

The dose for consumption of water was less than one mrem per year, historically and for 2018; therefore low-level iodine analysis is not required.

K-40 and Be-7 are naturally occurring radionuclides observed in drinking water samples in 2018.

Figure 3.2-1

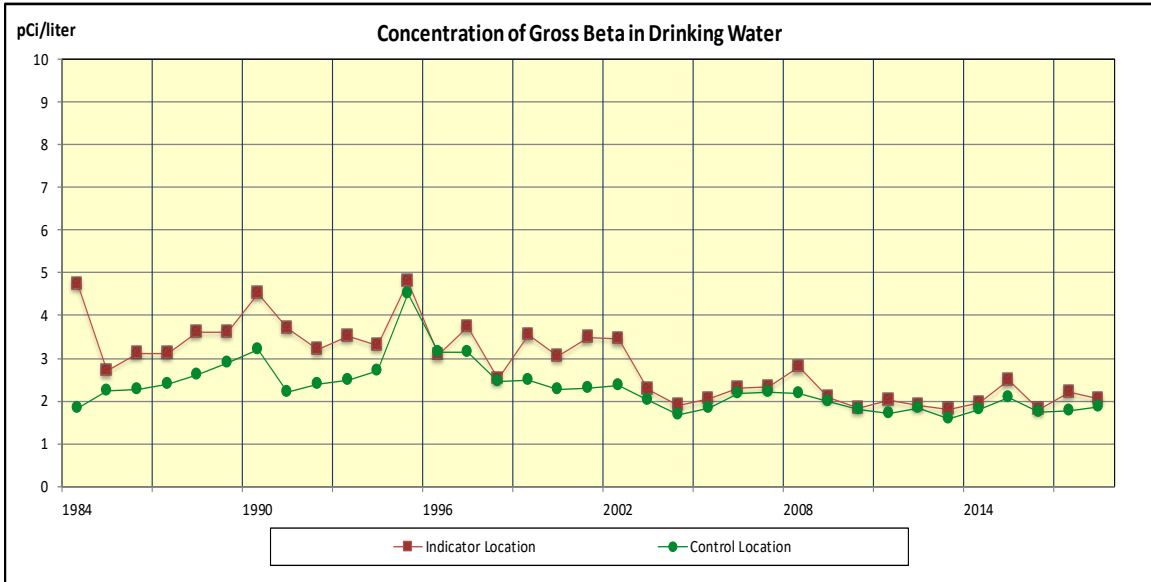


Figure 3.2-2

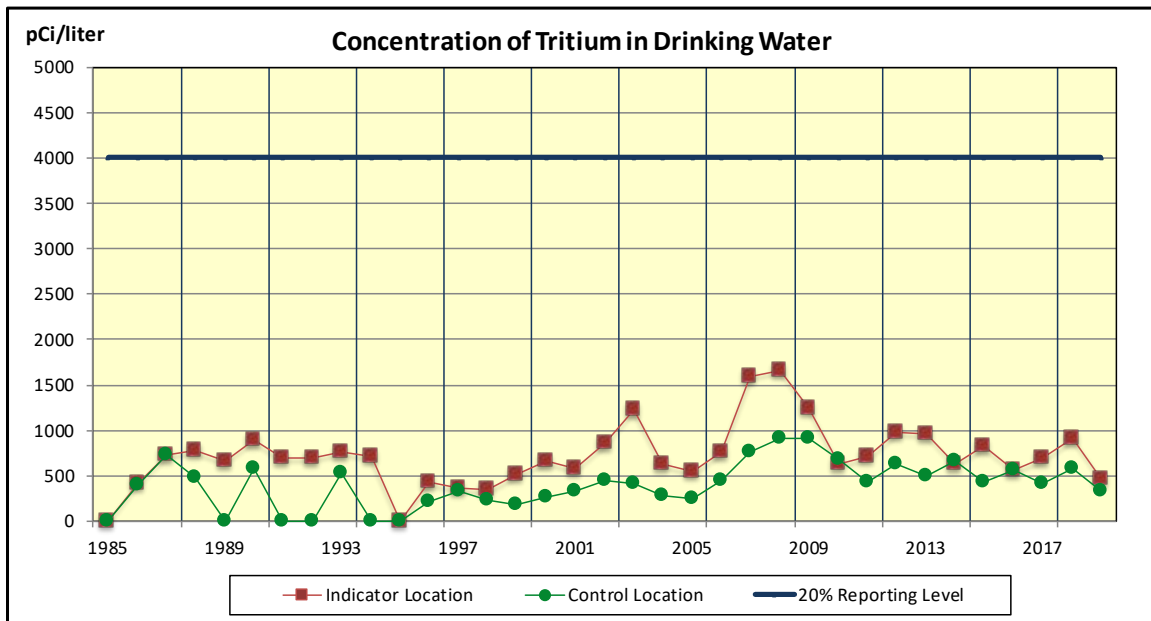


Table 3.2 Mean Concentration of Radionuclides in Drinking Water

YEAR	Gross Beta (pCi/l)		Tritium (pCi/l)	
	Indicator Location	Control Location	Indicator Location	Control Location
1984	4.72	1.83	3.10E-2	3.10E-2
1985	2.70	2.24	4.13E2	4.00E2
1986	3.11	2.26	7.23E2	7.33E2
1987	3.10	2.40	7.80E2	4.80E2
1988	3.60	2.60	6.64E2	0.00E0
1989	3.60	2.90	8.91E2	5.72E2
1990	4.50	3.20	7.03E2	0.00E0
1991	3.70	2.20	7.04E2	0.00E0
1992	3.20	2.40	7.65E2	5.38E2
1993	3.50	2.50	7.06E2	0.00E0
1994	3.30	2.70	0.00E0	0.00E0
1995	4.80	4.50	4.28E2	2.21E2
1996	3.08	3.14	3.71E2	3.27E2
1997	3.74	3.15	3.54E2	2.28E2
1998	2.51	2.44	5.07E2	1.83E2
1999	3.55	2.48	6.71E2	2.70E2
2000	3.04	2.27	5.87E2	3.26E2
2001	3.49	2.30	8.66E2	4.50E2
2002	3.44	2.36	1.22E3	4.11E2
2003	2.27	2.02	6.36E2	2.88E2
2004	1.88	1.69	5.47E2	2.54E2
2005	2.05	1.84	7.69E2	4.50E2
2006	2.30	2.17	1.59E3	7.70E2
2007	2.34	2.21	1.65E3	9.18E2
2008	2.81	2.16	1.25E3	9.16E2
2009	2.07	1.99	6.34E2	6.81E2
2010	1.84	1.80	7.05E2	4.27E2
2011	2.01	1.71	9.73E2	6.36E2
2012	1.89	1.84	9.54E2	5.02E2
2013	1.79	1.59	6.22E2	6.64E2
2014	1.96	1.79	8.21E2	4.37E2
2015	2.48	2.07	5.70E2	5.70E2
2016	1.80	1.75	6.88E2	4.06E2
2017	2.20	1.76	9.16E2	5.83E2
2018	2.06	1.86	4.71E2	3.26E2

0.00E0 indicates detectable measurements
 1984 - 1986 mean based on all net activity

3.3 SURFACE WATER

A total of 39 monthly surface water samples were analyzed for gamma emitting radionuclides. The samples were composited to create 12 quarterly composite period samples for tritium analysis. Two indicator locations and one control location were sampled. One indicator location (208) is located near the liquid effluent discharge point.

All 2018 indicator location samples contained tritium with an average concentration of 3,771 pCi/l. Indicator location 208 (Discharge Canal) showed a range of activities from 4,940 to 11,000 pCi/l which had the highest mean concentration of 7,065 pCi/l. Tritium was detected in three of the four control samples during 2018 with an average concentration of 279 pCi/l.

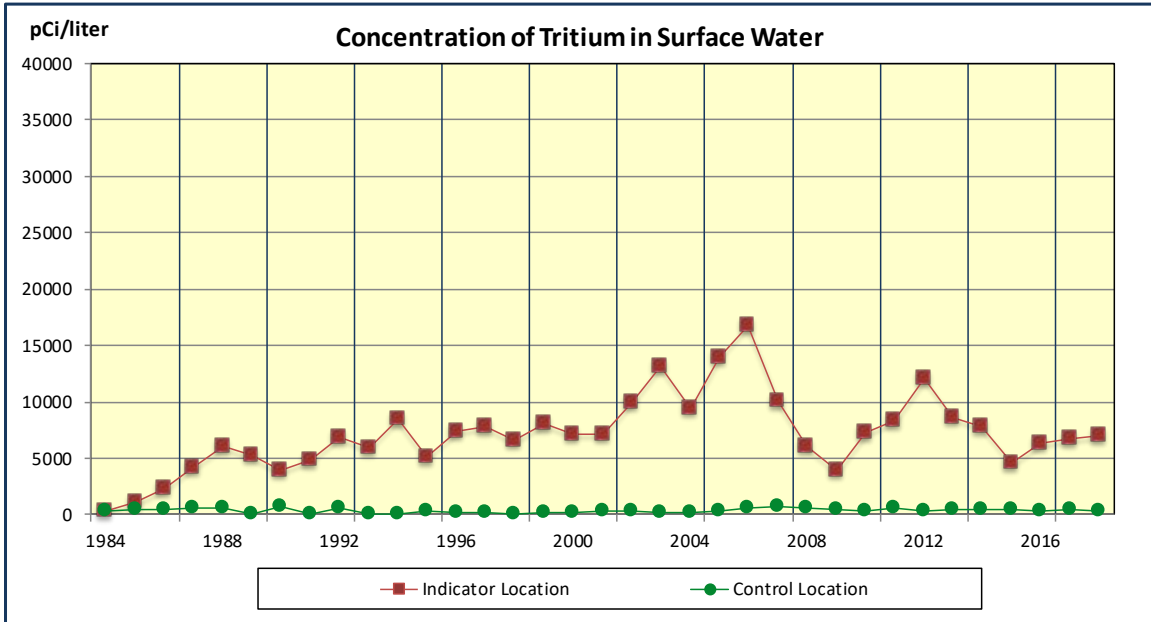
No gamma emitting radionuclides attributable to plant operations were identified in 2018 surface water samples. Table 3.3 summarizes the indicator annual means of radionuclides detected since 1984. Visual inspection of the tabular data did not reveal any increasing trends.

Figure 3.3 displays the highest indicator and control annual means for tritium since 1984. Table 3.3 lists the highest indicator annual means.

The concentration of tritium in surface water is affected by releases from the Catawba plant and the McGuire Nuclear Station, located approximately 40 miles upstream of the Catawba plant on the Catawba River.

K-40 and Be-7 are naturally occurring radionuclides observed in surface water samples in 2018.

Figure 3.3



There is no reporting level for tritium in surface water, however, if no drinking water pathway exists, a value of 30,000 pCi/l may be used. A drinking water pathway exists for Catawba Nuclear Station, so this limit does not apply for surface water. See section 3.2 for drinking water results.

Table 3.3 Mean Concentrations of Radionuclides in Surface Water (pCi/l)

YEAR	Co-58	Co-60	Nb-95	Cs-137	H-3 Indicator	H-3 Control
1984	4.59E-1	5.71E-1	6.48E-1	9.08E-1	3.35E2	3.18E2
1985	3.46E0	4.83E-2	2.70E0	8.19E-1	1.19E3	5.05E2
1986	3.10E-1	-4.12E-2	2.05E0	4.85E-1	2.34E3	5.05E2
1987 ⁽¹⁾	0.00E0	3.10E0	4.30E0	9.90E0	4.17E3	6.20E2
1988	9.20E0	0.00E0	0.00E0	0.00E0	6.03E3	6.07E2
1989	0.00E0	0.00E0	0.00E0	0.00E0	5.27E3	0.00E0
1990	6.50E0	0.00E0	0.00E0	0.00E0	3.98E3	7.73E2
1991	0.00E0	0.00E0	0.00E0	0.00E0	4.87E3	0.00E0
1992	0.00E0	0.00E0	0.00E0	0.00E0	6.91E3	6.64E2
1993	4.70E0	1.80E0	0.00E0	0.00E0	5.98E3	0.00E0
1994	0.00E0	0.00E0	0.00E0	0.00E0	8.42E3	0.00E0
1995	0.00E0	0.00E0	0.00E0	0.00E0	5.13E3	2.89E2
1996	0.00E0	0.00E0	0.00E0	0.00E0	7.36E3	2.61E2
1997	0.00E0	0.00E0	0.00E0	0.00E0	7.77E3	2.20E2
1998	0.00E0	0.00E0	0.00E0	0.00E0	6.61E3	0.00E0
1999	0.00E0	0.00E0	0.00E0	0.00E0	8.13E3	2.41E2
2000	0.00E0	0.00E0	0.00E0	0.00E0	7.19E3	2.56E2
2001	0.00E0	0.00E0	0.00E0	0.00E0	7.13E3	3.28E2
2002	0.00E0	0.00E0	0.00E0	0.00E0	1.00E4	3.80E2
2003	0.00E0	0.00E0	0.00E0	0.00E0	1.31E4	2.37E2
2004	0.00E0	0.00E0	0.00E0	0.00E0	9.43E3	2.60E2
2005	0.00E0	0.00E0	0.00E0	0.00E0	1.40E4	3.78E2
2006	0.00E0	0.00E0	0.00E0	0.00E0	1.67E4	5.83E2
2007	0.00E0	0.00E0	0.00E0	0.00E0	1.01E4	7.82E2
2008	6.80E0	1.16E1	0.00E0	0.00E0	6.02E3	6.31E2
2009	9.40E0	1.06E1	0.00E0	0.00E0	3.93E3	5.29E2
2010	0.00E0	0.00E0	0.00E0	0.00E0	7.26E3	2.94E2
2011	8.75E0	1.96E1	0.00E0	0.00E0	8.29E3	5.41E2
2012	0.00E0	0.00E0	0.00E0	0.00E0	1.21E4	3.71E2
2013	0.00E0	0.00E0	0.00E0	0.00E0	8.62E3	4.02E2
2014 ⁽²⁾⁽³⁾	7.23E0	4.69E0	0.00E0	0.00E0	7.79E3	4.18E2
2015 ⁽⁴⁾	1.15E1	1.07E0	0.00E0	0.00E0	4.61E3	4.14E2
2016	0.00E0	0.00E0	0.00E0	0.00E0	6.34E3	2.81E2
2017	0.00E0	0.00E0	0.00E0	0.00E0	6.80E3	5.24E2
2018	0.00E0	0.00E0	0.00E0	0.00E0	7.07E3	2.79E2

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

(3) 2014 – During the 3rd quarter, CNS experienced higher levels than normal of mixed fission and activation products in the liquid radioactive waste processing system and higher than normal liquid waste discharges (NCR # 01897053).

(4) 2015 – Co-58 and Co-60 were detected at SW Location 208 (NCR # 01934713).

3.4 MILK

A total of 26 milk samples were analyzed by gamma spectroscopy and low-level iodine during 2018. There was one control location sampled. No indicator dairies were identified by the 2018 land use census.

There were no gamma emitting radionuclides attributable to plant operations identified in milk samples in 2018. Cs-137 is the only radionuclide, other than naturally occurring, reported in milk samples since 1996. Cs-137 in milk is not unusual. It is a constituent of nuclear weapons test fallout and nuclear plant accidents and has been observed periodically in samples from indicator and control locations since the preoperational period. Airborne Cs-137 has not been released from the plant since 1992.

Table 3.4 lists highest indicator location annual mean and control location annual mean for Cs-137 since the preoperational period.

K-40 is a naturally occurring radionuclide observed in milk samples in 2018.

Table 3.4 Mean Concentration of Radionuclides in Milk

YEAR	Cs-137 Indicator (pCi/l)	Cs-137 Control (pCi/l)
1984	2.95E0	2.98E0
1985	2.11E0	2.12E0
1986	3.76E0	4.54E0
1987 ⁽¹⁾	5.00E0	5.50E0
1988	3.20E0	3.80E0
1989	0.00E0	0.00E0
1990	8.00E0	6.70E0
1991	0.00E0	0.00E0
1992	3.40E0	5.00E0
1993	5.00E0	0.00E0
1994	2.80E0	0.00E0
1995	8.60E0	0.00E0
1996	6.05E0	0.00E0
1997	0.00E0	0.00E0
1998	0.00E0	0.00E0
1999	0.00E0	0.00E0
2000	0.00E0	0.00E0
2001	0.00E0	0.00E0
2002	0.00E0	0.00E0
2003	0.00E0	0.00E0
2004	No Indicator Location	0.00E0
2005	No Indicator Location	0.00E0
2006	No Indicator Location	0.00E0
2007	No Indicator Location	0.00E0
2008	No Indicator Location	0.00E0
2009	No Indicator Location	0.00E0
2010	No Indicator Location	0.00E0
2011	No Indicator Location	0.00E0
2012	No Indicator Location	0.00E0
2013	No Indicator Location	0.00E0
2014 ⁽²⁾	No Indicator Location	0.00E0
2015	No Indicator Location	0.00E0
2016	No Indicator Location	0.00E0
2017	No Indicator Location	0.00E0
2018	No Indicator Location	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

3.5 BROADLEAF VEGETATION

Gamma spectroscopy was performed on 60 broadleaf vegetation samples during 2018. Four indicator locations and one control location were sampled. Cs-137 was reported in one indicator location, Location 201, in three of twelve samples collected with a mean concentration of 46.7 pCi/kg (2.34% of reporting level). Cs-137 was not detected in any of the control samples in 2018.

Cs-137 is the only gamma emitting radionuclide, other than naturally occurring, reported in vegetation samples. It is not unusual for Cs-137 to be present in vegetation. It is a constituent of nuclear weapons test fallout and nuclear plant accidents and has been observed in samples from indicator and control locations since the preoperational period. Table 3.5 lists the highest indicator location annual mean and control location annual mean for Cs-137 since early in the station's operational history. Visual inspection of the tabular data did not reveal any increasing trends.

Figure 3.5 shows indicator and control annual means for Cs-137 in vegetation since 1984. Values shown from 1984 to 2018 show a stable trend for Cs-137 in vegetation. No airborne Cs-137 has been released from the plant since 1992.

K-40 and Be-7 are naturally occurring radionuclides that were observed in broadleaf vegetation samples in 2018.

Figure 3.5

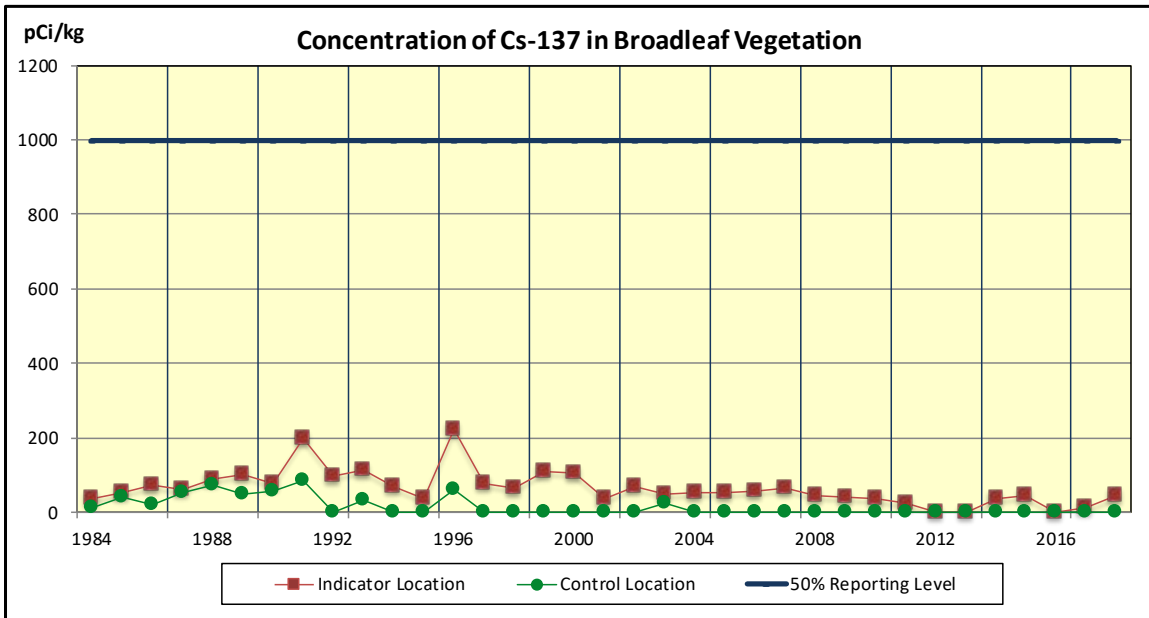


Table 3.5 Mean Concentration of Radionuclides in Broadleaf Vegetation

YEAR	Cs-137 Indicator (pCi/kg)	Cs-137 Control (pCi/kg)
1984	3.76E1	1.30E1
1985	5.48E1	4.16E1
1986	7.42E1	2.22E1
1987 ⁽¹⁾	6.10E1	5.10E1
1988	9.10E1	7.40E1
1989	1.00E2	4.80E1
1990	7.70E1	5.80E1
1991	1.98E2	8.60E1
1992	9.70E1	0.00E0
1993	1.13E2	3.20E1
1994	7.00E1	0.00E0
1995	3.60E1	0.00E0
1996	2.23E2	6.22E1
1997	7.57E1	0.00E0
1998	6.53E1	0.00E0
1999	1.08E2	0.00E0
2000	1.04E2	0.00E0
2001	3.76E1	0.00E0
2002	7.02E1	0.00E0
2003	4.96E1	2.40E1
2004	5.45E1	0.00E0
2005	5.48E1	0.00E0
2006	5.79E1	0.00E0
2007	6.31E1	0.00E0
2008	4.44E1	0.00E0
2009	4.25E1	0.00E0
2010	3.77E1	0.00E0
2011	2.62E1	0.00E0
2012	0.00E0	0.00E0
2013	0.00E0	0.00E0
2014 ⁽²⁾	3.72E1	0.00E0
2015	4.29E1	0.00E0
2016	0.00E0	0.00E0
2017	1.43E1	0.00E0
2018	4.67E1	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

2011 concentration affected by Fukushima Daiichi

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

3.6 FOOD PRODUCTS

Collection of food product samples (crops) from an irrigated garden began in 1989. The irrigated garden is located on Lake Wylie downstream from CNS, Location 260. During the 2018 growing season four samples were collected and analyzed for gamma radionuclides. There were no gamma emitting radionuclides attributable to plant operations identified in food product samples in 2018. There is no control location for this media type.

Table 3.6 shows Cs-137 indicator location highest annual mean concentrations since 1989.

K-40 and Be-7 are naturally occurring radionuclides that were observed in food product samples in 2018.

Table 3.6 Mean Concentration of Radionuclides in Food Products

YEAR	Cs-137 Indicator (pCi/kg)
1989	0.00E0
1990	0.00E0
1991	0.00E0
1992	0.00E0
1993	2.50E1
1994	0.00E0
1995	0.00E0
1996	0.00E0
1997	0.00E0
1998	0.00E0
1999	0.00E0
2000	0.00E0
2001	0.00E0
2002	0.00E0
2003	0.00E0
2004	0.00E0
2005	0.00E0
2006	0.00E0
2007	0.00E0
2008	0.00E0
2009	0.00E0
2010	0.00E0
2011	0.00E0
2012	0.00E0
2013	0.00E0
2014 ⁽¹⁾	0.00E0
2015	0.00E0
2016	0.00E0
2017	0.00E0
2018	0.00E0

0.00E0 indicates no detectable measurements

There is no control location for Food Products.

(1) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

3.7 FISH

Gamma spectroscopy was performed on 12 fish samples collected during 2018. One downstream indicator location and one control location were sampled.

Co-58, Co-60, and Cs-137 are normally the predominant radionuclides identified in fish samples. There were no gamma emitting radionuclides attributable to plant operations identified in any fish samples in 2018.

Figures 3.7-1, 3.7-2, and 3.7-3 are graphs displaying annual mean concentrations for Co-58, Co-60, and Cs-137. Table 3.7 depicts the highest indicator location annual mean for radionuclides detected. In addition, radionuclides identified in fish samples since 1988 have been included in the table. Overall, radionuclides have not shown a significant trend or accumulation.

K-40 was observed in some fish samples collected during 2018.

Figure 3.7-1

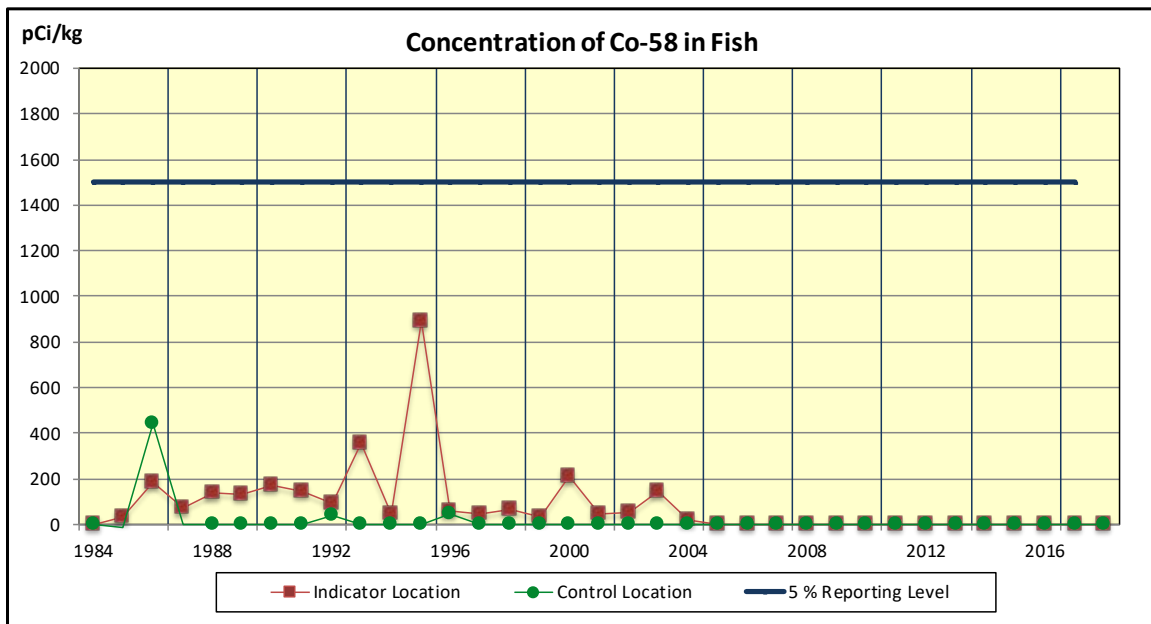


Figure 3.7-2

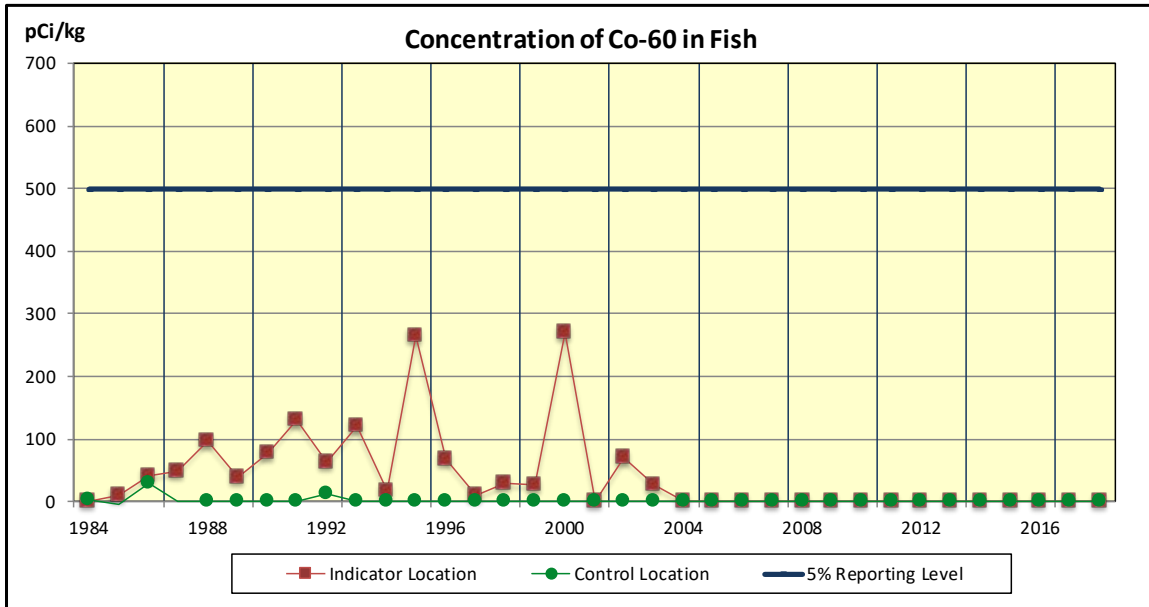


Figure 3.7-3

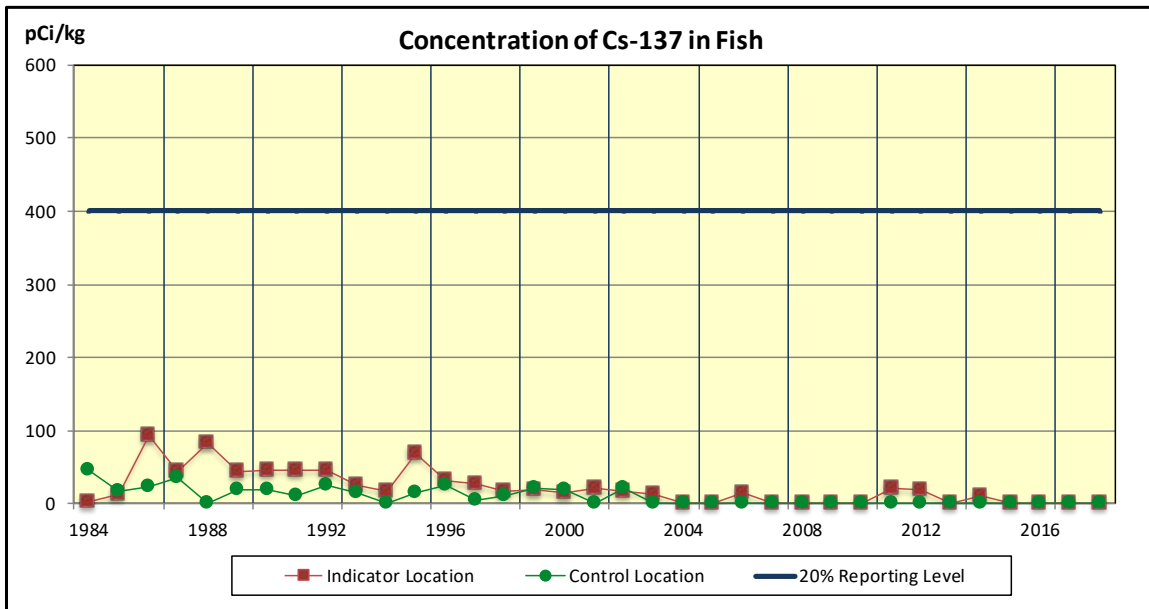


Table 3.7 Mean Concentrations of Radionuclides in Fish (pCi/kg)

Year	Mn-54	Co-58	Co-60	Cs-134	Cs-137	Nb-95	Fe-59	Sb-122	Sb-125
1984	3.07E0	3.00E0	6.11E-1	-5.32E0	1.83E0	0.00E0	0.00E0	0.00E0	0.00E0
1985	7.68E-1	3.40E1	9.11E0	3.22E0	1.28E1	5.07E0	0.00E0	0.00E0	0.00E0
1986	2.01E1	1.86E2	4.01E1	3.51E1	9.29E1	0.00E0	7.30E0	0.00E0	0.00E0
1987 ⁽¹⁾	7.24E0	7.57E1	4.81E1	3.83E0	4.27E1	5.40E0	0.00E0	0.00E0	0.00E0
1988	2.85E1	1.40E2	9.70E1	1.67E1	8.24E1	0.00E0	0.00E0	0.00E0	0.00E0
1989	8.28E0	1.33E2	3.83E1	1.47E1	4.37E1	8.58E-1	0.00E0	0.00E0	0.00E0
1990	2.51E1	1.75E2	7.77E1	1.32E1	4.66E1	3.33E0	0.00E0	7.00E0	9.25E0
1991	3.15E1	1.46E2	1.29E2	1.03E1	4.60E1	7.90E-1	2.30E0	0.00E0	7.45E0
1992	1.34E1	9.02E1	6.20E1	1.27E1	4.61E1	0.00E0	0.00E0	0.00E0	0.00E0
1993	2.14E1	3.58E2	1.21E2	2.73E0	2.56E1	0.00E0	0.00E0	0.00E0	0.00E0
1994	1.91E0	4.75E1	1.81E1	0.00E0	1.75E1	0.00E0	0.00E0	0.00E0	1.45E1
1995	5.65E1	8.90E2	2.66E2	0.00E0	6.77E1	1.38E1	0.00E0	0.00E0	0.00E0
1996	0.00E0	5.95E1	6.68E1	0.00E0	3.02E1	0.00E0	0.00E0	0.00E0	0.00E0
1997	0.00E0	4.93E1	9.88E0	0.00E0	2.74E1	0.00E0	0.00E0	0.00E0	0.00E0
1998	0.00E0	6.44E1	2.86E1	0.00E0	1.58E1	0.00E0	0.00E0	0.00E0	0.00E0
1999	0.00E0	3.12E1	2.71E1	0.00E0	1.87E1	0.00E0	0.00E0	0.00E0	0.00E0
2000	0.00E0	2.13E2	2.69E2	0.00E0	1.52E1	0.00E0	0.00E0	0.00E0	0.00E0
2001	0.00E0	4.66E1	0.00E0	0.00E0	2.08E1	0.00E0	0.00E0	0.00E0	0.00E0
2002	0.00E0	5.23E1	7.00E1	0.00E0	1.73E1	0.00E0	0.00E0	0.00E0	0.00E0
2003	0.00E0	1.43E2	2.61E1	0.00E0	1.19E1	0.00E0	0.00E0	0.00E0	0.00E0
2004	4.92E1	1.81E1	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2005	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2006	0.00E0	0.00E0	0.00E0	0.00E0	1.44E1	0.00E0	0.00E0	0.00E0	0.00E0
2007	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2008	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2009	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2010	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2011	0.00E0	0.00E0	0.00E0	0.00E0	2.16E1	0.00E0	0.00E0	0.00E0	0.00E0
2012	0.00E0	0.00E0	0.00E0	0.00E0	1.84E1	0.00E0	0.00E0	0.00E0	0.00E0
2013	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2014 ⁽²⁾	0.00E0	0.00E0	0.00E0	0.00E0	1.10E1	0.00E0	0.00E0	0.00E0	0.00E0
2015	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2016	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2017	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2018	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

3.8 SHORELINE SEDIMENT

During 2018, a total of 6 shoreline sediment samples was analyzed, four from two indicator locations and two from the control location.

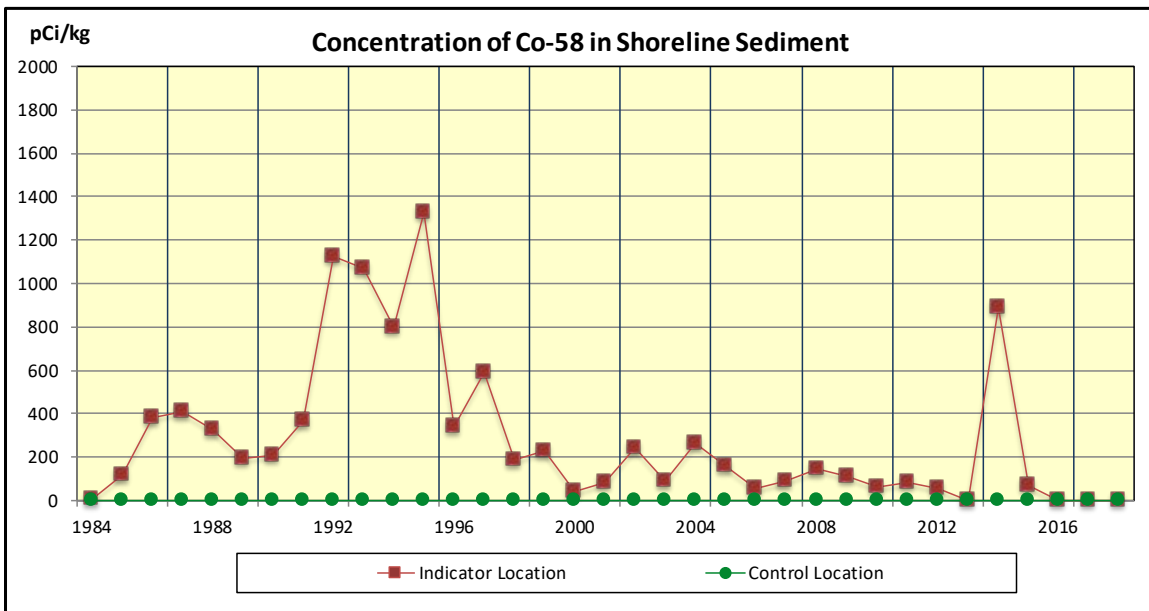
Co-58, Co-60, and Cs-137 are normally the predominant radionuclides identified in shoreline sediment samples. There were no gamma emitting radionuclides attributable to plant operations identified in samples from the indicator locations or the control location.

Table 3.8 lists highest indicator location annual mean since 1984. Included in the table are radionuclides that have been identified in shoreline sediment samples since 1988.

Figures 3.8-1, 3.8-2, and 3.8-3 are graphs displaying annual mean concentrations for Co-58, Co-60, and Cs-137.

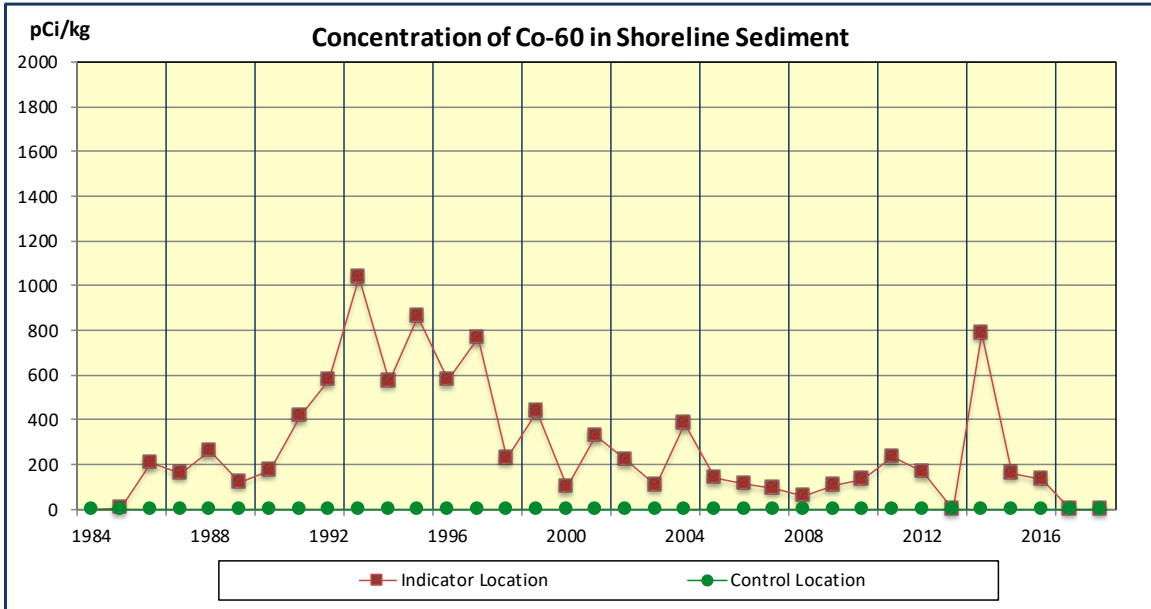
Naturally occurring K-40 was observed in some shoreline sediment samples collected during 2018.

Figure 3.8-1



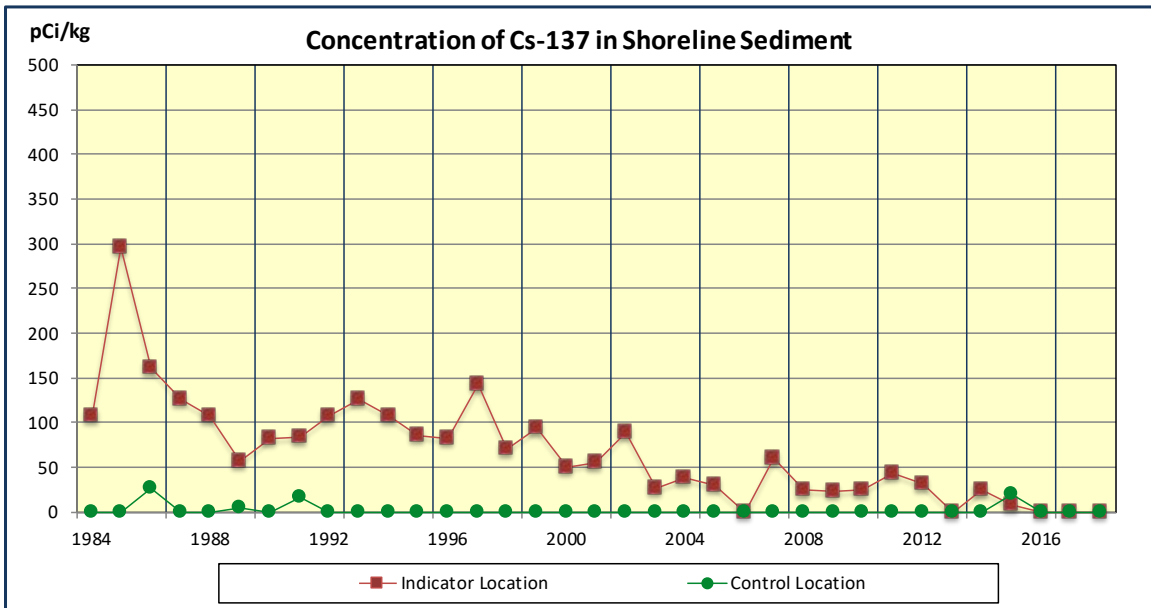
There is no reporting level for Co-58 in Shoreline Sediment

Figure 3.8-2



There is no reporting level for Co-60 in Shoreline Sediment

Figure 3.8-3



There is no reporting level for Cs-137 in Shoreline Sediment

Table 3.8 Mean Concentrations of Radionuclides in Shoreline Sediment (pCi/kg)

Year	Mn-54	Co-58	Co-60	Nb-95	Zr-95	Cs-134	Cs-137	Co-57	Sb-125
1984	1.03E0	4.40E0	-2.34E0	0.00E0	0.00E0	3.19E1	1.07E2	0.00E0	0.00E0
1985	-3.12E0	1.16E2	5.18E0	0.00E0	0.00E0	2.11E2	2.97E2	0.00E0	0.00E0
1986	1.09E2	3.79E2	2.05E2	0.00E0	3.96E1	6.50E1	1.61E2	0.00E0	0.00E0
1987 ⁽¹⁾	8.83E1	4.08E2	1.61E2	4.22E1	0.00E0	6.08E1	1.26E2	0.00E0	0.00E0
1988	1.07E2	3.29E2	2.63E2	2.28E1	7.54E0	2.59E1	1.07E2	7.65E-1	3.68E0
1989	4.58E1	1.94E2	1.21E2	5.02E0	0.00E0	1.65E1	5.77E1	0.00E0	1.57E1
1990	5.39E1	2.08E2	1.77E2	0.00E0	0.00E0	1.66E1	8.18E1	0.00E0	7.15E0
1991	8.50E1	3.70E2	4.19E2	5.30E0	0.00E0	1.82E1	8.33E1	1.20E0	1.50E1
1992	1.17E2	1.13E3	5.80E2	3.50E0	0.00E0	1.69E1	1.07E2	3.00E0	2.70E1
1993	1.33E2	1.07E3	1.04E3	0.00E0	0.00E0	2.80E1	1.26E2	2.47E1	2.16E2
1994	4.93E1	7.98E2	5.73E2	0.00E0	0.00E0	5.67E0	1.07E2	4.38E0	4.60E1
1995	1.02E2	1.33E3	8.65E2	1.13E2	0.00E0	0.00E0	8.50E1	3.69E1	1.49E2
1996	8.73E1	3.39E2	5.81E2	0.00E0	0.00E0	0.00E0	8.30E1	0.00E0	1.96E2
1997	6.96E1	5.90E2	7.64E2	0.00E0	0.00E0	0.00E0	1.43E2	0.00E0	1.76E2
1998	3.07E1	1.88E2	2.30E2	0.00E0	0.00E0	0.00E0	7.11E1	0.00E0	0.00E0
1999	7.28E1	2.29E2	4.39E2	0.00E0	0.00E0	0.00E0	9.42E1	0.00E0	1.40E2
2000	0.00E0	3.90E1	1.03E2	0.00E0	0.00E0	0.00E0	4.96E1	0.00E0	0.00E0
2001	3.86E1	8.27E1	3.29E2	0.00E0	0.00E0	0.00E0	5.58E1	0.00E0	0.00E0
2002	3.51E1	2.41E2	2.22E2	0.00E0	0.00E0	0.00E0	8.83E1	0.00E0	0.00E0
2003	2.17E1	8.75E1	1.08E2	0.00E0	0.00E0	0.00E0	2.69E1	0.00E0	0.00E0
2004	6.60E1	2.67E2	3.83E2	0.00E0	0.00E0	0.00E0	3.79E1	0.00E0	0.00E0
2005	0.00E0	1.61E2	1.41E2	0.00E0	0.00E0	0.00E0	3.04E1	0.00E0	0.00E0
2006	0.00E0	5.40E1	1.11E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2007	0.00E0	8.77E1	9.46E1	0.00E0	0.00E0	0.00E0	6.13E1	0.00E0	0.00E0
2008	0.00E0	1.48E2	6.24E1	0.00E0	0.00E0	0.00E0	2.57E1	0.00E0	0.00E0
2009	0.00E0	1.10E2	1.04E2	0.00E0	0.00E0	0.00E0	2.27E1	0.00E0	0.00E0
2010	0.00E0	6.56E1	1.37E2	0.00E0	0.00E0	0.00E0	2.56E1	0.00E0	0.00E0
2011	0.00E0	8.36E1	2.36E2	0.00E0	0.00E0	3.62E1	4.33E1	1.05E1	0.00E0
2012	0.00E0	5.59E1	1.70E2	0.00E0	0.00E0	0.00E0	3.15E1	0.00E0	0.00E0
2013	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2014 ^{(2) (3)}	6.84E1	8.87E2	7.90E2	0.00E0	0.00E0	0.00E0	2.46E1	0.00E0	0.00E0
2015	0.00E0	6.73E1	1.61E2	0.00E0	0.00E0	0.00E0	8.75E0	0.00E0	0.00E0
2016	0.00E0	0.00E0	1.31E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2017	0.00E0	0.00E0	1.31E2	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0
2018	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0	0.00E0

0.00E0 indicates no detectable measurements

1984 - 1986 mean based on all net activity

(1) 1987 – Gamma spectroscopy system change

(2) 2014 – Gamma spectroscopy system was replaced 10JUL2014. Gamma spectroscopy system hardware, detector cooling apparatus, software, electronics, nuclide identification libraries, and analytical test matrix components for test matrices were modified (NCR # 0739995). No analytical changes were noted due to the 2014 gamma spectroscopy system change.

(3) 2014 – During the 3rd quarter, CNS experienced higher levels than normal of mixed fission and activation products in the liquid radioactive waste processing system and higher than normal liquid waste discharges (NCR # 01897053).

3.9 DIRECT GAMMA RADIATION

3.9.1 ENVIRONMENTAL TLD

Catawba is licensed with an exclusion area boundary defined by UFSAR Section 2.1.1.2 as a 2500 foot radius from station center. This is the same boundary established for determining radioactive effluent release limits. No permanent public access is permitted within the exclusion area. TLD locations designated as "inner ring" are within a 1 mile radius from station center and all are used as indicators. TLD locations designated as "outer ring" are outside the 1 mile "inner ring" but within a 5 mile radius of station center. All outer ring TLD locations are used as indicators. A subset of TLD locations within a 7 to 11 mile radius from station center are designated as "special interest." The three "control" locations are greater than 7 miles from station center. These locations were chosen to reduce the probability of influence from Catawba operation on data. The control locations are not used as background subtraction in the TLD analysis. Their purpose is to provide a comparison to indicator locations.

In 2018, 163 total TLDs were analyzed, 151 at indicator locations and 12 at control locations. TLDs are collected and analyzed quarterly. Transit and laboratory background dose is determined and subtracted from gross field readings as required by ANSI N545-1975. Based on Appendix B TLD data, the highest annual total dose was 83.2 mrem at indicator location 206, 0.67 miles WNW of station center. Figure 3.9 and Table 3.9-A show TLD inner ring, outer ring, and control location annual averages in mrem per year. Data is provided from 1984 when TLD locations were added and arranged in an inner ring and outer ring configuration. Preoperational data is also provided in the table. As shown in the graph, doses measured by environmental TLDs show little or no change since the current TLD system was implemented. Comparing data from the 2018 Catawba Annual Radiological Effluent Release Report (ARERR), dose to a member of the public resulting from gaseous effluent releases at Catawba is a small fraction of measured TLD dose. Therefore, it can be concluded that gaseous effluents from Catawba had negligible impact on measured TLD values.

Starting in 2014, enhanced analytical methods were implemented. Quarterly and annual baseline dose was determined using appropriate statistical methods considering data from 2000 through 2012. Quarterly and annual dose for 2018 was compared to baseline values to determine if an Investigation Level had been exceeded for evaluation of potential dose to a member of the public. No TLD location exceeded the Quarterly or Annual Investigation Level in 2018, therefore no evaluation of dose to a member of the public from direct or scattered radiation was performed. Table 3.9-B summarizes the data.

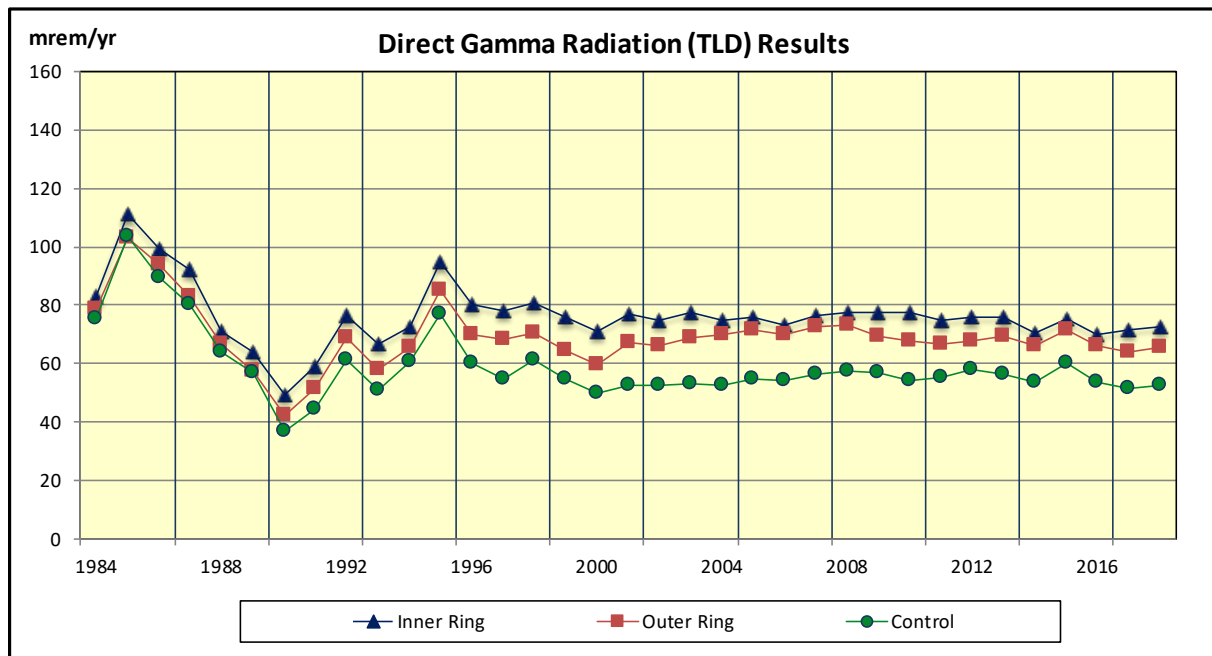
A TLD intercomparison program is conducted as part of the quality assurance program. Results of this program are included in section 5.7.

3.9.2 ISFSI

The Catawba ISFSI began operation in 2007. It is located approximately 0.2 miles north of station center in a secured area specifically constructed to provide dry storage for spent nuclear fuel. The ISFSI employs the NAC-UMS® and MAGNASTOR® vertical storage designs. Irradiated fuel assemblies are confined, protected, and shielded by a reinforced concrete modules. Both systems are completely passive and designed to provide radiation shielding and safe confinement for a range of accident conditions and natural events. Both systems use a passive natural circulation ventilation system to remove decay heat from the modules. No radiological liquid or gaseous effluents are expected from the passive storage provided by the ISFSI. Therefore, any dose to offsite locations would be from direct and scattered gamma radiation.

Environmental TLD results described in 3.9.1 above are reviewed quarterly to identify trends and demonstrate compliance with dose and dose rate limits at the 2500 foot exclusion area boundary. Additional TLD locations not associated with REMP are presently located on the Catawba protected area fence near the ISFSI and on the ISFSI boundary. These are used to demonstrate compliance with occupational exposure controls and augment REMP TLD results. Doses measured by environmental TLDs show little or no change since the ISFSI began operation.

Figure 3.9



There is no reporting level for Direct Radiation (TLD)

Table 3.9-A Direct Gamma Radiation (TLD) Results⁽¹⁾

Year	Inner Ring Average (mrem/yr)	Outer Ring Average (mrem/yr)	Control Average (mrem/yr)
1984*	8.31E1	7.85E1	7.53E1
1985	1.11E2	1.03E2	1.03E2
1986	9.91E1	9.36E1	8.97E1
1987	9.22E1	8.30E1	8.05E1
1988	7.09E1	6.68E1	6.37E1
1989	6.37E1	5.78E1	5.70E1
1990	4.94E1	4.23E1	3.71E1
1991	5.89E1	5.14E1	4.44E1
1992	7.64E1	6.89E1	6.13E1
1993	6.68E1	5.79E1	5.09E1
1994	7.25E1	6.58E1	6.07E1
1995	9.46E1	8.52E1	7.68E1
1996	8.01E1	7.02E1	6.04E1
1997	7.83E1	6.83E1	5.45E1
1998	8.10E1	7.05E1	6.14E1
1999	7.60E1	6.47E1	5.49E1
2000	7.13E1	5.98E1	4.98E1
2001	7.69E1	6.72E1	5.24E1
2002	7.49E1	6.60E1	5.24E1
2003	7.76E1	6.90E1	5.32E1
2004	7.47E1	7.01E1	5.28E1
2005	7.58E1	7.15E1	5.48E1
2006	7.31E1	6.99E1	5.43E1
2007	7.65E1	7.26E1	5.62E1
2008	7.74E1	7.32E1	5.74E1
2009	7.73E1	6.94E1	5.70E1
2010	7.74E1	6.80E1	5.43E1
2011	7.50E1	6.67E1	5.54E1
2012	7.61E1	6.80E1	5.83E1
2013	7.60E1	6.92E1	5.65E1
2014	7.07E1	6.60E1	5.40E1
2015	7.51E1	7.14E1	6.00E1
2016	7.00E1	6.61E1	5.37E1
2017	7.15E1	6.38E1	5.13E1
2018	7.26E1	6.58E1	5.25E1

* Preoperational Data

(1) 2014 AREOR, tabular results converted from mR/yr to mrem/yr (n * 0.95)

Table 3.9-B definition of terms

- MDD_Q = minimum differential dose, quarterly, 3 times 90th percentile s_Q determined from analysis in mrem
- MDD_A = minimum differential dose, annual, 3 times 90th percentile s_A determined from analysis in mrem
- B_Q = Quarterly baseline (mrem)
- M_Q = location's 91 day standard quarter normalized dose (mrem per standard quarter)
- L_Q = quarterly investigation level dose (mrem)
- B_A = baseline background dose (mrem) (annual)
- M_A = annual monitoring data - M_a determined by normalizing available quarterly data to 4 full quarters
- L_A = annual investigation level dose (mrem)
- ND = not detected

3.10 LAND USE CENSUS

The 2018 Annual Land Use Census was conducted June 19 - 20, 2018 as required by SLC 16.11-14. Table 3.10 summarizes census results. A map indicating identified locations is shown in Figure 3.10.

During the 2018 census no irrigated gardens (superior to existing gardens) or milk locations were identified. The nearest residence is located in the NE sector at 0.56 miles. No environmental program changes were required as a result of the 2018 land use census.

Table 3.10 Catawba 2018 Land Use Census Results

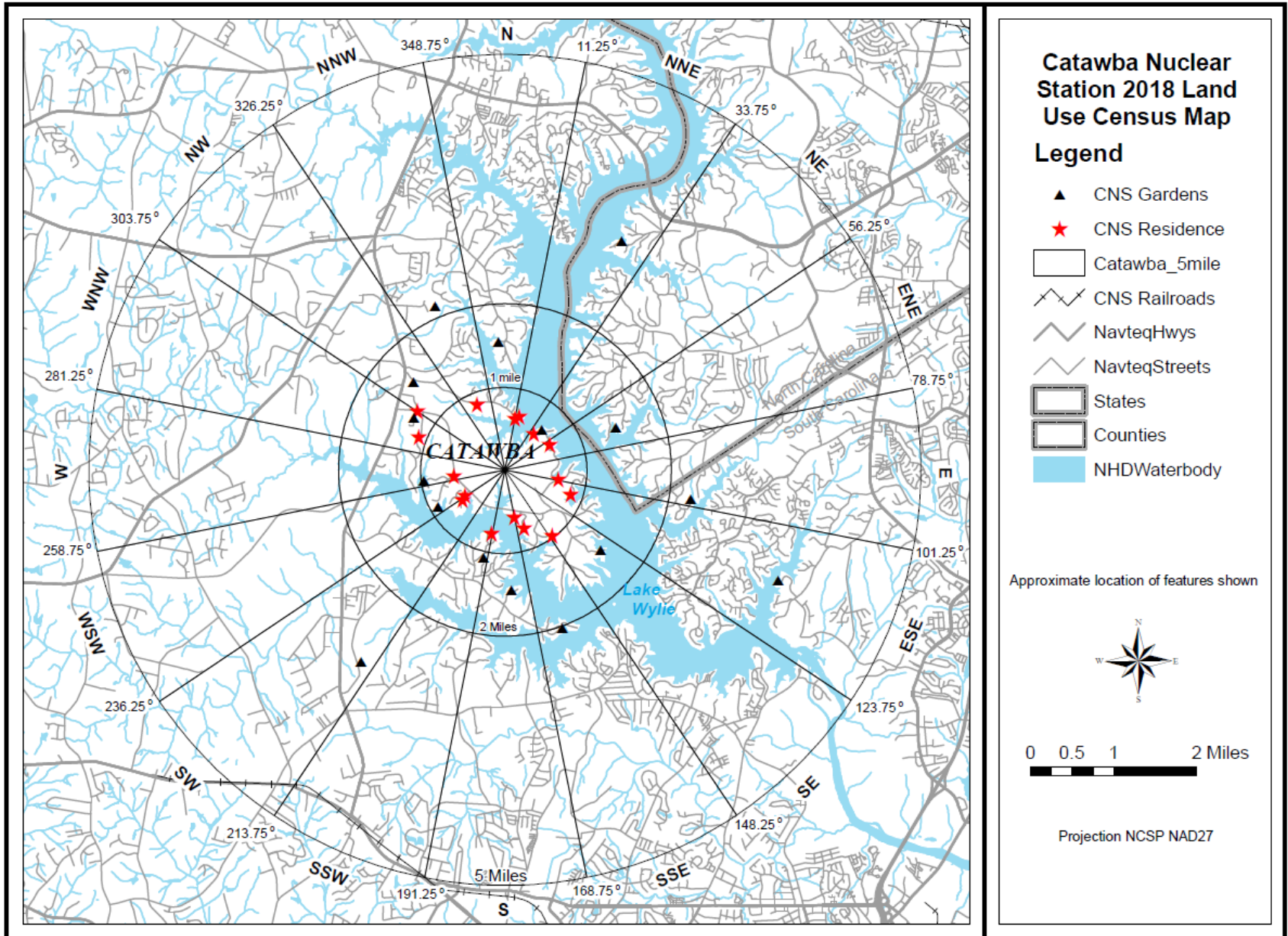
**Performed 6/19/2018 - 6/20/2018
Nearest Pathways (Miles)**

SECTOR	RESIDENCE		GARDEN		MILK ANIMAL	
	2017	2018	2017	2018	2017	2018
North	0.63	0.63	1.74	1.55*	---	---
North-Northeast	0.66	0.66	0.69	3.09*	---	---
Northeast	0.56	0.56	0.67	0.67	---	---
East-Northeast	0.61	0.61	1.44	1.44	---	---
East	0.65	0.65	2.26	2.26	---	---
East-Southeast	0.84	0.84	1.29	3.54*	---	---
Southeast	0.97	0.97	1.50	1.50	---	---
South-Southeast	0.74	0.74	1.64	2.02*	---	---
South	0.63	0.63	1.25	1.45*	---	---
South-Southwest	0.78	0.78	1.33	1.08*	---	---
Southwest	0.63	0.63	2.32	2.88*	---	---
West-Southwest	0.57	0.57	0.91	0.91	---	---
West	0.62	0.62	0.96	0.96	---	---
West-Northwest	1.10	1.10	2.53	1.27*	---	---
Northwest	1.27	1.27	1.54	1.54	---	---
North-Northwest	0.86	0.86	2.13	2.13	---	---

NOTE: Sector and distances were determined by Global Positioning System

*** Represents a change from the previous year**

Figure 3.10



4.0 EVALUATION OF DOSE

4.1 DOSE FROM ENVIRONMENTAL MEASUREMENTS

Annual doses to maximum exposed individuals were estimated based on measured concentrations of radionuclides in 2018 CNS REMP samples. The primary purpose of estimating doses based on sample results is to allow comparison to effluent program dose estimates.

Doses based on REMP sample results were calculated using the methodology and data presented in NRC Regulatory Guide 1.109. Measured radionuclide concentrations, averaged over the entire year for a specific radionuclide, indicator location, and sample type, were used to calculate REMP-based doses, after subtracting the applicable average background concentration (as measured at the corresponding control location). Regulatory Guide 1.109 consumption rates for the maximum exposed individual were used in the calculations. A dose factor of zero was assumed when the guide listed “NO DATA” as the dose factor for a given radionuclide and organ.

Maximum dose estimates (Highest Annual Mean Concentration) based on drinking water, fish, and vegetation sample results are reported in Table 4.1-A. The individual critical population and pathway dose calculations are reported in Table 4.1-B.

REMP-based dose estimates are not reported for airborne radioiodine, airborne particulate, milk, or ground water sample types because no radionuclides attributable to CNS operations were detected. Naturally occurring K-40 and Be-7 were detected in some samples but were not included in any REMP-based dose estimates. Dose estimates are not reported for surface water because sampled surface water is not considered to be a potable drinking water source although surface water tritium concentrations are used in calculating doses from fish. Exposure estimates based upon REMP TLD results are discussed in Section 3.9.

The maximum environmental organ dose estimate for any single sample type (excluding TLD results) collected during 2018 was 3.97E-01 mrem to the child bone from the consumption of vegetation.

4.2 ESTIMATED DOSE FROM RELEASES

Throughout the year, dose estimates were calculated based on actual 2018 liquid and gaseous effluent release data. Effluent-based dose estimates were calculated using the RETDAS computer program which employs methodology and data presented in NRC Regulatory Guide 1.109. These doses are shown in Table 4.1-A along with the corresponding REMP-based dose estimates. Summaries of RETDAS dose calculations are reported in the Annual Radioactive Effluent Release Report.

The effluent-based liquid release doses are summations of the dose contributions from the drinking water, fish, and shoreline pathways. For iodine, particulate, and tritium exposure the effluent-based gaseous release doses are summations of the dose contributors from ground/plane, inhalation, milk and vegetation pathways.

4.3 COMPARISON OF DOSES

The environmental and effluent dose estimates given in Table 4.1-A agree reasonably well. The similarity of the doses indicate that the radioactivity levels in the environment do not differ significantly from those expected based on effluent measurements and modeling of the environmental exposure pathways. This indicates that effluent program dose estimates are both valid and reasonably conservative.

There are some differences in how effluent and environmental doses are calculated that affect the comparison. Doses calculated from environmental data are conservative because they are based on a mean that includes only samples with a net positive activity versus a mean that includes all sample results (i.e. zero results are not included in the mean). Also, airborne tritium is not measured in environmental samples but is used to calculate effluent doses.

Additionally, in 2010 Catawba began reporting estimated dose from effluent Carbon 14 (C-14). This change came about with the issuing of Regulatory Guide 1.21, Revision 2, Measuring, Evaluating and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste. A description of this change is found in the 2010 Annual Radiological Effluent Release Report. C-14 is not easily measured in the environment and therefore, environmental and effluent doses from C-14 cannot be compared directly.

In calculations based on environmental data, the liquid release pathways of drinking water and fish were the predominant dose pathways. Liquid effluent release data indicated drinking water, fish, and shoreline sediment as the predominant dose pathways. The maximum total organ dose based on 2018 environmental sample results was 2.34E-2 mrem to the child liver, total body, thyroid, kidney, lung, and GI-LLI. The maximum total organ dose of 9.52E-2 mrem for liquid effluent-based estimates was to the child liver.

In calculations based on gaseous release pathways, vegetation was the predominant dose pathway based on effluent data. The maximum total organ dose based on 2018 gaseous effluent estimates was 4.73E0 mrem to the child bone, with C-14 being the primary dose contributor. Vegetation was the only gaseous release pathway media that contained detectable activity. The maximum total organ dose for gaseous environmental estimates was 3.97E-1 mrem to the child bone.

The doses calculated do not exceed 40CFR190 or 10CFR50 dose commitment limits for members of the public. Doses to members of the public attributable to the operation of CNS are being maintained well within regulatory limits and are described in the Annual Radiological Effluent Release Report (ARERR).

TABLE 4.1-A

**CATAWBA NUCLEAR STATION
2018 ENVIRONMENTAL AND EFFLUENT DOSE COMPARISON**

LIQUID RELEASE PATHWAY

Organ	Environmental or Effluent Data	Critical Age ⁽¹⁾	Critical Pathway ⁽²⁾	Location	Maximum Dose ⁽³⁾ (mrem)
Skin	Environmental	-	-	-	-
Skin	Effluent	Child	Shoreline Sediment	Discharge Pt.	1.87E-03
Bone	Environmental	-	-	-	-
Bone	Effluent	Child	Fresh Water Fish	Discharge Pt.	8.03E-02
Liver	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
Liver	Effluent	Child	Drinking Water	7.30 mi SSE	9.52E-02
T. Body	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
T. Body	Effluent	Child	Drinking Water	7.30 mi SSE	9.26E-02
Thyroid	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
Thyroid	Effluent	Child	Drinking Water	7.30 mi SSE	8.86E-02
Kidney	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
Kidney	Effluent	Child	Drinking Water	7.30 mi SSE	8.92E-02
Lung	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
Lung	Effluent	Child	Drinking Water	7.30 mi SSE	8.91E-02
GI-LLI	Environmental	Child	Drinking Water	214 (7.30 mi SSE)	2.34E-02
GI-LLI	Effluent	Child	Drinking Water	7.30 mi SSE	9.20E-02

- (1) Critical Age is the highest total dose (all pathways) to an age group.
- (2) Critical Pathway is the highest individual dose within the identified Critical Age group.
- (3) Maximum dose is a summation of the fish, drinking water and shoreline sediment pathways.

GASEOUS RELEASE PATHWAY**IODINE, PARTICULATE, and TRITIUM**

Organ	Environmental or Effluent Data	Critical Age ⁽¹⁾	Critical Pathway ⁽²⁾	Location	Maximum Dose ⁽³⁾ (mrem)
Skin	Environmental	-	-	-	-
Skin	Effluent	All	Ground Plane	0.5 mi NNE	0.00E+00
Bone	Environmental	Child	Vegetation	201 (0.53 mi NE)	3.97E-01
Bone	Effluent	Child	Vegetation	0.5 mi NE	4.73E+00
Liver	Environmental	Child	Vegetation	201 (0.53 mi NE)	3.80E-01
Liver	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00
T. Body	Environmental	Adult	Vegetation	201 (0.53 mi NE)	2.13E-01
T. Body	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00
Thyroid	Environmental	-	-	-	-
Thyroid	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00
Kidney	Environmental	Child	Vegetation	201 (0.53 mi NE)	1.24E-01
Kidney	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00
Lung	Environmental	Child	Vegetation	201 (0.53 mi NE)	4.46E-02
Lung	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00
GI-LLI	Environmental	Child	Vegetation	201 (0.53 mi NE)	2.38E-02
GI-LLI	Effluent	Child	Vegetation	0.5 mi NE	1.87E+00

(1) Critical Age is the highest total dose (all pathways) to an age group.

(2) Critical Pathway is the highest individual dose within the identified Critical Age group.

(3) Maximum dose is a summation of the ground/plane, inhalation, milk and vegetation pathways.

TABLE 4.1-B*Maximum Individual Dose for 2018 based on Environmental Measurements (mrem) for Catawba Nuclear Station*

Age	Sample Medium	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Skin
Infant	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	<u>TOTAL</u>	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	0.00E+00
Child	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	3.97E-01	3.80E-01	5.61E-02	0.00E+00	1.24E-01	4.46E-02	2.38E-02	0.00E+00
	Fish	0.00E+00	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	<u>TOTAL</u>	3.97E-01	4.04E-01	7.97E-02	2.36E-02	1.48E-01	6.82E-02	4.74E-02	0.00E+00
Teen	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	2.20E-01	2.92E-01	1.02E-01	0.00E+00	9.94E-02	3.86E-02	4.16E-03	0.00E+00
	Fish	0.00E+00	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	<u>TOTAL</u>	2.20E-01	3.10E-01	1.20E-01	1.82E-02	1.18E-01	5.68E-02	2.24E-02	0.00E+00
Adult	Airborne	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Drinking Water	0.00E+00	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	0.00E+00
	Milk	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Broadleaf Vegetation	2.38E-01	3.26E-01	2.13E-01	0.00E+00	1.11E-01	3.68E-02	6.31E-03	0.00E+00
	Fish	0.00E+00	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	0.00E+00
	Shoreline Sediment	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	<u>TOTAL</u>	2.38E-01	3.51E-01	2.38E-01	2.46E-02	1.36E-01	6.14E-02	3.09E-02	0.00E+00

Note: Dose tables are provided for sample media displaying positive nuclide occurrence.

Catawba Nuclear Station
Dose from Drinking Water Pathway for 2018 Data
Maximum Exposed Infant

Infant Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 330 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.99E-05	4.51E-06	NO DATA	4.41E-06	NO DATA	7.31E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	3.60E-06	8.98E-06	NO DATA	NO DATA	NO DATA	8.97E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	3.08E-05	5.38E-05	2.12E-05	NO DATA	NO DATA	1.59E-05	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	1.08E-05	2.55E-05	NO DATA	NO DATA	NO DATA	2.57E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.84E-05	6.31E-05	2.91E-05	NO DATA	3.06E-05	NO DATA	5.33E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	4.20E-08	1.73E-08	1.00E-08	NO DATA	1.24E-08	NO DATA	1.46E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	2.06E-07	5.02E-08	3.56E-08	NO DATA	5.41E-08	NO DATA	2.50E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	3.59E-05	4.23E-05	1.86E-05	1.39E-02	4.94E-05	NO DATA	1.51E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	3.77E-04	7.03E-04	7.10E-05	NO DATA	1.81E-04	7.42E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	5.22E-04	6.11E-04	4.33E-05	NO DATA	1.64E-04	6.64E-05	1.91E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	1.71E-04	1.71E-07	8.81E-06	NO DATA	4.06E-08	1.05E-07	4.20E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	214	145	0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02
Dose Commitment (mrem) =										0.00E+00	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02	1.47E-02

***Catawba Nuclear Station
Dose from Drinking Water Pathway for 2018 Data
Maximum Exposed Child***

Child Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 510 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C0-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	8.31E-05	7.28E-08	4.85E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	214	145	0.00E+00	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02
Dose Commitment (mrem) =										0.00E+00	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02	1.50E-02

Catawba Nuclear Station
Dose from Drinking Water Pathway for 2018 Data
Maximum Exposed Teen

Teen Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 510 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	9.72E-07	2.24E-06	NO DATA	NO DATA	NO DATA	1.34E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	5.87E-06	1.37E-05	5.29E-06	NO DATA	NO DATA	4.32E-06	3.24E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.81E-06	6.33E-06	NO DATA	NO DATA	NO DATA	3.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	5.76E-06	2.00E-05	9.33E-06	NO DATA	1.28E-05	NO DATA	8.47E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.91E-08	NO DATA	3.00E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.84E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	214	145	0.00E+00	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03
Dose Commitment (mrem)=										0.00E+00	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03	7.84E-03

Catawba Nuclear Station
Dose from Drinking Water Pathway for 2018 Data
Maximum Exposed Adult

Adult Dose from Drinking Water Pathway (mrem) = Usage (l) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/l)

Usage (intake in one year) = 730 l

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Water (pCi/l)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	7.45E-07	1.67E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	4.34E-06	1.02E-05	3.91E-06	NO DATA	NO DATA	2.85E-06	3.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.14E-06	4.72E-06	NO DATA	NO DATA	NO DATA	4.02E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.84E-06	1.54E-05	6.96E-06	NO DATA	1.03E-05	NO DATA	9.70E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr-95	3.04E-08	9.75E-09	6.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BaLa-140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-08	4.18E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	214	145	0.00E+00	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02
Dose Commitment (mrem) =										0.00E+00	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02

***Catawba Nuclear Station
Dose from Broadleaf Vegetation Pathway for 2018 Data
Maximum Exposed Child***

Child Dose from Vegetation Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

Usage (intake in one year) = 26 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	201	46.7	3.97E-01	3.80E-01	5.61E-02	0.00E+00	1.24E-01	4.46E-02	2.38E-03
Dose Commitment (mrem) =										3.97E-01	3.80E-01	5.61E-02	0.00E+00	1.24E-01	4.46E-02	2.38E-03

***Catawba Nuclear Station
Dose from Broadleaf Vegetation Pathway for 2018 Data
Maximum Exposed Teen***

Teen Dose from Vegetation Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

Usage (intake in one year) = 42 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	201	46.7	2.20E-01	2.92E-01	1.02E-01	0.00E+00	9.94E-02	3.86E-02	4.16E-03
Dose Commitment (mrem) =										2.20E-01	2.92E-01	1.02E-01	0.00E+00	9.94E-02	3.86E-02	4.16E-03

***Catawba Nuclear Station
Dose from Broadleaf Vegetation Pathway for 2018 Data
Maximum Exposed Adult***

Adult Dose from Vegetation (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

Usage (intake in one year) = 64 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Food (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
I-131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	201	46.7	2.38E-01	3.26E-01	2.13E-01	0.00E+00	1.11E-01	3.68E-02	6.31E-03
Dose Commitment (mrem) =										2.38E-01	3.26E-01	2.13E-01	0.00E+00	1.11E-01	3.68E-02	6.31E-03

Catawba Nuclear Station
Dose from Fish Pathway for 2018 Data
Maximum Exposed Child

Child Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6791 pCi/l x 0.9 = 6112 pCi/kg

Usage (intake in one year) = 6.9 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Indicator Location	Fish (pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C0-60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	1.37E-05	3.65E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	208	6112	0.00E+00	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03
Dose Commitment (mrem) =										0.00E+00	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03

***Catawba Nuclear Station
Dose from Fish Pathway for 2018 Data
Maximum Exposed Teen***

Teen Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6791 pCi/l x 0.9 = 6112 pCi/kg

Usage (intake in one year) = 16 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	(pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	9.72E-07	2.24E-06	NO DATA	NO DATA	NO DATA	1.34E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	5.87E-06	1.37E-05	5.29E-06	NO DATA	NO DATA	4.32E-06	3.24E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.81E-06	6.33E-06	NO DATA	NO DATA	NO DATA	3.66E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	5.76E-06	2.00E-05	9.33E-06	NO DATA	1.28E-05	NO DATA	8.47E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	208	6112	0.00E+00	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02
Dose Commitment (mrem) =										0.00E+00	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02

Catawba Nuclear Station
Dose from Fish Pathway for 2018 Data
Maximum Exposed Adult

Adult Dose from Fish Pathway (mrem) = Usage (kg) x Dose Factor (mrem/pCi ingested) x Concentration (pCi/kg)

H-3 Concentration in Fish = Surface Water pCi/l x Bioaccumulation Factor 0.9 pCi/kg per pCi/l = 6791 pCi/l x 0.9 = 6112 pCi/kg

Usage (intake in one year) = 21 kg

Radionuclide	<u>Ingestion Dose Factor</u>							<u>Highest Annual Net Mean Concentration</u>		<u>Dose (mrem)</u>						
	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI	Location	(pCi/kg)	Bone	Liver	T. Body	Thyroid	Kidney	Lung	GI-LLI
Mn-54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	NO DATA	7.45E-07	1.67E-06	NO DATA	NO DATA	NO DATA	1.51E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	4.34E-06	1.02E-05	3.91E-06	NO DATA	NO DATA	2.85E-06	3.40E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	NO DATA	2.14E-06	4.72E-06	NO DATA	NO DATA	NO DATA	4.02E-05	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	4.84E-06	1.54E-05	6.96E-06	NO DATA	1.03E-05	NO DATA	9.70E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06	ALL	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
H-3	NO DATA	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	208	6112	0.00E+00	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02
Dose Commitment (mrem) =										0.00E+00	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02	1.35E-02

5.0 QUALITY ASSURANCE

5.1 SAMPLE COLLECTION

EnRad Laboratories and Environmental Services performed the environmental sample collections as specified by approved sample collection procedures.

5.2 SAMPLE ANALYSIS

EnRad Laboratories performed the environmental sample analyses as specified by approved analysis procedures. EnRad Laboratories is located in Huntersville, North Carolina, at Duke Energy's Environmental Center.

5.3 DOSIMETRY ANALYSIS

The Dosimetry and Records group performed the environmental dosimetry measurements as specified by approved dosimetry analysis procedures. The Dosimetry and Records Laboratory is located in Huntersville, North Carolina, at Duke Energy's Environmental Center.

5.4 LABORATORY EQUIPMENT QUALITY ASSURANCE

5.4.1 DAILY QUALITY CONTROL

EnRad Laboratories has an internal quality assurance program which monitors each type of instrumentation for reliability and accuracy. Daily quality control checks ensure that instruments are in proper working order and these checks are used to monitor instrument performance.

5.4.2 CALIBRATION VERIFICATION

National Institute of Standards and Technology (NIST) standards that represent counting geometries are analyzed as unknowns at various frequencies ranging from weekly to annually to verify that efficiency calibrations are valid. The frequency is dependent upon instrument use and performance. Investigations are performed and documented should calibration verification data fall outside of the acceptable limits.

5.4.3 BATCH PROCESSING

Method quality control samples are analyzed with sample analyses that are processed in batches. These include tritium analyses in drinking water, surface water, and ground water samples.

5.5 DUKE ENERGY INTERLABORATORY COMPARISON PROGRAM

In 2018 Duke Energy Environmental Laboratory (EnRad) participated in interlaboratory programs to satisfy Radiological Environmental Monitoring Program requirements in Duke Energy nuclear plant Offsite Dose Calculation Manuals and Selected Licensee Commitments Manuals, as applicable.

EnRad Laboratory participated in an interlaboratory program with Eckert & Ziegler Analytics (EZA) in 2018. EZA results were evaluated against the NRC Inspection Manual Procedure 84750 (IP 84750) acceptance criteria stated in EnRad Procedure 515, Cross Check Program Administration. All regulatory requirements continue to be met by the EZA Cross Check Program.

5.5.1 ECKERT & ZIEGLER ANALYTICS CROSS CHECK PROGRAM

EZA mixed gamma in liquid, mixed gamma in soil, low-level I-131 in liquid, mixed gamma air filter composites, I-131 air cartridges, strontium in water, gross alpha and beta in water, gross alpha and beta in filters, and tritium in water were analyzed at various times of the year at EnRad Laboratories. A summary of the applicable REMP EnRad Laboratory program results for 2018 is documented in Table 5.0-A.

Interlaboratory cross check samples from EZA were received and analyzed in three of the four quarters of 2018. Table 5.0-A lists the performance for specific samples. Forty-six nuclide results were reported to EZA of which forty-six (100 %) met the acceptance criteria based on IP 84750.

5.6 INTERCOMPARISON PROGRAM

Catawba Nuclear Station routinely participates in an environmental sample intercomparison program. Program elements include sampling frequency and analysis parameters for drinking water, surface water, milk, fish, broadleaf vegetation, crops, and shoreline sediment samples that have been collected. Samples are routinely split with a vendor laboratory for intercomparison analysis.

5.7 TLD INTERCOMPARISON PROGRAM

5.7.1 NUCLEAR TECHNOLOGY SERVICES INTERCOMPARISON PROGRAM

Radiation Dosimetry and Records participates in a quarterly TLD intercomparison program administered by Nuclear Technology Services, Inc. of Roswell, GA. Nuclear Technology Services irradiates environmental dosimeters quarterly and sends them to the Radiation Dosimetry and Records group for analysis of the unknown estimated delivered exposure. A summary of the 2018 Nuclear Technology Services Intercomparison Report is documented in Table 5.0-B.

The individual measurements were evaluated and results falling outside the acceptable ratio criteria had an evaluation performed to identify any recommended remedial actions and to reduce anomalous errors.

5.7.2 INTERNAL CROSS CHECK (DUKE ENERGY)

Radiation Dosimetry and Records participates in a quarterly TLD internal comparison program administered internally by the Dosimetry Lab. The Dosimetry Lab Staff irradiates environmental dosimeters quarterly and submits them for analysis of the unknown estimated delivered exposure. A summary of the 2018 Internal Cross Check (Duke Energy) Program is documented in Table 5.0-B.

5.8 GENERAL ENGINEERING LABORATORY, LLC (GEL)

General Engineering Laboratory, LLC (GEL) participated in various Quality Assurance Programs for Inter-laboratory, Intra-laboratory, Third Party Cross Check programs, and a number of proficiency testing programs during 2018. A summary of the GEL quality assurance program results for the sample media types sent to GEL during 2018 is documented in Table 5.0-C. Table 5.0-C may not be applicable to all plants or stations.

TABLE 5.0-A

ECKERT & ZIEGLER ANALYTICS

CROSS CHECK PROGRAM

2018 Cross Check Results for EnRad Laboratories

Interlaboratory cross check samples from EZA were received and analyzed in three of the four quarters of 2018. Results are reported directly to Eckert & Ziegler Analytics. Environmental cross check samples were analyzed in replicate, and the result closest to the mean is reported to Eckert & Ziegler Analytics. The acceptance criteria for the program was based on the NRC Inspection Manual Procedure 84750 (IP 84750). Table 5.0-A lists the performance for specific samples. Forty-six nuclide results were reported to EZA of which forty-six (100 %) met the acceptance criteria based on IP 84750.

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Beta Filter in Planchet	E12096	Cs-137	1	pCi	212	207	1.02	Agreement
	E12180	Cs-137	2	pCi	202	210	0.96	Agreement
I-131 in Charcoal Cartridge	E12095	I-131	1	pCi	99.2	95.3	1.04	Agreement
	E12246	I-131	3	pCi	82.0	81.6	1.00	Agreement
Gamma in Composite Filter	E12094	Ce-141	1	pCi	83.8	82.0	1.02	Agreement
		Co-58	1	pCi	124	121	1.02	Agreement
		Co-60	1	pCi	197	199	0.99	Agreement
		Cr-51	1	pCi	349	347	1.01	Agreement
		Cs-134	1	pCi	180	191	0.94	Agreement
		Cs-137	1	pCi	192	183	1.05	Agreement
		Fe-59	1	pCi	160	148	1.08	Agreement
		Mn-54	1	pCi	138	140	0.99	Agreement
		Zn-65	1	pCi	283	260	1.09	Agreement
Gamma in Simulated Soil	E12249	Ce-141	3	pCi/g	0.217	0.221	0.98	Agreement
		Co-58	3	pCi/g	0.239	0.248	0.96	Agreement
		Co-60	3	pCi/g	0.317	0.328	0.97	Agreement
		Cr-51	3	pCi/g	0.407	0.457	0.89	Agreement
		Cs-134	3	pCi/g	0.207	0.212	0.98	Agreement
		Cs-137	3	pCi/g	0.311	0.330	0.94	Agreement
		Fe-59	3	pCi/g	0.196	0.206	0.95	Agreement
		Mn-54	3	pCi/g	0.309	0.289	1.07	Agreement
		Zn-65	3	pCi/g	0.362	0.347	1.04	Agreement

TABLE 5.0-A (Cont.)

Sample	Sample ID	Nuclide	Quarter	Units	EnRad Value	EZA Value	EnRad/EZA Ratio	Evaluation
Gamma in Water	E12250	Ce-141	3	pCi/L	146	137	1.07	Agreement
		Co-58	3	pCi/L	164	153	1.07	Agreement
		Co-60	3	pCi/L	215	202	1.06	Agreement
		Cr-51	3	pCi/L	307	282	1.09	Agreement
		Cs-134	3	pCi/L	127	131	0.97	Agreement
		Cs-137	3	pCi/L	169	157	1.07	Agreement
		Fe-59	3	pCi/L	138	127	1.08	Agreement
		I-131	3	pCi/L	64.7	62.5	1.04	Agreement
		Mn-54	3	pCi/L	193	178	1.08	Agreement
		Zn-65	3	pCi/L	240	214	1.12	Agreement
Gamma in Milk	E12097	Ce-141	1	pCi/L	79.4	77.0	1.03	Agreement
		Co-58	1	pCi/L	116	114	1.02	Agreement
		Co-60	1	pCi/L	192	187	1.03	Agreement
		Cr-51	1	pCi/L	335	326	1.03	Agreement
		Cs-134	1	pCi/L	174	180	0.97	Agreement
		Cs-137	1	pCi/L	183	172	1.06	Agreement
		Fe-59	1	pCi/L	151	139	1.09	Agreement
		Mn-54	1	pCi/L	141	131	1.07	Agreement
		Zn-65	1	pCi/L	266	244	1.09	Agreement
LLI-131 in Milk	E12097	I-131	1	pCi/L	101	108	0.93	Agreement
Gross Beta in Water	E12178	Cs-137	2	pCi/L	224	226	0.99	Agreement
	E12248	Cs-137	3	pCi/L	174	199	0.88	Agreement
Tritium in Water	E12179	H-3	2	pCi/L	11300	11000	1.02	Agreement
	E12247	H-3	3	pCi/L	13100	12900	1.02	Agreement

TABLE 5.0-B

2018 ENVIRONMENTAL DOSIMETER

CROSS-CHECK RESULTS

Nuclear Technology Services

Radiation Dosimetry and Records participates in a quarterly TLD intercomparison program administered by Nuclear Technology Services, Inc. of Roswell, GA. Nuclear Technology Services irradiates environmental dosimeters quarterly and sends them to Radiation Dosimetry and Records group for analysis of the unknown estimated delivered exposure. The individual measurements were evaluated and results falling outside the acceptable ratio criteria had an evaluation performed to identify any recommended remedial actions and to reduce anomalous errors.

1st Quarter 2018						2nd Quarter 2018					
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail
103109	84.34	76.32	10.51	<+/-15%	Pass	100476	57.72	60.80	-5.07	<+/-15%	Pass
103168	83.20	76.32	9.01	<+/-15%	Pass	101207	59.63	60.80	-1.92	<+/-15%	Pass
102842	79.60	76.32	4.30	<+/-15%	Pass	100628	58.40	60.80	-3.95	<+/-15%	Pass
102197	79.34	76.32	3.96	<+/-15%	Pass	100232	54.45	60.80	-10.44	<+/-15%	Pass
102240	79.98	76.32	4.80	<+/-15%	Pass	103236	58.36	60.80	-4.01	<+/-15%	Pass
Average Bias (B)			6.51			Average Bias (B)			-5.08		
Standard Deviation (S)			3.03			Standard Deviation (S)			3.21		
Measure Performance B +S			9.54	<15%	Pass	Measure Performance B +S			8.29	<15%	Pass
3rd Quarter 2018						4th Quarter 2018					
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail
102475	18.69	18.84	-0.80	<+/-15%	Pass	103532	67.52	61.93	9.03	<+/-15%	Pass
100674	18.66	18.84	-0.96	<+/-15%	Pass	102805	67.74	61.93	9.38	<+/-15%	Pass
100287	17.66	18.84	-6.96	<+/-15%	Pass	103209	66.84	61.93	7.93	<+/-15%	Pass
101172	18.23	18.84	-3.24	<+/-15%	Pass	103347	69.03	61.93	11.46	<+/-15%	Pass
101202	18.48	18.84	-1.91	<+/-15%	Pass	103399	67.21	61.93	8.53	<+/-15%	Pass
Average Bias (B)			-2.63			Average Bias (B)			9.27		
Standard Deviation (S)			2.25			Standard Deviation (S)			1.35		
Measure Performance B +S			4.88	<15%	Pass	Measure Performance B +S			10.61	<15%	Pass

TABLE 5.0-B (Cont.)

2018 ENVIRONMENTAL DOSIMETER

CROSS CHECK RESULTS

Internal Crosscheck (Duke Energy)

Radiation Dosimetry and Records participates in a quarterly TLD internal comparison program administered internally by the Dosimetry Lab. The Dosimetry Lab Staff irradiates environmental dosimetry quarterly and submits them for analysis of the unknown estimated delivered exposure.

1st Quarter 2018						2nd Quarter 2018						
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	
103932	34.28	37.26	-7.99	<+/-15%	Pass	103049	20.41	18.49	10.38	<+/-15%	Pass	
103952	34.50	37.26	-7.40	<+/-15%	Pass	103360	21.06	18.49	13.90	<+/-15%	Pass	
104007	34.95	37.26	-6.19	<+/-15%	Pass	100021	18.06	18.49	-2.33	<+/-15%	Pass	
103961	35.30	37.26	-5.26	<+/-15%	Pass	102504	20.03	18.49	8.33	<+/-15%	Pass	
103962	35.10	37.26	-5.79	<+/-15%	Pass	102466	19.51	18.49	5.52	<+/-15%	Pass	
103931	35.54	37.26	-4.61	<+/-15%	Pass	100208	17.93	18.49	-3.03	<+/-15%	Pass	
104011	35.22	37.26	-5.47	<+/-15%	Pass	101155	18.66	18.49	0.92	<+/-15%	Pass	
103950	35.48	37.26	-4.77	<+/-15%	Pass	101145	17.93	18.49	-3.03	<+/-15%	Pass	
103949	35.37	37.26	-5.07	<+/-15%	Pass	101272	18.00	18.49	-2.65	<+/-15%	Pass	
103951	35.75	37.26	-4.05	<+/-15%	Pass	100515	17.87	18.49	-3.35	<+/-15%	Pass	
Average Bias (B)			-5.66				Average Bias (B)			2.47		
Standard Deviation (S)			1.24				Standard Deviation (S)			6.52		
Measure Performance B +S			6.90	<15%	Pass	Measure Performance B +S			8.99	<15%	Pass	
3rd Quarter 2018						4th Quarter 2018						
TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	TLD Number	Reported (mR)	Delivered (mR)	Bias (% diff)	Pass/Fail Criteria	Pass/Fail	
102886	44.09	40.0	10.23	<+/-15%	Pass	102089	46.94	45.0	4.31	<+/-15%	Pass	
102730	44.27	40.0	10.68	<+/-15%	Pass	102442	45.03	45.0	0.07	<+/-15%	Pass	
102248	41.02	40.0	2.55	<+/-15%	Pass	102336	47.40	45.0	5.33	<+/-15%	Pass	
102867	42.58	40.0	6.45	<+/-15%	Pass	103721	48.89	45.0	8.64	<+/-15%	Pass	
102464	40.91	40.0	2.27	<+/-15%	Pass	102738	48.54	45.0	7.87	<+/-15%	Pass	
102752	43.09	40.0	7.73	<+/-15%	Pass	103194	47.94	45.0	6.53	<+/-15%	Pass	
102803	43.80	40.0	9.50	<+/-15%	Pass	102931	47.59	45.0	5.76	<+/-15%	Pass	
103531	43.17	40.0	7.93	<+/-15%	Pass	103742	49.22	45.0	9.38	<+/-15%	Pass	
102880	44.04	40.0	10.10	<+/-15%	Pass	102029	47.14	45.0	4.76	<+/-15%	Pass	
102415	42.26	40.0	5.65	<+/-15%	Pass	102290	46.10	45.0	2.44	<+/-15%	Pass	
Average Bias (B)			7.31				Average Bias (B)			5.51		
Standard Deviation (S)			3.06				Standard Deviation (S)			2.84		
Measure Performance B +S			10.37	<15%	Pass	Measure Performance B +S			8.35	<15%	Pass	

TABLE 5.0-C

2018 GEL Laboratories, LLC QA Results

Interlaboratory cross check samples from Eckert & Ziegler Analytics (EZA) and Proficiency Tests from the Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP) were received and analyzed by GEL in all four quarters of 2018 from EZA and in two quarters from MAPEP. Table 5.0-C lists the performance for specific samples. Table 5.0-C may not be applicable to all plants/stations.

Sample	Sample ID	Nuclide	Quarter	Units	GEL Value	Known Value	Acceptance Range/Ratio	Evaluation
Hard To Detect in Soil	MAPEP -18-MaS38	Fe-55	2	Bq/kg	67	N/A	False Pos Test	Agreement
		Ni-63	2	Bq/kg	1.05	N/A	False Pos Test	Agreement
		Sr-90	2	Bq/kg	-1.08	N/A	False Pos Test	Agreement
	MAPEP -18-MaS39	Fe-55	4	Bq/kg	434	512	358 - 666	Agreement
		Ni-63	4	Bq/kg	793	765	536 - 995	Agreement
		Sr-90	4	Bq/kg	162	193	135 - 251	Agreement
I-131 in Milk with EZA	E12173	I-131	1	pCi/L	105	108	0.97	Agreement
	E12173	I-131	2	pCi/L	78.9	71.9	1.10	Agreement
	E12242	I-131	3	pCi/L	71.8	58.2	1.23	Agreement
	E12348	I-131	4	pCi/L	95.8	93.3	1.03	Agreement
Gross Beta in Water	E12304 ⁽¹⁾	Cs-137	4	pCi/L	241	295	0.82	Agreement

⁽¹⁾ One set of December 2018 Gross Beta in water analyses were analyzed at GEL.

APPENDIX A

**ENVIRONMENTAL SAMPLING
&
ANALYSIS PROCEDURES**

2018

APPENDIX A

ENVIRONMENTAL SAMPLING AND ANALYSIS PROCEDURES

Adherence to established procedures for sampling and analysis of all environmental media at Catawba Nuclear Station was required to ensure compliance with Station Selected Licensee Commitments. Analytical procedures were employed to ensure that Selected Licensee Commitments detection capabilities were achieved.

Environmental sampling was performed by EnRad Laboratories and Environmental Services. Environmental sample analysis was performed by EnRad Laboratories and Dosimetry and Records.

This appendix describes the environmental sampling frequencies and analysis procedures by media type.

I. CHANGE OF SAMPLING PROCEDURES

Shoreline Sediment location 215 (Control) was removed from the sampling program due to safety and accessibility concerns. Location 262 (T-Bones Restaurant/Lake Wylie Marina – Hwy 49 (4.19 mi NNE)) is the replacement control for CNS Shoreline Sediment. An ODCM update was made as a result of this location change, effective 3/13/18.

II. DESCRIPTION OF ANALYSIS PROCEDURES

Gamma spectroscopy analyses are performed using high purity germanium gamma detectors and Canberra analytical software. Designated sample volumes are transferred to appropriate counting geometries and analyzed by gamma spectroscopy. Perishable samples such as fish and broadleaf vegetation are ground to achieve a homogeneous mixture. Soils and sediments are dried, sifted to remove foreign objects (rocks, clams, glass, etc.) then transferred to appropriate counting geometry.

Low-level iodine analyses are performed by passing a designated sample aliquot through a pre-measured amount of ion exchange resin to remove and concentrate any iodine in the aqueous sample (milk). The resin is then dried, mixed thoroughly, and a net resin weight determined before being transferred to appropriate counting geometry and analyzed by gamma spectroscopy.

Tritium analyses are performed by using low-level environmental liquid scintillation analysis technique on a Perkin-Elmer 4910TR liquid scintillation system or Perkin-Elmer 3100TR liquid scintillation system. Tritium samples are distilled and batch processed

with a laboratory fortified blank, matrix spike, matrix spike duplicate, and blank to verify instrument performance and sample preparation technique are acceptable.

Gross beta analysis is performed by concentrating a designated aliquot of sample precipitate and analyzing by Tennelec XLB Series 5 gas-flow proportional counters. Samples are batch processed with a blank to ensure sample contamination has not occurred.

III. CHANGE OF ANALYSIS PROCEDURES

No analysis procedures were changed during 2018.

IV. SAMPLING AND ANALYSIS PROCEDURES

A.1 AIRBORNE PARTICULATE AND RADIOIODINE

Airborne particulate and radioiodine samples at each of six locations were composited continuously by means of continuous air samplers. Air particulates were collected on a particulate filter and radioiodines were collected in a charcoal cartridge positioned behind the filter in the sampler. The samplers are designed to operate at a constant flow rate (in order to compensate for any filter loading) and are set to sample approximately 2 cubic feet per minute. Filters and cartridges were collected weekly. A separate weekly gamma analysis was performed on each charcoal cartridge. A weekly gross beta analysis was performed on each filter. A quarterly gamma analysis was performed on the quarterly filter composite (by location). The continuous composite samples were collected from the locations listed below.

Location 200 = Site Boundary (0.63 mi. NNE)
Location 201 = Site Boundary (0.53 mi. NE)
Location 208 = Discharge Canal (0.45 mi. S)
Location 212 = Tega Cay (3.32 mi. E)
Location 258 = Fairhope Road (9.84 mi. W)(Control)
Location 261 = Site Boundary (0.72 mi. N)

A.2 DRINKING WATER

Monthly composite drinking water samples were collected at each of two locations. A gross beta and gamma analysis was performed on monthly composites. Tritium analysis was performed on the quarterly composites. The composites were collected monthly from the locations listed below.

Location 214 = Rock Hill Water Supply (7.30 mi. SSE)
Location 218 = Belmont Water Supply (13.5 mi. NNE)(Control)

A.3 SURFACE WATER

Monthly composite samples were collected at each of three locations. A gamma analysis was performed on the monthly composites. Tritium analysis was performed on the quarterly composites. The composites were collected monthly from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)

Location 211 = Wylie Dam (4.06 mi. ESE)

Location 215 = River Pointe - Hwy 49 (4.21 mi. NNE)(Control)

A.4 MILK

Biweekly grab samples were collected at one location. A gamma and low-level Iodine-131 analysis was performed on each sample. The biweekly grab samples were collected from the location listed below.

Location 221 = Dairy (14.5 mi. NW)(Control)

A.5 BROADLEAF VEGETATION

Monthly samples were collected at each of five locations. A gamma analysis was performed on each sample. The samples were collected from the locations listed below.

Location 200 = Site Boundary (0.63 mi. NNE)

Location 201 = Site Boundary (0.53 mi. NE)

Location 222 = Site Boundary (0.70 mi. N)

Location 226 = Site Boundary (0.48 mi. S)

Location 258 = Fairhope Road (9.84 mi. W)(Control)

A.6 FOOD PRODUCTS

Monthly samples were collected when available during the harvest season at one location. A gamma analysis was performed on each sample. The samples were collected from the location listed below.

Location 260 = Irrigated Gardens (2.00 mi. SSE)

A.7 FISH

Semiannual samples were collected at each of two locations. A gamma analysis was performed on the edible portions of each sample. Boney fish (i.e. Sunfish)

were prepared whole minus the head and tail portions. The samples were collected from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)
Location 216 = Hwy 49 Bridge (4.19 mi. NNE)(Control)

A.8 SHORELINE SEDIMENT

Semiannual samples were collected at each of three locations. A gamma analysis was performed on each sample following the drying and removal of rocks and clams. The samples were collected from the locations listed below.

Location 208 = Discharge Canal (0.45 mi. S)
Location 210 = Ebenezer Access (2.31 mi. SE)
Location 262 = T-Bones/Lake Wylie Marina- Hwy 49 (4.19 mi. NNE)(Control)

A.9 DIRECT GAMMA RADIATION (TLD)

Thermoluminescent dosimeters (TLD) were collected quarterly at forty-one locations. A gamma exposure rate was determined for each TLD. TLD locations are listed in Table 2.1-B. The TLDs were placed as indicated below.

- * An inner ring of 16 TLDs, one in each meteorological sector in the general area of the site boundary.
- * An outer ring of 16 TLDs, one in each meteorological sector in the 6 to 8 kilometer range.
- * The remaining TLDs were placed in special interest areas such as population centers, residential areas, schools, and at three control locations.

A.10 ANNUAL LAND USE CENSUS

An Annual Land Use Census was conducted to identify within a distance of 8 kilometers (5.0 miles) from the station, the nearest location from the site boundary in each of the sixteen meteorological sectors, the following:

- * The Nearest Residence
- * The Nearest Garden greater than 50 square meters or 500 square feet
- * The Nearest Milk-giving Animal (cow, goat, etc.)

The census was conducted during the growing season on 6/19 and 6/20/2018. Results are shown in Table 3.11. No changes were made to the sampling procedures during 2018 as a result of the 2018 census.

V. GLOBAL POSITIONING SYSTEM (GPS) ANALYSIS

The Catawba site centerline used for GPS measurements was referenced from the Catawba Nuclear Station Updated Final Safety Analysis Report (UFSAR), section 2.1.1.1, Specification of Location. Waypoint coordinates used for CNS GPS measurements were latitude 35°-3'-5"N and longitude 81°-4'-10"W. Maps and tables were generated using North American Datum (NAD) 27. Data normally reflect accuracy to within 2 to 5 meters from point of measurement. All GPS field measurements were taken as close as possible to the item of interest. Distances for the locations are displayed using three significant figures.

APPENDIX B

**RADIOLOGICAL
ENVIRONMENTAL MONITORING
PROGRAM**

SUMMARY OF RESULTS

2018

**CATAWBA NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DATA SUMMARY**

Catawba Nuclear Station
York County, South Carolina

Docket Numbers 50-413, 414
Calendar Year 2018

Medium or Pathway Sampled or Measured (Unit of Measurement)	Type and Total No. of Measurements Performed	Lower Limit of Detection (LLD) ⁽¹⁾	All Indicator Locations ^{(2) (3)} Mean Range	Location w/Highest Annual Mean		Control Locations Mean Range ^{(2) (3)}	No. of Non-Routine Report Meas.
				Name, Distance, and Direction	Mean Range ^{(2) (3)}		
Air Particulate (pCi/m ³)	Gross Beta 312 ⁽⁴⁾	See Table 2.2-C	2.09E-02 (260/260) 4.77E-03 – 3.99E-02	208 (0.45 mi S)	2.17E-02 (52/52) 4.87E-03 – 3.99E-02	258 (9.84 mi W) 2.03E-02 (52/52) 5.45E-03 – 3.47E-02	0
	Gamma 24 ⁽⁴⁾	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Air Radioiodine (pCi/m ³)	Gamma 312 ⁽⁴⁾	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Drinking Water (pCi/l)	Gross Beta 26 ⁽⁴⁾	4	2.06E+00 (12/13) 1.12E+00 – 3.34E+00	214 (7.30 mi SSE)	2.06E+00 (12/13) 1.12E+00 – 3.34E+00	218 (13.5 mi NNE) 1.86E+00 (12/13) 7.4E-01 – 3.20E+00	0
	Gamma 26 ⁽⁴⁾	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
	Tritium 8 ⁽⁴⁾⁽⁵⁾	2000	4.71E+02 (4/4) 2.95E+02 – 6.21E+02	214 (7.30 mi SSE)	4.71E+02 (4/4) 2.95E+02 – 6.21E+02	218 (13.5 mi NNE) 3.26E+02 (4/4) 1.99E+02 – 4.20E+02	0
Surface Water (pCi/l)	Gamma 39 ⁽⁴⁾	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
	Tritium 12 ⁽⁴⁾	2000	3.77E+03 (8/8) 3.63E+02 – 1.10E+04	208 (0.45 mi S)	7.07E+03 (4/4) 4.94E+03 – 1.10E+04	215 (4.21 mi NNE) 2.79E+02 (3/4) 2.30E+02 – 3.38E+02	0
Milk (pCi/l)	Gamma 26	See Table 2.2-C	No Indicator Location	-----	-----	All less than LLD	0
	I-131 26	See Table 2.2-C	No Indicator Location	-----	-----	All less than LLD	0

**CATAWBA NUCLEAR STATION
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM DATA SUMMARY**

Catawba Nuclear Station
York County, South Carolina

Docket Numbers 50-413, 414
Calendar Year 2018

Medium or Pathway Sampled or Measured (Unit of Measurement)	Type and Total No. of Measurements Performed	Lower Limit of Detection (LLD) ⁽¹⁾	All Indicator Locations ^{(2) (3)} Mean Range	Location w/Highest Annual Mean		Control Locations Mean Range ^{(2) (3)}	No. of Non-Routine Report Meas.
				Name, Distance, and Direction	Mean Range ^{(2) (3)}		
Broadleaf Vegetation (pCi/kg, wet)	Gamma 60 Cs-137	See Table 2.2-C	4.67E+01 (3/48) 1.19E+01 – 6.58E+01	201 (0.53 mi NE)	4.67E+01 (3/12) 1.19E+01 – 6.58E+01	All less than LLD	0
Food Products (pCi/kg, wet)	Gamma 4 ⁽⁴⁾	See Table 2.2-C	All less than LLD	-----	-----	No Control Location	0
Fish (pCi/kg, wet)	Gamma 12	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
Sediments--Shoreline (pCi/kg, dry)	Gamma 6	See Table 2.2-C	All less than LLD	-----	-----	All less than LLD	0
TLD (mR per quarter) ⁽⁶⁾	TLD Readout 163 ⁽⁴⁾	-----	1.79E+01 (151/151) 1.12E+01 – 2.60E+01	206 (0.67 mi WNW)	2.19E+01 (4/4) 2.06E+01 – 2.40E+01	217 (10.3 mi SSE) 247 (7.33 mi ESE) 251 (9.72 mi WNW) 1.38E+01 (12/12) 9.50E+00 – 1.83E+01	0

Footnotes to Appendix B

1. The Lower Limit of Detection (LLD) is the smallest concentration of radioactive material in a sample that will yield a net count above system background which will be detected with 95 percent probability and with only 5 percent probability of falsely concluding that a blank observation represents a "real" signal. Due to counting statistics and varying volumes, occasionally lower LLDs are achieved. Refer to Section 2.3.2 for an explanation of how LLD values were derived.
2. Mean and range are based on detectable measurements only.
3. The fractions of all samples with detectable activities at specific locations are indicated in parentheses.
4. Missing samples or surveillances are discussed in Appendix C or Appendix D.
5. Quarterly tritium composites determined using quarter days (92 days +/- 25% (23 days)).
6. TLD exposure is reported in milliroentgen (mR) per standard quarter (91 days). TLD data indicated in section 3.9 (Direct Gamma Radiation) are reported in mrem /yr ($n * 0.95 \text{ ergs/g-Roentgen}$)².

² Cember, H. (2009). Introduction to Health Physics, 4th Edition. United States: McGraw-Hill Companies, Inc.

APPENDIX C

**SAMPLING DEVIATIONS
&
UNAVAILABLE ANALYSES**

2018

APPENDIX C

CATAWBA NUCLEAR STATION SAMPLING DEVIATIONS & UNAVAILABLE ANALYSES

DEVIATION & UNAVAILABLE REASON CODES			
BF	Blown Fuse	PM	Preventive Maintenance
CN	Construction	PO	Power Outage
FZ	Sample Frozen	PS	Pump out of service / Undergoing repair
IV	Insufficient Volume	SL	Sample Loss/Lost due to Lab Accident
IW	Inclement Weather	SM	Motor / Rotor Seized
LC	Line Clog to Sampler	SU	Seasonally Unavailable
OT	Other	TF	Torn Filter
PI	Power Interrupt	VN	Vandalism

C.1 SAMPLING DEVIATIONS

Air Particulate and Air Radioiodine

REMP weekly air samples (Air Particulate (AP) or Air Radioiodine (AR)) that experience any downtime during a surveillance period are reported as a Deviation and classified as a “Sampling Deviation.” However, the sample is counted and the data reported, whereas a Deviation with no available sample is classified as an “Unavailable Analyses” and does not have any data reported. The Catawba REMP air samplers operated for a total of 99.9% availability in 2018.

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
258	2/6 – 2/13/2018	PI	1.01 hours downtime due to power interruption, cause undetermined.	NCR # 02184297
200	4/10 – 4/17/2018	IW	5.43 hours downtime due to severe storms and high winds.	NCR # 02199335
261	4/10 – 4/17/2018	IW	5.45 hours downtime due to severe storms and high winds.	NCR # 02199339
201	5/15 – 5/22/2018	PI	1.23 hours downtime due to power interruption, cause undetermined.	NCR # 02208367
201	5/22 – 5/30/2018	IW	0.64 hours downtime due to power interruption from Tropical Depression Alberto.	NCR # 02209954
208	5/22 – 5/30/2018	IW	0.63 hours downtime due to power interruption from Tropical Depression Alberto.	NCR # 02209956
200	6/12 – 6/19/2018	PI	25.60 hours downtime due to power interruption from thunderstorms and tripped breaker.	NCR # 02214274
208	6/12 – 6/19/2018	PI	25.79 hours downtime due to power interruption from thunderstorms and tripped breaker.	NCR # 02214275
200	12/4 – 12/11/2018	IW	0.66 hours downtime due to power interruption from snow/sleet.	NCR # 02248350
261	12/4 – 12/11/2018	IW	0.68 hours downtime due to power interruption from snow/sleet.	NCR # 02248371

Drinking Water and Surface Water

REMP monthly drinking water samples (Drinking Water (DW)) or surface water samples (Surface Water (SW)) that experience any downtime during a surveillance period are reported as a deviation and classified as a “Sampling Deviation.” However, the sample is counted and the data reported, whereas a Deviation with no available sample is classified as an “Unavailable Analyses” and does not have any data reported. The water samplers operated for a total of 97.1% availability in 2018.

Surface Water

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
215	5/22 – 6/19/2018	OT	576 hours downtime. Pier/dock equipment malfunction. Tubing was out of the water. Grab sample taken. No missed surveillance.	NCR # 02214583
215	11/6 – 12/4/2018	OT	672 hours downtime of pier/dock equipment due to human intervention during construction/maintenance. Grab sample taken. No missed surveillance.	NCR # 02247055

C.2 UNAVAILABLE ANALYSES

Food Products / Crops

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
260	1/3/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02174788
260	2/6/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02182556
260	3/6/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02189330
260	4/3/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02195922
260	5/1/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02202858
260	10/2/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02234572
260	11/6/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02241516
260	12/4/2018	SU	Sample seasonally unavailable at time of collection.	NCR # 02246908

TLDs

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
246	12/14/17 – 3/15/18	CN	Alpha and Bravo TLDs missing at the time of collection, fencing had been replaced due to construction.	NCR # 02191935

APPENDIX D

ANALYTICAL DEVIATIONS

2018

APPENDIX D

CATAWBA NUCLEAR STATION ANALYTICAL DEVIATIONS

DEVIATION & UNAVAILABLE REASON CODES			
BF	Blown Fuse	PM	Preventive Maintenance
CN	Construction	PO	Power Outage
FZ	Sample Frozen	PS	Pump out of service / Undergoing repair
IV	Insufficient Volume	SL	Sample Loss/Lost due to Lab Accident
IW	Inclement Weather	SM	Motor / Rotor Seized
LC	Line Clog to Sampler	SU	Seasonally Unavailable
OT	Other	TF	Torn Filter
PI	Power Interrupt	VN	Vandalism

D.1 ANALYTICAL DEVIATIONS

Catawba environmental Alpha (A) and Bravo (B) TLDs are co-located TLDs placed next to each other to comply with ANSI/HPS N13.37-2014 Section 7.1 Paragraph 7. The TLD collections indicated incurred tampering/vandalism with one of the two co-located TLDs. One TLD for each collection was available and did not appear to have experienced any tampering/vandalism during the quarter. The remaining Alpha (A) TLD was collected and analyzed, but did not get averaged with the unusable Bravo (B) TLD which is normally included in the established process for the Catawba REMP TLDs.

TLDs

Location	Scheduled Collection Dates	Code	Description & Action to Prevent Recurrence	Corrective Action
249	9/13 – 12/13/2018	VN	Alpha TLD vandalized, not usable, 1 TLD reported.	NCR # 02248944

APPENDIX E

**RADIOLOGICAL
ENVIRONMENTAL MONITORING
PROGRAM RESULTS**

2018

This appendix includes sample analysis report summaries and supportive data generated from each sample medium for 2018.

CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
465949	1/3/2018 - 1/9/2018	Beta	3.41E-02	3.98E-03	3.56E-03
466151	1/9/2018 - 1/16/2018	Beta	1.83E-02	3.00E-03	3.28E-03
466350	1/16/2018 - 1/23/2018	Beta	2.86E-02	3.12E-03	2.90E-03
466937	1/23/2018 - 1/30/2018	Beta	1.50E-02	2.73E-03	3.06E-03
467294	1/30/2018 - 2/6/2018	Beta	1.59E-02	2.76E-03	2.99E-03
467605	2/6/2018 - 2/13/2018	Beta	1.45E-02	2.78E-03	3.29E-03
468398	2/13/2018 - 2/20/2018	Beta	1.52E-02	2.40E-03	2.54E-03
468718	2/20/2018 - 2/27/2018	Beta	1.24E-02	2.69E-03	3.33E-03
469528	2/27/2018 - 3/6/2018	Beta	2.42E-02	3.22E-03	3.11E-03
470549	3/6/2018 - 3/13/2018	Beta	2.30E-02	3.20E-03	3.28E-03
471120	3/13/2018 - 3/20/2018	Beta	2.75E-02	3.39E-03	3.16E-03
471674	3/20/2018 - 3/27/2018	Beta	1.38E-02	2.76E-03	3.33E-03
472444	3/27/2018 - 4/3/2018	Beta	1.33E-02	2.47E-03	2.98E-03
472450	1/3/2018 - 4/3/2018	Cs-134	<1.61E-03	0.00E+00	1.61E-03
		Cs-137	<8.05E-04	0.00E+00	8.05E-04
		Be-7	1.47E-01	3.94E-02	3.99E-02
		K-40	<2.74E-02	0.00E+00	2.74E-02
472936	4/3/2018 - 4/10/2018	Beta	2.15E-02	3.09E-03	3.18E-03
473228	4/10/2018 - 4/17/2018	Beta	2.01E-02	2.82E-03	2.97E-03
473592	4/17/2018 - 4/24/2018	Beta	1.92E-02	2.63E-03	2.65E-03
474110	4/24/2018 - 5/1/2018	Beta	1.23E-02	2.57E-03	3.08E-03
474490	5/1/2018 - 5/8/2018	Beta	2.61E-02	3.32E-03	3.19E-03
474850	5/8/2018 - 5/15/2018	Beta	3.21E-02	3.61E-03	3.23E-03
475172	5/15/2018 - 5/22/2018	Beta	1.34E-02	2.66E-03	3.14E-03
475496	5/22/2018 - 5/30/2018	Beta	8.90E-03	2.23E-03	2.90E-03
476323	5/30/2018 - 6/5/2018	Beta	2.01E-02	2.88E-03	2.90E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
477336	6/5/2018 - 6/12/2018	Beta	2.58E-02	3.36E-03	3.38E-03
478060	6/12/2018 - 6/19/2018	Beta	2.25E-02	3.20E-03	3.38E-03
478383	6/19/2018 - 6/26/2018	Beta	1.83E-02	3.07E-03	3.56E-03
478730	6/26/2018 - 7/3/2018	Beta	1.70E-02	2.55E-03	2.70E-03
478736	4/3/2018 - 7/3/2018	Cs-134	<1.61E-03	0.00E+00	1.61E-03
		Cs-137	<1.32E-03	0.00E+00	1.32E-03
		Be-7	1.53E-01	3.99E-02	4.11E-02
		K-40	<2.61E-02	0.00E+00	2.61E-02
479182	7/3/2018 - 7/10/2018	Beta	2.28E-02	2.82E-03	2.70E-03
479838	7/10/2018 - 7/17/2018	Beta	3.09E-02	3.20E-03	2.85E-03
480206	7/17/2018 - 7/24/2018	Beta	2.16E-02	2.75E-03	2.66E-03
481035	7/24/2018 - 7/31/2018	Beta	2.82E-02	3.38E-03	3.01E-03
481480	7/31/2018 - 8/7/2018	Beta	1.16E-02	2.83E-03	3.76E-03
481912	8/7/2018 - 8/14/2018	Beta	2.31E-02	3.17E-03	3.21E-03
482442	8/14/2018 - 8/21/2018	Beta	2.30E-02	2.79E-03	2.53E-03
482769	8/21/2018 - 8/28/2018	Beta	2.53E-02	3.22E-03	3.02E-03
483395	8/28/2018 - 9/4/2018	Beta	1.80E-02	2.98E-03	3.29E-03
483966	9/4/2018 - 9/11/2018	Beta	1.72E-02	2.68E-03	3.06E-03
484579	9/11/2018 - 9/18/2018	Beta	4.77E-03	1.83E-03	2.66E-03
484990	9/18/2018 - 9/25/2018	Beta	2.78E-02	3.02E-03	2.64E-03
485439	9/25/2018 - 10/2/2018	Beta	1.74E-02	2.65E-03	2.93E-03
485445	7/3/2018 - 10/2/2018	Cs-134	<1.04E-03	0.00E+00	1.04E-03
		Cs-137	<1.40E-03	0.00E+00	1.40E-03
		Be-7	1.63E-01	3.81E-02	2.95E-02
		K-40	2.26E-02	1.27E-02	4.71E-03
486105	10/2/2018 - 10/9/2018	Beta	3.21E-02	3.57E-03	3.08E-03
486658	10/9/2018 - 10/16/2018	Beta	1.71E-02	2.60E-03	2.83E-03
487699	10/16/2018 - 10/23/2018	Beta	2.30E-02	2.89E-03	2.88E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
487947	10/23/2018 - 10/30/2018	Beta	2.13E-02	2.69E-03	2.50E-03
488431	10/30/2018 - 11/6/2018	Beta	1.54E-02	2.82E-03	3.24E-03
488805	11/6/2018 - 11/13/2018	Beta	1.94E-02	2.73E-03	2.90E-03
489111	11/13/2018 - 11/20/2018	Beta	2.32E-02	3.22E-03	3.23E-03
489697	11/20/2018 - 11/27/2018	Beta	1.79E-02	2.73E-03	3.08E-03
490112	11/27/2018 - 12/4/2018	Beta	2.10E-02	2.76E-03	2.79E-03
490755	12/4/2018 - 12/11/2018	Beta	1.55E-02	2.89E-03	3.40E-03
491138	12/11/2018 - 12/19/2018	Beta	1.70E-02	2.67E-03	2.85E-03
491443	12/19/2018 - 12/27/2018	Beta	1.76E-02	2.61E-03	2.68E-03
491692	12/27/2018 - 1/2/2019	Beta	1.68E-02	2.82E-03	3.15E-03
491698	10/2/2018 - 1/2/2019	Cs-134	<1.22E-03	0.00E+00	1.22E-03
		Cs-137	<1.16E-03	0.00E+00	1.16E-03
		Be-7	1.08E-01	3.26E-02	3.50E-02
		K-40	<2.47E-02	0.00E+00	2.47E-02

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465950	1/3/2018 - 1/9/2018	Beta	3.20E-02	3.88E-03	3.54E-03
466152	1/9/2018 - 1/16/2018	Beta	1.89E-02	3.02E-03	3.28E-03
466351	1/16/2018 - 1/23/2018	Beta	2.86E-02	3.12E-03	2.90E-03
466938	1/23/2018 - 1/30/2018	Beta	1.41E-02	2.69E-03	3.07E-03
467295	1/30/2018 - 2/6/2018	Beta	1.72E-02	2.81E-03	2.98E-03
467606	2/6/2018 - 2/13/2018	Beta	1.72E-02	2.92E-03	3.28E-03
468399	2/13/2018 - 2/20/2018	Beta	1.61E-02	2.45E-03	2.54E-03
468719	2/20/2018 - 2/27/2018	Beta	1.35E-02	2.75E-03	3.34E-03
469529	2/27/2018 - 3/6/2018	Beta	2.93E-02	3.46E-03	3.11E-03
470550	3/6/2018 - 3/13/2018	Beta	2.06E-02	3.08E-03	3.27E-03
471121	3/13/2018 - 3/20/2018	Beta	2.64E-02	3.35E-03	3.16E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
471675	3/20/2018 - 3/27/2018	Beta	1.38E-02	2.76E-03	3.33E-03
472445	3/27/2018 - 4/3/2018	Beta	1.48E-02	2.55E-03	2.99E-03
472451	1/3/2018 - 4/3/2018	Cs-134	<1.82E-03	0.00E+00	1.82E-03
		Cs-137	<1.36E-03	0.00E+00	1.36E-03
		Be-7	1.79E-01	3.99E-02	2.76E-02
		K-40	3.21E-02	1.64E-02	1.50E-02
472937	4/3/2018 - 4/10/2018	Beta	2.24E-02	3.13E-03	3.17E-03
473229	4/10/2018 - 4/17/2018	Beta	2.05E-02	2.77E-03	2.87E-03
473593	4/17/2018 - 4/24/2018	Beta	2.24E-02	2.79E-03	2.66E-03
474111	4/24/2018 - 5/1/2018	Beta	1.40E-02	2.67E-03	3.08E-03
474491	5/1/2018 - 5/8/2018	Beta	2.44E-02	3.23E-03	3.18E-03
474851	5/8/2018 - 5/15/2018	Beta	3.43E-02	3.70E-03	3.23E-03
475173	5/15/2018 - 5/22/2018	Beta	1.56E-02	2.79E-03	3.18E-03
475497	5/22/2018 - 5/30/2018	Beta	1.03E-02	2.30E-03	2.89E-03
476324	5/30/2018 - 6/5/2018	Beta	1.83E-02	2.81E-03	2.91E-03
477337	6/5/2018 - 6/12/2018	Beta	3.15E-02	3.61E-03	3.39E-03
478061	6/12/2018 - 6/19/2018	Beta	2.22E-02	2.85E-03	2.86E-03
478384	6/19/2018 - 6/26/2018	Beta	1.90E-02	3.10E-03	3.55E-03
478731	6/26/2018 - 7/3/2018	Beta	1.59E-02	2.51E-03	2.72E-03
478737	4/3/2018 - 7/3/2018	Cs-134	<1.47E-03	0.00E+00	1.47E-03
		Cs-137	<8.24E-04	0.00E+00	8.24E-04
		Be-7	1.67E-01	4.04E-02	3.74E-02
		K-40	2.63E-02	1.53E-02	1.62E-02
479183	7/3/2018 - 7/10/2018	Beta	2.18E-02	2.76E-03	2.68E-03
479839	7/10/2018 - 7/17/2018	Beta	3.29E-02	3.28E-03	2.86E-03
480207	7/17/2018 - 7/24/2018	Beta	2.11E-02	2.72E-03	2.65E-03
481036	7/24/2018 - 7/31/2018	Beta	2.38E-02	3.18E-03	3.01E-03
481481	7/31/2018 - 8/7/2018	Beta	1.08E-02	2.79E-03	3.76E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
481913	8/7/2018 - 8/14/2018	Beta	2.16E-02	3.11E-03	3.22E-03
482443	8/14/2018 - 8/21/2018	Beta	2.39E-02	2.82E-03	2.52E-03
482770	8/21/2018 - 8/28/2018	Beta	3.04E-02	3.44E-03	3.02E-03
483396	8/28/2018 - 9/4/2018	Beta	1.55E-02	2.85E-03	3.30E-03
483967	9/4/2018 - 9/11/2018	Beta	1.71E-02	2.69E-03	3.07E-03
484580	9/11/2018 - 9/18/2018	Beta	7.31E-03	1.99E-03	2.65E-03
484991	9/18/2018 - 9/25/2018	Beta	2.98E-02	3.10E-03	2.64E-03
485440	9/25/2018 - 10/2/2018	Beta	1.92E-02	2.74E-03	2.94E-03
485446	7/3/2018 - 10/2/2018	Cs-134	<1.45E-03	0.00E+00	1.45E-03
		Cs-137	<1.02E-03	0.00E+00	1.02E-03
		Be-7	1.35E-01	3.42E-02	2.89E-02
		K-40	<2.20E-02	0.00E+00	2.20E-02
486106	10/2/2018 - 10/9/2018	Beta	3.39E-02	3.65E-03	3.07E-03
486659	10/9/2018 - 10/16/2018	Beta	1.95E-02	2.71E-03	2.82E-03
487700	10/16/2018 - 10/23/2018	Beta	2.60E-02	3.02E-03	2.89E-03
487948	10/23/2018 - 10/30/2018	Beta	2.44E-02	2.82E-03	2.50E-03
488432	10/30/2018 - 11/6/2018	Beta	1.86E-02	2.99E-03	3.25E-03
488806	11/6/2018 - 11/13/2018	Beta	1.95E-02	2.74E-03	2.89E-03
489112	11/13/2018 - 11/20/2018	Beta	2.45E-02	3.29E-03	3.23E-03
489698	11/20/2018 - 11/27/2018	Beta	2.36E-02	2.99E-03	3.08E-03
490113	11/27/2018 - 12/4/2018	Beta	2.17E-02	2.80E-03	2.80E-03
490756	12/4/2018 - 12/11/2018	Beta	2.14E-02	3.18E-03	3.38E-03
491139	12/11/2018 - 12/19/2018	Beta	1.99E-02	2.81E-03	2.86E-03
491444	12/19/2018 - 12/27/2018	Beta	2.05E-02	2.75E-03	2.68E-03
491693	12/27/2018 - 1/2/2019	Beta	1.97E-02	2.98E-03	3.16E-03
491699	10/2/2018 - 1/2/2019	Cs-134	<9.80E-04	0.00E+00	9.80E-04
		Cs-137	<1.18E-03	0.00E+00	1.18E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491699	10/2/2018 - 1/2/2019	Be-7	1.52E-01	3.55E-02	2.73E-02
		K-40	<3.44E-02	0.00E+00	3.44E-02

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465951	1/3/2018 - 1/9/2018	Beta	3.99E-02	4.22E-03	3.55E-03
466153	1/9/2018 - 1/16/2018	Beta	1.72E-02	2.94E-03	3.28E-03
466352	1/16/2018 - 1/23/2018	Beta	3.32E-02	3.30E-03	2.90E-03
466939	1/23/2018 - 1/30/2018	Beta	1.84E-02	2.92E-03	3.07E-03
467296	1/30/2018 - 2/6/2018	Beta	1.97E-02	2.95E-03	2.98E-03
467607	2/6/2018 - 2/13/2018	Beta	1.92E-02	3.02E-03	3.29E-03
468400	2/13/2018 - 2/20/2018	Beta	1.90E-02	2.60E-03	2.54E-03
468720	2/20/2018 - 2/27/2018	Beta	1.43E-02	2.80E-03	3.34E-03
469530	2/27/2018 - 3/6/2018	Beta	3.39E-02	3.65E-03	3.11E-03
470551	3/6/2018 - 3/13/2018	Beta	2.55E-02	3.31E-03	3.28E-03
471122	3/13/2018 - 3/20/2018	Beta	3.04E-02	3.53E-03	3.16E-03
471676	3/20/2018 - 3/27/2018	Beta	1.57E-02	2.86E-03	3.33E-03
472446	3/27/2018 - 4/3/2018	Beta	1.49E-02	2.55E-03	2.99E-03
472452	1/3/2018 - 4/3/2018	Cs-134	<1.85E-03	0.00E+00	1.85E-03
		Cs-137	<1.15E-03	0.00E+00	1.15E-03
		Be-7	1.59E-01	3.68E-02	2.57E-02
		K-40	1.70E-02	1.24E-02	1.52E-02
472938	4/3/2018 - 4/10/2018	Beta	2.46E-02	3.24E-03	3.17E-03
473230	4/10/2018 - 4/17/2018	Beta	2.23E-02	2.86E-03	2.87E-03
473594	4/17/2018 - 4/24/2018	Beta	2.36E-02	2.84E-03	2.66E-03
474112	4/24/2018 - 5/1/2018	Beta	1.70E-02	2.83E-03	3.09E-03
474492	5/1/2018 - 5/8/2018	Beta	2.91E-02	3.44E-03	3.19E-03
474852	5/8/2018 - 5/15/2018	Beta	3.33E-02	3.66E-03	3.23E-03
475174	5/15/2018 - 5/22/2018	Beta	1.31E-02	2.65E-03	3.15E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
475498	5/22/2018 - 5/30/2018	Beta	1.16E-02	2.38E-03	2.89E-03
476325	5/30/2018 - 6/5/2018	Beta	2.13E-02	2.95E-03	2.91E-03
477338	6/5/2018 - 6/12/2018	Beta	3.17E-02	3.62E-03	3.39E-03
478062	6/12/2018 - 6/19/2018	Beta	2.56E-02	3.33E-03	3.38E-03
478385	6/19/2018 - 6/26/2018	Beta	2.01E-02	3.15E-03	3.55E-03
478732	6/26/2018 - 7/3/2018	Beta	1.54E-02	2.49E-03	2.72E-03
478738	4/3/2018 - 7/3/2018	Cs-134	<1.97E-03	0.00E+00	1.97E-03
		Cs-137	<1.61E-03	0.00E+00	1.61E-03
		Be-7	1.70E-01	3.95E-02	3.38E-02
		K-40	<2.71E-02	0.00E+00	2.71E-02
479184	7/3/2018 - 7/10/2018	Beta	2.26E-02	2.80E-03	2.68E-03
479840	7/10/2018 - 7/17/2018	Beta	3.22E-02	3.25E-03	2.85E-03
480208	7/17/2018 - 7/24/2018	Beta	1.99E-02	2.67E-03	2.65E-03
481037	7/24/2018 - 7/31/2018	Beta	2.42E-02	3.19E-03	3.01E-03
481482	7/31/2018 - 8/7/2018	Beta	7.50E-03	2.60E-03	3.76E-03
481914	8/7/2018 - 8/14/2018	Beta	2.11E-02	3.09E-03	3.22E-03
482444	8/14/2018 - 8/21/2018	Beta	2.71E-02	2.96E-03	2.52E-03
482771	8/21/2018 - 8/28/2018	Beta	2.45E-02	3.18E-03	3.02E-03
483397	8/28/2018 - 9/4/2018	Beta	1.88E-02	3.02E-03	3.29E-03
483968	9/4/2018 - 9/11/2018	Beta	1.84E-02	2.75E-03	3.07E-03
484581	9/11/2018 - 9/18/2018	Beta	4.87E-03	1.84E-03	2.65E-03
484992	9/18/2018 - 9/25/2018	Beta	2.63E-02	2.96E-03	2.64E-03
485441	9/25/2018 - 10/2/2018	Beta	1.86E-02	2.71E-03	2.93E-03
485447	7/3/2018 - 10/2/2018	Cs-134	<1.49E-03	0.00E+00	1.49E-03
		Cs-137	<1.49E-03	0.00E+00	1.49E-03
		Be-7	1.19E-01	3.19E-02	2.63E-02
		K-40	<2.57E-02	0.00E+00	2.57E-02
486107	10/2/2018 - 10/9/2018	Beta	3.41E-02	3.66E-03	3.08E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
486660	10/9/2018 - 10/16/2018	Beta	1.71E-02	2.60E-03	2.82E-03
487701	10/16/2018 - 10/23/2018	Beta	2.23E-02	2.86E-03	2.88E-03
487949	10/23/2018 - 10/30/2018	Beta	1.97E-02	2.61E-03	2.50E-03
488433	10/30/2018 - 11/6/2018	Beta	1.70E-02	2.92E-03	3.25E-03
488807	11/6/2018 - 11/13/2018	Beta	2.09E-02	2.80E-03	2.89E-03
489113	11/13/2018 - 11/20/2018	Beta	2.39E-02	3.26E-03	3.23E-03
489699	11/20/2018 - 11/27/2018	Beta	2.22E-02	2.92E-03	3.08E-03
490114	11/27/2018 - 12/4/2018	Beta	2.16E-02	2.79E-03	2.79E-03
490757	12/4/2018 - 12/11/2018	Beta	1.50E-02	2.86E-03	3.38E-03
491140	12/11/2018 - 12/19/2018	Beta	2.17E-02	2.89E-03	2.85E-03
491445	12/19/2018 - 12/27/2018	Beta	1.84E-02	2.65E-03	2.68E-03
491694	12/27/2018 - 1/2/2019	Beta	1.82E-02	2.90E-03	3.16E-03
491700	10/2/2018 - 1/2/2019	Cs-134	<1.27E-03	0.00E+00	1.27E-03
		Cs-137	<1.21E-03	0.00E+00	1.21E-03
		Be-7	9.72E-02	3.20E-02	3.57E-02
		K-40	<2.95E-02	0.00E+00	2.95E-02

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465952	1/3/2018 - 1/9/2018	Beta	3.23E-02	3.92E-03	3.58E-03
466154	1/9/2018 - 1/16/2018	Beta	1.80E-02	2.98E-03	3.27E-03
466353	1/16/2018 - 1/23/2018	Beta	2.99E-02	3.18E-03	2.90E-03
466940	1/23/2018 - 1/30/2018	Beta	1.59E-02	2.77E-03	3.05E-03
467297	1/30/2018 - 2/6/2018	Beta	1.61E-02	2.76E-03	2.99E-03
467608	2/6/2018 - 2/13/2018	Beta	1.93E-02	3.03E-03	3.29E-03
468401	2/13/2018 - 2/20/2018	Beta	1.64E-02	2.46E-03	2.54E-03
468721	2/20/2018 - 2/27/2018	Beta	1.39E-02	2.77E-03	3.32E-03
469531	2/27/2018 - 3/6/2018	Beta	3.07E-02	3.52E-03	3.12E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
470552	3/6/2018 - 3/13/2018	Beta	2.06E-02	3.09E-03	3.29E-03
471123	3/13/2018 - 3/20/2018	Beta	2.59E-02	3.31E-03	3.16E-03
471677	3/20/2018 - 3/27/2018	Beta	1.44E-02	2.79E-03	3.32E-03
472447	3/27/2018 - 4/3/2018	Beta	1.75E-02	2.68E-03	2.99E-03
472453	1/3/2018 - 4/3/2018	Cs-134	<1.46E-03	0.00E+00	1.46E-03
		Cs-137	<1.18E-03	0.00E+00	1.18E-03
		Be-7	1.70E-01	3.91E-02	2.97E-02
		K-40	<2.92E-02	0.00E+00	2.92E-02
472939	4/3/2018 - 4/10/2018	Beta	2.33E-02	3.19E-03	3.19E-03
473231	4/10/2018 - 4/17/2018	Beta	1.74E-02	2.63E-03	2.87E-03
473595	4/17/2018 - 4/24/2018	Beta	2.05E-02	2.68E-03	2.62E-03
474113	4/24/2018 - 5/1/2018	Beta	1.65E-02	2.81E-03	3.09E-03
474493	5/1/2018 - 5/8/2018	Beta	2.15E-02	3.13E-03	3.23E-03
474853	5/8/2018 - 5/15/2018	Beta	3.20E-02	3.60E-03	3.23E-03
475175	5/15/2018 - 5/22/2018	Beta	1.36E-02	2.66E-03	3.13E-03
475499	5/22/2018 - 5/30/2018	Beta	8.86E-03	2.23E-03	2.90E-03
476326	5/30/2018 - 6/5/2018	Beta	1.99E-02	2.93E-03	2.98E-03
477339	6/5/2018 - 6/12/2018	Beta	2.52E-02	3.29E-03	3.31E-03
478063	6/12/2018 - 6/19/2018	Beta	2.38E-02	2.91E-03	2.85E-03
478386	6/19/2018 - 6/26/2018	Beta	2.46E-02	3.38E-03	3.58E-03
478733	6/26/2018 - 7/3/2018	Beta	1.58E-02	2.49E-03	2.70E-03
478739	4/3/2018 - 7/3/2018	Cs-134	<1.60E-03	0.00E+00	1.60E-03
		Cs-137	<1.31E-03	0.00E+00	1.31E-03
		Be-7	1.84E-01	4.10E-02	3.40E-02
		K-40	<3.12E-02	0.00E+00	3.12E-02
479185	7/3/2018 - 7/10/2018	Beta	2.27E-02	2.82E-03	2.70E-03
479841	7/10/2018 - 7/17/2018	Beta	2.92E-02	3.13E-03	2.84E-03
480209	7/17/2018 - 7/24/2018	Beta	2.06E-02	2.71E-03	2.66E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
481038	7/24/2018 - 7/31/2018	Beta	2.64E-02	3.30E-03	3.01E-03
481483	7/31/2018 - 8/7/2018	Beta	1.25E-02	2.88E-03	3.76E-03
481915	8/7/2018 - 8/14/2018	Beta	2.18E-02	3.11E-03	3.20E-03
482445	8/14/2018 - 8/21/2018	Beta	2.69E-02	2.96E-03	2.54E-03
482772	8/21/2018 - 8/28/2018	Beta	2.45E-02	3.19E-03	3.03E-03
483398	8/28/2018 - 9/4/2018	Beta	1.58E-02	2.86E-03	3.29E-03
483969	9/4/2018 - 9/11/2018	Beta	1.83E-02	2.73E-03	3.04E-03
484582	9/11/2018 - 9/18/2018	Beta	6.72E-03	1.97E-03	2.67E-03
484993	9/18/2018 - 9/25/2018	Beta	2.97E-02	3.10E-03	2.65E-03
485442	9/25/2018 - 10/2/2018	Beta	1.74E-02	2.65E-03	2.93E-03
485448	7/3/2018 - 10/2/2018	Cs-134	<1.37E-03	0.00E+00	1.37E-03
		Cs-137	<1.30E-03	0.00E+00	1.30E-03
		Be-7	1.61E-01	4.03E-02	3.67E-02
		K-40	<3.30E-02	0.00E+00	3.30E-02
486108	10/2/2018 - 10/9/2018	Beta	2.88E-02	3.42E-03	3.06E-03
486661	10/9/2018 - 10/16/2018	Beta	1.94E-02	2.72E-03	2.85E-03
487702	10/16/2018 - 10/23/2018	Beta	2.27E-02	2.87E-03	2.88E-03
487950	10/23/2018 - 10/30/2018	Beta	2.27E-02	2.75E-03	2.50E-03
488434	10/30/2018 - 11/6/2018	Beta	1.82E-02	2.96E-03	3.23E-03
488808	11/6/2018 - 11/13/2018	Beta	2.03E-02	2.78E-03	2.91E-03
489114	11/13/2018 - 11/20/2018	Beta	2.36E-02	3.23E-03	3.22E-03
489700	11/20/2018 - 11/27/2018	Beta	2.24E-02	2.94E-03	3.08E-03
490115	11/27/2018 - 12/4/2018	Beta	2.45E-02	2.90E-03	2.77E-03
490758	12/4/2018 - 12/11/2018	Beta	1.96E-02	3.12E-03	3.42E-03
491141	12/11/2018 - 12/19/2018	Beta	1.91E-02	2.77E-03	2.85E-03
491446	12/19/2018 - 12/27/2018	Beta	1.78E-02	2.62E-03	2.68E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491695	12/27/2018 - 1/2/2019	Beta	2.06E-02	3.00E-03	3.13E-03
491701	10/2/2018 - 1/2/2019	Cs-134	<1.35E-03	0.00E+00	1.35E-03
		Cs-137	<1.29E-03	0.00E+00	1.29E-03
		Be-7	1.36E-01	3.45E-02	2.71E-02
		K-40	<3.39E-02	0.00E+00	3.39E-02
Sample Point 258 [CONTROL - W @ 9.84 miles]					
465953	1/3/2018 - 1/9/2018	Beta	3.47E-02	3.99E-03	3.53E-03
466155	1/9/2018 - 1/16/2018	Beta	1.99E-02	3.08E-03	3.28E-03
466354	1/16/2018 - 1/23/2018	Beta	3.08E-02	3.21E-03	2.89E-03
466941	1/23/2018 - 1/30/2018	Beta	1.53E-02	2.76E-03	3.08E-03
467298	1/30/2018 - 2/6/2018	Beta	1.73E-02	2.82E-03	2.98E-03
467609	2/6/2018 - 2/13/2018	Beta	1.82E-02	2.97E-03	3.30E-03
468402	2/13/2018 - 2/20/2018	Beta	1.46E-02	2.37E-03	2.54E-03
468722	2/20/2018 - 2/27/2018	Beta	1.44E-02	2.81E-03	3.34E-03
469532	2/27/2018 - 3/6/2018	Beta	2.90E-02	3.44E-03	3.12E-03
470553	3/6/2018 - 3/13/2018	Beta	2.46E-02	3.27E-03	3.27E-03
471124	3/13/2018 - 3/20/2018	Beta	2.68E-02	3.37E-03	3.17E-03
471678	3/20/2018 - 3/27/2018	Beta	1.46E-02	2.80E-03	3.33E-03
472448	3/27/2018 - 4/3/2018	Beta	1.34E-02	2.49E-03	2.99E-03
472454	1/3/2018 - 4/3/2018	Cs-134	<1.64E-03	0.00E+00	1.64E-03
		Cs-137	<1.34E-03	0.00E+00	1.34E-03
		Be-7	1.35E-01	3.60E-02	3.22E-02
		K-40	<2.39E-02	0.00E+00	2.39E-02
472940	4/3/2018 - 4/10/2018	Beta	2.34E-02	3.18E-03	3.17E-03
473232	4/10/2018 - 4/17/2018	Beta	1.69E-02	2.60E-03	2.87E-03
473596	4/17/2018 - 4/24/2018	Beta	2.19E-02	2.77E-03	2.67E-03
474114	4/24/2018 - 5/1/2018	Beta	1.42E-02	2.68E-03	3.08E-03
474494	5/1/2018 - 5/8/2018	Beta	2.26E-02	3.14E-03	3.18E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
474854	5/8/2018 - 5/15/2018	Beta	3.04E-02	3.54E-03	3.22E-03
475176	5/15/2018 - 5/22/2018	Beta	1.27E-02	2.62E-03	3.16E-03
475500	5/22/2018 - 5/30/2018	Beta	7.90E-03	2.16E-03	2.89E-03
476327	5/30/2018 - 6/5/2018	Beta	1.87E-02	2.86E-03	2.96E-03
477340	6/5/2018 - 6/12/2018	Beta	2.74E-02	3.41E-03	3.34E-03
478064	6/12/2018 - 6/19/2018	Beta	2.46E-02	2.95E-03	2.86E-03
478387	6/19/2018 - 6/26/2018	Beta	1.88E-02	3.09E-03	3.55E-03
478734	6/26/2018 - 7/3/2018	Beta	1.68E-02	2.56E-03	2.73E-03
478740	4/3/2018 - 7/3/2018	Cs-134	<1.86E-03	0.00E+00	1.86E-03
		Cs-137	<1.40E-03	0.00E+00	1.40E-03
		Be-7	1.61E-01	3.58E-02	1.68E-02
		K-40	<3.16E-02	0.00E+00	3.16E-02
479186	7/3/2018 - 7/10/2018	Beta	1.94E-02	2.65E-03	2.67E-03
479842	7/10/2018 - 7/17/2018	Beta	2.96E-02	3.15E-03	2.86E-03
480210	7/17/2018 - 7/24/2018	Beta	2.25E-02	2.78E-03	2.64E-03
481039	7/24/2018 - 7/31/2018	Beta	2.21E-02	3.09E-03	3.02E-03
481484	7/31/2018 - 8/7/2018	Beta	1.04E-02	2.77E-03	3.77E-03
481916	8/7/2018 - 8/14/2018	Beta	1.99E-02	3.02E-03	3.21E-03
482446	8/14/2018 - 8/21/2018	Beta	2.52E-02	2.87E-03	2.52E-03
482773	8/21/2018 - 8/28/2018	Beta	2.73E-02	3.31E-03	3.03E-03
483399	8/28/2018 - 9/4/2018	Beta	1.67E-02	2.92E-03	3.30E-03
483970	9/4/2018 - 9/11/2018	Beta	1.73E-02	2.70E-03	3.06E-03
484583	9/11/2018 - 9/18/2018	Beta	5.45E-03	1.88E-03	2.66E-03
484994	9/18/2018 - 9/25/2018	Beta	2.51E-02	2.90E-03	2.63E-03
485443	9/25/2018 - 10/2/2018	Beta	1.48E-02	2.53E-03	2.94E-03
485449	7/3/2018 - 10/2/2018	Cs-134	<1.37E-03	0.00E+00	1.37E-03
		Cs-137	<1.45E-03	0.00E+00	1.45E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
485449	7/3/2018 - 10/2/2018	Be-7	1.64E-01	3.85E-02	2.85E-02
		K-40	<3.03E-02	0.00E+00	3.03E-02
486109	10/2/2018 - 10/9/2018	Beta	3.41E-02	3.65E-03	3.07E-03
486662	10/9/2018 - 10/16/2018	Beta	1.87E-02	2.67E-03	2.82E-03
487703	10/16/2018 - 10/23/2018	Beta	2.52E-02	2.99E-03	2.89E-03
487951	10/23/2018 - 10/30/2018	Beta	1.93E-02	2.59E-03	2.49E-03
488435	10/30/2018 - 11/6/2018	Beta	1.70E-02	2.92E-03	3.26E-03
488809	11/6/2018 - 11/13/2018	Beta	1.88E-02	2.69E-03	2.88E-03
489115	11/13/2018 - 11/20/2018	Beta	2.39E-02	3.25E-03	3.23E-03
489701	11/20/2018 - 11/27/2018	Beta	2.10E-02	2.86E-03	3.07E-03
490116	11/27/2018 - 12/4/2018	Beta	2.17E-02	2.80E-03	2.80E-03
490759	12/4/2018 - 12/11/2018	Beta	1.92E-02	3.06E-03	3.37E-03
491142	12/11/2018 - 12/19/2018	Beta	1.69E-02	2.66E-03	2.86E-03
491447	12/19/2018 - 12/27/2018	Beta	2.01E-02	2.73E-03	2.67E-03
491696	12/27/2018 - 1/2/2019	Beta	1.64E-02	2.82E-03	3.16E-03
491702	10/2/2018 - 1/2/2019	Nuclide	Activity	2 Sigma Error	MDA
		Cs-134	<1.62E-03	0.00E+00	1.62E-03
		Cs-137	<1.19E-03	0.00E+00	1.19E-03
		Be-7	1.16E-01	3.30E-02	3.26E-02
		K-40	3.27E-02	1.66E-02	1.60E-02

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465954	1/3/2018 - 1/9/2018	Beta	3.28E-02	3.92E-03	3.56E-03
466156	1/9/2018 - 1/16/2018	Beta	1.73E-02	2.94E-03	3.28E-03
466355	1/16/2018 - 1/23/2018	Beta	2.95E-02	3.17E-03	2.90E-03
466942	1/23/2018 - 1/30/2018	Beta	1.54E-02	2.75E-03	3.06E-03
467299	1/30/2018 - 2/6/2018	Beta	1.79E-02	2.86E-03	2.99E-03
467610	2/6/2018 - 2/13/2018	Beta	1.78E-02	2.95E-03	3.29E-03
468403	2/13/2018 - 2/20/2018	Beta	1.59E-02	2.44E-03	2.54E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
468723	2/20/2018 - 2/27/2018	Beta	1.49E-02	2.83E-03	3.33E-03
469533	2/27/2018 - 3/6/2018	Beta	2.60E-02	3.31E-03	3.11E-03
470554	3/6/2018 - 3/13/2018	Beta	2.01E-02	3.07E-03	3.28E-03
471125	3/13/2018 - 3/20/2018	Beta	2.66E-02	3.35E-03	3.16E-03
471679	3/20/2018 - 3/27/2018	Beta	1.43E-02	2.78E-03	3.33E-03
472449	3/27/2018 - 4/3/2018	Beta	1.69E-02	2.65E-03	2.98E-03
472455	1/3/2018 - 4/3/2018	Cs-134	<1.39E-03	0.00E+00	1.39E-03
		Cs-137	<1.30E-03	0.00E+00	1.30E-03
		Be-7	1.63E-01	4.10E-02	3.49E-02
		K-40	<3.07E-02	0.00E+00	3.07E-02
472941	4/3/2018 - 4/10/2018	Beta	2.50E-02	3.25E-03	3.18E-03
473233	4/10/2018 - 4/17/2018	Beta	2.00E-02	2.82E-03	2.97E-03
473597	4/17/2018 - 4/24/2018	Beta	1.99E-02	2.67E-03	2.65E-03
474115	4/24/2018 - 5/1/2018	Beta	1.22E-02	2.57E-03	3.08E-03
474495	5/1/2018 - 5/8/2018	Beta	2.37E-02	3.21E-03	3.20E-03
474855	5/8/2018 - 5/15/2018	Beta	2.89E-02	3.47E-03	3.23E-03
475177	5/15/2018 - 5/22/2018	Beta	1.12E-02	2.53E-03	3.14E-03
475501	5/22/2018 - 5/30/2018	Beta	9.55E-03	2.26E-03	2.90E-03
476328	5/30/2018 - 6/5/2018	Beta	1.94E-02	2.85E-03	2.90E-03
477341	6/5/2018 - 6/12/2018	Beta	2.73E-02	3.44E-03	3.39E-03
478065	6/12/2018 - 6/19/2018	Beta	2.05E-02	2.77E-03	2.85E-03
478388	6/19/2018 - 6/26/2018	Beta	2.08E-02	3.19E-03	3.56E-03
478735	6/26/2018 - 7/3/2018	Beta	1.91E-02	2.66E-03	2.70E-03
478741	4/3/2018 - 7/3/2018	Cs-134	<1.46E-03	0.00E+00	1.46E-03
		Cs-137	<1.56E-03	0.00E+00	1.56E-03
		Be-7	1.73E-01	3.68E-02	1.81E-02
		K-40	<2.67E-02	0.00E+00	2.67E-02
479187	7/3/2018 - 7/10/2018	Beta	2.13E-02	2.76E-03	2.70E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID	Sample Dates	Nuclide	Activity	2 Sigma Error	MDA
479843	7/10/2018 - 7/17/2018	Beta	3.19E-02	3.23E-03	2.84E-03
480211	7/17/2018 - 7/24/2018	Beta	2.01E-02	2.68E-03	2.66E-03
481040	7/24/2018 - 7/31/2018	Beta	2.16E-02	3.07E-03	3.01E-03
481485	7/31/2018 - 8/7/2018	Beta	8.79E-03	2.67E-03	3.76E-03
481917	8/7/2018 - 8/14/2018	Beta	1.98E-02	3.01E-03	3.21E-03
482447	8/14/2018 - 8/21/2018	Beta	2.78E-02	2.99E-03	2.53E-03
482774	8/21/2018 - 8/28/2018	Beta	2.22E-02	3.08E-03	3.02E-03
483400	8/28/2018 - 9/4/2018	Beta	1.75E-02	2.95E-03	3.29E-03
483971	9/4/2018 - 9/11/2018	Beta	1.64E-02	2.65E-03	3.06E-03
484584	9/11/2018 - 9/18/2018	Beta	7.80E-03	2.03E-03	2.66E-03
484995	9/18/2018 - 9/25/2018	Beta	2.84E-02	3.05E-03	2.64E-03
485444	9/25/2018 - 10/2/2018	Beta	1.78E-02	2.67E-03	2.93E-03
485450	7/3/2018 - 10/2/2018	Cs-134	<1.02E-03	0.00E+00	1.02E-03
		Cs-137	<3.08E-04	0.00E+00	3.08E-04
		Be-7	1.25E-01	3.37E-02	3.04E-02
		K-40	<3.22E-02	0.00E+00	3.22E-02
486110	10/2/2018 - 10/9/2018	Beta	3.07E-02	3.51E-03	3.07E-03
486663	10/9/2018 - 10/16/2018	Beta	2.11E-02	2.79E-03	2.83E-03
487704	10/16/2018 - 10/23/2018	Beta	2.51E-02	2.98E-03	2.88E-03
487952	10/23/2018 - 10/30/2018	Beta	2.06E-02	2.65E-03	2.50E-03
488436	10/30/2018 - 11/6/2018	Beta	1.43E-02	2.76E-03	3.24E-03
488810	11/6/2018 - 11/13/2018	Beta	2.02E-02	2.77E-03	2.90E-03
489116	11/13/2018 - 11/20/2018	Beta	3.07E-02	3.57E-03	3.23E-03
489702	11/20/2018 - 11/27/2018	Beta	2.06E-02	2.85E-03	3.08E-03
490117	11/27/2018 - 12/4/2018	Beta	2.24E-02	2.83E-03	2.79E-03
490760	12/4/2018 - 12/11/2018	Beta	1.54E-02	2.89E-03	3.40E-03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR PARTICULATE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491143	12/11/2018 - 12/19/2018	Beta	2.16E-02	2.89E-03	2.85E-03
491448	12/19/2018 - 12/27/2018	Beta	1.74E-02	2.60E-03	2.68E-03
491697	12/27/2018 - 1/2/2019	Beta	2.13E-02	3.04E-03	3.15E-03
491703	10/2/2018 - 1/2/2019	Cs-134	<1.58E-03	0.00E+00	1.58E-03
		Cs-137	<1.41E-03	0.00E+00	1.41E-03
		Be-7	1.27E-01	3.21E-02	2.59E-02
		K-40	<2.98E-02	0.00E+00	2.98E-02

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465955	1/3/2018 - 1/9/2018	I-131	<2.57E-02	0.00E+00	2.57E-02
		Cs-134	<2.64E-02	0.00E+00	2.64E-02
		Cs-137	<2.15E-02	0.00E+00	2.15E-02
		Be-7	<1.41E-01	0.00E+00	1.41E-01
		K-40	6.51E-01	2.19E-01	1.70E-01
466157	1/9/2018 - 1/16/2018	I-131	<2.55E-02	0.00E+00	2.55E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	3.80E-01	1.62E-01	1.61E-01
466356	1/16/2018 - 1/23/2018	I-131	<2.23E-02	0.00E+00	2.23E-02
		Cs-134	<2.10E-02	0.00E+00	2.10E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	5.43E-01	2.00E-01	2.02E-01
466943	1/23/2018 - 1/30/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.99E-02	0.00E+00	1.99E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	5.59E-01	1.87E-01	1.47E-01
467300	1/30/2018 - 2/6/2018	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<2.22E-02	0.00E+00	2.22E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.62E-01	1.96E-01	1.81E-01
467611	2/6/2018 - 2/13/2018	I-131	<1.72E-02	0.00E+00	1.72E-02
		Cs-134	<1.61E-02	0.00E+00	1.61E-02
		Cs-137	<1.49E-02	0.00E+00	1.49E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	5.05E-01	1.78E-01	1.38E-01
468404	2/13/2018 - 2/20/2018	I-131	<2.37E-02	0.00E+00	2.37E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	6.01E-01	1.94E-01	1.46E-01
468724	2/20/2018 - 2/27/2018	I-131	<2.33E-02	0.00E+00	2.33E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
468724	2/20/2018 - 2/27/2018	Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.95E-02	0.00E+00	1.95E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.49E-01	1.84E-01	1.38E-01
469534	2/27/2018 - 3/6/2018	I-131	<2.16E-02	0.00E+00	2.16E-02
		Cs-134	<1.85E-02	0.00E+00	1.85E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	5.21E-01	2.10E-01	2.43E-01
470555	3/6/2018 - 3/13/2018	I-131	<1.94E-02	0.00E+00	1.94E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.55E-01	1.96E-01	1.82E-01
471126	3/13/2018 - 3/20/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	7.19E-01	2.17E-01	1.74E-01
471680	3/20/2018 - 3/27/2018	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	<3.63E-01	0.00E+00	3.63E-01
472456	3/27/2018 - 4/3/2018	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	6.26E-01	1.86E-01	3.46E-02
472942	4/3/2018 - 4/10/2018	I-131	<2.09E-02	0.00E+00	2.09E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	3.60E-01	1.79E-01	2.21E-01
473234	4/10/2018 - 4/17/2018	I-131	<2.01E-02	0.00E+00	2.01E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.94E-02	0.00E+00	1.94E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	2.87E-01	2.20E-01	3.34E-01
473598	4/17/2018 - 4/24/2018	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<2.03E-02	0.00E+00	2.03E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	5.07E-01	1.79E-01	1.45E-01
474116	4/24/2018 - 5/1/2018	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.40E-01	0.00E+00	1.40E-01
		K-40	<3.93E-01	0.00E+00	3.93E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
474496	5/1/2018 - 5/8/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<2.05E-02	0.00E+00	2.05E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<1.36E-01	0.00E+00	1.37E-01
		K-40	5.33E-01	1.80E-01	1.28E-01
474856	5/8/2018 - 5/15/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	5.79E-01	2.07E-01	2.08E-01
475178	5/15/2018 - 5/22/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.74E-01	1.60E-01	3.47E-02
475502	5/22/2018 - 5/30/2018	I-131	<1.74E-02	0.00E+00	1.74E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.35E-02	0.00E+00	1.35E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	5.35E-01	1.74E-01	1.40E-01
476329	5/30/2018 - 6/5/2018	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.84E-02	0.00E+00	1.84E-02
		Cs-137	<2.11E-02	0.00E+00	2.11E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	5.72E-01	2.32E-01	2.61E-01
477342	6/5/2018 - 6/12/2018	I-131	<1.86E-02	0.00E+00	1.86E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	6.04E-01	1.96E-01	1.50E-01
478066	6/12/2018 - 6/19/2018	I-131	<2.80E-02	0.00E+00	2.80E-02
		Cs-134	<1.70E-02	0.00E+00	1.70E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.53E-01	0.00E+00	1.53E-01
		K-40	5.61E-01	2.29E-01	2.53E-01
478389	6/19/2018 - 6/26/2018	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	5.30E-01	1.93E-01	1.84E-01
478742	6/26/2018 - 7/3/2018	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.34E-01	1.87E-01	1.62E-01
479188	7/3/2018 - 7/10/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.49E-02	0.00E+00	1.49E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	<3.80E-01	0.00E+00	3.80E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
479844	7/10/2018 - 7/17/2018	I-131	<1.85E-02	0.00E+00	1.85E-02
		Cs-134	<1.85E-02	0.00E+00	1.85E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.44E-01	0.00E+00	1.44E-01
		K-40	<3.38E-01	0.00E+00	3.38E-01
480212	7/17/2018 - 7/24/2018	I-131	<1.93E-02	0.00E+00	1.93E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	6.32E-01	1.96E-01	1.33E-01
481041	7/24/2018 - 7/31/2018	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<9.33E-02	0.00E+00	9.33E-02
		K-40	5.83E-01	2.06E-01	2.02E-01
481486	7/31/2018 - 8/7/2018	I-131	<2.28E-02	0.00E+00	2.28E-02
		Cs-134	<2.03E-02	0.00E+00	2.03E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	3.56E-01	2.10E-01	2.95E-01
481918	8/7/2018 - 8/14/2018	I-131	<2.28E-02	0.00E+00	2.28E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	3.80E-01	1.62E-01	1.61E-01
482448	8/14/2018 - 8/21/2018	I-131	<1.48E-02	0.00E+00	1.48E-02
		Cs-134	<1.23E-02	0.00E+00	1.23E-02
		Cs-137	<1.21E-02	0.00E+00	1.21E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	2.62E-01	1.59E-01	2.15E-01
482775	8/21/2018 - 8/28/2018	I-131	<1.30E-02	0.00E+00	1.30E-02
		Cs-134	<1.48E-02	0.00E+00	1.48E-02
		Cs-137	<1.51E-02	0.00E+00	1.51E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	3.99E-01	1.43E-01	3.28E-02
483401	8/28/2018 - 9/4/2018	I-131	<1.64E-02	0.00E+00	1.64E-02
		Cs-134	<1.45E-02	0.00E+00	1.45E-02
		Cs-137	<1.46E-02	0.00E+00	1.46E-02
		Be-7	<9.75E-02	0.00E+00	9.75E-02
		K-40	1.42E-01	1.40E-01	2.18E-01
483972	9/4/2018 - 9/11/2018	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.41E-01	0.00E+00	1.41E-01
		K-40	6.40E-01	2.25E-01	2.38E-01
484585	9/11/2018 - 9/18/2018	I-131	<3.50E-02	0.00E+00	3.50E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	2.82E-01	1.77E-01	2.46E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
484996	9/18/2018 - 9/25/2018	I-131	<1.73E-02	0.00E+00	1.73E-02
		Cs-134	<1.61E-02	0.00E+00	1.61E-02
		Cs-137	<1.71E-02	0.00E+00	1.71E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	3.76E-01	1.93E-01	2.49E-01
485451	9/25/2018 - 10/2/2018	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	4.31E-01	1.82E-01	1.97E-01
486111	10/2/2018 - 10/9/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<2.04E-02	0.00E+00	2.04E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	5.00E-01	1.65E-01	3.47E-02
486664	10/9/2018 - 10/16/2018	I-131	<2.42E-02	0.00E+00	2.42E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	<3.68E-01	0.00E+00	3.68E-01
487705	10/16/2018 - 10/23/2018	I-131	<1.84E-02	0.00E+00	1.84E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	4.84E-01	2.05E-01	2.40E-01
487953	10/23/2018 - 10/30/2018	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	2.19E-02	7.19E-02	1.27E-01
		K-40	4.10E-01	1.49E-01	3.47E-02
488437	10/30/2018 - 11/6/2018	I-131	<2.01E-02	0.00E+00	2.01E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.63E-01	1.67E-01	1.25E-01
488811	11/6/2018 - 11/13/2018	I-131	<1.86E-02	0.00E+00	1.86E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	4.34E-01	1.71E-01	1.62E-01
489117	11/13/2018 - 11/20/2018	I-131	<3.30E-02	0.00E+00	3.30E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	4.24E-01	2.00E-01	2.50E-01
489703	11/20/2018 - 11/27/2018	I-131	<2.35E-02	0.00E+00	2.35E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	4.19E-01	1.79E-01	1.96E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490118	11/27/2018 - 12/4/2018	I-131	<2.36E-02	0.00E+00	2.36E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.46E-01	1.72E-01	2.08E-01
490761	12/4/2018 - 12/11/2018	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.36E-01	0.00E+00	1.36E-01
		K-40	<3.79E-01	0.00E+00	3.79E-01
491144	12/11/2018 - 12/19/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.65E-02	0.00E+00	1.65E-02
		Cs-137	<1.24E-02	0.00E+00	1.24E-02
		Be-7	<9.96E-02	0.00E+00	9.96E-02
		K-40	1.60E-01	1.32E-01	1.93E-01
491449	12/19/2018 - 12/27/2018	I-131	<2.51E-02	0.00E+00	2.51E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<9.49E-02	0.00E+00	9.49E-02
		K-40	3.60E-01	1.80E-01	2.35E-01
491704	12/27/2018 - 1/2/2019	I-131	<2.45E-02	0.00E+00	2.45E-02
		Cs-134	<2.25E-02	0.00E+00	2.25E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	6.13E-01	2.27E-01	2.22E-01
Sample Point 201 [INDICATOR - NE @ 0.53 miles]					
465956	1/3/2018 - 1/9/2018	I-131	<2.57E-02	0.00E+00	2.57E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<2.24E-02	0.00E+00	2.24E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	5.34E-01	2.29E-01	2.67E-01
466158	1/9/2018 - 1/16/2018	I-131	<2.33E-02	0.00E+00	2.33E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.71E-01	1.96E-01	1.72E-01
466357	1/16/2018 - 1/23/2018	I-131	<2.16E-02	0.00E+00	2.16E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<2.05E-02	0.00E+00	2.05E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	4.21E-01	1.91E-01	2.28E-01
466944	1/23/2018 - 1/30/2018	I-131	<2.05E-02	0.00E+00	2.05E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<9.38E-02	0.00E+00	9.38E-02
		K-40	4.09E-01	1.61E-01	1.39E-01
467301	1/30/2018 - 2/6/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.85E-02	0.00E+00	1.85E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467301	1/30/2018 - 2/6/2018	Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	5.10E-01	1.97E-01	2.10E-01
467612	2/6/2018 - 2/13/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.49E-02	0.00E+00	1.49E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	5.97E-01	2.19E-01	2.37E-01
468405	2/13/2018 - 2/20/2018	I-131	<2.45E-02	0.00E+00	2.45E-02
		Cs-134	<2.10E-02	0.00E+00	2.10E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.38E-01	1.94E-01	2.66E-01
468725	2/20/2018 - 2/27/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	4.17E-01	1.72E-01	1.75E-01
469535	2/27/2018 - 3/6/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.14E-02	0.00E+00	1.14E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.72E-01	1.84E-01	1.84E-01
470556	3/6/2018 - 3/13/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	4.72E-01	1.87E-01	1.93E-01
471127	3/13/2018 - 3/20/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<2.09E-02	0.00E+00	2.09E-02
		Cs-137	<2.08E-02	0.00E+00	2.08E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	2.81E-01	1.75E-01	2.42E-01
471681	3/20/2018 - 3/27/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	4.51E-01	1.80E-01	1.82E-01
472457	3/27/2018 - 4/3/2018	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	5.51E-01	2.07E-01	2.22E-01
472943	4/3/2018 - 4/10/2018	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<2.16E-02	0.00E+00	2.16E-02
		Be-7	<8.87E-02	0.00E+00	8.87E-02
		K-40	5.90E-01	2.04E-01	1.94E-01
473235	4/10/2018 - 4/17/2018	I-131	<1.96E-02	0.00E+00	1.96E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
473235	4/10/2018 - 4/17/2018	Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.74E-01	1.84E-01	2.29E-01
473599	4/17/2018 - 4/24/2018	I-131	<2.16E-02	0.00E+00	2.16E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	3.93E-01	1.74E-01	1.94E-01
474117	4/24/2018 - 5/1/2018	I-131	<2.14E-02	0.00E+00	2.14E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	3.97E-01	1.68E-01	1.72E-01
474497	5/1/2018 - 5/8/2018	I-131	<2.28E-02	0.00E+00	2.28E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.39E-01	0.00E+00	1.39E-01
		K-40	4.23E-01	1.99E-01	2.47E-01
474857	5/8/2018 - 5/15/2018	I-131	<1.75E-02	0.00E+00	1.75E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.22E-02	0.00E+00	1.22E-02
		Be-7	<9.98E-02	0.00E+00	9.98E-02
		K-40	2.80E-01	1.67E-01	2.24E-01
475179	5/15/2018 - 5/22/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<1.09E-01	0.00E+00	1.09E-01
		K-40	<3.36E-01	0.00E+00	3.36E-01
475503	5/22/2018 - 5/30/2018	I-131	<1.55E-02	0.00E+00	1.55E-02
		Cs-134	<1.84E-02	0.00E+00	1.84E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	2.83E-01	1.77E-01	2.53E-01
476330	5/30/2018 - 6/5/2018	I-131	<2.45E-02	0.00E+00	2.45E-02
		Cs-134	<1.84E-02	0.00E+00	1.84E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02
		Be-7	<1.69E-01	0.00E+00	1.69E-01
		K-40	4.74E-01	2.50E-01	3.40E-01
477343	6/5/2018 - 6/12/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<2.10E-02	0.00E+00	2.10E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	5.08E-01	1.96E-01	2.05E-01
478067	6/12/2018 - 6/19/2018	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	6.15E-01	1.95E-01	1.39E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
478390	6/19/2018 - 6/26/2018	I-131	<1.70E-02	0.00E+00	1.70E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	6.00E-01	2.14E-01	2.21E-01
478743	6/26/2018 - 7/3/2018	I-131	<1.98E-02	0.00E+00	1.98E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	6.05E-01	1.95E-01	1.45E-01
479189	7/3/2018 - 7/10/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	4.22E-01	1.86E-01	2.13E-01
479845	7/10/2018 - 7/17/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	5.40E-01	1.93E-01	1.80E-01
480213	7/17/2018 - 7/24/2018	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	5.86E-01	2.03E-01	1.91E-01
481042	7/24/2018 - 7/31/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	5.79E-01	2.01E-01	1.86E-01
481487	7/31/2018 - 8/7/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	4.47E-01	1.67E-01	1.37E-01
481919	8/7/2018 - 8/14/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	4.35E-01	1.79E-01	1.87E-01
482449	8/14/2018 - 8/21/2018	I-131	<1.67E-02	0.00E+00	1.67E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	<3.97E-01	0.00E+00	3.97E-01
482776	8/21/2018 - 8/28/2018	I-131	<1.66E-02	0.00E+00	1.66E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<9.91E-02	0.00E+00	9.91E-02
		K-40	4.79E-01	2.07E-01	2.51E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483402	8/28/2018 - 9/4/2018	I-131	<1.43E-02	0.00E+00	1.43E-02
		Cs-134	<1.62E-02	0.00E+00	1.62E-02
		Cs-137	<1.40E-02	0.00E+00	1.40E-02
		Be-7	<9.80E-02	0.00E+00	9.80E-02
		K-40	1.73E-01	1.37E-01	1.96E-01
483973	9/4/2018 - 9/11/2018	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<2.09E-02	0.00E+00	2.09E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	5.00E-01	1.99E-01	2.18E-01
484586	9/11/2018 - 9/18/2018	I-131	<3.13E-02	0.00E+00	3.13E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.97E-01	2.01E-01	2.62E-01
484997	9/18/2018 - 9/25/2018	I-131	<2.29E-02	0.00E+00	2.29E-02
		Cs-134	<1.45E-02	0.00E+00	1.45E-02
		Cs-137	<1.55E-02	0.00E+00	1.55E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	5.85E-01	2.35E-01	2.84E-01
485452	9/25/2018 - 10/2/2018	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	3.80E-01	1.62E-01	1.62E-01
486112	10/2/2018 - 10/9/2018	I-131	<2.18E-02	0.00E+00	2.18E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	6.32E-01	2.08E-01	1.85E-01
486665	10/9/2018 - 10/16/2018	I-131	<2.63E-02	0.00E+00	2.63E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.31E-01	1.87E-01	1.63E-01
487706	10/16/2018 - 10/23/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	6.36E-01	2.40E-01	2.81E-01
487954	10/23/2018 - 10/30/2018	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	3.78E-01	1.75E-01	2.01E-01
488438	10/30/2018 - 11/6/2018	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<2.09E-02	0.00E+00	2.09E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.86E-01	1.62E-01	3.47E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488812	11/6/2018 - 11/13/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	<3.39E-01	0.00E+00	3.39E-01
489118	11/13/2018 - 11/20/2018	I-131	<3.47E-02	0.00E+00	3.47E-02
		Cs-134	<2.11E-02	0.00E+00	2.11E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	4.97E-01	2.02E-01	2.28E-01
489704	11/20/2018 - 11/27/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<1.42E-01	0.00E+00	1.42E-01
		K-40	3.34E-01	1.67E-01	1.99E-01
490119	11/27/2018 - 12/4/2018	I-131	<2.64E-02	0.00E+00	2.64E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.36E-01	0.00E+00	1.36E-01
		K-40	2.68E-01	1.55E-01	1.98E-01
490762	12/4/2018 - 12/11/2018	I-131	<1.97E-02	0.00E+00	1.97E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	4.02E-01	1.90E-01	2.33E-01
491145	12/11/2018 - 12/19/2018	I-131	<2.91E-02	0.00E+00	2.91E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.33E-02	0.00E+00	1.33E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	1.87E-01	1.39E-01	2.02E-01
491450	12/19/2018 - 12/27/2018	I-131	<2.64E-02	0.00E+00	2.64E-02
		Cs-134	<1.64E-02	0.00E+00	1.64E-02
		Cs-137	<2.03E-02	0.00E+00	2.03E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	<3.02E-01	0.00E+00	3.02E-01
491705	12/27/2018 - 1/2/2019	I-131	<2.72E-02	0.00E+00	2.72E-02
		Cs-134	<1.78E-02	0.00E+00	1.78E-02
		Cs-137	<2.10E-02	0.00E+00	2.10E-02
		Be-7	<1.49E-01	0.00E+00	1.49E-01
		K-40	3.48E-01	2.59E-01	3.92E-01

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465957	1/3/2018 - 1/9/2018	I-131	<2.58E-02	0.00E+00	2.58E-02
		Cs-134	<1.20E-02	0.00E+00	1.20E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<9.40E-02	0.00E+00	9.40E-02
		K-40	<4.65E-01	0.00E+00	4.65E-01
466159	1/9/2018 - 1/16/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<2.36E-02	0.00E+00	2.36E-02
		Cs-137	<1.60E-02	0.00E+00	1.60E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466159	1/9/2018 - 1/16/2018	Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	4.70E-01	1.90E-01	2.04E-01
466358	1/16/2018 - 1/23/2018	I-131	<1.69E-02	0.00E+00	1.69E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	5.17E-01	1.89E-01	1.77E-01
466945	1/23/2018 - 1/30/2018	I-131	<2.34E-02	0.00E+00	2.34E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.47E-01	0.00E+00	1.47E-01
		K-40	4.65E-01	1.98E-01	2.31E-01
467302	1/30/2018 - 2/6/2018	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<2.08E-02	0.00E+00	2.08E-02
		Cs-137	<1.98E-02	0.00E+00	1.98E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.22E-01	1.61E-01	1.30E-01
467613	2/6/2018 - 2/13/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	5.28E-01	1.97E-01	1.97E-01
468406	2/13/2018 - 2/20/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	2.69E-01	1.76E-01	2.48E-01
468726	2/20/2018 - 2/27/2018	I-131	<2.44E-02	0.00E+00	2.44E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.42E-02	0.00E+00	1.42E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	4.47E-01	1.55E-01	3.46E-02
469536	2/27/2018 - 3/6/2018	I-131	<1.93E-02	0.00E+00	1.93E-02
		Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	4.42E-01	1.94E-01	2.28E-01
470557	3/6/2018 - 3/13/2018	I-131	<1.98E-02	0.00E+00	1.98E-02
		Cs-134	<1.99E-02	0.00E+00	1.99E-02
		Cs-137	<1.37E-02	0.00E+00	1.37E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	5.29E-01	2.03E-01	2.16E-01
471128	3/13/2018 - 3/20/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.60E-01	1.66E-01	1.86E-01
471682	3/20/2018 - 3/27/2018	I-131	<2.40E-02	0.00E+00	2.40E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
471682	3/20/2018 - 3/27/2018	Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.32E-01	1.91E-01	1.75E-01
472458	3/27/2018 - 4/3/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.25E-01	0.00E+00	1.25E-01
		K-40	4.40E-01	1.75E-01	1.73E-01
472944	4/3/2018 - 4/10/2018	I-131	<1.87E-02	0.00E+00	1.87E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.42E-02	0.00E+00	1.42E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	3.65E-01	1.78E-01	2.16E-01
473236	4/10/2018 - 4/17/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	3.92E-01	1.78E-01	2.04E-01
473600	4/17/2018 - 4/24/2018	I-131	<2.09E-02	0.00E+00	2.09E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	5.32E-01	1.95E-01	1.93E-01
474118	4/24/2018 - 5/1/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.42E-02	0.00E+00	1.42E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	4.66E-01	2.01E-01	2.37E-01
474498	5/1/2018 - 5/8/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	4.46E-01	1.97E-01	2.34E-01
474858	5/8/2018 - 5/15/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	3.98E-01	1.93E-01	2.42E-01
475180	5/15/2018 - 5/22/2018	I-131	<1.82E-02	0.00E+00	1.82E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.92E-02	0.00E+00	1.92E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	6.67E-01	1.92E-01	3.48E-02
475504	5/22/2018 - 5/30/2018	I-131	<1.59E-02	0.00E+00	1.59E-02
		Cs-134	<1.64E-02	0.00E+00	1.64E-02
		Cs-137	<1.61E-02	0.00E+00	1.61E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	4.39E-01	1.79E-01	2.03E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
476331	5/30/2018 - 6/5/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<2.22E-02	0.00E+00	2.22E-02
		Cs-137	<2.22E-02	0.00E+00	2.22E-02
		Be-7	<1.39E-01	0.00E+00	1.39E-01
		K-40	6.60E-01	2.22E-01	1.81E-01
477344	6/5/2018 - 6/12/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<9.79E-02	0.00E+00	9.79E-02
		K-40	4.57E-01	1.92E-01	2.16E-01
478068	6/12/2018 - 6/19/2018	I-131	<2.75E-02	0.00E+00	2.75E-02
		Cs-134	<2.27E-02	0.00E+00	2.27E-02
		Cs-137	<2.27E-02	0.00E+00	2.27E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	4.76E-01	2.49E-01	3.34E-01
478391	6/19/2018 - 6/26/2018	I-131	<2.02E-02	0.00E+00	2.02E-02
		Cs-134	<1.25E-02	0.00E+00	1.25E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	5.79E-01	1.87E-01	1.30E-01
478744	6/26/2018 - 7/3/2018	I-131	<1.80E-02	0.00E+00	1.80E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02
		Be-7	<1.27E-01	0.00E+00	1.27E-01
		K-40	4.81E-01	1.86E-01	1.85E-01
479190	7/3/2018 - 7/10/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	4.32E-01	1.68E-01	1.51E-01
479846	7/10/2018 - 7/17/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.89E-01	1.90E-01	1.37E-01
480214	7/17/2018 - 7/24/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	4.99E-01	2.01E-01	2.25E-01
481043	7/24/2018 - 7/31/2018	I-131	<1.90E-02	0.00E+00	1.90E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	2.53E-01	1.81E-01	2.65E-01
481488	7/31/2018 - 8/7/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	5.06E-01	1.88E-01	1.80E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
481920	8/7/2018 - 8/14/2018	I-131	<2.15E-02	0.00E+00	2.15E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<1.03E-01	0.00E+00	1.03E-01
		K-40	3.05E-01	1.50E-01	1.64E-01
482450	8/14/2018 - 8/21/2018	I-131	<1.50E-02	0.00E+00	1.50E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<7.42E-02	0.00E+00	7.42E-02
		K-40	2.48E-01	1.16E-01	9.29E-02
482777	8/21/2018 - 8/28/2018	I-131	<1.28E-02	0.00E+00	1.28E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	<2.91E-01	0.00E+00	2.91E-01
483403	8/28/2018 - 9/4/2018	I-131	<1.61E-02	0.00E+00	1.61E-02
		Cs-134	<1.55E-02	0.00E+00	1.55E-02
		Cs-137	<1.61E-02	0.00E+00	1.61E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	<2.89E-01	0.00E+00	2.89E-01
483974	9/4/2018 - 9/11/2018	I-131	<2.34E-02	0.00E+00	2.34E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	4.10E-01	1.73E-01	1.81E-01
484587	9/11/2018 - 9/18/2018	I-131	<3.62E-02	0.00E+00	3.62E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.64E-01	1.93E-01	2.55E-01
484998	9/18/2018 - 9/25/2018	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<1.61E-02	0.00E+00	1.61E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	<3.77E-01	0.00E+00	3.77E-01
485453	9/25/2018 - 10/2/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	5.48E-01	1.86E-01	1.46E-01
486113	10/2/2018 - 10/9/2018	I-131	<1.94E-02	0.00E+00	1.94E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	3.97E-01	1.75E-01	1.92E-01
486666	10/9/2018 - 10/16/2018	I-131	<2.02E-02	0.00E+00	2.02E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.06E-01	0.00E+00	1.06E-01
		K-40	2.73E-01	1.62E-01	2.14E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
487707	10/16/2018 - 10/23/2018	I-131	<2.44E-02	0.00E+00	2.44E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	6.19E-01	1.94E-01	1.33E-01
487955	10/23/2018 - 10/30/2018	I-131	<1.78E-02	0.00E+00	1.78E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<2.04E-02	0.00E+00	2.04E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	4.74E-01	1.83E-01	1.81E-01
488439	10/30/2018 - 11/6/2018	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<2.03E-02	0.00E+00	2.03E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.37E-01	0.00E+00	1.37E-01
		K-40	4.60E-01	1.70E-01	1.40E-01
488813	11/6/2018 - 11/13/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	<3.56E-01	0.00E+00	3.56E-01
489119	11/13/2018 - 11/20/2018	I-131	<3.33E-02	0.00E+00	3.33E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	3.72E-01	1.91E-01	2.47E-01
489705	11/20/2018 - 11/27/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<2.05E-02	0.00E+00	2.05E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	<4.23E-01	0.00E+00	4.23E-01
490120	11/27/2018 - 12/4/2018	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.83E-01	1.43E-01	3.46E-02
490763	12/4/2018 - 12/11/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	4.98E-01	1.64E-01	3.46E-02
491146	12/11/2018 - 12/19/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.19E-02	0.00E+00	1.19E-02
		Be-7	<8.70E-02	0.00E+00	8.70E-02
		K-40	2.81E-01	1.20E-01	1.01E-01
491451	12/19/2018 - 12/27/2018	I-131	<3.15E-02	0.00E+00	3.15E-02
		Cs-134	<1.46E-02	0.00E+00	1.46E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<9.84E-02	0.00E+00	9.84E-02
		K-40	4.94E-01	1.54E-01	3.04E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491706	12/27/2018 - 1/2/2019	I-131	<2.52E-02	0.00E+00	2.52E-02
		Cs-134	<1.78E-02	0.00E+00	1.78E-02
		Cs-137	<2.35E-02	0.00E+00	2.35E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	4.31E-01	2.16E-01	2.72E-01

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465958	1/3/2018 - 1/9/2018	I-131	<2.53E-02	0.00E+00	2.53E-02
		Cs-134	<1.96E-02	0.00E+00	1.96E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.27E-01	0.00E+00	1.27E-01
		K-40	5.64E-01	2.47E-01	3.02E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466160	1/9/2018 - 1/16/2018	I-131	<2.37E-02	0.00E+00	2.37E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	4.42E-01	1.64E-01	1.26E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466359	1/16/2018 - 1/23/2018	I-131	<2.73E-02	0.00E+00	2.73E-02
		Cs-134	<1.06E-02	0.00E+00	1.06E-02
		Cs-137	<8.62E-03	0.00E+00	8.62E-03
		Be-7	9.98E-03	4.22E-02	7.54E-02
		K-40	2.52E-01	1.06E-01	1.31E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466946	1/23/2018 - 1/30/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	<4.36E-01	0.00E+00	4.36E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467303	1/30/2018 - 2/6/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<2.19E-02	0.00E+00	2.19E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.64E-01	1.78E-01	1.71E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467614	2/6/2018 - 2/13/2018	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.76E-02	0.00E+00	1.76E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	5.05E-01	2.35E-01	3.09E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
468407	2/13/2018 - 2/20/2018	I-131	<2.49E-02	0.00E+00	2.49E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	4.25E-01	1.92E-01	2.28E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
468727	2/20/2018 - 2/27/2018	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.52E-02	0.00E+00	1.52E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	3.49E-01	1.46E-01	1.20E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
469537	2/27/2018 - 3/6/2018	I-131	<2.43E-02	0.00E+00	2.43E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
469537	2/27/2018 - 3/6/2018	Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	4.70E-01	1.95E-01	2.20E-01
470558	3/6/2018 - 3/13/2018	I-131	<1.85E-02	0.00E+00	1.85E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<2.06E-02	0.00E+00	2.06E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	4.20E-01	1.94E-01	2.36E-01
471129	3/13/2018 - 3/20/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.85E-01	1.98E-01	2.60E-01
471683	3/20/2018 - 3/27/2018	I-131	<2.26E-02	0.00E+00	2.26E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	2.82E-01	1.76E-01	2.43E-01
472459	3/27/2018 - 4/3/2018	I-131	<1.72E-02	0.00E+00	1.72E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	4.73E-01	1.84E-01	1.86E-01
472945	4/3/2018 - 4/10/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<2.20E-02	0.00E+00	2.20E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	5.28E-01	1.70E-01	3.49E-02
473237	4/10/2018 - 4/17/2018	I-131	<1.86E-02	0.00E+00	1.86E-02
		Cs-134	<2.09E-02	0.00E+00	2.09E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	<4.03E-01	0.00E+00	4.03E-01
473601	4/17/2018 - 4/24/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<2.05E-02	0.00E+00	2.05E-02
		Cs-137	<1.51E-02	0.00E+00	1.51E-02
		Be-7	<9.92E-02	0.00E+00	9.92E-02
		K-40	5.27E-01	1.80E-01	1.42E-01
474119	4/24/2018 - 5/1/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.15E-01	0.00E+00	1.15E-01
		K-40	5.36E-01	1.96E-01	1.93E-01
474499	5/1/2018 - 5/8/2018	I-131	<1.79E-02	0.00E+00	1.79E-02
		Cs-134	<1.77E-02	0.00E+00	1.77E-02
		Cs-137	<1.51E-02	0.00E+00	1.51E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	5.23E-01	1.82E-01	1.38E-01
474859	5/8/2018 - 5/15/2018	I-131	<1.94E-02	0.00E+00	1.94E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
474859	5/8/2018 - 5/15/2018	Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.28E-01	0.00E+00	1.28E-01
		K-40	<3.77E-01	0.00E+00	3.77E-01
475181	5/15/2018 - 5/22/2018	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.33E-01	1.96E-01	1.95E-01
475505	5/22/2018 - 5/30/2018	I-131	<2.02E-02	0.00E+00	2.02E-02
		Cs-134	<1.34E-02	0.00E+00	1.34E-02
		Cs-137	<1.30E-02	0.00E+00	1.30E-02
		Be-7	<8.88E-02	0.00E+00	8.88E-02
		K-40	3.00E-01	1.53E-01	1.90E-01
476332	5/30/2018 - 6/5/2018	I-131	<2.56E-02	0.00E+00	2.56E-02
		Cs-134	<2.13E-02	0.00E+00	2.13E-02
		Cs-137	<2.22E-02	0.00E+00	2.22E-02
		Be-7	<1.27E-01	0.00E+00	1.27E-01
		K-40	7.91E-01	2.50E-01	2.11E-01
477345	6/5/2018 - 6/12/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.71E-02	0.00E+00	1.71E-02
		Cs-137	<1.51E-02	0.00E+00	1.51E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	6.76E-01	2.18E-01	2.02E-01
478069	6/12/2018 - 6/19/2018	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.87E-02	0.00E+00	1.87E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	4.90E-01	1.92E-01	2.02E-01
478392	6/19/2018 - 6/26/2018	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.26E-02	0.00E+00	1.26E-02
		Cs-137	<1.98E-02	0.00E+00	1.98E-02
		Be-7	<1.09E-01	0.00E+00	1.09E-01
		K-40	4.09E-01	1.68E-01	1.62E-01
478745	6/26/2018 - 7/3/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<1.42E-02	0.00E+00	1.42E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.88E-01	1.86E-01	1.82E-01
479191	7/3/2018 - 7/10/2018	I-131	<2.13E-02	0.00E+00	2.13E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.60E-02	0.00E+00	1.60E-02
		Be-7	<1.40E-01	0.00E+00	1.40E-01
		K-40	5.17E-01	2.00E-01	2.13E-01
479847	7/10/2018 - 7/17/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.65E-02	0.00E+00	1.65E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	4.90E-01	1.93E-01	2.05E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
480215	7/17/2018 - 7/24/2018	I-131	<2.14E-02	0.00E+00	2.14E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.89E-02	0.00E+00	1.89E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	5.04E-01	1.89E-01	1.82E-01
481044	7/24/2018 - 7/31/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	4.36E-01	1.95E-01	2.33E-01
481489	7/31/2018 - 8/7/2018	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	5.74E-01	1.77E-01	3.46E-02
481921	8/7/2018 - 8/14/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	3.07E-01	1.81E-01	2.46E-01
482451	8/14/2018 - 8/21/2018	I-131	<1.53E-02	0.00E+00	1.53E-02
		Cs-134	<1.50E-02	0.00E+00	1.50E-02
		Cs-137	<1.48E-02	0.00E+00	1.48E-02
		Be-7	<9.44E-02	0.00E+00	9.44E-02
		K-40	<3.49E-01	0.00E+00	3.49E-01
482778	8/21/2018 - 8/28/2018	I-131	<1.30E-02	0.00E+00	1.30E-02
		Cs-134	<1.13E-02	0.00E+00	1.13E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<8.46E-02	0.00E+00	8.46E-02
		K-40	2.71E-01	1.41E-01	1.62E-01
483404	8/28/2018 - 9/4/2018	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<9.94E-03	0.00E+00	9.94E-03
		Be-7	<8.72E-02	0.00E+00	8.72E-02
		K-40	3.77E-01	1.54E-01	1.37E-01
483975	9/4/2018 - 9/11/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.50E-02	0.00E+00	1.50E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	4.76E-01	1.91E-01	2.05E-01
484588	9/11/2018 - 9/18/2018	I-131	<3.32E-02	0.00E+00	3.32E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.35E-01	0.00E+00	1.35E-01
		K-40	4.53E-01	2.11E-01	2.67E-01
484999	9/18/2018 - 9/25/2018	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<2.17E-02	0.00E+00	2.17E-02
		Cs-137	<1.31E-02	0.00E+00	1.31E-02
		Be-7	<1.35E-01	0.00E+00	1.35E-01
		K-40	4.26E-01	1.68E-01	1.52E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
485454	9/25/2018 - 10/2/2018	I-131	<2.38E-02	0.00E+00	2.38E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	5.43E-01	1.88E-01	1.59E-01
486114	10/2/2018 - 10/9/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.69E-01	1.88E-01	2.40E-01
486667	10/9/2018 - 10/16/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.76E-02	0.00E+00	1.76E-02
		Be-7	<1.37E-01	0.00E+00	1.37E-01
		K-40	3.82E-01	2.09E-01	2.85E-01
487708	10/16/2018 - 10/23/2018	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<9.35E-02	0.00E+00	9.35E-02
		K-40	4.52E-01	1.89E-01	2.11E-01
487956	10/23/2018 - 10/30/2018	I-131	<1.81E-02	0.00E+00	1.81E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.10E-01	0.00E+00	1.10E-01
		K-40	5.09E-01	1.92E-01	1.92E-01
488440	10/30/2018 - 11/6/2018	I-131	<1.83E-02	0.00E+00	1.83E-02
		Cs-134	<1.78E-02	0.00E+00	1.78E-02
		Cs-137	<1.28E-02	0.00E+00	1.28E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	4.99E-01	1.73E-01	1.27E-01
488814	11/6/2018 - 11/13/2018	I-131	<2.05E-02	0.00E+00	2.05E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.77E-01	1.70E-01	1.86E-01
489120	11/13/2018 - 11/20/2018	I-131	<3.57E-02	0.00E+00	3.57E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	4.08E-01	1.87E-01	2.21E-01
489706	11/20/2018 - 11/27/2018	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.35E-01	0.00E+00	1.35E-01
		K-40	5.75E-01	1.92E-01	1.54E-01
490121	11/27/2018 - 12/4/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.33E-02	0.00E+00	1.33E-02
		Cs-137	<1.67E-02	0.00E+00	1.67E-02
		Be-7	<9.97E-02	0.00E+00	9.97E-02
		K-40	5.35E-01	2.07E-01	2.29E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 212 [INDICATOR - E @ 3.32 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490764	12/4/2018 - 12/11/2018	I-131	<2.18E-02	0.00E+00	2.18E-02
		Cs-134	<1.94E-02	0.00E+00	1.94E-02
		Cs-137	<1.85E-02	0.00E+00	1.85E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	<3.96E-01	0.00E+00	3.96E-01
491147	12/11/2018 - 12/19/2018	I-131	<2.59E-02	0.00E+00	2.59E-02
		Cs-134	<1.27E-02	0.00E+00	1.27E-02
		Cs-137	<1.21E-02	0.00E+00	1.21E-02
		Be-7	<8.49E-02	0.00E+00	8.49E-02
		K-40	2.19E-01	1.24E-01	1.53E-01
491452	12/19/2018 - 12/27/2018	I-131	<2.86E-02	0.00E+00	2.86E-02
		Cs-134	<1.64E-02	0.00E+00	1.64E-02
		Cs-137	<1.57E-02	0.00E+00	1.57E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.27E-01	1.43E-01	3.05E-02
491707	12/27/2018 - 1/2/2019	I-131	<2.32E-02	0.00E+00	2.32E-02
		Cs-134	<2.10E-02	0.00E+00	2.10E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	6.28E-01	2.14E-01	1.63E-01

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465959	1/3/2018 - 1/9/2018	I-131	<2.52E-02	0.00E+00	2.52E-02
		Cs-134	<2.09E-02	0.00E+00	2.09E-02
		Cs-137	<2.42E-02	0.00E+00	2.42E-02
		Be-7	<1.62E-01	0.00E+00	1.62E-01
		K-40	5.94E-01	2.13E-01	1.86E-01
466161	1/9/2018 - 1/16/2018	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<1.88E-02	0.00E+00	1.88E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.18E-01	0.00E+00	1.18E-01
		K-40	3.25E-01	1.45E-01	1.32E-01
466360	1/16/2018 - 1/23/2018	I-131	<1.99E-02	0.00E+00	1.99E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<2.00E-02	0.00E+00	2.00E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.30E-01	1.89E-01	1.72E-01
466947	1/23/2018 - 1/30/2018	I-131	<2.29E-02	0.00E+00	2.29E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	3.99E-01	2.24E-01	3.15E-01
467304	1/30/2018 - 2/6/2018	I-131	<1.96E-02	0.00E+00	1.96E-02
		Cs-134	<1.91E-02	0.00E+00	1.91E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	5.78E-01	1.89E-01	1.41E-01
467615	2/6/2018 - 2/13/2018	I-131	<1.76E-02	0.00E+00	1.76E-02
		Cs-134	<1.36E-02	0.00E+00	1.36E-02
		Cs-137	<1.50E-02	0.00E+00	1.50E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467615	2/6/2018 - 2/13/2018	Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	7.18E-01	2.43E-01	2.60E-01
468408	2/13/2018 - 2/20/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	5.17E-01	1.78E-01	1.30E-01
468728	2/20/2018 - 2/27/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	6.43E-01	2.06E-01	1.72E-01
469538	2/27/2018 - 3/6/2018	I-131	<2.14E-02	0.00E+00	2.14E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.70E-01	1.55E-01	1.43E-01
470559	3/6/2018 - 3/13/2018	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<2.00E-02	0.00E+00	2.00E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.46E-01	0.00E+00	1.46E-01
		K-40	3.89E-01	1.71E-01	1.85E-01
471130	3/13/2018 - 3/20/2018	I-131	<2.28E-02	0.00E+00	2.28E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<2.12E-02	0.00E+00	2.12E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	4.65E-01	1.79E-01	1.71E-01
471684	3/20/2018 - 3/27/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	4.62E-01	1.71E-01	1.43E-01
472460	3/27/2018 - 4/3/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.67E-01	2.14E-01	2.34E-01
472946	4/3/2018 - 4/10/2018	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<1.03E-02	0.00E+00	1.03E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.41E-01	0.00E+00	1.41E-01
		K-40	4.57E-01	1.85E-01	1.94E-01
473238	4/10/2018 - 4/17/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.43E-01	0.00E+00	1.43E-01
		K-40	5.82E-01	2.00E-01	1.84E-01
473602	4/17/2018 - 4/24/2018	I-131	<2.09E-02	0.00E+00	2.09E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
473602	4/17/2018 - 4/24/2018	Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.36E-02	0.00E+00	1.36E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	5.06E-01	2.03E-01	2.27E-01
474120	4/24/2018 - 5/1/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	4.88E-01	1.96E-01	2.13E-01
474500	5/1/2018 - 5/8/2018	I-131	<1.93E-02	0.00E+00	1.93E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.16E-01	1.71E-01	1.71E-01
474860	5/8/2018 - 5/15/2018	I-131	<6.82E-03	0.00E+00	6.82E-03
		Cs-134	<7.18E-03	0.00E+00	7.18E-03
		Cs-137	<6.97E-03	0.00E+00	6.97E-03
		Be-7	<4.70E-02	0.00E+00	4.70E-02
		K-40	2.39E-01	5.96E-02	6.80E-02
475182	5/15/2018 - 5/22/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	2.95E-01	1.86E-01	2.61E-01
475506	5/22/2018 - 5/30/2018	I-131	<1.89E-02	0.00E+00	1.89E-02
		Cs-134	<1.46E-02	0.00E+00	1.46E-02
		Cs-137	<1.34E-02	0.00E+00	1.34E-02
		Be-7	<1.00E-01	0.00E+00	1.00E-01
		K-40	3.76E-01	1.59E-01	1.74E-01
476333	5/30/2018 - 6/5/2018	I-131	<2.53E-02	0.00E+00	2.53E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<2.15E-02	0.00E+00	2.15E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	5.47E-01	2.45E-01	3.01E-01
477346	6/5/2018 - 6/12/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	5.23E-01	2.09E-01	2.37E-01
478070	6/12/2018 - 6/19/2018	I-131	<2.36E-02	0.00E+00	2.36E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.47E-01	0.00E+00	1.47E-01
		K-40	6.80E-01	1.94E-01	3.48E-02
478393	6/19/2018 - 6/26/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	5.34E-01	1.87E-01	1.61E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
478746	6/26/2018 - 7/3/2018	I-131	<2.58E-02	0.00E+00	2.58E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.71E-02	0.00E+00	1.71E-02
		Be-7	<1.36E-01	0.00E+00	1.36E-01
		K-40	5.31E-01	1.93E-01	1.83E-01
479192	7/3/2018 - 7/10/2018	I-131	<1.92E-02	0.00E+00	1.92E-02
		Cs-134	<2.08E-02	0.00E+00	2.08E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	3.39E-01	1.67E-01	1.99E-01
479848	7/10/2018 - 7/17/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<2.15E-02	0.00E+00	2.15E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<8.54E-02	0.00E+00	8.54E-02
		K-40	3.70E-01	1.78E-01	2.14E-01
480216	7/17/2018 - 7/24/2018	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<2.19E-02	0.00E+00	2.19E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02
		Be-7	<1.33E-01	0.00E+00	1.33E-01
		K-40	5.64E-01	2.32E-01	2.84E-01
481045	7/24/2018 - 7/31/2018	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.93E-02	0.00E+00	1.93E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	<4.09E-01	0.00E+00	4.09E-01
481490	7/31/2018 - 8/7/2018	I-131	<2.23E-02	0.00E+00	2.23E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.12E-01	1.78E-01	1.38E-01
481922	8/7/2018 - 8/14/2018	I-131	<2.52E-02	0.00E+00	2.52E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<2.08E-02	0.00E+00	2.08E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	<3.67E-01	0.00E+00	3.67E-01
482452	8/14/2018 - 8/21/2018	I-131	<1.58E-02	0.00E+00	1.58E-02
		Cs-134	<1.50E-02	0.00E+00	1.50E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	3.12E-01	1.68E-01	2.12E-01
482779	8/21/2018 - 8/28/2018	I-131	<1.63E-02	0.00E+00	1.63E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.38E-02	0.00E+00	1.38E-02
		Be-7	<1.07E-01	0.00E+00	1.07E-01
		K-40	<2.56E-01	0.00E+00	2.56E-01
483405	8/28/2018 - 9/4/2018	I-131	<1.60E-02	0.00E+00	1.60E-02
		Cs-134	<1.09E-02	0.00E+00	1.09E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<8.75E-02	0.00E+00	8.75E-02
		K-40	2.06E-01	1.28E-01	1.65E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483976	9/4/2018 - 9/11/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	4.91E-01	2.47E-01	3.40E-01
484589	9/11/2018 - 9/18/2018	I-131	<3.18E-02	0.00E+00	3.18E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.41E-02	0.00E+00	1.41E-02
		Be-7	<1.35E-01	0.00E+00	1.35E-01
		K-40	4.76E-01	1.70E-01	1.27E-01
485000	9/18/2018 - 9/25/2018	I-131	<2.08E-02	0.00E+00	2.08E-02
		Cs-134	<1.81E-02	0.00E+00	1.81E-02
		Cs-137	<1.37E-02	0.00E+00	1.37E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	3.86E-01	1.63E-01	1.61E-01
485455	9/25/2018 - 10/2/2018	I-131	<2.62E-02	0.00E+00	2.62E-02
		Cs-134	<1.98E-02	0.00E+00	1.98E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.44E-01	0.00E+00	1.44E-01
		K-40	4.88E-01	1.74E-01	1.34E-01
486115	10/2/2018 - 10/9/2018	I-131	<1.91E-02	0.00E+00	1.91E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.32E-01	0.00E+00	1.32E-01
		K-40	4.15E-01	1.58E-01	1.21E-01
486668	10/9/2018 - 10/16/2018	I-131	<2.12E-02	0.00E+00	2.12E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<1.29E-02	0.00E+00	1.29E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	4.34E-01	2.10E-01	2.71E-01
487709	10/16/2018 - 10/23/2018	I-131	<2.46E-02	0.00E+00	2.46E-02
		Cs-134	<2.05E-02	0.00E+00	2.05E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	4.08E-01	1.67E-01	1.61E-01
487957	10/23/2018 - 10/30/2018	I-131	<2.04E-02	0.00E+00	2.04E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.67E-01	1.75E-01	2.07E-01
488441	10/30/2018 - 11/6/2018	I-131	<1.78E-02	0.00E+00	1.78E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<2.04E-02	0.00E+00	2.04E-02
		Be-7	<1.29E-01	0.00E+00	1.29E-01
		K-40	4.08E-01	1.78E-01	1.96E-01
488815	11/6/2018 - 11/13/2018	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<2.03E-02	0.00E+00	2.03E-02
		Cs-137	<1.15E-02	0.00E+00	1.15E-02
		Be-7	<1.30E-01	0.00E+00	1.30E-01
		K-40	5.37E-01	1.71E-01	3.46E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
489121	11/13/2018 - 11/20/2018	I-131	<3.62E-02	0.00E+00	3.62E-02
		Cs-134	<1.94E-02	0.00E+00	1.94E-02
		Cs-137	<1.49E-02	0.00E+00	1.49E-02
		Be-7	<1.47E-01	0.00E+00	1.47E-01
		K-40	4.39E-01	1.89E-01	2.14E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
489707	11/20/2018 - 11/27/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.40E-01	0.00E+00	1.40E-01
		K-40	7.06E-01	1.98E-01	3.48E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490122	11/27/2018 - 12/4/2018	I-131	<1.98E-02	0.00E+00	1.98E-02
		Cs-134	<1.92E-02	0.00E+00	1.92E-02
		Cs-137	<1.53E-02	0.00E+00	1.53E-02
		Be-7	<1.42E-01	0.00E+00	1.42E-01
		K-40	5.60E-01	2.08E-01	2.21E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490765	12/4/2018 - 12/11/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.51E-02	0.00E+00	1.51E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	3.12E-01	1.79E-01	2.39E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491148	12/11/2018 - 12/19/2018	I-131	<3.15E-02	0.00E+00	3.15E-02
		Cs-134	<1.37E-02	0.00E+00	1.37E-02
		Cs-137	<8.90E-03	0.00E+00	8.90E-03
		Be-7	<8.66E-02	0.00E+00	8.66E-02
		K-40	2.06E-01	1.20E-01	1.48E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491453	12/19/2018 - 12/27/2018	I-131	<2.94E-02	0.00E+00	2.94E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.56E-02	0.00E+00	1.56E-02
		Be-7	<1.02E-01	0.00E+00	1.02E-01
		K-40	4.63E-01	2.15E-01	2.87E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491708	12/27/2018 - 1/2/2019	I-131	<2.92E-02	0.00E+00	2.92E-02
		Cs-134	<1.35E-02	0.00E+00	1.35E-02
		Cs-137	<2.16E-02	0.00E+00	2.16E-02
		Be-7	<1.46E-01	0.00E+00	1.46E-01
		K-40	5.21E-01	2.21E-01	2.48E-01

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
465960	1/3/2018 - 1/9/2018	I-131	<2.24E-02	0.00E+00	2.24E-02
		Cs-134	<2.11E-02	0.00E+00	2.11E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.51E-01	0.00E+00	1.51E-01
		K-40	5.53E-01	2.29E-01	2.58E-01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466162	1/9/2018 - 1/16/2018	I-131	<2.27E-02	0.00E+00	2.27E-02
		Cs-134	<2.05E-02	0.00E+00	2.05E-02
		Cs-137	<1.80E-02	0.00E+00	1.80E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	5.67E-01	1.77E-01	3.49E-02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466361	1/16/2018 - 1/23/2018	I-131	<2.06E-02	0.00E+00	2.06E-02
		Cs-134	<1.93E-02	0.00E+00	1.93E-02
		Cs-137	<1.83E-02	0.00E+00	1.83E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466361	1/16/2018 - 1/23/2018	Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.63E-01	1.66E-01	1.84E-01
466948	1/23/2018 - 1/30/2018	I-131	<2.38E-02	0.00E+00	2.38E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<2.11E-02	0.00E+00	2.11E-02
		Be-7	<1.27E-01	0.00E+00	1.27E-01
		K-40	3.21E-01	1.95E-01	2.72E-01
467305	1/30/2018 - 2/6/2018	I-131	<2.11E-02	0.00E+00	2.11E-02
		Cs-134	<1.58E-02	0.00E+00	1.58E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	5.22E-01	2.10E-01	2.42E-01
467616	2/6/2018 - 2/13/2018	I-131	<1.97E-02	0.00E+00	1.97E-02
		Cs-134	<1.61E-02	0.00E+00	1.61E-02
		Cs-137	<1.66E-02	0.00E+00	1.66E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	<3.48E-01	0.00E+00	3.48E-01
468409	2/13/2018 - 2/20/2018	I-131	<2.66E-02	0.00E+00	2.66E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	6.56E-01	2.28E-01	2.41E-01
468729	2/20/2018 - 2/27/2018	I-131	<2.03E-02	0.00E+00	2.03E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.68E-02	0.00E+00	1.68E-02
		Be-7	<9.35E-02	0.00E+00	9.35E-02
		K-40	5.25E-01	2.12E-01	2.45E-01
469539	2/27/2018 - 3/6/2018	I-131	<2.39E-02	0.00E+00	2.39E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<2.11E-02	0.00E+00	2.11E-02
		Be-7	<1.08E-01	0.00E+00	1.08E-01
		K-40	2.85E-01	1.63E-01	2.12E-01
470560	3/6/2018 - 3/13/2018	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.75E-02	0.00E+00	1.75E-02
		Cs-137	<2.10E-02	0.00E+00	2.10E-02
		Be-7	<1.23E-01	0.00E+00	1.23E-01
		K-40	4.69E-01	1.73E-01	1.42E-01
471131	3/13/2018 - 3/20/2018	I-131	<2.17E-02	0.00E+00	2.17E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<1.34E-01	0.00E+00	1.34E-01
		K-40	6.30E-01	2.04E-01	1.70E-01
471685	3/20/2018 - 3/27/2018	I-131	<2.49E-02	0.00E+00	2.49E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.43E-02	0.00E+00	1.43E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	4.46E-01	2.13E-01	2.75E-01
472461	3/27/2018 - 4/3/2018	I-131	<1.92E-02	0.00E+00	1.92E-02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472461	3/27/2018 - 4/3/2018	Cs-134	<1.97E-02	0.00E+00	1.97E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.04E-01	0.00E+00	1.04E-01
		K-40	3.19E-01	1.59E-01	1.86E-01
472947	4/3/2018 - 4/10/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.74E-02	0.00E+00	1.74E-02
		Cs-137	<1.60E-02	0.00E+00	1.60E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	5.74E-01	1.93E-01	1.57E-01
473239	4/10/2018 - 4/17/2018	I-131	<2.22E-02	0.00E+00	2.22E-02
		Cs-134	<1.72E-02	0.00E+00	1.72E-02
		Cs-137	<1.64E-02	0.00E+00	1.64E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	5.04E-01	2.22E-01	2.73E-01
473603	4/17/2018 - 4/24/2018	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<2.13E-02	0.00E+00	2.13E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	4.08E-01	1.64E-01	1.51E-01
474121	4/24/2018 - 5/1/2018	I-131	<2.02E-02	0.00E+00	2.02E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.88E-02	0.00E+00	1.88E-02
		Be-7	<1.27E-01	0.00E+00	1.27E-01
		K-40	4.16E-01	1.71E-01	1.70E-01
474501	5/1/2018 - 5/8/2018	I-131	<1.79E-02	0.00E+00	1.79E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.40E-01	0.00E+00	1.40E-01
		K-40	5.59E-01	1.85E-01	1.30E-01
474861	5/8/2018 - 5/15/2018	I-131	<2.26E-02	0.00E+00	2.26E-02
		Cs-134	<1.79E-02	0.00E+00	1.79E-02
		Cs-137	<1.73E-02	0.00E+00	1.73E-02
		Be-7	<9.64E-02	0.00E+00	9.64E-02
		K-40	4.61E-01	1.91E-01	2.13E-01
475183	5/15/2018 - 5/22/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.78E-02	0.00E+00	1.78E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	4.77E-01	2.01E-01	2.33E-01
475507	5/22/2018 - 5/30/2018	I-131	<1.77E-02	0.00E+00	1.77E-02
		Cs-134	<1.52E-02	0.00E+00	1.52E-02
		Cs-137	<1.44E-02	0.00E+00	1.44E-02
		Be-7	<9.18E-02	0.00E+00	9.18E-02
		K-40	4.63E-01	1.84E-01	2.08E-01
476334	5/30/2018 - 6/5/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.84E-02	0.00E+00	1.84E-02
		Cs-137	<2.01E-02	0.00E+00	2.01E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	5.19E-01	1.93E-01	1.56E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
477347	6/5/2018 - 6/12/2018	I-131	<1.82E-02	0.00E+00	1.82E-02
		Cs-134	<2.11E-02	0.00E+00	2.11E-02
		Cs-137	<1.85E-02	0.00E+00	1.85E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	<4.21E-01	0.00E+00	4.21E-01
478071	6/12/2018 - 6/19/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.43E-02	0.00E+00	1.43E-02
		Cs-137	<1.59E-02	0.00E+00	1.59E-02
		Be-7	<9.38E-02	0.00E+00	9.38E-02
		K-40	2.84E-01	1.90E-01	2.75E-01
478394	6/19/2018 - 6/26/2018	I-131	<2.38E-02	0.00E+00	2.38E-02
		Cs-134	<2.15E-02	0.00E+00	2.15E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	4.20E-01	1.99E-01	2.49E-01
478747	6/26/2018 - 7/3/2018	I-131	<2.40E-02	0.00E+00	2.40E-02
		Cs-134	<1.59E-02	0.00E+00	1.59E-02
		Cs-137	<1.79E-02	0.00E+00	1.79E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	4.71E-01	1.75E-01	1.51E-01
479193	7/3/2018 - 7/10/2018	I-131	<2.21E-02	0.00E+00	2.21E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.24E-01	0.00E+00	1.24E-01
		K-40	5.20E-01	2.17E-01	2.59E-01
479849	7/10/2018 - 7/17/2018	I-131	<1.84E-02	0.00E+00	1.84E-02
		Cs-134	<1.73E-02	0.00E+00	1.73E-02
		Cs-137	<1.58E-02	0.00E+00	1.58E-02
		Be-7	<1.31E-01	0.00E+00	1.31E-01
		K-40	2.94E-01	1.39E-01	1.37E-01
480217	7/17/2018 - 7/24/2018	I-131	<2.25E-02	0.00E+00	2.25E-02
		Cs-134	<1.80E-02	0.00E+00	1.80E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	3.57E-01	1.79E-01	2.21E-01
481046	7/24/2018 - 7/31/2018	I-131	<1.95E-02	0.00E+00	1.95E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.84E-02	0.00E+00	1.84E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	5.78E-01	2.02E-01	1.91E-01
481491	7/31/2018 - 8/7/2018	I-131	<2.19E-02	0.00E+00	2.19E-02
		Cs-134	<1.85E-02	0.00E+00	1.85E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	4.68E-01	1.89E-01	2.03E-01
481923	8/7/2018 - 8/14/2018	I-131	<2.33E-02	0.00E+00	2.33E-02
		Cs-134	<1.44E-02	0.00E+00	1.44E-02
		Cs-137	<2.15E-02	0.00E+00	2.15E-02
		Be-7	<1.13E-01	0.00E+00	1.13E-01
		K-40	3.91E-01	1.76E-01	1.99E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
482453	8/14/2018 - 8/21/2018	I-131	<1.53E-02	0.00E+00	1.53E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.32E-02	0.00E+00	1.32E-02
		Be-7	<9.27E-02	0.00E+00	9.27E-02
		K-40	<2.48E-01	0.00E+00	2.48E-01
482780	8/21/2018 - 8/28/2018	I-131	<1.47E-02	0.00E+00	1.47E-02
		Cs-134	<1.05E-02	0.00E+00	1.05E-02
		Cs-137	<1.40E-02	0.00E+00	1.40E-02
		Be-7	<8.36E-02	0.00E+00	8.36E-02
		K-40	2.58E-01	1.42E-01	1.70E-01
483406	8/28/2018 - 9/4/2018	I-131	<1.02E-02	0.00E+00	1.02E-02
		Cs-134	<1.32E-02	0.00E+00	1.32E-02
		Cs-137	<1.52E-02	0.00E+00	1.52E-02
		Be-7	<8.93E-02	0.00E+00	8.93E-02
		K-40	2.78E-01	1.76E-01	2.49E-01
483977	9/4/2018 - 9/11/2018	I-131	<2.38E-02	0.00E+00	2.38E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.82E-02	0.00E+00	1.82E-02
		Be-7	<1.01E-01	0.00E+00	1.01E-01
		K-40	4.68E-01	1.85E-01	1.91E-01
484590	9/11/2018 - 9/18/2018	I-131	<3.06E-02	0.00E+00	3.06E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.35E-01	0.00E+00	1.35E-01
		K-40	4.43E-01	1.92E-01	2.23E-01
485001	9/18/2018 - 9/25/2018	I-131	<1.72E-02	0.00E+00	1.72E-02
		Cs-134	<2.47E-02	0.00E+00	2.47E-02
		Cs-137	<1.61E-02	0.00E+00	1.61E-02
		Be-7	<1.21E-01	0.00E+00	1.21E-01
		K-40	3.43E-01	2.05E-01	2.87E-01
485456	9/25/2018 - 10/2/2018	I-131	<2.54E-02	0.00E+00	2.54E-02
		Cs-134	<2.04E-02	0.00E+00	2.04E-02
		Cs-137	<1.91E-02	0.00E+00	1.91E-02
		Be-7	<1.22E-01	0.00E+00	1.22E-01
		K-40	<3.61E-01	0.00E+00	3.61E-01
486116	10/2/2018 - 10/9/2018	I-131	<2.31E-02	0.00E+00	2.31E-02
		Cs-134	<1.86E-02	0.00E+00	1.86E-02
		Cs-137	<1.96E-02	0.00E+00	1.96E-02
		Be-7	<1.12E-01	0.00E+00	1.12E-01
		K-40	4.26E-01	2.04E-01	2.60E-01
486669	10/9/2018 - 10/16/2018	I-131	<2.29E-02	0.00E+00	2.29E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.16E-01	0.00E+00	1.16E-01
		K-40	4.83E-01	2.02E-01	2.32E-01
487710	10/16/2018 - 10/23/2018	I-131	<1.88E-02	0.00E+00	1.88E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.75E-02	0.00E+00	1.75E-02
		Be-7	<1.05E-01	0.00E+00	1.05E-01
		K-40	3.27E-01	1.71E-01	2.14E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: AIR RADIOIODINE Concentration (Activity): pCi/m3

Sample Point 261 [INDICATOR - N @ 0.72 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
487958	10/23/2018 - 10/30/2018	I-131	<2.07E-02	0.00E+00	2.07E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.74E-02	0.00E+00	1.74E-02
		Be-7	<1.20E-01	0.00E+00	1.20E-01
		K-40	4.75E-01	1.84E-01	1.82E-01
488442	10/30/2018 - 11/6/2018	I-131	<2.36E-02	0.00E+00	2.36E-02
		Cs-134	<1.66E-02	0.00E+00	1.66E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.11E-01	0.00E+00	1.11E-01
		K-40	3.70E-01	1.40E-01	3.46E-02
488816	11/6/2018 - 11/13/2018	I-131	<1.71E-02	0.00E+00	1.71E-02
		Cs-134	<1.60E-02	0.00E+00	1.60E-02
		Cs-137	<1.69E-02	0.00E+00	1.69E-02
		Be-7	<1.17E-01	0.00E+00	1.17E-01
		K-40	3.43E-01	1.56E-01	1.62E-01
489122	11/13/2018 - 11/20/2018	I-131	<3.24E-02	0.00E+00	3.24E-02
		Cs-134	<1.61E-02	0.00E+00	1.61E-02
		Cs-137	<1.70E-02	0.00E+00	1.70E-02
		Be-7	<9.62E-02	0.00E+00	9.62E-02
		K-40	5.11E-01	1.82E-01	1.52E-01
489708	11/20/2018 - 11/27/2018	I-131	<2.20E-02	0.00E+00	2.20E-02
		Cs-134	<1.87E-02	0.00E+00	1.87E-02
		Cs-137	<1.65E-02	0.00E+00	1.65E-02
		Be-7	<1.38E-01	0.00E+00	1.38E-01
		K-40	4.95E-01	2.11E-01	2.54E-01
490123	11/27/2018 - 12/4/2018	I-131	<2.00E-02	0.00E+00	2.00E-02
		Cs-134	<1.91E-02	0.00E+00	1.91E-02
		Cs-137	<1.63E-02	0.00E+00	1.63E-02
		Be-7	<1.14E-01	0.00E+00	1.14E-01
		K-40	<3.48E-01	0.00E+00	3.48E-01
490766	12/4/2018 - 12/11/2018	I-131	<2.10E-02	0.00E+00	2.10E-02
		Cs-134	<1.67E-02	0.00E+00	1.67E-02
		Cs-137	<1.54E-02	0.00E+00	1.54E-02
		Be-7	<1.26E-01	0.00E+00	1.26E-01
		K-40	5.88E-01	1.94E-01	1.52E-01
491149	12/11/2018 - 12/19/2018	I-131	<2.88E-02	0.00E+00	2.88E-02
		Cs-134	<1.09E-02	0.00E+00	1.09E-02
		Cs-137	<1.17E-02	0.00E+00	1.17E-02
		Be-7	<6.87E-02	0.00E+00	6.87E-02
		K-40	<2.21E-01	0.00E+00	2.21E-01
491454	12/19/2018 - 12/27/2018	I-131	<3.32E-02	0.00E+00	3.32E-02
		Cs-134	<1.53E-02	0.00E+00	1.53E-02
		Cs-137	<1.52E-02	0.00E+00	1.52E-02
		Be-7	<1.19E-01	0.00E+00	1.19E-01
		K-40	3.33E-01	1.70E-01	2.20E-01
491709	12/27/2018 - 1/2/2019	I-131	<2.83E-02	0.00E+00	2.83E-02
		Cs-134	<1.68E-02	0.00E+00	1.68E-02
		Cs-137	<2.15E-02	0.00E+00	2.15E-02
		Be-7	<1.46E-01	0.00E+00	1.46E-01
		K-40	6.31E-01	2.26E-01	2.12E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: CROPS Concentration (Activity): pCi/kg

Sample Point 260 [INDICATOR - SSE @ 2 miles]

Sample ID:	Sample Dates:	MIXEDCROPS	Nuclide	Activity	2 Sigma Error	MDA
475184	6/5/2018 - 6/5/2018		I-131	<1.19E+01	0.00E+00	1.19E+01
			Cs-134	<1.58E+01	0.00E+00	1.58E+01
			Cs-137	<1.02E+01	0.00E+00	1.02E+01
			Be-7	<1.01E+02	0.00E+00	1.01E+02
			K-40	2.67E+03	4.01E+02	1.25E+02
478188	7/3/2018 - 7/3/2018		I-131	<1.45E+01	0.00E+00	1.45E+01
			Cs-134	<9.35E+00	0.00E+00	9.35E+00
			Cs-137	<9.29E+00	0.00E+00	9.29E+00
			Be-7	<9.29E+01	0.00E+00	9.29E+01
			K-40	1.94E+03	3.15E+02	9.99E+01
480183	8/7/2018 - 8/7/2018		I-131	<9.58E+00	0.00E+00	9.58E+00
			Cs-134	<1.25E+01	0.00E+00	1.25E+01
			Cs-137	<1.35E+01	0.00E+00	1.35E+01
			Be-7	<1.09E+02	0.00E+00	1.09E+02
			K-40	2.66E+03	4.01E+02	2.93E+01
482387	9/4/2018 - 9/4/2018		I-131	<3.69E+01	0.00E+00	3.69E+01
			Cs-134	<2.64E+01	0.00E+00	2.64E+01
			Cs-137	<2.08E+01	0.00E+00	2.08E+01
			Be-7	<1.48E+02	0.00E+00	1.48E+02
			K-40	3.08E+03	5.72E+02	3.29E+02

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [INDICATOR - SSE @ 7.3 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466674	1/3/2018 - 1/30/2018	Beta	1.99E+00	8.64E-01	1.34E+00
		Mn-54	<4.15E+00	0.00E+00	4.15E+00
		Co-58	<3.93E+00	0.00E+00	3.93E+00
		Fe-59	<6.67E+00	0.00E+00	6.67E+00
		Co-60	<3.86E+00	0.00E+00	3.86E+00
		Zn-65	<1.03E+01	0.00E+00	1.03E+01
		Zr-95	<7.72E+00	0.00E+00	7.72E+00
		Nb-95	<5.64E+00	0.00E+00	5.64E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<4.41E+00	0.00E+00	4.41E+00
		Cs-137	<5.07E+00	0.00E+00	5.07E+00
		BaLa-140	<1.08E+01	0.00E+00	1.08E+01
		Be-7	<3.80E+01	0.00E+00	3.80E+01
		K-40	4.56E+01	3.64E+01	5.32E+01
		468529	1/30/2018 - 2/27/2018	Beta	2.47E+00
Mn-54	<2.59E+00			0.00E+00	2.59E+00
Co-58	<3.64E+00			0.00E+00	3.64E+00
Fe-59	<4.64E+00			0.00E+00	4.64E+00
Co-60	<3.28E+00			0.00E+00	3.28E+00
Zn-65	<7.00E+00			0.00E+00	7.00E+00
Zr-95	<6.85E+00			0.00E+00	6.85E+00
Nb-95	<4.45E+00			0.00E+00	4.45E+00
I-131	<1.01E+01			0.00E+00	1.01E+01
Cs-134	<3.15E+00			0.00E+00	3.15E+00
Cs-137	<2.75E+00			0.00E+00	2.75E+00
BaLa-140	<1.01E+01			0.00E+00	1.01E+01
Be-7	<2.64E+01			0.00E+00	2.64E+01
K-40	3.41E+01			2.71E+01	4.01E+01
471517	2/27/2018 - 3/27/2018			Beta	3.34E+00
		Mn-54	<2.05E+00	0.00E+00	2.05E+00
		Co-58	<2.11E+00	0.00E+00	2.11E+00
		Fe-59	<4.54E+00	0.00E+00	4.54E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [INDICATOR - SSE @ 7.3 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
471517	2/27/2018 - 3/27/2018	Co-60	<2.06E+00	0.00E+00	2.06E+00
		Zn-65	<3.97E+00	0.00E+00	3.97E+00
		Zr-95	<4.79E+00	0.00E+00	4.79E+00
		Nb-95	<2.75E+00	0.00E+00	2.75E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<2.01E+00	0.00E+00	2.01E+00
		Cs-137	<1.79E+00	0.00E+00	1.79E+00
		BaLa-140	<6.22E+00	0.00E+00	6.22E+00
		Be-7	<1.97E+01	0.00E+00	1.97E+01
		K-40	3.75E+01	1.84E+01	2.48E+01
467519	1/3/2018 - 4/24/2018	H3DW	6.21E+02	1.30E+02	1.91E+02
473429	3/27/2018 - 4/24/2018	Beta	2.47E+00	9.16E-01	1.40E+00
		Mn-54	<3.10E+00	0.00E+00	3.10E+00
		Co-58	<3.44E+00	0.00E+00	3.44E+00
		Fe-59	<8.21E+00	0.00E+00	8.21E+00
		Co-60	<4.48E+00	0.00E+00	4.48E+00
		Zn-65	<6.29E+00	0.00E+00	6.29E+00
		Zr-95	<8.45E+00	0.00E+00	8.45E+00
		Nb-95	<3.86E+00	0.00E+00	3.86E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.94E+00	0.00E+00	3.94E+00
		Cs-137	<4.16E+00	0.00E+00	4.16E+00
		BaLa-140	<6.46E+00	0.00E+00	6.46E+00
		Be-7	<3.35E+01	0.00E+00	3.35E+01
		K-40	<6.90E+01	0.00E+00	6.90E+01
474993	4/24/2018 - 5/22/2018	Beta	1.97E+00	8.12E-01	1.26E+00
		Mn-54	<3.11E+00	0.00E+00	3.11E+00
		Co-58	<3.45E+00	0.00E+00	3.45E+00
		Fe-59	<1.05E+01	0.00E+00	1.05E+01
		Co-60	<3.53E+00	0.00E+00	3.53E+00
		Zn-65	<7.30E+00	0.00E+00	7.30E+00
		Zr-95	<6.39E+00	0.00E+00	6.39E+00
		Nb-95	<5.08E+00	0.00E+00	5.08E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<4.03E+00	0.00E+00	4.03E+00
		Cs-137	<3.52E+00	0.00E+00	3.52E+00
		BaLa-140	<7.44E+00	0.00E+00	7.44E+00
		Be-7	<3.09E+01	0.00E+00	3.09E+01
		K-40	5.70E+01	3.34E+01	4.47E+01
477656	5/22/2018 - 6/19/2018	Beta	1.76E+00	9.74E-01	1.57E+00
		Mn-54	<3.23E+00	0.00E+00	3.23E+00
		Co-58	<3.76E+00	0.00E+00	3.76E+00
		Fe-59	<6.75E+00	0.00E+00	6.75E+00
		Co-60	<4.79E+00	0.00E+00	4.79E+00
		Zn-65	<4.92E+00	0.00E+00	4.92E+00
		Zr-95	<5.05E+00	0.00E+00	5.05E+00
		Nb-95	<5.79E+00	0.00E+00	5.79E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.58E+00	0.00E+00	3.58E+00
		Cs-137	<4.19E+00	0.00E+00	4.19E+00
		BaLa-140	<7.08E+00	0.00E+00	7.08E+00
		Be-7	<2.63E+01	0.00E+00	2.63E+01
		K-40	4.65E+01	3.32E+01	4.66E+01
474716	4/24/2018 - 7/17/2018	H3DW	2.95E+02	1.20E+02	1.90E+02
479524	6/19/2018 - 7/17/2018	Beta	2.32E+00	9.58E-01	1.50E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [INDICATOR - SSE @ 7.3 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
479524	6/19/2018 - 7/17/2018	Mn-54	<3.49E+00	0.00E+00	3.49E+00
		Co-58	<4.10E+00	0.00E+00	4.10E+00
		Fe-59	<7.76E+00	0.00E+00	7.76E+00
		Co-60	<4.34E+00	0.00E+00	4.34E+00
		Zn-65	<5.66E+00	0.00E+00	5.66E+00
		Zr-95	<7.26E+00	0.00E+00	7.26E+00
		Nb-95	<4.81E+00	0.00E+00	4.81E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<4.36E+00	0.00E+00	4.36E+00
		Cs-137	<4.18E+00	0.00E+00	4.18E+00
		BaLa-140	<8.08E+00	0.00E+00	8.08E+00
		Be-7	<3.71E+01	0.00E+00	3.71E+01
		K-40	<8.05E+01	0.00E+00	8.05E+01
481611	7/17/2018 - 8/14/2018	Beta	2.59E+00	9.06E-01	1.37E+00
		Mn-54	<3.94E+00	0.00E+00	3.94E+00
		Co-58	<3.61E+00	0.00E+00	3.61E+00
		Fe-59	<7.05E+00	0.00E+00	7.05E+00
		Co-60	<3.98E+00	0.00E+00	3.98E+00
		Zn-65	<9.18E+00	0.00E+00	9.18E+00
		Zr-95	<8.85E+00	0.00E+00	8.85E+00
		Nb-95	<5.60E+00	0.00E+00	5.60E+00
		I-131	<9.92E+00	0.00E+00	9.92E+00
		Cs-134	<2.55E+00	0.00E+00	2.55E+00
		Cs-137	<3.81E+00	0.00E+00	3.81E+00
		BaLa-140	<1.10E+01	0.00E+00	1.10E+01
		Be-7	<3.06E+01	0.00E+00	3.06E+01
		K-40	4.50E+01	3.64E+01	5.31E+01
483527	8/14/2018 - 9/11/2018	Beta	1.12E+00	9.11E-01	1.50E+00
		Mn-54	<3.59E+00	0.00E+00	3.59E+00
		Co-58	<3.85E+00	0.00E+00	3.85E+00
		Fe-59	<8.83E+00	0.00E+00	8.83E+00
		Co-60	<3.36E+00	0.00E+00	3.36E+00
		Zn-65	<6.18E+00	0.00E+00	6.18E+00
		Zr-95	<6.83E+00	0.00E+00	6.83E+00
		Nb-95	<4.95E+00	0.00E+00	4.95E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.51E+00	0.00E+00	4.51E+00
		Cs-137	<4.04E+00	0.00E+00	4.04E+00
		BaLa-140	<9.46E+00	0.00E+00	9.46E+00
		Be-7	<3.00E+01	0.00E+00	3.00E+01
		K-40	<6.83E+01	0.00E+00	6.83E+01
481613	7/17/2018 - 10/9/2018	Nuclide	Activity	2 Sigma Error	MDA
		H3DW	5.31E+02	1.24E+02	1.83E+02
485846	9/11/2018 - 10/9/2018	Beta	1.38E+00	7.79E-01	1.25E+00
		Mn-54	<2.48E+00	0.00E+00	2.48E+00
		Co-58	<2.44E+00	0.00E+00	2.44E+00
		Fe-59	<6.15E+00	0.00E+00	6.15E+00
		Co-60	<1.55E+00	0.00E+00	1.55E+00
		Zn-65	<5.06E+00	0.00E+00	5.06E+00
		Zr-95	<5.55E+00	0.00E+00	5.55E+00
		Nb-95	<3.74E+00	0.00E+00	3.74E+00
		I-131	<1.05E+01	0.00E+00	1.05E+01
		Cs-134	<3.27E+00	0.00E+00	3.27E+00
		Cs-137	<3.41E+00	0.00E+00	3.41E+00
		BaLa-140	<4.08E+00	0.00E+00	4.08E+00
		Be-7	<2.51E+01	0.00E+00	2.51E+01
		K-40	<5.69E+01	0.00E+00	5.69E+01
488194	10/9/2018 - 11/6/2018	Nuclide	Activity	2 Sigma Error	MDA
		Beta	1.56E+00	8.90E-01	1.43E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 214 [INDICATOR - SSE @ 7.3 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488194	10/9/2018 - 11/6/2018	Mn-54	<2.92E+00	0.00E+00	2.92E+00
		Co-58	<2.50E+00	0.00E+00	2.50E+00
		Fe-59	<5.46E+00	0.00E+00	5.46E+00
		Co-60	<3.33E+00	0.00E+00	3.33E+00
		Zn-65	<5.09E+00	0.00E+00	5.09E+00
		Zr-95	<5.61E+00	0.00E+00	5.61E+00
		Nb-95	<3.63E+00	0.00E+00	3.63E+00
		I-131	<9.21E+00	0.00E+00	9.21E+00
		Cs-134	<3.16E+00	0.00E+00	3.16E+00
		Cs-137	<2.41E+00	0.00E+00	2.41E+00
		BaLa-140	<5.50E+00	0.00E+00	5.50E+00
		Be-7	<2.00E+01	0.00E+00	2.00E+01
		K-40	4.45E+01	2.55E+01	3.50E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490023	11/6/2018 - 12/4/2018	Beta	1.77E+00	9.28E-01	1.48E+00
		Mn-54	<1.66E+00	0.00E+00	1.66E+00
		Co-58	<2.03E+00	0.00E+00	2.03E+00
		Fe-59	<4.68E+00	0.00E+00	4.68E+00
		Co-60	<1.78E+00	0.00E+00	1.78E+00
		Zn-65	<3.51E+00	0.00E+00	3.51E+00
		Zr-95	<4.32E+00	0.00E+00	4.32E+00
		Nb-95	<2.95E+00	0.00E+00	2.95E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<2.19E+00	0.00E+00	2.19E+00
		Cs-137	<1.69E+00	0.00E+00	1.69E+00
		BaLa-140	<5.27E+00	0.00E+00	5.27E+00
		Be-7	<1.99E+01	0.00E+00	1.99E+01
		K-40	7.71E+01	2.00E+01	1.97E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488734	10/9/2018 - 1/2/2019	H3DW	4.39E+02	1.23E+02	1.87E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
491608	12/4/2018 - 1/2/2019	Beta	<5.2E+00	0.00E+00	2.49E+00
		Mn-54	<1.61E+00	0.00E+00	1.61E+00
		Co-58	<1.79E+00	0.00E+00	1.79E+00
		Fe-59	<4.09E+00	0.00E+00	4.09E+00
		Co-60	<1.31E+00	0.00E+00	1.31E+00
		Zn-65	<3.40E+00	0.00E+00	3.40E+00
		Zr-95	<3.70E+00	0.00E+00	3.70E+00
		Nb-95	<2.53E+00	0.00E+00	2.53E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<1.82E+00	0.00E+00	1.82E+00
		Cs-137	<1.46E+00	0.00E+00	1.46E+00
		BaLa-140	<6.27E+00	0.00E+00	6.27E+00
		Be-7	2.40E+00	7.84E+00	1.73E+01
		K-40	9.52E+01	2.08E+01	2.18E+01

Sample Point 218 [CONTROL - NNE @ 13.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466675	1/3/2018 - 1/30/2018	Beta	2.34E+00	8.75E-01	1.33E+00
		Mn-54	<3.66E+00	0.00E+00	3.66E+00
		Co-58	<3.21E+00	0.00E+00	3.21E+00
		Fe-59	<6.64E+00	0.00E+00	6.64E+00
		Co-60	<2.43E+00	0.00E+00	2.43E+00
		Zn-65	<7.61E+00	0.00E+00	7.61E+00
		Zr-95	<7.13E+00	0.00E+00	7.13E+00
		Nb-95	<4.77E+00	0.00E+00	4.77E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<2.83E+00	0.00E+00	2.83E+00
		Cs-137	<4.02E+00	0.00E+00	4.02E+00
		BaLa-140	<9.57E+00	0.00E+00	9.57E+00
		Be-7	<4.09E+01	0.00E+00	4.09E+01
		K-40	3.69E+01	3.56E+01	5.58E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [CONTROL - NNE @ 13.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
468530	1/30/2018 - 2/27/2018	Beta	2.62E+00	8.88E-01	1.33E+00
		Mn-54	<2.58E+00	0.00E+00	2.58E+00
		Co-58	<4.44E+00	0.00E+00	4.44E+00
		Fe-59	<7.65E+00	0.00E+00	7.65E+00
		Co-60	<2.99E+00	0.00E+00	2.99E+00
		Zn-65	<5.50E+00	0.00E+00	5.50E+00
		Zr-95	<6.67E+00	0.00E+00	6.67E+00
		Nb-95	<5.85E+00	0.00E+00	5.85E+00
		I-131	<1.09E+01	0.00E+00	1.09E+01
		Cs-134	<3.75E+00	0.00E+00	3.75E+00
		Cs-137	<4.67E+00	0.00E+00	4.67E+00
		BaLa-140	<1.18E+01	0.00E+00	1.18E+01
		Be-7	<3.89E+01	0.00E+00	3.89E+01
		K-40	2.76E+01	2.96E+01	4.62E+01
471518	2/27/2018 - 3/27/2018	Beta	1.41E+00	8.68E-01	1.40E+00
		Mn-54	<1.78E+00	0.00E+00	1.78E+00
		Co-58	<1.73E+00	0.00E+00	1.73E+00
		Fe-59	<4.48E+00	0.00E+00	4.48E+00
		Co-60	<1.83E+00	0.00E+00	1.83E+00
		Zn-65	<3.61E+00	0.00E+00	3.61E+00
		Zr-95	<3.67E+00	0.00E+00	3.67E+00
		Nb-95	<2.84E+00	0.00E+00	2.84E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<1.96E+00	0.00E+00	1.96E+00
		Cs-137	<2.10E+00	0.00E+00	2.10E+00
		BaLa-140	<6.37E+00	0.00E+00	6.37E+00
		Be-7	<1.76E+01	0.00E+00	1.76E+01
		K-40	1.82E+01	1.74E+01	2.77E+01
467520	1/3/2018 - 4/24/2018	Nuclide	Activity	2 Sigma Error	MDA
		H3DW	4.15E+02	1.24E+02	1.91E+02
473430	3/27/2018 - 4/24/2018	Beta	1.74E+00	8.76E-01	1.39E+00
		Mn-54	<3.17E+00	0.00E+00	3.17E+00
		Co-58	<3.56E+00	0.00E+00	3.56E+00
		Fe-59	<5.09E+00	0.00E+00	5.09E+00
		Co-60	<1.82E+00	0.00E+00	1.82E+00
		Zn-65	<4.73E+00	0.00E+00	4.73E+00
		Zr-95	<5.80E+00	0.00E+00	5.80E+00
		Nb-95	<3.42E+00	0.00E+00	3.42E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<3.72E+00	0.00E+00	3.72E+00
		Cs-137	<3.32E+00	0.00E+00	3.32E+00
		BaLa-140	<5.93E+00	0.00E+00	5.93E+00
		Be-7	<2.36E+01	0.00E+00	2.36E+01
		K-40	3.38E+01	2.75E+01	4.17E+01
474994	4/24/2018 - 5/22/2018	Beta	2.18E+00	8.04E-01	1.24E+00
		Mn-54	<3.18E+00	0.00E+00	3.18E+00
		Co-58	<2.89E+00	0.00E+00	2.89E+00
		Fe-59	<5.19E+00	0.00E+00	5.19E+00
		Co-60	<2.99E+00	0.00E+00	2.99E+00
		Zn-65	<6.12E+00	0.00E+00	6.12E+00
		Zr-95	<5.93E+00	0.00E+00	5.93E+00
		Nb-95	<4.58E+00	0.00E+00	4.58E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<3.72E+00	0.00E+00	3.72E+00
		Cs-137	<2.82E+00	0.00E+00	2.82E+00
		BaLa-140	<8.81E+00	0.00E+00	8.81E+00
		Be-7	<2.79E+01	0.00E+00	2.79E+01
		K-40	6.68E+01	3.08E+01	3.81E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [CONTROL - NNE @ 13.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
477657	5/22/2018 - 6/19/2018	Beta	3.20E+00	1.03E+00	1.56E+00
		Mn-54	<2.46E+00	0.00E+00	2.46E+00
		Co-58	<2.99E+00	0.00E+00	2.99E+00
		Fe-59	<5.75E+00	0.00E+00	5.75E+00
		Co-60	<2.94E+00	0.00E+00	2.94E+00
		Zn-65	<6.07E+00	0.00E+00	6.07E+00
		Zr-95	<5.93E+00	0.00E+00	5.93E+00
		Nb-95	<4.20E+00	0.00E+00	4.20E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<3.24E+00	0.00E+00	3.24E+00
		Cs-137	<2.93E+00	0.00E+00	2.93E+00
		BaLa-140	<7.89E+00	0.00E+00	7.89E+00
		Be-7	<2.57E+01	0.00E+00	2.57E+01
		K-40	5.47E+01	2.94E+01	3.82E+01
474717	4/24/2018 - 7/17/2018	H3DW	1.99E+02	1.18E+02	1.91E+02
479525	6/19/2018 - 7/17/2018	Beta	1.66E+00	9.15E-01	1.47E+00
		Mn-54	<3.72E+00	0.00E+00	3.72E+00
		Co-58	<3.39E+00	0.00E+00	3.39E+00
		Fe-59	<8.60E+00	0.00E+00	8.60E+00
		Co-60	<2.89E+00	0.00E+00	2.89E+00
		Zn-65	<7.53E+00	0.00E+00	7.53E+00
		Zr-95	<6.48E+00	0.00E+00	6.48E+00
		Nb-95	<4.81E+00	0.00E+00	4.81E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.13E+00	0.00E+00	4.13E+00
		Cs-137	<2.74E+00	0.00E+00	2.74E+00
		BaLa-140	<1.09E+01	0.00E+00	1.09E+01
		Be-7	<3.43E+01	0.00E+00	3.43E+01
		K-40	<6.58E+01	0.00E+00	6.58E+01
481612	7/17/2018 - 8/14/2018	Beta	1.85E+00	8.64E-01	1.35E+00
		Mn-54	<2.49E+00	0.00E+00	2.49E+00
		Co-58	<3.36E+00	0.00E+00	3.36E+00
		Fe-59	<5.40E+00	0.00E+00	5.40E+00
		Co-60	<3.56E+00	0.00E+00	3.56E+00
		Zn-65	<6.11E+00	0.00E+00	6.11E+00
		Zr-95	<6.55E+00	0.00E+00	6.55E+00
		Nb-95	<5.08E+00	0.00E+00	5.08E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<3.17E+00	0.00E+00	3.17E+00
		Cs-137	<2.93E+00	0.00E+00	2.93E+00
		BaLa-140	<7.61E+00	0.00E+00	7.61E+00
		Be-7	<3.10E+01	0.00E+00	3.10E+01
		K-40	<4.70E+01	0.00E+00	4.70E+01
483528	8/14/2018 - 9/11/2018	Beta	7.35E-01	8.76E-01	1.47E+00
		Mn-54	<3.60E+00	0.00E+00	3.60E+00
		Co-58	<3.26E+00	0.00E+00	3.26E+00
		Fe-59	<5.90E+00	0.00E+00	5.90E+00
		Co-60	<3.48E+00	0.00E+00	3.48E+00
		Zn-65	<5.47E+00	0.00E+00	5.47E+00
		Zr-95	<6.87E+00	0.00E+00	6.87E+00
		Nb-95	<4.52E+00	0.00E+00	4.52E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<4.48E+00	0.00E+00	4.48E+00
		Cs-137	<3.70E+00	0.00E+00	3.70E+00
		BaLa-140	<9.17E+00	0.00E+00	9.17E+00
		Be-7	<2.99E+01	0.00E+00	2.99E+01
		K-40	<5.20E+01	0.00E+00	5.20E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [CONTROL - NNE @ 13.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
481614	7/17/2018 - 10/9/2018	H3DW	4.20E+02	1.21E+02	1.85E+02
485847	9/11/2018 - 10/9/2018	Beta	1.58E+00	7.70E-01	1.22E+00
		Mn-54	<3.54E+00	0.00E+00	3.54E+00
		Co-58	<3.66E+00	0.00E+00	3.66E+00
		Fe-59	<7.30E+00	0.00E+00	7.30E+00
		Co-60	<3.08E+00	0.00E+00	3.08E+00
		Zn-65	<6.10E+00	0.00E+00	6.10E+00
		Zr-95	<6.50E+00	0.00E+00	6.50E+00
		Nb-95	<3.26E+00	0.00E+00	3.26E+00
		I-131	<1.10E+01	0.00E+00	1.10E+01
		Cs-134	<3.41E+00	0.00E+00	3.41E+00
		Cs-137	<3.65E+00	0.00E+00	3.65E+00
		BaLa-140	<5.82E+00	0.00E+00	5.82E+00
		Be-7	<2.84E+01	0.00E+00	2.84E+01
		K-40	<5.34E+01	0.00E+00	5.34E+01
488195	10/9/2018 - 11/6/2018	Beta	1.56E+00	8.84E-01	1.42E+00
		Mn-54	<3.41E+00	0.00E+00	3.41E+00
		Co-58	<4.36E+00	0.00E+00	4.36E+00
		Fe-59	<7.78E+00	0.00E+00	7.78E+00
		Co-60	<3.65E+00	0.00E+00	3.65E+00
		Zn-65	<8.39E+00	0.00E+00	8.39E+00
		Zr-95	<5.33E+00	0.00E+00	5.33E+00
		Nb-95	<5.61E+00	0.00E+00	5.61E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<5.51E+00	0.00E+00	5.51E+00
		Cs-137	<3.66E+00	0.00E+00	3.66E+00
		BaLa-140	<5.93E+00	0.00E+00	5.93E+00
		Be-7	<3.18E+01	0.00E+00	3.18E+01
		K-40	<5.45E+01	0.00E+00	5.45E+01
490024	11/6/2018 - 12/4/2018	Beta	1.41E+00	9.18E-01	1.49E+00
		Mn-54	<1.86E+00	0.00E+00	1.86E+00
		Co-58	<2.08E+00	0.00E+00	2.08E+00
		Fe-59	<3.55E+00	0.00E+00	3.55E+00
		Co-60	<1.73E+00	0.00E+00	1.73E+00
		Zn-65	<2.84E+00	0.00E+00	2.84E+00
		Zr-95	<3.76E+00	0.00E+00	3.76E+00
		Nb-95	<2.70E+00	0.00E+00	2.70E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<1.77E+00	0.00E+00	1.77E+00
		Cs-137	<1.59E+00	0.00E+00	1.59E+00
		BaLa-140	<5.70E+00	0.00E+00	5.70E+00
		Be-7	<2.01E+01	0.00E+00	2.01E+01
		K-40	<3.17E+01	0.00E+00	3.17E+01
488735	10/9/2018 - 1/2/2019	H3DW	2.73E+02	1.17E+02	1.86E+02
491609	12/4/2018 - 1/2/2019	Beta	<-6.6E+00	0.00E+00	2.49E+00
		Mn-54	<1.67E+00	0.00E+00	1.67E+00
		Co-58	<1.81E+00	0.00E+00	1.81E+00
		Fe-59	<4.06E+00	0.00E+00	4.06E+00
		Co-60	<1.76E+00	0.00E+00	1.76E+00
		Zn-65	<3.46E+00	0.00E+00	3.46E+00
		Zr-95	<3.70E+00	0.00E+00	3.70E+00
		Nb-95	<2.43E+00	0.00E+00	2.43E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<1.97E+00	0.00E+00	1.97E+00
		Cs-137	<1.43E+00	0.00E+00	1.43E+00
		BaLa-140	<4.93E+00	0.00E+00	4.93E+00
		Be-7	<1.59E+01	0.00E+00	1.59E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: DRINKING WATER Concentration (Activity): pCi/l

Sample Point 218 [CONTROL - NNE @ 13.5 miles]

Sample ID:	Sample Dates:		Nuclide	Activity	2 Sigma Error	MDA
491609	12/4/2018 - 1/2/2019		K-40	<2.32E+01	0.00E+00	2.32E+01

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
472900	4/3/2018 - 4/3/2018		Mn-54	<2.91E+01	0.00E+00	2.91E+01
			Co-58	<2.31E+01	0.00E+00	2.31E+01
			Fe-59	<7.02E+01	0.00E+00	7.02E+01
			Co-60	<4.99E+01	0.00E+00	4.99E+01
			Zn-65	<8.75E+01	0.00E+00	8.75E+01
			Nb-95	<5.03E+01	0.00E+00	5.03E+01
			I-131	<3.85E+01	0.00E+00	3.85E+01
			Cs-134	<3.54E+01	0.00E+00	3.54E+01
			Cs-137	<1.71E+01	0.00E+00	1.71E+01
			Be-7	<2.38E+02	0.00E+00	2.38E+02
			K-40	3.03E+03	7.56E+02	5.57E+02
			Ag-110M	<2.51E+01	0.00E+00	2.51E+01
			Sb-122	<1.51E+02	0.00E+00	1.51E+02
			Sb-125	<6.79E+01	0.00E+00	6.79E+01

Sample ID:	Sample Dates:	FORAGER	Nuclide	Activity	2 Sigma Error	MDA
472901	4/3/2018 - 4/3/2018		Mn-54	<2.39E+01	0.00E+00	2.39E+01
			Co-58	<3.17E+01	0.00E+00	3.17E+01
			Fe-59	<4.57E+01	0.00E+00	4.57E+01
			Co-60	<3.49E+01	0.00E+00	3.49E+01
			Zn-65	<6.11E+01	0.00E+00	6.11E+01
			Nb-95	<3.48E+01	0.00E+00	3.48E+01
			I-131	<4.55E+01	0.00E+00	4.55E+01
			Cs-134	<3.76E+01	0.00E+00	3.76E+01
			Cs-137	<3.23E+01	0.00E+00	3.23E+01
			Be-7	<2.21E+02	0.00E+00	2.21E+02
			K-40	2.94E+03	7.30E+02	3.79E+02
			Ag-110M	<2.91E+01	0.00E+00	2.91E+01
			Sb-122	<1.63E+02	0.00E+00	1.63E+02
			Sb-125	<6.13E+01	0.00E+00	6.13E+01

Sample ID:	Sample Dates:	BOTMFEEDER	Nuclide	Activity	2 Sigma Error	MDA
472902	4/3/2018 - 4/3/2018		Mn-54	<2.98E+01	0.00E+00	2.98E+01
			Co-58	<3.78E+01	0.00E+00	3.78E+01
			Fe-59	<4.74E+01	0.00E+00	4.74E+01
			Co-60	<4.05E+01	0.00E+00	4.05E+01
			Zn-65	<7.10E+01	0.00E+00	7.10E+01
			Nb-95	<3.28E+01	0.00E+00	3.28E+01
			I-131	<3.15E+01	0.00E+00	3.15E+01
			Cs-134	<3.55E+01	0.00E+00	3.55E+01
			Cs-137	<3.22E+01	0.00E+00	3.22E+01
			Be-7	<2.41E+02	0.00E+00	2.41E+02
			K-40	3.13E+03	6.74E+02	8.40E+01
			Ag-110M	<2.74E+01	0.00E+00	2.74E+01
			Sb-122	<1.40E+02	0.00E+00	1.40E+02
			Sb-125	<5.04E+01	0.00E+00	5.04E+01

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
486117	10/29/2018 - 10/29/2018		Mn-54	<6.94E+01	0.00E+00	6.94E+01
			Co-58	<5.44E+01	0.00E+00	5.44E+01
			Fe-59	<1.25E+02	0.00E+00	1.25E+02
			Co-60	<6.58E+01	0.00E+00	6.58E+01
			Zn-65	<1.17E+02	0.00E+00	1.17E+02
			Nb-95	<6.08E+01	0.00E+00	6.08E+01
			I-131	<1.06E+02	0.00E+00	1.06E+02
			Cs-134	<6.90E+01	0.00E+00	6.90E+01
			Cs-137	<6.75E+01	0.00E+00	6.75E+01
			Be-7	<6.02E+02	0.00E+00	6.02E+02
			K-40	4.49E+03	1.23E+03	1.05E+03
			Ag-110M	<6.69E+01	0.00E+00	6.69E+01
			Sb-122	<4.62E+02	0.00E+00	4.62E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
486117	10/29/2018 - 10/29/2018	PREDATOR	Sb-125	<1.35E+02	0.00E+00	1.35E+02
486118	10/29/2018 - 10/29/2018	FORAGER	Mn-54	<6.04E+01	0.00E+00	6.04E+01
			Co-58	<5.07E+01	0.00E+00	5.07E+01
			Fe-59	<9.91E+01	0.00E+00	9.91E+01
			Co-60	<8.02E+01	0.00E+00	8.02E+01
			Zn-65	<1.44E+02	0.00E+00	1.44E+02
			Nb-95	<6.41E+01	0.00E+00	6.41E+01
			I-131	<6.53E+01	0.00E+00	6.53E+01
			Cs-134	<5.47E+01	0.00E+00	5.47E+01
			Cs-137	<4.05E+01	0.00E+00	4.05E+01
			Be-7	<3.32E+02	0.00E+00	3.32E+02
			K-40	3.89E+03	9.76E+02	6.80E+02
			Ag-110M	<4.29E+01	0.00E+00	4.29E+01
			Sb-122	<2.75E+02	0.00E+00	2.75E+02
			Sb-125	<9.91E+01	0.00E+00	9.91E+01
486119	10/29/2018 - 10/29/2018	BOTMFEEDER	Mn-54	<8.17E+01	0.00E+00	8.17E+01
			Co-58	<4.28E+01	0.00E+00	4.28E+01
			Fe-59	<1.37E+02	0.00E+00	1.37E+02
			Co-60	<4.98E+01	0.00E+00	4.98E+01
			Zn-65	<1.35E+02	0.00E+00	1.35E+02
			Nb-95	<7.92E+01	0.00E+00	7.92E+01
			I-131	<9.95E+01	0.00E+00	9.95E+01
			Cs-134	<6.05E+01	0.00E+00	6.05E+01
			Cs-137	<4.90E+01	0.00E+00	4.90E+01
			Be-7	<3.96E+02	0.00E+00	3.96E+02
			K-40	3.47E+03	9.80E+02	7.60E+02
			Ag-110M	<4.76E+01	0.00E+00	4.76E+01
			Sb-122	<4.07E+02	0.00E+00	4.07E+02
			Sb-125	<1.19E+02	0.00E+00	1.19E+02

Sample Point 216 [CONTROL - NNE @ 4.19 miles]

Sample ID:	Sample Dates:	PREDATOR	Nuclide	Activity	2 Sigma Error	MDA
472903	4/4/2018 - 4/4/2018	PREDATOR	Mn-54	<5.74E+01	0.00E+00	5.74E+01
			Co-58	<3.61E+01	0.00E+00	3.61E+01
			Fe-59	<1.19E+02	0.00E+00	1.19E+02
			Co-60	<4.08E+01	0.00E+00	4.08E+01
			Zn-65	<2.63E+01	0.00E+00	2.63E+01
			Nb-95	<4.66E+01	0.00E+00	4.66E+01
			I-131	<6.44E+01	0.00E+00	6.44E+01
			Cs-134	<5.14E+01	0.00E+00	5.14E+01
			Cs-137	<6.42E+01	0.00E+00	6.42E+01
			Be-7	<3.93E+02	0.00E+00	3.93E+02
			K-40	4.71E+03	1.15E+03	7.13E+02
			Ag-110M	<3.07E+01	0.00E+00	3.07E+01
			Sb-122	<1.98E+02	0.00E+00	1.98E+02
			Sb-125	<9.96E+01	0.00E+00	9.96E+01
472904	4/4/2018 - 4/4/2018	FORAGER	Mn-54	<3.40E+01	0.00E+00	3.40E+01
			Co-58	<3.78E+01	0.00E+00	3.78E+01
			Fe-59	<8.79E+01	0.00E+00	8.79E+01
			Co-60	<5.38E+01	0.00E+00	5.38E+01
			Zn-65	<1.20E+02	0.00E+00	1.20E+02
			Nb-95	<2.67E+01	0.00E+00	2.67E+01
			I-131	<4.99E+01	0.00E+00	4.99E+01
			Cs-134	<3.80E+01	0.00E+00	3.80E+01
			Cs-137	<4.33E+01	0.00E+00	4.33E+01
			Be-7	<3.06E+02	0.00E+00	3.06E+02
			K-40	4.48E+03	9.86E+02	6.18E+02
			Ag-110M	<2.94E+01	0.00E+00	2.94E+01
			Sb-122	<1.65E+02	0.00E+00	1.65E+02
			Sb-125	<1.06E+02	0.00E+00	1.06E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: FISH Concentration (Activity): pCi/kg

Sample Point 216 [CONTROL - NNE @ 4.19 miles]

Sample ID:	Sample Dates:		Nuclide	Activity	2 Sigma Error	MDA
472905	4/4/2018 - 4/4/2018	BOTMFEEDER	Mn-54	<3.84E+01	0.00E+00	3.84E+01
			Co-58	<3.50E+01	0.00E+00	3.50E+01
			Fe-59	<9.15E+01	0.00E+00	9.15E+01
			Co-60	<4.35E+01	0.00E+00	4.35E+01
			Zn-65	<9.83E+01	0.00E+00	9.83E+01
			Nb-95	<4.88E+01	0.00E+00	4.88E+01
			I-131	<4.40E+01	0.00E+00	4.40E+01
			Cs-134	<5.04E+01	0.00E+00	5.04E+01
			Cs-137	<5.35E+01	0.00E+00	5.35E+01
			Be-7	<2.49E+02	0.00E+00	2.49E+02
			K-40	4.06E+03	9.78E+02	6.06E+02
			Ag-110M	<3.89E+01	0.00E+00	3.89E+01
			Sb-122	<1.34E+02	0.00E+00	1.34E+02
			Sb-125	<6.84E+01	0.00E+00	6.84E+01
486120	10/29/2018 - 10/29/2018	PREDATOR	Mn-54	<6.74E+01	0.00E+00	6.74E+01
			Co-58	<4.95E+01	0.00E+00	4.95E+01
			Fe-59	<1.33E+02	0.00E+00	1.33E+02
			Co-60	<5.33E+01	0.00E+00	5.33E+01
			Zn-65	<1.69E+02	0.00E+00	1.69E+02
			Nb-95	<7.71E+01	0.00E+00	7.71E+01
			I-131	<8.92E+01	0.00E+00	8.92E+01
			Cs-134	<6.19E+01	0.00E+00	6.19E+01
			Cs-137	<8.32E+01	0.00E+00	8.32E+01
			Be-7	<4.98E+02	0.00E+00	4.98E+02
			K-40	4.27E+03	1.31E+03	1.18E+03
			Ag-110M	<7.86E+01	0.00E+00	7.86E+01
			Sb-122	<3.52E+02	0.00E+00	3.52E+02
			Sb-125	<1.76E+02	0.00E+00	1.76E+02
486121	10/29/2018 - 10/29/2018	FORAGER	Mn-54	<8.63E+01	0.00E+00	8.63E+01
			Co-58	<9.94E+01	0.00E+00	9.94E+01
			Fe-59	<1.48E+02	0.00E+00	1.48E+02
			Co-60	<5.92E+01	0.00E+00	5.92E+01
			Zn-65	<1.06E+02	0.00E+00	1.06E+02
			Nb-95	<5.68E+01	0.00E+00	5.68E+01
			I-131	<1.07E+02	0.00E+00	1.07E+02
			Cs-134	<5.97E+01	0.00E+00	5.97E+01
			Cs-137	<6.03E+01	0.00E+00	6.03E+01
			Be-7	<5.96E+02	0.00E+00	5.96E+02
			K-40	3.03E+03	1.18E+03	1.21E+03
			Ag-110M	<4.70E+01	0.00E+00	4.70E+01
			Sb-122	<5.51E+02	0.00E+00	5.51E+02
			Sb-125	<1.88E+02	0.00E+00	1.88E+02
486122	10/29/2018 - 10/29/2018	BOTMFEEDER	Mn-54	<8.40E+01	0.00E+00	8.40E+01
			Co-58	<5.38E+01	0.00E+00	5.38E+01
			Fe-59	<1.24E+02	0.00E+00	1.24E+02
			Co-60	<7.19E+01	0.00E+00	7.19E+01
			Zn-65	<1.51E+02	0.00E+00	1.51E+02
			Nb-95	<6.47E+01	0.00E+00	6.47E+01
			I-131	<1.22E+02	0.00E+00	1.22E+02
			Cs-134	<6.80E+01	0.00E+00	6.80E+01
			Cs-137	<6.29E+01	0.00E+00	6.29E+01
			Be-7	<4.40E+02	0.00E+00	4.40E+02
			K-40	4.74E+03	1.15E+03	5.51E+02
			Ag-110M	<4.55E+01	0.00E+00	4.55E+01
			Sb-122	<3.86E+02	0.00E+00	3.86E+02
			Sb-125	<1.52E+02	0.00E+00	1.52E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [CONTROL - NW @ 14.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
466163	1/9/2018 - 1/9/2018	LLI-131	<5.09E-01	0.00E+00	5.09E-01
		I-131	<7.07E+00	0.00E+00	7.07E+00
		Cs-134	<7.74E+00	0.00E+00	7.74E+00
		Cs-137	<6.37E+00	0.00E+00	6.37E+00
		BaLa-140	<7.66E+00	0.00E+00	7.66E+00
		Be-7	<4.24E+01	0.00E+00	4.24E+01
		K-40	1.40E+03	2.24E+02	6.80E+01
466949	1/23/2018 - 1/23/2018	LLI-131	<6.34E-01	0.00E+00	6.34E-01
		I-131	<7.82E+00	0.00E+00	7.82E+00
		Cs-134	<6.11E+00	0.00E+00	6.11E+00
		Cs-137	<7.96E+00	0.00E+00	7.96E+00
		BaLa-140	<9.24E+00	0.00E+00	9.24E+00
		Be-7	<5.56E+01	0.00E+00	5.56E+01
		K-40	1.74E+03	2.68E+02	1.35E+02
467617	2/6/2018 - 2/6/2018	LLI-131	<6.20E-01	0.00E+00	6.20E-01
		I-131	<5.20E+00	0.00E+00	5.20E+00
		Cs-134	<8.15E+00	0.00E+00	8.15E+00
		Cs-137	<7.61E+00	0.00E+00	7.61E+00
		BaLa-140	<8.80E+00	0.00E+00	8.80E+00
		Be-7	<5.30E+01	0.00E+00	5.30E+01
		K-40	1.65E+03	2.46E+02	1.78E+01
468730	2/20/2018 - 2/20/2018	LLI-131	<5.38E-01	0.00E+00	5.38E-01
		I-131	<6.05E+00	0.00E+00	6.05E+00
		Cs-134	<7.38E+00	0.00E+00	7.38E+00
		Cs-137	<6.52E+00	0.00E+00	6.52E+00
		BaLa-140	<2.16E+00	0.00E+00	2.16E+00
		Be-7	<5.15E+01	0.00E+00	5.15E+01
		K-40	1.57E+03	2.41E+02	9.98E+01
470561	3/6/2018 - 3/6/2018	LLI-131	<6.34E-01	0.00E+00	6.34E-01
		I-131	<6.94E+00	0.00E+00	6.94E+00
		Cs-134	<7.38E+00	0.00E+00	7.38E+00
		Cs-137	<8.06E+00	0.00E+00	8.06E+00
		BaLa-140	<7.33E+00	0.00E+00	7.33E+00
		Be-7	<4.04E+01	0.00E+00	4.04E+01
		K-40	1.55E+03	2.42E+02	1.13E+02
471686	3/20/2018 - 3/20/2018	LLI-131	<6.32E-01	0.00E+00	6.32E-01
		I-131	<7.75E+00	0.00E+00	7.75E+00
		Cs-134	<6.63E+00	0.00E+00	6.63E+00
		Cs-137	<7.33E+00	0.00E+00	7.33E+00
		BaLa-140	<8.97E+00	0.00E+00	8.97E+00
		Be-7	<5.39E+01	0.00E+00	5.39E+01
		K-40	1.61E+03	2.45E+02	7.10E+01
472948	4/3/2018 - 4/3/2018	LLI-131	<5.36E-01	0.00E+00	5.36E-01
		I-131	<6.55E+00	0.00E+00	6.55E+00
		Cs-134	<5.97E+00	0.00E+00	5.97E+00
		Cs-137	<8.17E+00	0.00E+00	8.17E+00
		BaLa-140	<6.21E+00	0.00E+00	6.21E+00
		Be-7	<4.26E+01	0.00E+00	4.26E+01
		K-40	1.55E+03	2.41E+02	1.83E+01
473604	4/17/2018 - 4/17/2018	LLI-131	<6.46E-01	0.00E+00	6.46E-01
		I-131	<6.90E+00	0.00E+00	6.90E+00
		Cs-134	<1.04E+01	0.00E+00	1.04E+01
		Cs-137	<6.89E+00	0.00E+00	6.89E+00
		BaLa-140	<6.20E+00	0.00E+00	6.20E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [CONTROL - NW @ 14.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
473604	4/17/2018 - 4/17/2018	Be-7	<5.88E+01	0.00E+00	5.88E+01
		K-40	1.55E+03	2.41E+02	9.62E+01
474502	5/1/2018 - 5/1/2018	LLI-131	<5.35E-01	0.00E+00	5.35E-01
		I-131	<7.28E+00	0.00E+00	7.28E+00
		Cs-134	<7.65E+00	0.00E+00	7.65E+00
		Cs-137	<7.99E+00	0.00E+00	7.99E+00
		BaLa-140	<2.23E+00	0.00E+00	2.23E+00
		Be-7	<4.79E+01	0.00E+00	4.79E+01
		K-40	1.54E+03	2.37E+02	6.87E+01
475185	5/15/2018 - 5/15/2018	LLI-131	<6.10E-01	0.00E+00	6.10E-01
		I-131	<7.34E+00	0.00E+00	7.34E+00
		Cs-134	<9.75E+00	0.00E+00	9.75E+00
		Cs-137	<9.02E+00	0.00E+00	9.02E+00
		BaLa-140	<6.57E+00	0.00E+00	6.57E+00
		Be-7	<4.14E+01	0.00E+00	4.14E+01
		K-40	1.71E+03	2.69E+02	1.43E+02
476335	5/30/2018 - 5/30/2018	LLI-131	<6.19E-01	0.00E+00	6.19E-01
		I-131	<6.11E+00	0.00E+00	6.11E+00
		Cs-134	<4.87E+00	0.00E+00	4.87E+00
		Cs-137	<8.08E+00	0.00E+00	8.08E+00
		BaLa-140	<7.12E+00	0.00E+00	7.12E+00
		Be-7	<5.32E+01	0.00E+00	5.32E+01
		K-40	1.41E+03	2.24E+02	7.34E+01
478077	6/12/2018 - 6/12/2018	LLI-131	<6.46E-01	0.00E+00	6.46E-01
		I-131	<7.08E+00	0.00E+00	7.08E+00
		Cs-134	<7.23E+00	0.00E+00	7.23E+00
		Cs-137	<7.33E+00	0.00E+00	7.33E+00
		BaLa-140	<7.45E+00	0.00E+00	7.45E+00
		Be-7	<3.45E+01	0.00E+00	3.45E+01
		K-40	1.56E+03	2.37E+02	1.80E+01
478748	6/26/2018 - 6/26/2018	LLI-131	<5.08E-01	0.00E+00	5.08E-01
		I-131	<6.05E+00	0.00E+00	6.05E+00
		Cs-134	<6.86E+00	0.00E+00	6.86E+00
		Cs-137	<7.71E+00	0.00E+00	7.71E+00
		BaLa-140	<8.60E+00	0.00E+00	8.60E+00
		Be-7	<5.38E+01	0.00E+00	5.38E+01
		K-40	1.64E+03	2.46E+02	7.39E+01
479850	7/10/2018 - 7/10/2018	LLI-131	<6.47E-01	0.00E+00	6.47E-01
		I-131	<6.21E+00	0.00E+00	6.21E+00
		Cs-134	<7.25E+00	0.00E+00	7.25E+00
		Cs-137	<9.23E+00	0.00E+00	9.23E+00
		BaLa-140	<2.16E+00	0.00E+00	2.16E+00
		Be-7	<4.56E+01	0.00E+00	4.56E+01
		K-40	1.50E+03	2.32E+02	1.80E+01
481047	7/24/2018 - 7/24/2018	LLI-131	<4.94E-01	0.00E+00	4.94E-01
		I-131	<5.99E+00	0.00E+00	5.99E+00
		Cs-134	<7.19E+00	0.00E+00	7.19E+00
		Cs-137	<8.81E+00	0.00E+00	8.81E+00
		BaLa-140	<6.09E+00	0.00E+00	6.09E+00
		Be-7	<5.39E+01	0.00E+00	5.39E+01
		K-40	1.53E+03	2.37E+02	6.87E+01
481924	8/7/2018 - 8/7/2018	LLI-131	<6.47E-01	0.00E+00	6.47E-01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [CONTROL - NW @ 14.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
481924	8/7/2018 - 8/7/2018	I-131	<6.45E+00	0.00E+00	6.45E+00
		Cs-134	<9.21E+00	0.00E+00	9.21E+00
		Cs-137	<7.78E+00	0.00E+00	7.78E+00
		BaLa-140	<2.16E+00	0.00E+00	2.16E+00
		Be-7	<5.86E+01	0.00E+00	5.86E+01
		K-40	1.33E+03	2.25E+02	1.28E+02
482781	8/21/2018 - 8/21/2018	LLI-131	<5.81E-01	0.00E+00	5.81E-01
		I-131	<7.70E+00	0.00E+00	7.70E+00
		Cs-134	<6.63E+00	0.00E+00	6.63E+00
		Cs-137	<5.26E+00	0.00E+00	5.26E+00
		BaLa-140	<2.24E+00	0.00E+00	2.24E+00
		Be-7	<5.86E+01	0.00E+00	5.86E+01
483978	9/4/2018 - 9/4/2018	LLI-131	<6.50E-01	0.00E+00	6.50E-01
		I-131	<6.31E+00	0.00E+00	6.31E+00
		Cs-134	<7.39E+00	0.00E+00	7.39E+00
		Cs-137	<1.06E+01	0.00E+00	1.06E+01
		BaLa-140	<6.23E+00	0.00E+00	6.23E+00
		Be-7	<5.22E+01	0.00E+00	5.22E+01
485002	9/18/2018 - 9/18/2018	LLI-131	<5.92E-01	0.00E+00	5.92E-01
		I-131	<7.09E+00	0.00E+00	7.09E+00
		Cs-134	<7.67E+00	0.00E+00	7.67E+00
		Cs-137	<7.77E+00	0.00E+00	7.77E+00
		BaLa-140	<6.60E+00	0.00E+00	6.60E+00
		Be-7	<5.48E+01	0.00E+00	5.48E+01
486123	10/2/2018 - 10/2/2018	LLI-131	<6.49E-01	0.00E+00	6.49E-01
		I-131	<7.06E+00	0.00E+00	7.06E+00
		Cs-134	<8.75E+00	0.00E+00	8.75E+00
		Cs-137	<7.33E+00	0.00E+00	7.33E+00
		BaLa-140	<2.17E+00	0.00E+00	2.17E+00
		Be-7	<4.81E+01	0.00E+00	4.81E+01
487711	10/16/2018 - 10/16/2018	LLI-131	<6.13E-01	0.00E+00	6.13E-01
		I-131	<5.95E+00	0.00E+00	5.95E+00
		Cs-134	<5.43E+00	0.00E+00	5.43E+00
		Cs-137	<6.13E+00	0.00E+00	6.13E+00
		BaLa-140	<9.17E+00	0.00E+00	9.17E+00
		Be-7	<4.47E+01	0.00E+00	4.47E+01
488443	10/30/2018 - 10/30/2018	LLI-131	<6.22E-01	0.00E+00	6.22E-01
		I-131	<6.12E+00	0.00E+00	6.12E+00
		Cs-134	<7.78E+00	0.00E+00	7.78E+00
		Cs-137	<7.75E+00	0.00E+00	7.75E+00
		BaLa-140	<7.44E+00	0.00E+00	7.44E+00
		Be-7	<5.34E+01	0.00E+00	5.34E+01
489123	11/13/2018 - 11/13/2018	LLI-131	<5.32E-01	0.00E+00	5.32E-01
		I-131	<7.07E+00	0.00E+00	7.07E+00
		Cs-134	<8.23E+00	0.00E+00	8.23E+00
		Cs-137	<4.51E+00	0.00E+00	4.51E+00
		BaLa-140	<7.35E+00	0.00E+00	7.35E+00
		Be-7	<4.20E+01	0.00E+00	4.20E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: MILK Concentration (Activity): pCi/l

Sample Point 221 [CONTROL - NW @ 14.5 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
489123	11/13/2018 - 11/13/2018	K-40	1.60E+03	2.42E+02	1.79E+01
490124	11/27/2018 - 11/27/2018	LLI-131	<6.01E-01	0.00E+00	6.01E-01
		I-131	<4.97E+00	0.00E+00	4.97E+00
		Cs-134	<1.03E+01	0.00E+00	1.03E+01
		Cs-137	<8.10E+00	0.00E+00	8.10E+00
		BaLa-140	<7.36E+00	0.00E+00	7.36E+00
		Be-7	<5.08E+01	0.00E+00	5.08E+01
		K-40	1.59E+03	2.44E+02	8.50E+01
491150	12/11/2018 - 12/11/2018	LLI-131	<5.28E-01	0.00E+00	5.28E-01
		I-131	<6.27E+00	0.00E+00	6.27E+00
		Cs-134	<7.19E+00	0.00E+00	7.19E+00
		Cs-137	<7.30E+00	0.00E+00	7.30E+00
		BaLa-140	<7.67E+00	0.00E+00	7.67E+00
		Be-7	<4.24E+01	0.00E+00	4.24E+01
		K-40	1.43E+03	2.32E+02	1.13E+02
491710	12/27/2018 - 12/27/2018	LLI-131	<6.49E-01	0.00E+00	6.49E-01
		I-131	<7.02E+00	0.00E+00	7.02E+00
		Cs-134	<6.63E+00	0.00E+00	6.63E+00
		Cs-137	<5.26E+00	0.00E+00	5.26E+00
		BaLa-140	<2.16E+00	0.00E+00	2.16E+00
		Be-7	<6.63E+01	0.00E+00	6.63E+01
		K-40	1.61E+03	2.51E+02	1.29E+02

Media Type: SEDIMENT_SHORE Concentration (Activity): pCi/kg

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
470562	3/20/2018 - 3/20/2018	Mn-54	<5.67E+01	0.00E+00	5.67E+01
		Co-58	<3.96E+01	0.00E+00	3.96E+01
		Fe-59	<9.03E+01	0.00E+00	9.03E+01
		Co-60	<4.87E+01	0.00E+00	4.87E+01
		Zn-65	<9.41E+01	0.00E+00	9.41E+01
		Zr-95	<8.74E+01	0.00E+00	8.74E+01
		Nb-95	<5.25E+01	0.00E+00	5.25E+01
		I-131	<5.04E+01	0.00E+00	5.04E+01
		Cs-134	<5.82E+01	0.00E+00	5.82E+01
		Cs-137	<4.52E+01	0.00E+00	4.52E+01
		Be-7	<4.13E+02	0.00E+00	4.13E+02
		K-40	1.43E+04	1.78E+03	4.37E+02
		Co-57	<3.45E+01	0.00E+00	3.45E+01
		Mo-99	<1.77E+03	0.00E+00	1.77E+03
		Ag-110M	<3.66E+01	0.00E+00	3.66E+01
		Sb-122	<2.92E+02	0.00E+00	2.92E+02
		Sb-125	<9.59E+01	0.00E+00	9.59E+01
483979	9/18/2018 - 9/18/2018	Mn-54	<3.23E+01	0.00E+00	3.23E+01
		Co-58	<3.47E+01	0.00E+00	3.47E+01
		Fe-59	<8.65E+01	0.00E+00	8.65E+01
		Co-60	<3.48E+01	0.00E+00	3.48E+01
		Zn-65	<7.29E+01	0.00E+00	7.29E+01
		Zr-95	<7.28E+01	0.00E+00	7.28E+01
		Nb-95	<4.29E+01	0.00E+00	4.29E+01
		I-131	<6.12E+01	0.00E+00	6.12E+01
		Cs-134	<5.38E+01	0.00E+00	5.38E+01
		Cs-137	<2.99E+01	0.00E+00	2.99E+01
		Be-7	<2.64E+02	0.00E+00	2.64E+02
		K-40	1.16E+04	1.33E+03	5.12E+02
		Co-57	<3.20E+01	0.00E+00	3.20E+01
		Mo-99	<2.78E+03	0.00E+00	2.78E+03
		Ag-110M	<2.49E+01	0.00E+00	2.49E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SEDIMENT_SHORE Concentration (Activity): pCi/kg

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483979	9/18/2018 - 9/18/2018	Sb-122	<3.98E+02	0.00E+00	3.98E+02
		Sb-125	<7.96E+01	0.00E+00	7.96E+01

Sample Point 210 [INDICATOR - SE @ 2.31 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
470563	3/20/2018 - 3/20/2018	Mn-54	<2.44E+01	0.00E+00	2.44E+01
		Co-58	<2.80E+01	0.00E+00	2.80E+01
		Fe-59	<7.80E+01	0.00E+00	7.80E+01
		Co-60	<4.04E+01	0.00E+00	4.04E+01
		Zn-65	<6.24E+01	0.00E+00	6.24E+01
		Zr-95	<5.38E+01	0.00E+00	5.38E+01
		Nb-95	<3.60E+01	0.00E+00	3.60E+01
		I-131	<7.14E+01	0.00E+00	7.14E+01
		Cs-134	<3.50E+01	0.00E+00	3.50E+01
		Cs-137	<2.79E+01	0.00E+00	2.79E+01
		Be-7	<2.77E+02	0.00E+00	2.77E+02
		K-40	1.15E+04	1.42E+03	3.65E+02
		Co-57	<2.12E+01	0.00E+00	2.12E+01
		Mo-99	<4.83E+03	0.00E+00	4.83E+03
		Ag-110M	<2.75E+01	0.00E+00	2.75E+01
		Sb-122	<9.62E+02	0.00E+00	9.62E+02
		Sb-125	<7.33E+01	0.00E+00	7.33E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483980	9/18/2018 - 9/18/2018	Mn-54	<2.21E+01	0.00E+00	2.21E+01
		Co-58	<2.02E+01	0.00E+00	2.02E+01
		Fe-59	<3.93E+01	0.00E+00	3.93E+01
		Co-60	<2.16E+01	0.00E+00	2.16E+01
		Zn-65	<4.77E+01	0.00E+00	4.77E+01
		Zr-95	<3.53E+01	0.00E+00	3.53E+01
		Nb-95	<2.05E+01	0.00E+00	2.05E+01
		I-131	<3.50E+01	0.00E+00	3.50E+01
		Cs-134	<2.87E+01	0.00E+00	2.87E+01
		Cs-137	<2.02E+01	0.00E+00	2.02E+01
		Be-7	1.25E+02	1.24E+02	1.99E+02
		K-40	9.50E+03	1.06E+03	2.43E+02
		Co-57	<1.59E+01	0.00E+00	1.59E+01
		Mo-99	<1.35E+03	0.00E+00	1.35E+03
		Ag-110M	<1.57E+01	0.00E+00	1.57E+01
		Sb-122	<2.03E+02	0.00E+00	2.03E+02
		Sb-125	<4.08E+01	0.00E+00	4.08E+01

Sample Point 262 [CONTROL - NNE @ 4.19 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
471992	3/20/2018 - 3/20/2018	Mn-54	<5.34E+01	0.00E+00	5.34E+01
		Co-58	<3.68E+01	0.00E+00	3.68E+01
		Fe-59	<1.12E+02	0.00E+00	1.12E+02
		Co-60	<4.93E+01	0.00E+00	4.93E+01
		Zn-65	<9.53E+01	0.00E+00	9.53E+01
		Zr-95	<9.58E+01	0.00E+00	9.58E+01
		Nb-95	<5.08E+01	0.00E+00	5.08E+01
		I-131	<6.46E+01	0.00E+00	6.46E+01
		Cs-134	<8.91E+01	0.00E+00	8.91E+01
		Cs-137	<5.48E+01	0.00E+00	5.48E+01
		Be-7	<4.06E+02	0.00E+00	4.06E+02
		K-40	6.47E+03	1.13E+03	7.63E+02
		Co-57	<4.02E+01	0.00E+00	4.02E+01
		Mo-99	<2.01E+03	0.00E+00	2.01E+03
		Ag-110M	<4.52E+01	0.00E+00	4.52E+01
		Sb-122	<3.99E+02	0.00E+00	3.99E+02
		Sb-125	<1.30E+02	0.00E+00	1.30E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483981	9/18/2018 - 9/18/2018	Mn-54	<3.63E+01	0.00E+00	3.63E+01
		Co-58	<3.04E+01	0.00E+00	3.04E+01



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Media Type: SEDIMENT_SHORE Concentration (Activity): pCi/kg

Sample Point 262 [CONTROL - NNE @ 4.19 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
483981	9/18/2018 - 9/18/2018	Fe-59	<5.61E+01	0.00E+00	5.61E+01
		Co-60	<2.96E+01	0.00E+00	2.96E+01
		Zn-65	<6.15E+01	0.00E+00	6.15E+01
		Zr-95	<8.73E+01	0.00E+00	8.73E+01
		Nb-95	<4.65E+01	0.00E+00	4.65E+01
		I-131	<5.57E+01	0.00E+00	5.57E+01
		Cs-134	<5.54E+01	0.00E+00	5.54E+01
		Cs-137	<3.62E+01	0.00E+00	3.62E+01
		Be-7	<2.52E+02	0.00E+00	2.52E+02
		K-40	6.40E+03	8.25E+02	3.80E+02
		Co-57	<3.12E+01	0.00E+00	3.12E+01
		Mo-99	<2.54E+03	0.00E+00	2.54E+03
		Ag-110M	<3.11E+01	0.00E+00	3.11E+01
		Sb-122	<3.37E+02	0.00E+00	3.37E+02
		Sb-125	<7.83E+01	0.00E+00	7.83E+01

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467306	1/3/2018 - 1/30/2018	Mn-54	<2.91E+00	0.00E+00	2.91E+00
		Co-58	<3.19E+00	0.00E+00	3.19E+00
		Fe-59	<8.44E+00	0.00E+00	8.44E+00
		Co-60	<4.05E+00	0.00E+00	4.05E+00
		Zn-65	<5.79E+00	0.00E+00	5.79E+00
		Zr-95	<5.41E+00	0.00E+00	5.41E+00
		Nb-95	<3.82E+00	0.00E+00	3.82E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.09E+00	0.00E+00	3.09E+00
		Cs-137	<3.45E+00	0.00E+00	3.45E+00
		BaLa-140	<6.19E+00	0.00E+00	6.19E+00
		Be-7	<2.49E+01	0.00E+00	2.49E+01
		K-40	<4.17E+01	0.00E+00	4.17E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
469540	1/30/2018 - 2/27/2018	Mn-54	<4.13E+00	0.00E+00	4.13E+00
		Co-58	<3.33E+00	0.00E+00	3.33E+00
		Fe-59	<6.93E+00	0.00E+00	6.93E+00
		Co-60	<2.48E+00	0.00E+00	2.48E+00
		Zn-65	<7.81E+00	0.00E+00	7.81E+00
		Zr-95	<6.84E+00	0.00E+00	6.84E+00
		Nb-95	<4.51E+00	0.00E+00	4.51E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<3.32E+00	0.00E+00	3.32E+00
		Cs-137	<4.22E+00	0.00E+00	4.22E+00
		BaLa-140	<8.02E+00	0.00E+00	8.02E+00
		Be-7	<2.94E+01	0.00E+00	2.94E+01
		K-40	<5.49E+01	0.00E+00	5.49E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472462	2/27/2018 - 3/27/2018	Mn-54	<1.91E+00	0.00E+00	1.91E+00
		Co-58	<2.34E+00	0.00E+00	2.34E+00
		Fe-59	<5.33E+00	0.00E+00	5.33E+00
		Co-60	<2.00E+00	0.00E+00	2.00E+00
		Zn-65	<4.00E+00	0.00E+00	4.00E+00
		Zr-95	<3.47E+00	0.00E+00	3.47E+00
		Nb-95	<2.69E+00	0.00E+00	2.69E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<2.40E+00	0.00E+00	2.40E+00
		Cs-137	<2.01E+00	0.00E+00	2.01E+00
		BaLa-140	<5.34E+00	0.00E+00	5.34E+00
		Be-7	<1.90E+01	0.00E+00	1.90E+01
		K-40	6.39E+01	2.10E+01	2.48E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467521	1/3/2018 - 4/24/2018	H3SW	7.30E+03	2.59E+02	1.90E+02



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Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
474122	3/27/2018 - 4/24/2018	Mn-54	<3.24E+00	0.00E+00	3.24E+00
		Co-58	<5.43E+00	0.00E+00	5.43E+00
		Fe-59	<9.14E+00	0.00E+00	9.14E+00
		Co-60	<4.04E+00	0.00E+00	4.04E+00
		Zn-65	<7.43E+00	0.00E+00	7.43E+00
		Zr-95	<7.87E+00	0.00E+00	7.87E+00
		Nb-95	<5.39E+00	0.00E+00	5.39E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<4.61E+00	0.00E+00	4.61E+00
		Cs-137	<3.52E+00	0.00E+00	3.52E+00
		BaLa-140	<9.21E+00	0.00E+00	9.21E+00
		Be-7	<3.61E+01	0.00E+00	3.61E+01
		K-40	3.66E+01	3.83E+01	6.06E+01
475508	4/24/2018 - 5/22/2018	Mn-54	<2.45E+00	0.00E+00	2.45E+00
		Co-58	<2.40E+00	0.00E+00	2.40E+00
		Fe-59	<5.01E+00	0.00E+00	5.01E+00
		Co-60	<3.29E+00	0.00E+00	3.29E+00
		Zn-65	<4.08E+00	0.00E+00	4.08E+00
		Zr-95	<5.52E+00	0.00E+00	5.52E+00
		Nb-95	<3.06E+00	0.00E+00	3.06E+00
		I-131	<9.00E+00	0.00E+00	9.00E+00
		Cs-134	<2.89E+00	0.00E+00	2.89E+00
		Cs-137	<2.62E+00	0.00E+00	2.62E+00
		BaLa-140	<7.80E+00	0.00E+00	7.80E+00
		Be-7	<2.00E+01	0.00E+00	2.00E+01
		K-40	3.41E+01	2.35E+01	3.48E+01
478395	5/22/2018 - 6/19/2018	Mn-54	<2.91E+00	0.00E+00	2.91E+00
		Co-58	<3.09E+00	0.00E+00	3.09E+00
		Fe-59	<5.94E+00	0.00E+00	5.94E+00
		Co-60	<2.32E+00	0.00E+00	2.32E+00
		Zn-65	<7.18E+00	0.00E+00	7.18E+00
		Zr-95	<4.72E+00	0.00E+00	4.72E+00
		Nb-95	<2.97E+00	0.00E+00	2.97E+00
		I-131	<1.08E+01	0.00E+00	1.08E+01
		Cs-134	<2.97E+00	0.00E+00	2.97E+00
		Cs-137	<2.59E+00	0.00E+00	2.59E+00
		BaLa-140	<7.58E+00	0.00E+00	7.58E+00
		Be-7	<3.56E+01	0.00E+00	3.56E+01
		K-40	4.93E+01	3.02E+01	4.16E+01
474718	4/24/2018 - 7/17/2018	H3SW	5.02E+03	2.22E+02	1.89E+02
480218	6/19/2018 - 7/17/2018	Mn-54	<2.87E+00	0.00E+00	2.87E+00
		Co-58	<3.76E+00	0.00E+00	3.76E+00
		Fe-59	<6.65E+00	0.00E+00	6.65E+00
		Co-60	<4.38E+00	0.00E+00	4.38E+00
		Zn-65	<6.27E+00	0.00E+00	6.27E+00
		Zr-95	<5.32E+00	0.00E+00	5.32E+00
		Nb-95	<3.71E+00	0.00E+00	3.71E+00
		I-131	<1.07E+01	0.00E+00	1.07E+01
		Cs-134	<3.50E+00	0.00E+00	3.50E+00
		Cs-137	<3.54E+00	0.00E+00	3.54E+00
		BaLa-140	<8.37E+00	0.00E+00	8.37E+00
		Be-7	<2.91E+01	0.00E+00	2.91E+01
		K-40	<5.37E+01	0.00E+00	5.37E+01
482454	7/17/2018 - 8/14/2018	Mn-54	<3.53E+00	0.00E+00	3.53E+00
		Co-58	<3.00E+00	0.00E+00	3.00E+00
		Fe-59	<8.66E+00	0.00E+00	8.66E+00
		Co-60	<3.59E+00	0.00E+00	3.59E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
482454	7/17/2018 - 8/14/2018	Zn-65	<4.53E+00	0.00E+00	4.53E+00
		Zr-95	<5.94E+00	0.00E+00	5.94E+00
		Nb-95	<4.10E+00	0.00E+00	4.10E+00
		I-131	<1.13E+01	0.00E+00	1.13E+01
		Cs-134	<4.18E+00	0.00E+00	4.18E+00
		Cs-137	<3.86E+00	0.00E+00	3.86E+00
		BaLa-140	<9.96E+00	0.00E+00	9.96E+00
		Be-7	<4.29E+01	0.00E+00	4.29E+01
		K-40	<6.65E+01	0.00E+00	6.65E+01
		484591	8/14/2018 - 9/11/2018	Mn-54	<2.16E+00
Co-58	<2.84E+00			0.00E+00	2.84E+00
Fe-59	<5.75E+00			0.00E+00	5.75E+00
Co-60	<2.47E+00			0.00E+00	2.47E+00
Zn-65	<5.68E+00			0.00E+00	5.68E+00
Zr-95	<6.08E+00			0.00E+00	6.08E+00
Nb-95	<3.98E+00			0.00E+00	3.98E+00
I-131	<1.11E+01			0.00E+00	1.11E+01
Cs-134	<2.83E+00			0.00E+00	2.83E+00
Cs-137	<2.35E+00			0.00E+00	2.35E+00
BaLa-140	<4.27E+00			0.00E+00	4.27E+00
Be-7	<2.49E+01			0.00E+00	2.49E+01
K-40	5.08E+01			3.08E+01	4.30E+01
481615	7/17/2018 - 10/9/2018	H3SW	4.94E+03	2.22E+02	1.84E+02
486670	9/11/2018 - 10/9/2018	Mn-54	<2.22E+00	0.00E+00	2.22E+00
		Co-58	<3.80E+00	0.00E+00	3.80E+00
		Fe-59	<7.58E+00	0.00E+00	7.58E+00
		Co-60	<4.35E+00	0.00E+00	4.35E+00
		Zn-65	<6.07E+00	0.00E+00	6.07E+00
		Zr-95	<6.42E+00	0.00E+00	6.42E+00
		Nb-95	<4.43E+00	0.00E+00	4.43E+00
		I-131	<1.15E+01	0.00E+00	1.15E+01
		Cs-134	<3.64E+00	0.00E+00	3.64E+00
		Cs-137	<3.35E+00	0.00E+00	3.35E+00
		BaLa-140	<7.86E+00	0.00E+00	7.86E+00
		Be-7	<2.80E+01	0.00E+00	2.80E+01
		K-40	2.35E+01	2.50E+01	3.89E+01
488817	10/9/2018 - 11/6/2018	Mn-54	<4.01E+00	0.00E+00	4.01E+00
		Co-58	<3.91E+00	0.00E+00	3.91E+00
		Fe-59	<8.93E+00	0.00E+00	8.93E+00
		Co-60	<2.72E+00	0.00E+00	2.72E+00
		Zn-65	<5.57E+00	0.00E+00	5.57E+00
		Zr-95	<5.18E+00	0.00E+00	5.18E+00
		Nb-95	<3.85E+00	0.00E+00	3.85E+00
		I-131	<8.89E+00	0.00E+00	8.89E+00
		Cs-134	<3.31E+00	0.00E+00	3.31E+00
		Cs-137	<3.18E+00	0.00E+00	3.18E+00
		BaLa-140	<1.12E+01	0.00E+00	1.12E+01
		Be-7	<3.26E+01	0.00E+00	3.26E+01
		K-40	<5.63E+01	0.00E+00	5.63E+01
490768	11/6/2018 - 12/4/2018	Mn-54	<1.75E+00	0.00E+00	1.75E+00
		Co-58	<1.95E+00	0.00E+00	1.95E+00
		Fe-59	<5.31E+00	0.00E+00	5.31E+00
		Co-60	<1.89E+00	0.00E+00	1.89E+00
		Zn-65	<3.94E+00	0.00E+00	3.94E+00
		Zr-95	<3.64E+00	0.00E+00	3.64E+00
		Nb-95	<2.82E+00	0.00E+00	2.82E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 208 [INDICATOR - S @ 0.45 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490768	11/6/2018 - 12/4/2018	Cs-134	<1.31E+00	0.00E+00	1.31E+00
		Cs-137	<2.17E+00	0.00E+00	2.17E+00
		BaLa-140	<6.09E+00	0.00E+00	6.09E+00
		Be-7	<2.16E+01	0.00E+00	2.16E+01
		K-40	2.72E+01	2.20E+01	3.46E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488736	10/9/2018 - 1/2/2019	H3SW	1.10E+04	3.09E+02	1.87E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
492194	12/4/2018 - 1/2/2019	Mn-54	<1.65E+00	0.00E+00	1.65E+00
		Co-58	<2.45E+00	0.00E+00	2.45E+00
		Fe-59	<4.06E+00	0.00E+00	4.06E+00
		Co-60	<2.17E+00	0.00E+00	2.17E+00
		Zn-65	<3.68E+00	0.00E+00	3.68E+00
		Zr-95	<3.73E+00	0.00E+00	3.73E+00
		Nb-95	<2.74E+00	0.00E+00	2.74E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<1.94E+00	0.00E+00	1.94E+00
		Cs-137	<1.81E+00	0.00E+00	1.81E+00
		BaLa-140	<6.86E+00	0.00E+00	6.86E+00
		Be-7	<1.84E+01	0.00E+00	1.84E+01
		K-40	2.83E+01	1.78E+01	2.66E+01

Sample Point 211 [INDICATOR - ESE @ 4.06 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467307	1/3/2018 - 1/30/2018	Mn-54	<2.98E+00	0.00E+00	2.98E+00
		Co-58	<2.82E+00	0.00E+00	2.82E+00
		Fe-59	<5.95E+00	0.00E+00	5.95E+00
		Co-60	<3.07E+00	0.00E+00	3.07E+00
		Zn-65	<5.98E+00	0.00E+00	5.98E+00
		Zr-95	<4.48E+00	0.00E+00	4.48E+00
		Nb-95	<3.12E+00	0.00E+00	3.12E+00
		I-131	<9.47E+00	0.00E+00	9.47E+00
		Cs-134	<3.54E+00	0.00E+00	3.54E+00
		Cs-137	<2.61E+00	0.00E+00	2.61E+00
		BaLa-140	<6.25E+00	0.00E+00	6.25E+00
		Be-7	<2.62E+01	0.00E+00	2.62E+01
		K-40	<4.46E+01	0.00E+00	4.46E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
469541	1/30/2018 - 2/27/2018	Mn-54	<2.94E+00	0.00E+00	2.94E+00
		Co-58	<3.37E+00	0.00E+00	3.37E+00
		Fe-59	<6.20E+00	0.00E+00	6.20E+00
		Co-60	<2.74E+00	0.00E+00	2.74E+00
		Zn-65	<6.11E+00	0.00E+00	6.11E+00
		Zr-95	<6.17E+00	0.00E+00	6.17E+00
		Nb-95	<4.96E+00	0.00E+00	4.96E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.37E+00	0.00E+00	3.37E+00
		Cs-137	<3.03E+00	0.00E+00	3.03E+00
		BaLa-140	<6.27E+00	0.00E+00	6.27E+00
		Be-7	<2.66E+01	0.00E+00	2.66E+01
		K-40	4.25E+01	3.54E+01	5.47E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472463	2/27/2018 - 3/27/2018	Mn-54	<1.71E+00	0.00E+00	1.71E+00
		Co-58	<2.19E+00	0.00E+00	2.19E+00
		Fe-59	<4.12E+00	0.00E+00	4.12E+00
		Co-60	<1.65E+00	0.00E+00	1.65E+00
		Zn-65	<4.62E+00	0.00E+00	4.62E+00
		Zr-95	<3.76E+00	0.00E+00	3.76E+00
		Nb-95	<2.87E+00	0.00E+00	2.87E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<2.09E+00	0.00E+00	2.09E+00
		Cs-137	<2.21E+00	0.00E+00	2.21E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [INDICATOR - ESE @ 4.06 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472463	2/27/2018 - 3/27/2018	BaLa-140	<5.80E+00	0.00E+00	5.80E+00
		Be-7	<2.15E+01	0.00E+00	2.15E+01
		K-40	2.91E+01	1.98E+01	2.99E+01
467522	1/3/2018 - 4/24/2018	H3SW	6.47E+02	1.31E+02	1.91E+02
474123	3/27/2018 - 4/24/2018	Mn-54	<2.99E+00	0.00E+00	2.99E+00
		Co-58	<3.75E+00	0.00E+00	3.75E+00
		Fe-59	<6.21E+00	0.00E+00	6.21E+00
		Co-60	<2.58E+00	0.00E+00	2.58E+00
		Zn-65	<7.01E+00	0.00E+00	7.01E+00
		Zr-95	<6.88E+00	0.00E+00	6.88E+00
		Nb-95	<4.05E+00	0.00E+00	4.05E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<2.61E+00	0.00E+00	2.61E+00
		Cs-137	<3.80E+00	0.00E+00	3.80E+00
		BaLa-140	<7.94E+00	0.00E+00	7.94E+00
		Be-7	1.34E+01	1.88E+01	3.12E+01
		K-40	<6.27E+01	0.00E+00	6.27E+01
475509	4/24/2018 - 5/22/2018	Mn-54	<3.14E+00	0.00E+00	3.14E+00
		Co-58	<4.11E+00	0.00E+00	4.11E+00
		Fe-59	<7.06E+00	0.00E+00	7.06E+00
		Co-60	<2.77E+00	0.00E+00	2.77E+00
		Zn-65	<6.59E+00	0.00E+00	6.59E+00
		Zr-95	<7.29E+00	0.00E+00	7.29E+00
		Nb-95	<5.39E+00	0.00E+00	5.39E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.48E+00	0.00E+00	3.48E+00
		Cs-137	<3.04E+00	0.00E+00	3.04E+00
		BaLa-140	<7.65E+00	0.00E+00	7.65E+00
		Be-7	<3.80E+01	0.00E+00	3.80E+01
		K-40	3.24E+01	3.39E+01	5.34E+01
478396	5/22/2018 - 6/19/2018	Mn-54	<3.32E+00	0.00E+00	3.32E+00
		Co-58	<2.78E+00	0.00E+00	2.78E+00
		Fe-59	<7.71E+00	0.00E+00	7.71E+00
		Co-60	<3.66E+00	0.00E+00	3.66E+00
		Zn-65	<8.57E+00	0.00E+00	8.57E+00
		Zr-95	<7.15E+00	0.00E+00	7.15E+00
		Nb-95	<5.19E+00	0.00E+00	5.19E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.28E+00	0.00E+00	3.28E+00
		Cs-137	<3.23E+00	0.00E+00	3.23E+00
		BaLa-140	<8.91E+00	0.00E+00	8.91E+00
		Be-7	<2.95E+01	0.00E+00	2.95E+01
		K-40	1.53E+01	2.34E+01	3.95E+01
474719	4/24/2018 - 7/17/2018	H3SW	3.84E+02	1.22E+02	1.90E+02
480219	6/19/2018 - 7/17/2018	Mn-54	<3.38E+00	0.00E+00	3.38E+00
		Co-58	<3.72E+00	0.00E+00	3.72E+00
		Fe-59	<8.84E+00	0.00E+00	8.84E+00
		Co-60	<4.54E+00	0.00E+00	4.54E+00
		Zn-65	<9.67E+00	0.00E+00	9.67E+00
		Zr-95	<8.27E+00	0.00E+00	8.27E+00
		Nb-95	<4.14E+00	0.00E+00	4.14E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<3.52E+00	0.00E+00	3.52E+00
		Cs-137	<3.08E+00	0.00E+00	3.08E+00
		BaLa-140	<7.39E+00	0.00E+00	7.39E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [INDICATOR - ESE @ 4.06 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
480219	6/19/2018 - 7/17/2018	Be-7	<3.50E+01	0.00E+00	3.50E+01
		K-40	<6.03E+01	0.00E+00	6.03E+01
482455	7/17/2018 - 8/14/2018	Mn-54	<2.98E+00	0.00E+00	2.98E+00
		Co-58	<3.73E+00	0.00E+00	3.73E+00
		Fe-59	<7.33E+00	0.00E+00	7.33E+00
		Co-60	<3.04E+00	0.00E+00	3.04E+00
		Zn-65	<6.26E+00	0.00E+00	6.26E+00
		Zr-95	<5.46E+00	0.00E+00	5.46E+00
		Nb-95	<4.59E+00	0.00E+00	4.59E+00
		I-131	<1.14E+01	0.00E+00	1.14E+01
		Cs-134	<3.72E+00	0.00E+00	3.72E+00
		Cs-137	<3.41E+00	0.00E+00	3.41E+00
		BaLa-140	<5.76E+00	0.00E+00	5.76E+00
		Be-7	<2.74E+01	0.00E+00	2.74E+01
		K-40	<7.27E+01	0.00E+00	7.27E+01
484592	8/14/2018 - 9/11/2018	Mn-54	<4.36E+00	0.00E+00	4.36E+00
		Co-58	<3.98E+00	0.00E+00	3.98E+00
		Fe-59	<7.97E+00	0.00E+00	7.97E+00
		Co-60	<4.21E+00	0.00E+00	4.21E+00
		Zn-65	<7.00E+00	0.00E+00	7.00E+00
		Zr-95	<7.30E+00	0.00E+00	7.30E+00
		Nb-95	<4.32E+00	0.00E+00	4.32E+00
		I-131	<1.16E+01	0.00E+00	1.16E+01
		Cs-134	<4.23E+00	0.00E+00	4.23E+00
		Cs-137	<2.92E+00	0.00E+00	2.92E+00
		BaLa-140	<9.32E+00	0.00E+00	9.32E+00
		Be-7	<3.56E+01	0.00E+00	3.56E+01
		K-40	<6.50E+01	0.00E+00	6.50E+01
481616	7/17/2018 - 10/9/2018	H3SW	5.12E+02	1.24E+02	1.84E+02
486671	9/11/2018 - 10/9/2018	Mn-54	<3.98E+00	0.00E+00	3.98E+00
		Co-58	<4.24E+00	0.00E+00	4.24E+00
		Fe-59	<6.42E+00	0.00E+00	6.42E+00
		Co-60	<4.12E+00	0.00E+00	4.12E+00
		Zn-65	<7.99E+00	0.00E+00	7.99E+00
		Zr-95	<6.65E+00	0.00E+00	6.65E+00
		Nb-95	<4.72E+00	0.00E+00	4.72E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<3.95E+00	0.00E+00	3.95E+00
		Cs-137	<3.73E+00	0.00E+00	3.73E+00
		BaLa-140	<8.76E+00	0.00E+00	8.76E+00
		Be-7	<3.17E+01	0.00E+00	3.17E+01
		K-40	<6.27E+01	0.00E+00	6.27E+01
488818	10/9/2018 - 11/6/2018	Mn-54	<2.97E+00	0.00E+00	2.97E+00
		Co-58	<3.44E+00	0.00E+00	3.44E+00
		Fe-59	<6.87E+00	0.00E+00	6.87E+00
		Co-60	<3.75E+00	0.00E+00	3.75E+00
		Zn-65	<6.02E+00	0.00E+00	6.02E+00
		Zr-95	<7.13E+00	0.00E+00	7.13E+00
		Nb-95	<5.52E+00	0.00E+00	5.52E+00
		I-131	<1.11E+01	0.00E+00	1.11E+01
		Cs-134	<5.40E+00	0.00E+00	5.40E+00
		Cs-137	<3.42E+00	0.00E+00	3.42E+00
		BaLa-140	<4.85E+00	0.00E+00	4.85E+00
		Be-7	<2.90E+01	0.00E+00	2.90E+01
		K-40	6.50E+01	3.34E+01	4.16E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 211 [INDICATOR - ESE @ 4.06 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
490769	11/6/2018 - 12/4/2018	Mn-54	<1.57E+00	0.00E+00	1.57E+00
		Co-58	<1.86E+00	0.00E+00	1.86E+00
		Fe-59	<3.92E+00	0.00E+00	3.92E+00
		Co-60	<1.41E+00	0.00E+00	1.41E+00
		Zn-65	<3.89E+00	0.00E+00	3.89E+00
		Zr-95	<3.51E+00	0.00E+00	3.51E+00
		Nb-95	<2.47E+00	0.00E+00	2.47E+00
		I-131	<1.12E+01	0.00E+00	1.12E+01
		Cs-134	<1.79E+00	0.00E+00	1.79E+00
		Cs-137	<2.14E+00	0.00E+00	2.14E+00
		BaLa-140	<5.73E+00	0.00E+00	5.73E+00
		Be-7	<1.60E+01	0.00E+00	1.60E+01
		K-40	3.70E+01	1.69E+01	2.27E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488737	10/9/2018 - 1/2/2019	H3SW	3.63E+02	1.20E+02	1.86E+02

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
492195	12/4/2018 - 1/2/2019	Mn-54	<1.31E+00	0.00E+00	1.31E+00
		Co-58	<1.38E+00	0.00E+00	1.38E+00
		Fe-59	<3.32E+00	0.00E+00	3.32E+00
		Co-60	<1.28E+00	0.00E+00	1.28E+00
		Zn-65	<2.72E+00	0.00E+00	2.72E+00
		Zr-95	<2.59E+00	0.00E+00	2.59E+00
		Nb-95	<2.30E+00	0.00E+00	2.30E+00
		I-131	<1.02E+01	0.00E+00	1.02E+01
		Cs-134	<1.39E+00	0.00E+00	1.39E+00
		Cs-137	<1.22E+00	0.00E+00	1.22E+00
		BaLa-140	<4.82E+00	0.00E+00	4.82E+00
		Be-7	<1.44E+01	0.00E+00	1.44E+01
		K-40	7.56E+01	1.71E+01	2.02E+01

Sample Point 215 [CONTROL - NNE @ 4.21 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
467308	1/3/2018 - 1/30/2018	Mn-54	<3.64E+00	0.00E+00	3.64E+00
		Co-58	<3.67E+00	0.00E+00	3.67E+00
		Fe-59	<9.45E+00	0.00E+00	9.45E+00
		Co-60	<3.54E+00	0.00E+00	3.54E+00
		Zn-65	<7.42E+00	0.00E+00	7.42E+00
		Zr-95	<7.59E+00	0.00E+00	7.59E+00
		Nb-95	<4.75E+00	0.00E+00	4.75E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.14E+00	0.00E+00	3.14E+00
		Cs-137	<3.79E+00	0.00E+00	3.79E+00
		BaLa-140	<9.80E+00	0.00E+00	9.80E+00
		Be-7	<4.06E+01	0.00E+00	4.06E+01
		K-40	5.97E+01	3.43E+01	4.47E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
469542	1/30/2018 - 2/27/2018	Mn-54	<2.99E+00	0.00E+00	2.99E+00
		Co-58	<3.69E+00	0.00E+00	3.69E+00
		Fe-59	<5.74E+00	0.00E+00	5.74E+00
		Co-60	<3.76E+00	0.00E+00	3.76E+00
		Zn-65	<7.16E+00	0.00E+00	7.16E+00
		Zr-95	<5.89E+00	0.00E+00	5.89E+00
		Nb-95	<3.27E+00	0.00E+00	3.27E+00
		I-131	<1.10E+01	0.00E+00	1.10E+01
		Cs-134	<3.93E+00	0.00E+00	3.93E+00
		Cs-137	<2.43E+00	0.00E+00	2.43E+00
		BaLa-140	<5.77E+00	0.00E+00	5.77E+00
		Be-7	<2.33E+01	0.00E+00	2.33E+01
		K-40	<5.13E+01	0.00E+00	5.13E+01

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472464	2/27/2018 - 3/27/2018	Mn-54	<1.88E+00	0.00E+00	1.88E+00
		Co-58	<2.45E+00	0.00E+00	2.45E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [CONTROL - NNE @ 4.21 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
472464	2/27/2018 - 3/27/2018	Fe-59	<3.66E+00	0.00E+00	3.66E+00
		Co-60	<2.02E+00	0.00E+00	2.02E+00
		Zn-65	<3.50E+00	0.00E+00	3.50E+00
		Zr-95	<3.59E+00	0.00E+00	3.59E+00
		Nb-95	<2.51E+00	0.00E+00	2.51E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<2.20E+00	0.00E+00	2.20E+00
		Cs-137	<1.67E+00	0.00E+00	1.67E+00
		BaLa-140	<4.77E+00	0.00E+00	4.77E+00
		Be-7	<1.85E+01	0.00E+00	1.85E+01
		K-40	1.50E+01	1.87E+01	3.07E+01
467523	1/3/2018 - 4/24/2018	H3SW	2.30E+02	1.18E+02	1.91E+02
474124	3/27/2018 - 4/24/2018	Mn-54	<2.70E+00	0.00E+00	2.70E+00
		Co-58	<3.63E+00	0.00E+00	3.63E+00
		Fe-59	<7.13E+00	0.00E+00	7.13E+00
		Co-60	<3.48E+00	0.00E+00	3.48E+00
		Zn-65	<5.41E+00	0.00E+00	5.41E+00
		Zr-95	<5.33E+00	0.00E+00	5.33E+00
		Nb-95	<3.89E+00	0.00E+00	3.89E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<2.70E+00	0.00E+00	2.70E+00
		Cs-137	<2.53E+00	0.00E+00	2.53E+00
		BaLa-140	<8.15E+00	0.00E+00	8.15E+00
		Be-7	<3.18E+01	0.00E+00	3.18E+01
		K-40	8.96E+01	3.19E+01	3.41E+01
475510	4/24/2018 - 5/22/2018	Mn-54	<2.67E+00	0.00E+00	2.67E+00
		Co-58	<3.88E+00	0.00E+00	3.88E+00
		Fe-59	<8.59E+00	0.00E+00	8.59E+00
		Co-60	<4.35E+00	0.00E+00	4.35E+00
		Zn-65	<9.18E+00	0.00E+00	9.18E+00
		Zr-95	<8.85E+00	0.00E+00	8.85E+00
		Nb-95	<5.38E+00	0.00E+00	5.38E+00
		I-131	<1.05E+01	0.00E+00	1.05E+01
		Cs-134	<5.36E+00	0.00E+00	5.36E+00
		Cs-137	<3.60E+00	0.00E+00	3.60E+00
		BaLa-140	<1.10E+01	0.00E+00	1.10E+01
		Be-7	<3.76E+01	0.00E+00	3.76E+01
		K-40	<7.55E+01	0.00E+00	7.55E+01
478397	5/22/2018 - 6/19/2018	Mn-54	<3.83E+00	0.00E+00	3.83E+00
		Co-58	<3.58E+00	0.00E+00	3.58E+00
		Fe-59	<6.49E+00	0.00E+00	6.49E+00
		Co-60	<3.71E+00	0.00E+00	3.71E+00
		Zn-65	<6.10E+00	0.00E+00	6.10E+00
		Zr-95	<7.13E+00	0.00E+00	7.13E+00
		Nb-95	<3.39E+00	0.00E+00	3.39E+00
		I-131	<1.18E+01	0.00E+00	1.18E+01
		Cs-134	<3.59E+00	0.00E+00	3.59E+00
		Cs-137	<4.04E+00	0.00E+00	4.04E+00
		BaLa-140	<2.22E+00	0.00E+00	2.22E+00
		Be-7	<2.67E+01	0.00E+00	2.67E+01
		K-40	<5.55E+01	0.00E+00	5.55E+01
474720	4/24/2018 - 7/17/2018	H3SW	2.69E+02	1.18E+02	1.89E+02
480220	6/19/2018 - 7/17/2018	Mn-54	<4.45E+00	0.00E+00	4.45E+00
		Co-58	<3.54E+00	0.00E+00	3.54E+00
		Fe-59	<9.84E+00	0.00E+00	9.84E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [CONTROL - NNE @ 4.21 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
480220	6/19/2018 - 7/17/2018	Co-60	<4.70E+00	0.00E+00	4.70E+00
		Zn-65	<7.08E+00	0.00E+00	7.08E+00
		Zr-95	<8.69E+00	0.00E+00	8.69E+00
		Nb-95	<4.62E+00	0.00E+00	4.62E+00
		I-131	<1.06E+01	0.00E+00	1.06E+01
		Cs-134	<3.56E+00	0.00E+00	3.56E+00
		Cs-137	<4.70E+00	0.00E+00	4.70E+00
		BaLa-140	<1.02E+01	0.00E+00	1.02E+01
		Be-7	<3.28E+01	0.00E+00	3.28E+01
		K-40	<6.69E+01	0.00E+00	6.69E+01
		482456	7/17/2018 - 8/14/2018	Mn-54	<3.54E+00
Co-58	<4.42E+00			0.00E+00	4.42E+00
Fe-59	<7.12E+00			0.00E+00	7.12E+00
Co-60	<3.10E+00			0.00E+00	3.10E+00
Zn-65	<8.68E+00			0.00E+00	8.68E+00
Zr-95	<8.24E+00			0.00E+00	8.24E+00
Nb-95	<5.46E+00			0.00E+00	5.46E+00
I-131	<1.08E+01			0.00E+00	1.08E+01
Cs-134	<4.18E+00			0.00E+00	4.18E+00
Cs-137	<2.92E+00			0.00E+00	2.92E+00
BaLa-140	<1.11E+01			0.00E+00	1.11E+01
Be-7	<3.95E+01			0.00E+00	3.95E+01
K-40	4.58E+01			3.39E+01	4.70E+01
484593	8/14/2018 - 9/11/2018			Mn-54	<3.13E+00
		Co-58	<3.05E+00	0.00E+00	3.05E+00
		Fe-59	<7.66E+00	0.00E+00	7.66E+00
		Co-60	<2.50E+00	0.00E+00	2.50E+00
		Zn-65	<6.02E+00	0.00E+00	6.02E+00
		Zr-95	<5.41E+00	0.00E+00	5.41E+00
		Nb-95	<3.77E+00	0.00E+00	3.77E+00
		I-131	<1.20E+01	0.00E+00	1.20E+01
		Cs-134	<2.51E+00	0.00E+00	2.51E+00
		Cs-137	<2.91E+00	0.00E+00	2.91E+00
		BaLa-140	<6.08E+00	0.00E+00	6.08E+00
		Be-7	<3.11E+01	0.00E+00	3.11E+01
		K-40	<5.28E+01	0.00E+00	5.28E+01
		481617	7/17/2018 - 10/9/2018	Nuclide	Activity
H3SW	3.38E+02			1.18E+02	1.83E+02
486672	9/11/2018 - 10/9/2018	Mn-54	<3.93E+00	0.00E+00	3.93E+00
		Co-58	<2.54E+00	0.00E+00	2.54E+00
		Fe-59	<9.13E+00	0.00E+00	9.13E+00
		Co-60	<4.35E+00	0.00E+00	4.35E+00
		Zn-65	<1.65E+00	0.00E+00	1.65E+00
		Zr-95	<6.34E+00	0.00E+00	6.34E+00
		Nb-95	<4.83E+00	0.00E+00	4.83E+00
		I-131	<1.17E+01	0.00E+00	1.17E+01
		Cs-134	<4.98E+00	0.00E+00	4.98E+00
		Cs-137	<3.81E+00	0.00E+00	3.81E+00
		BaLa-140	<1.15E+01	0.00E+00	1.15E+01
		Be-7	<3.33E+01	0.00E+00	3.33E+01
		K-40	3.51E+01	3.19E+01	4.76E+01
		488819	10/9/2018 - 11/6/2018	Mn-54	<2.76E+00
Co-58	<3.05E+00			0.00E+00	3.05E+00
Fe-59	<8.84E+00			0.00E+00	8.84E+00
Co-60	<3.68E+00			0.00E+00	3.68E+00
Zn-65	<6.03E+00			0.00E+00	6.03E+00
Zr-95	<7.06E+00			0.00E+00	7.06E+00
Nb-95	<3.21E+00			0.00E+00	3.21E+00



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: SURFACE WATER Concentration (Activity): pCi/l

Sample Point 215 [CONTROL - NNE @ 4.21 miles]

Sample ID:	Sample Dates:	Nuclide	Activity	2 Sigma Error	MDA
488819	10/9/2018 - 11/6/2018	I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<3.22E+00	0.00E+00	3.22E+00
		Cs-137	<2.22E+00	0.00E+00	2.22E+00
		BaLa-140	<8.64E+00	0.00E+00	8.64E+00
		Be-7	<2.80E+01	0.00E+00	2.80E+01
		K-40	8.49E+00	2.26E+01	4.05E+01
490770	12/4/2018 - 12/4/2018	Mn-54	<4.43E+00	0.00E+00	4.43E+00
		Co-58	<2.43E+00	0.00E+00	2.43E+00
		Fe-59	<6.36E+00	0.00E+00	6.36E+00
		Co-60	<4.34E+00	0.00E+00	4.34E+00
		Zn-65	<7.20E+00	0.00E+00	7.20E+00
		Zr-95	<5.96E+00	0.00E+00	5.96E+00
		Nb-95	<4.30E+00	0.00E+00	4.30E+00
		I-131	<6.51E+00	0.00E+00	6.51E+00
		Cs-134	<3.85E+00	0.00E+00	3.85E+00
		Cs-137	<4.18E+00	0.00E+00	4.18E+00
		BaLa-140	<6.87E+00	0.00E+00	6.87E+00
		Be-7	<2.50E+01	0.00E+00	2.50E+01
		K-40	<5.72E+01	0.00E+00	5.72E+01
		488738	10/9/2018 - 1/2/2019	H3SW	<1.72E+02
492196	12/4/2018 - 1/2/2019	Mn-54	<1.68E+00	0.00E+00	1.68E+00
		Co-58	<1.86E+00	0.00E+00	1.86E+00
		Fe-59	<3.82E+00	0.00E+00	3.82E+00
		Co-60	<1.20E+00	0.00E+00	1.20E+00
		Zn-65	<2.99E+00	0.00E+00	2.99E+00
		Zr-95	<3.11E+00	0.00E+00	3.11E+00
		Nb-95	<2.30E+00	0.00E+00	2.30E+00
		I-131	<1.19E+01	0.00E+00	1.19E+01
		Cs-134	<1.71E+00	0.00E+00	1.71E+00
		Cs-137	<1.24E+00	0.00E+00	1.24E+00
		BaLa-140	<5.94E+00	0.00E+00	5.94E+00
		Be-7	<1.64E+01	0.00E+00	1.64E+01
		K-40	7.54E+01	1.84E+01	2.07E+01

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470123	12/14/2017 - 3/15/2018	mR/Std Qtr	19.73
477081	3/15/2018 - 6/14/2018	mR/Std Qtr	15.88
483711	6/14/2018 - 9/12/2018	mR/Std Qtr	15.97
490495	9/12/2018 - 12/13/2018	mR/Std Qtr	16.15

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470124	12/14/2017 - 3/15/2018	mR/Std Qtr	18.86
477082	3/15/2018 - 6/14/2018	mR/Std Qtr	15.94
483712	6/14/2018 - 9/12/2018	mR/Std Qtr	15.23
490496	9/12/2018 - 12/13/2018	mR/Std Qtr	17.61



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 203 [INDICATOR - ESE @ 0.38 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470125	12/14/2017 - 3/15/2018	mR/Std Qtr	21.39
477083	3/15/2018 - 6/14/2018	mR/Std Qtr	16.63
483713	6/14/2018 - 9/12/2018	mR/Std Qtr	17.61
490497	9/12/2018 - 12/13/2018	mR/Std Qtr	19.59

Sample Point 204 [INDICATOR - SSW @ 0.48 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470126	12/14/2017 - 3/15/2018	mR/Std Qtr	19.43
477084	3/15/2018 - 6/14/2018	mR/Std Qtr	15.79
483714	6/14/2018 - 9/12/2018	mR/Std Qtr	15.65
490498	9/12/2018 - 12/13/2018	mR/Std Qtr	19.23

Sample Point 205 [INDICATOR - SW @ 0.5 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470127	12/14/2017 - 3/15/2018	mR/Std Qtr	21.85
477085	3/15/2018 - 6/14/2018	mR/Std Qtr	16.71
483715	6/14/2018 - 9/12/2018	mR/Std Qtr	17.99
490499	9/12/2018 - 12/13/2018	mR/Std Qtr	19.13

Sample Point 206 [INDICATOR - WNW @ 0.67 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470128	12/14/2017 - 3/15/2018	mR/Std Qtr	23.96
477086	3/15/2018 - 6/14/2018	mR/Std Qtr	21.21
483716	6/14/2018 - 9/12/2018	mR/Std Qtr	20.62
490500	9/12/2018 - 12/13/2018	mR/Std Qtr	21.92

Sample Point 207 [INDICATOR - NNW @ 0.95 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470129	12/14/2017 - 3/15/2018	mR/Std Qtr	22.34
477087	3/15/2018 - 6/14/2018	mR/Std Qtr	18.25
483717	6/14/2018 - 9/12/2018	mR/Std Qtr	18.82
490501	9/12/2018 - 12/13/2018	mR/Std Qtr	19.37

Sample Point 212 [INDICATOR - E @ 3.32 miles]

TLD RING TLD_SPEC

Sample ID	Sample Dates	Nuclide	Activity
470130	12/14/2017 - 3/15/2018	mR/Std Qtr	17.81



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 212 [INDICATOR - E @ 3.32 miles]

TLD RING TLD_SPEC

Sample ID	Sample Dates	Nuclide	Activity
477088	3/15/2018 - 6/14/2018	mR/Std Qtr	14.44
483718	6/14/2018 - 9/12/2018	mR/Std Qtr	14.82
490502	9/12/2018 - 12/13/2018	mR/Std Qtr	16.37

Sample Point 217 [CONTROL - SSE @ 10.3 miles]

TLD RING TLD_CTRL

Sample ID	Sample Dates	Nuclide	Activity
470131	12/14/2017 - 3/15/2018	mR/Std Qtr	13.37
477089	3/15/2018 - 6/14/2018	mR/Std Qtr	9.50
483719	6/14/2018 - 9/12/2018	mR/Std Qtr	10.20
490503	9/12/2018 - 12/13/2018	mR/Std Qtr	11.04

Sample Point 222 [INDICATOR - N @ 0.71 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470132	12/14/2017 - 3/15/2018	mR/Std Qtr	20.02
477090	3/15/2018 - 6/14/2018	mR/Std Qtr	15.46
483720	6/14/2018 - 9/12/2018	mR/Std Qtr	15.93
490504	9/12/2018 - 12/13/2018	mR/Std Qtr	17.75

Sample Point 223 [INDICATOR - E @ 0.57 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470133	12/14/2017 - 3/15/2018	mR/Std Qtr	22.42
477091	3/15/2018 - 6/14/2018	mR/Std Qtr	19.26
483721	6/14/2018 - 9/12/2018	mR/Std Qtr	19.2
490505	9/12/2018 - 12/13/2018	mR/Std Qtr	21.71

Sample Point 225 [INDICATOR - SE @ 0.68 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470134	12/14/2017 - 3/15/2018	mR/Std Qtr	22.30
477092	3/15/2018 - 6/14/2018	mR/Std Qtr	18.10
483722	6/14/2018 - 9/12/2018	mR/Std Qtr	18.64
490506	9/12/2018 - 12/13/2018	mR/Std Qtr	20.02

Sample Point 226 [INDICATOR - S @ 0.48 miles]

TLD RING TLD_INNER

Sample ID	Sample Dates	Nuclide	Activity
470135	12/14/2017 - 3/15/2018	mR/Std Qtr	19.80
477093	3/15/2018 - 6/14/2018	mR/Std Qtr	18.03



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 226 [INDICATOR - S @ 0.48 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
483723	6/14/2018 - 9/12/2018	mR/Std Qtr	17.68
490507	9/12/2018 - 12/13/2018	mR/Std Qtr	17.61

Sample Point 227 [INDICATOR - WSW @ 0.52 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470136	12/14/2017 - 3/15/2018	mR/Std Qtr	20.08
477094	3/15/2018 - 6/14/2018	mR/Std Qtr	16.29
483724	6/14/2018 - 9/12/2018	mR/Std Qtr	17.3
490508	9/12/2018 - 12/13/2018	mR/Std Qtr	16.62

Sample Point 228 [INDICATOR - W @ 0.61 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470137	12/14/2017 - 3/15/2018	mR/Std Qtr	21.47
477095	3/15/2018 - 6/14/2018	mR/Std Qtr	16.45
483725	6/14/2018 - 9/12/2018	mR/Std Qtr	17.32
490509	9/12/2018 - 12/13/2018	mR/Std Qtr	17.45

Sample Point 229 [INDICATOR - NW @ 0.84 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470138	12/14/2017 - 3/15/2018	mR/Std Qtr	25.90
477096	3/15/2018 - 6/14/2018	mR/Std Qtr	19.81
483726	6/14/2018 - 9/12/2018	mR/Std Qtr	20.14
490510	9/12/2018 - 12/13/2018	mR/Std Qtr	20.98

Sample Point 230 [INDICATOR - N @ 4.37 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470139	12/14/2017 - 3/15/2018	mR/Std Qtr	16.25
477097	3/15/2018 - 6/14/2018	mR/Std Qtr	11.56
483727	6/14/2018 - 9/12/2018	mR/Std Qtr	12.25
490511	9/12/2018 - 12/13/2018	mR/Std Qtr	13.40

Sample Point 231 [INDICATOR - NNE @ 4.21 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470140	12/14/2017 - 3/15/2018	mR/Std Qtr	19.14
477098	3/15/2018 - 6/14/2018	mR/Std Qtr	15.13
483728	6/14/2018 - 9/12/2018	mR/Std Qtr	16.01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 231 [INDICATOR - NNE @ 4.21 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
490512	9/12/2018 - 12/13/2018	mR/Std Qtr	16.68

Sample Point 232 [INDICATOR - NE @ 4.18 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470141	12/14/2017 - 3/15/2018	mR/Std Qtr	24.90

Sample ID:	Sample Dates:	Nuclide	Activity
477099	3/15/2018 - 6/14/2018	mR/Std Qtr	20.03

Sample ID:	Sample Dates:	Nuclide	Activity
483729	6/14/2018 - 9/12/2018	mR/Std Qtr	19.59

Sample ID:	Sample Dates:	Nuclide	Activity
490513	9/12/2018 - 12/13/2018	mR/Std Qtr	22.07

Sample Point 233 [INDICATOR - ENE @ 3.95 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470142	12/14/2017 - 3/15/2018	mR/Std Qtr	16.24

Sample ID:	Sample Dates:	Nuclide	Activity
477100	3/15/2018 - 6/14/2018	mR/Std Qtr	13.20

Sample ID:	Sample Dates:	Nuclide	Activity
483730	6/14/2018 - 9/12/2018	mR/Std Qtr	14.20

Sample ID:	Sample Dates:	Nuclide	Activity
490514	9/12/2018 - 12/13/2018	mR/Std Qtr	15.17

Sample Point 234 [INDICATOR - E @ 4.5 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470143	12/14/2017 - 3/15/2018	mR/Std Qtr	20.55

Sample ID:	Sample Dates:	Nuclide	Activity
477101	3/15/2018 - 6/14/2018	mR/Std Qtr	17.35

Sample ID:	Sample Dates:	Nuclide	Activity
483731	6/14/2018 - 9/12/2018	mR/Std Qtr	17.36

Sample ID:	Sample Dates:	Nuclide	Activity
490515	9/12/2018 - 12/13/2018	mR/Std Qtr	18.48

Sample Point 235 [INDICATOR - ESE @ 4.07 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470144	12/14/2017 - 3/15/2018	mR/Std Qtr	19.06

Sample ID:	Sample Dates:	Nuclide	Activity
477102	3/15/2018 - 6/14/2018	mR/Std Qtr	17.02

Sample ID:	Sample Dates:	Nuclide	Activity
483732	6/14/2018 - 9/12/2018	mR/Std Qtr	16.45

Sample ID:	Sample Dates:	Nuclide	Activity
490516	9/12/2018 - 12/13/2018	mR/Std Qtr	17.74

Sample Point 236 [INDICATOR - SE @ 4.25 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470145	12/14/2017 - 3/15/2018	mR/Std Qtr	24.54

Sample ID:	Sample Dates:	Nuclide	Activity
477103	3/15/2018 - 6/14/2018	mR/Std Qtr	19.66

Sample ID:	Sample Dates:	Nuclide	Activity
483733	6/14/2018 - 9/12/2018	mR/Std Qtr	20.17

Sample ID:	Sample Dates:	Nuclide	Activity
490517	9/12/2018 - 12/13/2018	mR/Std Qtr	21.74



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 237 [INDICATOR - SSE @ 4.75 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470146	12/14/2017 - 3/15/2018	mR/Std Qtr	25.12
477104	3/15/2018 - 6/14/2018	mR/Std Qtr	19.84
483734	6/14/2018 - 9/12/2018	mR/Std Qtr	20.55
490518	9/12/2018 - 12/13/2018	mR/Std Qtr	21.93

Sample Point 238 [INDICATOR - S @ 4.02 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470147	12/14/2017 - 3/15/2018	mR/Std Qtr	20.39
477105	3/15/2018 - 6/14/2018	mR/Std Qtr	15.82
483735	6/14/2018 - 9/12/2018	mR/Std Qtr	16.38
490519	9/12/2018 - 12/13/2018	mR/Std Qtr	16.34

Sample Point 239 [INDICATOR - SSW @ 4.49 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470148	12/14/2017 - 3/15/2018	mR/Std Qtr	21.32
477106	3/15/2018 - 6/14/2018	mR/Std Qtr	17.52
483736	6/14/2018 - 9/12/2018	mR/Std Qtr	16.18
490520	9/12/2018 - 12/13/2018	mR/Std Qtr	19.72

Sample Point 240 [INDICATOR - SW @ 4.07 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470149	12/14/2017 - 3/15/2018	mR/Std Qtr	14.98
477107	3/15/2018 - 6/14/2018	mR/Std Qtr	11.19
483737	6/14/2018 - 9/12/2018	mR/Std Qtr	11.57
490521	9/12/2018 - 12/13/2018	mR/Std Qtr	13.79

Sample Point 241 [INDICATOR - WSW @ 4.58 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470150	12/14/2017 - 3/15/2018	mR/Std Qtr	14.81
477108	3/15/2018 - 6/14/2018	mR/Std Qtr	12.44
483738	6/14/2018 - 9/12/2018	mR/Std Qtr	11.93
490522	9/12/2018 - 12/13/2018	mR/Std Qtr	13.55

Sample Point 242 [INDICATOR - W @ 4.56 miles]

TLD RING TLD_OUTER

Sample ID:	Sample Dates:	Nuclide	Activity
470151	12/14/2017 - 3/15/2018	mR/Std Qtr	17.87



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 242 [INDICATOR - W @ 4.56 miles]

TLD RING TLD_OUTER

Sample ID	Sample Dates	Nuclide	Activity
477109	3/15/2018 - 6/14/2018	mR/Std Qtr	14.11
483739	6/14/2018 - 9/12/2018	mR/Std Qtr	14.43
490523	9/12/2018 - 12/13/2018	mR/Std Qtr	16.23

Sample Point 243 [INDICATOR - WNW @ 4.39 miles]

TLD RING TLD_OUTER

Sample ID	Sample Dates	Nuclide	Activity
470152	12/14/2017 - 3/15/2018	mR/Std Qtr	19.13
477110	3/15/2018 - 6/14/2018	mR/Std Qtr	14.64
483740	6/14/2018 - 9/12/2018	mR/Std Qtr	14.55
490524	9/12/2018 - 12/13/2018	mR/Std Qtr	18.34

Sample Point 244 [INDICATOR - NW @ 4.02 miles]

TLD RING TLD_OUTER

Sample ID	Sample Dates	Nuclide	Activity
470153	12/14/2017 - 3/15/2018	mR/Std Qtr	22.43
477111	3/15/2018 - 6/14/2018	mR/Std Qtr	17.60
483741	6/14/2018 - 9/12/2018	mR/Std Qtr	19.08
490525	9/12/2018 - 12/13/2018	mR/Std Qtr	19.68

Sample Point 245 [INDICATOR - NNW @ 4.01 miles]

TLD RING TLD_OUTER

Sample ID	Sample Dates	Nuclide	Activity
470154	12/14/2017 - 3/15/2018	mR/Std Qtr	18.82
477112	3/15/2018 - 6/14/2018	mR/Std Qtr	17.23
483742	6/14/2018 - 9/12/2018	mR/Std Qtr	15.88
490526	9/12/2018 - 12/13/2018	mR/Std Qtr	16.10

Sample Point 246 [INDICATOR - ENE @ 7.87 miles]

TLD RING TLD_SPEC

Sample ID	Sample Dates	Nuclide	Activity
477113	3/15/2018 - 6/14/2018	mR/Std Qtr	12.73
483743	6/14/2018 - 9/12/2018	mR/Std Qtr	13.01
490527	9/12/2018 - 12/13/2018	mR/Std Qtr	14.79

Sample Point 247 [CONTROL - ESE @ 7.33 miles]

TLD RING TLD_CTRL

Sample ID	Sample Dates	Nuclide	Activity
470156	12/14/2017 - 3/15/2018	mR/Std Qtr	15.46
477114	3/15/2018 - 6/14/2018	mR/Std Qtr	12.14
483744	6/14/2018 - 9/12/2018	mR/Std Qtr	13.29



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 247 [CONTROL - ESE @ 7.33 miles]

TLD RING TLD_CTRL

Sample ID:	Sample Dates:	Nuclide	Activity
490528	9/12/2018 - 12/13/2018	mR/Std Qtr	13.10

Sample Point 248 [INDICATOR - S @ 6.54 miles]

TLD RING TLD_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
470157	12/14/2017 - 3/15/2018	mR/Std Qtr	17.00

Sample ID:	Sample Dates:	Nuclide	Activity
477115	3/15/2018 - 6/14/2018	mR/Std Qtr	13.56

Sample ID:	Sample Dates:	Nuclide	Activity
483745	6/14/2018 - 9/12/2018	mR/Std Qtr	12.96

Sample ID:	Sample Dates:	Nuclide	Activity
490529	9/12/2018 - 12/13/2018	mR/Std Qtr	14.51

Sample Point 249 [INDICATOR - S @ 7.17 miles]

TLD RING TLD_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
470158	12/14/2017 - 3/15/2018	mR/Std Qtr	20.22

Sample ID:	Sample Dates:	Nuclide	Activity
477116	3/15/2018 - 6/14/2018	mR/Std Qtr	17.24

Sample ID:	Sample Dates:	Nuclide	Activity
483746	6/14/2018 - 9/12/2018	mR/Std Qtr	16.3

Sample ID:	Sample Dates:	Nuclide	Activity
490530	9/12/2018 - 12/13/2018	mR/Std Qtr	17.09

Sample Point 250 [INDICATOR - WSW @ 10.4 miles]

TLD RING TLD_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
470159	12/14/2017 - 3/15/2018	mR/Std Qtr	19.68

Sample ID:	Sample Dates:	Nuclide	Activity
477117	3/15/2018 - 6/14/2018	mR/Std Qtr	15.23

Sample ID:	Sample Dates:	Nuclide	Activity
483747	6/14/2018 - 9/12/2018	mR/Std Qtr	15.62

Sample ID:	Sample Dates:	Nuclide	Activity
490531	9/12/2018 - 12/13/2018	mR/Std Qtr	16.99

Sample Point 251 [CONTROL - WNW @ 9.72 miles]

TLD RING TLD_CTRL

Sample ID:	Sample Dates:	Nuclide	Activity
470160	12/14/2017 - 3/15/2018	mR/Std Qtr	18.32

Sample ID:	Sample Dates:	Nuclide	Activity
477118	3/15/2018 - 6/14/2018	mR/Std Qtr	16.07

Sample ID:	Sample Dates:	Nuclide	Activity
483748	6/14/2018 - 9/12/2018	mR/Std Qtr	15.15

Sample ID:	Sample Dates:	Nuclide	Activity
490532	9/12/2018 - 12/13/2018	mR/Std Qtr	18.12

Sample Point 255 [INDICATOR - ENE @ 0.61 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470161	12/14/2017 - 3/15/2018	mR/Std Qtr	23.80

Sample ID:	Sample Dates:	Nuclide	Activity
477119	3/15/2018 - 6/14/2018	mR/Std Qtr	17.91

Sample ID:	Sample Dates:	Nuclide	Activity
483749	6/14/2018 - 9/12/2018	mR/Std Qtr	19.95

Sample ID:	Sample Dates:	Nuclide	Activity
490533	9/12/2018 - 12/13/2018	mR/Std Qtr	20.85



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: TLD Concentration (Activity): mR/Standard Quarter

Sample Point 256 [INDICATOR - SSE @ 0.58 miles]

TLD RING TLD_INNER

Sample ID:	Sample Dates:	Nuclide	Activity
470162	12/14/2017 - 3/15/2018	mR/Std Qtr	22.57
477120	3/15/2018 - 6/14/2018	mR/Std Qtr	20.01
483750	6/14/2018 - 9/12/2018	mR/Std Qtr	20.49
490534	9/12/2018 - 12/13/2018	mR/Std Qtr	20.89

Sample Point 258 [INDICATOR - W @ 9.84 miles]

TLD RING TLD_SPEC

Sample ID:	Sample Dates:	Nuclide	Activity
470163	12/14/2017 - 3/15/2018	mR/Std Qtr	22.50
477121	3/15/2018 - 6/14/2018	mR/Std Qtr	17.42
483751	6/14/2018 - 9/12/2018	mR/Std Qtr	16.35
490535	9/12/2018 - 12/13/2018	mR/Std Qtr	18.69

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432624	1/3/2018 - 1/3/2018	MIXEDBLV	Mn-54	<3.33E+01	0.00E+00	3.33E+01
			Co-58	<3.07E+01	0.00E+00	3.07E+01
			Fe-59	<5.44E+01	0.00E+00	5.44E+01
			Co-60	<3.15E+01	0.00E+00	3.15E+01
			Zn-65	<6.63E+01	0.00E+00	6.63E+01
			Zr-95	<5.39E+01	0.00E+00	5.39E+01
			Nb-95	<3.21E+01	0.00E+00	3.21E+01
			I-131	<3.64E+01	0.00E+00	3.64E+01
			Cs-134	<3.55E+01	0.00E+00	3.55E+01
			Cs-137	<2.95E+01	0.00E+00	2.95E+01
			BaLa-140	<4.11E+01	0.00E+00	4.11E+01
			Be-7	1.17E+03	2.71E+02	3.25E+02
			K-40	3.93E+03	6.68E+02	6.09E+02
466669	2/6/2018 - 2/6/2018	MIXEDBLV	Mn-54	<2.57E+01	0.00E+00	2.57E+01
			Co-58	<2.34E+01	0.00E+00	2.34E+01
			Fe-59	<5.96E+01	0.00E+00	5.96E+01
			Co-60	<2.58E+01	0.00E+00	2.58E+01
			Zn-65	<4.55E+01	0.00E+00	4.55E+01
			Zr-95	<4.91E+01	0.00E+00	4.91E+01
			Nb-95	<2.47E+01	0.00E+00	2.47E+01
			I-131	<3.26E+01	0.00E+00	3.26E+01
			Cs-134	<2.50E+01	0.00E+00	2.50E+01
			Cs-137	<2.47E+01	0.00E+00	2.47E+01
			BaLa-140	<3.55E+01	0.00E+00	3.55E+01
			Be-7	1.10E+03	2.73E+02	2.87E+02
			K-40	3.29E+03	5.95E+02	2.99E+02
468628	3/6/2018 - 3/6/2018	MIXEDBLV	Mn-54	<2.66E+01	0.00E+00	2.66E+01
			Co-58	<2.37E+01	0.00E+00	2.37E+01
			Fe-59	<4.20E+01	0.00E+00	4.20E+01
			Co-60	<1.79E+01	0.00E+00	1.79E+01
			Zn-65	<4.73E+01	0.00E+00	4.73E+01
			Zr-95	<2.72E+01	0.00E+00	2.72E+01
			Nb-95	<2.28E+01	0.00E+00	2.28E+01
			I-131	<2.10E+01	0.00E+00	2.10E+01
			Cs-134	<3.08E+01	0.00E+00	3.08E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
468628	3/6/2018 - 3/6/2018	MIXEDBLV	Cs-137	<1.93E+01	0.00E+00	1.93E+01
			BaLa-140	<2.63E+01	0.00E+00	2.63E+01
			Be-7	1.20E+03	2.57E+02	2.26E+02
			K-40	3.13E+03	6.03E+02	4.38E+02
471647	4/3/2018 - 4/3/2018	MIXEDBLV	Mn-54	<2.38E+01	0.00E+00	2.38E+01
			Co-58	<1.92E+01	0.00E+00	1.92E+01
			Fe-59	<3.35E+01	0.00E+00	3.35E+01
			Co-60	<2.62E+01	0.00E+00	2.62E+01
			Zn-65	<4.17E+01	0.00E+00	4.17E+01
			Zr-95	<4.74E+01	0.00E+00	4.74E+01
			Nb-95	<1.86E+01	0.00E+00	1.86E+01
			I-131	<1.88E+01	0.00E+00	1.88E+01
			Cs-134	<3.27E+01	0.00E+00	3.27E+01
			Cs-137	<1.99E+01	0.00E+00	1.99E+01
			BaLa-140	<2.46E+01	0.00E+00	2.46E+01
			Be-7	5.72E+02	1.92E+02	2.23E+02
			K-40	3.92E+03	6.63E+02	2.98E+02
			473568	5/1/2018 - 5/1/2018	MIXEDBLV	Mn-54
Co-58	<3.01E+01	0.00E+00				3.01E+01
Fe-59	<6.70E+01	0.00E+00				6.70E+01
Co-60	<2.73E+01	0.00E+00				2.73E+01
Zn-65	<4.80E+01	0.00E+00				4.81E+01
Zr-95	<3.77E+01	0.00E+00				3.77E+01
Nb-95	<3.67E+01	0.00E+00				3.67E+01
I-131	<3.04E+01	0.00E+00				3.04E+01
Cs-134	<3.26E+01	0.00E+00				3.26E+01
Cs-137	<3.06E+01	0.00E+00				3.06E+01
BaLa-140	<3.94E+01	0.00E+00				3.94E+01
Be-7	9.83E+02	2.80E+02				2.94E+02
K-40	3.34E+03	6.74E+02				4.06E+02
475151	6/5/2018 - 6/5/2018	MIXEDBLV				Mn-54
			Co-58	<3.69E+01	0.00E+00	3.69E+01
			Fe-59	<4.64E+01	0.00E+00	4.64E+01
			Co-60	<4.60E+01	0.00E+00	4.60E+01
			Zn-65	<7.64E+01	0.00E+00	7.64E+01
			Zr-95	<5.20E+01	0.00E+00	5.20E+01
			Nb-95	<2.91E+01	0.00E+00	2.91E+01
			I-131	<2.58E+01	0.00E+00	2.58E+01
			Cs-134	<4.16E+01	0.00E+00	4.16E+01
			Cs-137	<3.59E+01	0.00E+00	3.59E+01
			BaLa-140	<3.91E+01	0.00E+00	3.91E+01
			Be-7	1.04E+03	3.39E+02	4.27E+02
			K-40	5.26E+03	9.32E+02	6.17E+02
			478072	7/3/2018 - 7/3/2018	MIXEDBLV	Mn-54
Co-58	<3.02E+01	0.00E+00				3.02E+01
Fe-59	<6.17E+01	0.00E+00				6.17E+01
Co-60	<3.05E+01	0.00E+00				3.05E+01
Zn-65	<8.31E+01	0.00E+00				8.31E+01
Zr-95	<3.25E+01	0.00E+00				3.25E+01
Nb-95	<3.54E+01	0.00E+00				3.54E+01
I-131	<4.32E+01	0.00E+00				4.32E+01
Cs-134	<4.12E+01	0.00E+00				4.12E+01
Cs-137	<3.41E+01	0.00E+00				3.41E+01
BaLa-140	<4.34E+01	0.00E+00				4.34E+01
Be-7	5.17E+02	2.37E+02				3.08E+02
K-40	5.35E+03	9.20E+02				4.25E+02
479940	8/7/2018 - 8/7/2018	MIXEDBLV				Mn-54



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
479940	8/7/2018 - 8/7/2018	MIXEDBLV	Co-58	<2.32E+01	0.00E+00	2.32E+01
			Fe-59	<4.26E+01	0.00E+00	4.26E+01
			Co-60	<2.46E+01	0.00E+00	2.46E+01
			Zn-65	<5.37E+01	0.00E+00	5.37E+01
			Zr-95	<4.85E+01	0.00E+00	4.85E+01
			Nb-95	<2.49E+01	0.00E+00	2.49E+01
			I-131	<2.38E+01	0.00E+00	2.38E+01
			Cs-134	<2.52E+01	0.00E+00	2.52E+01
			Cs-137	<1.98E+01	0.00E+00	1.98E+01
			BaLa-140	<3.79E+01	0.00E+00	3.79E+01
			Be-7	1.39E+03	2.73E+02	2.54E+02
			K-40	4.28E+03	6.66E+02	3.79E+02
			482187	9/4/2018 - 9/4/2018	MIXEDBLV	Mn-54
Co-58	<2.81E+01	0.00E+00				2.81E+01
Fe-59	<6.72E+01	0.00E+00				6.72E+01
Co-60	<2.39E+01	0.00E+00				2.39E+01
Zn-65	<6.75E+01	0.00E+00				6.75E+01
Zr-95	<5.11E+01	0.00E+00				5.11E+01
Nb-95	<3.66E+01	0.00E+00				3.66E+01
I-131	<2.87E+01	0.00E+00				2.87E+01
Cs-134	<3.32E+01	0.00E+00				3.32E+01
Cs-137	<3.00E+01	0.00E+00				3.00E+01
BaLa-140	<3.18E+01	0.00E+00				3.18E+01
Be-7	9.77E+02	2.89E+02				3.29E+02
K-40	5.85E+03	9.20E+02				3.13E+02
484145	10/2/2018 - 10/2/2018	MIXEDBLV	Mn-54	<1.97E+01	0.00E+00	1.97E+01
			Co-58	<1.58E+01	0.00E+00	1.58E+01
			Fe-59	<3.38E+01	0.00E+00	3.38E+01
			Co-60	<2.00E+01	0.00E+00	2.00E+01
			Zn-65	<4.15E+01	0.00E+00	4.15E+01
			Zr-95	<3.47E+01	0.00E+00	3.47E+01
			Nb-95	<1.94E+01	0.00E+00	1.94E+01
			I-131	<1.79E+01	0.00E+00	1.79E+01
			Cs-134	<2.21E+01	0.00E+00	2.21E+01
			Cs-137	<2.02E+01	0.00E+00	2.02E+01
			BaLa-140	<1.84E+01	0.00E+00	1.84E+01
			Be-7	7.40E+02	1.92E+02	2.33E+02
			K-40	3.92E+03	5.42E+02	2.12E+02
488783	11/6/2018 - 11/6/2018	MIXEDBLV	Mn-54	<2.53E+01	0.00E+00	2.53E+01
			Co-58	<3.05E+01	0.00E+00	3.05E+01
			Fe-59	<6.01E+01	0.00E+00	6.01E+01
			Co-60	<3.01E+01	0.00E+00	3.01E+01
			Zn-65	<5.34E+01	0.00E+00	5.34E+01
			Zr-95	<4.40E+01	0.00E+00	4.40E+01
			Nb-95	<3.73E+01	0.00E+00	3.73E+01
			I-131	<4.52E+01	0.00E+00	4.52E+01
			Cs-134	<4.17E+01	0.00E+00	4.17E+01
			Cs-137	<2.54E+01	0.00E+00	2.54E+01
			BaLa-140	<5.92E+01	0.00E+00	5.92E+01
			Be-7	6.84E+02	2.68E+02	3.53E+02
			K-40	5.27E+03	8.39E+02	3.62E+02
490734	12/4/2018 - 12/4/2018	MIXEDBLV	Mn-54	<3.85E+01	0.00E+00	3.85E+01
			Co-58	<2.62E+01	0.00E+00	2.62E+01
			Fe-59	<7.18E+01	0.00E+00	7.18E+01
			Co-60	<4.84E+01	0.00E+00	4.84E+01
			Zn-65	<7.59E+01	0.00E+00	7.59E+01
			Zr-95	<7.40E+01	0.00E+00	7.40E+01
			Nb-95	<3.85E+01	0.00E+00	3.85E+01
			I-131	<3.84E+01	0.00E+00	3.84E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 200 [INDICATOR - NNE @ 0.63 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
490734	12/4/2018 - 12/4/2018		Cs-134	<3.56E+01	0.00E+00	3.56E+01
			Cs-137	<2.46E+01	0.00E+00	2.45E+01
			BaLa-140	<3.72E+01	0.00E+00	3.72E+01
			Be-7	1.31E+03	3.89E+02	4.57E+02
			K-40	4.37E+03	8.34E+02	4.11E+02

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432625	1/3/2018 - 1/3/2018		Mn-54	<2.27E+01	0.00E+00	2.27E+01
			Co-58	<2.29E+01	0.00E+00	2.29E+01
			Fe-59	<4.43E+01	0.00E+00	4.43E+01
			Co-60	<2.57E+01	0.00E+00	2.57E+01
			Zn-65	<5.07E+01	0.00E+00	5.07E+01
			Zr-95	<4.46E+01	0.00E+00	4.46E+01
			Nb-95	<2.62E+01	0.00E+00	2.62E+01
			I-131	<3.22E+01	0.00E+00	3.22E+01
			Cs-134	<2.74E+01	0.00E+00	2.74E+01
			Cs-137	<2.37E+01	0.00E+00	2.37E+01
			BaLa-140	<2.73E+01	0.00E+00	2.73E+01
			Be-7	9.41E+02	2.56E+02	3.69E+02
			K-40	5.10E+03	6.12E+02	4.06E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
466670	2/6/2018 - 2/6/2018		Mn-54	<2.64E+01	0.00E+00	2.64E+01
			Co-58	<3.45E+01	0.00E+00	3.45E+01
			Fe-59	<7.28E+01	0.00E+00	7.28E+01
			Co-60	<3.49E+01	0.00E+00	3.49E+01
			Zn-65	<6.15E+01	0.00E+00	6.15E+01
			Zr-95	<5.41E+01	0.00E+00	5.41E+01
			Nb-95	<3.95E+01	0.00E+00	3.95E+01
			I-131	<3.66E+01	0.00E+00	3.66E+01
			Cs-134	<4.38E+01	0.00E+00	4.38E+01
			Cs-137	<3.22E+01	0.00E+00	3.22E+01
			BaLa-140	<1.31E+01	0.00E+00	1.31E+01
			Be-7	1.47E+03	3.67E+02	3.68E+02
			K-40	3.66E+03	7.29E+02	3.12E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
468629	3/6/2018 - 3/6/2018		Mn-54	<2.92E+01	0.00E+00	2.92E+01
			Co-58	<2.97E+01	0.00E+00	2.97E+01
			Fe-59	<4.77E+01	0.00E+00	4.77E+01
			Co-60	<2.34E+01	0.00E+00	2.34E+01
			Zn-65	<6.59E+01	0.00E+00	6.59E+01
			Zr-95	<5.02E+01	0.00E+00	5.02E+01
			Nb-95	<2.86E+01	0.00E+00	2.86E+01
			I-131	<2.59E+01	0.00E+00	2.59E+01
			Cs-134	<3.97E+01	0.00E+00	3.97E+01
			Cs-137	<3.36E+01	0.00E+00	3.36E+01
			BaLa-140	<1.83E+01	0.00E+00	1.83E+01
			Be-7	1.00E+03	2.99E+02	3.85E+02
			K-40	3.22E+03	5.90E+02	3.38E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
471648	4/3/2018 - 4/3/2018		Mn-54	<2.79E+01	0.00E+00	2.79E+01
			Co-58	<2.63E+01	0.00E+00	2.63E+01
			Fe-59	<5.65E+01	0.00E+00	5.65E+01
			Co-60	<2.38E+01	0.00E+00	2.38E+01
			Zn-65	<6.70E+01	0.00E+00	6.70E+01
			Zr-95	<5.71E+01	0.00E+00	5.71E+01
			Nb-95	<2.70E+01	0.00E+00	2.70E+01
			I-131	<2.42E+01	0.00E+00	2.42E+01
			Cs-134	<2.79E+01	0.00E+00	2.79E+01
			Cs-137	<2.97E+01	0.00E+00	2.97E+01
			BaLa-140	<3.15E+01	0.00E+00	3.15E+01
			Be-7	1.09E+03	2.90E+02	3.01E+02
			K-40	4.92E+03	8.32E+02	3.01E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
473569	5/1/2018 - 5/1/2018	MIXEDBLV	Mn-54	<2.65E+01	0.00E+00	2.65E+01
			Co-58	<2.24E+01	0.00E+00	2.24E+01
			Fe-59	<5.84E+01	0.00E+00	5.84E+01
			Co-60	<7.89E+00	0.00E+00	7.89E+00
			Zn-65	<8.56E+01	0.00E+00	8.56E+01
			Zr-95	<6.02E+01	0.00E+00	6.02E+01
			Nb-95	<3.16E+01	0.00E+00	3.16E+01
			I-131	<4.14E+01	0.00E+00	4.14E+01
			Cs-134	<3.18E+01	0.00E+00	3.18E+01
			Cs-137	6.58E+01	3.07E+01	3.78E+01
			BaLa-140	<3.59E+01	0.00E+00	3.59E+01
			Be-7	6.41E+02	2.68E+02	3.44E+02
			K-40	4.95E+03	9.23E+02	6.17E+02
475152	6/5/2018 - 6/5/2018	MIXEDBLV	Mn-54	<4.03E+01	0.00E+00	4.03E+01
			Co-58	<3.87E+01	0.00E+00	3.87E+01
			Fe-59	<7.45E+01	0.00E+00	7.45E+01
			Co-60	<3.24E+01	0.00E+00	3.24E+01
			Zn-65	<9.13E+01	0.00E+00	9.13E+01
			Zr-95	<5.66E+01	0.00E+00	5.66E+01
			Nb-95	<4.25E+01	0.00E+00	4.25E+01
			I-131	<3.50E+01	0.00E+00	3.50E+01
			Cs-134	<4.21E+01	0.00E+00	4.21E+01
			Cs-137	<5.98E+01	0.00E+00	5.98E+01
			BaLa-140	<3.68E+01	0.00E+00	3.68E+01
			Be-7	9.07E+02	3.49E+02	4.68E+02
			K-40	4.41E+03	8.67E+02	5.94E+02
478073	7/3/2018 - 7/3/2018	MIXEDBLV	Mn-54	<3.03E+01	0.00E+00	3.03E+01
			Co-58	<3.02E+01	0.00E+00	3.02E+01
			Fe-59	<7.07E+01	0.00E+00	7.07E+01
			Co-60	<3.68E+01	0.00E+00	3.68E+01
			Zn-65	<7.48E+01	0.00E+00	7.48E+01
			Zr-95	<6.14E+01	0.00E+00	6.14E+01
			Nb-95	<3.64E+01	0.00E+00	3.64E+01
			I-131	<4.64E+01	0.00E+00	4.64E+01
			Cs-134	<3.66E+01	0.00E+00	3.66E+01
			Cs-137	6.23E+01	3.49E+01	5.15E+01
			BaLa-140	<4.22E+01	0.00E+00	4.22E+01
			Be-7	1.42E+03	3.37E+02	3.73E+02
			K-40	3.36E+03	6.67E+02	5.37E+02
479941	8/7/2018 - 8/7/2018	MIXEDBLV	Mn-54	<2.78E+01	0.00E+00	2.78E+01
			Co-58	<2.94E+01	0.00E+00	2.94E+01
			Fe-59	<5.35E+01	0.00E+00	5.35E+01
			Co-60	<4.80E+01	0.00E+00	4.80E+01
			Zn-65	<6.57E+01	0.00E+00	6.57E+01
			Zr-95	<4.44E+01	0.00E+00	4.44E+01
			Nb-95	<3.54E+01	0.00E+00	3.54E+01
			I-131	<3.19E+01	0.00E+00	3.19E+01
			Cs-134	<4.02E+01	0.00E+00	4.02E+01
			Cs-137	<3.04E+01	0.00E+00	3.04E+01
			BaLa-140	<4.43E+01	0.00E+00	4.43E+01
			Be-7	1.64E+03	3.82E+02	3.85E+02
			K-40	2.53E+03	6.69E+02	6.28E+02
482188	9/4/2018 - 9/4/2018	MIXEDBLV	Mn-54	<2.13E+01	0.00E+00	2.13E+01
			Co-58	<2.98E+01	0.00E+00	2.98E+01
			Fe-59	<4.71E+01	0.00E+00	4.71E+01
			Co-60	<3.01E+01	0.00E+00	3.01E+01
			Zn-65	<6.89E+01	0.00E+00	6.89E+01
			Zr-95	<4.70E+01	0.00E+00	4.70E+01
Nb-95	<2.75E+01	0.00E+00	2.75E+01			



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 201 [INDICATOR - NE @ 0.53 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
482188	9/4/2018 - 9/4/2018		I-131	<2.64E+01	0.00E+00	2.64E+01
			Cs-134	<2.94E+01	0.00E+00	2.94E+01
			Cs-137	1.19E+01	1.52E+01	2.50E+01
			BaLa-140	<2.40E+01	0.00E+00	2.40E+01
			Be-7	2.27E+03	3.59E+02	3.14E+02
			K-40	4.17E+03	6.29E+02	3.52E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
484146	10/2/2018 - 10/2/2018		Mn-54	<3.00E+01	0.00E+00	3.00E+01
			Co-58	<2.99E+01	0.00E+00	2.99E+01
			Fe-59	<5.23E+01	0.00E+00	5.23E+01
			Co-60	<3.34E+01	0.00E+00	3.34E+01
			Zn-65	<6.66E+01	0.00E+00	6.66E+01
			Zr-95	<6.36E+01	0.00E+00	6.36E+01
			Nb-95	<3.36E+01	0.00E+00	3.36E+01
			I-131	<2.90E+01	0.00E+00	2.90E+01
			Cs-134	<4.06E+01	0.00E+00	4.06E+01
			Cs-137	<4.06E+01	0.00E+00	4.06E+01
			BaLa-140	<3.70E+01	0.00E+00	3.70E+01
			Be-7	1.63E+03	3.64E+02	4.08E+02
			K-40	3.76E+03	6.62E+02	3.20E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
488784	11/6/2018 - 11/6/2018		Mn-54	<2.12E+01	0.00E+00	2.12E+01
			Co-58	<2.15E+01	0.00E+00	2.15E+01
			Fe-59	<5.58E+01	0.00E+00	5.58E+01
			Co-60	<2.19E+01	0.00E+00	2.19E+01
			Zn-65	<5.41E+01	0.00E+00	5.41E+01
			Zr-95	<5.12E+01	0.00E+00	5.12E+01
			Nb-95	<2.75E+01	0.00E+00	2.75E+01
			I-131	<4.32E+01	0.00E+00	4.32E+01
			Cs-134	<2.34E+01	0.00E+00	2.34E+01
			Cs-137	<2.42E+01	0.00E+00	2.42E+01
			BaLa-140	<4.96E+01	0.00E+00	4.96E+01
			Be-7	6.52E+02	2.08E+02	2.58E+02
			K-40	2.38E+03	4.51E+02	3.12E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
490735	12/4/2018 - 12/4/2018		Mn-54	<3.22E+01	0.00E+00	3.22E+01
			Co-58	<2.90E+01	0.00E+00	2.90E+01
			Fe-59	<6.03E+01	0.00E+00	6.03E+01
			Co-60	<3.61E+01	0.00E+00	3.61E+01
			Zn-65	<8.19E+01	0.00E+00	8.19E+01
			Zr-95	<5.98E+01	0.00E+00	5.98E+01
			Nb-95	<3.35E+01	0.00E+00	3.35E+01
			I-131	<4.43E+01	0.00E+00	4.43E+01
			Cs-134	<3.31E+01	0.00E+00	3.31E+01
			Cs-137	<4.01E+01	0.00E+00	4.01E+01
			BaLa-140	<4.59E+01	0.00E+00	4.59E+01
			Be-7	1.61E+03	4.15E+02	4.93E+02
			K-40	3.89E+03	7.71E+02	5.90E+02

Sample Point 222 [INDICATOR - N @ 0.71 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432626	1/3/2018 - 1/3/2018		Mn-54	<3.58E+01	0.00E+00	3.58E+01
			Co-58	<3.40E+01	0.00E+00	3.40E+01
			Fe-59	<7.43E+01	0.00E+00	7.43E+01
			Co-60	<3.91E+01	0.00E+00	3.91E+01
			Zn-65	<7.16E+01	0.00E+00	7.16E+01
			Zr-95	<5.65E+01	0.00E+00	5.65E+01
			Nb-95	<4.06E+01	0.00E+00	4.06E+01
			I-131	<4.66E+01	0.00E+00	4.66E+01
			Cs-134	<4.39E+01	0.00E+00	4.39E+01
			Cs-137	<3.85E+01	0.00E+00	3.85E+01
			BaLa-140	<5.79E+01	0.00E+00	5.79E+01
			Be-7	3.12E+02	2.92E+02	4.72E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [INDICATOR - N @ 0.71 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432626	1/3/2018 - 1/3/2018		K-40	3.41E+03	6.62E+02	6.46E+02
466671	2/6/2018 - 2/6/2018		Mn-54	<3.32E+01	0.00E+00	3.32E+01
			Co-58	<3.58E+01	0.00E+00	3.58E+01
			Fe-59	<7.10E+01	0.00E+00	7.10E+01
			Co-60	<2.62E+01	0.00E+00	2.62E+01
			Zn-65	<6.98E+01	0.00E+00	6.98E+01
			Zr-95	<5.29E+01	0.00E+00	5.29E+01
			Nb-95	<3.54E+01	0.00E+00	3.54E+01
			I-131	<4.55E+01	0.00E+00	4.55E+01
			Cs-134	<3.89E+01	0.00E+00	3.89E+01
			Cs-137	<3.98E+01	0.00E+00	3.98E+01
			BaLa-140	<3.92E+01	0.00E+00	3.92E+01
			Be-7	1.08E+03	3.71E+02	3.45E+02
			K-40	2.39E+03	5.53E+02	4.62E+02
468630	3/6/2018 - 3/6/2018		Mn-54	<2.66E+01	0.00E+00	2.66E+01
			Co-58	<3.72E+01	0.00E+00	3.72E+01
			Fe-59	<6.53E+01	0.00E+00	6.53E+01
			Co-60	<4.05E+01	0.00E+00	4.05E+01
			Zn-65	<7.06E+01	0.00E+00	7.06E+01
			Zr-95	<5.51E+01	0.00E+00	5.51E+01
			Nb-95	<3.96E+01	0.00E+00	3.96E+01
			I-131	<3.54E+01	0.00E+00	3.54E+01
			Cs-134	<3.72E+01	0.00E+00	3.72E+01
			Cs-137	<3.57E+01	0.00E+00	3.57E+01
			BaLa-140	<3.56E+01	0.00E+00	3.56E+01
			Be-7	4.93E+02	2.43E+02	3.47E+02
			K-40	2.57E+03	6.00E+02	5.25E+02
471649	4/3/2018 - 4/3/2018		Mn-54	<3.15E+01	0.00E+00	3.15E+01
			Co-58	<2.89E+01	0.00E+00	2.89E+01
			Fe-59	<5.32E+01	0.00E+00	5.32E+01
			Co-60	<3.13E+01	0.00E+00	3.13E+01
			Zn-65	<6.10E+01	0.00E+00	6.10E+01
			Zr-95	<5.34E+01	0.00E+00	5.34E+01
			Nb-95	<3.42E+01	0.00E+00	3.42E+01
			I-131	<4.19E+01	0.00E+00	4.19E+01
			Cs-134	<2.63E+01	0.00E+00	2.63E+01
			Cs-137	<2.86E+01	0.00E+00	2.86E+01
			BaLa-140	<4.02E+01	0.00E+00	4.02E+01
			Be-7	6.85E+02	2.36E+02	3.32E+02
			K-40	3.46E+03	5.37E+02	3.83E+02
473570	5/1/2018 - 5/1/2018		Mn-54	<2.50E+01	0.00E+00	2.50E+01
			Co-58	<2.85E+01	0.00E+00	2.85E+01
			Fe-59	<5.64E+01	0.00E+00	5.64E+01
			Co-60	<2.58E+01	0.00E+00	2.58E+01
			Zn-65	<7.36E+01	0.00E+00	7.36E+01
			Zr-95	<5.19E+01	0.00E+00	5.19E+01
			Nb-95	<3.37E+01	0.00E+00	3.37E+01
			I-131	<3.84E+01	0.00E+00	3.84E+01
			Cs-134	<3.24E+01	0.00E+00	3.24E+01
			Cs-137	<2.78E+01	0.00E+00	2.78E+01
			BaLa-140	<2.94E+01	0.00E+00	2.94E+01
			Be-7	1.68E+02	1.93E+02	3.14E+02
			K-40	4.01E+03	7.24E+02	3.79E+02
475153	6/5/2018 - 6/5/2018		Mn-54	<3.87E+01	0.00E+00	3.87E+01
			Co-58	<2.06E+01	0.00E+00	2.06E+01
			Fe-59	<5.25E+01	0.00E+00	5.25E+01
			Co-60	<3.68E+01	0.00E+00	3.68E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [INDICATOR - N @ 0.71 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
475153	6/5/2018 - 6/5/2018	MIXEDBLV	Zn-65	<5.87E+01	0.00E+00	5.87E+01
			Zr-95	<7.25E+01	0.00E+00	7.25E+01
			Nb-95	<2.94E+01	0.00E+00	2.94E+01
			I-131	<3.17E+01	0.00E+00	3.17E+01
			Cs-134	<3.91E+01	0.00E+00	3.91E+01
			Cs-137	<2.95E+01	0.00E+00	2.95E+01
			BaLa-140	<3.44E+01	0.00E+00	3.44E+01
			Be-7	1.08E+03	3.05E+02	3.27E+02
			K-40	2.65E+03	5.88E+02	7.65E+01
			478074	7/3/2018 - 7/3/2018	MIXEDBLV	Mn-54
Co-58	<3.59E+01	0.00E+00				3.59E+01
Fe-59	<6.35E+01	0.00E+00				6.35E+01
Co-60	<4.17E+01	0.00E+00				4.17E+01
Zn-65	<9.32E+01	0.00E+00				9.32E+01
Zr-95	<5.28E+01	0.00E+00				5.28E+01
Nb-95	<3.81E+01	0.00E+00				3.81E+01
I-131	<4.77E+01	0.00E+00				4.77E+01
Cs-134	<3.90E+01	0.00E+00				3.90E+01
Cs-137	<3.53E+01	0.00E+00				3.53E+01
BaLa-140	<6.90E+01	0.00E+00				6.90E+01
Be-7	1.28E+02	2.24E+02				3.79E+02
K-40	2.43E+03	7.34E+02				8.08E+02
479942	8/7/2018 - 8/7/2018	MIXEDBLV				Mn-54
			Co-58	<2.64E+01	0.00E+00	2.64E+01
			Fe-59	<5.46E+01	0.00E+00	5.46E+01
			Co-60	<2.53E+01	0.00E+00	2.53E+01
			Zn-65	<4.66E+01	0.00E+00	4.66E+01
			Zr-95	<3.61E+01	0.00E+00	3.61E+01
			Nb-95	<2.73E+01	0.00E+00	2.73E+01
			I-131	<2.16E+01	0.00E+00	2.16E+01
			Cs-134	<3.37E+01	0.00E+00	3.37E+01
			Cs-137	<2.85E+01	0.00E+00	2.85E+01
			BaLa-140	<2.94E+01	0.00E+00	2.94E+01
			Be-7	6.68E+02	2.18E+02	2.80E+02
			K-40	2.24E+03	5.08E+02	4.89E+02
			482189	9/4/2018 - 9/4/2018	MIXEDBLV	Mn-54
Co-58	<2.87E+01	0.00E+00				2.87E+01
Fe-59	<4.66E+01	0.00E+00				4.66E+01
Co-60	<3.46E+01	0.00E+00				3.46E+01
Zn-65	<8.40E+01	0.00E+00				8.40E+01
Zr-95	<5.35E+01	0.00E+00				5.35E+01
Nb-95	<3.54E+01	0.00E+00				3.54E+01
I-131	<3.86E+01	0.00E+00				3.86E+01
Cs-134	<3.48E+01	0.00E+00				3.48E+01
Cs-137	<4.15E+01	0.00E+00				4.15E+01
BaLa-140	<1.16E+01	0.00E+00				1.16E+01
Be-7	4.51E+02	2.48E+02				3.45E+02
K-40	2.32E+03	5.80E+02				8.74E+01
484147	10/2/2018 - 10/2/2018	MIXEDBLV				Mn-54
			Co-58	<4.04E+01	0.00E+00	4.04E+01
			Fe-59	<7.84E+01	0.00E+00	7.84E+01
			Co-60	<3.92E+01	0.00E+00	3.92E+01
			Zn-65	<1.22E+02	0.00E+00	1.22E+02
			Zr-95	<8.27E+01	0.00E+00	8.27E+01
			Nb-95	<4.38E+01	0.00E+00	4.38E+01
			I-131	<3.48E+01	0.00E+00	3.48E+01
			Cs-134	<4.26E+01	0.00E+00	4.26E+01
			Cs-137	<3.96E+01	0.00E+00	3.96E+01
			BaLa-140	<7.10E+01	0.00E+00	7.10E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 222 [INDICATOR - N @ 0.71 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
484147	10/2/2018 - 10/2/2018		Be-7	1.98E+03	5.04E+02	5.15E+02
			K-40	2.34E+03	7.18E+02	5.90E+02
488785	11/6/2018 - 11/6/2018		Mn-54	<1.87E+01	0.00E+00	1.87E+01
			Co-58	<1.83E+01	0.00E+00	1.83E+01
			Fe-59	<4.29E+01	0.00E+00	4.29E+01
			Co-60	<1.58E+01	0.00E+00	1.58E+01
			Zn-65	<3.92E+01	0.00E+00	3.92E+01
			Zr-95	<3.38E+01	0.00E+00	3.38E+01
			Nb-95	<2.28E+01	0.00E+00	2.28E+01
			I-131	<4.67E+01	0.00E+00	4.67E+01
			Cs-134	<2.08E+01	0.00E+00	2.08E+01
			Cs-137	<1.93E+01	0.00E+00	1.93E+01
			BaLa-140	<3.08E+01	0.00E+00	3.08E+01
			Be-7	1.03E+03	2.08E+02	2.59E+02
			K-40	4.29E+03	4.88E+02	2.49E+02
490736	12/4/2018 - 12/4/2018		Mn-54	<2.94E+01	0.00E+00	2.94E+01
			Co-58	<2.66E+01	0.00E+00	2.66E+01
			Fe-59	<5.20E+01	0.00E+00	5.20E+01
			Co-60	<2.81E+01	0.00E+00	2.81E+01
			Zn-65	<6.38E+01	0.00E+00	6.38E+01
			Zr-95	<5.38E+01	0.00E+00	5.38E+01
			Nb-95	<3.19E+01	0.00E+00	3.19E+01
			I-131	<4.11E+01	0.00E+00	4.11E+01
			Cs-134	<3.18E+01	0.00E+00	3.18E+01
			Cs-137	<2.75E+01	0.00E+00	2.75E+01
			BaLa-140	<3.41E+01	0.00E+00	3.41E+01
			Be-7	2.64E+02	1.63E+02	2.53E+02
			K-40	3.08E+03	4.84E+02	3.94E+02

Sample Point 226 [INDICATOR - S @ 0.48 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432627	1/3/2018 - 1/3/2018		Mn-54	<2.55E+01	0.00E+00	2.55E+01
			Co-58	<3.01E+01	0.00E+00	3.01E+01
			Fe-59	<5.86E+01	0.00E+00	5.86E+01
			Co-60	<2.69E+01	0.00E+00	2.69E+01
			Zn-65	<7.55E+01	0.00E+00	7.55E+01
			Zr-95	<5.94E+01	0.00E+00	5.94E+01
			Nb-95	<3.57E+01	0.00E+00	3.57E+01
			I-131	<4.73E+01	0.00E+00	4.73E+01
			Cs-134	<3.12E+01	0.00E+00	3.12E+01
			Cs-137	<2.77E+01	0.00E+00	2.77E+01
			BaLa-140	<4.12E+01	0.00E+00	4.12E+01
			Be-7	1.07E+03	2.15E+02	3.16E+02
			K-40	6.44E+03	6.46E+02	3.31E+02
466672	2/6/2018 - 2/6/2018		Mn-54	<2.99E+01	0.00E+00	2.99E+01
			Co-58	<2.84E+01	0.00E+00	2.84E+01
			Fe-59	<6.37E+01	0.00E+00	6.37E+01
			Co-60	<3.00E+01	0.00E+00	3.00E+01
			Zn-65	<7.32E+01	0.00E+00	7.32E+01
			Zr-95	<4.00E+01	0.00E+00	4.00E+01
			Nb-95	<1.98E+01	0.00E+00	1.98E+01
			I-131	<3.46E+01	0.00E+00	3.46E+01
			Cs-134	<3.08E+01	0.00E+00	3.08E+01
			Cs-137	<2.15E+01	0.00E+00	2.15E+01
			BaLa-140	<1.03E+01	0.00E+00	1.03E+01
			Be-7	8.38E+02	2.71E+02	3.30E+02
			K-40	3.81E+03	7.16E+02	4.78E+02
468631	3/6/2018 - 3/6/2018		Mn-54	<3.19E+01	0.00E+00	3.19E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [INDICATOR - S @ 0.48 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
468631	3/6/2018 - 3/6/2018	MIXEDBLV	Co-58	<2.76E+01	0.00E+00	2.76E+01
			Fe-59	<5.76E+01	0.00E+00	5.76E+01
			Co-60	<2.78E+01	0.00E+00	2.78E+01
			Zn-65	<6.68E+01	0.00E+00	6.68E+01
			Zr-95	<5.77E+01	0.00E+00	5.77E+01
			Nb-95	<2.73E+01	0.00E+00	2.73E+01
			I-131	<2.88E+01	0.00E+00	2.88E+01
			Cs-134	<3.72E+01	0.00E+00	3.72E+01
			Cs-137	<3.21E+01	0.00E+00	3.21E+01
			BaLa-140	<3.09E+01	0.00E+00	3.09E+01
			Be-7	1.07E+03	2.93E+02	3.64E+02
			K-40	6.62E+03	9.17E+02	4.81E+02
			471650	4/3/2018 - 4/3/2018	MIXEDBLV	Mn-54
Co-58	<2.01E+01	0.00E+00				2.01E+01
Fe-59	<6.37E+01	0.00E+00				6.37E+01
Co-60	<2.27E+01	0.00E+00				2.27E+01
Zn-65	<6.40E+01	0.00E+00				6.40E+01
Zr-95	<5.65E+01	0.00E+00				5.65E+01
Nb-95	<3.37E+01	0.00E+00				3.37E+01
I-131	<3.01E+01	0.00E+00				3.01E+01
Cs-134	<3.42E+01	0.00E+00				3.42E+01
Cs-137	<2.84E+01	0.00E+00				2.84E+01
BaLa-140	<2.38E+01	0.00E+00				2.38E+01
Be-7	5.93E+02	2.40E+02				3.15E+02
K-40	6.01E+03	9.42E+02				4.96E+02
473571	5/1/2018 - 5/1/2018	MIXEDBLV	Mn-54	<2.78E+01	0.00E+00	2.78E+01
			Co-58	<2.71E+01	0.00E+00	2.71E+01
			Fe-59	<7.03E+01	0.00E+00	7.03E+01
			Co-60	<3.56E+01	0.00E+00	3.56E+01
			Zn-65	<6.69E+01	0.00E+00	6.69E+01
			Zr-95	<5.69E+01	0.00E+00	5.69E+01
			Nb-95	<2.57E+01	0.00E+00	2.57E+01
			I-131	<3.61E+01	0.00E+00	3.61E+01
			Cs-134	<2.94E+01	0.00E+00	2.94E+01
			Cs-137	<2.80E+01	0.00E+00	2.80E+01
			BaLa-140	<4.55E+01	0.00E+00	4.55E+01
			Be-7	6.84E+02	2.70E+02	3.51E+02
			K-40	6.04E+03	9.51E+02	4.82E+02
475154	6/5/2018 - 6/5/2018	MIXEDBLV	Mn-54	<3.32E+01	0.00E+00	3.32E+01
			Co-58	<3.42E+01	0.00E+00	3.42E+01
			Fe-59	<6.69E+01	0.00E+00	6.69E+01
			Co-60	<3.63E+01	0.00E+00	3.63E+01
			Zn-65	<7.11E+01	0.00E+00	7.11E+01
			Zr-95	<4.83E+01	0.00E+00	4.83E+01
			Nb-95	<3.09E+01	0.00E+00	3.09E+01
			I-131	<3.00E+01	0.00E+00	3.00E+01
			Cs-134	<2.60E+01	0.00E+00	2.60E+01
			Cs-137	<2.85E+01	0.00E+00	2.85E+01
			BaLa-140	<4.08E+01	0.00E+00	4.08E+01
			Be-7	1.06E+03	2.98E+02	3.30E+02
			K-40	4.93E+03	8.40E+02	3.88E+02
478075	7/3/2018 - 7/3/2018	MIXEDBLV	Mn-54	<3.21E+01	0.00E+00	3.21E+01
			Co-58	<2.48E+01	0.00E+00	2.48E+01
			Fe-59	<7.73E+01	0.00E+00	7.73E+01
			Co-60	<4.01E+01	0.00E+00	4.01E+01
			Zn-65	<6.62E+01	0.00E+00	6.62E+01
			Zr-95	<5.22E+01	0.00E+00	5.22E+01
			Nb-95	<3.72E+01	0.00E+00	3.72E+01
			I-131	<3.74E+01	0.00E+00	3.74E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [INDICATOR - S @ 0.48 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
478075	7/3/2018 - 7/3/2018		Cs-134	<3.87E+01	0.00E+00	3.87E+01
			Cs-137	<3.44E+01	0.00E+00	3.44E+01
			BaLa-140	<4.77E+01	0.00E+00	4.77E+01
			Be-7	1.29E+03	3.27E+02	3.28E+02
			K-40	5.56E+03	9.43E+02	5.60E+02
479943	8/7/2018 - 8/7/2018		Mn-54	<1.80E+01	0.00E+00	1.80E+01
			Co-58	<3.04E+01	0.00E+00	3.04E+01
			Fe-59	<6.14E+01	0.00E+00	6.14E+01
			Co-60	<2.07E+01	0.00E+00	2.07E+01
			Zn-65	<6.91E+01	0.00E+00	6.91E+01
			Zr-95	<5.53E+01	0.00E+00	5.53E+01
			Nb-95	<4.34E+01	0.00E+00	4.34E+01
			I-131	<2.42E+01	0.00E+00	2.42E+01
			Cs-134	<3.94E+01	0.00E+00	3.94E+01
			Cs-137	<3.89E+01	0.00E+00	3.89E+01
			BaLa-140	<3.87E+01	0.00E+00	3.87E+01
			Be-7	5.98E+02	2.75E+02	3.79E+02
			K-40	1.61E+03	5.63E+02	6.45E+02
482190	9/4/2018 - 9/4/2018		Mn-54	<2.87E+01	0.00E+00	2.87E+01
			Co-58	<3.14E+01	0.00E+00	3.14E+01
			Fe-59	<7.18E+01	0.00E+00	7.18E+01
			Co-60	<3.27E+01	0.00E+00	3.27E+01
			Zn-65	<7.66E+01	0.00E+00	7.66E+01
			Zr-95	<4.95E+01	0.00E+00	4.95E+01
			Nb-95	<3.41E+01	0.00E+00	3.41E+01
			I-131	<3.46E+01	0.00E+00	3.46E+01
			Cs-134	<3.38E+01	0.00E+00	3.38E+01
			Cs-137	<2.92E+01	0.00E+00	2.92E+01
			BaLa-140	<3.26E+01	0.00E+00	3.26E+01
			Be-7	1.51E+03	3.35E+02	3.03E+02
			K-40	5.41E+03	9.21E+02	5.39E+02
484148	10/2/2018 - 10/2/2018		Mn-54	<3.70E+01	0.00E+00	3.70E+01
			Co-58	<4.07E+01	0.00E+00	4.07E+01
			Fe-59	<7.25E+01	0.00E+00	7.25E+01
			Co-60	<3.31E+01	0.00E+00	3.31E+01
			Zn-65	<7.47E+01	0.00E+00	7.47E+01
			Zr-95	<6.71E+01	0.00E+00	6.71E+01
			Nb-95	<4.87E+01	0.00E+00	4.87E+01
			I-131	<3.24E+01	0.00E+00	3.24E+01
			Cs-134	<3.32E+01	0.00E+00	3.32E+01
			Cs-137	<3.59E+01	0.00E+00	3.59E+01
			BaLa-140	<4.91E+01	0.00E+00	4.91E+01
			Be-7	9.30E+02	3.57E+02	4.58E+02
			K-40	4.75E+03	9.08E+02	9.68E+01
488786	11/6/2018 - 11/6/2018		Mn-54	<1.78E+01	0.00E+00	1.78E+01
			Co-58	<2.10E+01	0.00E+00	2.10E+01
			Fe-59	<4.13E+01	0.00E+00	4.13E+01
			Co-60	<1.78E+01	0.00E+00	1.78E+01
			Zn-65	<4.24E+01	0.00E+00	4.24E+01
			Zr-95	<3.57E+01	0.00E+00	3.57E+01
			Nb-95	<2.36E+01	0.00E+00	2.36E+01
			I-131	<4.59E+01	0.00E+00	4.59E+01
			Cs-134	<1.97E+01	0.00E+00	1.97E+01
			Cs-137	<1.59E+01	0.00E+00	1.59E+01
			BaLa-140	<3.85E+01	0.00E+00	3.85E+01
			Be-7	9.02E+02	2.03E+02	2.50E+02
			K-40	5.44E+03	6.33E+02	3.13E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 226 [INDICATOR - S @ 0.48 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
490737	12/4/2018 - 12/4/2018		Mn-54	<3.21E+01	0.00E+00	3.21E+01
			Co-58	<2.97E+01	0.00E+00	2.97E+01
			Fe-59	<5.57E+01	0.00E+00	5.57E+01
			Co-60	<3.34E+01	0.00E+00	3.34E+01
			Zn-65	<7.78E+01	0.00E+00	7.78E+01
			Zr-95	<6.00E+01	0.00E+00	6.00E+01
			Nb-95	<3.34E+01	0.00E+00	3.34E+01
			I-131	<4.04E+01	0.00E+00	4.04E+01
			Cs-134	<3.90E+01	0.00E+00	3.90E+01
			Cs-137	<1.99E+01	0.00E+00	1.99E+01
			BaLa-140	<5.56E+01	0.00E+00	5.56E+01
			Be-7	1.18E+03	3.22E+02	3.38E+02
			K-40	5.69E+03	9.51E+02	4.37E+02

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
432628	1/3/2018 - 1/3/2018		Mn-54	<3.34E+01	0.00E+00	3.34E+01
			Co-58	<3.14E+01	0.00E+00	3.14E+01
			Fe-59	<5.66E+01	0.00E+00	5.66E+01
			Co-60	<3.40E+01	0.00E+00	3.40E+01
			Zn-65	<6.69E+01	0.00E+00	6.69E+01
			Zr-95	<6.26E+01	0.00E+00	6.26E+01
			Nb-95	<3.65E+01	0.00E+00	3.65E+01
			I-131	<4.46E+01	0.00E+00	4.46E+01
			Cs-134	<4.31E+01	0.00E+00	4.31E+01
			Cs-137	<3.53E+01	0.00E+00	3.53E+01
			BaLa-140	<4.56E+01	0.00E+00	4.56E+01
			Be-7	2.65E+03	4.19E+02	3.89E+02
			K-40	7.14E+03	9.57E+02	5.96E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
466673	2/6/2018 - 2/6/2018		Mn-54	<2.97E+01	0.00E+00	2.97E+01
			Co-58	<3.32E+01	0.00E+00	3.32E+01
			Fe-59	<6.04E+01	0.00E+00	6.04E+01
			Co-60	<2.76E+01	0.00E+00	2.76E+01
			Zn-65	<5.43E+01	0.00E+00	5.43E+01
			Zr-95	<6.00E+01	0.00E+00	6.00E+01
			Nb-95	<3.49E+01	0.00E+00	3.49E+01
			I-131	<3.68E+01	0.00E+00	3.68E+01
			Cs-134	<3.74E+01	0.00E+00	3.74E+01
			Cs-137	<2.85E+01	0.00E+00	2.85E+01
			BaLa-140	<5.17E+01	0.00E+00	5.17E+01
			Be-7	2.21E+03	4.34E+02	3.84E+02
			K-40	5.37E+03	9.06E+02	5.45E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
468632	3/6/2018 - 3/6/2018		Mn-54	<2.85E+01	0.00E+00	2.85E+01
			Co-58	<2.33E+01	0.00E+00	2.33E+01
			Fe-59	<5.88E+01	0.00E+00	5.88E+01
			Co-60	<2.12E+01	0.00E+00	2.12E+01
			Zn-65	<4.77E+01	0.00E+00	4.77E+01
			Zr-95	<4.48E+01	0.00E+00	4.48E+01
			Nb-95	<2.37E+01	0.00E+00	2.37E+01
			I-131	<2.11E+01	0.00E+00	2.11E+01
			Cs-134	<3.20E+01	0.00E+00	3.20E+01
			Cs-137	<2.97E+01	0.00E+00	2.97E+01
			BaLa-140	<3.13E+01	0.00E+00	3.13E+01
			Be-7	1.03E+03	2.72E+02	2.90E+02
			K-40	4.07E+03	7.52E+02	5.47E+02

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
471651	4/3/2018 - 4/3/2018		Mn-54	<3.59E+01	0.00E+00	3.59E+01
			Co-58	<3.06E+01	0.00E+00	3.06E+01
			Fe-59	<5.90E+01	0.00E+00	5.90E+01
			Co-60	<3.50E+01	0.00E+00	3.50E+01
			Zn-65	<5.60E+01	0.00E+00	5.60E+01



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
471651	4/3/2018 - 4/3/2018	MIXEDBLV	Zr-95	<4.77E+01	0.00E+00	4.77E+01
			Nb-95	<2.82E+01	0.00E+00	2.82E+01
			I-131	<3.13E+01	0.00E+00	3.13E+01
			Cs-134	<2.92E+01	0.00E+00	2.92E+01
			Cs-137	<4.20E+01	0.00E+00	4.20E+01
			BaLa-140	<4.26E+01	0.00E+00	4.26E+01
			Be-7	8.88E+02	2.81E+02	3.26E+02
			K-40	6.75E+03	1.04E+03	5.02E+02
473572	5/1/2018 - 5/1/2018	MIXEDBLV	Mn-54	<2.38E+01	0.00E+00	2.38E+01
			Co-58	<2.69E+01	0.00E+00	2.69E+01
			Fe-59	<5.76E+01	0.00E+00	5.76E+01
			Co-60	<3.27E+01	0.00E+00	3.27E+01
			Zn-65	<6.94E+01	0.00E+00	6.94E+01
			Zr-95	<4.68E+01	0.00E+00	4.68E+01
			Nb-95	<2.61E+01	0.00E+00	2.61E+01
			I-131	<3.43E+01	0.00E+00	3.43E+01
			Cs-134	<3.47E+01	0.00E+00	3.47E+01
			Cs-137	<3.74E+01	0.00E+00	3.74E+01
			BaLa-140	<3.94E+01	0.00E+00	3.94E+01
			Be-7	2.56E+02	1.65E+02	2.40E+02
			K-40	4.11E+03	7.44E+02	5.30E+02
			475155	6/5/2018 - 6/5/2018	MIXEDBLV	Mn-54
Co-58	<3.51E+01	0.00E+00				3.51E+01
Fe-59	<6.99E+01	0.00E+00				6.99E+01
Co-60	<4.10E+01	0.00E+00				4.10E+01
Zn-65	<6.40E+01	0.00E+00				6.40E+01
Zr-95	<5.71E+01	0.00E+00				5.71E+01
Nb-95	<3.95E+01	0.00E+00				3.95E+01
I-131	<3.72E+01	0.00E+00				3.72E+01
Cs-134	<3.45E+01	0.00E+00				3.45E+01
Cs-137	<4.86E+01	0.00E+00				4.86E+01
BaLa-140	<4.89E+01	0.00E+00				4.89E+01
Be-7	1.82E+03	4.45E+02				4.60E+02
K-40	3.43E+03	7.38E+02				9.29E+01
478076	7/3/2018 - 7/3/2018	MIXEDBLV				Mn-54
			Co-58	<3.15E+01	0.00E+00	3.15E+01
			Fe-59	<6.51E+01	0.00E+00	6.51E+01
			Co-60	<3.51E+01	0.00E+00	3.51E+01
			Zn-65	<7.19E+01	0.00E+00	7.19E+01
			Zr-95	<6.03E+01	0.00E+00	6.03E+01
			Nb-95	<3.18E+01	0.00E+00	3.18E+01
			I-131	<4.78E+01	0.00E+00	4.78E+01
			Cs-134	<4.07E+01	0.00E+00	4.07E+01
			Cs-137	<3.67E+01	0.00E+00	3.67E+01
			BaLa-140	<4.19E+01	0.00E+00	4.19E+01
			Be-7	7.46E+02	3.14E+02	4.41E+02
			K-40	3.36E+03	6.86E+02	5.39E+02
			479944	8/7/2018 - 8/7/2018	MIXEDBLV	Mn-54
Co-58	<3.29E+01	0.00E+00				3.29E+01
Fe-59	<6.95E+01	0.00E+00				6.95E+01
Co-60	<5.14E+01	0.00E+00				5.14E+01
Zn-65	<7.82E+01	0.00E+00				7.82E+01
Zr-95	<6.07E+01	0.00E+00				6.07E+01
Nb-95	<3.57E+01	0.00E+00				3.57E+01
I-131	<4.05E+01	0.00E+00				4.05E+01
Cs-134	<3.47E+01	0.00E+00				3.47E+01
Cs-137	<5.26E+01	0.00E+00				5.26E+01
BaLa-140	<4.72E+01	0.00E+00				4.72E+01
Be-7	2.96E+03	5.90E+02				5.82E+02



CATAWBA Radiological Environmental Monitoring Analysis Report - 2018 (Appendix E)

Media Type: VEGETATION Concentration (Activity): pCi/kg

Sample Point 258 [CONTROL - W @ 9.84 miles]

Sample ID:	Sample Dates:	MIXEDBLV	Nuclide	Activity	2 Sigma Error	MDA
479944	8/7/2018 - 8/7/2018		K-40	3.55E+03	8.01E+02	5.41E+02
482191	9/4/2018 - 9/4/2018		Mn-54	<2.44E+01	0.00E+00	2.44E+01
			Co-58	<2.72E+01	0.00E+00	2.72E+01
			Fe-59	<4.84E+01	0.00E+00	4.84E+01
			Co-60	<2.49E+01	0.00E+00	2.49E+01
			Zn-65	<5.81E+01	0.00E+00	5.81E+01
			Zr-95	<4.60E+01	0.00E+00	4.60E+01
			Nb-95	<2.65E+01	0.00E+00	2.65E+01
			I-131	<2.40E+01	0.00E+00	2.40E+01
			Cs-134	<3.67E+01	0.00E+00	3.67E+01
			Cs-137	<2.89E+01	0.00E+00	2.89E+01
			BaLa-140	<3.36E+01	0.00E+00	3.36E+01
			Be-7	1.25E+03	2.91E+02	3.29E+02
			K-40	3.42E+03	6.26E+02	4.81E+02
484149	10/2/2018 - 10/2/2018		Mn-54	<3.54E+01	0.00E+00	3.54E+01
			Co-58	<2.63E+01	0.00E+00	2.63E+01
			Fe-59	<5.09E+01	0.00E+00	5.09E+01
			Co-60	<4.10E+01	0.00E+00	4.10E+01
			Zn-65	<6.24E+01	0.00E+00	6.24E+01
			Zr-95	<4.85E+01	0.00E+00	4.85E+01
			Nb-95	<3.72E+01	0.00E+00	3.72E+01
			I-131	<3.70E+01	0.00E+00	3.70E+01
			Cs-134	<4.55E+01	0.00E+00	4.55E+01
			Cs-137	<3.78E+01	0.00E+00	3.78E+01
			BaLa-140	<3.26E+01	0.00E+00	3.26E+01
			Be-7	1.89E+03	4.05E+02	3.94E+02
			K-40	2.99E+03	6.44E+02	3.54E+02
488787	11/6/2018 - 11/6/2018		Mn-54	<1.58E+01	0.00E+00	1.58E+01
			Co-58	<1.86E+01	0.00E+00	1.86E+01
			Fe-59	<3.34E+01	0.00E+00	3.34E+01
			Co-60	<1.76E+01	0.00E+00	1.76E+01
			Zn-65	<3.23E+01	0.00E+00	3.23E+01
			Zr-95	<2.72E+01	0.00E+00	2.72E+01
			Nb-95	<1.84E+01	0.00E+00	1.84E+01
			I-131	<4.30E+01	0.00E+00	4.30E+01
			Cs-134	<2.50E+01	0.00E+00	2.50E+01
			Cs-137	<1.58E+01	0.00E+00	1.58E+01
			BaLa-140	<3.09E+01	0.00E+00	3.09E+01
			Be-7	1.06E+03	2.00E+02	2.38E+02
			K-40	2.81E+03	3.79E+02	2.80E+02
490738	12/4/2018 - 12/4/2018		Mn-54	<2.70E+01	0.00E+00	2.70E+01
			Co-58	<2.53E+01	0.00E+00	2.53E+01
			Fe-59	<5.84E+01	0.00E+00	5.84E+01
			Co-60	<2.85E+01	0.00E+00	2.85E+01
			Zn-65	<6.16E+01	0.00E+00	6.16E+01
			Zr-95	<4.41E+01	0.00E+00	4.41E+01
			Nb-95	<2.91E+01	0.00E+00	2.91E+01
			I-131	<3.55E+01	0.00E+00	3.55E+01
			Cs-134	<3.29E+01	0.00E+00	3.29E+01
			Cs-137	<3.03E+01	0.00E+00	3.03E+01
			BaLa-140	<2.94E+01	0.00E+00	2.94E+01
			Be-7	1.54E+03	3.19E+02	3.76E+02
			K-40	3.40E+03	5.36E+02	3.79E+02



APPENDIX F

**ERRATA TO
PREVIOUS REPORTS**

2018

There are no errata to be appended to the 2018
Catawba Nuclear Station AREOR.