

INFORMATION SHEET

PRESIDING: Commissioner Clodfelter, Presiding; Chair Mitchell; and Commissioners Brown-Bland, Gray, Duffley, Hughes, McKissick

PLACE: Held Via Videoconference

DATE: Tuesday, September 29, 2020

TIME: 1:32 p.m. – 4:37 p.m.

DOCKET NOS.: E-2, Sub 1219 and E-2, Sub 1193

COMPANY: Duke Energy Carolinas, LLC; Duke Energy Progress, LLC

DESCRIPTION: E-2, Sub 1219, In the Matter of Duke Energy Progress, LLC, for Adjustment of Rates and Charges Applicable to Electric Utility Service in North Carolina; E-2, Sub 1193, Application of Duke Energy Progress, LLC, for an Accounting Order to Defer Incremental Storm Damage Expenses Incurred as a Result of Hurricanes Florence and Michael and Winter Storm Diego

VOLUME NUMBER: 12

APPEARANCES

(See attached.)

WITNESSES

(See attached.)

EXHIBITS

(See attached.)

COPIES ORDERED: Downey, Culpepper, Holt, Cummings, Edmondson, Grantmyre, Dodge, Jost, Little, Luhr, Force, Townsend, Robinson, Somers, Kells, Mehta, Lee, Cress, Ross, Ledford, Smith, Schauer, Heslin, Su, Crystal and Beverly

CONFIDENTIAL TRANSCRIPTS and EXHIBITS ORDERED: Robinson, Heslin, Somers, Kells, Jagannathan, Mehta, Lee, Cress, Ross, Jenkins, Beverly, Ledford, Smith, Crystal, Su, Force, Townsend, Downey, Schauer, Culpepper, Cummings, Dodge, Edmondson, Grantmyre, Holt, Jost, Little, Luhr and Coxton

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TIME: 1:32 P.M. - 4:37 P.M.

DOCKET NO.: E-2, Sub 1219

E-2, Sub 1193

BEFORE: Commissioner Daniel G. Clodfelter, Presiding
Chair Charlotte A. Mitchell

Commissioner Tonia D. Brown-Bland

Commissioner Lyons Gray

Commissioner Kimberly W. Duffley

Commissioner Jeffrey A. Hughes

Commissioner Floyd B. McKissick, Jr.

IN THE MATTER OF:

DOCKET NO. E-2, SUB 1219

Application by Duke Energy Progress, LLC,
for Adjustment of Rates and Charges Applicable to
Electric Utility Service in North Carolina
and



DOCKET NO. E-2, SUB 1193

Application of Duke Energy Progress, LLC
for an Accounting Order to Defer Incremental Storm
Damage Expenses Incurred as a Result of Hurricanes
Florence and Michael and Winter Storm Diego

VOLUME 12

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T A B L E O F C O N T E N T S
E X A M I N A T I O N S

PANEL OF MICHAEL J. PIRRO, LON HUBER, AND JANICE HAGER PAGE

Cross Examination By Mr. Neal 19

JESSICA L. BEDNARCIK PAGE

Direct Examination By Mr. Marzo 28

Prefiled Direct Testimony of 31
Jessica L. Bednarci k

Prefiled Summary of Testimony of 60
Jessica L. Bednarci k

Testimony From Docket Number E-7, Sub 1214 64
Transcript
Volume 13, Page 223, Line 1 Through
Page 233, Line 18

Testimony From Docket Number E-7, Sub 1214 75
Transcript
Volume 14, Page 12, Line 1 Through Page 143,
Line 20

Testimony From Docket Number E-7, Sub 1214 207
Transcript
Volume 15, Page 12, Line 2 Through Page 85,
Line 7

Cross Examination By Ms. Townsend 287

E X H I B I T S

I D E N T I F I E D / A D M I T T E D

1		
2		
3	Justice Center, et al. Pirro/Hager ...	22/26
4	Cross Exhibit Number 2	
5	Hager/Pirro/Huber Public Staff Cross .	- /25
6	Examination Exhibit 2	
7	Pirro Exhibit 1	- /26
8	Pirro Revised Exhibit 2	- /26
9	Pirro Exhibit 3	- /26
10	Pirro Corrected Exhibit 4	- /26
11	Pirro Exhibits 5 through 8	- /26
12	Pirro Supplemental Exhibits 2 and 4 ..	- /26
13	Pirro Second Settlement Exhibits 4 ...	- /26
14	and 8	
15	Bednarci k Direct Exhibits 1 through ..	30/ -
16	19	
17	AGO Bednarci k Direct Cross Exhibits ..	- /281
18	Number 1 through 6 from Docket Number	
19	E-7, Sub 1214	
20	Sierra Club Bednarci k Direct Cross ...	- /281
21	Exhibit Number 1 From Docket Number	
22	E-7, Sub 1214	
23	AGO DEP Bednarci k Cross Exhibit	290/ -
24	Numbers 7 through 14	
	AGO DEP Bednarci k Cross Exhibit	308/ -
	Numbers 7 through 14 were renamed as	
	Bednarci k Direct AGO Cross	
	Examination Exhibits 7 through 14	
	Bednarci k Direct AGO Cross	308/ -
	Examination Exhibit 15	

1	Bednarci k Di rect AGO Cross	312/ -
2	Exami nati on Exhi bi t 16	
3	Bednarci k Di rect AGO Cross	320/ -
4	Exami nati on Exhi bi t 17	
5	Bednarci k Di rect AGO Cross	324/ -
6	Exami nati on Exhi bi t 18	
7	Bednarci k Di rect AGO Cross	341/ -
8	Exami nati on Exhi bi t Number 19	
9	Bednarci k Di rect AGO Cross	349/ -
10	Exami nati on Exhi bi t 20	
11	Bednarci k Di rect AGO Cross	353/ -
12	Exami nati on Exhi bi t 21	
13	Bednarci k Di rect AGO Cross	361/ -
14	Exami nati on Exhi bi t Number 22	
15	Bednarci k Di rect AGO Cross	365/ -
16	Exami nati on Exhi bi t 23	
17	Bednarci k Di rect AGO Cross	367/ -
18	Exami nati on Exhi bi t Number 24	
19	Bednarci k Di rect AGO Cross	371/ -
20	Exami nati on Exhi bi t Number 25	
21	Bednarci k Di rect AGO Cross	375/ -
22	Exami nati on Exhi bi t Number 26	
23	Bednarci k Di rect AGO Cross	379/ -
24	Exami nati on Exhi bi t Number 27	

**Duke Energy Progress
Response to
NC Public Staff Data Request
Data Request No. NCPS 60**

Docket No. E-2, Sub 1219

**Date of Request: January 8, 2020
Date of Response: January 17, 2020**

☐

CONFIDENTIAL

☒

NOT CONFIDENTIAL

Confidential Responses are provided pursuant to Confidentiality Agreement

The attached response to NC Public Staff Data Request No. 60-15, was provided to me by the following individual(s): Sumita M. Deshmukh, Rates & Regulatory Strategy Manager, and was provided to NC Public Staff under my supervision.

Camal. O. Robinson
Senior Counsel
Duke Energy Progress

Request:

15. Please provide a calculation for the "minimum intercept method" and the "basic customer method" of apportioning distribution system costs as customer or demand-related. The Company's response should be accompanied by workpapers showing the calculations. The Company's response may refer to information or workpapers provided to the Public Staff in response to the Public Staff's report filed March 28, 2019 in Docket No. E-100, Sub 162.

Response:

DEP has not done a minimum system calculation using the "minimum intercept method" because the Company's fixed asset system does not contain sufficient detail required to calculate this method. Unit costs applying the basic customer method to the adjusted cost of service at proposed rates under the 1 summer CP allocation method can be found below row 77 of the attached "[DEP PS DR 60-15 No Min Sys Unit Costs.xlsx](#)" file.

The supporting bundled and unbundled cost of service studies for this scenario have also been attached with this response.



DEP PS DR 60-15 No
Min Sys Unit Costs.x



DEP PS DR 60-15
1CP No Min Sys Unb



DEP PS DR 60-15
1CP No Min Sys Bun

DUKE ENERGY PROGRESS, LLC
DOCKET NO. E-2 Sub 1219 E1 Item #45E "Proforma Adjusted at Proposed Rates"
NORTH CAROLINA RETAIL COST OF SERVICE STUDY
TEST YEAR ENDING DECEMBER 31 2018
Summer 1 CP Demand Allocation without Minimum System
PS DR 60-15 Unit Costs

		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UNIT COST DETAIL - REVENUES		RETAIL	RES	SGS	SGSCLR	MGS	LGS	SI	TSS	ALS	SLS	SFL
TOTAL FUNCTIONALIZED REVENUES												
	PROD_DEMAND	1,275,538,882	639,402,155	80,769,176	905,968	352,104,522	201,332,939	869,511	145,688	7,825	1,089	9
	PROD_ENERGY	1,512,477,135	656,508,987	78,062,438	1,255,277	469,301,676	290,835,678	1,872,726	193,094	11,071,607	3,331,624	44,027
	TRANSMISSION	186,475,334	93,532,631	11,996,087	154,578	50,577,169	30,066,058	123,084	25,728	0	0	0
	DIST_SUBS	81,406,095	52,408,702	5,084,567	30,209	15,164,105	7,575,443	467,935	5,063	528,573	102,350	39,147
	DIST_PRIMARY	392,193,924	264,276,209	25,445,248	138,255	77,189,678	19,550,876	2,405,131	22,668	2,431,815	524,540	209,504
	DIST_L_XFMR	95,246,543	64,621,258	6,313,624	39,082	18,581,662	4,312,521	564,733	6,615	681,965	125,082	0
	DIST_SEC_SERV	202,676,871	85,139,687	8,186,606	45,195	18,858,642	0	270,201	7,436	55,260,408	34,908,696	0
	CUSTOMER	179,320,823	147,345,755	19,960,184	950,910	9,716,750	935,406	186,532	61,351	15,565	133,905	14,466
	Total	3,925,335,607	2,003,235,384	235,817,930	3,519,474	1,011,494,205	554,608,921	6,759,852	467,641	69,997,759	39,127,286	307,153
TOTAL SALES OF ELECTRICITY												
	PROD_DEMAND	1,269,669,429	635,600,364	80,257,511	895,504	351,093,830	200,802,688	866,547	144,062	7,825	1,089	9
	PROD_ENERGY	1,500,198,934	653,978,414	77,224,807	1,223,343	468,748,807	286,419,607	1,869,563	189,398	8,959,675	1,541,546	43,777
	TRANSMISSION	179,121,483	89,761,770	11,524,991	149,594	48,597,739	28,944,364	118,047	24,978	0	0	0
	DIST_SUBS	80,307,201	51,657,066	5,011,361	29,704	14,988,062	7,489,454	462,075	4,984	524,808	101,130	38,556
	DIST_PRIMARY	377,823,908	254,438,803	24,511,367	133,632	74,488,066	18,943,940	2,317,270	21,969	2,373,131	394,851	200,880
	DIST_L_XFMR	93,800,083	63,591,131	6,213,371	38,404	18,333,807	4,260,250	556,605	6,508	676,645	123,362	0
	DIST_SEC_SERV	200,797,918	84,255,276	8,099,492	44,536	18,718,727	0	268,003	7,333	54,862,973	34,541,578	0
	CUSTOMER	172,270,753	141,377,029	19,154,715	914,435	9,498,835	928,901	181,857	57,673	15,565	127,696	14,046
	Total	3,873,989,709	1,974,659,853	231,997,614	3,429,152	1,004,467,874	547,789,204	6,639,967	456,904	67,420,622	36,831,251	297,268
NON REQ'T SALES REVENUE												
	PROD_DEMAND	4,817,627	2,389,495	294,137	2,421	1,357,641	770,167	3,415	351	0	0	0
	PROD_ENERGY	130,052,588	56,205,112	6,579,490	106,617	37,638,146	28,168,655	144,595	16,035	903,123	287,021	3,793
	TRANSMISSION	45,117	22,377	2,755	23	12,714	7,213	32	3	0	0	0
	DIST_SUBS	0	0	0	0	0	0	0	0	0	0	0
	DIST_PRIMARY	0	0	0	0	0	0	0	0	0	0	0
	DIST_L_XFMR	0	0	0	0	0	0	0	0	0	0	0
	DIST_SEC_SERV	0	0	0	0	0	0	0	0	0	0	0
	CUSTOMER	0	0	0	0	0	0	0	0	0	0	0
	Total	134,915,331	58,616,985	6,876,382	109,061	39,008,501	28,946,034	148,042	16,389	903,123	287,021	3,793
FUNCTIONALIZED REQ'TS RATE SCHED REV												
	PROD_DEMAND	1,264,851,802	633,210,869	79,963,374	893,083	349,736,190	200,032,521	863,132	143,711	7,825	1,089	9
	PROD_ENERGY	1,370,146,347	597,773,302	70,645,316	1,116,725	431,110,660	258,250,953	1,724,968	173,362	8,056,552	1,254,525	39,983
	TRANSMISSION	179,076,366	89,739,392	11,522,236	149,571	48,585,025	28,937,152	118,015	24,975	0	0	0
	DIST_SUBS	80,307,201	51,657,066	5,011,361	29,704	14,988,062	7,489,454	462,075	4,984	524,808	101,130	38,556
	DIST_PRIMARY	377,823,908	254,438,803	24,511,367	133,632	74,488,066	18,943,940	2,317,270	21,969	2,373,131	394,851	200,880
	DIST_L_XFMR	93,800,083	63,591,131	6,213,371	38,404	18,333,807	4,260,250	556,605	6,508	676,645	123,362	0
	DIST_SEC_SERV	200,797,918	84,255,276	8,099,492	44,536	18,718,727	0	268,003	7,333	54,862,973	34,541,578	0
	CUSTOMER	172,270,753	141,377,029	19,154,715	914,435	9,498,835	928,901	181,857	57,673	15,565	127,696	14,046
	Total	3,739,074,378	1,916,042,868	225,121,232	3,320,091	965,459,373	518,843,170	6,491,925	440,515	66,517,499	36,544,230	293,474
Revenues for Rate Design: Including Proposed Increase												
Present Revenues per Pirro Exhibit 4, col. (B)		3,160,649,746	1,605,490,440	192,929,820	3,261,129	818,808,517	445,917,273	5,098,850	442,999	62,409,821	26,085,299	205,598
Minus: Adjustments to Exclude per Pirro Exhibit 4		72,209,674	63,014,384	19,155,966	296,747	(8,622,376)	(1,423,708)	(374,132)	(5,324)	120,775	50,480	(3,137)
Plus: Target Revenue Increase for Rate Design per Pirro Exhibit 4, col. (U)		599,783,973	327,722,883	36,559,280	103,715	146,134,249	73,112,288	1,300,002	1,449	10,411,311	4,351,593	87,202
Proposed Revenues for Rate Design		3,832,643,393	1,996,227,708	248,645,065	3,661,591	956,320,390	517,605,853	6,024,720	439,123	72,941,907	30,487,373	289,663

DUKE ENERGY PROGRESS, LLC
DOCKET NO. E-2 Sub 1219 E1 Item #45E "Proforma Adjusted at Proposed Rates"
NORTH CAROLINA RETAIL COST OF SERVICE STUDY
TEST YEAR ENDING DECEMBER 31 2018
Summer 1 CP Demand Allocation without Minimum System
PS DR 60-15 Unit Costs

	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UNIT COST DETAIL - REVENUES	RETAIL	RES	SGS	SGSCLR	MGS	LGS	SI	TSS	ALS	SLS	SFL
FUNCT REQ'TS RATE SCHED RE											
PROD_DEMAND	1,296,504,271	659,710,230	88,319,072	984,945	346,425,607	199,555,491	801,015	143,257	8,581	908	9
PROD_ENERGY	1,404,433,775	622,789,629	78,027,333	1,231,590	427,029,792	257,635,086	1,600,827	172,815	8,834,672	1,046,600	39,464
TRANSMISSION	183,557,689	93,494,913	12,726,242	164,956	48,125,122	28,868,143	109,522	24,896	0	0	0
DIST_SUBS	82,316,860	53,818,873	5,535,018	32,760	14,846,186	7,471,593	428,821	4,968	575,495	84,369	38,056
DIST_PRIMARY	387,278,818	265,086,861	27,072,659	147,377	73,782,966	18,898,763	2,150,503	21,900	2,602,333	329,408	198,271
DIST_L_XFMR	96,147,397	66,252,368	6,862,631	42,355	18,160,261	4,250,090	516,548	6,487	741,997	102,916	0
DIST_SEC_SERV	205,822,815	87,781,291	8,945,841	49,117	18,541,537	0	248,716	7,309	60,161,761	28,816,642	0
CUSTOMER	176,581,768	147,293,543	21,156,269	1,008,493	9,408,920	926,686	168,769	57,491	17,068	106,531	13,864
Total	3,832,643,393	1,996,227,708	248,645,065	3,661,591	956,320,390	517,605,853	6,024,720	439,123	72,941,907	30,487,373	289,663
FUNCT REVENUE for RATE DES Demand	2,251,627,851	1,226,144,536	149,461,463	1,421,508	519,881,679	259,044,081	4,255,124	208,817	64,090,166	29,334,242	236,335
Energy	1,404,433,775	622,789,629	78,027,333	1,231,590	427,029,792	257,635,086	1,600,827	172,815	8,834,672	1,046,600	39,464
Customer	176,581,768	147,293,543	21,156,269	1,008,493	9,408,920	926,686	168,769	57,491	17,068	106,531	13,864
	3,832,643,393	1,996,227,708	248,645,065	3,661,591	956,320,390	517,605,853	6,024,720	439,123	72,941,907	30,487,373	289,663
Billing Determinants	Summer CP kW (DP adj @ meter)	3,690,872	454,333	3,739	2,099,254	1,204,485	5,292				
	Adj kWh Sales (E2 at meter)	16,666,046,589	1,950,982,004	31,614,397	11,178,964,878	8,457,791,022	43,075,313	4,754,792			1,134,908
	Year End No. Cust (C1)	1,199,988	160,062	6,011	38,728	279	851	780			78
Unit Cost per Billing Determinants											
	Demand \$/kW-Month	27.68	27.41	31.68	20.64	17.92	67.00	N/A	N/A	N/A	N/A
	Energy ¢/kWh	3.74	4.00	3.90	3.82	3.05	3.72	3.63	N/A	N/A	3.48
	Cust \$/Month	10.23	11.01	13.98	20.25	276.79	16.53	6.14	N/A	N/A	14.81
Unit Costs - ¢/kWh	Demand	7.36	7.66	4.50	4.65	3.06	9.88	4.39	N/A	N/A	20.82
	Energy	3.74	4.00	3.90	3.82	3.05	3.72	3.63	N/A	N/A	3.48
	Customer	0.88	1.08	3.19	0.08	0.01	0.39	1.21	N/A	N/A	1.22
	Total	11.98	12.74	11.58	8.55	6.12	13.99	9.24	N/A	N/A	25.52



June 26, 2020

VIA ELECTRONIC FILING

Ms. Kimberley A. Campbell
Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

**Re: Duke Energy Progress, LLC's Agreement and Stipulation of
Settlement with CIGFUR
Docket No. E-2, Sub 1219**

Dear Ms. Campbell:

I enclose the Agreement and Stipulation of Settlement between Duke Energy Progress, LLC and Carolina Industrial Group for Fair Utility Rates II for filing in connection with the referenced matter.

Thank you for your attention to this matter. If you have any questions, please let me know.

Sincerely,

A handwritten signature in black ink, appearing to read "Lawrence B. Somers", written in a cursive style.

Lawrence B. Somers

Enclosure

cc: Parties of Record

**STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH**

DOCKET NO. E-2, SUB 1219

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of:)	
Application of Duke Energy Progress, LLC)	
For Adjustment of Rates and Charges)	AGREEMENT AND STIPULATION
Applicable to Electric Service in North)	OF SETTLEMENT
Carolina)	

Duke Energy Progress, LLC (“DEP” or the “Company”) and the Carolina Industrial Group for Fair Utility Rates II (“CIGFUR II”), collectively referred to herein as the “Stipulating Parties” through counsel and pursuant to N.C. Gen. Stat. § 62-69, respectfully submit the following Agreement and Stipulation of Settlement (“Stipulation”) for consideration by the North Carolina Utilities Commission (“Commission”) in the above captioned docket (the “Docket”).

I. Background

A. On September 30, 2019, the Company filed its Notice of Intent to file a General Rate Case Application in the Docket.

B. On October 28, 2019, CIGFUR II filed its Petition to Intervene. The Commission granted CIGFUR II’s intervention in an order dated October 30, 2019.

A. Also on October 30, 2019, the Company filed its application for a general rate increase pursuant to N.C. Gen. Stat. §§ 62-133 and 62-134 and Commission Rule R1-17, along with direct testimony and exhibits requesting a non-fuel base rate increase of approximately \$585.9 million. DEP further proposed to partially offset the increase in revenues by refunding \$120.2 million related to certain tax benefits resulting from the Federal Tax Cut and Jobs Act

through a proposed rider and a rate reduction of \$2.1 million related to the proposed Regulatory Asset and Liability Rider, which results in a proposed net revenue increase of \$463.6 million. Further, DEP's filing requested that the Commission authorize a rate of return on equity ("ROE") of 10.30% and approve a 53 percent equity component of the capital structure.

B. On November 14, 2019, the Commission issued its Order Establishing General Rate Case and Suspending Rates.

C. On December 6, 2019, the Commission issued its Order Scheduling Investigation and Hearings, Establishing Intervention and Testimony Due Dates and Discovery Guidelines, and Requiring Public Notice.

D. On April 13, 2020, CIGFUR II filed the Direct Testimony and Exhibits of Nicholas Phillips, Jr. Mr. Phillips' focused on cost allocation methodology and revenue distribution between the customer classes, industrial rate design, the Company's requested ROE and capital structure, the Company's request to defer Grid Improvement Plan ("GIP") costs, and Rider EDIT-2¹.

E. On May 4, 2020, the Company filed its rebuttal testimony.

F. On May 29, 2020, the Commission issued its Order Proposing Procedures for Partially Consolidated Expert Witness Hearing Scheduling Pre-Hearing Conference, which partially consolidated this Docket with Duke Energy Carolina, LLC's general rate case proceeding, NCUC Docket E-7, Sub 1214.

G. On June 2, 2020, DEP and the Public Staff, North Carolina Utilities Commission filed an Agreement and Stipulation of Partial Settlement as to certain issues in the Docket.

¹ Mr. Phillips did not provide an opinion on a number of the contested issues underlying this docket and nothing in this Stipulation should be interpreted as CIGFUR II's agreement with the Company's proposals on any issue not expressly described herein.

H. On June 8, 2020, DEP filed a Settlement Agreement with Harris Teeter, LLC as to certain issues in the Docket.

I. On June 9, 2020, DEP filed a Settlement Agreement with the Commercial Group as to certain issues in the Docket.

J. The parties to this proceeding have conducted substantial discovery on the issues raised in the Company's Application as well as on the direct, supplemental, and rebuttal testimony of the Company and the testimony of the intervenors.

K. The Company and CIGFUR II now desire to resolve and settle issues that will narrow the number of issues in controversy in this docket.

II. Rate of Return & Capital Structure

The Stipulating Parties agree that the revenues to be approved in this proceeding should be adjusted to provide the Company, through sound management, the opportunity to earn an ROE of 9.75%. The Stipulating Parties further agree that this ROE should be applied to the common equity component of the stipulated ratemaking capital structure consisting of 52% equity and 48% long-term debt.

III. Grid Improvement Plan

A. For the purposes of settlement only and without taking a position on the appropriateness of the individual items comprising the proposed three-year GIP, CIGFUR II supports the Company's request in the Docket for an accounting order for approval to defer costs associated with the incremental grid investments not included in this case and incurred over a three-year period for cost recovery consideration in future general rate cases. Because the three-year GIP plan contains estimates, CIGFUR II's support for the GIP deferral will be subject to a reservation of its rights to review and object to the reasonableness of specific project costs in

future rate cases. To the extent that DEP enters into an agreement with other intervening parties agreeing to a cost cap or to otherwise limit the maximum allowed amount of the three-year GIP deferral, CIGFUR II supports such cost containment measures.

B. With regard to allocating the deferred GIP costs amongst the customer classes, in its next general rate case, DEP will propose to allocate these costs consistent with its distribution cost allocation methodologies as proposed in this Docket. This includes use of the minimum system methodology and use of voltage differentiated allocation factors for distribution plant. Finally, assuming NCUC approval, DEP agrees to use this methodology to allocate any GIP costs occurring during the three-year period for which it may seek cost recovery in future rate cases.

C. For GIP costs incurred beyond the three-year period nothing herein shall be precedent for appropriateness of future deferrals or the allocation of deferred costs and these issues may be contested in future general rate case proceedings.

IV. Unprotected Excess Deferred Income Taxes

The Stipulating Parties agree that unprotected Excess Deferred Income Taxes and deferred revenue giveback to be provided through the EDIT rider should be refunded to customers on a uniform cent/kWh basis.

V. Cost Allocation & Rate Design

A. Prior to the Company's next general rate case, the Stipulating Parties agree to meet to discuss potential cost of service methodologies that the Company may recommend for the purpose of allocating production and transmission costs. In addition, in its next general rate case, the Company shall also file the results of a class cost of service study with production and transmission costs allocated on the basis of the Summer/Winter Coincident Peak method and

consider such results for the sole purpose of apportionment of the change in revenue to the customer classes.

B. In its next general rate case, the Company will adjust its peak demand to remove curtailable/non-firm load, even if it does not call the load. If the Commission approves this adjustment in the Company's next general rate case, then DEP will propose use of this adjustment in its next subsequent rate case.

C. In the Company's next two annual fuel cost recovery proceedings (to be filed in 2021 and 2022), it will propose the uniform percentage average bill adjustment methodology that was most recently approved by the Commission in the Company's 2019 fuel cost recovery proceeding.

D. In its next three general rate cases, DEP agrees to propose to allocate distribution expenses using the minimum system approach; however if the Commission orders a different approach be used in the current rate case or either of the next two rate cases, DEP may elect to propose the minimum system approach in the next subsequent rate case after the NCUC denial, but DEP is not obligated to do so.

E. Should the Company independently undertake or should the Commission order a comprehensive rate design process prior to the Company's next general rate case, the Company agrees to explore the following: (1) a rate schedule targeted at high load users similar to Duke Energy Indiana's HLF rate, (2) allowing RTP customers the opportunity to adjust Customer Baseline Loads ("CBL") to enhance RTP usage, including additional special periods of adjustment, (3) an emergency demand response program similar to Southern California Edison's Time-of-Use Base Interruptible Program (TOU-BIP) tariff, and (4) a rate schedule similar to the Northern Indiana PSC Interruptible Industrial Service Rider. If there is mutual agreement

between CIGFUR II and the Company on the terms of any of the above-referenced rates, and CIGFUR II indicates that at least one of its member customers is willing to take service under such rates, the Company agrees to file said rates with the Commission for approval in its next rate case filing.

1. In the event that the NCUC does not order or DEP does not independently undertake a comprehensive rate design process prior to its next general rate case, then prior to its next general rate case, the Company agrees to consult with CIGFUR II on: (1) a rate schedule targeted at high load users similar to Duke Energy Indiana's HLF rate, (2) allowing RTP customers the opportunity to adjust Customer Baseline Loads ("CBL") to enhance RTP usage, including additional special periods of adjustment, (3) an emergency demand response program similar to Southern California Edison's Time-of-Use Base Interruptible Program (TOU-BIP) tariff, and (4) a rate schedule similar to the Northern Indiana PSC Interruptible Industrial Service Rider. If there is mutual agreement between CIGFUR II and the Company on the terms of discussed rates, and CIGFUR II indicates that at least one of its member customers is willing to take service under such rates, the Company agrees to file said rates with the Commission for approval in its next rate case filing.

2. In the event that rate(s) proposed by the Company pursuant to either section V.E. or section V.E.1., above, are withdrawn by the Company or not approved by the Commission, the Company shall be obligated to work with CIGFUR II to identify an agreeable alternative, and if there is mutual agreement between CIGFUR II and the Company on the terms of alternative rate(s), and CIGFUR II indicates that at least one of its member customers is willing to take service under such rate(s), the Company agrees to file said alternative rates with the Commission for approval in its subsequent rate case filing.

F. CIGFUR and DEP agree that the LGS, LGS-TOU, and LGS-RTP on-peak and off-peak energy charges shall be increased by a percentage that is less than half of the approved overall increase percentage exclusive of any EDIT decrements for the LGS, LGS-TOU and LGS-RTP and rate schedules, respectively. The demand charges for the LGS, LGS-TOU and LGS-RTP rate schedules shall be adjusted by the amount necessary to recover the final LGS, LGS-TOU and LGS-RTP revenue targets, respectively.

VI. Agreement in Support of Settlement; Non-Waiver

A. The Stipulating Parties shall act in good faith and use their best efforts to recommend to the Commission that this Stipulation be accepted and approved. The Stipulating Parties further agree that this Stipulation is in the public interest because it reasonably balances customer interests in mitigating rate impacts with investor interests in providing for reasonable recovery of investments, thereby providing the necessary level of revenue requirement to allow the Company to maintain its financial strength and credit quality and continue to provide high quality electric utility service to its customers. The Stipulating Parties intend to support the reasonableness of this Stipulation in any hearing before the Commission and any proposed order or brief in this docket.

VII. Receipt of Testimony and Waiver of Cross-Examination

The Stipulating Parties agree that all pre-filed testimony and exhibits filed by the Stipulating Parties may be received into evidence without objection. Each Stipulating Party waives all right to cross-examine each other's witnesses with respect to such pre-filed testimony and exhibits. If, however, questions are asked by any Commissioner, or if questions are asked or positions are taken by any person who is not a Stipulating Party, then any Stipulating Party may respond to such questions by presenting testimony or exhibits and cross-examining any witness

with respect to such testimony and exhibits, provided such testimony, exhibits, and cross-examination are not inconsistent with this Stipulation.

VIII. Stipulation Binding Only If Accepted in its Entirety

This Stipulation is the product of negotiation and compromise of a complex set of issues, and no portion of this Stipulation is or will be binding on any of the Stipulating Parties unless the entire Agreement and Stipulation is accepted by the Commission. If the Commission rejects any part of this Stipulation or approves this Stipulation subject to any change or condition or if the Commission's approval of this Stipulation is rejected or conditioned by a reviewing court, the Parties agree to meet and discuss the applicable Commission or court order within five business days of its issuance and to attempt in good faith to determine if they are willing to modify the Stipulation consistent with the order. No Party shall withdraw from the Stipulation prior to complying with the foregoing sentence. If any Party withdraws from the Stipulation, each Party retains the right to seek additional procedures before the Commission, including cross-examination of witnesses, with respect to issues addressed by the Stipulation and shall not be bound or prejudiced by the terms and conditions of the Stipulation.

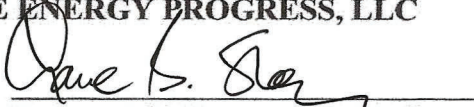
IX. Counterparts

This Stipulation may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Execution by facsimile signature shall be deemed to be, and shall have the same effect as, execution by original signature.

The foregoing is agreed upon and stipulated to this the 26th day of June, 2020.

DUKE ENERGY PROGRESS, LLC

By:



Lawrence B. Somers, Deputy General Counsel

CAROLINA INDUSTRIAL GROUP FOR FAIR UTILITY RATES II

By:



Warren K. Hicks, CIGFUR II Counsel

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Progress, LLC's Agreement and Stipulation of Settlement with CIGFUR, in Docket No. E-2, Sub 1219, has been served by electronic mail, hand delivery or by depositing a copy in the United States mail, postage prepaid to the following parties:

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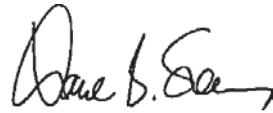
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This the 26th day of June, 2020.



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Duke Energy Progress, LLC Proposed North Carolina Tariffs

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Oct 30 2019

<u>SCHEDULE</u>	<u>DESCRIPTION</u>	<u>PAGE NO.</u>
I. RETAIL CLASSIFICATION		
A. RESIDENTIAL RATE SCHEDULES		
RES -60	Residential Service.....	R-1
R-TOUD-60	Residential Service Time-of-Use	R-2
R-TOU-60	Residential Service Time-of-Use	R-3
B. GENERAL SERVICE RATE SCHEDULES		
SGS-60	Small General Service.....	G-1
SGS-TOUE-60	Small General Service (All-Energy) Time-of-Use	G-2
MGS-60	Medium General Service.....	G-3
SI-60	Seasonal or Intermittent Service.....	G-4
SGS-TOU-60	Small General Service (Time-of-Use).....	G-5
CH-TOUE-60	Church Service (Time-of-Use).....	G-6
GS-TES-60	General Service (Thermal Energy Storage).....	G-7
APH-TES-60	Agricultural Post-Harvest Service.....	G-8
LGS-60	Large General Service.....	G-9
LGS-TOU-60	Large General Service (Time-of-Use).....	G-10
LGS-RTP-60	Large General Service (Real Time Pricing)	G-11
CSG-60	Church and School Service	G-12
CSE-60	Church and School Service	G-13
SGS-TOU-CLR-60	Small General Service (Constant Load)	G-14
C. LIGHTING RATE SCHEDULES		
TSS-60	Traffic Signal Service	L-1
TFS-60	Traffic Signal Service (Metered).....	L-2
ALS-60	Area Lighting Service	L-3
SLS-60	Street Lighting Service.....	L-4
SLR-60	Street Lighting Service – Residential Subdivisions and Neighborhoods.....	L-5
SFLS-60	Sports Field Lighting Service.....	L-6
D. RETAIL RIDERS	IN CONJUNCTION WITH:	
BA-22	Annual Billing Adjustments.....	RR-1
SS-61	Supplementary and Firm Standby Service	RR-15
NFS-13	Supplementary and Non-Firm Standby Service (Experimental)...	RR-16
LLC-14	Large Load Curtailable	RR-17
680	Dispatched Power	RR-18
IPS-12	Incremental Power Service	RR-19
MROP-15	Meter-Related Optional Programs.....	RR-23
EDIT-1A	Excess Deferred Income Tax Rider.....	RR-26
EDIT-2	Excess Deferred Income Tax Rider (NEW)	RR-32
RAL-1	Regulatory Asset and Liability Rider (NEW)	RR-33
E. ADMINISTRATIVE PROCEDURES		
	Outdoor Lighting Service Regulations (Rev. 11/28/19)	A-1
	Service Regulations (Rev. 11/28/19).....	A-2
	Line Extension Plan E-68.....	A-3
II. COGENERATION CLASSIFICATION		
	Terms and Conditions for the Purchase of Electric Power (Rev. 11/28/19)	C-2

I/A

Duke Energy Progress, LLC
(North Carolina Only)

R-1

RESIDENTIAL SERVICE SCHEDULE RES-60

AVAILABILITY

This Schedule is available when electric service is used for domestic purposes in and about (1) a residential dwelling unit, including electric service used on a farm and in the preparation of the farm's products for market, or (2) a family care home. A residential dwelling unit served under this Schedule may be used as a boarding house, fraternity house, tourist home, or like establishment, provided such residential dwelling unit is one which ordinarily would be used as a private residence. A family care home is defined as a home with support and supervisory personnel that provides room and board, personal care and habilitation services in a family environment for not more than six resident handicapped persons.

Service under this Schedule is not available for processing (or handling) for market of farm products produced by others; for separately metered domestic or farm operations; for individual motors in excess of 10 HP (in exceptional cases, motors as large as 15 HP may be served upon approval by the Engineering Department); for commercial or industrial purposes; for other uses not specifically provided for by the provisions herein; or for resale service, except as provided for in Chapter 22 of the Commission Rules regarding the provision of electric service by landlords.

Nonfossil energy sources caused by acts of nature such as wind or solar are permitted as supplement to Customer's energy requirement provided Company is granted the right to install, operate, and monitor special equipment at Company's expense to measure Customer's load or any part thereof and to obtain any other data necessary to determine the operating characteristics and effects of the installation. In situations where special equipment is needed to assure safety, reliability, or metering accuracy, the installation of such equipment shall be at the Customer's expense.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one kilowatt-hour meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

MONTHLY RATE

I. For Single-Phase Service:

Bills Rendered During July - October

A. Basic Customer Charge:
\$14.00 per month

B. Kilowatt-Hour Charge:
12.632¢ per kWh

Bills Rendered During November - June

Basic Customer Charge:
\$14.00 per month

Kilowatt-Hour Charge:
12.030¢ per kWh

OFFICIAL COPY

Oct 30 2019

I/A

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Residential Classification - \$1.42/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule RES-56

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

OFFICIAL COPY

Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

R-2

RESIDENTIAL SERVICE
TIME-OF-USE
SCHEDULE R-TOUD-60

AVAILABILITY

This Schedule is available on a voluntary basis when electric service is used for domestic purposes in and about (1) a residential dwelling unit, including electric service used on a farm and in the preparation of the farm products for market, or (2) a family care home. A residential dwelling unit served under this Schedule may be used as a boarding house, fraternity house, tourist home, or like establishment, provided such residential dwelling unit is one which ordinarily would be used as a private residence. A family care home is defined as a home with support and supervisory personnel that provides room and board, personal care and habilitation services in a family environment for not more than six resident handicapped persons. This Schedule is also available to an existing residential customer (1) if service is also received under Net Metering for Renewable Energy Facilities Rider NM or (2) if served under the Residential Service Time-of-Use Schedule R-TOUD before December 1, 2013 until such time as service is terminated or service is elected under another available schedule.

This Schedule is also available to customers served under the Residential Service Load Control Rider with applicable billing credits. Billing demands established and energy consumed by the load subject to control will be billed in accordance with this Schedule.

Service under this Schedule is not available: (1) for processing (or handling) for market of farm products produced by others; (2) for separately metered domestic or farm operations; (3) for individual motors in excess of 10 HP (in exceptional cases, motors as large as 15 HP may be served upon approval by the Engineering Department); (4) for commercial or industrial purposes; (5) for other uses not specifically provided for by the provisions herein; (6) for new applicants on and after December 1, 2013, or (7) for resale service, except as provided for in Chapter 22 of the Commission Rules regarding the provision of electric service by landlords.

Nonfossil energy sources caused by acts of nature such as wind or solar are permitted as supplement to Customer's energy requirement provided Company is granted the right to install, operate, and monitor special equipment at Company's expense to measure Customer's load or any part thereof and to obtain any other data necessary to determine the operating characteristics and effects of the installation. In situations where special equipment is needed to assure safety, reliability, or metering accuracy, the installation of such equipment shall be at the Customer's expense.

APPLICABILITY

This Schedule is applicable to all electric service of the same type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

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I/A

MONTHLY RATE

I. For Single-Phase Service:

A. Service used during calendar months of June through September:

1. Basic Customer Charge:
\$16.85
2. On-Peak kW Demand Charge:
\$5.65 per kW for all on-peak
Billing Demand
3. kWh Energy Charge:
8.763¢ per on-peak kWh
7.096¢ per off-peak kWh

B. Service used during calendar months of October through May:

1. Basic Customer Charge:
\$16.85
2. On-Peak kW Demand Charge:
\$4.52 per kW for all on-peak
Billing Demand
3. kWh Energy Charge:
8.763¢ per on-peak kWh
7.096¢ per off-peak kWh

Minimum Bill

The minimum monthly charge shall be the Basic Customer Charge plus the REPS Adjustment.

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Residential Classification - \$1.42/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

BILLING DEMAND

The on-peak Billing Demand shall be the maximum demand used in the on-peak hours of the current month during any 15-minute interval.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 10:00 a.m. and 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

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I/A

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., plus 4:00 p.m. through 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the Holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall be on a monthly basis. For a Customer who has previously received service under this Schedule or its predecessor, at the current location, the Contract Period shall not be less than one year.

GENERAL

Service under this Schedule is subject to the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule R-TOUD-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

R-3

RESIDENTIAL SERVICE
TIME-OF-USE
SCHEDULE R-TOU-60

AVAILABILITY

This Schedule is available on a voluntary basis when electric service is used for domestic purposes in and about (1) a residential dwelling unit, including electric service used on a farm and in the preparation of the farm products for market, or (2) a family care home. A residential dwelling unit served under this Schedule may be used as a boarding house, fraternity house, tourist home, or like establishment, provided such residential dwelling unit is one which ordinarily would be used as a private residence. A family care home is defined as a home with support and supervisory personnel that provides room and board, personal care and habilitation services in a family environment for not more than six resident handicapped persons.

Service under this Schedule is not available: (1) for processing (or handling) for market of farm products produced by others; (2) for separately metered domestic or farm operations; (3) for individual motors in excess of 10 HP (in exceptional cases, motors as large as 15 HP may be served upon approval by the Engineering Department); (4) for commercial or industrial purposes; (5) for other uses not specifically provided for by the provisions herein; or (6) for resale service, except as provided for in Chapter 22 of the Commission Rules regarding provision of electric service by landlords.

Nonfossil energy sources caused by acts of nature such as wind or solar are permitted as supplement to Customer's energy requirement provided Company is granted the right to install, operate, and monitor special equipment to measure Customer's load or any part thereof and to obtain any other data necessary to determine the operating characteristics and effects of the installation. In situations where special equipment is needed to assure safety, reliability, or metering accuracy, the installation of such equipment shall be at the Customer's expense.

APPLICABILITY

This Schedule is applicable to all electric service of the same type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

MONTHLY RATE

I. For Single-Phase Service:

A. Service used during the calendar months of June through September:

1. Basic Customer Charge:

\$16.85

B. Service used during the calendar months of October through May:

1. Basic Customer Charge:

\$16.85

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I/A

2. kWh Energy Charge:

29.295¢ per on-peak kWh
14.648¢ per shoulder kWh
8.370¢ per off-peak kWh

2. kWh Energy Charge:

27.830¢ per on-peak kWh
14.282¢ per shoulder kWh
8.370¢ per off-peak kWh

Minimum Bill

The minimum monthly charge shall be the Basic Customer Charge.

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Residential Classification - \$1.42/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

DETERMINATION OF ON-PEAK, SHOULDER, AND OFF-PEAK HOURS

I. Service used beginning at 12:00 midnight March 31, and ending at 12:00 midnight September 30:

- A. The on-peak hours are defined as the hours between 1:00 p.m. and 6:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- B. The shoulder hours are defined as the hours between 11:00 a.m. and 1:00 p.m. and between 6:00 p.m. and 8:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- C. The off-peak hours are defined as all other hours, plus holidays defined as off-peak.

II. Service used beginning at 12:00 midnight September 30, and ending at 12:00 midnight March 31:

- A. The on-peak hours are defined as the hours between 6:00 a.m. and 9:00 a.m. Monday through Friday, excluding holidays defined as off-peak.
- B. The shoulder hours are defined as the hours between 9:00 a.m. and noon and between 5:00 p.m. and 8:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- C. The off-peak hours are defined as all other hours, plus holidays defined as off-peak.

III. Off-Peak Holidays:

All hours for the following holidays will be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the Holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

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SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall be on a monthly basis. For a Customer who has previously received service under this Schedule or its predecessor, at the current location, the Contract Period shall not be less than one year.

GENERAL

Service under this Schedule is subject to the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule R-TOU-56

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-1

SMALL GENERAL SERVICE
SCHEDULE SGS-60

AVAILABILITY

This Schedule is available for electric service used by a nonresidential customer at a single point of delivery, at one of the Company's standard voltages, with a Contract Demand of less than 30 kW, until the Customer's registered demand equals or exceeds 35 kW in two or more of the preceding 12 months, or until the Customer's registered demand equals or exceeds 50 kW.

This Schedule is not available: (1) for residential service, (2) for resale service, (3) for a Contract Demand of 30 kW or more, (4) whenever the monthly registered demand equals or exceeds 35 kW in two or more of the preceding 12 months, or (5) whenever the monthly registered demand equals or exceeds 50 kW. The Company may at any time conduct a test or install a demand meter to determine the maximum 15-minute demand.

When the Customer has installed generating or converting equipment that can operate in parallel with the Company's service, the Customer shall install the protective equipment acceptable to the Company that will protect the Company's employees, its other customers, and its distribution system. The Company shall have the right to suspend delivery of electricity to the Customer with such generating or converting equipment until the Customer has installed the protective equipment.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. For Single-Phase Service:

A. \$21.00 Customer Charge

B. Kilowatt-Hour Energy Charge:

13.580¢ per kWh for the first 750 kWh
11.606¢ per kWh for the next 1,250 kWh
11.071¢ per kWh for all additional kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

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SALES TAX

I/A

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, the Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year; except for short-term, construction, or temporary service, the Contract Period may be for the period requested by the Customer and in such event the Customer agrees:

1. That the service supplied shall be for a continuous period until disconnected; and
2. That where it is necessary for the Company to extend lines, erect transformers, or do any work necessary to supply service, except the installation of a self-contained meter, the Customer shall pay for the line extension in accordance with Line Extension Plan E.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SGS-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-2

SMALL GENERAL SERVICE
ALL-ENERGY TIME-OF-USE
SCHEDULE SGS-TOUE-60

AVAILABILITY

This Schedule is available for electric service used by a nonresidential customer at a single point of delivery, at one of the Company's standard voltages, with a Contract Demand of less than 30 kW, until the Customer's registered demand equals or exceeds 35 kW in two or more of the preceding 12 months, or until the Customer's registered demand equals or exceeds 50 kW.

This Schedule is not available: (1) for residential service, (2) for resale service, (3) for a Contract Demand of 30 kW or more, (4) whenever the monthly registered demand equals or exceeds 35 kW in two or more of the preceding 12 months, or (5) whenever the monthly registered demand equals or exceeds 50 kW. The Company may at any time conduct a test or install a demand meter to determine the maximum 15 minute demand.

When the Customer has installed generating or converting equipment that can operate in parallel with the Company's service, the Customer shall install the protective equipment acceptable to the Company that will protect the Company's employees, its other customers, and its distribution system. The Company shall have the right to suspend delivery of electricity to the Customer with such generating or converting equipment until the Customer has installed the protective equipment.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. For Single-Phase Service:

A. Service used during the calendar
months of June through September:

1. Basic Customer Charge:

\$21.00

B. Service used during the calendar
months of October through May:

1. Basic Customer Charge:

\$21.00

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2. kWh Energy Charge:

30.840¢ per on-peak kWh
15.420¢ per shoulder kWh
7.710¢ per off-peak kWh

2. kWh Energy Charge:

27.756¢ per on-peak kWh
14.649¢ per shoulder kWh
7.710¢ per off-peak kWh

Minimum Bill

The minimum monthly charge shall be the Basic Customer Charge.

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

DETERMINATION OF ON-PEAK, SHOULDER, AND OFF-PEAK HOURS

I. Service used beginning at 12:00 midnight March 31, and ending at 12:00 midnight September 30:

- A. The on-peak hours are defined as the hours between 1:00 p.m. and 6:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- B. The shoulder hours are defined as the hours between 11:00 a.m. and 1:00 p.m. and between 6:00 p.m. and 8:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- C. The off-peak hours are defined as all other hours, plus holidays defined as off-peak.

II. Service used beginning at 12:00 midnight September 30, and ending at 12:00 midnight March 31:

- A. The on-peak hours are defined as the hours between 6:00 a.m. and 9:00 a.m. Monday through Friday, excluding holidays defined as off-peak.
- B. The shoulder hours are defined as the hours between 9:00 a.m. and noon and between 5:00 p.m. and 8:00 p.m. Monday through Friday, excluding holidays defined as off-peak.
- C. The off-peak hours are defined as all other hours, plus holidays defined as off-peak.

III. Off-Peak Holidays:

All hours for the following holidays will be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the Holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

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SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, the Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year; except for short-term, construction, or temporary service, the Contract Period may be for the period requested by the Customer and in such event the Customer agrees:

1. That the service supplied shall be for a continuous period until disconnected; and
2. That where it is necessary for the Company to extend lines, erect transformers, or do any work necessary to supply service, except the installation of a self-contained meter, the Customer shall pay for the line extension in accordance with Line Extension Plan E.

GENERAL

Service under this Schedule is subject to the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SGS-TOUE-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

G-3

MEDIUM GENERAL SERVICE
SCHEDULE MGS-60

AVAILABILITY

This Schedule is available for electric service used by a nonresidential customer at a single point of delivery, at one of the Company's standard voltages, with a Contract Demand or a registered or computed demand of 30 kW and greater, but less than 1,000 kW. This Schedule is also available to an existing nonresidential customer if served under the Small General Service Schedule SGS on September 24, 1982 with: (1) a Contract Demand of 1,000 kW or more, until such time as service is terminated, or service is elected under another available schedule; or (2) a Contract Demand below 1,000 kW until such time as the registered or computed demand equals or exceeds 1,200 kW in two or more of the preceding 12 months or the Customer's Contract Demand is increased to 1,000 kW or more, whereupon this Schedule will no longer be available thereafter.

This Schedule is not available: (1) for residential service; (2) for breakdown, standby, or supplementary service unless used in conjunction with the applicable standby or generation service rider for a continuous period of not less than one year; (3) for resale service; or (4) for a new customer after September 23, 1982 with a Contract Demand of 1,000 kW or more, or whenever the registered or computed demand equals or exceeds 1,200 kW in two or more of the preceding 12 months.

MONTHLY RATE

I. For Single-Phase Service:

- A. Customer Charge: \$28.50 per month
- B. Billing Demand: \$6.72 per kW
- C. Kilowatt-Hour Energy Charge:
8.068¢ per kWh for all kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

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BILLING DEMAND

I/A

The Billing Demand shall be the greater of: (1) the maximum kW registered or computed, by or from the Company's metering facilities, during any 15-minute interval within the current billing month; (2) 80% of the maximum 15-minute demand during the billing months of July through October of the preceding 11 billing months; (3) 60% of the maximum monthly 15-minute demand during the billing months of November through June of the preceding 11 billing months; (4) 75% of the Contract Demand until such time as the Billing Demand first equals or exceeds the effective Contract Demand; or (5) 25 kW.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, the Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year; except for short-term, construction, or temporary service, the Contract Period may be for the period requested by the Customer and in such event the Customer agrees:

- I. That the service supplied shall be for a continuous period until disconnected; and
- II. That where it is necessary for the Company to extend lines, erect transformers, or do any work necessary to supply service, except the installation of a self-contained meter, the Customer shall pay for the line extension in accordance with Line Extension Plan E.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule MGS-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

I/A

G-4

SEASONAL OR INTERMITTENT SERVICE
SCHEDULE SI-60

AVAILABILITY

This Schedule is available for a nonresidential customer at a single point of delivery, at one of the Company's standard voltages, and whose operation is normally seasonal or varies greatly from month to month; whose actual kW demand for at least two consecutive months is less than 30% of the greater of the Contract Demand or maximum demand registered in the preceding 12 months; and whose Contract Demand or registered or computed demand is 30 kW or more.

This Schedule is not available for short-term, construction, temporary, breakdown, standby, or supplementary service or for Contract Demands or loads of less than 30 kW or greater than 100,000 kW.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

- I. For those months when service is used:

For Single-Phase Service:

- A. \$28.50 Customer Charge
- B. Kilowatt-hour Energy Charge:
- 13.544¢ per kWh for the first 2,000 kWh
- 11.241¢ per kWh for all additional kWh

For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

- II. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

- III. A charge will be added to the monthly bill in each of three consecutive months in each contract year to be referred to as facilities charge months. Facilities charge months shall begin with the first month service is taken or as specified in the Service Agreement but shall not begin later than the tenth month of the contract year. The charge to be added during each facilities charge month will be determined as follows:

- \$41.00 Customer Seasonal Charge
- \$ 1.84 per kW Facilities Charge for each kW of demand registered in the first facilities charge month or the maximum 15-minute registered demand in the previous 11 months or the Contract Demand, whichever is greater.

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SALES TAX

I/A

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, the Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

REMOVAL OF FACILITIES

If the Customer is not using service or is only partially using service, the Company may, after notice to the Customer, remove any of its transformers and other equipment (other than structures and conductors) or may substitute other equipment for that which is being only partially used by the Customer. In either event, the Company will furnish and install, at its own expense, the same or equivalent equipment, or any needed substitute equipment, at the time the Customer notifies the Company of their desire to resume taking service.

CONTRACT PERIOD

The Contract Period shall not be less than one year, except where the Customer fails to meet the availability requirement of this Schedule.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SI-56
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NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-5

SMALL GENERAL SERVICE
(TIME-OF-USE)
SCHEDULE SGS-TOU-60

AVAILABILITY

This Schedule is available on a voluntary basis for electric service used by a nonresidential customer with an initial Contract Demand of 30 kW or greater but less than 1,000 kW. This Schedule is also available to an existing nonresidential customer with a Contract Demand below 30 kW (1) if service is also received under Net Metering for Renewable Energy Facilities Rider NM or (2) if served under the Small General Service (Time-of-Use) Schedule SGS-TOU before December 1, 2013, until such time as service is terminated or service is elected under another available schedule.

This Schedule is not available: (1) for residential service; (2) for breakdown, standby, or supplementary service, unless used in conjunction with the applicable standby or generation service rider for a continuous period of not less than one year; (3) for resale service; (4) for new applicants with a Contract Demand below 30 kW on and after December 1, 2013; or (5) whenever the registered or computed demand equals or exceeds 1,000 kW and an increase in the capacity of Company's facilities is required.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. Service used during the calendar months of June through September:

A. Basic Customer Charge:

\$35.50

B. kW Demand Charge:

1. \$ 11.58 per kW for all kW of on-peak Billing Demand
2. \$ 1.85 per kW for all off-peak excess Billing Demand

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C. kWh Energy Charge: I/A

7.100¢ per on-peak kWh
5.754¢ per off-peak kWh

II. Service used during the calendar months of October through May:

A. Basic Customer Charge:

\$35.50

B. kW Demand Charge:

1. \$9.73 per kW for all kW of on-peak Billing Demand
2. \$1.85 per kW for all off-peak excess Billing Demand

C. kWh Energy Charge:

7.100¢ per on-peak kWh
5.754¢ per off-peak kWh

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

IV. Minimum Bill:

The minimum monthly charge shall be the sum of (1) the Basic Customer Charge, (2) the REPS Adjustment, (3) 5.502¢ per kWh, and (4) \$1.85 per kW for the higher of: (a) the Contract Demand or (b) the maximum monthly 15-minute demand during the current and preceding 11 billing months.

BILLING DEMANDS

- I. The on-peak Billing Demand shall be the maximum demand registered or computed from Company's metering facilities used in the on-peak hours of the current month during any 15-minute interval.
- II. The off-peak excess Billing Demand is the maximum demand registered or computed from Company's metering facilities used during any 15-minute interval in the off-peak hours of the current month less the on-peak Billing Demand.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

- A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 10:00 a.m. and 10:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., plus 4:00 p.m. through 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year, except where Customer fails to meet the availability requirements of this Schedule. For short-term, construction, or temporary service, the Contract Period may be for the period requested by the Customer and in such event Customer agrees:

- I. That the service supplied shall be for a continuous period until discontinued; and
- II. That where it is necessary for Company to extend lines, erect transformers, or do any work necessary to supply service, Customer shall pay for the line extension in accordance with Line Extension Plan E.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

I/A

The MONTHLY RATE includes fuel, DSM and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SGS-TOU-56

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-6

CHURCH SERVICE
(TIME-OF-USE)
SCHEDULE CH-TOUE-60

AVAILABILITY

This schedule is available on a voluntary basis for electric service used by churches with a Contract Demand or a registered or computed demand of 30 kW and greater, but less than 1,000 kW.

This Schedule is not available: (1) for residential service; (2) for short-term, construction, temporary, breakdown, standby, or supplementary service; (3) for resale service; (4) for a Contract Demand of 1,000 kW or more; (5) whenever the registered or computed demand equals or exceeds 1,200 kW in two or more of the preceding 12 months and an increase in the capacity of Company's facilities is required; (6) whenever the registered or computed demand equals or exceeds 1,500 kW; or (7) for electric service to a building which is wholly or partially used for other purposes not specifically provided for by the provisions of this Schedule.

Company has the right to install, operate, and monitor special equipment to measure Customer's load characteristics.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. For Service used during the calendar months of June through September:

- A. Basic Customer Charge:
\$35.50
- B. kWh Energy Charge:
28.444¢ per on-peak kWh
8.111¢ per off-peak kWh

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I/A

II. For Service used during the calendar months of October through May:

- A. Basic Customer Charge:
\$35.50
- B. kWh Energy Charge:
26.775¢ per on-peak kWh
8.111¢ per off-peak kWh

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

IV. Minimum Bill:

The minimum monthly charge shall be the sum of (1) the Basic Customer Charge, (2) the REPS Adjustment, (3) 5.502¢ per kWh and (4) \$1.85 per kW for the higher of: (a) the Contract Demand or (b) the maximum monthly 15-minute demand registered or computed from Company's metering facilities during the current and preceding 11 billing months.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

- A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 10:00 a.m. and 10:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., plus 4:00 p.m. through 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will also be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

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Oct 30 2019

I/A

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall be on a monthly basis. For a Customer who has previously received service under this Schedule or its predecessors, the Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule CH-TOUE-56
Effective for service rendered on and after November 29, 2010
NCUC Docket No. E-2, Sub 1219

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-7

GENERAL SERVICE
(THERMAL ENERGY STORAGE)
SCHEDULE GS-TES-60

AVAILABILITY

This Schedule is available on a voluntary basis for electric service when used for thermal storage equipment to provide space conditioning requirements by a nonresidential customer with a Contract Demand less than 4,000 kW. Thermal storage equipment as defined herein must incorporate storage mediums of water, ice, or other phase change materials and would normally utilize electrical loads of chillers, boilers, pumps, or fans.

This Schedule is not available: (1) for residential service; (2) for temporary service; (3) for service used for purposes other than thermal storage space conditioning equipment; (4) for breakdown, standby, or supplementary service; (5) for resale service; or (6) for a Contract Demand of 4,000 kW or more.

APPLICABILITY

This Schedule is applicable to electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. Basic Customer Charge:

For Contract Demands less than 1,000 kW*	\$35.50
For Contract Demands of 1,000 kW or greater	\$200.00

*If the registered or computed demand equals or exceeds 1,200 kW in two or more of the preceding 12 months, the Basic Customer Charge shall be increased to \$200.00 thereafter.

II. kW Demand Charge:

	<u>Service Rendered During the Calendar Months Of:</u>	
	<u>June through September</u>	<u>October through May</u>
A. On-Peak Billing Demand	\$13.36 per kW	\$11.98 per kW
B. Off-Peak Excess Billing Demand	\$1.85 per kW	\$1.85 per kW

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Oct 30 2019

I/A

III. kWh Energy Charge:

5.760¢ per on-peak kWh
5.485¢ per off-peak kWh

IV. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

V. Minimum Bill:

The minimum monthly charge shall be the sum of (1) the Basic Customer Charge, (2) the REPS Adjustment, (3) 5.502¢ per kWh, and (4) \$1.85 per kW for the higher of: (a) the Contract Demand or (b) the maximum monthly 15-minute demand during the current and preceding 11 billing months.

BILLING DEMANDS

- I. The on-peak Billing Demand shall be the maximum demand registered or computed from Company's metering facilities used in the on-peak hours of the current month during any 15-minute interval.
- II. The off-peak excess Billing Demand is the maximum demand registered or computed from Company's metering facilities used during any 15-minute interval in the off-peak hours of the current month less the on-peak Billing Demand.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

- A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 12:00 noon and 8:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

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I/A

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule GS-TES-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-8

AGRICULTURAL POST-HARVEST PROCESSING
(EXPERIMENTAL THERMAL ENERGY STORAGE)
SCHEDULE APH-TES-60

AVAILABILITY

This Schedule is available on an experimental basis for electric service to the first ten customers applying when used by thermal storage equipment installed for the post-harvest processing of fruits and vegetables. Thermal storage equipment as defined herein must incorporate storage mediums of water, ice, or other phase change materials and would normally utilize electrical loads of chillers, boilers, pumps, or fans. The Contract Demand must be less than 1,000 kW.

This Schedule is not available: (1) for service used for purposes other than thermal storage equipment utilized in the processing of fruits and vegetables; (2) for temporary service; (3) for breakdown, standby, or supplementary service; (4) for resale service; (5) for a Contract Demand of 1,000 kW or more; or (6) whenever the registered or computed demand equals or exceeds 1,200 kW in two or more of the preceding 12 months.

APPLICABILITY

This Schedule is applicable to electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. Basic Customer Charge:

\$35.50

II. kW Demand Charge:

	<u>Service Rendered During the Calendar Months Of:</u>	
	<u>June through September</u>	<u>October through May</u>
A. On-Peak Billing Demand	\$13.36 per kW	\$11.98 per kW
B. Off-Peak Excess Billing Demand	\$ 1.85 per kW	\$ 1.85 per kW

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Oct 30 2019

I/A

III. kWh Energy Charge:

5.760¢ per on-peak kWh
5.485¢ per off-peak kWh

IV. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

V. Minimum Bill:

The minimum monthly charge shall be the sum of (1) the Basic Customer Charge, (2) the REPS Adjustment, (3) 5.502¢ per kWh, and (4) \$1.85 per kW for the higher of: (a) the Contract Demand or (b) the maximum monthly 15-minute demand during the current and preceding 11 billing months.

BILLING DEMANDS

- I. The on-peak Billing Demand shall be the maximum demand registered or computed from Company's metering facilities used in the on-peak hours of the current month during any 15-minute interval.
- II. The off-peak excess Billing Demand is the maximum demand registered or computed from Company's metering facilities used during any 15-minute interval in the off-peak hours of the current month less the on-peak Billing Demand.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

- A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 12:00 noon and 8:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

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I/A

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered as off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule APH-TES-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-9

LARGE GENERAL SERVICE
SCHEDULE LGS-60

AVAILABILITY

This Schedule is available for electric service used by a nonresidential customer with either a Contract Demand that equals or exceeds 1,000 kW or whenever the registered or computed demand equals or exceeds 1,000 kW in the preceding 12 months.

This Schedule is not available: (1) for breakdown, standby, or supplementary service unless used in conjunction with the applicable standby or generation service rider for a continuous period of not less than one year; (2) for resale service; or (3) for any new customer with a Contract Demand in excess of 100,000 kW.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, three-phase 3 or 4 wires, at Company's standard voltages of 480 volts or higher or the voltage at which Customer was being served on September 24, 1982. When Customer desires two or more types of service, which types can be supplied from a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. Basic Customer Charge:

\$200.00

II. kW Demand Charge:

\$14.15 per kW for the first 5,000 kW of Billing Demand
\$13.15 per kW for the next 5,000 kW of Billing Demand
\$12.15 per kW for all over 10,000 kW of Billing Demand

III. kWh Energy Charge:

6.327¢ per kWh

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I/A

IV. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

V. Transformation Discounts:

When Customer owns the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, the charge per kW of Billing Demand and per kWh will be reduced in accordance with the following:

<u>Transmission Service</u> <u>Transformation Discount</u>	<u>Distribution Service</u> <u>Transformation Discount</u>
\$0.53/kW	\$0.45/kW
\$0.00020/kWh	\$0.00008/kWh

Transmission: For Customer to qualify for the Transmission Service Transformation Discount, Customer must own the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, necessary to take service at the voltage of the 69 kV, 115 kV, or 230 kV transmission line from which Customer received service.

Distribution: For Customer to qualify for the Distribution Service Transformation Discount, Customer must own the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, necessary to take service from the distribution line of 12.47 kV or higher from which Customer receives service. The distribution service source must be from a general distribution line and must be from other than a transmission-to-distribution substation built primarily for Customer's use in order to qualify for the Distribution Service Transformation Discount. A general distribution line is a 12.47 kV or higher voltage distribution line built to serve the general area and not built primarily to serve a specific customer.

Company shall have the option to install high-side metering equipment or low-side metering equipment compensated for Customer-owned transformer and line losses.

Any facilities which Company provides above those which Company would normally have utilized to service Customer's Contract Demand shall be considered as Extra Facilities. Any Company-owned protection system installed when service is directly from Company's 69 kV, 115 kV, or 230 kV transmission system or a distribution line of 12.47 kV or higher shall be considered Extra Facilities.

If changing conditions on Company's electrical system make continuation of the current delivery voltage impractical, Customer shall be responsible for all costs for the conversion beyond the point of delivery except any Company-owned metering equipment. At the time of the conversion, Company reserves the right to provide service at one of its available voltages.

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I/A

If subsequent changes in the use of Company's facilities occur which cause the reclassification of either transformers or lines, Customer's entitlement to the discount may be changed.

VI. Minimum Bill:

The minimum monthly charge shall be the Basic Customer Charge plus the REPS Adjustment plus a charge for 1,000 kW.

BILLING DEMAND

The Billing Demand shall be the maximum kW registered or computed, by or from Company's metering facilities, during any 15-minute interval within the current billing month. However, the Billing Demand shall not be less than the greater of: (1) 80% of the maximum monthly 15-minute demand during the billing months of July through October of the preceding 11 billing months, or (2) 60% of the maximum monthly 15-minute demand during the billing months of November through June of the preceding 11 billing months, or (3) 75% of the Contract Demand until such time as the Billing Demand first equals or exceeds the effective Contract Demand, or (4) 1,000 kW.

POWER FACTOR ADJUSTMENT

When the power factor in the current billing month is less than 85%, the monthly bill will be increased by a sum equal to \$0.32 multiplied by the difference between the maximum reactive kilovolt-amperes (kVAr) registered by a demand meter suitable for measuring the demands used during a 15-minute interval and 62% of the maximum kW demand registered in the current billing month.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year; except for short-term, construction or temporary service, the Contract Period may be for the period requested by Customer and in such event Customer agrees:

1. That the service supplied shall be for a continuous period until disconnected; and
2. That where it is necessary for Company to extend lines, erect transformers, or do any work necessary to supply service, Customer shall pay for the line extension in accordance with Line Extension Plan E.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

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Oct 30 2019

I/A

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule LGS-56
Effective for service rendered on and after November 29, 2019
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Duke Energy Progress, LLC
(North Carolina Only)

I/A

G-10

LARGE GENERAL SERVICE
(TIME-OF-USE)
SCHEDULE LGS-TOU-60

AVAILABILITY

This Schedule is available on a voluntary basis for electric service used by a nonresidential customer with either a Contract Demand that equals or exceeds 1,000 kW or whenever the registered or computed demand equals or exceeds 1,000 kW in the preceding 12 months.

This Schedule is not available: (1) for breakdown, standby, or supplementary service, unless used in conjunction with the applicable standby or generation service rider for a continuous period of not less than one year; (2) for resale service; (3) for short-term or temporary service; or (4) for any new customer with a Contract Demand in excess of 100,000 kW.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, three-phase 3 or 4 wires, at Company's standard voltages of 480 volts or higher or the voltage at which Customer was being served on September 19, 1983. When Customer desires two or more types of service, which types can be supplied from a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

MONTHLY RATE

I. Basic Customer Charge:
\$200.00

II. kW Demand Charge:

	<u>Service Rendered During the Calendar Months Of:</u>	
	<u>June through September</u>	<u>October through May</u>
A. On-Peak Billing Demand:		
First 5,000 kW of Billing Demand	\$22.21 per kW	\$16.59 per kW
For the next 5,000 kW of Billing Demand	\$21.21 per kW	\$15.59 per kW
All over 10,000 kW of Billing Demand	\$20.21 per kW	\$14.59 per kW
B. All off-peak excess Billing Demand	\$ 1.13 per kW	\$ 1.13 per kW

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III. kWh Energy Charge:

I/A

5.821¢ per on-peak kWh
5.321¢ per off-peak kWh

IV. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month
Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

V. Transformation Discounts:

When Customer owns the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, the charge per kW of on-peak Billing Demand and per kWh will be reduced in accordance with the following:

<u>Transmission Service</u>	<u>Distribution Service</u>
<u>Transformation Discount</u>	<u>Transformation Discount</u>
\$0.53/kW	\$0.45/kW
\$0.00020/kWh	\$0.00008/kWh

Transmission: For Customer to qualify for the Transmission Service Transformation Discount, Customer must own the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, necessary to take service at the voltage of the 69 kV, 115 kV, or 230 kV transmission line from which Customer received service.

Distribution: For Customer to qualify for the Distribution Service Transformation Discount, Customer must own the step-down transformation and all other facilities beyond the transformation which Company would normally own, except Company's metering equipment, necessary to take service from the distribution line of 12.47 kV or higher from which Customer receives service. The distribution service source must be from a general distribution line and must be from other than a transmission-to-distribution substation built primarily for Customer's use in order to qualify for the Distribution Service Transformation Discount. A general distribution line is a 12.47 kV or higher voltage distribution line built to serve the general area and not built primarily to serve a specific customer.

Company shall have the option to install high-side metering equipment or low-side metering equipment compensated for Customer-owned transformer and line losses.

Any facilities which Company provides above those which Company would normally have utilized to service Customer's Contract Demand shall be considered as Extra Facilities. Any Company-owned protection system installed when service is directly from Company's 69 kV, 115 kV, or 230 kV transmission system or a distribution line of 12.47 kV or higher shall be considered Extra Facilities.

I/A

If changing conditions on Company's electrical system make continuation of the current delivery voltage impractical, Customer shall be responsible for all costs for the conversion beyond the point of delivery except any Company-owned metering equipment. At the time of the conversion, Company reserves the right to provide service at one of its available voltages.

If subsequent changes in the use of Company's facilities occur which cause the reclassification of either transformers or lines, Customer's entitlement to the discount may be changed.

VI. Minimum Bill:

The minimum monthly charge shall be the Basic Customer Charge plus the REPS Adjustment plus a charge for 1,000 kW at the off-peak excess demand rate.

BILLING DEMANDS

- I. The on-peak Billing Demand shall be the maximum demand registered or computed by or from Company's metering facilities used in the on-peak hours of the current month during any 15-minute interval.
- II. The off-peak excess Billing Demand is the maximum demand registered or computed by or from Company's metering facilities used during any 15-minute interval in the off-peak hours of the current month less the on-peak Billing Demand.

DETERMINATION OF ON-PEAK AND OFF-PEAK HOURS

I. On-Peak Hours:

- A. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 10:00 a.m. and 10:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

- B. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as those hours between 6:00 a.m. and 1:00 p.m., plus 4:00 p.m. through 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

II. Off-Peak Hours:

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

POWER FACTOR ADJUSTMENT

When the power factor in the current billing month is less than 85%, the monthly bill will be increased by a sum equal to \$0.32 multiplied by the difference between the maximum reactive kilovolt-amperes (kVAR) registered by a demand meter suitable for measuring the demand used during a 15-minute interval and 62% of the maximum kW demand registered in the current billing month.

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SALES TAX

I/A

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

RIDER APPLICATIONS

When this Schedule is used in conjunction with any applicable rider, the charges, if any, as stated in the rider will be adjusted to reflect the on-peak and off-peak periods and on-peak and off-peak charges in this Schedule unless specific and different on-peak and off-peak periods and charges are stated in the rider.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule LGS-TOU-56
Effective for service rendered on and after November 29, 2019
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Duke Energy Progress, LLC
(North Carolina Only)

G-11

LARGE GENERAL SERVICE
(REAL TIME PRICING)
SCHEDULE LGS-RTP-60

AVAILABILITY

This Schedule is available for electric service to a maximum of eighty-five (85) nonresidential Customer accounts with a Contract Demand that equals or exceeds 1,000 kW.

This Schedule is not available: (1) for short-term or temporary service; (2) for electric service in conjunction with Incremental Power Service Rider IPS or Dispatched Power Rider No. 68; (3) for electric service in conjunction with Economic Development Rider ED and Large Load Curtailable Rider LLC, except as provided for in the RTP Base Charge; or (4) for any new Customer with a Contract Demand in excess of 50,000 kW.

Power delivered under this Schedule shall not be used for resale, or as a substitute for power contracted for or which may be contracted for under any other schedule of Company, except at the option of Company, under special terms and conditions expressed in writing in the contract with Customer. Customer shall be required to furnish and maintain a communication link and equipment suitable to support remote reading of Company's meter serving Customer and to support daily receipt of the Hourly Real Time Pricing (RTP) rates. Customer may use emergency or back-up generation to respond to RTP hourly rates without receiving standby service.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, three-phase 3 or 4 wires, at Company's standard voltages of 480 volts or higher. When Customer desires two or more types of service, which types can be supplied from a three-phase 4 wire type, without voltage transformation, only the type of service necessary for Customer's requirements will be supplied under this Schedule.

CONTRACT DEMAND

The Contract Demand shall be the kW of demand specified in the Service Agreement.

CUSTOMER BASELINE LOAD (CBL)

Company shall establish a Customer Baseline Load (CBL), expressed in kilowatt-hours, using one complete year of Customer-specific hourly load data that, in Company's opinion, represents Customer's electricity consumption pattern and is typical of Customer's operation for billing under the otherwise applicable tariffs and from which to measure changes in consumption for billing pursuant to this Schedule. For situations in which hourly load data are not available, a CBL will be constructed by Company using load shapes of Customers with similar usage patterns and from relevant information provided by Customer and verified by Company. The initial CBL shall consider verifiable changes in Customer's operation such as (1) installation of permanent energy efficiency measures; (2) permanent removal or addition of Customer's equipment; (3) one-time extraordinary events such as natural disasters; (4) annual plant shutdowns or other random variations in the load patterns; and (5) other on-going changes in demand. The CBL for new Customers will be calculated in the same manner as the CBL for existing Customers. Establishment of a CBL is a precondition for use of this Schedule.

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SUBSEQUENT CBL ADJUSTMENT

After the initial CBL is established, it shall only be subject to an adjustment at Customer's request by providing 30-days advance written notice. Any downward adjustment is subject to Company's concurrence and will be consistent with the principles of initial CBL establishment.

CBL CALENDAR MAPPING

To provide Customer with the appropriate CBL for the RTP Service Year, the hourly consumptions established by the CBL shall be calendar-mapped to the corresponding day of the RTP Service Year. Calendar-mapping is a day-matching method to ensure that Mondays are matched to Mondays, holidays to holidays, etc.

The CBL shall be established by first identifying holidays and then grouping the remaining days (i.e., Mondays, Tuesdays, etc.) and averaging over the calendar month to result in hourly consumption for a typical week in each calendar month. The CBL result shall then be adjusted for each calendar month to reflect annual plant shutdowns, holidays, or other known work stoppages during the next RTP Service Year. Calendar-mapping is performed prior to each annual renewal of service under this Schedule after adjustments, if any, are made to the CBL.

MONTHLY RATE

The monthly rate shall consist of the following charges:

I. RTP Administrative Charge:

\$165.00

II. RTP Base Charge:

RTP Base Charge = Monthly Bill for the CBL consumption and monthly billing demand of the current billing month pursuant to the conventional LGS Class tariffs under which Customer either previously received service or would have elected to receive service prior to electing this Schedule. When the conventional tariffs include Economic Development Rider ED or Large Load Curtailable Rider LLC, the provisions of these Riders shall only apply to the CBL usage.

III. RTP Hourly Energy Charge Adjustment:

RTP Hourly Energy Charge = $\Sigma\{\text{Hourly RTP Rate} \times (\text{Hourly Consumption} - \text{CBL Consumption})\}$

where:

Σ = The summation of the RTP charges and credits for each hour of the current billing month.

The Hourly RTP Rate shall be determined based upon the following formula:

Hourly RTP Rate = $(\text{MENERGY} + \text{CAP} + \text{ADDER}) \times (1 + \text{TAXES})$

where:

MENERGY = Marginal Energy Cost per kilowatt-hour including marginal fuel, variable operating and maintenance expenses, and delivery losses

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CAP	=	Tiered Capacity Charge per kilowatt-hour applicable whenever the day-ahead forecast of the ratio of hourly available generation to hourly demand is equal or less than 1.15
ADDER	=	$\beta \times (\text{Class Rate-Hourly Marginal Cost})$, but not less than zero
where:		
β	=	a fixed value equal to 0.20
Class Rate	=	the prior calendar year average rate per kilowatt-hour under the conventional tariffs applicable to the LGS class, as updated annually effective with the February billing
Hourly Marginal Cost	=	the sum of the specific hour's kilowatt-hour price for MENERGY and CAP, all as defined above
TAXES	=	NC Regulatory Fee (currently 0.13%)

IV. Facilities Demand Charge:

per kW of Facilities Demand for service provided from:

Transmission System (voltage of 69 kV or higher) without transformation	\$1.88/kW
Transmission System (voltage of 69 kV or higher) with one transformation	\$2.42/kW
Distribution System (voltage below 69 kV) without transformation	\$3.34/kW
Distribution System (voltage below 69 kV) with one transformation	\$3.80/kW

The kW of Facilities Demand shall be the greater of (1) the Contract Demand or (2) the maximum demand registered or recorded by Company's meter during a 15-minute interval in the current billing month, in excess of the maximum 15-minute billing demand included in the CBL applicable to the current billing month. The Contract Demand used to determine the Facilities Demand shall exclude any Standby Service kW, when applicable.

V. Rider Adjustments:

DSM/EE/JRRR Incremental Charge = $(\text{Actual Consumption} - \text{CBL Consumption}) \times \text{Rider Adjustment}$

where:

Actual Consumption = kWh consumed during the billing month

CBL Consumption = kWh billed as the CBL during the billing month

Rider Adjustment = Sum of the DSM/EE and DSM/EE EMF rate adjustments during the current billing month

VI. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification -	\$7.96/month
Industrial/Public Authority Classification -	\$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an

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auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

PROVISION OF STANDBY SERVICE

If service is received under a standby or back-up service tariff prior to service under this Schedule, the use of standby service shall be excluded from initial determination of the CBL. The RTP Base Charge, as set forth in the Monthly Rate provision above, shall include billing of Supplementary Service but shall not include charges related to use of Standby Service. The Monthly Rate provisions of the applicable standby or back-up service tariff shall be calculated assuming no standby or back-up service was used with any actual use of Standby Service being billed pursuant to the RTP Hourly Energy Charge provisions of this Schedule. All other provisions of the applicable standby or back-up service tariff apply.

POWER FACTOR ADJUSTMENT

When the power factor in the current billing month is less than 85%, the monthly bill will be increased by a sum equal to \$0.32 multiplied by the difference between the maximum reactive kilovolt-amperes (kVAr) registered by a demand meter suitable for measuring the demand used during a 15-minute interval and 62% of the maximum kW demand registered in the current billing month.

CUSTOMER RATE NOTIFICATION

Company will notify Customer of the hourly prices via electronic mail, or other method of communications acceptable to Company, by 4 p.m. of the preceding business day. Prices for Saturday, Sunday, and Monday will generally be available on the preceding Friday. For a recognized holiday and the day following the holiday, prices will be available the preceding Company business day. Whenever prices are provided in excess of a day ahead and updated projections would result in significantly different prices, Company reserves the right to issue revised prices provided such prices are conveyed no later than 4 p.m. on the preceding calendar day.

Company is not responsible or liable for Customer's failure to receive and act upon the hourly prices. If Customer does not receive these prices, it is Customer's responsibility to inform Company so that future prices may be supplied.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall be monthly and will be automatically renewed unless terminated by either party by giving not less than thirty (30) days written notice of termination.

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GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations and any changes therein, substitutions therefore, or additions thereto lawfully made.

Where Customer's other source of power is connected electrically or mechanically to equipment which may be operated concurrently with service supplied by Company, Customer shall install and maintain at his expense such devices as may be necessary to protect his equipment and service and to automatically disconnect his generating equipment, which is operated in parallel with Company, when service used by Customer is affected by electrical disturbances on Company's or Customer's systems. Should Company determine that Customer's facilities are not adequate to protect Company's facilities, Company may install the necessary facilities and Customer shall pay for the extra facilities in accordance with Company's Service Regulations.

Company makes no representation regarding the benefits of Customer subscribing to this Schedule. Customer, in its sole discretion, shall determine the feasibility and benefits of Customer subscribing to this Schedule.

Supersedes Schedule LGS-RTP-56
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Duke Energy Progress, LLC
(North Carolina Only)

G-12

CHURCH AND SCHOOL SERVICE
SCHEDULE CSG-60

AVAILABILITY

This Schedule is available for electric service used in a church plant contracting to pay for service for 12 months in each calendar year when Company does not own equipment, other than meters or metering equipment, on Customer's side of the point of delivery.

This Schedule is also available for electric service used in educational and recreational buildings operated as an educational institution of elementary or high school level provided that no part of the school is used for boarding facilities to accommodate students or faculty members.

This Schedule is not available for service to other types of schools, such as an industrial, vocational or training school; or for service to a building which is wholly or partially used for other purposes not specifically provided for by the provisions of this Schedule; or for breakdown, standby, or supplementary service.

This Schedule is not available for new applications after June 30, 1977. Customer will be billed on this Schedule until Customer requests another available schedule or until Company's review of the preceding 12 months' history indicates the total annual bill on another available schedule would have been equal to or less than billing under this Schedule.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one kilowatt-hour meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 2 or 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two or more types of service, which types can be supplied from a single-phase 3 wire type or a three-phase 4 wire type, without voltage transformation, only the one of these two types necessary for Customer's requirements will be supplied.

MONTHLY RATE

I. For Single-Phase Service:

A. Customer Charge: \$28.50

B. Kilowatt-hour Energy Charge: 17.774¢ per kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

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Minimum: The minimum charge shall be the sum of (1) the Customer Charge, (2) the Three-Phase charge, if applicable, (3) the REPS Adjustment, (4) \$3.45 for each kW, and (5) 5.502¢ per kWh. The kW of Demand shall be the greater of (a) the Contract Demand or (b) the maximum kW registered or computed, by or from Company's metering facilities, during any 15-minute interval within the current or preceding 11 billing months.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-13

CHURCH AND SCHOOL SERVICE SCHEDULE CSE-60

AVAILABILITY

This Schedule is available when permanently installed electric space heating equipment is the only type of space heating equipment installed in either: (1) all parts of the church plant; (2) in the church sanctuary and pertinent rooms thereto; (3) in all parts of the church plant, except the parts contained in item (2); (4) in a newly constructed church educational building with not less than 50% of the floor area of the existing church plant, excluding the parts contained in item (2); or (5) any separately metered church building comprising a part of the church plant.

This Schedule is also available for electric service used in educational and recreational buildings operated as an educational institution of elementary or high school level when permanently installed electric space heating equipment is the only type of equipment installed for space heating purposes and all installed cooking and water heating equipment is electrical, provided that no part of the school is used for boarding facilities to accommodate students or faculty members.

This Schedule is not available for service to other types of schools, such as an industrial, vocational or training school; or for service to a building which is wholly or partially used for other purposes not specifically provided for by the provisions of this Schedule; or for breakdown, standby, or supplementary service.

This Schedule is not available for new applications after June 30, 1977. Customer will be billed on this Schedule until Customer requests another available schedule or until Company's review of the preceding 12 months' history indicates the total annual bill on another available schedule would have been equal to or less than billing under this Schedule.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one kilowatt-hour meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, single-phase 3 wires, or three-phase 3 or 4 wires, at Company's standard voltages. When Customer desires two types of service, which types can be supplied from a three-phase 4 wire type, without voltage transformation, only the three-phase 4 wire type will be supplied.

MONTHLY RATE

I. For Single-Phase Service:

- A. Customer Charge: \$28.50
- B. Kilowatt-hour Energy Charge: 14.452¢ per kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00

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Minimum: The minimum charge shall be the sum^{1/A} of (1) the Customer Charge, (2) the Three-Phase Charge, if applicable, (3) the REPS Adjustment, (4) \$3.45 for each kW, and (5) 5.502¢ per kWh. The kW of Demand shall be the greater of (a) the contract demand or (b) the maximum kW registered or computed, by or from Company's metering facilities, during any 15-minute interval within the current or preceding 11 billing months.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

G-14

SMALL GENERAL SERVICE (CONSTANT LOAD)
SCHEDULE SGS-TOU-CLR-60

AVAILABILITY

This Schedule is available at Company's sole discretion for electric service used by a nonresidential customer with equipment that supports an expectation of constant operation at a single point of delivery, at one of the Company's standard voltages. Customer may be required to furnish Company engineering specifications, meter history results, or other evidence to support an expectation of a constant load. This Schedule is not available other applications. Customer shall notify Company in writing if Customer's equipment or mode of operation change to no longer support an expectation of constant operation.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one kilowatt-hour meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

MONTHLY RATE

I. For Single-Phase Service:

\$21.00 Basic Facilities Charge

10.148¢ per kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, the Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

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I/A

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service under this Schedule is subject to the Company's Service Regulations, and any changes therein, substitutions therefore, or additions thereto lawfully made.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SGS-TOU-CLR-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

I/A

L-1

TRAFFIC SIGNAL SERVICE
SCHEDULE TSS-60

AVAILABILITY

This Schedule is available for electric service supplied for the operation and illumination of traffic signals installed along public and private highways where Company has an existing secondary distribution line.

INSTALLATION

The Company, for each signal or group of signals operating from one controller, will make its connection to Customer's service wire at a point one foot below the lowest support, carrying existing 120/240 volt conductors, or the equivalent, on the nearest pole. Customer will furnish, install, and maintain all service wires, fixtures, and other necessary equipment, including lamps and lamp renewals, for the installation and operation of all traffic signals.

TYPE OF SERVICE

Alternating current, 60 hertz, single-phase, 2 wires, 120 volts nominal.

DEFINITIONS

A One-way Signal is a signal with only one face which can be seen from only one approach.

A Multi-Direction Signal is a signal with more than one face each of which can be seen from only one approach.

MONTHLY RATE

I. MONTHLY RATE PER SIGNAL

TYPE OF SIGNAL	With Lamps of 70 Watts or Less(1) <u>Operating for a Maximum Day of</u>		With Lamps of 150 Watts or Less <u>Operating for a Maximum Day of</u>	
	<u>16 Hours/kWh</u>	<u>24 Hours/kWh</u>	<u>16 Hours/kWh</u>	<u>24 Hours/kWh</u>
Blinker Signal with One Lamp.....	\$ 2.28 / 19	\$3.11 / 28	\$4.12 / 33	\$5.79 / 49
One-way Signal with One Lamp.....	3.15 / 35	4.32 / 51	6.25 / 62	9.04 / 92
Two Lamps.....	3.78 / 35	5.06 / 51	7.66 / 62	10.56 / 92
Three Lamps.....	3.96 / 35	5.41 / 51	7.80 / 62	10.84 / 92
Four/Six Lamps.....	5.03 / 50	7.06 / 75	10.77 / 91	14.99 / 135
Five Lamps (2).....	3.96 / 35	5.41 / 51	7.80 / 62	10.84 / 92

(1) When a customer elects to install a lamp of 120 watts or less, in lieu of 70 watts or less, in the red cycle of a One-way Signal with two or more lamps, then the rates for all One-way Signals with two, three, or four lamps will be increased by \$1.16 and \$1.50, respectively, for 16 hours and 24 hours of operation.

(2) Used as indicating signals for a turning lane of traffic.

II. Multi-Direction Signal

The rate for a Multi-Direction Signal is the sum of the applicable One-way Signal rate for each face of the Multi-Direction Signal.

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III. Renewable Energy Portfolio Standard (REPS)^{1/A} Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

IV. Minimum: The amount computed under the above rates but not less than \$21.00 plus the REPS Adjustment.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule TSS-56

Effective for service rendered on and after November 29, 2019

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

L-2

TRAFFIC SIGNAL SERVICE (METERED)
SCHEDULE TFS-60

AVAILABILITY

This Schedule is available for electric service supplied solely for the operation and illumination of traffic signals installed along public and private highways.

INSTALLATION

The Company, for each signal or group of signals operating from one controller, will make its connection to Customer's service wire at a point where Company's conductors may be conveniently extended and terminated. Customer will furnish, install, and maintain all service wires, fixtures, and other necessary equipment, including lamps and lamp renewals, for the installation and operation of all traffic signals.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one kilowatt-hour meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 or 3 wires, or three-phase 4 wires, at Company's standard voltages of 240 volts or less.

MONTHLY RATE

I. For Single-Phase Service:

A. For the cost to bill and provide facilities necessary to support consumption of electricity:

\$21.00 Customer Charge

B. For the cost of electricity consumed:

Kilowatt-Hour Energy Charge: 9.179¢ per kWh

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

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PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one year.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule TFS-56
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Duke Energy Progress, LLC
(North Carolina Only)

L-3

AREA LIGHTING SERVICE SCHEDULE ALS-60

AVAILABILITY

This Schedule is available for service supplied in the lighting of outdoor areas, private streets, and private driveways by means of mercury vapor, metal halide, sodium vapor lighting, and light emitting diode units. Lighting units will be bracket-mounted on Company-owned poles, and the mercury vapor lamps will be color-corrected.

This Schedule is not available for the lighting of dedicated streets or highways.

SERVICE

Prior to installing area lighting facilities, Customer and Company must enter into an agreement for Area Lighting Service. The service supplied by Company will include the installation and operation, according to Company standards and requirements, of the area lighting units and will include the furnishing of electricity required for the illumination of the lamps from dusk to dawn. After Customer has notified Company that a lamp is not burning, Company will perform as soon as practicable, during regular working hours, the necessary maintenance to restore illumination. The lumen rating of the lighting units listed under the MONTHLY RATE indicates the class of lamp.

MONTHLY RATE

I. Overhead Service

Basic Rate: The basic rate per fixture defined below will be billed for installations of standard area lighting fixtures installed on Company's system distribution poles. The basic rate does not include the monthly charges for extra facilities, area lighting poles, underground service, Masterpiece Series Standard Facilities, or any contribution required under this Schedule.

	<u>Monthly Charge</u> <u>Per Fixture</u>	<u>Monthly kWh</u> <u>Per Fixture</u>
<u>Light Emitting Diode Units</u>		
LED 50	\$8.04	18
LED 50 floodlight	11.66	18
LED 75	8.32	25
LED 105	10.24	35
LED 130 floodlight	23.54	44
LED 150	13.22	54
LED 215	16.26	73
LED 220 Shoebox	20.54	74
LED 260 floodlight	42.88	88
LED 280	18.57	101
LED 420	43.21	142
LED 530	52.58	179
<u>Lighting Fixtures - No Longer Available to New Applicants</u>		
5,800 lumen (Sodium Vapor) ¹	\$ 7.21	29
9,000 lumen (Metal Halide) ²	13.42	41
9,500 lumen ³	\$11.49	46
7,000 lumen semi-enclosed (Mercury Vapor) ¹	9.18	69
7,000 lumen (Mercury Vapor) ¹	10.53	69
12,000 lumen (Retrofit Sodium Vapor) ¹	13.03	59
16,000 lumen ³	13.47	59
20,000 lumen (Metal Halide) ²	19.79	94
21,000 lumen (Mercury Vapor) ¹	17.05	149

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Monthly Charge
Per Fixture

Monthly kWh
Per Fixture

Lighting Fixtures - No Longer Available to New Applicants (Continued)

21,000 lumen flood (Mercury Vapor) ¹	20.67	160
22,000 lumen (Sodium Vapor) ²	14.66	86
28,500 lumen ³	16.84	109
33,000 lumen (Metal Halide) ²	25.80	133
38,000 lumen (Retrofit Sodium Vapor) ¹	19.44	135
40,000 lumen (Metal Halide) ²	27.23	160
50,000 lumen ³	23.35	152
50,000 lumen floodlight ³	26.19	168
60,000 lumen (Mercury Vapor) ¹	34.88	382
60,000 lumen floodlight (Mercury Vapor) ¹	37.62	382
110,000 lumen (Metal Halide) ²	52.07	370

¹ Not available for new installations. For all fixtures, upon failure of the lamp, photocell, fixture or ballast or by no later than December 31, 2023 pursuant to Commission Rule R8-47, the fixture shall be replaced at no charge with a similar style fixture as shown in the table below and the monthly rate for the new fixture will apply. Mercury vapor fixtures shall also be replaced, prior to failure, upon Customer's request.

² Not available for new installations. For all fixtures other than Masterpiece, non-standard, and custom design, upon failure of the fixture or ballast, the fixture shall be replaced at no charge with a similar style fixture as shown in the table below and the monthly rate for the new fixture will apply. Fixtures shall also be replaced, prior to failure, upon Customer's request.

Restricted Lumen Classification	Default Replacement Classification*
5,800 lumen HPS, 7000 lumen MV, 9,000 lumen MH, 9,500 lumen HPS, and 12,000 lumen RSV	LED 50
16,000 lumen HPS	LED 105
20,000 lumen MH, 21,000 lumen MV and 22,000 lumen HPS	LED 150
33,000 lumen MH and 40,000 lumen	LED 220
28,500 lumen HPS and 38,000 lumen RSV	LED 215
50,000 lumen HPS and 60,000 lumen MV	LED 280
50,000 lumen HPS floodlight	LED 130 floodlight
110,000 lumen MH	LED 530

* Actual default replacement may vary based upon fixture style.

³ Not available for new installations, except to existing customers for additional units of the same type on the same or contiguous property. For all fixtures other than Masterpiece, non-standard, and custom design, upon failure of the fixture or ballast, the fixture shall be replaced at no charge with a similar style LED fixture as shown in the table above and the monthly rate for the new fixture will apply.

II. Overhead Service to Light Emitting Diode (LED) Lighting

The rate per fixture defined below will be billed for installations of DEP-approved lighting fixtures installed on Company's system distribution poles. Upon notification by Customer that 35% or greater of the light emitting diodes contained within the fixture are not burning, Company will perform as soon as practicable, during regular working hours, the necessary maintenance to restore illumination. The rate does not include the monthly charges for extra facilities, special lighting poles or posts, underground service, or any contribution required under this Schedule.

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I/A

LED Rate (Standard Offer):

<u>Fixture</u>	<u>LED Wattage*</u>	<u>Monthly Charge Per Fixture**</u>	<u>Monthly kWh Per Fixture</u>
LED 75 ¹	75	\$6.40	25
LED 105 ¹	105	9.17	35
LED 215 ¹	215	13.46	73
LED 205 Site Lighter ¹	205	13.53	69

* Approximate wattage of fixture class

** In addition to the Rate, Customer shall pay a monthly charge of 1.0% times the cost difference between the estimated installed cost of a DEP-approved fixture and the LED fixture cost allowance for the stated lumen category in accordance with the EXTRA FACILITIES paragraph below. The monthly charge shall not be less than zero.

¹ The LED 75, LED 105, and LED 215 are not available to new installations under the Standard Option effective September 15, 2014. The LED 205 Site Lighter is not available to new installations under the Standard Option effective November 29, 2019.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Residential Classification -	\$1.42/month
Commercial/Governmental Classification -	\$7.96/month
Industrial/Public Authority Classification -	\$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

IV. Underground Service

For underground service, the monthly bill will be increased by \$3.49 per pole or, in lieu thereof, a one-time contribution of \$580.00 per pole. The monthly pole charge, if selected, may be terminated at any time upon payment by Customer of the one-time contribution. The monthly pole charge defined below will also be applicable to underground service.

V. Special Area Lighting Poles and Posts

A special area lighting pole or post is any Company-owned pole or post, except those installed under Extra Facilities Item IV. below, installed as a part of an area lighting system and on which no other Company overhead distribution facilities are installed except those necessary to provide service to an area lighting system or a pole or post installed as a part of a Company-owned underground area lighting system.

	<u>Monthly Charge Per Pole or Post</u>
Wood	\$2.40
Metal*, Fiberglass, or Post	5.71
12-Foot Smooth Concrete Post**	11.13
16-Foot Smooth Concrete Post**	12.25
Decorative Square Metal	12.25
13-Foot Fluted Concrete Post**	16.72
Decorative Aluminum 12-Foot Post	20.05
Decorative 35- or 39-Foot Tapered Metal Pole	31.84

* Metal will be installed in locations where fiberglass cannot be used as determined by Company.

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I/A

** Concrete posts will not be available for new installations on and after August 1, 2007. Concrete posts or similar material posts, as determined by Company, will be offered in accordance with the Extra Facilities paragraph.

V. Masterpiece Series Standard Facilities

Masterpiece Series Standard Facilities are deluxe decorative fixtures, posts, and brackets that are normally maintained in inventory by Company to meet the lighting needs of customers. The initial Contract Period for All Masterpiece Series facilities is 10 years. The MONTHLY RATE for Masterpiece Series Standard Facilities is as follows:

Masterpiece Series Fixtures: In addition to the MONTHLY RATE, Item I., for a 9,000 or 9,500 lumen fixture, Customer pays:

Masterpiece Series A Fixture	\$ 3.00
Masterpiece Series B Fixture	\$ 4.15

Masterpiece Series Decorative Posts:

Masterpiece Series A 12-Foot decorative metal post	\$20.05
Masterpiece Series A 16-Foot decorative metal post	\$24.51

Masterpiece Series Bracket:

Masterpiece Series A Twin Mounting Bracket	\$ 5.00
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SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The initial Contract Period for lighting units shall be one of the following:

- (a) Three (3) years when the lighting unit will be mounted on Company's existing distribution pole, excluding temporary service poles and (c) or (d) does not apply; or
- (b) Five years for underground service; or
- (c) Ten years for service to all Masterpiece Series facilities, the LED site lighter and shoe-box fixtures, LED facilities (only if installed under the Rate plus a monthly charge option), and for service utilizing fixtures, poles, and posts determined by Company as Special Order nonstandard; or
- (d) Twenty years for service utilizing fixtures, poles, and posts determined by Company as Custom Design nonstandard.
- (e) For temporary lighting facilities, the Customer shall pay the total estimated installed cost plus removal cost minus salvage value of the facilities installed to provide such service in lieu of a Contract Period.

Company may require Customer to initially make a termination deposit which will not exceed the termination amount computed in accordance with the Outdoor Lighting Service Regulations. Such termination deposit will be refunded in equal amounts at the end of each full year service is rendered. This annual refund will be the termination deposit divided by the number of years in the Contract Period.

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GENERAL

Service rendered under this Schedule is subject to the provisions of Company's Outdoor Lighting Service Regulations filed with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule ALS-56
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Duke Energy Progress, LLC
(North Carolina Only)

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L-4

STREET LIGHTING SERVICE SCHEDULE SLS-60

AVAILABILITY

This Schedule is available for service supplied in the lighting of dedicated public streets, highways, municipally owned and operated public parking lots, and municipally owned and operated public parks by lighting fixtures mounted on Company-owned poles or government-owned traffic signal poles. This Schedule is also available for continuous service to other installations which were being served on April 1, 1973, under superseded Schedules SL-1G and SL-2C.

SERVICE

The service supplied by Company will include the installation of a street lighting system, according to Company's standards and requirements, which will be owned, maintained, and operated by Company, including the furnishing of the electricity required for the illumination of the lamps from dusk to dawn. The lumen ratings of lighting units listed under the MONTHLY RATE indicate the general class of lamp.

MONTHLY RATE

I. Overhead Service

Basic Rate: The basic rate per fixture defined below will be billed for installations of standard street lighting fixtures. The basic rate does not include the monthly charges for additional facilities, street lighting poles, underground service, Masterpiece Series Standard Facilities, or any contribution required under this Schedule and under the Outdoor Lighting Service Regulations.

<u>Light Emitting Diode Units</u>	<u>LED Wattage*</u>	<u>Monthly Charge Per Fixture</u>	<u>Monthly kWh Per Fixture</u>
LED 50	50	\$8.04	18
LED 75	75	8.32	25
LED 105	105	10.24	35
LED 150	150	13.22	54
LED 215	215	16.26	73
LED 220 Shoebox	220	20.54	
LED 280	280	18.57	101
LED 420	420	43.21	142
LED 530	530	52.58	179

* Approximate wattage of fixture class.

Lighting Fixtures - No Longer Available to New Applicants

5,800 lumen (sodium vapor) ¹	\$7.21	29
7,000 lumen semi-enclosed (mercury vapor) ¹	9.18	69
7,000 lumen (mercury vapor) ¹	10.53	69
9,000 lumen (metal halide) ²	13.42	41
9,500 lumen ³	11.49	46
12,000 lumen (Retrofit Sodium Vapor) ¹	13.03	59
16,000 lumen ³	13.47	59
20,000 lumen (metal halide) ²	19.79	94
21,000 lumen (mercury vapor) ¹	17.05	149
22,000 lumen (Sodium Vapor) ²	14.66	86
28,500 lumen ³	16.84	109
33,000 lumen (metal halide) ²	25.80	133
38,000 lumen (Retrofit Sodium Vapor) ¹	19.44	135
50,000 lumen ³	23.35	152
40,000 lumen (metal halide) ²	27.23	160
60,000 lumen (mercury vapor) ¹	34.88	382
110,000 lumen (metal halide) ²	52.07	370

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Oct 30 2019

74

¹ Not available for new installations. For all fixtures, upon failure of the lamp, photocell, fixture or ballast, or by no later than December 31, 2023 pursuant to Commission Rule R8-47, the fixture shall be replaced at no charge with a similar style fixture as shown in the table below and the monthly rate for the new fixture will apply. Mercury vapor fixtures shall also be replaced, prior to failure, upon Customer's request.

² Not available for new installations. For all fixtures other than Masterpiece, non-standard, and custom design, upon failure of the fixture or ballast, the fixture shall be replaced at no charge with a similar style fixture as shown in the table below and the monthly rate for the new fixture will apply. Fixtures shall also be replaced, prior to failure, upon Customer's request.

Restricted Lumen Classification	Default Replacement Classification*
5,800 lumen HPS, 7000 lumen MV, 9,000 lumen MH, 9,500 lumen HPS, and 12,000 lumen RSV	LED 50
16,000 lumen HPS	LED 105
20,000 lumen MH, 21,000 lumen MV and 22,000 lumen HPS	LED 150
33,000 lumen MH and 40,000 lumen MH	LED 220
28,500 lumen HPS and 38,000 lumen RSV	LED 215
50,000 lumen HPS and 60,000 lumen MV	LED 280
110,000 lumen MH	LED 530

*Actual default replacement may vary based upon fixture style.

³ Not available for new installations, except to existing customers for additional units of the same type on the same or contiguous property. For all fixtures other than Masterpiece, non-standard, and custom design, upon failure of the fixture or ballast, the fixture shall be replaced at no charge with a similar style LED fixture as shown in the table above and the monthly rate for the new fixture will apply.

II. Overhead Service to Light Emitting Diode (LED) Lighting

The rate per fixture defined below will be billed for installations of DEP-approved lighting fixtures installed on Company's system distribution poles. Upon notification by Customer that 35% or greater of the light emitting diodes contained within the fixture are not burning, Company will perform as soon as practicable, during regular working hours, the necessary maintenance to restore illumination. The rate does not include the monthly charges for extra facilities, special lighting poles or posts, underground service, or any contribution required under this Schedule.

A. LED Rate (Standard Option):

Fixture	LED Wattage*	Monthly Charge Per Fixture**	Monthly kWh Per Fixture
LED 75 ¹	75	\$6.40	25
LED 105 ¹	105	9.17	35
LED 215 ¹	215	13.46	73
LED 205 Site Lighter ¹	205	13.53	69

* Approximate wattage of fixture class.

** In addition to the Rate, Customer shall pay a monthly charge of 1.0% times the cost difference between the estimated installed cost of a DEP-approved fixture and the LED fixture cost allowance for the stated lumen category in accordance with the EXTRA FACILITIES paragraph below. The monthly charge shall not be less than zero.

¹ The LED 75, LED 105, and LED 215 are not available to new installations under the Standard Option effective September 15, 2014. The LED 205 Site Lighter is not available to new installations under the Standard Option effective November 29, 2019.

B. LED Rate (Customer-Ownership Option): The Customer-Ownership Option is not available for new installations effective September 15, 2014. Customer with existing installations

installed prior to this date shall provide a DEP-approved LED fixture at no cost to Company for installation on Company's system distribution poles. Customer retains full ownership of the fixture and after removal from service will be picked up by the Customer.

The rate defined below will be billed for installation, operation and maintenance of Customer-owned lighting fixture. Customer shall provide a replacement fixture, if required, to maintain the lighting service.

<u>Fixture</u>	<u>LED Wattage*</u>	<u>Monthly Charge Per Fixture</u>	<u>Monthly kWh Per Fixture</u>
LED 75	75	\$5.57	25
LED 105	105	6.03	35
LED 215	215	7.63	73
LED 205 Site Lighter	205	7.48	69

* Approximate wattage of fixture class.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include an REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Industrial/Public Authority Classification - \$73.17/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

IV. Underground Service

For underground service, the monthly bill will be increased by \$3.49 per pole, or in lieu thereof, a one-time contribution of \$580.00 per pole. The monthly charge, if selected, may be terminated at any time upon payment by Customer of the one-time contribution. The monthly pole charge defined below will also be applicable to underground service.

V. Special Street Lighting Poles and Posts

	<u>Monthly Charge Per Pole or Post</u>
Wood	\$ 1.91
Metal*, Fiberglass, or Post	3.35
12-Foot Smooth Concrete Post**	11.13
Decorative Square Metal	12.25
16-Foot Smooth Concrete Post**	12.25
13-Foot Fluted Concrete Post**	16.72
Decorative Aluminum 12-Foot Post	20.05
Decorative 35- or 39-Foot Tapered Metal Pole	31.84
System Metal	1.15

* Metal will be installed in locations where fiberglass cannot be used as determined by Company.

** Concrete posts will not be available for new installations on and after August 1, 2007. Concrete posts or similar material posts, as determined by Company, will be offered in accordance with the Extra Facilities paragraph.

VI. Masterpiece Series Standard Facilities

Masterpiece Series Standard Facilities are deluxe decorative fixtures, posts, and brackets that are normally maintained in inventory by Company to meet the lighting needs of customers. The MONTHLY RATE for Masterpiece Series Standard Facilities is as follows:

Masterpiece Series Fixtures: In addition to the MONTHLY RATE Item I, for a 9,000 or 9,500 lumen fixture, Customer pays: I/A

Masterpiece Series A Fixture	\$ 3.00
Masterpiece Series B Fixture	\$ 4.15

Masterpiece Series Decorative Posts:

Masterpiece Series A 12-Foot decorative metal post	\$20.05
Masterpiece Series A 16-Foot decorative metal post	\$24.51

Masterpiece Series Bracket:

Masterpiece Series A Twin Mounting Bracket	\$5.00
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SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than the following:

- (a) Ten years for standard and Masterpiece Series standard fixtures, poles, and posts, and
- (b) Twenty years for service utilizing fixtures, poles, and posts determined by Company as nonstandard or custom-designed.

GENERAL

Service rendered under this Schedule is subject to the provisions of Company's Outdoor Lighting Service Regulations filed with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

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I/A

Duke Energy Progress, LLC
(North Carolina Only)

L-5

STREET LIGHTING SERVICE SCHEDULE SLR-60
(RESIDENTIAL SUBDIVISIONS AND NEIGHBORHOODS)

AVAILABILITY

This Schedule is available for service supplied in the lighting of residential dedicated public streets by means of mercury vapor, light emitting diode or sodium vapor lighting units installed within residential subdivisions or neighborhoods, consisting of single or duplex dwelling units, located (1) outside the corporate limits of a municipality at the time of the installation or (2) inside the corporate limits of a municipality when the area served was subsequently annexed by the municipality after lighting service was first established. This Schedule is also available inside a municipality jointly served by a municipal-owned electric utility when the municipality approves a regulation or ordinance requiring its residents to individually pay for lighting service. The street lighting must conform to the installations set forth in the Monthly Rate paragraph.

This Schedule is not available to supply service for the lighting of parking lots, shopping centers, other public or commercial areas within the residential subdivision or neighborhood, or areas not specifically provided for by the provisions herein.

SERVICE

The service supplied by Company will include the installation of a street lighting system, according to Company's standards and requirements, which will be owned, maintained, and operated by Company, including the furnishing of the electricity required for the illumination of the lamps from dusk to dawn. Lighting units will be located by Company to provide the most uniform lighting possible in the residential area. The lumen ratings of the lighting units furnished under the Monthly Rate indicate the class of lamp.

MONTHLY RATE

The following amount will be added to each monthly bill rendered for residential electric service within the subdivision or neighborhood:

	Monthly Charge <u>Per Customer</u>
OVERHEAD DISTRIBUTION AREA:	
Bracket-mounted, enclosed luminaire on approved wood pole:	
1 light per 10 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	\$1.32
LED 50 light emitting diode	1.05
1 light per 5 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	2.63
LED 50 light emitting diode	2.10
1 light per 3 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	4.33
LED 50 light emitting diode	3.42
UNDERGROUND DISTRIBUTION AREA:	
Bracket-mounted, enclosed luminaire on approved wood pole:	
1 light per 10 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	1.83
LED 50 light emitting diode	1.50

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1 light per 5 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	3.65
LED 50 light emitting diode	3.01
1 light per 3 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	6.03
LED 50 light emitting diode	4.94

Bracket-mounted, enclosed luminaire on standard fiberglass or metal* pole or approved direct burial post:

1 light per 10 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	2.08
LED 50 light emitting diode	1.74
LED 50 light emitting diode (post-top fixture)	2.16
1 light per 6 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	3.45
LED 50 light emitting diode	2.90
LED 50 light emitting diode (post-top fixture)	3.59
1 light per 3 customers or major fraction thereof:	
7,000 lumen mercury vapor ¹ or 9,500 lumen sodium vapor ¹	6.86
LED 50 light emitting diode	5.74
LED 50 light emitting diode (post-top fixture)	7.09

*Metal will be installed in locations where fiberglass cannot be used as determined by Company on or after January 15, 1997.

Mercury vapor units converted before September 19, 1983, to 12,000 lumen retrofit sodium vapor units, add to mercury vapor prices:

If 1 light per 10 customers:	0.17
If 1 light per 5 customers:	0.32
If 1 light per 6 customers:	0.26

¹ Mercury vapor, sodium vapor or retrofit sodium vapor fixtures are not available to new installations. For mercury vapor and retrofit sodium vapor, upon failure of the lamp, fixture or ballast or but no later than December 31, 2023 pursuant to Commission Rule R8-47, these fixtures shall be replaced at no charge with a comparable LED 50 fixture. For sodium vapor, upon failure of the fixture or ballast, these fixtures will be replaced at no charge with a comparable LED 50 fixture.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

ANNEXATION CONSIDERATIONS

- I. If any of the following conditions exist, the developer of the subdivision or neighborhood will be required to obtain from the municipal governing agency its written approval of the street lighting service being provided under this Schedule and the number and location of the lights to be installed:
 - A. The subdivision or neighborhood abuts a boundary of the municipality.
 - B. It is known that the subdivision or neighborhood will be annexed into the municipality.
 - C. The municipal governing agency has enacted a subdivision or neighborhood control ordinance which applies to the subdivision or neighborhood or any portion thereof.

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Oct 30 2019

- II. If the subdivision or neighborhood is subsequently annexed and the municipality accepts the street lighting under a street lighting service contract on the rate for the equivalent lighting unit, the following will apply:
- A. Overhead Distribution: If the municipality accepts the street lighting service under Street Lighting Service Schedule SLS, no monthly customer charge will be applied to the subdivision or neighborhood residents.
- B. Underground Distribution: If the municipality accepts the street lighting service under Street Lighting Service Schedule SLS and agrees to pay the contribution under the schedule for the street lighting system, no monthly customer charge will be applied to the subdivision or neighborhood residents. If the municipality accepts the street lighting service but does not agree to pay the contribution for the underground system, the monthly customer charges will be reduced according to the following schedule:

Lights per Customer	Pole type	Monthly Customer Charge		
		7,000 lumen	9,500 lumen	LED 50
1 light per 10	Wood	\$0.33	\$0.45	\$0.42
1 light per 10	Post, Fiberglass or Metal	\$0.40	\$0.55	\$0.44
1 light per 5	Wood	\$0.62	\$0.83	\$0.84
1 light per 6	Post, Fiberglass or Metal	\$0.67	\$0.95	\$0.74
1 light per 3	Wood	\$0.73	\$0.99	\$1.39
1 light per 3	Post, Fiberglass or Metal	\$0.78	\$1.11	\$1.46

The retrofit 12,000 Lumen Sodium Vapor units will be reduced to the corresponding reduced 7,000 Lumen Mercury Vapor Monthly Customer Charge.

- III. If the subdivision or neighborhood is subsequently annexed and the municipality does not accept the installed street lighting under a street lighting service contract, the service will be provided under this Schedule with the applicable monthly charges. If the municipality initially accepts the installed street lighting under a street lighting service contract and subsequently terminates such lighting service contract, the service will be provided under this Schedule only upon approval of an authorizing ordinance requiring the municipal residents to pay the applicable monthly charges.

NONREFUNDABLE CONTRIBUTION

Normally, a contribution will not be required for service under this Schedule. Company will require a nonrefundable contribution from the developer under the following conditions:

- I. Unusual Circumstances: In the event rock, unstable soil, or other conditions require the use of materials and methods of installation other than Company's normal materials and methods, the developer will contribute the additional cost incurred thereby.
- II. Paved Areas: If Company has to install any portion of the street lighting system under existing paved areas, the developer will either cut and replace the pavement or contribute to Company the additional cost incurred to install its facilities under the paved area.
- III. Excess Circuitry: When any lighting unit is located so that the span of underground cable necessary to serve such unit exceeds 250 feet, the developer will contribute the sum of the estimated installed costs of all such overages within the subdivision or neighborhood.

EXISTING SUBDIVISIONS OR NEIGHBORHOODS

Street lighting service under this Schedule will be available in existing residential subdivisions or neighborhoods not previously receiving lighting service provided either Company receives a petition requesting this service signed by all the owners of residential lots within the subdivision or neighborhood or a municipality requests this service and approves an ordinance requiring residents to pay the applicable monthly charges. When the electrical distribution system within the subdivision or neighborhood is installed underground, the persons requesting the installation of the street lighting system will pay to

Company, in addition to any contribution required above, a nonrefundable contribution equal to the cost of trenching and backfilling necessary for the installation of the street lighting system. If a contribution is required under Excess Circuitry, that portion of trenching and backfilling included in such contribution will be excluded from the preceding requirement. Re-landscaping of the area necessary due to the installation of the street lighting system will be the responsibility of the residents within the subdivision or neighborhood. The appropriate monthly charge as set forth above will be applied to the monthly billings of all residents in the subdivision or neighborhood.

CONVERSION OF EXISTING LIGHTING SYSTEM

Street lighting installed pursuant to this schedule is subject to conversion upon request of an Applicant under the conditions stated below. An Applicant is a duly authorized representative of customers served under this Schedule with the authority to seek changes to the lighting system.

- I. Upon request of an Applicant, the street lighting may be converted to a different light type, light source or installation density provided all of the following conditions are met:
 - A. Applicant requesting a change in the street lighting system must submit a petition signed by all the owners of residential lots within the subdivision or neighborhood requesting the revised lighting service.
 - B. If the current lighting has been installed fewer than 20 years, Applicant must submit a payment of \$50 per fixture for fixture conversions on existing poles or \$500 per fixture if the change also involves a pole or post. If the change requires a redesign of the system layout, Applicant shall also pay any required Nonrefundable Contribution, as described in the above paragraph.
 - C. The converted lighting system must conform to the options offered under this Schedule and must be applicable to all lighting within the subdivision or neighborhood.
 - D. The new monthly rate shall apply immediately following completion of the revised lighting installation.
- II. Upon request of a Homeowners Association or other legal entity representing the interest of residents served under this Schedule, the street lighting may be converted to service under Outdoor Lighting Service Schedule SLS provided all of the following conditions are met:
 - A. The Applicant must demonstrate legal authority to represent the interests of all land-owners within the subdivision or neighborhood. Absent this demonstration, the Applicant must submit a petition signed by all the owners of residential lots within the subdivision or neighborhood requesting conversion to Schedule SLS.
 - B. The Applicant must execute an Agreement for lighting service under Schedule SLS. The Agreement shall include a statement by the Applicant verifying that all residential land owners will be notified in writing prior to the conversion to lighting service under Schedule SLS and transfer of the lighting responsibilities to the Applicant. The Agreement shall also include a statement by the Applicant verifying that once service is established under Schedule SLS, the Applicant shall also be required to notify land owners in writing of any future changes to the lighting system including, but not limited to, potential disconnection of the lighting service due to nonpayment or termination of service.
 - C. The Applicant must demonstrate credit-worthiness or provide a deposit satisfactory to Company in case of default.
 - D. Following conversion of the street lighting to Schedule SLS, any change in the light type, light source or lighting design shall be made pursuant to the Outdoor Lighting Service Regulations.

PAYMENTS

I/A

The monthly charges set forth under this Schedule will be billed in conjunction with the normal bill for residential service. The total of the bill so rendered shall be subject to the terms and conditions of the Service Regulations approved and on file with the state regulatory commission. Failure to pay the total bill rendered when due and payable shall constitute a failure to pay the bill for residential service.

CONTRACT PERIOD

The applicable monthly charge set forth in this Schedule shall be applied to the monthly billings of all residents in the subdivision or neighborhood as long as street lighting service is provided under any of the conditions as set out herein.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SLR-56

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

L-6

SPORTS FIELD LIGHTING
SCHEDULE SFLS-60

AVAILABILITY

This Schedule is available for electric service used for lighting specifically designed for outdoor fields which are normally used for football, baseball, softball, tennis, races, and other organized competitive sports.

This Schedule is not available for breakdown, standby, supplementary, or resale service.

APPLICABILITY

This Schedule is applicable to all electric service of the same available type supplied to Customer's premises at one point of delivery through one meter.

TYPE OF SERVICE

The types of service to which this Schedule is applicable are alternating current, 60 hertz, either single-phase 2 wires, or three-phase 3 or 4 wires, at Company's standard distribution voltage available for the area or the voltage at which an installation was served on December 1, 1973.

EXTENSION OF FACILITIES

Company will make the type of service agreed upon available to Customer, provided Customer will pay to Company the total estimated cost of extending or increasing the capacity of Company's facilities located on Company's side of the point of delivery, exclusive of the material cost of transformers and the entire cost of the meter installation.

MONTHLY RATE

I. For Single-Phase Service:

- | | |
|---------------------------------|----------------|
| A. Basic Customer Charge | \$28.50 |
| B. Billing Demand: | \$1.37per kW |
| C. Kilowatt-hour Energy Charge: | 6.767¢ per kWh |

II. For Three-Phase Service:

The bill computed for single-phase service plus \$7.00.

III. Renewable Energy Portfolio Standard (REPS) Adjustment:

The monthly bill shall include a REPS Adjustment based upon the revenue classification:

Commercial/Governmental Classification - \$7.96/month

Upon written request, only one REPS Adjustment shall apply to premises serving the same customer for all accounts of the same revenue classification. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts regardless of their revenue classification (see Annual Billing Adjustments Rider BA).

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BILLING DEMAND

I/A

The Billing Demand shall be the maximum kW registered or computed, by or from Company's metering facilities, during any 15-minute interval within the current billing month, but not less than the maximum kW previously registered during the current season (period of continuous connection).

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

BILLING

The billing to Customer will be continuous from the beginning to the end of each complete season or period of special use, and service will not be disconnected until the end of each complete season or period of special use. If the season or period of use is for less than 30 consecutive days, Customer will be billed the estimated cost of connecting and disconnecting service, which estimated cost shall not be less than \$9.14.

PAYMENTS

Bills are due when rendered and are payable within 25 days from the date of the bill. If any bill is not so paid, Company has the right to suspend service in accordance with its Service Regulations. In addition, any bill not paid on or before the expiration of twenty-five (25) days from the date of the bill is subject to an additional charge of 1% per month as provided in Rule R12-9 of the Rules and Regulations of the North Carolina Utilities Commission.

CONTRACT PERIOD

The Contract Period shall not be less than one month, unless Customer agrees to pay the estimated cost of connection and disconnection, which estimated cost shall be \$9.14.

GENERAL

Service rendered under this Schedule is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission.

ADDITIONAL CHARGES

The MONTHLY RATE includes fuel, DSM, and EE Billing Adjustment Factors set forth in Annual Billing Adjustments Rider BA, Excess Deferred Income Tax Riders EDIT-1 and EDIT-2, Regulatory Asset and Liability Rider RAL, Joint Agency Asset Rider JAA, and Fuel EMF Deficiency Rider.

Supersedes Schedule SFLS-56
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

RR-1

ANNUAL BILLING ADJUSTMENTS RIDER BA-22

APPLICABILITY – RATES INCLUDED IN TARIFF CHARGES

The rates shown below are included in the MONTHLY RATE provision in each schedule identified in the table below:

Billing Adjustment Factors (¢/kWh)*					
Rate Class	Fuel and Fuel-Related Adjustment		DSM and EE Adjustment		Net Adjustment
	Rate ⁽¹⁾	EMF ⁽²⁾	Rate ⁽³⁾	EMF ⁽⁴⁾	
Residential Applicable to Schedules: RES, R-TOUD, & R-TOU	0.000	0.576	0.641	0.003	1.220
Small General Service Applicable to Schedules: SGS, SGS-TOUE, SGS-TOU-CLR, TSF & TSS	0.000	0.364	0.698 (EE Only) 0.063 (DSM Only)	0.122 (EE Only) (0.018) (DSM Only)	1.229
Medium General Service Applicable to Schedules: MGS, SGS-TOU, SI, CH-TOUE, GS-TES, APH-TES, CSG, CSE	0.000	0.343	0.698 (EE Only) 0.063 (DSM Only)	0.122 (EE Only) (0.018) (DSM Only)	1.208
Large General Service Applicable to Schedules: LGS, LGS-TOU, LGS-RTP	0.000	1.039	0.698 (EE Only) 0.063 (DSM Only)	0.122 (EE Only) (0.018) (DSM Only)	1.904
Lighting Applicable to Schedules: ALS, SLS, SLR & SFLS	0.000	0.886	0.099 (EE Only) 0.000 (DSM Only)	0.001 (EE Only) 0.000 (DSM Only)	0.986

* Billing Adjustment Factors, shown above, includes a North Carolina regulatory fee.

Billing Adjustment Factors Description:

- (1) The Fuel and Fuel-Related Adjustment Rate is adjusted annually to reflect incremental changes in the costs of fuel and fuel-related costs from the rates approved in the last general rate case.
- (2) The Fuel and Fuel-Related Adjustment Experience Modification Factor (EMF) is adjusted annually to reflect the difference between reasonable and prudently incurred fuel and fuel-related costs and the fuel and fuel-related revenues realized during a test period under review and shall remain in effect for a fixed 12-month period.
- (3) The Demand Side Management (DSM) and Energy Efficiency (EE) Rates are adjusted annually to reflect the costs and incentives associated with DSM and EE measures and programs approved by the North Carolina Utilities Commission.
- (4) The DSM and EE Experience Modification Factors (DSM EMF and EE EMF) are adjusted annually to reflect the difference between reasonable and prudently incurred DSM and EE costs and incentives and DSM and EE revenues realized during the period under review and shall remain in effect for a fixed 12-month period.

The fuel rate included in base tariff rates effective November 29, 2019 are 2.314¢/kWh for RES, 2.560¢/kWh for SGS, 2.480¢/kWh for MGS, 1.759¢/kWh for LGS and 2.254¢/kWh for Lighting, including

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the North Carolina regulatory fee.

Demand Side Management and Energy Efficiency “Opt-Out” Option

North Carolina Utilities Commission Rule R8-69(e) allows commercial customers with annual consumption of 1,000,000 kWh or greater in the billing months of the prior calendar year and all industrial customers to elect to not participate in either or both (1) any utility-offered DSM or (2) any utility-offered EE program and, after written notification to the utility, not be subject to either or both the DSM or EE Rates and EMFs, as applicable and as shown above. For purposes of application of this option, a customer is defined to be a metered account billed under a single application of a Company rate tariff. For commercial accounts, once one account meets the opt-out eligibility requirement, all other accounts billed to the same entity with lesser annual usage located on the same or contiguous properties are also eligible to opt-out in the same manner from paying either or both of the DSM and EE Rates and EMFs. Since these rates are included in the rate tariff charges, Customers electing this option shall receive either or both of the following DSM and EE Credit(s) on their monthly bill statement:

DSM Opt-Out Credit = Billed kWh times the sum of the DSM Rate and EMF*
EE Opt-Out Credit = Billed kWh times the sum of the EE Rate and EMF*

* The DSM and EE Rates and EMFs shall be as shown in the above table for the schedule applicable to Customer’s monthly bill.

Following the December bill each year, usage for commercial accounts electing to “opt-out” of the DSM/EE rates shall be reviewed and the customer shall be notified and removed from the “opt-out” option if annual consumption is less than 1,000,000 kWh in the prior twelve months.

APPLICABILITY – RATES NOT INCLUDED IN TARIFF CHARGES

The rates shown below are not included in the MONTHLY RATE provision of the applicable schedule used in billing and shall therefore be added to Customer’s monthly bill statement:

Billing Adjustment Factors Per Customer (\$/month)*			
Revenue Class	REPS Rate ⁽⁵⁾	REPS EMF ⁽⁶⁾	Net Billing Rate
Residential	\$ 1.30 per month	\$0.12 per month	\$ 1.42 per month
Commercial/Public Streets and Highways	\$ 8.62 per month	(\$0.66) per month	\$ 7.96 per month
Industrial/Public Authority	\$ 65.05 per month	\$8.12 per month	\$73.17 per month

* Billing Adjustment Factors, shown above, includes a North Carolina regulatory fee.

For purposes of the applicability of the Renewable Energy Portfolio Standard (REPS) Billing Adjustment Factors, a “Customer” is defined as all accounts (metered and unmetered) serving the same customer of the same revenue classification located on the same or contiguous properties. If a customer has accounts which serve in an auxiliary role to a main account on the same premises, no REPS charge should apply to the auxiliary accounts, regardless of their revenue classification. Upon written notification from Customer, accounts meeting these criteria shall be coded in the billing system to allow Customer to receive only one monthly REPS charge for all identified accounts.

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Billing Adjustment Factors Description:

- (5) The REPS Rate is adjusted annually to reflect research and development costs and incremental costs incurred to comply with the state's Renewable Energy and Energy Efficiency Portfolio Standard (REPS).
- (6) The REPS Experience Modification Factor (REPS EMF) Rate is adjusted annually to recover the difference between reasonable and prudently incurred REPS costs and REPS revenues realized during the period under review and shall remain in effect for a fixed 12-month period.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

The Fuel and Fuel-Related Adjustment EMF and REPS EMF are effective for service rendered through November 30, 2019. The DSM EMF and EE EMF are effective for service rendered through December 31, 2019.

Supersedes Rider BA-19
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
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RR-15

SUPPLEMENTARY AND FIRM STANDBY SERVICE RIDER SS-61

AVAILABILITY

This Rider is available to customers in conjunction with any of Company's general service rate schedules to permit Supplementary and Standby Service to Customer having generation equipment not held solely for emergency use and for which Company's service may be substituted either directly or indirectly or used as an additional power supply. Customer shall execute (1) a Service Agreement specifying separately the requirements for both Supplementary Service and Standby Service and (2) an Interconnection Agreement in accordance with the North Carolina Interconnection Procedures, Forms, and Agreements for State-Jurisdictional Generation Interconnections.

This Rider is not available (1) for temporary or supplementary seasonal service, (2) for use in conjunction with any of Company's other standby service riders, (3) for use in conjunction with Company's Dispatched Power Rider No. 68 or Incremental Power Service Rider IPS, or (4) for Standby Service in excess of 50,000 kW. The provisions of the rate schedule with which this Rider is used are modified only as shown herein.

DEFINITIONS

Contract Demand

The Contract Demand is the total maximum kW that Customer desires Company to supply for both Supplementary and Standby Service combined, as specified in the Service Agreement. It shall be increased by the amount of the excess when the sum of the Supplementary Service Contract Demand and Standby Service Contract Demand exceeds the previously established Contract Demand. The increase shall be effective with the following billing month unless Company requests Customer to reduce such demand to a specified amount but not less than the previously established Contract Demand.

Standby Service

Standby Service is the service which Company supplies to replace Customer's generation. This includes breakdown and maintenance periods. For generation with a planning capacity factor of less than 60%, the Standby Service Contract Demand shall be the nameplate kW capacity of Customer's installed generation. For generation with a planning capacity factor of 60% or greater, the Standby Service Contract Demand shall be the maximum increased demand Company is requested to serve whenever Customer's generation is not operating, which may be less than the generator nameplate rating. The Standby Service Contract Demand may be increased by mutual agreement.

Supplementary Service

Supplementary Service is the service which Company continuously supplies to replace Customer's generation. The Contract Demand of Supplementary Service shall be the established Contract Demand minus the Standby Service Contract Demand; however, whenever the established Contract Demand is exceeded, the Supplementary Service Contract Demand shall increase effective with the following billing month by the amount the established Contract Demand exceeds the Standby Service Contract Demand. However, in all events, Company may within 30 days request Customer to reduce such demand to a specified amount, but not less than the previously established Supplementary Service Contract Demand.

MONTHLY BILLING

I/A

The Monthly Bill shall be the sum of the following amounts:

1. Availability to Serve Charges:

- a. Generation Reservation Charge applicable customers both less than 60% and 60% or greater planning capacity factor - \$0.75/kW of Standby Service Contract Demand.
- b. Standby Service Delivery Charge (applicable to customer generation with a planning capacity factor 60% or greater):

Per kW of Standby Service Contract Demand for Customer served from:

Transmission System (voltage of 69 kV or higher) \$1.58/kW

Distribution System (voltage below 69 kV) \$2.59/kW

- c. Extra Facilities Billing applicable to both less than 60% and 60% or greater planning capacity factor customers: An amount equal to the monthly facilities charge, as specified in Company's Service Regulations, times the difference between the installed cost of (1) the facilities required by Company to supply the Contract Demand, including any protective or other equipment deemed necessary to accommodate Customer's parallel operation, and (2) the facilities required by Company to supply the contract kW of Supplementary Service.

2. Supplementary and Standby Service Usage Charges:

- a. For generation with a planning capacity factor of less than 60%:

Supplementary and Standby Service billing for the established demand and kilowatt-hours consumed during the month is under the rate schedule and rider(s) with which this Rider is used.

- b. For generation with a planning capacity factor of 60% or greater:

- i. Supplementary Service billing for the Billing Demand established and the kilowatt-hours consumed associated with the Supplementary Service Contract Demand is under the rate schedule and rider(s) with which this Rider is used.
- ii. Standby Service billing for the kilowatt-hours consumed in excess of the Supplementary Service Contract Demand shall be at the sum of the (1) Standby Service RTP Hourly Energy Rate, as shown below, plus (2) the Rider Adjustment applicable during the current billing month. The Rider Adjustment shall include the sum of the DSM/EE and DSM/EE EMF rate adjustments during the current billing month. This amount shall be computed on an hourly basis.

STANDBY SERVICE RTP HOURLY ENERGY RATE

The Real Time Pricing (RTP) Hourly Energy Rate applicable to all usage in excess of the Supplementary Service Contract Demand shall be calculated as follows:

$$\text{Hourly RTP Rate} = (\text{MENERGY} + \text{CAP} + \text{ADDER}) \times (1 + \text{TAXES})$$

where:

MENERGY = Marginal Energy Cost per kilowatt-hour including marginal fuel, variable operating and maintenance expenses, and delivery losses

CAP = Tiered Capacity Charge per kilowatt-hour applicable whenever the day-ahead forecast of the ratio of hourly available generation to hourly demand is equal or less than 1.15

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ADDER = $\beta \times (\text{Class Rate-Hourly Marginal Cost})$, but not less than zero

where:

β = a fixed value equal to 0.20

Class Rate = the prior calendar year average rate per kilowatt-hour under the conventional tariffs applicable to the LGS class, as updated annually effective with the February billing

Hourly Marginal Cost = the sum of the specific hour's kilowatt-hour price for MENERGY and CAP, all as defined above

TAXES = NC Regulatory Fee (currently 0.13%)

CONTRACT PERIOD

As specified in the Application for the Supply of Electricity, but not less than one year.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

GENERAL

Where Customer's generation equipment is connected either electrically or mechanically to equipment which may be operated concurrently with service supplied by Company, Customer shall install and maintain at his expense such devices as may be necessary to protect his equipment and service and to automatically disconnect his generating equipment, which is operated in parallel with Company, when service used by Customer is affected by electrical disturbances on Company's or Customer's systems.

Service rendered under this Rider is subject to the provisions of the Service Regulations and any changes therein, substitutions therefore, or additions thereto lawfully made.

Supersedes Riders SS-60
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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RR-16

SUPPLEMENTARY AND NON-FIRM STANDBY SERVICE
RIDER NFS-13

AVAILABILITY

This Rider is available to customers in conjunction with any of Company's General Service rate schedules to permit Supplementary and Non-Firm Standby Service to Customer having generation equipment with a planning capacity factor of 60% or greater not held solely for emergency use and for which Company's service may be substituted either directly or indirectly or used as an additional power supply. Customer shall execute (1) a Service Agreement specifying separately the requirements for both Supplementary Service and Non-Firm Standby Service and (2) an Interconnection Agreement in accordance with the North Carolina Interconnection Procedures, Forms, and Agreements for State-Jurisdictional Generation Interconnections.

This Rider is not available (1) for temporary or supplementary seasonal service, (2) for use in conjunction with any of Company's other standby or generation service riders, (3) for Customer's with nameplate generation capacity below 200 kW, (4) for a customer who is not currently receiving service under this Rider but had previously received service under the Rider in the preceding twelve months, (5) in conjunction with curtailable service schedules or riders, or (6) for Non-Firm Standby Service in excess of 50,000 kW. The provisions of the rate schedule with which this Rider is used are modified only as shown herein.

DEFINITIONS

Contract Demand

The Contract Demand is the maximum kW that Customer desires Company to supply for Supplementary and Non-Firm Standby Service combined, as specified in the Service Agreement, and shall be increased by the amount of the excess when the sum of the Supplementary Service Contract Demand and Non-Firm Standby Service Contract Demand exceeds the previously established Contract Demand, unless and until Company within 60 days requests Customer to reduce such demand to a specified amount but not less than the established Contract Demand.

During a Non-Firm Period, the Contract Demand is subject to curtailment by Customer to not exceed the Supplementary Service Contract Demand.

Non-Firm Standby Service

Non-Firm Standby Service is the service which Company supplies to replace Customer's generation. This includes breakdown and maintenance periods approved by Company. The amount of Non-Firm Standby Service shall not exceed the nameplate kW capacity of Customer's installed generation. The amount of Non-Firm Standby Service initially contracted will automatically be increased whenever the established Contract Demand is exceeded, unless Company within 60 days requests Customer to reduce such demand to a specified amount. The Non-Firm Standby Service Demand shall increase by the amount the established demand exceeds the Supplementary Service Contract Demand.

Supplementary Service

Supplementary Service is service continuously available to supplement Customer's other power sources and is the kW of demand to which Customer shall reduce his requirement during a Non-Firm period specified by Company. The Supplementary Service Contract Demand shall be specified in the contract and shall only change based upon mutual consent of the parties, but in no case can it be less than the minimum contained in the rate schedule with which this Rider is used.

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MONTHLY BILLING

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The Monthly Billing shall be the sum of the following amounts:

1. Supplementary Service Billing:

An amount computed under the rate schedule with which this Rider is used for the Billing Demand established and the kilowatt-hours consumed associated with the Supplementary Service Contract Demand.

2. Non-Firm Standby Service Billing:

An amount computed as the kilowatt-hours consumed in excess of the Supplementary Service Contract Demand times the sum of the (a) Non-Firm Standby Service Hourly RTP Energy Rate, as shown below, plus (b) the Rider Adjustment applicable during the current billing month. The Rider Adjustment shall include the sum of the DSM/EE and DSM/EE EMF rate adjustments during the current billing month. This shall be computed on an hourly basis.

3. Non-Firm Standby Notification Customer Charge: \$65.00

4. Non-Firm Standby Service Delivery Charge:

Per kWh of Non-Firm Standby Service Usage for Customer served from:

Transmission System (voltage of 69 kV or higher)	\$0.00355/kWh
Distribution System (voltage below 69 kV)	\$0.00602/kWh

Non-Firm Standby Service Usage shall be all kilowatt-hours consumed in excess of the Supplementary Service Contract Demand in the current billing month.

5. Extra Facilities Billing:

An amount equal to the monthly facilities charge as specified in Company's Service Regulations times the difference between the installed cost of (1) the facilities required by Company to supply the Contract Demand, including any protective or other equipment deemed necessary to accommodate Customer's parallel operation, and (2) the facilities required by Company to supply the contract kW of Supplementary Service.

NON-FIRM STANDBY SERVICE RTP HOURLY ENERGY CHARGE

The Real Time Pricing (RTP) Hourly Rate applicable to all usage in excess of the Supplementary Service contract kW shall be calculated as follows:

$$\text{Hourly RTP Rate} = (\text{MENERGY} + \text{CAP} + \text{ADDER}) \times (1 + \text{TAXES})$$

where:

$$\text{MENERGY} = \text{Marginal Energy Cost per kilowatt-hour including marginal fuel, variable operating and maintenance expenses, and delivery losses}$$

$$\text{CAP} = \text{Tiered Capacity Charge per kilowatt-hour applicable whenever the day-ahead forecast of the ratio of hourly available generation to hourly demand is equal or less than 1.15}$$

$$\text{ADDER} = \beta \times (\text{Class Rate-Hourly Marginal Cost}), \text{ but not less than zero}$$

where:

$$\beta = \text{a fixed value equal to 0.20}$$

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Class Rate = the prior calendar year average rate per kilowatt-hour under the conventional tariffs applicable to the LGS class, as updated annually effective with the February billing

Hourly

Marginal Cost = the sum of the specific hour's kilowatt-hour price for MENERGY and CAP, all as defined above

TAXES = NC Regulatory Fee (currently 0.13%)

During Non-Firm Periods, the applicable Non-Firm Standby Service Hourly RTP Energy Rate shall be the greater of the Hourly RTP Rate, as calculated above, or the PJM price during the hour, plus 5%, plus any applicable transmission charges to deliver the electricity from PJM plus the North Carolina regulatory fee. The applicable PJM rate shall be final settlement hourly rate for the PJM Western Hub.

NON-FIRM PERIOD

The Non-Firm Period shall be a fifteen-hour period, unless Company specifies a shorter period at the time the Customer is notified. Customer shall be given a minimum of 30-minutes notice before the requested Non-Firm Period is to take place. Company shall use reasonable diligence to notify Customer of an impending Non-Firm Period and having used reasonable diligence shall not be liable to Customer should Customer not receive notification. To assist Customer in reviewing the financial impact of Non-Firm Standby Service usage, Company will provide its Hourly RTP Rates on a password-secured website. A forecast of PJM hourly rates is available from the PJM website; however, the final settlement rate will be used for billing which may differ from the PJM forecast.

SUPPLEMENTARY SERVICE BILLING DEMAND

The Billing Demand of Supplementary Service shall be the maximum kW registered or computed, by or from Company's metering facilities, during a 15-minute interval within the current billing month, but not greater than the Billing Demand determined in accordance with the schedule with which this Rider is used for the contract kW of Supplementary Service.

FAILURE TO COMPLY WITH NON-FIRM STANDBY SERVICE REQUIREMENTS

Customer shall undertake all reasonable steps to ensure that Customer's load does not exceed the Supplementary Service kW during all Non-Firm Periods. Continual failure to limit usage to the Supplementary Service kW or less during Non-Firm Periods shall constitute grounds for either increasing the Supplementary Service contract demand or removal from this Rider.

CONTRACT PERIOD

The Contract Period shall not be less than five years, and shall automatically extend thereafter for successive periods of two years unless terminated by either party at the end of any contract period by giving not less than sixty (60) days' written notice to the other party prior to the end of the contract period.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

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GENERAL

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Where Customer's generation equipment is connected either electrically or mechanically to equipment which may be operated concurrently with service supplied by Company, Customer shall install and maintain at his expense such devices as may be necessary to protect his equipment and service and to automatically disconnect his generating equipment, which is operated in parallel with Company, when service used by Customer is affected by electrical disturbances on Company's or Customer's systems.

Service rendered under this Rider is subject to the provisions of the Service Regulations and any changes therein, substitutions therefore, or additions thereto lawfully made.

Supersedes Rider NFS-12

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

RR-17

LARGE LOAD CURTAILABLE RIDER LLC-14

AVAILABILITY

This Rider is available on a voluntary basis to Customer receiving electric service under any general service schedule provided Customer contracts for 1,000 kW or greater which is subject to be curtailed under the provisions of this Rider. Customers continually served under a predecessor of this Rider prior to June 1, 2013 with a lesser amount of curtailable demand shall continue to be served under this Rider until such time that service under the Rider is terminated by Customer or Company.

This Rider is not available: (1) for temporary service, (2) for a customer who is not currently receiving service under this Rider, but had previously received service under this Rider in the preceding twenty-four months, or (3) in conjunction with another non-firm or curtailable rider. Customer may use other sources of power to curtail electrical load without being subject to standby service requirements.

APPLICABILITY

The schedule used in conjunction with this Rider is modified only as shown herein. By electing service under this Rider, Customer agrees to curtail electrical load according to the provisions of this Rider.

Where Customer's other source of power is connected electrically or mechanically to equipment which may be operated concurrently with service supplied by Company, Customer shall install and maintain at his expense such devices as may be necessary to protect his equipment and service and to automatically disconnect his generating equipment, which is operated in parallel with Company, when service used by Customer is affected by electrical disturbances on Company's or Customer's systems. Should Company determine that Customer's facilities are not adequate to protect Company's facilities, Company may install the necessary facilities and Customer shall pay for the extra facilities in accordance with Company's Service Regulations. When this Rider is used in conjunction with the applicable standby or back-up service rider, standby service shall not be substituted for curtailable load and in no event shall the Demonstrated Curtailable Demand be greater than the difference between the Supplementary Service Demand and the Firm Demand.

When this Rider is used in conjunction with either the Dispatched Power or Incremental Power Service Riders, any Class 2 Dispatched or Incremental energy (kWh) will be excluded from the determination of Demonstrated Curtailable Demand under this Rider and the Customer Charge contained herein will not be applicable.

DEFINITIONS

A. FIRM DEMAND

The Firm Demand shall be the kW of demand specified in the Service Agreement to which Customer shall reduce his requirement at the time specified by Company. Customer shall contract for a Winter Firm Demand for the service rendered during the calendar months of October through March and a Summer Firm Demand for service rendered during the calendar months of April through September.

B. DEMONSTRATED CURTAILABLE DEMAND

The Demonstrated Curtailable Demand shall be the average kW demand during the on-peak hours less the applicable Firm Demand. The Summer Firm Demand shall be applicable during the billing months of April through September and the Winter Firm Demand shall be applicable during the billing months of October through March. The average on-peak kW shall be determined by dividing the on-peak kWh by 252.

C. PREMIUM DEMAND

The Premium Demand shall be the maximum 15-minute kW demand registered or computed by or from Company's metering facilities during any Curtailment Period in the billing month less the

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applicable Firm Demand, but not less than zero. The applicable Firm Demand shall be determined based upon the calendar month when the Premium Demand was consumed.

D. CURTAILMENT PERIOD

The Curtailment Period(s) may occur during on-peak or off-peak hours of any month and shall be an 8-hour period unless Company specifies a shorter period at the time Customer is notified. Company shall send notification to Customer a minimum of 30 minutes before the requested curtailment is to occur. At the time Customer is notified to curtail, Customer will be advised whether the Curtailment Period is a Level 1 or a Level 2 Capacity Curtailment Period. Company shall use reasonable diligence to notify Customer of an impending Curtailment Period and having used reasonable diligence shall not be liable to Customer should Customer not receive notification. The number of hours of Curtailment in any calendar day shall be no more than 8 hours. Company reserves the right for a longer interruption in the event continuity of service is threatened. The total hours of Capacity Curtailment Periods shall be no more than 400 hours during a calendar year.

E. ON-PEAK HOURS

1. Service used beginning at 12:00 midnight March 31 and ending at 12:00 midnight September 30:

The on-peak hours are defined as the hours between 10:00 a.m. and 10:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

2. Service used beginning at 12:00 midnight September 30 and ending at 12:00 midnight March 31:

The on-peak hours are defined as the hours between 6:00 a.m. and 1:00 p.m., plus 4:00 p.m. through 9:00 p.m., Monday through Friday, excluding holidays considered as off-peak.

F. OFF-PEAK HOURS

The off-peak hours in any month are defined as all hours not specified above as on-peak hours. All hours for the following holidays will be considered off-peak: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and the day after, and Christmas Day. When one of the above holidays falls on a Saturday, the Friday before the holiday will be considered off-peak; when the holiday falls on a Sunday, the following Monday will be considered off-peak.

MONTHLY RATE

An amount computed under the applicable schedule and other riders with which this Rider is used, plus the following Customer Charge and Credit:

A. Customer Charge: \$65.00

B. Credit = Discount x Demonstrated Curtailable Demand, but not less than zero (\$0)

Where: Discount = \$5.60 per kW

ADDITIONAL CHARGES FOR USE OF PREMIUM DEMAND

If Customer exceeds the Firm Demand during a Level 1 or Level 2 Capacity Curtailment Period, it shall be considered to be the Use of Premium Demand.

A. DURING A LEVEL 1 CAPACITY CURTAILMENT PERIOD

For use of Premium Demand during a Level 1 Capacity Curtailment, Customer shall pay to Company \$2.80 per kilowatt-hour for all kilowatt-hours attributable to Premium Demand during the Level 1 Curtailable Period. This charge shall be in addition to applicable kWh charge(s) in the rate schedule with which this Rider is used.

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DURING A LEVEL 2 CAPACITY CURTAILMENT PERIOD

Customer shall pay to Company \$50.00 for each kW of Premium Demand for each and every Level 2 Curtailable Period during the billing period.

In addition to the charge(s) for the use of Premium Demand, for the second Use of Premium Demand (Level 2 Only) during a 12-month period, the Firm Demand shall automatically be increased to equal the maximum 15-minute demand registered during the Level 2 Curtailment Period. In addition to the charges for the use of Premium Demand (Level 2 Only), for the third or subsequent Use of Premium Demand during a 12-month period, service under this Rider shall be terminated and Customer shall pay the sum of all credits received during the current and prior 11 billing months, reduced by any payments for the Use of Premium Demand during the 12-month period, but not less than zero.

CURTAILABLE NOTIFICATION

Customer must provide, at Customer's expense, contact information and suitable mean(s) for Company communication of Curtailment Periods, including but not limited to text messaging, telephone, and electronic mail. Customer is solely responsible to notify Company of changes in Customer's contact and communication information as they occur. Company shall use reasonable diligence to notify Customer of an impending Curtailment period and having used reasonable diligence shall not be liable for Customer's failure to receive and act upon curtailment notifications.

CONTRACT PERIOD

The Contract Period shall be five (5) years, with automatic successive extensions of two (2) years thereafter, unless: (a) terminated by either party at the end of the Contract Period by giving not less than sixty (60) days written prior notice, (b) terminated by Company in accordance with the Additional Charges for Use of Premium Demand provision above.

CUSTOMER REQUESTED TERMINATION OR CHANGES IN FIRM DEMAND

Customer may terminate service under the Rider or revise the Firm Demand at the end of any Contract Period without charge. The Firm Demand is also subject to upward adjustment at no charge if the Contract Demand is increased, provided there is no net change in the amount of demand that is subject to curtailment.

The difference in the Firm Demand and the Contract Demand may be reduced during the Contract Period provided Customer pays Company a charge of \$50.00 for each kW of Contract Demand that will no longer be subject to curtailment. If Curtailable Service is terminated at any other time, for reasons other than automatic disqualification due to the excessive Use of Premium Demand, Customer shall pay Company the sum of all credits received during the current and prior 11 billing months. Any adjustment of the Firm Demand shall not be applied retroactive to any prior Use of Premium Demand.

SALES TAX

To the above charges will be added any applicable North Carolina Sales Tax.

GENERAL

Service rendered under this Rider is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission. The provisions of this Rider are subject to change upon approval by the North Carolina Utilities Commission.

Supersedes Rider No LLC-6

Effective for service rendered on and after November 29, 2019

NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

RR-18

DISPATCHED POWER
RIDER NO. 68O

AVAILABILITY

This Rider is available in conjunction with Company's Large General Service Schedules. The rate schedule with which this Rider is used is modified only as shown herein. The Contract Period for service under this Rider shall continue until terminated either by Customer or Company by giving not less than 30 days written notice to the other party.

Service under this Rider may be offered at Company option and only during Company's low production cost periods, for Customer usage normally above levels at which they would otherwise operate.

DEFINITIONS

Class 2 Dispatched Power Period

A Class 2 Dispatched Power Period shall normally be a 24-hour period for days which contain on-peak hours. Company will attempt to schedule Class 2 periods adjacent to Saturdays, Sundays, and holidays which are as specified in the Company's LGS-TOU Schedule.

Dispatched Demand

Dispatched Demand is the kW demand in each 15-minute interval, during a Class 2 Dispatched Power Period, minus: 1) the maximum on-peak demand established outside a Dispatched Power Period, exclusive of standby service, if the applicable schedule is LGS-TOU, or 2) the maximum billing demand established outside a Dispatched Power Period, exclusive of standby service, if the applicable schedule is LGS. In no event will Dispatched Demand be less than zero.

Dispatched Energy

Dispatched Energy is all kilowatt-hours attributable to use of Dispatched Demand.

MONTHLY RATE

- A. Customer Charge in addition to the Basic Customer Charge in the rate schedule: \$65.00.
- B. Demands established during a Class 2 Dispatched Power Period will not be 1) used to determine Billing Demand of the applicable rate schedule or 2) considered a use of standby or back-up service.
- C. Dispatched Energy: Class 2 Dispatched Energy shall be billed at the rate specified in the applicable schedule plus the following increment:

<u>LGS-TOU</u>		<u>LGS</u>
<u>On-peak</u>	<u>Off-peak</u>	
1.5¢/kWh	0.0¢/kWh	1.5¢/kWh

NOTIFICATION

When Company determines that it has Dispatched Power available for sale, Company will provide notification to Customer of the beginning and ending times of a Dispatched Power Period. Notification will be provided via procedures established by Company and such procedures shall be given to Customer.

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Company shall use reasonable diligence to notify Customer of the institution of a Dispatched Power Period including the beginning and ending time(s). Company, having used reasonable diligence to notify Customer, shall not be liable should Customer not receive notification. Customer must install, at his expense, a dedicated telephone line in order to receive notification from Company and he must also provide satisfactory space for Company's communication equipment.

CHANGES TO A DISPATCHED POWER PERIOD

Upon Company's review of its generation costs and its system requirements, Company may notify Customer during a Dispatched Power Period that it will extend beyond the time which Company previously communicated to Customer that such Dispatched Power Period would end.

Upon 30-minute notice, Company may terminate a Dispatched Power Period prematurely in order to decrease the likelihood of instituting a Curtailable Period. A Dispatched Power Period will automatically terminate upon the actual commencement of a Curtailable Period.

GENERAL

Company will not install transformation capacity or other facilities which exceed Customer's requirement during non-Dispatched Power Periods. Demands established during Dispatched Power Periods shall not serve to satisfy Contract obligations of Customer.

Decisions to institute or extend a Dispatched Power Period rest solely with Company.

SALES TAX

To the above stated charges will be added any applicable North Carolina Sales Tax.

Supersedes Rider No. 68M
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina Only)

RR-19

INCREMENTAL POWER SERVICE
RIDER IPS-12

AVAILABILITY

This Rider is available to customers in conjunction with Company's Large General Service (Time-of-Use) Schedule LGS-TOU, which is modified only as shown herein.

Service under this Rider is only available at the option of Company, in conjunction with monthly Base Demands established by Company, for Customer usage above Base Demand levels at which Customer would otherwise operate.

This Rider is not available: 1) in conjunction with Company's Dispatched Power Rider No. 68, or 2) for twelve months following Customer's discontinuation of service under this Rider.

DEFINITIONS

Class 2 Incremental Power Period

A Class 2 Incremental Power Period shall normally be a 24-hour period for days that contain on-peak hours.

Base Demand

Company shall establish Customer's Base Demand for each month of the year. These monthly Base Demands shall be established by Company in advance of Customer's election to utilize this Rider in any given month. Generally, Company will establish or change Base Demand levels upon the following factors: 1) the maximum kW registered or computed, by or from Company's metering facilities, during any on-peak 15-minute interval for the corresponding billing month in the twelve months prior to contracting for this Rider; 2) recent added or reduced electrical load; and 3) whether Customer's historical electrical loads represent Customer's ongoing operation. The Base Demands shall also exclude any demands resulting from standby service, back-up service, dispatched power, or Incremental Power. The monthly Base Demand level shall automatically increase to the maximum on-peak demand established outside any Incremental Power Periods whenever the maximum on-peak demand established outside any Incremental Power Periods exceeds the monthly Base Demand. Customer shall provide thirty (30) days advance written notification to Company when electrical load is to be added or removed or a change in Customer's operation is expected to occur. Company shall adjust any previous monthly bills to reflect the change in the Base Demands upon Company determining that Customer had not provided Company advanced written notification of Customer's increase in electrical load. Company may require Customer to operate at proposed Base Demand levels for up to 12 months before receiving or continuing to receive service under this Rider. Company reserves the right to modify a monthly Base Demand at any time when in its opinion the Base Demand no longer represents Customer's demand level in the absence of the availability of Incremental Power.

Incremental Demand

When the registered or computed 15-minute kW demand during an Incremental Power Period exceeds the Base Demand, Incremental Demand shall be the kW demand in each 15-minute interval during the Incremental Power Period minus the greater of: 1) the maximum on-peak demand established outside an Incremental Power Period exclusive of standby or backup service, or 2) the Base Demand.

When the registered or computed 15-minute kW demand during an Incremental Power Period is less than or equal to the Base Demand, then the Incremental Demand shall be zero. In no event, shall Incremental Demand(s) be less than zero.

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Incremental Energy

Incremental Energy is the sum of all kilowatt-hours attributable to use of Incremental Demand.

MONTHLY RATE

- A. Customer Charge in addition to the Basic Customer Charge in the rate schedule: \$65.00.
- B. The Billing Demand shall be as determined in accordance with Schedule LGS-TOU, disregarding any Incremental Demands used during the billing month.
- C. Incremental Energy: Class 2 Incremental Energy shall be billed at the rate specified in Schedule LGS-TOU plus the following increment:

<u>On-peak</u>	<u>Off-peak</u>
1.5¢/kWh	0.0¢/kWh

NOTIFICATION

When Company determines that it has Incremental Power available for sale, Company will provide notification to Customer of the beginning and ending times of an Incremental Power Period. Notification will be provided via procedures established by Company and such procedures shall be given to Customer.

Company shall use reasonable diligence to notify Customer of the institution of an Incremental Power Period including the beginning and ending time(s). Company, having used reasonable diligence to notify Customer, shall not be liable should Customer not receive notification. Customer must install, at Customer's expense, a dedicated telephone line in order to receive notification from Company and Customer must also provide satisfactory space for Company's communication equipment.

CHANGES TO AN INCREMENTAL POWER PERIOD

Company may notify Customer during an Incremental Power Period that it will extend beyond the time which Company previously communicated to Customer that such Incremental Power Period would end.

Upon thirty (30) minutes notice, Company may terminate an Incremental Power Period prematurely in order to decrease the likelihood of instituting a Curtailable Period. An Incremental Power Period will automatically terminate upon the actual commencement of a Curtailable Period.

CONTRACT PERIOD

The Contract Period for service under this Rider shall continue until terminated by Customer or Company by giving not less than thirty (30) days written notice to the other party.

GENERAL

Company will not install transformation capacity or other facilities which exceed Customer's requirement during non-Incremental Power Periods. Demands established during Incremental Power Periods shall not serve to satisfy Contract obligations of Customer.

Decisions to institute, extend, or terminate an Incremental Power Period rest solely with Company.

SALES TAX

To the above stated charges will be added any applicable North Carolina Sales Tax.

Supersedes Rider No. IPS-10
Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, LLC
(North Carolina)

RR-23

METER-RELATED OPTIONAL PROGRAMS RIDER MROP-15

AVAILABILITY

These programs are available upon request and on a voluntary basis to those customers as described below, subject to the availability of appropriate metering and meter-related equipment.

I. TOTALMETER PROGRAM

Metering equipment to allow remote automated meter reading by Company will be provided upon execution of an application for TotalMeter. The application describes the conditions of service, states all charges, and provides for a termination charge should the TotalMeter option be discontinued prior to 24 consecutive months of service. Customer receiving the TotalMeter option may select a desired meter-reading day. Monthly rates and other charges related to the TotalMeter are as follows:

Monthly Rate for TotalMeter

Option 1: Customer-supplied suitable telephone communications line ¹	\$ 3.10
Option 2: Company-supplied wireless telephone communications circuit ²	\$13.20

Charge for Customer-requested termination of TotalMeter	
Option prior to 24 consecutive months of service	\$50.00

¹ Option 1 is not available to new applicants on and after October 1, 2013. Existing participants may continue under this option until such time that the metering equipment requires replacement.

² Option 2 is not available to new applicants on and after January 23, 2019. Existing participants may continue under this option until such time that the metering equipment requires replacement.

TotalMeter charges shall not apply when Company, at its option, determines that remote automated meter reading is necessary for Company's own use. Receipt of the TotalMeter option shall in no way restrict or otherwise limit Company's right of ingress and egress to read meters and inspect, maintain, repair and replace the meters and other facilities installed to serve Customer whenever necessary.

II. ENERGY PROFILER ONLINE

The Energy Profiler Online (EPO) program is available to any non-residential customer with a registered or contract demand of 30 kW or greater. EPO is an Internet-based program permitting Customer access to historic meter data from any internet-capable location. Access to meter data is both identification/name and password restricted. Monthly rates and other charges related to EPO are as follows:

Monthly Rate for EPO

Rate for totalized meter data only (updated monthly) ³	\$20.00 per totalized account
Rate for meter data per individual meter (updated each business day)	\$20.00 per meter

Set-up fee per meter	\$85.00
Set-up fee for totalized meter data only	\$85.00

³ The rate applicable for totalized meter data only is not available to new applicants on and after July 1, 2017.

Provision of EPO requires that the standard meter, as determined solely by Company based upon the Customer's electrical requirement, have the capability of recording electrical consumption information on

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a 15-minute interval basis. Additional monthly rates and other charges, as described in Section III below, will apply if the standard meter based upon customer's electrical requirement does not have interval data capability.

III. MANUALLY READ METERING (MRM)

Customers served under residential Schedules RES, R-TOU or R-TOUD or nonresidential Schedule SGS may request metering that either does not utilize radio frequency communications to transmit data, or is otherwise required to be read manually. This service is not available when service is requested in conjunction with any net metering rider. At the Company's option, meters to be read manually may be either an advanced meter with the radio frequency communication capability disabled or other non-communicating meter. The meter manufacturer and model chosen to service the customer's premise are at the discretion of the Company and are subject to change at the Company's option, at any time. Customers choosing this option are responsible for the payment of the rates shown below and will not be eligible for any current or future services or offerings that require the use of an advanced or other communicating meter.

Monthly Rate for MRM Service⁴:

1. Initial Set-up Fee	\$170.00
2. Monthly Rate For MRM	\$14.75
3. Early Termination Charge (Prior to 12 consecutive months of service only)	\$50.00

Upon request, the one-time Initial Set-up Fee may be paid in six installments included as a part of the Customer's first six monthly electric service bills following installation of the manually read meter. The contract term shall be a minimum of 12 months and may be terminated by either party with thirty (30) days written notice. The Company may refuse to provide service under this option under the following conditions: (1) the Customer has a history of meter tampering or unauthorized use of electricity at the current or any prior location, (2) provision of such service creates a safety hazard to consumers or their premises, the public or the electric utility's personnel or facilities, or (3) the customer fails to provide the Company satisfactory access to the Customer's facilities for the purpose of obtaining meter readings or maintaining its equipment.

⁴ The Initial Set-up Fee and Monthly Rate shall be waived and not apply for customers providing a notarized statement from a medical physician fully licensed by the North Carolina Medical Board stating that the customer must avoid exposure to radio frequency emissions, to the extent possible, to protect their health. All such statements shall be retained in Company records on a secure and confidential basis. The Company will provide the customer with a medical release form, to identify general enrollment information, and a physician verification statement. At the physician's option, a comparable physician verification statement may be submitted.

IV. CUSTOMER REQUESTS INSTALLATION OF NON-STANDARD METERING

Company, in its sole determination, shall establish appropriate meter standards based upon Customer's electrical requirement. If a non-residential customer desires additional meter services that require the installation of a non-standard meter, Company will comply for the following monthly rate and other charges:

Monthly Rate for non-standard meter with interval data capability	\$0.61 per month
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The following fees apply when the non-standard meter will not be remotely read:

Meter Set-up Fee	\$16.50
Meter Exchange Fee	\$92.00

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A charge shall apply if Customer requests termination prior to 24 consecutive months of operation of a non-standard meter option that provides interval data. The charge shall equal the monthly rate times the sum of 24 minus the number of months the non-standard meter service has been received, not to exceed 24 months.

GENERAL

Company agrees to seek Commission approval if it determines that the provision of the meter-related program can no longer be offered due to equipment obsolescence or the availability of a more efficient alternative to provide the same or improved level of service. Company does not guarantee continuous provision of these meter-related programs but shall use reasonable diligence at all times to provide the program without interruption and having used reasonable diligence shall not be liable to Customer for damages, for failure in, or for interruptions or suspension of the same. Company further agrees to provide Customer with at least 30-day advanced notice prior to any changes to their service under this rider.

Service rendered under this Rider is subject to the provisions of the Service Regulations of the Company on file with the state regulatory commission. The provisions of this Rider are subject to change upon approval of the North Carolina Utilities Commission.

Supersedes Meter-Related Optional Programs Rider MROP-13
Effective on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Duke Energy Progress, Inc.
(North Carolina Only)

RR-26

EXCESS DEFERRED INCOME TAX RIDER EDIT-1A

APPLICABILITY

The decremental rate shown below is included in the MONTHLY RATE provision in each residential, general service and lighting schedule. This adjustment reduces rates for excess deferred income taxes associated with House Bill 989, An Act to Simplify the North Carolina Tax Structure and to Reduce Individual and Business Tax Rates. The Commission's order dated May 13, 2014 in Docket No. M-100, Sub 138 required that Excess Deferred Income Taxes associated with a reduced corporate income taxes be credited to income tax expense in a rate case. This rider shall remain in effect for 48 months and shall terminate and no longer be applicable for service on and after March 16, 2022.

MONTHLY RATE

Effective for service rendered on and after November 29, 2019 the applicable kilowatt hour rider amount including revenue-related taxes and regulatory fees is a decrement of 0.094¢ per kilowatt hour.

Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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EXCESS DEFERRED INCOME TAX RIDER EDIT-2

APPLICABILITY

The decremental rate shown below is included in the MONTHLY RATE provision in each residential, general service and lighting schedule. This adjustment includes a credit to return to customers savings associated with Excess Deferred Income Taxes resulting from the North Carolina Income Tax Rates in House Bill 989, An Act to Simplify the North Carolina Tax Structure and to Reduce Individual and Business Tax Rates. This adjustment also reduces billing rates for savings realized with The Federal Tax Cuts and Jobs Act that reduced corporate federal income tax rates from 35% to 21% effective January 1, 2018. These federal savings include a credit for deferred revenue associated with the lower tax rate and a credit for excess deferred income taxes. This adjustment shall be updated effective December 1 annually.

MONTHLY RATE

Effective for service rendered on and after November 29, 2019, the decremental rate for the appropriate rate class, including revenue-related taxes and regulatory fees, shall be as shown in the following table:

Rate Class	Applicable Schedules	Billing Rate (¢/kWh)
Residential	RES, R-TOUD, R-TOU	(0.00430)
General Service (Small)	SGS, SGS-TOUE	(0.00443)
General Service (Constant Load)	SGS-TOU-CLR	(0.00440)
General Service (Medium)	MGS, SGS-TOU, GS-TES, APH-TES, CSE, CSG, CH-TOUE	(0.00247)
General Service (Large)	LGS, LGS-TOU, LGS-RTP	(0.00171)
Traffic Signal Service	TSS, TFS	(0.00336)
Outdoor Lighting	ALS, SLS, SLR	(0.01367)
Sports Field Lighting	SFLS	(0.00704)
Seasonal	SI	(0.00424)

Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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REGULATORY ASSET AND LIABILITY RIDER RAL-1

APPLICABILITY

The rate shown below is included in the MONTHLY RATE provision in each residential, general service and lighting schedule. This adjustment recovers from or credits customers for the net over-amortization of regulatory assets or liabilities. This rider shall remain in effect for a fixed 12-month period and shall terminate and no longer be applicable for service on and after November 29, 2020.

MONTHLY RATE

The applicable kilowatt hour rider amount, including current North Carolina regulatory fees, is a decremental rate of 0.00005¢ per kilowatt hour.

Effective for service rendered on and after November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

Duke Energy Progress, LLC
(North Carolina)

A-1

OUTDOOR LIGHTING SERVICE REGULATIONS

1. SERVICE AGREEMENT

In order to assure certainty and uniformity of conditions, Company will only supply outdoor lighting service under its uniform Service Agreement, consisting of (1) the Application for Lighting Service, (2) the applicable Schedule, and (3) the Outdoor Lighting Service Regulations.

2. DEFINITIONS

- (a) Dusk is a period before nightfall and in the illumination of lamps it will be considered as being approximately 30 minutes after sunset.
- (b) Dawn is a period after daybreak and in the illumination of lamps it will be considered as being approximately 30 minutes before sunrise.
- (c) A special outdoor lighting pole or post is any standard Company-owned pole or post installed as a part of its overhead lighting system and on which no other Company overhead distribution facilities are installed or a pole or post installed as a part of its underground lighting system. If another utility or company has overhead conductors or equipment installed on a Company-owned pole or post used by Company only for lighting, such pole or post will be classified as a special lighting pole; however, if Company installs its overhead lighting equipment on a pole or post owned by another utility, such pole or post will not be classified as a special lighting pole or post.
- (d) A system lighting pole is a system distribution pole on which Company has attached both lighting and overhead distribution facilities or a pole installed in conjunction with the lighting system to which only overhead distribution facilities are attached.
- (e) A system lighting metal pole is a metal pole, available only under Street Lighting Service Schedule SLS, on which Company has attached both street lighting and overhead distribution facilities or a metal pole installed in conjunction with the street lighting system to which only overhead distribution facilities are attached.

3. SERVICE EXTENSIONS

The installation of lighting fixtures or poles shall be in a location that is readily accessible by a Company truck to support installation and maintenance of Company facilities.

4. EXTENSIONS AND ADDITIONS

Company will extend its lighting system to supply additional lighting units at Customer's request and install the additional lighting units insofar as practical, in accordance with good engineering practice, at the locations Customer designates. If any overhead lighting unit is more than 500 feet from the next adjacent lighting unit or Company has to extend its secondary overhead distribution system more than 500 feet, the Customer will make a nonrefundable contribution to Company equal to the estimated installed cost of the new circuit in excess of 500 feet.

5. CHANGE IN FIXTURE STYLE, LIGHT SOURCE OR LAMP LUMEN RATING

At Customer's request, Company will, at no cost to Customer, change the fixture, pole or post style or color at the same location provided the facilities to be replaced have been in service for 20 years or longer and the contract term for the new facilities is extended. The appropriate term shall be as described in the Contract Period paragraph stated in the applicable Outdoor Lighting Service

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Schedule. If the facilities to be changed to a different style or color have been in service less than 20 years, Customer shall pay a charge of \$50 if only the fixture is changed or \$500 if the facilities to be changed includes the pole or post. If the request requires a change in the overall lighting design and layout and the fixture or pole are not installed in the same location, in addition to the fixture and pole change charge for an underground installation, Customer shall pay the estimated installed cost of the new underground circuit in excess of 250 feet plus any abnormal construction costs.

6. EXTRA FACILITIES

In addition to the MONTHLY RATE stated in the applicable schedule, Customer shall pay a monthly facilities charge when facilities are requested that exceed facilities normally supplied by Company to render lighting service. Customer shall pay a Monthly Facilities Charge of 1.0 percent of the estimated installed cost of the Special Facilities. Special Facilities that are considered to be above normal include, but are not limited to, the following:

- (a) Upon Company review and approval, multiple lighting fixtures may be installed per pole. Special facilities shall be considered as the estimated installed cost of the facilities necessary to serve the multiple fixture installation in excess of that normally required to provide standard outdoor lighting service.
- (b) Special facilities shall include any distribution transformer and/or primary conductor extension.
- (c) For a work request installing an underground circuit, special facilities shall include any conductor length in excess of an average of 250 feet per span. Customer may elect to make a nonrefundable contribution of the estimated installed cost of an underground circuit deemed to be special facilities without being required to pay a monthly facilities charge.
- (d) Special facilities shall include special nonstandard poles and posts not listed in the MONTHLY RATE provision of the applicable schedule.
- (e) For nonstandard fixtures not included in the MONTHLY RATE provision of the applicable schedule, the monthly charge will be the charge in accordance with the MONTHLY RATE and the Special Facilities shall be the difference between the estimated installed cost of the nonstandard fixture and the estimated installed cost of the equivalent standard fixture.
- (f) The cost of a bracket or mast arm in excess of the standard facilities for a given fixture type shall be considered as Special Facilities.

7. NONREFUNDABLE CONTRIBUTIONS

- (a) In the event that rock, unstable soil, or other conditions require the use of materials and methods of installation other than Company's normal materials and methods, Customer will contribute the additional cost except when the Service Extension Provision as stated below is applicable.
- (b) Customer will contribute the estimated cost of installing cables under paved or landscaped surface areas; however, Customer may cut and replace the pavement or surface in lieu of making the contribution.
- (c) Service supplied under the MONTHLY RATE in this Schedule does not include the conversion of existing overhead secondary conductors to underground. Should Customer desire such a conversion under this Schedule, Customer will contribute to Company, in addition to the applicable contributions above, the estimated net loss in salvage value of the overhead facilities being removed. The Customer will thereafter pay the applicable rate for underground service.

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8. RELOCATION OF FACILITIES

If the Company's lighting facilities are installed within its rights-of-way or easements, upon Customer's request Company will relocate such facilities to a new location within the same general area provided Customer will pay to Company any applicable charge as set forth in the Termination of a Service Agreement paragraph shown below. A new Contract Term shall not be required. If the relocation request involves both lighting and other distribution facilities, the cost of the relocation of all facilities shall be determined pursuant to the Line Extension Plan.

9. RIGHTS-OF-WAY

Customer shall furnish, without cost to Company, satisfactory rights-of-way or franchise for Company to install its lighting circuits and necessary equipment. Customer will be responsible for trimming trees and other vegetation that obstruct the light output from the fixture(s) or maintenance access to the facilities.

10. CONTINUITY OF SERVICE

Company will exercise due diligence and reasonable care and foresight to maintain continuity of service as provided in the Service Agreement, but shall not be considered to be in default in respect of any obligation under the Service Agreement if prevented from fulfilling such obligation by reason of uncontrollable forces or by reason of outages of facilities for repair, replacement or inspection, provided due diligence was used to limit such outages, and provided such outages, except in emergencies, were conducted upon a reasonable prearranged schedule; the term "uncontrollable forces" shall be deemed for the purposes of this Agreement to mean earthquake, storm, lightning, flood, backwater caused by flood, fire, epidemic, accident, failure of facilities, war, riot, civil disturbance, strike, labor disturbance, restraint by an order of court or public authority, or other causes beyond the control of Company, which by exercise of due diligence and foresight Company could not reasonably have been expected to avoid. When Company is rendered unable to fulfill any obligation by reason of uncontrollable forces Company will exercise due diligence to remove such disability with reasonable dispatch.

11. BURNED OUT OR BROKEN LAMPS

Company will use reasonable diligence to see that all lamps are burning each night but does not guarantee the lamps against burn outs and breakage. Customer will be responsible for notifying Company of any and all lamps which are not burning according to schedule and Company shall have until dusk of two business days following notice to replace the lamps. If Customer has given Company written notice and Company fails to so replace the lamps designated in the notice within such two days, then, upon request by Customer, there shall be a pro rata reduction of the "Monthly Rate" charge per fixture.

When a pro rata reduction of the "Monthly Rate" charges is to be made, the lamp or lamps will be considered as burning until the day on which Company was first notified in writing by Customer and the amount of the "Monthly Rate" charges to be billed will be determined by multiplying the "Monthly Rate" charges by the ratio of the number of days in the month which the lamp actually burned to thirty days.

12. DAMAGE TO COMPANY FACILITIES

Customer shall protect Company's wiring, apparatus, lighting fixtures, and poles covered by the Service Agreement from damage or harm. In the event of any loss or damage to such property of Company caused by or arising out of carelessness, neglect, or misuse by Customer, his employees or agents, or vandalism, the cost incurred by Company to repair such facilities shall be paid by Customer.

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13. CONFLICTS

In case of conflict between any provision of a lighting schedule and these Outdoor Lighting Service Regulations, the provisions of the applicable lighting schedule shall prevail.

14. NONSTANDARD FACILITIES

At the request of the Customer the Company may consent to install lighting facilities, using Company approved equipment, which has not been established as a system standard subject to Customer paying to Company a Monthly Facilities Charge as determined under Company's filed Service Regulations.

The Company may, at its own discretion and without additional cost to Customer, install facilities on an experimental basis without adopting such facilities as standards.

15. TERMINATION OF A SERVICE AGREEMENT

If Customer desires to terminate all or a portion of the facilities installed pursuant to the Service Agreement, Company will agree to such termination if Company is satisfied that Customer no longer has need for lighting service. If such termination request occurs before the expiration of the initial contract term, Company will agree to such termination and remove its facilities provided Customer pays an amount of money equal to 40% of the bills which otherwise would have been rendered for the unexpired months of the initial Contract Period.

16. AMENDMENT OF A SERVICE AGREEMENT

If and when mutually agreed upon, a lighting unit or pole may be added or removed from the lighting system or the size of the lamp may be changed. Any change made under this paragraph shall be evidenced by a written memorandum.

If Company extends its general distribution system so as to use special lighting poles for distribution poles or removes its distribution facilities from a pole used for lighting purposes, Company shall so notify Customer of the poles affected and appropriate adjustments will be made in the rendering of monthly bills.

17. SALES TAX

Any applicable North Carolina Sales Tax shall be added to the charges contained in the Schedules and Outdoor Lighting Service Regulations.

Superseding Street Lighting Service Regulations dated August 1, 2015
Current Revision Date: November 29, 2019
NCUC Docket No. E-2, Sub 1219

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Oct 30 2019

Duke Energy Progress, LLC
(North Carolina)

A-2

SERVICE REGULATIONS

1. SERVICE AGREEMENT

- (a) Description: The Service Agreement (hereinafter sometimes termed "Agreement") shall consist of (1) Company's form of Application for Supply of Electricity, when signed by Customer and accepted by Company, (2) the applicable Schedule and Riders and (3) these Service Regulations, and all changes, revisions, alterations therein, or substitutions therefor lawfully made; provided that when the requested supply of electricity (1) is for residential uses or (2) is for other uses when the Customer's contract demand (a) is initially not more than 1,000 kW or (b) does not require an increase in Company's facilities when the demand increases above 1,000 kW, and (3) when no extra charges for installation or other special contractual provisions are involved, the Customer's application and the Company's acceptance thereof may be verbal, and in such event the Company's applicable Schedule, Riders and these Service Regulations shall be effective in the same manner as if Company's form of Application for Supply of Electricity had been signed by Customer and accepted by Company. Such a verbal Service Agreement shall be conclusively presumed, when there is no written application by a Customer accepted in writing by Company, if electricity supplied by Company is used by Customer or is used on Customer's premises.
- (b) Application of Service Regulations and Schedules: All Service Agreements in effect at the time of the approval hereof or that may be entered into in the future, are made expressly subject to these Service Regulations, and subject to all applicable Schedules and Riders, and any changes therein, substitutions therefor, or additions thereto lawfully made.
- (c) Selection of Optional Schedules: Where two or more rate schedules and/or riders are available, Company will attempt to assist Customer to a reasonable extent in determining which rate schedule and/or rider to select. It is the Customer's right and responsibility to select the available rate and/or rider. The Company will not assume responsibility for this choice since the control of the electrical usage is under Customer's ultimate control.
- (d) Conflicts: In case of conflict between any provision of a Schedule or Rider and of these Service Regulations, the provision of the Schedule or the Rider shall prevail.
- (e) Transfer of Agreement: A Service Agreement between Company and Customer may be transferred and assigned by Customer to any person, firm, or corporation purchasing or leasing and intending to continue the operation of the plant or business which is being served under such Agreement, subject to the written approval of Company. Company will grant such approval upon being reasonably satisfied that the assignee will fulfill the terms of the Agreement and if, at Company's option, a satisfactory guarantee for the payment of bills is furnished by assignee.
- (f) Suspension of Billing Under Agreement at Customer's Request: If Customer is temporarily unable to take the electricity contracted for due to physical destruction of or damage to his premises, Company will, upon written request of Customer, and for a period reasonably required to replace or repair such premises, suspend billing under the Agreement effective with the beginning of the next ensuing billing period. However, if Customer desires to use electricity in a lesser amount than the minimum provided in the Agreement it will be supplied and billed under Company's Schedule and Riders applicable to his use. The Service Charge and any temporary service charges for electric service to temporary facilities will not be applied when Company's construction costs of such construction do not exceed a reasonable amount or to reestablish permanent electric service. A residential or small nonresidential customer, following the physical destruction of his premises from a natural disaster, may also suspend or terminate area lighting service within the initial contract period without incurring early termination charges.

If Customer will be using less than one-half of Contract Demand during a period of suspended operations for at least three consecutive months but no longer than twelve consecutive months, and upon written request by Customer, the Billing Demand shall be the maximum kW registered during the current billing month under the Schedules and Riders effective for the reduced usage. When Customer's load regularly falls below one-half of his Contract Demand, such operations shall not be considered as suspended operations.

During the initial twelve months of service, Customer's monthly bills will be rendered under the most advantageous available Schedule and Rider, except that once a bill is rendered under the Schedule and Rider(s) specified in the Service Agreement, service will thereafter be provided only under that Schedule and Rider. The Contract Demand will be excluded from the determination of the Billing Demand and Availability provisions of the Schedule during this initial period.

- (g) Termination of Agreement at Customer's Request: If Customer desires to terminate the Agreement, Company will agree to such termination if Company is satisfied that Customer no longer has use for electricity at the premises and all bills for electricity previously rendered have been paid, and provided that Customer pays to Company, for standard facilities, a termination charge equal to (1) for Customers served from Company's distribution system the loss in salvage of the facilities used to serve Customer less the greater of (a) 20 percent of the loss in salvage for each full year that such facilities shall have been in service or (b) 20 percent of each full year's revenue that such facilities shall have been in service; (2) for Customers served from Company's transmission system, the loss in salvage of the facilities used to serve Customer less the greater of (a) 10 percent of the loss in salvage for each full year that such facilities shall have been in service or (b) 10 percent of each full year's revenue that such facilities shall have been in service. Company may waive the foregoing provision if Company has secured or expects to secure from a new occupant or operator of the premises an Agreement satisfactory to Company for the supply of electricity for a term not less than the unexpired portion of Customer's Agreement.
- (h) Company's Right to Terminate or Suspend Agreement Company, in addition to all other legal remedies, may either terminate the Agreement or suspend delivery of electricity to Customer for (a) any default or breach of Agreement by Customer, (b) fraudulent or unauthorized use of electricity or use in such manner as to circumvent Company's meter, (c) failure to pay bills when due and payable or failure to restore deposit within the specified period or, (d) in case of a condition on Customer's side of the point of delivery actually known by Company to be, or which Company reasonably anticipates may be, dangerous to life or property. No such termination or suspension, however, will be made by Company without written notice, as required by the state regulatory authority, delivered to Customer personally or by mail, stating in what particular the Agreement has been violated, except that no notice need be given in instances set forth in (b) and (d) above.

Failure of Company to terminate the Agreement or to suspend the delivery of electricity at any time after the occurrence of grounds therefor or to resort to any other legal remedy or to exercise any one or more of such alternative remedies, shall not waive or in any manner affect Company's right later to resort to any one or more of such rights or remedies on account of any such ground then existing or which may subsequently occur.

Any suspension of the delivery of electricity by Company or termination of the Agreement upon any authorized grounds shall in no wise operate to relieve Customer of his liability to pay for electricity supplied, nor shall it relieve Customer (1) of his liability for the payment of minimum monthly charges during the period of suspension, nor (2) of his liability for damages, if the Agreement has been terminated, in the amount of (a) the minimum monthly charges which would have been payable during the unexpired term of the Agreement, plus (b) the termination charges provided for in paragraph 1(g) above. Whenever the supply of electricity is suspended for any authorized reason, Company will make a charge of \$12.94 for the restoration of service made during the normal business hours of Company's office or \$19.48 for the restoration of service made during all other hours.

2. CONDITIONS OF SERVICE

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- (a) Company is not obligated to supply electricity to Customer unless and until: (1) Company's form of Application for Supply of Electricity is executed by Customer and accepted by Company; (2) in cases where it is necessary to cross private property to deliver electricity to Customer, Customer conveys or causes to be conveyed to Company, without cost to Company, a right-of-way easement, satisfactory to Company, across such private property for the construction, maintenance, and operation of Company's lines and facilities, necessary to the delivery of electricity by Company to Customer, provided, however, in the absence of a formal conveyance, Company, nevertheless, shall be vested with an easement over Customer's premises authorizing it to do all things necessary to the construction, maintenance, and operation of its lines and facilities for such purpose; (3) any inspection certificates or permits that may be required by law in the local area are furnished to Company.
- (b) If Company installs a substation or other facilities for service to Customer, any available capacity of such facilities not needed to supply Customer may be used by Company to supply others.
- (c) Company may refuse to furnish electric service to any Applicant, or Customer, who at the time is indebted to Company for electric service previously supplied to such Applicant or Customer or business, in any area served by Company, except that an applicant for residential service shall not be denied service for failure to pay such bills for classes of nonresidential service.
- (d) If electricity is supplied by lines which cross the lands of the United States of America, a state, or any agency or subdivision of the United States of America or of a state, Company shall have the right, upon 30 days written notice, to discontinue the supply of electricity to any Customer or Customers receiving electricity from such lines, if and when (1) Company is required by governmental authority to incur expense in the relocation or the reconstruction underground of any portion of said lines, unless Company is reimbursed for such expense by Customer or Customers served therefrom, or (2) the right of Company to maintain and operate said lines shall be terminated, revoked, or denied by governmental authority for any reason.

3. SERVICE CHARGE

When Company first supplies electricity under any applicable metered Schedule, Customer shall pay Company a service charge of \$9.14, except a Landlord Agreement Customer shall pay a service charge of \$2.00, which shall be in addition to all other charges under the Service Agreement. This service charge shall become a part of the first bill rendered thereafter to Customer for electricity supplied at such premises unless it is paid in advance of the rendition of such bill.

4. RETURNED CHECK CHARGE

In conformity with an Order of the North Carolina Utilities Commission, Company will make a charge of \$5.00 for checks tendered on a Customer's account and returned for insufficient funds. Such charge shall apply regardless of when the check is tendered.

5. DEPOSITS

The collection of Customer deposits shall be as provided in Chapter 12 of the Rules and Regulations of the North Carolina Utilities Commission establishing uniform rules for all public utilities for the collection of Customer deposits.

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6. USE OF ELECTRICITY

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Electricity shall be supplied directly to Customer by Company and shall be used by Customer only for the purposes specified in, and in accordance with, the Agreement. Electricity supplied by Company shall be for Customer's use only and may not be sold directly on a metered or unmetered basis by Customer to lessees, tenants or others, except as provided for in G.S. 62-110(h) and Chapter 22 of the Commission's Rules regarding resale of electricity by landlords to residential tenants, or as may be exempt from regulation under G.S. 62-3(23)(d) and (h). Under no circumstances may Customer or other person or concern install or maintain any meter for the purposes of metering electricity with the object of rendering a bill therefor unless authorized by G.S. 62-3(23)(d) and (h).

A Customer who desires electricity for more than one classification of use on the same premises shall execute a separate Agreement for each separate classification, Customer's wiring being so arranged that electricity for each separate classification can be metered separately. When Customer conducts a business in his residence, for which business electricity is used, Company will supply all electricity through one meter under the Schedule applicable to the classification for his business use, unless Customer's wiring is so arranged that his residential use and his business use can be separately metered, in which event the appropriate Schedule will be applied to each such use.

In the event Customer utilizes a form of load control, such controls shall not cause a demand to be placed on Company's facilities which, in Company's opinion, unreasonably exceeds the integrated metered demand. Company reserves the right to determine the maximum 15-minute demand on a rolling time interval rather than the time interval of the metering facility in order to reflect the effect of any such controlled demand. The rolling time interval may or may not coincide with a time interval, if any, being supplied to Customer.

Customer shall not without the written assent of Company connect his installation to lines which cross over or under any public or semi-public space in order to supply electricity purchased through one meter to his adjacent properties. Such written assent may be given only in instances where such adjacent properties are operated as one integral unit under the same name and proprietorship and for carrying on parts of the same business, and where a separate type of business is not involved.

7. CONTRACT DEMAND

- (a) The Contract Demand shall be the kW of demand specified in the Service Agreement. In cases where any change is required in Company's facilities due to the actual demand exceeding the Contract Demand or due to Customer requesting an increase in available capacity, Company may require Customer to execute a new Agreement or amend an existing Agreement, thereby establishing a new Contract Demand. If Company is unable to supply such actual or requested increase, then upon written request, Customer will not exceed the existing Contract Demand or such amount in excess thereof as Company determines it is able to provide.
- (b) If Customer desires to reduce the effective Contract Demand at any time prior to the time the Billing Demand of the applicable Schedule first equals or exceeds the Contract Demand, Company may agree to reduce the Contract Demand to the number of kilowatts specified in writing by Customer provided Customer pays to Company a sum of money equal to the estimated cost (after deducting the then value of usable materials and facilities and the salvage value of nonusable materials and facilities) of installing and removing the existing facilities in place for serving Customer, plus any money spent by Company which would not have been spent if Customer had originally requested the reduced Contract Demand less 10% (20% if Customer is served from Company's distribution system) for each full year such facilities shall have been in service. The agreed upon reduction shall be effective with the beginning of the next ensuing billing period.

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The Company reserves the right to reduce^{1/A} its facilities to the capacity adequate to serve the Customer's maximum 15-minute demand of the preceding 12 billing months and to amend the Service Agreement to such maximum demand. If Customer desires that Company not change its facilities, Company may agree to do so provided Customer executes a Service Agreement for the amount such facilities were installed to serve.

- (c) If Customer increases his load without adequate notice to Company, and without receiving Company's consent, and such unauthorized increase causes loss of or damage to Company's facilities, the cost of making good such loss or repairing such damage shall be paid by Customer.

8. LOW POWER FACTOR ADJUSTMENT

Customer shall at all times maintain a power factor at the point of delivery as nearly 100% as practicable; however, if Customer's power factor is found to be less than 85%, Company will increase the monthly bill by a sum equal to \$0.32 multiplied by the difference between the maximum reactive kilovolt - amperes (kVAr) registered or computed by a demand meter suitable for measuring the demands used during any 15-minute interval and 62% of the maximum kW demand registered in the current billing month.

9. BILLING

- (a) Company's meters will be read as nearly as practicable at regular intervals of not less than 27 days and not more than 33 days. By special contract, Company and Customer may agree to billing intervals exceeding the 27-33 day period provided that Company renders 3 monthly bills per quarter. (By special order of the regulatory agencies bimonthly reading is permitted under certain conditions.)
- (b) If Company is unable to read Customer's meter for any reason, his use may be estimated by Company on the basis of his use during the next preceding billing period for which readings were obtained, unless some unusual condition is known to exist. A bill rendered on the basis of such estimate shall be as valid as if made from actual meter readings.
- (c) The term "Month" or "Monthly" as used in Company's Schedules and Riders refers to the interval transpiring between the previous meter reading date and the current reading date and bills shall be rendered accordingly, except that if the period covered by an initial or final bill or due to rerouting of meter reading schedule is more or less than 27-33 days, the bill will be prorated based on a 30-day billing month.

10. METER TESTING AND METER STOPPAGE OR ERROR

- (a) Upon reasonable notice, when requested in writing by Customer, Company shall test the accuracy of the meter serving Customer. Such testing will be performed free of charge, except when Customer has requested, within the previous twelve months, that the same meter be tested, in which case Customer shall pay Company \$45.00 for testing a non-demand meter, other than a time-of-use meter, and \$57.00 for testing a demand or time-of-use meter. This charge shall be refunded or credited to Customer (as a part of the settlement in the case of a disputed account) if the meter is found, when tested, to register more than 2% fast; otherwise the charge shall be retained by Company.
- (b) In the event a meter fails to register accurately within the allowable limits established by the state regulatory body having jurisdiction, Company will adjust the measured usage for the period of time the meter was shown to be in error, and shall, as provided in Rule R8-44 of the Rules and Regulations of the North Carolina Utilities Commission, refund or credit to Customer or Customer shall pay to Company the difference between the amount billed and the estimated amount which would have been billed had the meter not exceeded the allowable limits. No part of any minimum service charge shall be refunded.

11. POINT OF DELIVERY

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The point of delivery is the point where Company's service conductors are, or are to be, connected to Customer's conductors. Customer shall do all things necessary to bring his service conductors to such point of delivery for connection to the Company's service conductors, and he shall maintain his said conductors in good order at all times. Unless otherwise stipulated in the Agreement, the point of delivery shall be located as follows:

- (a) In cases of a connection of Company's overhead service conductors to Customer's overhead service conductors, such point of delivery shall be on the outside of the wall of Customer's building where Company's service conductors may be conveniently extended and anchored.
- (b) In cases of connection of Company's overhead service conductors to Customer's underground service conductors, such point of delivery shall be at a place on Company's nearest pole approximately one foot below the Company's conductors from which Customer is to be supplied.
- (c) In cases of connection of Company's underground service conductors to Customer's service conductors, such point of delivery shall be at a place on the outside wall of Customer's building to which Company's conductors may be conveniently extended and terminated.
- (d) In cases where a ground type substation is installed by Company to supply electricity to Customer, the point of delivery shall be at a place designated by Company.
- (e) In cases where a service entrance panel box was installed by Company on the exterior of the outside wall of Customer's dwelling for the purpose of supplying electricity under Company's All Electric Residential Service Schedule, the point of delivery shall be the point where Customer's conductors are connected to Company's conductors in such panel box.
- (f) In cases where electric wiring was installed by Company in residences or apartment buildings with service entrances of 400 amperes or larger, by connection from Company's overhead service conductors, for the purpose of supplying electricity under Company's All Electric Residential Service Schedule, the point of delivery shall be the point where Company's conductors are connected to the main switch owned by Customer, or the point where Customer's conductors are connected to the meter trough provided for multiple dwelling units if there is not a main switch for all dwelling units.

Where special circumstances render it impracticable for the point of delivery to be located as above stated, then it shall be at a place selected or approved by Company and when so done the Customer shall bring his service conductors to and maintain them at such place.

12. INSTALLATIONS

- (a) By Company: Company shall install, own, operate, and maintain all lines and equipment located on its side of the point of delivery. It shall also furnish and install the necessary meter, and meter transformers where necessary, for measuring the electricity used, though such meter will usually be located on Customer's side of the point of delivery.

When Customer requests Company to supply electricity to a single premises in a special manner requiring facilities over and above those normally provided by Company, such extra facilities will be provided, if Company finds it practicable, under the following conditions:

- (1) The facilities will be a kind and type normally used by or acceptable to Company and will be installed at a place and in a manner satisfactory to Company.
- (2) Customer will pay to Company a Monthly Facilities Charge of 1.0 percent of the estimated installed cost and rearrangement cost of all facilities required, including metering, in addition to those Company would have provided, but not less than \$25 per month.

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- (3) If Company increases its investment, other than replacement of existing equipment with equipment of equal capacity and kind, in facilities necessary to supply Customer's special electric requirements (including conversion of the primary voltage to a higher voltage), the monthly charge for providing the extra facilities will be adjusted at that time. The Customer may terminate the extra facilities in accordance with the applicable termination provisions or continue the extra facilities under the changed conditions.
- (4) In lieu of the Monthly Facilities Charge of 1.0 percent, Customer may elect to make a contribution for the extra facilities as determined in 12(a)(2) and (3) above. After such payment the Monthly Facilities Charge for the extra facilities will be 0.3 percent of said payment.
- (5) When customer desires more than one point of delivery to a single premises at one or more voltages with a meter installation, acceptable to Company, to obtain the total kilowatt hours and simultaneous kilowatts of demand, Company will furnish such service under the applicable terms and conditions of this Section 12.

Only those points of delivery located external to Customer's plant structure may be included in a totalized metering system arrangement. In case of a primary meter installation, the installed cost of metering equipment will not be included as extra facilities nor will the metering equipment be compensated for line or transformation losses.

- (6) Company shall not be required to make such installation of facilities in addition to those normally provided until Customer has signed such agreements, including provisions for termination, as may be required by Company.
 - (7) The cost basis for Extra Facilities provided before March 16, 2018, shall continue to apply until a change in Customer's requirements necessitates a recalculation of the facilities that Company normally would have provided for standard electric service.
- (b) By Customer: Customer shall install, own, operate and maintain all lines, service conductors, meter bases, and equipment, exclusive of Company's meter and meter transformers on Customer's side of the point of delivery and Customer will be the owner and have exclusive control thereof as well as of all electricity after it passes the point of delivery. Customer shall so arrange his wiring that all electricity for one type of use can be supplied at one point of delivery and measured by a single meter. Except under special circumstances, Company's meter will be located on Customer's side of the point of delivery, and when it is to be so located Customer must make suitable provisions in his wiring for the convenient installation of the type of meter Company will use, and at a place suitable to Company. Customer's service entrance conductors shall not be installed within hollow walls unless the conductors are in conduit. Service entrance conductors not installed in conduit must be readily visible on the source side of Company's meter. Where a socket-type meter is to be used, Customer will provide, install at a place suitable to Company, own, and maintain a meter base or meter/switch enclosure to accommodate Company's meter under the following conditions: (1) the meter base or meter/switch enclosure shall be in accordance with Company specifications and bear the seal of approval of UL or other recognized authority in the industry, (2) Customer agrees to allow Company to install, maintain, and exercise exclusive control over all Company-owned facilities located inside Customer-owned meter base or meter/switch enclosure, including termination of Company-owned conductors to the line side terminals of Customer's meter base or meter/switch enclosure, (3) Customer agrees to allow Company to open and inspect the meter base or meter/switch enclosure at any time, and (4) Customer shall notify Company and obtain permission before altering or performing maintenance inside the meter base or metering section of the meter/switch enclosure. Socket-type meter bases furnished by Company prior to January 1, 1991 will continue to be owned by Company until replacement of meter base is necessary, at which time Customer will provide, install at a place suitable to Company, own, and maintain a replacement meter base under the above conditions.

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Customer shall not utilize any equipment,^{/A} appliance, or device which tends to affect adversely Company's supply of service to, or the use of service by, Customer or others. Customer shall not install gaseous discharge lighting with a power factor of less than 90 percent lagging. When polyphase service is supplied by Company, Customer shall control his use so that his load will be maintained in reasonable electrical balance between the phases at the point of delivery. Customer shall install and maintain devices adequate to protect his equipment against irregularities on Company's system, including devices to protect against single phasing.

- (c) Access To Premises: The duly authorized agents of Company shall have the right of ingress and egress to the premises of Customer at all reasonable hours over the same general route as Customer utilizes for the purpose of reading meters, inspecting Company's wiring and apparatus, changing, exchanging, or repairing its property on the premises of Customer and to remove such property at the time of or at any time after suspension of service or termination of Agreement.
- (d) Protection: Customer shall protect Company's wiring and apparatus on Customer's premises and shall permit no one but Company's agents to handle same. In the event of any loss or damage to such property of Company caused by or arising out of carelessness, neglect, or misuse by Customer, his employees or agents, the cost of making good such loss or repairing such damage shall be paid by Customer. In cases where Company's service facilities on Customer's premises require abnormal maintenance due to Customer's operation, Customer shall reimburse Company for such abnormal maintenance.

13. CONTINUANCE OF SERVICE AND LIABILITY THEREFOR

Company does not guarantee continuous service but shall use reasonable diligence at all times to provide an uninterrupted supply of electricity and having used reasonable diligence shall not be liable to Customer for damage, for failure in, or for interruptions or suspensions of, the same.

Company reserves the right to suspend service without liability on its part at such times and for such periods and in such manner as it may deem advisable (a) for the purpose of making necessary adjustments to, changes in, or repairs on its lines, substations, and facilities and (b) in cases where, in its opinion, the continuance of service to Customer's premises would endanger persons or property.

In the event of an adverse condition or disturbance on the system of Company, or on any other system directly or indirectly interconnected with it, which requires automatic or manual interruption of the supply of electricity to some customers or areas in order to limit the extent or damage of the adverse condition or disturbance, or to prevent damage to generating or transmission facilities, or to expedite restoration of service, Company may, without incurring liability, interrupt service to customers or areas and take such other action as appears reasonably necessary.

Customer assumes responsibility for and shall indemnify, defend, and save the Company harmless against all liability, claims, judgments, losses, costs, and expenses for injury, loss, or damage to persons or property including personal injury or property damage to Customer and his employees on account of defective construction, wiring, or equipment, or improper or careless use of electricity, on Customer's side of the point of delivery.

14. GOVERNMENT RESTRICTIONS

The delivery date, quantity, and type of electricity to be supplied by Company are subject to changes, restrictions, curtailments, or complete suspensions by Company as may be deemed by it to be necessary or advisable (a) on account of any lawful order or regulation of any municipal, State, or Federal government or agency thereof, or order of any court of competent jurisdiction, or (b) on account of any emergency or shortage due to war or catastrophe, or during the duration thereof, all without liability on the part of the Company therefor.

15. COSTS INCURRED IN PREPARING TO SERVE^{VA} CUSTOMER

If a prospective customer advises Company that he intends to contract for electric service with Company, and Company incurs costs in preparing to furnish service to him, and thereafter he fails to enter into a written Service Agreement with Company within a reasonable time after the date when he advises Company that he expects to begin receiving service, then such prospective customer shall be liable to Company for all costs reasonably incurred by Company in preparing to serve him, subject to review by the Utilities Commission.

16. SALES TAX

Any applicable North Carolina Sales Tax shall be added to the charges contained in the Schedules, Riders, and these Service Regulations.

17. GENERAL

- (a) Whenever the term "service" or "electric service" is used in these Service Regulations or other portions of the Agreement, it shall be construed to refer to the electricity supplied to Customer.
- (b) The term "Company's service conductors" means Company's wires extending from the point of connection with Company's supply line to the point of delivery.
- (c) The term "Customer's service conductors" shall mean Customer's wires extending from the point of delivery to the switch box or other point where the branch circuits connect for the purpose of distributing the electricity taken from Company to his various places of use.
- (d) The term "service connection" means the connection of Company's service conductors to Customer's service conductors.

Superseding North Carolina Service Regulations dated March 16, 2018
Revised November 29, 2019
NCUC Docket No. E-2, Sub 1219

LINE EXTENSION PLAN E-68

I. AVAILABILITY

This line extension plan is applicable to distribution line extensions to all retail service.

II. DEFINITIONS

A. ABNORMAL INSTALLATIONS

Abnormal Installations include the following:

1. Abnormal Construction

Abnormal construction costs are incurred when physical obstacles or adverse conditions preclude the use of Company's standard construction methods, or excessive labor is necessary to install the Company's facilities to serve the Customer. Abnormal Construction includes (but is not limited to) the following conditions: the composition of the land where underground facilities are to be installed is such that Company's standard construction equipment cannot be used to complete the installation, or excessive labor is required to complete the installation; special equipment and materials are needed for stream crossing structures or concrete structures; explosives or other rock breaking measures are required; abrupt changes in final grade levels exceed a slope ratio of one when measured within three feet of the trench; or, cost is incurred to obtain special permits or in order to comply with requirements, if any, of the municipalities, counties, State and Federal highway or environmental agencies or departments regarding the replacement of pavement, ditching, compaction, backfilling, permitting or other related conditions. Also, when it is necessary to install underground facilities under existing streets, sidewalks, patios, or other paved areas, the Customer shall contribute the additional costs to install the Company's facilities had these physical obstructions not been present.

2. Abnormal Design

Abnormal design costs are incurred when the Customer requests facilities or construction methods that exceed the Company's standard engineering design practices and/or the standard design for normal service for a specific Customer.

Where abnormal installation costs are incurred by the Company, the Customer shall, in addition to any other charges contained in this Plan, pay for the excess costs incurred by the Company. Any Company facilities considered by the Company to be extra facilities in accordance with the Company's Service Regulations, Provision 12(a) INSTALLATIONS or its successor, shall not be treated as abnormal installation costs in this Line Extension Plan.

B. CONSTRUCTION COST

The Construction Cost is the Company's estimated installed cost based upon either a detailed cost estimate or an average/standardized estimate of constructing all necessary facilities to the point(s) of delivery, including the cost of transformers, materials, labor, metering, transportation, stores, tax, engineering, and general expenses, exclusive of any abnormal installation costs as defined in II.A. above.

When applied to Temporary Service, Construction Service, and electric service to Nonpermanent Manufactured Homes, the Construction Cost shall also include the removal costs minus the salvage value of the facilities. When it is necessary to remove, relocate, or rearrange existing Company facilities, the Construction Cost shall also include the removal cost of existing Company facilities, plus the rearrangement cost of existing Company facilities, minus the salvage value of any existing Company facilities being removed.

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C. CONSTRUCTION SERVICE

A Construction Service Customer is a customer whose need is for use in the construction of buildings or other establishments which will receive, upon completion, permanent electric service from the Company.

D. NONPERMANENT MANUFACTURED HOME

A manufactured home shall be considered nonpermanent if it does not meet the following requirements:

1. It must be attached to a permanent foundation;
2. It must be connected to permanent water and sewer facilities;
3. It must be labeled as a structure which can be used as a permanent dwelling; and
4. The owner/occupant must either own the land on which the structure is installed or must have a recorded lease of at least 5 years' duration.

E. NORMAL POINT OF DELIVERY

The Normal Point of Delivery for overhead service to residential customers shall be on the outside wall of the end of the building nearest to the source of the Company's facilities entering the Customer's premises.

The Normal Point of Delivery for service to all other customers shall be at a location designated by the Company.

F. PERMANENT SERVICE

A Permanent Service customer must have on-going year-round electric service needs. For purposes of this Plan, the following types of customers or structures shall not be considered Permanent Service customers: Temporary Service customers, Construction Service customers, Nonpermanent Manufactured Homes, and structures designed or used to provide mobility and/or nonpermanent living accommodations (including, but not limited to, boats, campers, motor homes, and recreational vehicles).

G. REAL ESTATE DEVELOPMENT

A Real Estate Development is a residential subdivision, commercial park, industrial park, mobile home park, apartment complex, planned area development, or other similar type development consisting of four or more contiguous lots recorded with the appropriate County Registry where permanent electric service will be provided to four or more customers.

H. REVENUE CREDIT

The Revenue Credit is equal to three years of estimated annual revenues (five years for the initial extension of distribution facilities to an individual residential dwelling unit other than a Nonpermanent Manufactured Home or any structure classified as a Temporary Service Customer). The estimated annual revenue shall be determined by the Company for the new or additional load and shall be based upon the charges set forth in the applicable rate schedule(s).

I. STANDARD DESIGN

Standard Design means the most cost effective and reliable design using the Company's current engineering design and construction practices which will meet the electrical service requirements of the Customer. The "standard design" which is the most cost effective may be either overhead or underground.

J. TEMPORARY SERVICE

A Temporary Service Customer is any residential or nonresidential customer whose electric service needs will not result in permanent electric service and the Company's facilities installed to serve the Customer shall not be needed to serve other customers in the near future. Customers requesting electric service to vehicles or structures designed or used to provide mobility and/or nonpermanent living accommodations (including, but not limited to, boats, campers, motor

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homes, and recreational vehicles), rock crushers, asphalt plants, carnivals, fairs and other nonpermanent installations shall also be classified as Temporary Service Customers.

III. EXTENSION OF SERVICE

A. SINGLE-PHASE SERVICE TO INDIVIDUAL CUSTOMERS

1. Extensions Involving Only Secondary Service

The Company will construct, own, operate, and maintain the overhead service facilities necessary to provide service from an overhead secondary source or an underground service lateral from an underground secondary source to the Normal Point of Delivery to all customer-requested facilities except Nonpermanent Manufactured Homes (see III.A.3. below), Temporary Service Customers (see III.C. below), or Construction Service Customers (see III.D. below) at the Company's expense, except that the Customer shall pay for any abnormal installation costs as determined by the Company. A non-residential Customer shall pay the Construction Cost minus the Revenue Credit (see II.H. above) for the service in excess of five hundred (500) feet.

If the Customer requests an installation other than the standard design and/or for points of delivery other than the Normal Point of Delivery that cause the Company to incur additional costs the customer shall pay such costs.

When it is necessary to relocate the secondary service for the Customer's convenience, the Customer's payment, if any, shall be the Construction Cost minus the Revenue Credit (see II.H. above), plus any abnormal installation costs as determined by the Company.

2. Extensions Involving Primary Distribution Facilities

The Company will construct, own, operate, and maintain all primary distribution facilities necessary to extend single-phase electric service to the Normal Point of Delivery at Company's expense, except as provided below. The Company will provide the secondary service portion of such line extension, if any, in accordance with III.A.1. above.

For the primary portion of a standard design single-phase line extension to all customer-requested facilities except Nonpermanent Manufactured Homes (see III.A.3. below), Temporary Service Customers (see III.C. below), or Construction Service Customers (see III.D. below), the Customer shall pay the amount (if any) by which the Construction Cost exceeds the Revenue Credit (see II.H. above).

If the Customer requests an installation other than the standard design and/or for Points of Delivery other than the Normal Point of Delivery that cause the Company to incur additional costs, the Customer shall pay for such additional cost.

When it is necessary to relocate the primary distribution facilities serving any customer-requested facilities except Nonpermanent Manufactured Homes (see III.A.3. below) or Temporary Service Customers (see III.C. below) for the Customer's convenience, the Customer shall pay the amount by which the Construction Cost exceeds the Revenue Credit (see II.H. above).

3. Service Extensions or Relocations for Nonpermanent Manufactured Homes

The Company shall construct, own, operate, and maintain the single-phase 120/240 volt secondary service to the Normal Point of Delivery necessary to provide service for a Nonpermanent Manufactured Home and the Customer shall pay the total installed cost plus removal cost minus salvage value of the facilities removed plus any abnormal installation costs as determined by the Company.

B. THREE-PHASE SERVICE TO INDIVIDUAL CUSTOMERS

1. Extensions Involving Only Secondary Service

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The Company will construct, own, operate, and maintain all overhead and/or underground distribution facilities necessary to extend three-phase secondary electric service to the Normal Point of Delivery at the Company's expense, except that the customer shall pay for any estimated abnormal installation costs as determined by the Company. A non-residential Customer shall pay the Construction Cost minus Revenue Credit (see II.H. above) for service in excess of five hundred (500) feet.

If the Customer requests an installation other than the standard design and/or for Points of Delivery other than the Normal Point of Delivery which causes the Company to incur additional costs, the Customer shall pay for such additional cost.

2. Extensions Involving Primary Distribution Facilities

The Company will construct, own, operate, and maintain all primary distribution facilities necessary to extend three-phase service to the Normal Point of Delivery at the Company's expense, except as provided below.

For a standard design three-phase primary line extension to all customer-requested facilities except Temporary Service Customers (see III.C. below) or Construction Service Customers (see III.D. below), the Customer shall pay the amount by which the Construction Cost exceeds the Revenue Credit (see II.H. above).

If the Customer requests an installation other than the standard design and/or for Points of Delivery other than the Normal Point of Delivery that cause the Company to incur additional costs, the Customer shall pay for such additional costs.

C. TEMPORARY SERVICE

For overhead single-phase 120/240 volt secondary service extensions requiring a service drop only, the Customer shall pay an overhead temporary service charge plus a service footage charge of conductor. For up to five feet of underground single-phase 120/240 volt secondary service provided from existing underground facilities, the Customer shall pay an underground temporary service charge. The service charge shall recover Company's cost for extending overhead or underground facilities for a typical installation. For all other types of Temporary Service, including but not limited to installation of transformers, the Customer shall pay for the actual cost of connection and disconnection. The cost shall include the total installed cost plus removal cost less salvage value of the facilities removed.

D. CONSTRUCTION SERVICE

Overhead single-phase 120/240 volt Construction Service requiring a service drop of no more than one hundred feet without the installation of any Company-owned transformers or poles, or an underground single-phase 120/240 volt Construction Service requiring a service lateral of no more than five feet from and existing 120/240 volt source shall be provided at the Company's expense. For all other types of Construction Service, the Customer shall pay the total installed plus removal costs less salvage value of the facilities removed.

In addition to any Customer payment for the initial Construction Service, the Customer shall pay for the estimated installed plus removal costs minus salvage value of the facilities installed to provide any Construction Service facilities in excess of one point of delivery per permanent building.

E. NEW REAL ESTATE DEVELOPMENTS

1. Residential Developments

At the developer's request, the Company will construct, own, operate, and maintain overhead and/or underground distribution facilities to provide a basic distribution system, normally 120/240 volt single-phase service or as determined by the Company, within the Real Estate Development in which it is contemplated that individual lots will be sold or leased. The developer requesting the basic distribution system shall pay any amount by which the Construction Cost exceeds the estimated Revenue Credit (see II.H.

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above) from the development, plus any estimated abnormal installation costs as determined by the Company.

2. Nonresidential Developments and Planned Area Developments

At the developer's request, the Company will construct, own, operate, and maintain overhead and/or underground distribution facilities to provide a basic distribution system within the Real Estate Development in which it is contemplated that individual lots will be sold or leased. The developer requesting the basic distribution system shall pay any amount by which the Construction Cost exceeds the estimated Revenue Credit (see II.H. above) from the development, plus any estimated abnormal installation costs as determined by the Company.

3. Idle Facilities Deposits

The Company may in its discretion limit installation of the Company's electrical facilities in a Real Estate Development to that area which in the Company's judgment is likely to be occupied within a reasonable period of time, in order to avoid excess investment in idle facilities. The developer may obtain installation in the additional area by paying a deposit equal to the total estimated installed cost of the facilities to serve the additional area. In lieu of such deposit and solely at the Company's option, an approved alternative financial instrument, such as an irrevocable standby letter of credit, may be used as security. Idle Facilities Deposits are reviewed annually and will be refunded based on the pro rata portion of the Company's idle facilities needed to serve customers during the preceding 12 months. Any deposit held by the Company for five years or more shall not be refunded.

4. General

In advance of any design work by the Company, the developer of a Real Estate Development shall be responsible for providing to the Company an estimate of electrical loads within the development, and a surveyor's recorded plot plan with premise addresses for each lot. In the case of a mobile home park or multi-family project, the plot plan shall indicate the location of each structure within the development. The developer recognizes and acknowledges that the Company will rely upon such information in sizing and installing the facilities necessary to serve the development.

Each individual customer within the development will be served in accordance with III.A., B., C., or D. above, and shall be subject to any applicable Customer payment obligation.

When the Company's existing facilities within a Real Estate Development must be rearranged and/or abandoned due to any actions of the original owner or developer, or any subsequent owner(s) or developer(s) within the development, the party requesting the changes shall pay: 1) the Construction Cost of relocating the facilities, plus 2) the installed cost plus removal cost less salvage value for any facilities removed or abandoned.

F. CONVERSIONS OF OVERHEAD TO UNDERGROUND SERVICE

The conversion of existing overhead distribution facilities to underground distribution facilities is governed solely by the provisions of this section. Conversions shall be in accordance with the following:

1. Residential Customers

When the Customer requests the Company to replace an existing single phase overhead residential service connection or a secondary and service combination, the Customer shall pay the average/standardized construction cost for a standard installation including the following charges:

- (a) The cost of converting from overhead to underground facilities.

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- (b) A per foot cost per linear foot of underground conductor.
- (c) Any estimated abnormal installation costs as determined by the Company.

If the Customer's load requirements necessitate replacing the overhead secondary or the secondary and service combination, the construction cost of replacing the overhead facilities shall be credited to the Customer. The above charges will not apply and charges will be determined pursuant to Section F.2. below when (1) the Customer requests to undertake certain tasks, as permitted by Section IV.B. (2) when load additions warrant replacement of the overhead facilities and the Customer requests a detailed cost estimate or (3) the Company is required to replace an existing residential overhead connection which involves primary distribution facilities.

2. Other Individual Customers

When the Customer requests the Company to replace an existing overhead connection with underground facilities and such change is not the result of an increase in the Customer's electrical requirement that would have necessitated replacing the overhead facilities, the Customer shall pay, based on the Company's estimates:

- (a) The installed cost of the underground facilities, plus
- (b) The costs of removing and rearranging the overhead facilities, plus
- (c) Any abnormal installation costs as determined by the Company, minus
- (d) The salvage value of the overhead facilities

When the Customer's electrical requirement necessitates replacing the overhead facilities serving the Customer, the Customer payment shall be determined in accordance with paragraph III.A., B., C., or D. of this Plan.

3. Replacement of General Overhead Distribution Facilities with Underground Facilities

For installations not otherwise covered by other sections of this Plan or rate schedules, or which include more facilities than are covered by other sections of this Plan, the Company shall replace overhead distribution facilities with underground facilities subject to the following conditions:

- (a) The party requesting the conversion shall deposit with the Company the estimated cost of the engineering study necessary to determine the cost of converting to underground facilities. If within one year after the date of the deposit an agreement is reached for converting the distribution facilities to underground facilities, the deposit shall be credited to the contribution required by the requesting party. Should an agreement not be executed within one year, the deposit shall not be refunded or credited to the requesting party.
- (b) The area to be converted shall be the area that the Company considers physically and technically feasible, but normally will not be less than one city block or 1,000 linear feet.
- (c) The party requesting the conversion shall arrange with all customers affected thereby to receive, at locations designated by the Company, electric service of the type and voltage available from the underground system. The area being converted shall be declared an underground area and only underground service will be available within such area. Underground service to future customers within the area shall be provided in accordance with III.A., B., C., D., and E. of this Plan.
- (d) The party requesting the conversion shall pay the estimated cost of underground facilities, plus the cost of removing and rearranging the overhead facilities, less the salvage value of the overhead facilities being removed. If the Company has to rebuild its overhead facilities within the area, such as relocating its facilities due to a street widening, the payment to the Company shall be reduced by the estimated

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cost of such work exclusive of the cost of rights of way, clearing, and street lighting.

- (e) Street lighting service and conversion to underground facilities shall be in accordance with the Company's filed street lighting schedules.
- (f) The party requesting the conversion shall provide the Company the necessary rights of way and clearing thereof, at no cost to the Company, for the installation of the Company's underground facilities. Such rights of way and clearing will include the necessary space for the Company to install any required vaults, pad mounted transformers, or other associated equipment.
- (g) The party requesting the conversion shall be responsible for placing all traffic and other control circuits underground.

IV. GENERAL

A. RIGHTS OF WAY

The Customer will furnish, without cost to the Company, necessary easements and rights of way for the supply of electric service to the Customer.

The location of the Company's transmission lines or right of way easements of the Company for existing or future transmission lines shall not be affected by this Plan or any contract executed thereunder.

The Customer shall be responsible for the initial clearing to final grade, free of stumps and other obstructions, for any right of way necessary to provide underground electric service. When it is necessary to clear the right of way on the Customer's property to provide overhead electric service, the Customer shall be responsible for the removal of all debris resulting from such clearing. In lieu thereof, the Company shall provide such service provided the Customer agrees to pay the Company for any and all estimated clearing costs and any tree debris removal and/or disposal costs.

B. PAYMENTS

The Company reserves the right to collect any line extension payments under this Plan before installation of the facilities begins.

The Customer may be allowed to perform certain tasks solely on property owned by Customer in accordance to the Company's specifications to reduce the Customer payments contained herein, provided the Company determines that the Customer's work will not reduce the quality of the installation and maintenance of the facilities to be installed. Such tasks include trenching, right of way clearing for overhead facilities, rock removal, and cutting and replacing pavement and other obstructions that would impede the Company from using normal construction materials and equipment, which the Company determines would not reduce the quality of the installation and maintenance of the facilities to be installed. When the Customer elects to perform such work, the Customer shall be solely responsible for obtaining all necessary permits and for complying with all state and federal laws and regulations.

The Company will only collect payments under this Plan when the total of all contributions, minus all credits, exceeds Company's administrative cost of collecting and processing the payment.

Whenever the Revenue Credit exceeds the Construction Cost, the difference shall always be expressed as zero.

C. TYPE OF FACILITIES

The Company shall have the right to install an overhead or underground distribution system at its option. However, if the Customer or developer requests, or a city ordinance or other legal restriction requires that such lines be placed underground rather than overhead, the Customer or developer shall pay for all costs associated with such service pursuant to this Plan. The Company, in reliance upon information provided by the Customer or Developer shall design

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the most efficient and cost-effective system to meet the Customer's needs based on the Company's current design and construction practices. The Company's cost calculations shall be based on this standard design for normal service. If the standard design for normal service includes multiple circuits installed in the same trench, the trench footage used in computing the Customer's payment shall be multiplied by the number of circuits installed in the trench.

Normally, the Company does not install overhead facilities in areas served (or contracted to be served) by an underground distribution system. However, where adverse conditions exist which would cause excessive costs to the Company if underground facilities were installed, overhead facilities may be utilized as needed to avoid such excessive costs. Should the Customer or local ordinance require the installation of underground facilities, the Customer shall pay the normal charges for underground service plus the estimated amount by which the cost of providing underground facilities under the adverse conditions exceeds the cost of providing underground facilities under normal conditions.

The Company shall provide electric service, either overhead or underground, at a single point of delivery at one of the Company's standard voltages. The type and location of these facilities shall be in accordance with sound engineering practices as determined by the Company's engineers and any information provided by the Customer.

In areas, where the Company's standard design requires that underground conductors be placed in concrete-encased duct systems, typically designated downtown underground areas, the Company will bear the expense of the concrete-encased duct system on public easements. Where the design to meet the Customer's request requires the concrete-encased duct system to be extended onto private property, the Customer will provide the appropriate concrete-encased duct system to the Company's specifications. Alternatively, the Customer may request that the Company install the concrete-encased duct system and the cost shall be paid to the Company by the Customer.

D. OBSTRUCTIONS

The Customer, developer, or other party requesting the Company's distribution facilities to be installed shall remove all obstructions from the route along which the Company's underground facilities are to be installed, and provide continuing access to the Company for operation, maintenance, or replacement of these facilities. The Company shall not be responsible for any damage to any shrubs, trees, grass, or any other foliage or property caused by the Company's equipment during installation, maintenance, or replacement of the Company's facilities. The Customer shall be responsible for all such items, and for reseeding or resodding the trench cover where required. In addition, the Company shall not be responsible for the repair or replacement of underground facilities on the Customer's premises damaged during the installation of the Company's facilities, unless, prior to the Company's construction, the Customer clearly identified the location of such facilities.

The Customer, developer, or other party requesting the Company's distribution facilities to be installed shall install conduit, as specified by the Company. If conduit is required and is improperly installed by Customer and therefore results in additional cost to the Company, Customer shall reimburse Company for such costs.

V. TAXES

To the above charges will be added any applicable taxes for contributions in aid of construction and any applicable Sales Tax.

Duke Energy Progress, LLC
(North Carolina)

C-2

TERMS AND CONDITIONS FOR THE PURCHASE OF ELECTRIC POWER

I. PURCHASE POWER AGREEMENT

These "Terms and Conditions" provide a mechanism through which Duke Energy Progress, LLC, hereafter called "Company," will agree to purchase energy or capacity or both from an Eligible Qualifying Facility as defined in the Purchased Power Schedule PP. This Purchase Power Agreement is solely for the purchase of electricity produced by Seller's generation, net of generator auxiliary requirement, and does not provide for the sale of any electric service by Company to Seller.

- (a) Description - The Purchase Power Agreement (hereinafter sometimes termed "Agreement") shall consist of (1) Company's form of Purchase Power Agreement when signed by Seller and accepted by Company, (2) the applicable Schedule for the purchase of electricity as specified in the Purchase Power Agreement, and (3) these Terms and Conditions for the Purchase of Electric Power (hereinafter referred to as "Terms and Conditions"), and all changes, revisions, alterations therein, or substitutions therefor lawfully made.
- (b) Application of Terms and Conditions and Schedules - All Purchase Agreements in effect at the effective date of this tariff or that may be entered into in the future, are made expressly subject to these Terms and Conditions, and subject to all applicable Schedules as specified in the Purchase Power Agreement, and any changes therein, substitutions thereof, or additions thereto lawfully made, provided no change may be made in rates or in essential terms and conditions of this contract except by agreement of the parties to this contract or by order of the state regulatory authority having jurisdiction (hereinafter "Commission").
- (c) Conflicts - In case of conflict between any provision of a Schedule and of these Terms and Conditions, the provision of the Schedule shall prevail.
- (d) Waiver - The failure of either Party to enforce or insist upon compliance with any of the terms or conditions of this Agreement shall not constitute a waiver or relinquishment of any such terms or conditions, but the same shall be and remain at all times in full force and effect.
- (e) Assignment of Agreement - A Purchase Power Agreement between Company and Seller may not be transferred and assigned by Seller to any person, firm, or corporation purchasing or leasing and intending to continue the operation of the plant or business which is interconnected under such Agreement, without the prior written approval of Company. A Purchase Power Agreement shall not be transferred and assigned by Seller to any person, firm, or corporation that is party to any other purchase agreement under which a party sells or seeks to sell power to the Company from another Qualifying Facility that is located within one-half mile, as measured from the electrical generating equipment. Company will not unreasonably withhold consent provided that such assignment does not require any amendment to the terms and conditions of this Agreement, other than the notice provision thereof. Any assignment that Company has not approved in writing shall be null and void and not effective for all purposes. However, before such rights and obligations are assigned, the assignee must first obtain necessary approval from all regulatory bodies including, but not limited to, the Commission.
- (f) Notification of Assignment, Transfer or Sale - In the event of an assignment of the rights and obligations accruing to Seller under this Agreement, or in the event of any contemplated sale, transfer or assignment of the Facility or the Certificate of Public Convenience and Necessity, the Seller shall, in addition to obtaining the approvals hereof, provide a minimum of 30 days prior written notice advising Company and the Commission of any plans for such an assignment, sale or transfer, or of any accompanying significant changes in the information required by Commission Rule R8-64, R9-65 or R8-66 which are incorporated by reference herein.

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- (g) Suspension of Sales Under Agreement at Seller's Request - If Seller is temporarily unable to produce the electricity contracted for due to physical destruction of, or damage to, his premises, Company will, upon written request of Seller, and for a period Company deems as reasonably required to replace or repair such premises, suspend billing under the Agreement, exclusive of any Monthly Facilities Charges, effective with the beginning of the next sales period.
- (h) Termination of Agreement at Seller's Request - If Seller desires to terminate the Agreement, Company will agree to such termination if all bills for services previously rendered to Seller including any termination or other charges applicable under any Interconnection Agreement, plus any applicable termination charges, have been paid. Termination charges shall consist of any applicable termination charges for premature termination of capacity as set forth in paragraphs 4 and 6 of these Terms and Conditions. Company may waive the foregoing provision if Company has secured or expects to secure from a new occupant or operator of the premises an Agreement satisfactory to Company for the delivery of electricity to Company for a term not less than the unexpired portion of Seller's Agreement.
- (i) Company's Right to Terminate or Suspend Agreement - Company, in addition to all other legal remedies, may either terminate the Agreement or suspend purchases of electricity from Seller (1) for any default or breach of Agreement by Seller, (2) for fraudulent or unauthorized use of Company's meter, (3) for failure to pay any applicable bills when due and payable, or (4) for a condition on Seller's side of the point of delivery actually known by Company to be, or which Company reasonably anticipates may be, dangerous to life or property. Termination of the contract is at Company's sole option and is only appropriate when Seller either cannot or will not cure its default or if Seller fails to deliver energy to Company for six (6) consecutive months.

No such termination or suspension, however, will be made by Company without written notice delivered to Seller, personally or by mail, stating what in particular in the Agreement has been violated, except that no notice need to be given in instances set forth in 1.(i)(2) above. Company shall give Seller thirty (30) calendar days prior written notice before suspending or terminating the Agreement pursuant to provisions 1.(i)(1) and (3). Company shall give Seller five (5) calendar days prior written notice before suspending or terminating the Agreement pursuant to provision 1.(i)(4).

Failure of Company to terminate the Agreement or to suspend the purchase of electricity at any time after the occurrence of grounds therefor, or to resort to any other legal remedy or to exercise any one or more of such alternative remedies, shall not waive or in any manner affect Company's right later to resort to any one or more of such rights or remedies on account of any such ground then existing or which may subsequently occur.

Any suspension of the purchase of electricity by Company or termination of the Agreement upon any authorized grounds shall in no way operate to relieve Seller of Seller's liability to compensate Company for services and/or facilities supplied, nor shall it relieve Seller (1) of Seller's liability for the payment of minimum monthly charges during the period of suspension, nor (2) of Seller's liability for damages, if the Agreement has been terminated, in the amount of (a) the minimum monthly charges which would have been payable during the unexpired term of the Agreement plus (b) the Early Contract Termination charge as set forth in these Terms and Conditions.

2. CONDITIONS OF SERVICE

- (a) Company is not obligated to purchase electricity from Seller unless and until: (1) Company's form of Purchase Power Agreement is executed by Seller and accepted by Company; (2) in cases where it is necessary to cross private property to accept delivery of electricity from Seller, Seller conveys or causes to be conveyed to Company, without cost to Company, a right-of-way easement, satisfactory to Company, across such private property which will provide for the construction, maintenance, and operation of Company's lines and facilities, necessary to receive electricity from Seller; provided, however, in the absence of a formal conveyance, Company nevertheless, shall be vested with an easement over Seller's premises authorizing it to do all things necessary including

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Oct 30 2019

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the construction, maintenance, and operation of its lines and facilities for such purpose; and (3) any inspection certificates or permits that may be required by law in the local area are furnished to Company. Where not required by law, an inspection by a Company-approved inspector shall be made at Seller's expense. In the event Seller is unable to secure such necessary rights of way, Seller shall reimburse Company for all costs Company may incur for the securing of such rights of way.

The obligation of Company in regard to service under the Agreement are dependent upon Company securing and retaining all necessary rights-of-way, privileges, franchises, and permits, for such service. Company shall not be liable to any Seller in the event Company is delayed or prevented from purchasing power by Company failure to secure and retain such rights-of-way, privileges, franchises, and permits.

- (b) Seller shall operate its Facility in compliance with all applicable operating guidelines established by the North American Electric Reliability Corporation ("NERC") and the SERC Reliability Corporation ("SERC") or any successor thereto.
- (c) Seller shall submit an Interconnection Request as set forth in the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Generation Interconnections. Company shall not be required to install facilities to support interconnection of Seller's generation or execute the Purchase Power Agreement until Seller has signed an Interconnection Agreement as set forth in the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Generation Interconnections, as may be required by Company.
- (d) If electricity is received through lines which cross the lands of the United States of America, a state, or any agency or subdivision of the United States of America or of a state, Company shall have the right, upon 30 days' written notice, to discontinue receiving electricity from any Seller or Sellers interconnected to such lines, if and when (1) Company is required by governmental authority to incur expenses in the relocation or the reconstruction underground of any portion of said lines, unless Company is reimbursed for such expense by Sellers or customers connected thereto, or (2) the right of Company to maintain and operate said lines is terminated, revoked, or denied by governmental authority for any reason.

3. DEFINITIONS

- (a) Nameplate Capacity: The term "Nameplate Capacity" shall mean the manufacturer's kW_{AC} nameplate rated output capability of the generator. For multi-unit generator facilities, the "Nameplate Capacity" of the facility shall be the sum of the individual manufacturer's kW_{AC} nameplate rated output capabilities of the generators. For inverted-based generating facilities, the "Nameplate Capacity" shall be the manufacturer's rated kW_{AC} output on the inverters.
- (b) Net Capacity: The term "Net Capacity" shall mean the Nameplate Capacity of the Seller's generating facilities, less the portion of that capacity needed to serve the generating facilities' Auxiliary Load.
- (c) Auxiliary Load: The term "Auxiliary Load" shall mean power used to operate auxiliary equipment in the facility necessary for power generation (such as pumps, blowers, fuel preparation machinery, and exciters).
- (d) Whenever the term "purchase" or "purchase of electricity" is used in these Terms and Conditions or other portions of the Agreement, it shall be construed to refer to the electricity supplied to Company by Seller.
- (e) The term "Company's conductors" shall mean Company's wires extending from the point of connection with Company's existing electric system to the point of delivery.

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Oct 30 2019

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- (f) The term "Seller's conductors" shall mean Seller's wires extending from the point of delivery to the switch box or other point where Seller's circuits connect for the purpose of supplying the electricity produced by Seller.
- (g) The term "interconnection" shall mean the connection of Company's conductors to Seller's conductors.

4. CONTRACT CAPACITY

- (a) The Contract Capacity shall be the kW_{AC} of capacity specified in the Purchase Power Agreement and shall not exceed the capacity specified in the Seller's Interconnection Agreement. This term shall mean the maximum continuous electrical output capability expressed on an alternating current basis of the generator(s) at any time, at a power factor of approximately unity, without consuming VARs supplied by Company, as measured at the Point of Delivery and shall be the maximum kW_{AC} delivered to Company during any billing period. In cases where any change is required in Company's facilities due to the actual capacity delivered exceeding the Contract Capacity or due to Seller requesting an increase in the capacity of Company's facilities, Company may require Seller to execute a new Agreement or amend an existing Agreement, thereby establishing a new Contract Capacity. If Company's facilities cannot be upgraded to accept such actual or requested increase, then upon written notice, Seller shall not exceed the existing Contract Capacity or such amount in excess thereof as Company determine it is able to accept.
- (b) Seller shall not change its generating capacity or contracted estimated annual kWh energy production without adequate notice to Company, and without receiving Company's consent, and if such unauthorized increase causes loss of or damage to Company's facilities, the cost of making good such loss or repairing such damage shall be paid by Seller.
- (c) Company may require that a new Contract Capacity be determined when it reasonably appears that the capacity of Seller's generating facility will deviate from contracted or established levels for any reason, including, but not limited to, a change in water flow, steam supply, or fuel supply.
- (d) In the event that the Contract Capacity is terminated prior to the completion of the term of the Agreement, the Seller shall pay to Company a penalty as set forth in paragraph 6, below.

5. CONTRACT ENERGY

The Contract Energy specified in the Purchase Power Agreement shall be the estimated total annual kilowatt-hours registered or computed by or from Company's metering facilities for each time period during a continuous 12-month interval.

6. EARLY CONTRACT TERMINATION OR INCREASE IN CONTRACT CAPACITY

If Seller terminates the Agreement or seeks to increase the Contract Capacity prior to the expiration of the initial (or extended) term of the Purchase Agreement:

Early Contract Termination – Seller shall pay to Company the total Energy and/or Capacity credits received in excess of the sum of what would have been received under the Variable Rate for Energy and/or Capacity Credits applicable at the initial term of the contract period and as updated every two years, plus interest. The interest should be the weighted average rate for new debt issued by the Company in the calendar year previous to that in which the Agreement was commenced.

Increase In Contract Capacity – Seller may apply to Company to increase the Contract Capacity during the Contract Period and, upon approval by Company, future Monthly Delivered Capacities shall not exceed the revised Contract Capacity. If such increase in Contract Capacity results in additional costs associated with redesign or a resizing of Company's facilities, such additional costs to Seller shall be determined in accordance with the Interconnection Agreement.

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Oct 30 2019

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7. CONTRACT RENEWAL

This Agreement shall be subject to renewal for subsequent term(s) at the option of Company on substantially the same terms and provisions and at a rate either (1) mutually agreed upon by the parties negotiating in good faith and taking into consideration the Company's then avoided cost rates and other relevant factors, or (2) set by arbitration.

8. QUALITY OF ENERGY RECEIVED

- (a) Seller has full responsibility for the routine maintenance of his generating and protective equipment to insure that reliable, utility grade electric energy is being delivered to Company.
- (b) Seller's facility shall be operated in such a manner as to generate reactive power as may be reasonably necessary to maintain voltage levels and reactive area support as specified by Company. Any operating requirement is subject to modification or revision if warranted by future changes in the distribution or transmission circuit conditions.
- (c) Seller may operate direct current generators in parallel with Company through a synchronous inverter. The inverter installation shall be designed such that a utility system interruption will result in the removal of the inverter infeed into the Company's system. Harmonics generated by a DC generator-inverter combination must not adversely affect Company's supply of electric service to, or the use of electric service by Company's other customers, and any correction thereof is the full responsibility of Seller.
- (d) In the event Company determines, based on calculations, studies, analyses, monitoring, measurement or observation, that the output of the Facility will cause or is causing the Company to be unable to provide proper voltage levels to its customers, Seller shall be required to comply with a voltage schedule and/or reactive power output schedule as prescribed by Company.
- (e) Seller shall provide Company written notification of any changes to their generation system, support equipment such as inverters, or interconnection facilities and shall provide Company adequate time to review such changes to ensure continued safe interconnection prior to implementation.
- (f) Failure of Seller to comply with either (a), (b), (c), (d) or (e) above will constitute grounds for Company to cease parallel operation with Seller's generation equipment and constitute grounds for termination or suspension of the Agreement as set forth under paragraph 1, above.

9. BILLING

- (a) Meters will be read and bills rendered monthly. Readings are taken each month at intervals of approximately thirty (30) days.
- (b) If Company is unable to read its purchase meter for any reason, Seller's production may be estimated by Company on the basis of Seller's production during the most recent preceding billing period for which readings were obtained, unless some unusual condition is known to exist. A bill or payment rendered on the basis of such estimate shall be as valid as if made from actual meter readings.
- (c) The term "Month" or "Monthly", as used in Company's Schedules and Riders, refers to the period of time between the regular meter readings by the Company, except that if the period covered by an initial or final bill, or due to rerouting of the meter reading schedule, is more 33 or less than 27 days, the bill will be prorated based on a 30-day billing month.
- (d) Payments for capacity and/or energy will be made to Seller based on the rate schedule stated in the Purchase Power Agreement.

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Oct 30 2019

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- (e) Company reserves the right to set off against any amounts due from the Company to Seller, any amounts which are due from Seller to Company, including, but not limited to, unpaid charges pursuant to the Interconnection Agreement or past due balances on any accounts Seller has with Company for other services.

10. RECORDS

In addition to the regular meter readings to be taken monthly for billing purposes, Company may require additional meter readings, records, transfer of information, etc. as may be agreed upon by the Parties. Company reserves the right to provide to the Commission or the FERC or any other regulatory body, upon request, information pertaining to this Agreement, including but not limited to: records of the Facility's generation output and Company's purchases thereof (including copies of monthly statements of power purchases and data from load recorders and telemetering installed at the Facility); copies of this Agreement. The Company will not provide any information developed solely by Seller and designated by Seller in writing to be "proprietary" unless required to do so by order of the Commission or the FERC or any other regulatory body or court, in which event, the Company will notify Seller prior to supplying the proprietary information.

Seller shall provide to Company, on a monthly basis within ten (10) days of the meter reading date and in form to be mutually agreed upon by the Parties, information on the Facility's fuel costs (coal, oil natural gas, supplemental firing, etc.), if any, for the power delivered to Company during the preceding month's billing period.

11. METER STOPPAGE OR ERROR

In the event a meter fails to register accurately within the allowable limits established by the state regulatory body having jurisdiction, Company will adjust the measured energy for the period of time the meter was shown to be in error, and shall, as provided in the rules and regulations of the state regulatory body having jurisdiction, pay to Seller, or Seller shall refund to Company, the difference between the amount billed and the estimated amount which would have been billed had the meter accurately registered the kilowatt hours provided by Seller. No part of any minimum service charge shall be refunded.

12. POINT OF DELIVERY

The point of delivery is the point where Company's conductors are, or are to be, connected to Seller's conductors. Seller shall do all things necessary to bring its conductors to such point of delivery for connection to Company's conductors, and shall maintain said conductors in good order at all times. If Seller chooses to deliver power to Company through a point of delivery where Seller presently receives power from Company, then the point of delivery for the purchase of generation shall be the same point as the point of delivery for electric service.

13. INTERCONNECTION FACILITIES

If Seller is not subject to the terms and conditions of the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Interconnection, as approved by the Commission in Docket No. E-100, Sub 101, the following conditions shall apply to Interconnection Facilities necessary to deliver Seller's electricity to Company. Otherwise, the terms and conditions of the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Interconnection, as approved by the Commission in Docket No. E-100, Sub 101 govern.

- (a) By Company: Company shall install, own, operate, maintain, and otherwise furnish all lines and equipment located on its side of the point of delivery to permit parallel operation of the Seller's facilities with the Company's system. It shall also install and own the necessary metering equipment, and meter transformers, where necessary, for measuring the electricity delivered to Company, though such meter may be located on Seller's side of the point of delivery. Interconnection facilities, installed by either Company or Seller, solely for such purpose, include,

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Oct 30 2019

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but are not limited to connection, line extension, transformation, switching equipment, protective relaying, metering, telemetering, communications, and appropriate safety equipment.

Any interconnection facilities installed by Company necessary to receive power from Seller shall be considered additional facilities and shall be provided, if Company finds it practicable, under the following conditions:

- (1) The facilities will be of a kind and type normally used by or acceptable to Company and will be installed at a place and in a manner satisfactory to Company.
 - (2) Seller will pay to Company a Monthly Interconnection Facilities Charge of 1.0 percent of the estimated original installed cost and rearrangement cost of all facilities, including metering, required to accept interconnection, but not less than \$25 per month. The monthly charge for the Interconnection Facilities to be provided under this Agreement is subject to the rates, Service Regulations and conditions of the Company as the same are now on file with the Commission and may be changed or modified from time to time upon approval by the Commission. Any such changes or modifications, including those which may result in increased charges for the Interconnection Facilities to be provided by the Company, shall be made a part of this Agreement to the same effect as if fully set forth herein.
 - (3) If Company increases its investment, other than replacement of existing equipment with equipment of equal capacity and kind, in interconnection facilities or other special facilities required by Seller (including conversion of the Company's primary voltage to a higher voltage), the Monthly Interconnection Facilities Charge for providing the interconnection facilities will be adjusted at that time. Seller may terminate the interconnection facilities in accordance with the applicable termination paragraph 1 above, or continue the interconnection facilities under the changed conditions.
 - (4) In lieu of the Monthly Interconnection Facilities Charge of 1.0 percent, Seller may elect to make a contribution equal to the total interconnection facilities investment, plus associated tax gross-ups. After such payment, the Monthly Interconnection Facilities Charge for the interconnection facilities will be 0.3 percent of said payment.
 - (5) The Monthly Interconnection Facilities Charge as determined shall continue regardless of the term of the Agreement until Seller no longer has need for such facilities. In the event Seller's interconnection facilities should be discontinued or terminated in whole or in part, such discontinuation or termination should be calculated in accordance with 1, above.
 - (6) Seller's wiring and appurtenant structures shall provide for the location, connection, and installation of Company's standard metering equipment or other equipment deemed necessary by Company for the metering of Seller's electrical output. Company shall, at its expense, be permitted to install, in Seller's wiring or equipment, any special metering devices or equipment as deemed necessary for experimental or monitoring purposes.
 - (7) Company shall furnish and install the Interconnection Facilities no later than the date requested by Seller for such installation. Seller's obligation to pay the Interconnection Facilities charges shall begin upon the earlier of (1) completion of the installation but no earlier than the requested in-service date specified in the Interconnection Agreement or (2) the first date when energy is generated and delivered to the Company and such charges shall apply at all times thereafter during the term of this Agreement, whether or not Seller is actually supplying electric power to Company.
- (b) By Seller: Seller shall install, own, operate, and maintain all lines, and equipment, exclusive of Company's meter and meter transformers, on Seller's side of the point of delivery. Seller will be the owner and have the exclusive control of, and responsibility for, all electricity on Seller's side of the point of delivery. Seller must conform to the North Carolina Interconnection Procedures, Forms and Agreements for State-Jurisdictional Generation Interconnections. Seller's wiring

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Oct 30 2019

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shall be arranged such that all electricity generated for sale can be supplied to one point of delivery and measured by a single meter. Company's meter may be located on Seller's side of the point of delivery, and when it is to be so located, Seller must make suitable provisions in Seller's wiring, at a place suitable to Company, for the convenient installation of the type of meter Company will use. All of Seller's conductors installed on the Company's side of the meter and not installed in conduit must be readily visible.

Seller shall install and maintain devices adequate to protect Seller's equipment against irregularities on Company's system, including devices to protect against single-phasing. Seller shall also install and maintain such devices as may be necessary to automatically disconnect Seller's generating equipment, which is operated in parallel with Company, when service provided by Seller is affected by electrical disturbances on Company's or Seller's systems, or at any time when Company's system is de-energized from its prime source.

- (c) Access to Premises: The duly authorized agents of Company shall have the right of ingress and egress to the premises of Seller at all reasonable hours for the purpose of reading meters, inspecting Company's wiring and apparatus, changing, exchanging, or repairing Company's property on the premises of Seller, or removing such property at the time of or at any time after suspension of purchases or termination of this Agreement.
- (d) Protection: Seller shall protect Company's wiring and apparatus on Seller's premises and shall permit no one but Company's agents to handle same. In the event of any loss of or damage to such property of Company caused by or arising out of carelessness, neglect, or misuse by Seller or Seller's employees or agents, the cost of making good such loss or repairing such damage shall be paid by Seller. In cases where Company's service facilities on Seller's premises require abnormal maintenance due to Seller's operation, Seller shall reimburse Company for such abnormal maintenance cost.

14. CONTINUANCE OF PURCHASES AND LIABILITY THEREFOR

The Parties do not guarantee continuous service but shall use reasonable diligence at all times to provide for uninterrupted acceptance and supply of electricity. Each party shall at all times use reasonable diligence to provide satisfactory service for the acceptance or supply of electricity, and to remove the cause or causes in the event of failure, interruption, reduction or suspension of service for the acceptance or supply of electricity, but neither Party shall be liable for any loss or damage resulting from such failure, interruption, reduction or suspension of service, nor shall same be a default hereunder, when any interruption of service for the acceptance or supply of electricity is due to any of the following:

- (a) An emergency condition or action due to an adverse condition, event, and/or disturbance on Company's system, or on any other system directly or indirectly interconnected with it, which requires automatic or manual interruption of the supply of electricity to some customers or areas or automatic or manual interruption, reduction, or cessation of the acceptance of electricity into Company's electrical system in order to limit the occurrence of or extent or damage of the adverse condition or disturbance to Company's system or capability to reliably provide service in compliance and accordance with prudent practices, regulatory requirements, and/or reliability standards, or to prevent damage to generating or transmission facilities, or to expedite restoration of service, or to effect a reduction in service to compensate for an emergency condition on an interconnected system. An emergency condition or action shall include any circumstance that requires action by the Company to comply with any electric reliability organization or NERC/SERC regulations or standards, including without limitation actions to respond to, prevent, limit, or manage loss or damage to Seller's Facility, reliability impairment, loss or damage to the Company's system, disruption of generation by the Seller, disruption of reliability or service on the Company's system, an abnormal condition on the system, and/or endangerment to human life or safety.

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Oct 30 2019

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- (b) An event or condition of force majeure, as described below.
- (c) Making necessary adjustments to, changes in, or repairs on Company lines, substations, and facilities, and in cases where, in its opinion, the continuance of service from Seller's premises would endanger persons or property.

Seller shall be responsible for promptly taking all actions requested or required by Company to avoid, prevent, or recover from the occurrence and/or imminent occurrence of any emergency condition and in response to any emergency condition or condition of force majeure, including without limitation installing and operating any equipment necessary to take such actions.

Seller shall be responsible for insuring the safe operation of his equipment at all times, and will install and maintain, to Company's satisfaction, the necessary automatic equipment to prevent the back feed of power into, or damage to Company's de-energized system, and shall be subject to immediate disconnection of its equipment from Company's system if Company determines that such equipment is unsafe or adversely affects Company's transmission/distribution system or service to its other customers.

Seller assumes responsibility for and shall indemnify, defend, and save Company harmless against all liability, claims, judgments, losses, costs, and expenses for injury, loss, or damage to persons or property including personal injury or property damage to Seller or Seller's employees on account of defective construction, wiring, or equipment, or improper or careless use of electricity, on Seller's side of the point of delivery.

15. FORCE MAJEURE

Circumstances beyond the reasonable control of a Party which solely cause that Party to experience delay or failure in delivering or receiving electricity or in providing continuous service hereunder, including: acts of God; unusually severe weather conditions; earthquake; strikes or other labor difficulties; war; riots; fire; requirements shall be deemed to be "events or conditions of force majeure". It also includes actions or failures to act on the part of governmental authorities (including the adoption or change in any rule or regulation or environmental constraints lawfully imposed by federal, state or local government bodies), but only if such requirements, actions or failures to act prevent or delay performance; or transportation delays or accidents. Events or conditions of force majeure do not include such circumstances which merely affect the cost of operating the Facility.

Neither Party shall be responsible nor liable for any delay or failure in its performance hereunder due solely to events or conditions of force majeure, provided that:

- (a) The affected Party gives the other Party written notice describing the particulars of the event or condition of force majeure, such notice to be provided within forty-eight (48) hours of the determination by the affected Party that an event or condition of force majeure has occurred, but in no event later than thirty (30) days from the date of the occurrence of the event or condition of force majeure;
- (b) The delay or failure of performance is of no longer duration and of no greater scope than is required by the event or condition of force majeure, provided that in no event shall such delay or failure of performance extend beyond a period of twelve (12) months;
- (c) The affected Party uses its best efforts to remedy its inability to perform;
- (d) When the affected Party is able to resume performance of its obligations under this Agreement, that Party shall give the other Party prompt written notice to that effect; and,
- (e) The event or condition of force majeure was not caused by or connected with any negligent or intentional acts, errors, or omissions, or failure to comply with any law, rule, regulation, order or ordinance, or any breach or default of this Agreement.

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Oct 30 2019

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16. INSURANCE

Seller shall obtain and retain, for as long as the generation is interconnected with Company's system, either the applicable homeowners insurance policy with liability coverage of at least \$100,000 per occurrence or the applicable comprehensive general liability insurance policy with liability coverage in the amount of at least \$300,000 per occurrence, which protects Seller from claims for bodily injury and/or property damage. This insurance shall be primary for all purposes. Seller shall provide certificates evidencing this coverage as required by Company. Company reserves the right to refuse to establish, or continue the interconnection of Seller's generation with Company's system, if such insurance is not in effect.

17. GOVERNMENTAL RESTRICTIONS

This Agreement is subject to the jurisdiction of those governmental agencies having control over either party or over this Agreement. This Agreement shall not become effective until all required governmental authorizations are obtained. Certification of receipt of all permits and authorizations shall be furnished by Seller to Company upon Company's request. This Agreement shall not become effective unless it and all provisions thereof are authorized and permitted by such governmental agencies without change or conditions.

This Agreement shall at all times be subject to changes by such governmental agencies, and the parties shall be subject to conditions and obligations, as such governmental agencies may, from time to time, direct in the exercise of their jurisdiction, provided no change may be made in rates or in essential terms and conditions of this contract except by agreement of the parties to this contract. Both parties agree to exert their best efforts to comply with all of the applicable rules and regulations of all governmental agencies having control over either party or this Agreement. The parties shall take all reasonable action necessary to secure all required governmental approval of this Agreement in its entirety and without change.

The delivery date, quantity, and type of electricity to be accepted for purchase by Company, from Seller, are subject to changes, restrictions, curtailments, or complete suspensions by Company as may be deemed by it to be necessary or advisable (a) on account of any lawful order or regulation of any municipal, State, or Federal government or agency thereof, or order of any court of competent jurisdiction, or (b) on account of any emergency due to war, or catastrophe, all without liability on the part of the Company therefor.

Supersedes: March 16, 2018
Effective: November 29, 2019
NCUC Docket No. E-2, Sub 1219

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OCT 30 2019

Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
North Carolina Retail Revenues - Base and Total Revenue at Current and Approved Rates

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Rate Class	Annualized Base Revenue @ Current Rates ¹	Annualized Base Revenue at Proposed Rates ¹	Increase (Decrease) (B) - (A)	Increase (Decrease) Percentage (B) / (A) - 1	REPS Clause Revenues ²	Total Revenue with Clauses & REPS at Current Rates ³	Total Revenue with Clauses & REPS at Proposed Rates ³	Increase (Decrease) Percentage (G) / (F) - 1
1 Residential	\$1,668,504,850	\$2,021,910,642	\$353,405,793	21.2%	\$20,585,080	\$1,951,014,278	\$2,235,141,164	14.6%
2 RES	\$1,625,518,113	\$1,969,484,076	\$343,965,962	21.2%	\$20,189,923	\$1,899,653,722	\$2,176,451,131	14.6%
3 R-TOUD	\$37,418,664	\$45,678,922	\$8,260,258	22.1%	\$336,611	\$44,851,325	\$51,234,680	14.2%
4 R-TOU	\$5,568,073	\$6,747,645	\$1,179,572	21.2%	\$58,547	\$6,509,231	\$7,455,352	14.5%
5								
6 Small General Service	\$212,085,786	\$256,840,310	\$44,754,524	21.1%	\$14,063,301	\$258,279,062	\$294,793,814	14.1%
7 SGS	\$211,676,126	\$256,344,956	\$44,668,830	21.1%	\$14,016,162	\$257,765,397	\$294,209,073	14.1%
8 SGS-TOUE	\$409,659	\$495,354	\$85,694	20.9%	\$47,139	\$513,665	\$584,742	13.8%
9								
10 SGS Constant Load (SGS-TOU-CLR)	\$3,557,875	\$4,338,457	\$780,582	21.9%	\$564,372	\$4,650,123	\$5,295,962	13.9%
11								
12 Medium General Service	\$810,186,141	\$930,405,643	\$120,219,501	14.8%	\$4,168,693	\$952,192,527	\$1,046,421,766	9.9%
13 MGS	\$242,725,236	\$275,522,245	\$32,797,009	13.5%	\$1,867,755	\$289,315,860	\$315,694,668	9.1%
14 SGS-TOU	\$564,603,355	\$651,632,910	\$87,029,555	15.4%	\$2,276,509	\$659,536,494	\$727,072,896	10.2%
15 CH-TOUE	\$1,174,859	\$1,322,796	\$147,937	12.6%	\$19,876	\$1,328,567	\$1,456,264	9.6%
16 GS-TES	\$1,350,017	\$1,548,315	\$198,298	14.7%	\$374	\$1,641,372	\$1,789,048	9.0%
17 APH-TES	\$134,507	\$153,187	\$18,680	13.9%	\$0	\$146,378	\$160,264	9.5%
18 CSE	\$193,825	\$221,321	\$27,496	14.2%	\$4,083	\$219,024	\$243,327	11.1%
19 CSG	\$4,341	\$4,868	\$527	12.1%	\$96	\$4,831	\$5,298	9.7%
20								
21 Large General Service	\$444,493,679	\$512,011,150	\$67,517,471	15.2%	\$135,213	\$548,174,071	\$602,509,840	9.9%
22 LGS	\$76,212,916	\$87,322,880	\$11,109,964	14.6%	\$48,972	\$91,850,169	\$101,166,254	10.1%
23 LGS-TOU	\$368,280,763	\$424,688,270	\$56,407,506	15.3%	\$86,241	\$456,323,902	\$501,343,586	9.9%
24								
25 Seasonal and Intermittent Service	\$4,724,718	\$5,288,312	\$563,593	11.9%	\$44,208	\$5,437,876	\$5,826,126	7.1%
26								
27 Traffic Signal Service (TSS)	\$437,675	\$518,136	\$80,462	18.4%	\$54,606	\$559,241	\$624,394	11.7%
28 TSS	\$402,826	\$477,526	\$74,700	18.5%	\$44,783	\$512,071	\$572,033	11.7%
29 TFS	\$34,848	\$40,610	\$5,762	16.5%	\$9,823	\$47,170	\$52,361	11.0%
30								

Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
North Carolina Retail Revenues - Base and Total Revenue at Current and Approved Rates

Rate Class	(A) Annualized Base Revenue @ Current Rates ¹	(B) Annualized Base Revenue at Proposed Rates ¹	(C) Increase (Decrease) (B) - (A)	(D) Increase (Decrease) Percentage (B) / (A) - 1	(E) REPS Clause Revenues ²	(F) Total Revenue with Clauses & REPS at Current Rates ³	(G) Total Revenue with Clauses & REPS at Proposed Rates ³	(H) Increase (Decrease) Percentage (G) / (F) - 1
31 Outdoor Lighting	\$88,687,542	\$102,700,570	\$14,013,028	15.8%	\$1,435,954	\$93,020,261	\$102,265,057	9.9%
32 ALS	\$62,407,901	\$72,534,457	\$10,126,555	16.2%	\$1,318,341	\$65,921,465	\$72,428,633	9.9%
33 SLS	\$20,292,383	\$23,348,984	\$3,056,601	15.1%	\$117,136	\$20,982,262	\$23,100,837	10.1%
34 SLR	\$5,987,258	\$6,817,129	\$829,872	13.9%	\$477	\$6,116,534	\$6,735,587	10.1%
35								
36 Sports Field Lighting Service	\$202,461	\$229,077	\$26,616	13.1%	\$5,118	\$216,929	\$235,667	8.6%
37								
38								
39 North Carolina Retail Tariff Revenue	\$3,232,880,726	\$3,834,242,297	\$601,361,571	18.6%	\$41,056,544	\$3,813,544,368	\$4,293,113,789	12.6%

¹ Base Revenue at Current & Proposed Rates excludes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset clause rates and are derived in the response to E-1 Item 42(c).

² Renewable Portfolio Standard (REPS) clause revenues reflect the test year annual customer count per CIM Report RMCY9 billed at rates approved December 1, 2018.

³ Total Revenue at Current and Proposed Rates includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset, and 12/2018 REPS clause rates.

Duke Energy Progress, LLC NCUC Docket No. E-2, Sub 1219

Monthly Bill at Annualized Current and Proposed Rates by Major Schedule

(includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset rates - ignores REPS & DSM/EE Opt-Out)

Residential Service Schedule RES

assumes single-phase service

kWh	Current Revenue	Proposed Revenue	Percent Increase
0	\$14.00	\$14.00	0.0%
100	\$24.50	\$26.23	7.1%
250	\$40.25	\$44.58	10.7%
500	\$66.51	\$75.15	13.0%
750	\$92.76	\$105.73	14.0%
1,000	\$119.02	\$136.31	14.5%
2,000	\$224.03	\$258.61	15.4%
3,000	\$329.05	\$380.92	15.8%
4,000	\$434.07	\$503.23	15.9%
5,000	\$539.08	\$625.53	16.0%
6,000	\$644.10	\$747.84	16.1%

Residential Service Time of Use R-TOUD

assumes single-phase service

Total kWh	On-peak kW	Current Revenue	Proposed Revenue	Percent Increase
0	0	\$16.85	\$16.85	0.0%
100	1	\$26.03	\$27.48	5.6%
250	1	\$38.56	\$41.99	8.9%
500	2	\$57.80	\$64.26	11.2%
750	2	\$77.21	\$86.74	12.3%
1,000	3	\$98.02	\$110.84	13.1%
2,000	5	\$174.96	\$199.92	14.3%
3,000	8	\$256.13	\$293.91	14.7%
4,000	11	\$337.30	\$387.89	15.0%
5,000	13	\$414.25	\$476.98	15.1%
6,000	16	\$495.42	\$570.97	15.2%

Monthly Bill at Annualized Current and Proposed Rates by Major Schedule*(includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset rates - ignores REPS & DSM/EE Opt-Out)***Small General Service Schedule SGS**

<i>assumes single-phase service</i>			
kWh	Present Revenue	Current Revenue	Percent Increase
0	\$21.00	\$21.00	0.0%
100	\$32.50	\$34.58	6.4%
250	\$49.74	\$54.95	10.5%
500	\$78.48	\$88.90	13.3%
750	\$107.22	\$122.85	14.6%
1,000	\$131.79	\$151.87	15.2%
2,000	\$230.05	\$267.93	16.5%
3,000	\$323.77	\$378.64	16.9%
4,000	\$417.49	\$489.35	17.2%
5,000	\$511.21	\$600.06	17.4%
6,000	\$604.93	\$710.77	17.5%

Medium General Service Schedule MGS

<i>assumes three-phase service</i>				
kWh	Billing kW	Current Revenue	Proposed Revenue	Percent Increase
0	25	\$189.25	\$203.50	7.5%
6,000	30	\$662.74	\$721.18	8.8%
10,000	35	\$988.65	\$1,077.50	9.0%
30,000	75	\$2,710.45	\$2,959.90	9.2%
50,000	125	\$4,493.75	\$4,909.50	9.3%
75,000	175	\$6,646.00	\$7,262.50	9.3%
100,000	250	\$8,952.00	\$9,783.50	9.3%
150,000	375	\$13,410.25	\$14,657.50	9.3%
200,000	500	\$17,868.50	\$19,531.50	9.3%
300,000	750	\$26,785.00	\$29,279.50	9.3%
400,000	900	\$35,086.50	\$38,355.50	9.3%
500,000	999	\$43,074.35	\$47,088.78	9.3%

Monthly Bill at Annualized Current and Proposed Rates by Major Schedule*(includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset rates - ignores REPS & DSM/EE Opt-Out)***Small Service Time of Use SGS-TOU**

Total kWh	On-peak kW	Current Revenue	Proposed Revenue	Percent Increase
0	0	\$35.50	\$35.50	0.0%
100	1	\$46.24	\$47.30	2.3%
250	1	\$59.84	\$62.25	4.0%
500	2	\$79.16	\$83.49	5.5%
750	2	\$98.64	\$104.90	6.4%
1,000	3	\$122.21	\$130.81	7.0%
2,000	5	\$199.50	\$215.77	8.2%
5,000	13	\$450.21	\$491.36	9.1%
10,000	25	\$855.50	\$936.87	9.5%
30,000	75	\$2,495.50	\$2,739.60	9.8%
50,000	125	\$4,135.50	\$4,542.33	9.8%
75,000	175	\$6,067.88	\$6,666.42	9.9%
100,000	250	\$8,235.50	\$9,049.17	9.9%
150,000	375	\$12,335.50	\$13,556.00	9.9%
200,000	500	\$16,435.50	\$18,062.83	9.9%
300,000	750	\$24,635.50	\$27,076.50	9.9%
400,000	900	\$31,894.50	\$35,055.50	9.9%
500,000	999	\$38,673.59	\$42,506.82	9.9%

Monthly Bill at Annualized Current and Proposed Rates by Major Schedule*(includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset rates - ignores REPS & DSM/EE Opt-Out)***Large General Service Schedule LGS**

kWh	Billing kW	Current Revenue	Proposed Revenue	Percent Increase
0	1,000	\$13,160	\$14,350	9.0%
300,000	1,000	\$30,548	\$33,331	9.1%
400,000	1,000	\$36,344	\$39,658	9.1%
600,000	1,000	\$47,936	\$52,312	9.1%
750,000	2,500	\$76,070	\$83,028	9.1%
1,100,000	2,500	\$96,356	\$105,172	9.1%
1,500,000	2,500	\$119,540	\$130,480	9.2%
1,500,000	5,000	\$151,940	\$165,855	9.2%
2,200,000	5,000	\$192,512	\$210,144	9.2%
2,900,000	5,000	\$233,084	\$254,433	9.2%
2,200,000	7,500	\$222,412	\$243,019	9.3%
3,300,000	7,500	\$286,168	\$312,616	9.2%
4,400,000	7,500	\$349,924	\$382,213	9.2%
2,900,000	10,000	\$292,884	\$320,183	9.3%
4,300,000	10,000	\$374,028	\$408,761	9.3%
5,800,000	10,000	\$460,968	\$503,666	9.3%
5,800,000	20,000	\$570,568	\$625,166	9.6%
8,700,000	20,000	\$738,652	\$808,649	9.5%
11,600,000	20,000	\$906,736	\$992,132	9.4%
14,600,000	50,000	\$1,409,416	\$1,546,442	9.7%
21,900,000	50,000	\$1,832,524	\$2,008,313	9.6%
29,200,000	50,000	\$2,255,632	\$2,470,184	9.5%

Monthly Bill at Annualized Current and Proposed Rates by Major Schedule*(includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset rates - ignores REPS & DSM/EE Opt-Out)***Large Service Time of Use LGS-TOU**

Total kWh	On-peak kW	Current Revenue	Proposed Revenue	Percent Increase
0	0	\$1,090	\$1,330	22.0%
450,000	1,000	\$39,752	\$43,620	9.7%
575,000	1,000	\$45,911	\$50,409	9.8%
660,000	1,000	\$50,011	\$54,937	9.9%
1,100,000	2,500	\$97,820	\$107,364	9.8%
1,460,000	2,500	\$115,607	\$126,965	9.8%
1,640,000	2,500	\$124,227	\$136,493	9.9%
2,190,000	5,000	\$194,936	\$213,974	9.8%
2,920,000	5,000	\$231,013	\$253,730	9.8%
3,285,000	5,000	\$248,504	\$273,060	9.9%
4,380,000	10,000	\$384,673	\$422,748	9.9%
5,840,000	10,000	\$456,826	\$502,260	9.9%
6,570,000	10,000	\$491,808	\$540,921	10.0%
8,760,000	20,000	\$754,146	\$830,296	10.1%
11,680,000	20,000	\$898,452	\$989,319	10.1%
13,140,000	20,000	\$968,415	\$1,066,641	10.1%
21,900,000	50,000	\$1,862,565	\$2,052,941	10.2%
29,200,000	50,000	\$2,223,331	\$2,450,499	10.2%
32,850,000	50,000	\$2,398,239	\$2,643,803	10.2%

DUKE ENERGY PROGRESS, LLC
DOCKET NO. E-2, SUB 1219
NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER
For the test year ending December 31, 2018
(DOLLARS IN THOUSANDS)

SPREAD OF PROPOSED INCREASE TO CUSTOMER CLASSES:

Present Revenue Run: E-1 Item 45b										25%										
Line		Annualized Rate Base	Present Rates Revenues Excl Riders	Present Net Operating Income	Present ROR	Gross Revenues At Average ROR	Variance From The Average	Reduction in Variance From The Average	Proposed Rate Increase Before Reduction in Variance	Proposed Rate Increase After Reduction in Variance	Total Adjusted Present Rates Revenues Incl Riders	Adjusted Proposed Percent Increase	ROR At Proposed Rates		Sum of Additional Rider Impacts	Proposed Rate Increase incl. Rider Impacts	Proposed Percent Increase incl. EDIT riders			
No.	Rate Class	(A)	(B)	(C)	(D) = (C) / (A)	(E)	(F)=(B)- (E)	(G) = - (F) * 25%	(H)	(I) = (H) + (G)	(J) = (V) / (I)	(K) = (I) / (J)	(L)	45B	(M) = (AB)	(N) = (I) + (M)	(O) = (N) / (J)			
1	RES	\$ 6,059,535	\$ 1,605,490	\$ 166,088	2.74%	\$ 1,649,661	\$ (44,171)	\$ 11,043	\$ 329,204	\$ 340,247	\$ 1,877,330	18.1%	6.99%	56%	\$ (69,474)	\$ 270,772	14.4%			
2	SGS	\$ 718,759	\$ 192,930	\$ 18,216	2.53%	\$ 200,101	\$ (7,171)	\$ 1,793	\$ 39,049	\$ 40,842	\$ 234,951	17.4%	6.84%	7%	\$ (8,381)	\$ 32,461	13.8%			
3	SGSCLR	\$ 11,938	\$ 3,261	\$ 187	1.57%	\$ 3,530	\$ (269)	\$ 67	\$ 649	\$ 716	\$ 4,262	16.8%	6.12%	0%	\$ (135)	\$ 581	13.6%			
4	MGS	\$ 2,336,328	\$ 818,809	\$ 93,547	4.00%	\$ 797,431	\$ 21,378	\$ (5,344)	\$ 126,929	\$ 121,584	\$ 962,326	12.6%	7.93%	22%	\$ (26,070)	\$ 95,514	9.9%			
5	LGS	\$ 1,259,576	\$ 445,917	\$ 43,297	3.44%	\$ 443,681	\$ 2,237	\$ (559)	\$ 68,431	\$ 67,871	\$ 549,930	12.3%	7.51%	12%	\$ (13,317)	\$ 54,554	9.9%			
6	SI	\$ 15,799	\$ 5,099	\$ 1,293	8.18%	\$ 4,095	\$ 1,004	\$ (251)	\$ 858	\$ 607	\$ 5,868	10.3%	11.06%	0%	\$ (174)	\$ 433	7.4%			
7	TSS	\$ 1,417	\$ 443	\$ 33	2.35%	\$ 461	\$ (18)	\$ 4	\$ 77	\$ 81	\$ 566	14.4%	6.71%	0%	\$ (15)	\$ 66	11.7%			
8	ALS, SLS	\$ 381,501	\$ 88,495	\$ 33,308	8.73%	\$ 61,534	\$ 26,961	\$ (6,740)	\$ 20,726	\$ 13,986	\$ 92,841	15.1%	11.46%	4%	\$ (4,767)	\$ 9,219	9.9%			
9	SFL	\$ 721	\$ 206	\$ 61	8.49%	\$ 157	\$ 49	\$ (12)	\$ 39	\$ 27	\$ 220	12.3%	11.29%	0%	\$ (8)	\$ 19	8.7%			
TOTAL RETAIL		\$ 10,785,574	\$ 3,160,650	\$ 356,031	3.30%	\$ 3,160,650	\$ 0	\$ 0	\$ 585,961	\$ 585,961	\$ 3,728,295	15.7%	7.41%	1	\$ (122,342)	\$ 463,619	12.4%			

DUKE ENERGY PROGRESS, LLC

DOCKET NO. E-2, SUB 1219

NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER

For the test year ending December 31, 2018

(DOLLARS IN THOUSANDS)

<u>Calculations for Rate Design in Order to Apply Increase to Unadjusted Billing Determinants.</u>										
Present Revenue Run: E-1 Item 45b						E-1 Item 42c				
Line No.	Rate Class	Proposed Rate Increase After Reduction in Variance (P) = (I)	Customer Growth Adjustment in Present Revenues (Q)	Weather Normalization Adjustment in Present Revenues (R)	Total Adjustments to Exclude for Rate Design (S) = (Q) + (R)	Ratio of Unadjusted Present Revenues to Adjusted (T) = [(B) - (S)] / (B)	Target Revenue Increase for Rate Design (to be applied to unadjusted billing determinants) (U) = (P) x (T)	Total Unadjusted Present Rates Revenues Including Riders (V)	Proposed Percent Increase to unadjusted Revenues for Rate Design (W) = (U) / (V)	Target Revenue Increase for Rate Design plus Sum of Additional Rider Impacts (X) = (U) + (M)
10	RES	\$ 340,247	\$ (8,344)	\$ (54,670)	\$ (63,014)	103.925%	353,601	1,951,014	18.1%	\$ 284,127
11	SGS	\$ 40,842	\$ 1,113	\$ (20,269)	\$ (19,156)	109.929%	44,897	258,279	17.4%	\$ 36,516
12	SGSCLR	\$ 716	\$ 43	\$ (340)	\$ (297)	109.100%	781	4,650	16.8%	\$ 646
13	MGS	\$ 121,584	\$ 10,097	\$ (1,475)	\$ 8,622	98.947%	120,304	952,193	12.6%	\$ 94,233
14	LGS	\$ 67,871	\$ 2,062	\$ (638)	\$ 1,424	99.681%	67,655	548,174	12.3%	\$ 54,338
15	SI	\$ 607	\$ 374	\$ -	\$ 374	92.662%	563	5,438	10.3%	\$ 388
16	TSS	\$ 81	\$ 5	\$ -	\$ 5	98.798%	80	559	14.4%	\$ 65
17	ALS, SLS	\$ 13,986	\$ (171)	\$ -	\$ (171)	100.194%	14,013	93,020	15.1%	\$ 9,246
18	SFL	\$ 27	\$ 3	\$ -	\$ 3	98.474%	27	217	12.3%	\$ 19
TOTAL RETAIL		\$ 585,961	\$ 5,182	\$ (77,392)	\$ (72,210)	102.285%	\$ 601,920	\$ 3,813,544	15.8%	\$ 479,578

DUKE ENERGY PROGRESS, LLC

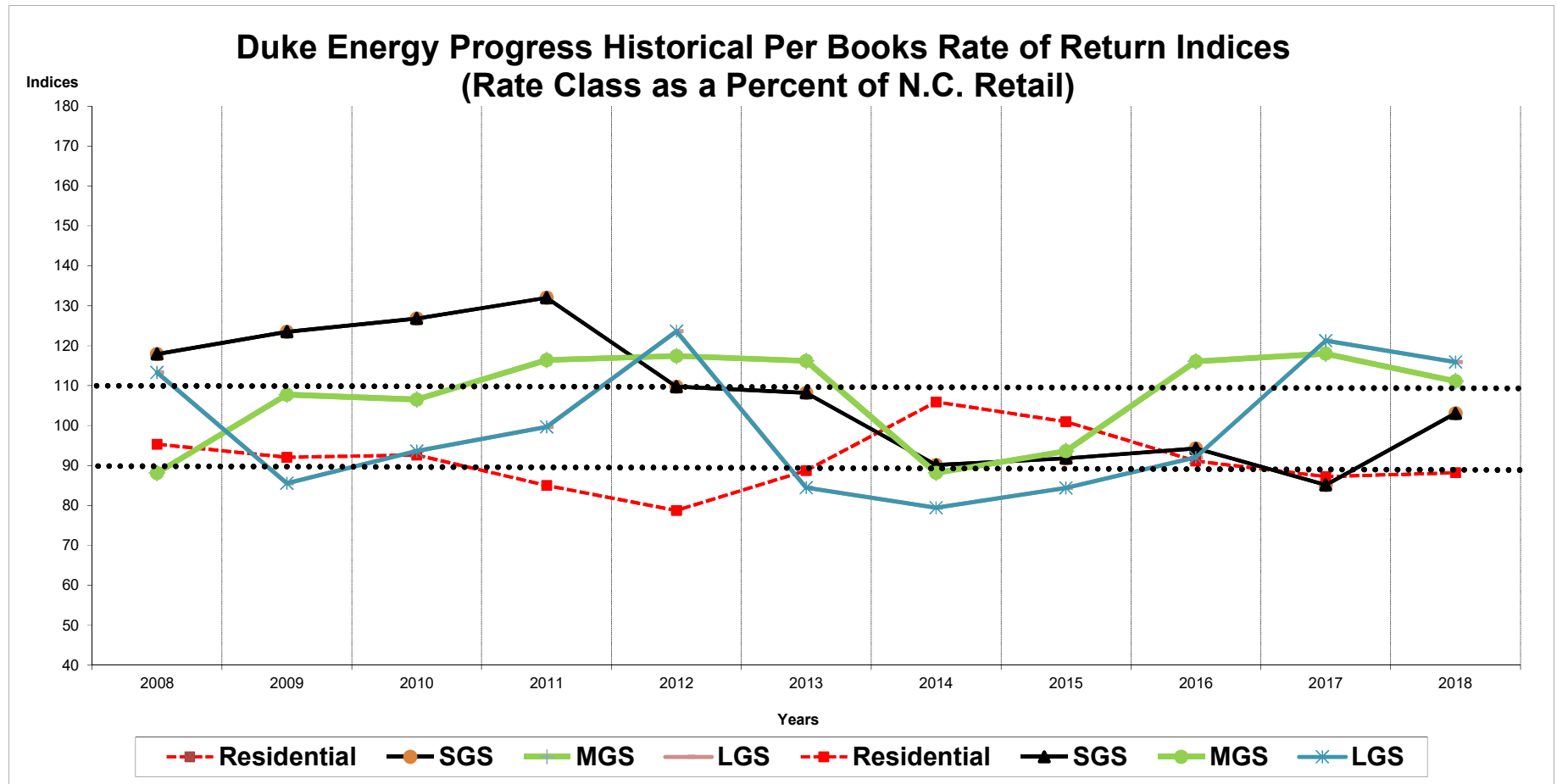
DOCKET NO. E-2, SUB 1219

NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER

For the test year ending December 31, 2018

(DOLLARS IN THOUSANDS)

Line No.	Rate Class	Summary of Additional Rider Impacts						
		Per Smith Exh 3	Per Smith Exh 4	Per Smith Exh 5				
		Change in 2018 NC EDIT-1 Rider	Proposed Federal EDIT-2 Rider	Proposed Regulatory Asset and Liability Rider	Sum of Additional Rider Impacts			
		(Y)	(Z)	(AA)	(AB) = (X) + (Y) + (Z)			
19	RES	3,071	\$ (71,645)	\$ (901)	\$ (69,474)	3,192	(74,457)	(936)
20	SGS	373	\$ (8,649)	\$ (105)	\$ (8,381)	410	(9,508)	(116)
21	SGSCLR	6	\$ (139)	\$ (2)	\$ (135)	6	(152)	(2)
22	MGS	2,200	\$ (27,666)	\$ (604)	\$ (26,070)	2,177	(27,375)	(598)
23	LGS	1,643	\$ (14,503)	\$ (457)	\$ (13,317)	1,637	(14,456)	(456)
24	SI	10	\$ (183)	\$ (2)	\$ (174)	10	(169)	(2)
25	TSS	1	\$ (16)	\$ (0)	\$ (15)	1	(16)	(0)
26	ALS, SLS	76	\$ (4,824)	\$ (19)	\$ (4,767)	76	(4,833)	(19)
27	SFL	0	\$ (8)	\$ (0.06)	\$ (8)	0	(8)	(0)
TOTAL RETAIL		\$ 7,381	\$ (127,633)	\$ (2,091)	\$ (122,342)	\$ 7,510	\$ (130,974)	\$ (2,129)



STATEMENT REGARDING PROBABLE EFFECT OF PROPOSED RATES ON DEP PEAK DEMANDS AND SALES

The following forecast from the DEP Spring 2019 Forecast incorporates the effect of the expected rate increase on forecasted peaks and sales. Overall, we expect the rate increase to result in a reduction in peak and energy of approximately 1.0% in 2020.

The Company estimates the gigawatt-hours which will be used by our DEP North Carolina Retail customers during the ensuing one year and the following five years are as follows:

DEP NC Retail Sales, GWH			
	With Rate Case	No Rate Case	% Difference
2020	37,794	38,184	-1.02%
2021	37,934	38,310	-0.98%
2022	38,133	38,527	-1.02%
2023	38,437	38,833	-1.02%
2024	38,794	39,190	-1.01%
2025	39,127	39,526	-1.01%

Duke Energy Progress, LLC

NCUC Docket No. E-2, Sub 1219

Rate Class Proposed Customer Charge

Rate Class	(A)	Annual Bills ¹ (B)	Customer-Related Revenue Requirement ¹ (C)	Theoretical Customer Charge (D) = (C) / (B)	Current Customer Charge	Proposed Customer Charge	Rate Change (H) = (G) - (F)	Percent Change (I) = (H) / (F)
					(F) per tariff	(G) No change		
1 Residential		14,399,856	\$457,180,739	\$31.75	\$14.00	\$14.00	\$0.00	0%
2 Small General Service (SGS)		1,920,744	\$63,954,824	\$33.30	\$21.00	\$21.00	\$0.00	0%
3 SGS-TOU-CLR (Constant Load)		72,132	\$2,300,486	\$31.89	\$21.00	\$21.00	\$0.00	0%
4 Medium General Service (MGS)		464,736	\$19,830,905	\$42.67	\$28.50	\$28.50	\$0.00	0%
6 Large General Service		3,348	\$981,343	\$293.11	\$200.00	\$200.00	\$0.00	0%
7 Seasonal and Intermittent Service		10,212	\$418,738	\$41.00	\$28.50	\$28.50	\$0.00	0%
8 Sports Field Lighting Service		936	\$35,211	\$37.62	\$28.50	\$28.50	\$0.00	0%

NOTES:

¹ Customer-related costs and bills reflect the functionalized customer-related unit cost from the proposed cost of service study.

Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
Derivation of North Carolina Excess Deferred Income Tax Rider EDIT-2

	(A)	(B)	(C)	(D)	(E)
	Rate Class	Applicable Schedules	Proposed EDIT-2 Revenue Requirement ¹	Test Year Sales (kWh) ²	Proposed EDIT-2 Decremental Rate
					(C) / (D)
1	Residential	Res. R-TOUD, R-TOU	(\$71,644,887)	16,666,046,589	(\$0.00430)
2	Small General Service	SGS, SGS-TOUE	(\$8,649,100)	1,950,982,004	(\$0.00443)
3	SGS Constant Load (SGS-TOU-CLR)	SGS-TOU-CLR	(\$138,963)	31,614,397	(\$0.00440)
4	Medium General Service	MGS, SGS-TOU, GS-TES, APH- TES, CH-TOUE, CSE, CSG,	(\$27,666,492)	11,178,964,878	(\$0.00247)
5	Large General Service	LGS, LGS-TOU, LGS-RTP	(\$14,502,703)	8,457,791,022	(\$0.00171)
6	Seasonal and Intermittent Service	SI	(\$182,563)	43,075,313	(\$0.00424)
7	Traffic Signal Service	TSS, TFS	(\$15,978)	4,754,792	(\$0.00336)
8	Outdoor Lighting	ALS, SLS, SLR	(\$4,824,062)	352,903,610	(\$0.01367)
9	Sports Field Lighting Service	SFLS	(\$7,995)	1,134,908	(\$0.00704)
10	North Carolina Retail Tariff Revenue		(\$127,632,743) \$0	38,687,267,513 0	

¹ The EDIT Revenue Requirement is provided on Pirro Exhibit No. 4, Page 3 of 3, column (Z).

² Test Year Sales are provided in CIM Report RMC1Y for December 2018.

DUKE ENERGY PROGRESS, LLC

DOCKET NO. E-2, SUB 1219

NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER

For the test year ending December 31, 2018

(DOLLARS IN THOUSANDS)

SPREAD OF PROPOSED INCREASE TO CUSTOMER CLASSES: PER SETTLEMENT WITH PUBLIC STAFF

Present Revenue Run: E-1 Item 45b															25%												
Line		Annualized Rate	Present Rates		Present Net Operating Income	Present ROR	Gross		Reduction in Variance From The Average	Proposed Rate Increase Before Reduction in Variance	Proposed Rate Increase After Reduction in Variance	Total Adjusted Present Rates Revenues Incl Riders	Adjusted Proposed Percent Increase	ROR At Proposed Rates	Sum of Additional Rider Impacts	Proposed Rate	Proposed Percent Increase incl. EDIT riders										
			Revenues Excl Riders				Revenues At Average ROR	Variance From The Average								Increase incl. Rider Impacts											
No.	Rate Class	(A)	(B)	(C)	(D) = (C) / (A)	(E)	(F)=(B)- (E)	(G) = - (F) * 25%	(H)	(I) = (H) + (G)	(J) = (V) / (T)	(K) = (I) / (J)	(L)	(M) = (AC)	(N) = (I) + (M)	(O) = (N) / (J)											
1	RES	\$ 5,967,044	\$ 1,637,134	\$ 233,451	3.91%	\$ 1,648,963	\$ (11,829)	\$ 2,957	\$ 226,073	\$ 229,030	\$ 1,913,917	12.0%	6.82%	\$ (63,459)	\$ 165,571	8.7%											
2	SGS	\$ 706,895	\$ 201,728	\$ 30,433	4.31%	\$ 199,515	\$ 2,213	\$ (553)	\$ 26,782	\$ 26,229	\$ 245,896	10.7%	7.11%	\$ (7,415)	\$ 18,814	7.7%											
3	SGSCLR	\$ 11,094	\$ 3,376	\$ 402	3.62%	\$ 3,440	\$ (64)	\$ 16	\$ 420	\$ 436	\$ 4,418	9.9%	6.60%	\$ (121)	\$ 316	7.1%											
4	MGS	\$ 2,397,199	\$ 769,200	\$ 86,440	3.61%	\$ 783,514	\$ (14,314)	\$ 3,578	\$ 90,823	\$ 94,401	\$ 904,416	10.4%	6.59%	\$ (42,426)	\$ 51,975	5.7%											
5	LGS	\$ 1,299,748	\$ 470,841	\$ 52,414	4.03%	\$ 471,382	\$ (541)	\$ 135	\$ 49,243	\$ 49,379	\$ 574,779	8.6%	6.91%	\$ (32,121)	\$ 17,258	3.0%											
6	SI	\$ 15,511	\$ 3,890	\$ 699	4.51%	\$ 3,801	\$ 89	\$ (22)	\$ 588	\$ 565	\$ 4,479	12.6%	7.27%	\$ (161)	\$ 404	9.0%											
7	TSS	\$ 1,291	\$ 429	\$ 42	3.26%	\$ 443	\$ (14)	\$ 3	\$ 49	\$ 52	\$ 549	9.5%	6.33%	\$ (18)	\$ 34	6.3%											
8	ALS, SLS	\$ 394,041	\$ 89,284	\$ 34,775	8.83%	\$ 64,868	\$ 24,416	\$ (6,104)	\$ 14,929	\$ 8,825	\$ 93,651	9.4%	10.49%	\$ (1,333)	\$ 7,492	8.0%											
9	SFL	\$ 671	\$ 195	\$ 60	9.01%	\$ 152	\$ 43	\$ (11)	\$ 25	\$ 15	\$ 209	7.0%	10.64%	\$ (4)	\$ 10	4.9%											
TOTAL RETAIL		\$ 10,793,491	\$ 3,176,078	\$ 438,717	4.06%	\$ 3,176,078	\$ 0	\$ 0	\$ 408,933	\$ 408,933	\$ 3,742,313	10.9%	6.93%	\$ (147,058)	\$ 261,875	7.0%											

Calculations for Rate Design in Order to Apply Increase to Unadjusted Billing Determinants

Present Revenue Run: E-1 Item 45b

E-1 Item 42c

Line		Proposed Rate Increase After Reduction in Variance	Customer Growth Adjustment in Present Revenues	Weather Normalization Adjustment in Present Revenues	Total Adjustments to Exclude for Rate Design	Ratio of Unadjusted Present Revenues to Adjusted	Target Revenue Increase for Rate Design (to be applied to unadjusted billing determinants)	Total Unadjusted Present Rates Revenues Including Riders	Proposed Percent Increase to unadjusted Revenues for Rate Design	Check
No.	Rate Class	(P) = (I)	(Q)	(R)	(S) = (Q) + (R)	(T) = [(B) - (S)] / (B)	(U) = (P) x (T)	(V)	(W) = (U) / (V)	
10	RES	\$ 229,030	\$ 21,513	\$ (55,388)	\$ (33,875)	102.069%	233,769	1,953,518	12.0%	0.00%
11	SGS	\$ 26,229	\$ (6,282)	\$ (2,967)	\$ (9,249)	104.585%	27,431	257,170	10.7%	0.00%
12	SGSCLR	\$ 436	\$ (128)	\$ (35)	\$ (163)	104.841%	457	4,632	9.9%	0.00%
13	MGS	\$ 94,401	\$ (27,084)	\$ (11,548)	\$ (38,633)	105.022%	99,142	949,840	10.4%	0.00%
14	LGS	\$ 49,379	\$ 3,739	\$ (2,572)	\$ 1,167	99.752%	49,256	573,355	8.6%	0.00%
15	SI	\$ 565	\$ (826)	\$ -	\$ (826)	121.221%	685	5,429	12.6%	0.00%
16	TSS	\$ 52	\$ (6)	\$ -	\$ (6)	101.384%	53	557	9.5%	0.00%
17	ALS, SLS	\$ 8,825	\$ 716	\$ -	\$ 716	99.198%	8,754	92,900	9.4%	0.00%
18	SFL	\$ 15	\$ (7)	\$ -	\$ (7)	103.618%	15	217	7.0%	0.00%
TOTAL RETAIL		\$ 408,933	\$ (8,366)	\$ (72,510)	\$ (80,875)	102.546%	\$ 419,565	\$ 3,837,617	10.9%	0.01%
Check		-	-	-	-	-	-	-	-	-

Summary of Additional Rider Impacts					
Line		Per Smith Exh 3	Per Smith Exh 4	Per Smith Exh 4	Per Smith Exh 5
No.	Rate Class	Change in 2018 NC EDIT-1 Rider	Proposed EDIT-3 Rider	Proposed EDIT-4 Rider	Proposed Regulatory Asset and Liability Rider
		(Y)	(Z)	(AA)	(AB)
19	RES	3,071	\$ (30,891)	\$ (34,739)	\$ (901)
20	SGS	373	\$ (3,616)	\$ (4,067)	\$ (105)
21	SGSCLR	6	\$ (59)	\$ (66)	\$ (2)
22	MGS	2,200	\$ (20,720)	\$ (23,302)	\$ (604)
23	LGS	1,643	\$ (15,677)	\$ (17,630)	\$ (457)
24	SI	10	\$ (80)	\$ (90)	\$ (2)
25	TSS	1	\$ (9)	\$ (10)	\$ (0)
26	ALS, SLS	76	\$ (654)	\$ (736)	\$ (19)
27	SFL	0	\$ (2)	\$ (2)	\$ (0.06)
TOTAL RETAIL		\$ 7,381	\$ (71,707)	\$ (80,641)	\$ (2,091)
					\$ (147,058)

Change in 2018 NC EDIT-1 Rider	Proposed EDIT-3 Rider	Proposed EDIT-4 Rider	Proposed Regulatory Asset and Liability Rider	Target Revenue Increase for Rate Design plus Sum of Additional Rider Impacts
(Y)-1	(Z)-1	(AA)-1	(AB)-1	(X) = (U) + SUM (Y)-1 to (AB)-1
\$ 3,135	\$ (31,530)	\$ (35,458)	\$ (919)	\$ 168,997
\$ 391	\$ (3,782)	\$ (4,253)	\$ (110)	\$ 19,677
\$ 6	\$ (61)	\$ (69)	\$ (2)	\$ 331
\$ 2,311	\$ (21,761)	\$ (24,472)	\$ (634)	\$ 54,586
\$ 1,639	\$ (15,638)	\$ (17,586)	\$ (456)	\$ 17,215
\$ 13	\$ (97)	\$ (109)	\$ (3)	\$ 490
\$ 1	\$ (9)	\$ (10)	\$ (0)	\$ 35
\$ 75	\$ (649)	\$ (730)	\$ (19)	\$ 7,432
\$ 0	\$ (2)	\$ (2)	\$ (0)	\$ 11
\$ 7,570	\$ (73,529)	\$ (82,689)	\$ (2,144)	\$ 268,773

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Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
Derivation of North Carolina Excess Deferred Income Tax Riders EDIT 3 and 4

(A)		(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
Rate Class		Applicable Schedules	Proposed EDIT-3 Revenue Requirement ¹	Proposed EDIT-4 Revenue Requirement ¹	Proposed Total Year 1 (EDIT-3 and EDIT-4) Revenue Requirement (D) + (E)	Test Year Sales (kWh) ²	Proposed EDIT-3 Decremental Rate (C) / (F)	Proposed EDIT-4 Decremental Rate (D) / (F)	Proposed Total Year 1 (EDIT-3 and EDIT4) Decremental Rate (G)+(H)
1	North Carolina Retail Tariff Revenue	RES, R-TOUD, R-TOU SGS, SGS-TOUE, SGS-TOU-CLR, MGS, SGS-TOU, GS-TES, APH-TES, CH-TOUE, CSE, CSG, LGS, LGS-TOU, LGS-RTP, SI, TSS, TFS, ALS, SLS, SLR, SFLS	(\$73,528,504)	(\$82,689,446)	(\$156,217,950)	38,687,267,513	(\$0.00190)	(\$0.00214)	(\$0.00404)

¹ The EDIT Revenue Requirement is provided on Pirro Exhibit No. 4, Page 2 of 3, columns (Z-1 and AA-1).

² Test Year Sales are provided in CIM Report RMC1Y for December 2018.

Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
North Carolina Retail Revenues - Base and Total Revenue at Current and Approved Rates

	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Rate Class	Annualized Base Revenue @ Current Rates ¹	Annualized Base Revenue at Proposed Rates ¹	Increase (Decrease) (B) - (A)	Increase (Decrease) Percentage (B) / (A) - 1	REPS Clause Revenues ²	Total Revenue with Clauses & REPS at Current Rates ³	Total Revenue with Clauses & REPS at Proposed Rates ³	Increase (Decrease) Percentage (G) / (F) - 1
1 Residential	\$1,671,008,906	\$2,027,252,630	\$356,243,724	21.3%	\$20,585,080	\$1,953,518,334	\$2,237,645,221	14.5%
2 RES	\$1,627,945,892	\$1,974,663,337	\$346,717,445	21.3%	\$20,189,923	\$1,902,081,501	\$2,178,878,910	14.6%
3 R-TOUD	\$37,486,504	\$45,823,647	\$8,337,144	22.2%	\$336,611	\$44,919,164	\$51,302,520	14.2%
4 R-TOU	\$5,576,511	\$6,765,646	\$1,189,135	21.3%	\$58,547	\$6,517,669	\$7,463,790	14.5%
5								
6 Small General Service	\$210,976,543	\$256,578,147	\$45,601,604	21.6%	\$14,063,301	\$257,169,820	\$293,684,572	14.2%
7 SGS	\$210,568,831	\$256,083,237	\$45,514,407	21.6%	\$14,016,162	\$256,658,101	\$293,101,777	14.2%
8 SGS-TOUE	\$407,712	\$494,910	\$87,197	21.4%	\$47,139	\$511,719	\$582,795	13.9%
9								
10 SGS Constant Load (SGS-TOU-CLR)	\$3,539,804	\$4,333,067	\$793,264	22.4%	\$564,372	\$4,632,051	\$5,277,890	13.9%
11								
12 Medium General Service	\$807,833,140	\$927,828,588	\$119,995,447	14.9%	\$4,168,693	\$949,839,960	\$1,044,069,199	9.9%
13 MGS	\$242,144,278	\$274,885,958	\$32,741,680	13.5%	\$1,867,755	\$288,734,902	\$315,113,710	9.1%
14 SGS-TOU	\$562,838,889	\$649,700,399	\$86,861,511	15.4%	\$2,276,509	\$657,772,028	\$725,308,429	10.3%
15 CH-TOUE	\$1,173,027	\$1,320,790	\$147,763	12.6%	\$19,876	\$1,326,735	\$1,454,432	9.6%
16 GS-TES	\$1,345,435	\$1,543,296	\$197,861	14.7%	\$374	\$1,636,790	\$1,784,466	9.0%
17 APH-TES	\$133,640	\$152,278	\$18,638	13.9%	\$0	\$145,944	\$159,831	9.5%
18 CSE	\$193,536	\$221,005	\$27,469	14.2%	\$4,083	\$218,735	\$243,038	11.1%
19 CSG	\$4,336	\$4,862	\$526	12.1%	\$96	\$4,825	\$5,293	9.7%
20								
21 Large General Service	\$469,674,111	\$537,191,581	\$67,517,471	14.4%	\$135,213	\$573,354,503	\$627,690,271	9.5%
22 LGS	\$79,639,686	\$90,749,650	\$11,109,964	14.0%	\$48,972	\$95,276,939	\$104,593,024	9.8%
23 LGS-TOU	\$390,034,425	\$446,441,931	\$56,407,506	14.5%	\$86,241	\$478,077,564	\$523,097,247	9.4%
24								
25 Seasonal and Intermittent Service	\$4,715,715	\$5,266,019	\$550,303	11.7%	\$44,208	\$5,428,873	\$5,817,123	7.2%
26								
27 Traffic Signal Service (TSS)	\$434,956	\$515,227	\$80,271	18.5%	\$54,606	\$556,523	\$621,675	11.7%
28 TSS	\$400,209	\$474,725	\$74,516	18.6%	\$44,783	\$509,454	\$569,416	11.8%
29 TFS	\$34,747	\$40,502	\$5,755	16.6%	\$9,823	\$47,069	\$52,259	11.0%
30								

Duke Energy Progress, LLC
NCUC Docket No. E-2, Sub 1219
North Carolina Retail Revenues - Base and Total Revenue at Current and Approved Rates

		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
Rate Class		Annualized Base Revenue @ Current Rates ¹	Annualized Base Revenue at Proposed Rates ¹	Increase (Decrease)	Increase (Decrease) Percentage	REPS Clause Revenues ²	Total Revenue with Clauses & REPS at Current Rates ³	Total Revenue with Clauses & REPS at Proposed Rates ³	Increase (Decrease) Percentage
				(B) - (A)	(B) / (A) - 1				(G) / (F) - 1
31	Outdoor Lighting	\$88,567,631	\$102,587,713	\$14,020,082	15.8%	\$1,435,954	\$92,900,350	\$102,145,146	10.0%
32	ALS	\$62,316,881	\$72,448,791	\$10,131,910	16.3%	\$1,318,341	\$65,830,445	\$72,337,613	9.9%
33	SLS	\$20,268,793	\$23,326,782	\$3,057,989	15.1%	\$117,136	\$20,958,672	\$23,077,248	10.1%
34	SLR	\$5,981,956	\$6,812,140	\$830,184	13.9%	\$477	\$6,111,232	\$6,730,285	10.1%
35									
36	Sports Field Lighting Service	\$202,072	\$228,574	\$26,502	13.1%	\$5,118	\$216,540	\$235,278	8.7%
37									
38									
39	North Carolina Retail Tariff Revenue	\$3,256,952,878	\$3,861,781,546	\$604,828,667	18.6%	\$41,056,544	\$3,837,616,954	\$4,317,186,375	12.5%

¹ Base Revenue at Current & Proposed Rates excludes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset clause rates and are derived in the response to E-1 Item 42(c).

² Renewable Portfolio Standard (REPS) clause revenues reflect the test year annual customer count per CIM Report RMCY9 billed at rates approved December 1, 2018.

³ Total Revenue at Current and Proposed Rates includes the 12/2018 Fuel EMF, DSM, EE, EDIT-1, EDIT-2, RAL-1, Fuel EMF Deficiency and Joint Agency Asset, and 12/2018 REPS clause rates.

DUKE ENERGY PROGRESS, LLC
DOCKET NO. E-2, SUB 1219
NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER
For the test year ending December 31, 2018
(DOLLARS IN THOUSANDS)

SPREAD OF PROPOSED INCREASE TO CUSTOMER CLASSES: REVISED FOR FUEL CHANGES AND POST-FILING CORRECTIONS

Present Revenue Run: E-1 Item 45b														25%			
Line		Annualized Rate Base	Present Rates Revenues Excl Riders	Present Net Operating Income	Present ROR	Gross Revenues At Average ROR	Variance From The Average	Reduction in Variance From The Average	Proposed Rate Increase Before Reduction in Variance	Proposed Rate Increase After Reduction in Variance	Total Adjusted Present Rates Revenues Incl Riders	Adjusted Proposed Percent Increase	ROR At Proposed Rates		Sum of Additional Rider Impacts	Proposed Rate Increase incl. Rider Impacts	Proposed Percent Increase incl. EDIT riders
No.	Rate Class	(A)	(B)	(C)	(D) = (C) / (A)	(E)	(F) = (B) - (E)	(G) = - (F) * 25%	(H)	(I) = (H) + (G)	(J) = (V) / (T)	(K) = (I) / (J)	(L)	45B	(M) = (AB)	(N) = (I) + (M)	(O) = (N) / (J)
1	RES	\$ 6,060,019	\$ 1,607,900	\$ 166,078	2.74%	\$ 1,652,058	\$ (44,158)	\$ 11,040	\$ 329,204	\$ 340,243	\$ 1,879,740	18.1%	6.99%	56%	\$ (69,474)	\$ 270,769	14.4%
2	SGS	\$ 718,817	\$ 191,921	\$ 18,219	2.53%	\$ 199,085	\$ (7,164)	\$ 1,791	\$ 39,049	\$ 40,840	\$ 233,942	17.5%	6.84%	7%	\$ (8,381)	\$ 32,459	13.9%
3	SGSCLR	\$ 11,939	\$ 3,245	\$ 187	1.57%	\$ 3,514	\$ (269)	\$ 67	\$ 649	\$ 716	\$ 4,246	16.9%	6.12%	0%	\$ (135)	\$ 581	13.7%
4	MGS	\$ 2,336,520	\$ 816,427	\$ 93,543	4.00%	\$ 795,045	\$ 21,382	\$ (5,345)	\$ 126,929	\$ 121,583	\$ 959,944	12.7%	7.93%	22%	\$ (26,070)	\$ 95,513	9.9%
5	LGS	\$ 1,259,678	\$ 471,131	\$ 43,268	3.43%	\$ 468,927	\$ 2,204	\$ (551)	\$ 68,431	\$ 67,880	\$ 575,133	11.8%	7.51%	12%	\$ (13,317)	\$ 54,562	9.5%
6	SI	\$ 15,801	\$ 5,089	\$ 1,293	8.18%	\$ 4,085	\$ 1,004	\$ (251)	\$ 858	\$ 607	\$ 5,859	10.4%	11.06%	0%	\$ (174)	\$ 433	7.4%
7	TSS	\$ 1,417	\$ 440	\$ 22	1.55%	\$ 472	\$ (32)	\$ 8	\$ 77	\$ 85	\$ 563	15.1%	6.11%	0%	\$ (15)	\$ 70	12.4%
8	ALS, SLS	\$ 381,532	\$ 88,396	\$ 33,325	8.73%	\$ 61,411	\$ 26,985	\$ (6,746)	\$ 20,726	\$ 13,980	\$ 92,721	15.1%	11.46%	4%	\$ (4,767)	\$ 9,213	9.9%
9	SFL	\$ 721	\$ 205	\$ 61	8.49%	\$ 157	\$ 49	\$ (12)	\$ 39	\$ 27	\$ 220	12.3%	11.29%	0%	\$ (8)	\$ 19	8.7%
TOTAL RETAIL		\$ 10,786,444	\$ 3,184,754	\$ 355,997	3.30%	\$ 3,184,754	\$ (0)	\$ 0	\$ 585,961	\$ 585,961	\$ 3,752,367	15.6%	7.41%	1	\$ (122,342)	\$ 463,619	12.4%

DUKE ENERGY PROGRESS, LLC

DOCKET NO. E-2, SUB 1219

NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER

For the test year ending December 31, 2018

(DOLLARS IN THOUSANDS)

Calculations for Rate Design in Order to Apply Increase to Unadjusted Billing Determinants.										
Present Revenue Run: E-1 Item 45b						E-1 Item 42c				
Line No.	Rate Class	Proposed Rate Increase After Reduction in Variance	Customer Growth Adjustment in Present Revenues	Weather Normalization Adjustment in Present Revenues	Total Adjustments to Exclude for Rate Design	Ratio of Unadjusted Present Revenues to Adjusted	Target Revenue Increase for Rate Design (to be applied to unadjusted billing determinants)	Total Unadjusted Present Rates Revenues Including Riders	Proposed Percent Increase to unadjusted Revenues for Rate Design	Target Revenue Increase for Rate Design plus Sum of Additional Rider Impacts
		(P) = (I)	(Q)	(R)	(S) = (Q) + (R)	(T) = [(R) - (S)] / (R)	(U) = (P) x (T)	(V)	(W) = (U) / (V)	(X) = (U) + (M)
10	RES	\$ 340,243	\$ (8,357)	\$ (54,752)	\$ (63,109)	103.925%	353,598	1,953,518	18.1%	\$ 284,124
11	SGS	\$ 40,840	\$ 1,107	\$ (20,163)	\$ (19,056)	109.929%	44,895	257,170	17.5%	\$ 36,514
12	SGSCLR	\$ 716	\$ 43	\$ (338)	\$ (295)	109.100%	781	4,632	16.9%	\$ 646
13	MGS	\$ 121,583	\$ 10,064	\$ (1,470)	\$ 8,594	98.947%	120,303	949,840	12.7%	\$ 94,233
14	LGS	\$ 67,880	\$ 2,131	\$ (674)	\$ 1,457	99.691%	67,670	573,355	11.8%	\$ 54,353
15	SI	\$ 607	\$ 373	\$ -	\$ 373	92.662%	563	5,429	10.4%	\$ 388
16	TSS	\$ 85	\$ 5	\$ -	\$ 5	98.798%	84	557	15.1%	\$ 69
17	ALS, SLS	\$ 13,980	\$ (171)	\$ -	\$ (171)	100.194%	14,007	92,900	15.1%	\$ 9,240
18	SFL	\$ 27	\$ 3	\$ -	\$ 3	98.474%	27	217	12.3%	\$ 19
TOTAL RETAIL		\$ 585,961	\$ 5,199	\$ (77,398)	\$ (72,199)	102.267%	\$ 601,927	\$ 3,837,617	15.7%	\$ 479,585

DUKE ENERGY PROGRESS, LLC

DOCKET NO. E-2, SUB 1219

NC RETAIL COST OF SERVICE - PRESENT - 1CP SUMMER

For the test year ending December 31, 2018

(DOLLARS IN THOUSANDS)

		Summary of Additional Rider Impacts				
		Per Smith Exh 3		Per Smith Exh 4	Per Smith Exh 5	
		Proposed				
Line No.	Rate Class	Change in 2018 NC EDIT-1 Rider	Proposed Federal EDIT-2 Rider	Regulatory Asset and Liability Rider	Sum of Additional Rider Impacts	Check
		(Y)	(Z)	(AA)	(AB) = (X) + (Y) + (Z)	
19	RES	3,071	\$ (71,645)	\$ (901)	\$ (69,474)	0
20	SGS	373	\$ (8,649)	\$ (105)	\$ (8,381)	0
21	SGSCLR	6	\$ (139)	\$ (2)	\$ (135)	0
22	MGS	2,200	\$ (27,666)	\$ (604)	\$ (26,070)	0
23	LGS	1,643	\$ (14,503)	\$ (457)	\$ (13,317)	0
24	SI	10	\$ (183)	\$ (2)	\$ (174)	0
25	TSS	1	\$ (16)	\$ (0)	\$ (15)	0
26	ALS, SLS	76	\$ (4,824)	\$ (19)	\$ (4,767)	0
27	SFL	0	\$ (8)	\$ (0.06)	\$ (8)	0
TOTAL RETAIL		\$ 7,381	\$ (127,633)	\$ (2,091)	\$ (122,342)	-0.000100156

Jessica L. Bednarcik
Stipulated Exhibits from DEC Evidentiary Hearing

Duke Energy Progress, LLC
Docket No. E-2, Sub 1219

/A
Duke Energy Carolinas
Response to
Attorney General's Office Data Request
Request No. AGO 2

Docket No. E-7, Sub 1214

Date of Request: November 27, 2019
Date of Response: December 17, 2019

☒ **CONFIDENTIAL**

☐ **NOT CONFIDENTIAL**

Confidential Responses are provided pursuant to Confidentiality Agreement

The attached response to AGO Data Request No. 2-1, was provided to me by the following individual(s): Trudy H. Morris, Project Manager II, and was provided to AGO under my supervision.

Camal O. Robinson
Senior Counsel
Duke Energy Carolinas

AGO
Data Request No. 2
DEC Docket No. E-7, Sub 1214
Item No. 2-1
Page 1 of 3

Request:

1. In reference to Table 1 of Witness Bednarcik's Direct Testimony on page 17, please delineate for each referenced site: Allen, Belews Creek, Cliffside/Rogers, and Marshall, a breakdown and explanation of each cost incurred for each line item created, as follows:
 - a. EHS cost at each site
 - i. Cost of well installation at each site
 1. Number and location of wells installed
 2. Internal cost
 3. Cost paid to each third party
 4. For what purpose was each well installed
 - a. an internal decision/voluntary
 - b. a third party requirement
 - i. Cost attributable to a court order, SOC, or Settlement Agreement
 - ii. Cost attributable to CAMA
 - iii. Cost attributable to CCR Rule
 - c. Any other reason other than (4)(b)(i-iii)
 - ii. Cost of well sampling/groundwater monitoring at each site
 1. How often wells sampled or monitored
 2. How many wells sampled or monitored
 3. Internal cost
 4. Cost paid to each third party
 5. Purpose of each sampling/monitoring event
 - a. Cost attributable to a SOC, other court order, or Settlement Agreement
 - b. Cost attributable to the CCR Rule
 - c. Cost attributable to CAMA
 - d. Cost attributable to sampling/monitoring for any other reason than those listed in (5)(a-c)
 - iii. Cost of bottled water at each site
 1. Cost of permanent water supplies
 - a. identification of types of permanent water supplies provided with the exception of bottled water, and the cost of each
 - iv. other EHS related costs at each site
 1. Purpose of costs being incurred
 - a. Costs incurred as a result of a court order, SOC, or Settlement Agreement
 - b. Costs incurred as a result of CAMA
 - c. Costs incurred as a result of the CCR Rule
 - d. Cost incurred for any other reason other than those listed in (1)(a-c)
 - b. Basin Closure/Engineering Design at each site
 - i. Internal cost
 - ii. Cost paid to each third party
 - iii. The actual documents prepared and activities conducted
 - iv. The purpose for which each document/report was prepared and activity conducted
 - a. Cost attributable to a court order, SOC, or Settlement Agreement
 - b. Cost attributable to CAMA

AGO
Data Request No. 2
DEC Docket No. E-7, Sub 1214
Item No. 2-1
Page 2 of 3

- c. Cost attributable to CCR Rule
- d. Cost attributable to any other reason other than those listed in (iv)(a-c)
- c. Basin Support Projects at each site
 - i. Internal cost
 - ii. Cost paid to each third party
 - iii. Specific projects completed or scheduled to be completed
 - 1. The specific cost for each project for each site
 - 2. The purpose for which each specific project was conducted
 - a. Cost attributable to a court order, SOC, or Settlement Agreement
 - b. Cost attributable to CAMA
 - c. Cost attributable to CCR Rule
 - d. Cost attributable to any other reason other than those listed in (iii)(a-c)
- d. Permanent Water Supply at each site
 - i. Internal cost
 - ii. Cost paid to each third party
 - iii. How this line item differs from those included in EHS
- e. Permitting at each site
 - i. What applications for permits made
 - ii. What permits issued
 - iii. Purpose of permit(s) acquired for each site
 - 1. Permits required under a court order, SOC, or Settlement Agreement
 - 2. Permits required under CAMA
 - 3. Permits required under the CCR Rule
 - 4. Permits attributable to any other reason other than those listed in (iii) (1-3)
 - iv. Cost for each permit
 - 1. Costs attributable to a court order, SOC, or Settlement Agreement
 - 2. Costs attributable to CAMA
 - 3. Costs attributable to the CCR Rule
 - 4. Costs attributable to any other reason other than those listed in (iv)(1-3)
- f. Other at each site
 - i. Internal cost
 - ii. Cost paid to each third party
 - iii. Purpose of costs being incurred
 - 1. Costs incurred as a result of a court order, SOC, or Settlement Agreement
 - 2. Costs incurred as a result of CAMA
 - 3. Costs incurred as a result of the CCR Rule
 - 4. Cost incurred for any other reason other than those listed in (iii) (1-3)

AGO
Data Request No. 2
DEC Docket No. E-7, Sub 1214
Item No. 2-1
Page 3 of 3

Confidential Response:

See attached documents.



2018-2019 GW
Sampling Programs



AGO 2 narrative
response.docx



DEC AG DR No.2
Other EHS Costs.xls

AGO #2 Narrative:

The attached file labeled “CONFIDENTIAL DEC AG DR No.2 Detailed Trans – Jan 18 to Jun 19-FinalwSummary.xlsx” contains detailed transactions for each location (Allen, Belews Creek, Cliffside, Marshall, Buck, Dan River, Riverbend and WS Lee.) The detailed transactions are separated by location. In order to be responsive to the data request, Duke Energy has provided a number of pivot tables to help arrange the data.

The pivot table in the “DEC Summary” provides a summary of costs by Testimony Cost Group.

The tabs that contain the name of the location as well as “-Summary” after it includes two pivot tables. One is cost by resource type. Resource types includes labor, contract and outside services, employee expenses, material supplies/purchases, transportation and vehicles, and other. The second pivot table shows a description of the project and the vendor costs associated with the project.

Costs are not allocated between CAMA, CCR, SOC, or other, unless noted in the attachment.

This file is responsive to the following requests:

1.a.i.2

1.a.4.b.i-iii

1.a.i.3

1.a.ii.3 & 4

1.a.ii.5.a-d

1.a.iii.1.a –Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

1.a.iv.a, b, c, d

1.b.i & ii

1.b.iv.a-d

1.c.i & ii

1.c.iii.1

1.c.iii.2.a-d

1.d.i-iii – costs are not different than those included in EHS.

1.e.iv.1-4

1.f.i & ii

1.f.iii.1-4

2.a.i.2 & 3

2.a.i.4.b.i-iii

2.a.ii.3 & 4

2.a.ii.5.a-d

2.a.iii.1.a - Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

2.a.iv.a-d

2.b.i & ii

2.b.iv.a-d

2.c.i & ii

2.c.iv.1-4 – costs associated with the beneficiation facility construction are attributable to CAMA, although beneficiation will also allow for closure under the CCR rule.

2.d.i & ii

2.d.iii.1

2.d.iii.2.a-d

2.e.i & ii & iii & iv 1-4 - Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

2.f.iv.1-4

2.g.1.a-d

3.a.i.2 & 3

3.a.i.4.b.i-iii

3.a.ii.3 & 4

3.a.ii.5.a-d

3.a.iii.1.a - Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

3.a.iv.1.a-d

3.b.i & ii

3.b.iv.a-d

3.c.i & ii & iii – costs are not different than those included in EHS.

3.d.iv.1-4

3.e.1.a-d

4.a.i.2

4.a.i.3

4.a.i.4.b.i-iii

4.a.ii.3

4.a.ii.4

4.a.ii.5.a-d

4.a.iii.1.a - Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

4.a.iv.1.a-d

4.b.v & vi

4.b.vii.e-h

4.c.i-iii – costs are not different than those included in EHS.

4.d.iv.1-4

4.e.1.a-d

5.a.i.2 & 3

5.a.i.4.b.i-iii

5.a.ii.3&4

5.a.ii.5.a-d

5.a.iii.1.a - Also see response to Public Staff DEC Data Request 2-6. As requested in the response, bottled water costs were excluded.

5.a.iv.1.a-d

5.b.i & ii

5.b.iv.a-d

5.c.iv.1-4

5.d.i & ii

5.d.iii.1

5.d.iii.2.a-d

5.e.1.a-d

Responsive information to the following items can be found in the attached document titled "2018-2019 GW Sampling Programs DEC.xlsx". Also see response to Public Staff DEC Data Request 2-11 and 2-12.

1.a.ii.1 & 2 & 5

2.a.4.a-c

2.a.ii.1 & 2 & 5

3.a.i.1 & 4.a-c

3.a.ii.1 & 2 & 5

4.a.i.1 & 4.a-c

4.a.ii.1 & 2 & 5

5.a.i.1 & 4.a-c

5.a.ii.1 & 2 & 5

Responsive information to the following items can be found in the attached document titled "DEC AG DR No.2 Other EHS Costs"

1.a.iv.1

2.a.iv.1

3.a.iv.1

4.a.iv.1

5.a.iv.1

Additional responsive information

1.c.iii & 2.d.iii Basin Support Projects at each site; specific projects completed or scheduled to be completed

- At Buck, Dan River and Marshall, stormwater projects were completed or scheduled to be completed from January 1, 2018 to January 31, 2020. These projects were executed to stop flows to the basins.

Duke Energy will be providing supplemental information related to permitting, purpose of "other" costs at each site, documents prepared and activities conducted for basin closure and the beneficitation project at Buck.

Additional cost information has also been provided in the response to Public Staff DEC Data Request 102-6.

AGO Data Request #2 - As it relates to 1 other EHS costs at each site, please provide an explanation for the costs incurred and the purpose of costs being incurred.

Jurisdiction	Station Name	CCR Rule Requirement	State Agency/Court Order/Settlement Agreement Requirement	CAMA Requirement
DEC	Allen	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 1 multiunit. Assessment of Corrective Measures report.	Two tri-annual NPDES Groundwater reports (2018, new permit effective 8/1/18).	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. 2018 Updated Comprehensive Site Assessment. Surface Water Evaluation to Assess 15A NCAC 2B Compliance. Ash Basin Pumping Test. Groundwater geochemical/fate and transport modeling. Revised Corrective Action Plan (to be submitted 12/2019).
DEC	Belews Creek	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 1 unit. Assessment of Corrective Measures report.	Semi-annual NCDEQ-DWM landfill report and annual landfill permit fees. Tri-annual NPDES Groundwater Report (2018 + one event in 2019 prior to receipt of new permit in March). Accelerated Remediation Interim Action Plan Effectiveness Monitoring Report, per Settlement Agreement.	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. 2017 Updated Comprehensive Site Assessment. Surface Water Evaluation to Assess 15A NCAC 2B Compliance. Ash Basin Pumping Test. Groundwater geochemical/fate and transport modeling. Revised Corrective Action Plan (to be submitted 12/2019).
DEC	Buck	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 2 units. Assessment of Corrective Measures report.	Tri-annual NPDES Groundwater reports (2018).	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. Surface Water Evaluation to Assess 15A NCAC 2B Compliance.
DEC	Cliffside (Rogers)	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 4 units. Semi-annual alternative source demonstrations for 1 unit. Assessment of Corrective Measures report.	Semi-annual NCDEQ-DWM landfill report and annual landfill permit fees. Tri-annual NPDES Groundwater Reporting (2018).	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. 2018 Updated Comprehensive Site Assessment. Surface Water Evaluation to Assess 15A NCAC 2B Compliance. Ash Basin Pumping Test. Groundwater geochemical/fate and transport modeling. Revised Corrective Action Plan (to be submitted 12/2019).
DEC	Dan River	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 2 units. Semi-annual alternative source demonstrations for 1 unit. Assessment of Corrective Measures report.	Semi-annual NCDEQ-DWM landfill report and annual landfill permit fees. Tri-annual NPDES Groundwater Reporting (2018 + one event in 2019 prior to receipt of new permit in March).	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. 2018 Updated Comprehensive Site Assessment. Surface Water Evaluation to Assess 15A NCAC 2B Compliance.
DEC	Marshall	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 1 multiunit. Assessment of Corrective Measures report and the Semi-Annual Progress Report.	Semi-annual landfill reports for two landfills and annual landfill permit fees. One Tri-annual NPDES Groundwater report in 2018 prior to NPDES renewal in April 2018 (2018).	Quarterly data validation and data submittals. DEC annual reports and 2018 Annual Interim Monitoring Report. 2018 Updated Comprehensive Site Assessment. Surface Water Evaluation to Assess 15A NCAC 2B Compliance. Ash Basin Pumping Test. Groundwater geochemical/fate and transport modeling. Revised Corrective Action Plan (to be submitted 12/2019).
DEC	Riverbend	N/A	Tri-annual NPDES Groundwater reports (2018).	Quarterly data validation and data submittals. 2017 Updated Comprehensive Site Assessment. DEC annual reports and 2018 Annual Interim Monitoring Report. Surface Water Evaluation to Assess 15A NCAC 2B Compliance.
DEC	WS Lee (SC)	One annual report, semi-annual statistical analysis reports, and semi-annual data validations will be completed per year for 1 multiunit. Assessment of Corrective Measures report.	Groundwater well installations, Post Excavation Soil Sampling/Analysis, Assessment Report and Baseline Risk Assessment per SCDHEC Consent Agreement.	N/A

Acronym	Definition
A	Annual
ALN	Allen Steam Electric Plant
ASV	Asheville Steam Electric Plant
CCR	Coal Combustion Residuals Final Rule
CAMA	Coal Ash Management Act
ASA	Asheville Airport
ASHB	Ash Basin
BLC	Belews Creek Steam Station
BNP	Brunswick Nuclear Station
BSC	Buck Steam Station
CFR	Cape Fear Steam Station
COMP	Compliance
CRLF	Craig Road Landfill
CLS	Cliffside Steam Station/ Rogers Energy Complex
CNS	Catawba Nuclear Station
BKLF	Background Landfill Event
DRC	Dan River Combined Cycle Station
FGDLF	FGD Landfill
LCC	H.F. Lee Steam Station
HNP	Shearon Harris Nuclear Station
HV	Huntersville Lab at McGuire Nuclear Station
LF	Landfill
LM	Landfarm
MSS	Marshall Steam Station
MNS	McGuire Nuclear Station
MAY	Mayo Steam Station
NH	New Hill Lab at Shearon Harris Nuclear Station
ONS	Oconee Nuclear Station
PHLF	Pine Hall Landfill
Q	Quarterly
RNP	H. B. Robinson Steam Electric Station
RP	Radiation Protection
RBS	Riverbend Steam Station
ROX	Roxboro Steam Station
S	Semiannual
SCC	Sutton Steam Station
T	Triannual
BK	Background Event
LEE	W.S. Lee Steam Station
WLs	Water Levels
DA/LEACHLF	Dry Ash and Leachate Landfill
WSC	Weatherspoon Steam Station
	Sampling Performed by Pace or SynTerra
	Tentative Event
	Sampling Performed by Duke's Groundwater Team

Colour	Program
	Special
	Tritium (H3)
	CAMA
	CCR
	Ash Basin
	Landfill
	Date CAMA Analysis is due by

Program	Site	Location	Number of Wells	Sampling Frequency	Months Sampled
Ash Basin - State NPDES	ALN		13	T	Mar, Jul, Nov
	BLC		9	T	Jan, May, Sep
	BSC		14	T	Mar, Jul, Nov
	CLS		8	T	Apr, Aug, Dec
	DRC		8	T	Jan, May, Sep
	LEE		15	S	Mar, Sep
	MSS		12	T	Feb
	RBS		22	T	Feb, Jun, Oct
CCR	ALN		54	T	
	BLC		35	T	
	BSC		63	T	
	CLS		125	T	
	DRC		43	T	
	LEE		38	T	
	MSS		34	T	
CAMA	ALN		125	Q	Q1, Q2, Q3, Q4
	BLC		109	Q	Q1, Q2, Q3, Q4
	BSC		110	Q	Q1, Q2, Q3, Q4
	DRC		57	Q	Q1, Q2, Q3, Q4
	CLS		175	Q	Q1, Q2, Q3, Q4
	MSS		135-170	Q	Q1, Q2, Q3, Q4
	RBS		94	Q	Q1, Q2, Q3, Q4
Landfill	BLC	Pine Hall	10	S	Apr, Oct
	CLS	CCP	17	S	Apr, Oct
	DRC	CCR	21	S	May, Nov
	MSS	Dry Ash Landfill	8	S	Feb, Aug
		FGD Landfill	9	S	Mar, Sep
		Industrial 1	2	S	Feb, Aug
SCDHEC Consent Agreement	LEE	Inactive Ash Basin and Ash Fill Area	41	Q	Q1, Q2, Q3, Q4

Program	Site	Location	Number of Wells				Number of Surface Waters/ Outfalls	Number of Leachate Cells	Months Sampled
			Semi-annually	Tri-annually	Quarterly	Annually			
Ash Basin - NPDES	BLC			9					Jan
	DRC			8					Jan
	LEE		15						Mar, Sep
	RBS			21					Feb, Jun, Oct
Landfill	BLC	Pine Hall	13				2		Apr, Oct
	CLS	CCP	13				3	1	Apr, Oct
	DRC	CCR	13				4	3	May, Nov
	MSS	Dry Ash Landfill	5						Feb, Aug
		FGD Landfill	9				1	1	Mar, Sep
		Industrial 1 Leachate						4	Feb, Aug
CCR	ALN		72						Mar, Sept
	BLC		62						Apr, Oct
	BSC		72						Feb, Aug
	CLS		134						Apr, Oct
	DRC		57						Jun, Dec
	LEE		36						Mar, Sept
	MSS		47						Feb, Aug
CAMA	ALN		103		33				Mar, Jun, Sep, Dec
	BLC		56		35				Jan, Apr, Jul, Oct
	BSC		74		31				Feb, May, Aug, Nov
	CLS		147		129				Jan, Apr, Jul, Oct
	DRC		43		7				Mar, Jun, Sep, Dec
	MSS		59		88				Feb, May, Aug, Nov (+June)
	RBS		66		23				Feb, May, Aug, Nov
						26			
SCDHEC Consent Agreement	LEE	Inactive Ash Basin and Ash Fill Area	3						Mar, Jun

2017 World of Coal Ash (WOCA) Conference in Lexington, KY - May 9-11, 2017
<http://www.flyash.info/>

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Sep 09 2020

Groundwater Monitoring Requirements of the CCR Rule – What's Next?

Thomas A. Mann, PE

SynTerra Corporation, 148 River Street, Greenville, SC 29601

CONFERENCE: 2017 World of Coal Ash – (www.worldofcoalash.org)

KEYWORDS: groundwater monitoring, coal combustion residuals, sampling and analysis, reporting

ABSTRACT

The U.S. Environmental Protection Agency published 40 CFR 257, Subpart D, the Coal Combustion Residuals (CCR) Rule ¹ on April 17, 2015. This Rule includes provisions for groundwater monitoring of active, inactive, and new CCR landfills and impoundments. Various deadlines are set for the establishment of a groundwater monitoring system, the sampling and analysis of groundwater, and the statistical evaluation of groundwater data. The CCR Rule created three phases of groundwater monitoring that include Detection Monitoring, Assessment Monitoring, and Corrective Action Monitoring. Groundwater protection standards will need to be developed based upon maximum contaminant levels (MCLs) or background levels. Criteria that trigger these phases of monitoring include a statistically significant increase (SSI) and a statistically significant level (SSL). If SSLs are determined in Assessment Monitoring, then the nature and extent of a release must be determined and a corrective action remedy developed. Reporting requirements that need to be a part of the operating record and/or posted to the public internet site are established. This presentation will provide an overview of upcoming CCR Rule requirements and corresponding deadlines. In addition, selected case studies of current CCR groundwater monitoring system designs including single units and multi-units with interconnected hydraulic water-bearing units, sampling and analysis programs, and data quality management challenges will be described.

INTRODUCTION

On April 17, 2015, in an effort to nationally regulate coal combustion residuals, the United States Environmental Protection Agency (USEPA) published the Final Rule of the Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments¹. This regulation addresses the safe disposal of coal combustion residuals (CCR) as solid waste under Subtitle D of the Resource Conservation and Recovery Act (RCRA) and is referred to herein as the CCR Rule. The CCR Rule became effective on October 19, 2015 and established national minimum criteria for the safe disposal of CCR. The regulations cover new and existing CCR landfills, surface impoundments, and lateral expansions. Requirements for the design and operation of

CCR units are identified along with groundwater monitoring and corrective action, closure and post closure care, and recordkeeping/notification.

This paper will focus on the groundwater monitoring and corrective action requirements of the CCR Rule as identified in 40 CFR Parts 257.90 through 257.98 and applicable record keeping and notification requirements. The activities initially required to comply with the CCR Rule will be discussed first and include development of the Site Conceptual Model, the design and installation of the CCR Monitoring Well Network, and the Sampling & Analysis Program. After these initial activities are complete, the remaining 'What's Next?' CCR Rule groundwater monitoring requirements will be discussed. These requirements include:

1. Detection Monitoring (Initial Phase);
2. Statistical Evaluation;
3. Detection Monitoring;
4. Assessment Monitoring;
5. Assessment of Corrective Measures; and
6. Annual Report.

PRELIMINARY CCR RULE GROUNDWATER MONITORING ACTIVITIES

Site Conceptual Model

A site conceptual model (SCM) provides a description of relevant site features and surface/subsurface conditions so that transport and migration of identified potential contaminants of concern can be understood. A hydrogeologic investigation is performed to collect the needed information to develop the SCM and can be refined through an iterative process through additional data gap investigations. The level of detail of the conceptual model should match the complexity of the site and available data. Development of the SCM will support eventual risk assessment evaluations and remedial decision making. If the migration pathways identified by the SCM are monitored, then the performance standard for the CCR Rule groundwater monitoring system design will be achieved.

CCR Monitoring Well Network Design and Installation

The CCR Rule contains a performance standard and a prescriptive requirement regarding the groundwater monitoring well network design and installation. The groundwater monitoring system should consist of a sufficient number of wells at

appropriate locations and depths to collect groundwater samples from the uppermost aquifer to meet the following performance criteria from 40 CFR 257.91(a):

- “Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit.”¹
- “Accurately represent the quality of groundwater passing the waste boundary of the CCR unit. The downgradient monitoring system must be installed at the waste boundary that ensures detection of groundwater contamination in the uppermost aquifer. All potential contaminant pathways must be monitored.”¹

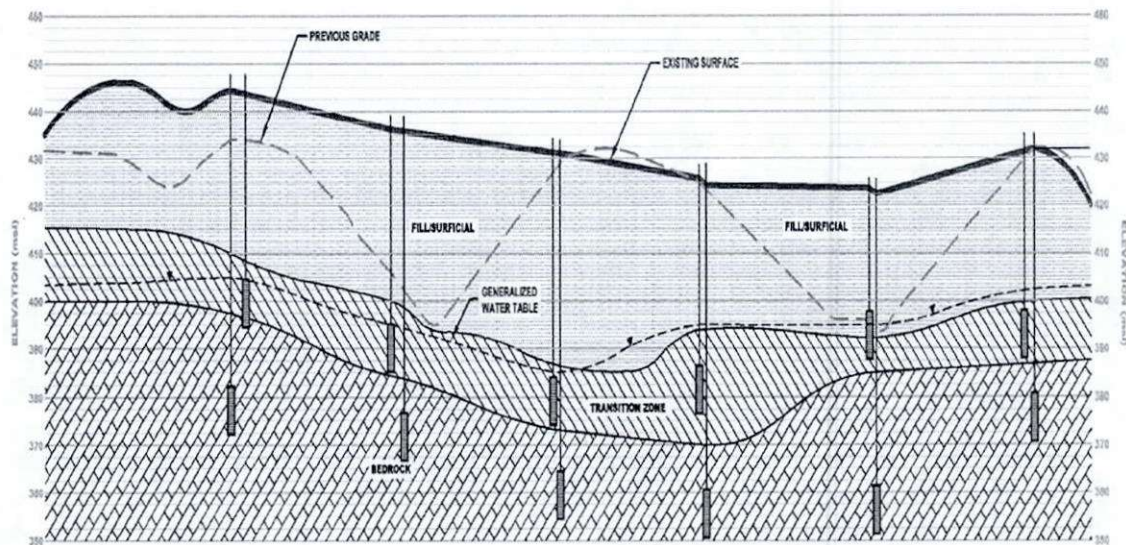
In addition, the CCR Rule prescribes that the monitoring system must include a minimum of one upgradient and three downgradient monitoring wells; however, additional monitoring wells must be installed as necessary to accurately represent the quality of background groundwater and the quality of groundwater passing the waste boundary of the CCR unit.

Background groundwater quality determinations do not have to be from hydraulically upgradient monitoring wells of the CCR unit. These exceptions include hydrogeological conditions that prevent the determination of what wells are hydraulically upgradient or other wells that are not hydraulically upgradient provide an indication of background groundwater quality that is as representative as upgradient monitoring wells.

The downgradient wells “must be located at the hydraulically downgradient perimeter of the CCR unit or at the closest practical distance from this location.”² Monitoring well locations must be chosen based on accessibility and proximity to the waste boundary at the unit to be in compliance with 40 CFR 257.91(a)(2). Typical well location restrictions include power transmission line right-of-ways, underground utilities, drainage ditches, wetland areas, seep areas, and drainage pipelines.

The uppermost aquifer is defined in the regulations at 40 CFR 257.53 as “the geologic formation nearest the natural ground surface that is an aquifer, as well as lower aquifers that are hydraulically interconnected with this aquifer within the facility’s property boundary. Upper limit is measured at a point nearest to the natural ground surface to which the aquifer rises during the wet season.”¹ In addition, the definition of an aquifer “means a geologic formation, group of formations, or portion of a formation capable of yielding usable quantities of groundwater to wells or springs.”¹ Therefore, the definition of a usable groundwater is based on the natural quality and the quantity. An example of a CCR monitoring well network that monitors hydraulically interconnected aquifers in the downgradient groundwater flow direction is shown below.

CCR MONITORING NETWORK FOR HYDRAULICALLY INTERCONNECTED AQUIFERS



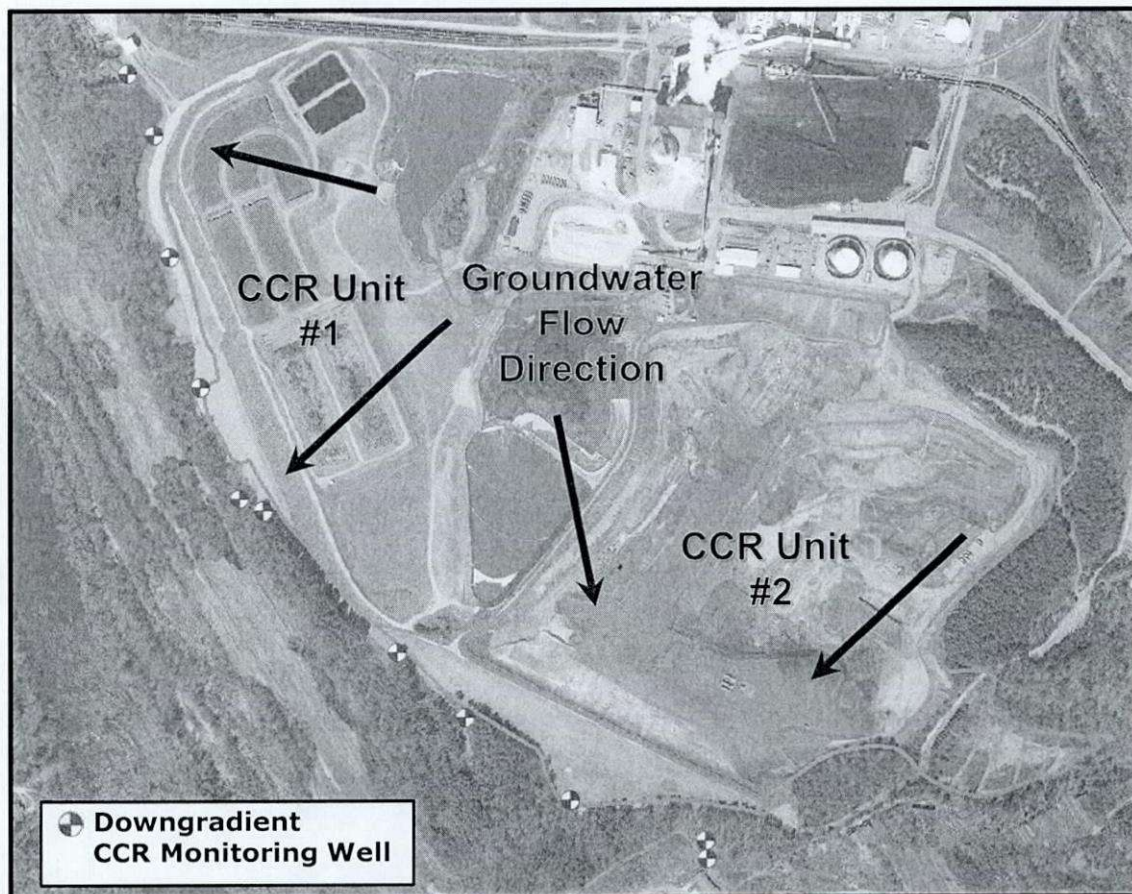
The CCR Rule provides a performance standard requiring groundwater monitoring wells to be constructed in a manner that maintains borehole integrity, consists of a screen, and is properly sealed to prevent cross contamination (40 CFR 257.91(e)). In addition to monitoring well installation and as part of the well construction process, wells must be developed to remove drill fluids, clay, silt, sand, and other fines which may have been introduced into the formation or sand pack during drilling and well installation, and to establish communication of the well with the aquifer.

Documentation of field activities can be achieved using a combination of log books and field forms. Log books are completed to provide a general record of activities and events that occur during daily tasks including detailed descriptions of subsurface media encountered and observations made during boring installation. During installation and development of the monitoring well, boring logs are used to document lithology and details of boring advancement. Monitoring well construction logs are used to detail final monitoring well construction details and well development records are created to track the well development process for each newly installed monitoring well.

Owners or operators must obtain a certification from a qualified professional engineer stating that the groundwater monitoring system was designed and constructed to meet the requirements of 40 CFR 257.91. In addition, Owners or operators will adhere to the recordkeeping and notification requirements of 40 CFR 257.91, 257.105, and 257.107. For existing units, the groundwater monitoring system certification must be placed in the owner or operator's operating record as it becomes available and then posted to the public internet site within 30 days of placing in the operating record.

The CCR Rule under 40 CFR 257.91(d) allows for groundwater monitoring of CCR units that are close to each other using a single system. A multi-unit groundwater monitoring system is allowed as long as this system is equally capable of detecting a release at the waste boundary as multiple single unit monitoring systems. With a multi-unit system, the number of monitoring wells required to meet the performance standard may be reduced. However, if the multi-unit system includes unlined CCR surface impoundments as defined in 40 CFR 257.71(a), then all of the unlined surface impoundments are subject to closure requirements under 40 CFR 257.101(a) if there is an Appendix IV statistical significant level detection (discussed later). Below is an example of a multi-unit system.

MULTI-UNIT GROUNDWATER MONITORING SYSTEM



Sampling and Analysis Program

Under 40 CFR 257.93(a), the CCR Rule requires the development of a sampling and analysis program so that consistent procedures and techniques result in an accurate representation of groundwater quality. The program should include procedures for sample collection, preservation, and shipment. In addition, techniques covering

analytical procedures, chain of custody control, and quality assurance and quality control (QA/QC) should be included. Though not expressly required by the CCR Rule, a sampling and analysis plan (SAP) is suggested to satisfy the sampling and analysis consistency requirements.

Groundwater samples are to be analyzed for total recoverable metals and field filtering is not allowed in accordance with 40 CFR 257.93(i). Analytical methods are required to be appropriate for groundwater and accurately measure constituent concentrations. Many sites may deal with turbid groundwater samples and low-flow sampling methods as well as proper well screen design should be considered to minimize this turbidity. Groundwater monitoring procedures including low-flow sampling should be developed in accordance with federal/state procedures such as the USEPA Region IV *Field Branches Quality System and Technical Procedures*.³ Other data quality challenges may occur when other sources other than from CCR units are suspected to be the cause of groundwater concentrations of Appendix III and IV constituents. Isotope analyses can be performed to investigate the source of a constituent in an aquifer. For example, boron concentrations in an aquifer located near a coast may be related to salt water intrusion and could be confirmed by analyzing for a particular marine boron isotope. Thus, it may be possible to show that the boron concentrations in groundwater are not entirely associated with materials from a CCR unit. Speciation evaluations can also be performed on groundwater for certain Appendix III and IV constituents to gain a better understanding of the presence of these metals originating from a CCR unit source or natural groundwater conditions.

WHAT'S NEXT?

Detection Groundwater Monitoring (Initial Phase)

In accordance with 40 CFR 257.90, groundwater monitoring and corrective action is required for CCR landfills, CCR surface impoundments, and lateral expansions of CCR units. As part of the first phase of detection monitoring, at least eight independent sampling events of initial monitoring is to be conducted for the Appendix III and Appendix IV constituents (Table 1) prior to October 17, 2017 for existing units. At new CCR units, EPA interprets the requirements of 40 CFR 257.90(b)(2) and 257.94(b) to mean at least eight sampling events in background wells are to be collected and analyzed before first placement of CCR. Sample results will be used to develop Site-specific background concentrations for each Appendix III and Appendix IV constituent that will be utilized during the detection monitoring phase.

The Appendix III constituents are considered by EPA to be the leading indicators of whether constituents are migrating from a CCR unit. Appendix III constituents include: boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids.

After completion of the sampling and analysis of the initial Detection Monitoring phase, EPA interprets the regulations to mean that the first statistical evaluation (discussed next) is to be completed no later than October 17, 2017 for the Appendix III constituents

for statistically significant increases (SSI) over background concentrations for each constituent in every downgradient well. If there is a SSI for any constituent in any well, the Site must begin Assessment Monitoring within 90 days.

Table 1. Part 257 Appendix III and Appendix IV Constituents

Appendix III - Constituents for Detection Monitoring	Appendix IV – Constituents for Assessment Monitoring	
Boron	Antimony	Lead
Calcium	Arsenic	Lithium
Chloride	Barium	Mercury
Fluoride	Beryllium	Molybdenum
pH	Cadmium	Selenium
Sulfate	Chromium	Thallium
Total Dissolved Solids	Cobalt	Radium 226/228 combined
	Fluoride	

Statistical Evaluation

The CCR Rule identifies four statistical methods (40 CFR 257.93(f)) that may be selected to evaluate the groundwater monitoring data in each well and for each constituent. In addition, an option is given to select another statistical method as long as the performance standards of 40 CFR 257.93(g) are met. The four identified methods include:

1. Parametric analysis of variance followed by multiple comparison procedures;
2. Analysis of variance followed by multiple comparison procedures;
3. Tolerance or prediction interval procedure; and
4. Control chart approach.

If a control chart, prediction interval, or tolerance interval approach is used, it must be at least as effective in evaluating groundwater data as any other procedure identified in the CCR Rule. Non-detect data must also be evaluated with a statistical method that is at least as effective as any other identified method.

A certification from a qualified professional engineer is required that states the “selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area”¹ (40 CFR 257.93(f)(6)). In addition, the certification must include a narrative description of whatever statistical method(s) was selected. For existing and new CCR units, the statistical method certification must be placed in the owner or operator’s operating record as it becomes available and then posted to the public internet site within 30 days of placing in the operating record. The CCR Rule also requires that statistical procedures be developed by October 17, 2017 for existing facilities per 40 CFR 257.90(b).

Conclusions drawn from the statistical evaluation may be invalid or in error if sample data do not satisfy basic statistical assumptions, such as the data are not independent or identically distributed. The groundwater samples need to be representative of the underlying population. EPA is concerned about false negative results from the statistical evaluation. Therefore, EPA suggests that for groundwater sampling and statistical evaluations the guidelines in the *Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* ⁴ be followed. These guidelines were cited throughout the preamble to the final CCR Rule.

Detection Monitoring

Groundwater is monitored for evidence of a release under Detection Monitoring. Upon completion of the Initial Phase of Detection Monitoring described above, Detection Monitoring will begin after October 17, 2017 for existing units and after first placement of CCR at new units or lateral expansions. The same wells used for the Initial Phase of Detection Monitoring will be used to collect groundwater samples for the Appendix III constituents. These groundwater samples will be collected semiannually. It is possible to perform a demonstration for an alternative detection monitoring frequency that is greater than semiannual. As described in 40 CFR 257.94 (d), an evaluation may be conducted to support an alternative frequency based upon the following factors:

- "Lithology of the aquifer and unsaturated zone;
- Hydraulic conductivity of the aquifer and unsaturated zone;
- Groundwater flow rates; and
- Information documenting that the alternative frequency is no less effective in ensuring that any leakage from the CCR unit is discovered within a timeframe that will not materially delay establishment of an assessment monitoring program."¹

A statistical evaluation must be completed within 90 days after completing sampling and analysis. The Appendix III constituents must be evaluated for SSIs over background concentrations for each constituent in every downgradient well. If there is a SSI for any Appendix III constituent in any downgradient well, the CCR unit must begin Assessment Monitoring within 90 days. The Detection Monitoring results must be reported in the Annual Report.

If there is a SSI, a written demonstration can be made within 90 days of the SSI determination that a source other than the CCR unit was the cause or the SSI resulted from a sampling and analysis error, statistical evaluation error, or natural groundwater quality variations as described under 40 CFR 257.94(e)(2). A CCR unit may continue with the detection monitoring program if a successful demonstration is made.

Assessment Monitoring Program

If a SSI above background groundwater concentrations has been determined for one or more constituents in Appendix III at one or more downgradient wells under Detection

Monitoring, then Assessment Monitoring is triggered. Appendix IV constituents must be sampled and analyzed within 90 days for each well. During Assessment Monitoring, all wells will be sampled at least annually for the Appendix IV constituents.

In accordance with 40 CFR 257.95(d)(1), within 90 days after receiving the analytical results and on a semiannual sampling basis thereafter, Appendix III and Appendix IV constituents with detected concentrations will be sampled and analyzed in all wells. An alternative monitoring frequency may also be demonstrated based upon the same factors as described above under Detection Monitoring.

Groundwater protection standards (GWPS) will also be established at this time for all constituents under the Assessment Monitoring program. The GWPS will be based upon maximum contaminant levels (MCLs) as established under 40 CFR 141.62 and 141.66 or background concentrations for constituents without an MCL identified or if background concentration is higher than the MCL. During assessment monitoring, downgradient concentrations will be evaluated for statistically significant levels (SSLs) relative to the GWPS.

If all downgradient Appendix III and IV constituents are shown to be at or below background and/or the GWPS after evaluating for SSLs for two consecutive sampling events, then the groundwater monitoring program for that CCR unit may return to the Detection Monitoring program. If any of the Appendix III or IV constituents are above background concentrations but below all of the GWPS, then the CCR unit will remain in the Assessment Monitoring program.

If there is an SSL above the GWPS for any constituent in any of the downgradient wells under Assessment Monitoring, Assessment of Corrective Measures must begin within 90 days or immediately upon determination of a release from a facility. The vertical and horizontal nature and extent of the Appendix IV constituent release must be determined. In addition, 40 CFR 257.95(g)(1)(iii) requires the installation of at least one additional groundwater monitoring well in the downgradient flow direction at the facility boundary. If constituents have migrated off-site, property owners or residents affected must be notified and the notifications placed in the operating record.

If the CCR unit is an existing unlined CCR surface impoundment operating after October 19, 2015 and an SSL determination has been made, the unlined surface impoundment is subject to closure or retrofit requirements under 40 CFR 257.101(a). Within 6 months of making the SSL determination, the existing unlined surface impoundment must cease accepting CCR and non-CCR waste streams and either close or retrofit.

If there is a SSL, a demonstration can be made within 90 days of the SSL determination that a source other than the CCR unit was the cause or the SSL resulted from a sampling and analysis error, statistical evaluation error, or natural groundwater quality variations as described under 40 CFR 257.95(g)(3). A CCR unit may continue with the assessment monitoring program if a successful demonstration is made.

Assessment of Corrective Measures

An Assessment of Corrective Measures is triggered by an SSL of any Appendix IV constituent from the Assessment Monitoring phase, or immediately upon detection of a release from a CCR unit. A 60 day extension for the Assessment of Corrective Measures is available upon a demonstration certified by a qualified professional engineer. The assessment evaluates the effectiveness of potential corrective measures to achieve the goals of the remedy including protectiveness of human health and the environment, achievement of the GWPS, and source control.

As soon as feasible, a remedy is selected upon the completion of the corrective measures assessment. As part of selecting the remedy, a remedial implementation and completion schedule must be developed. The corrective measures must be discussed in a public meeting at least 30 days prior to remedy selection.

Under the Assessment of Corrective Measures, the groundwater monitoring will be the same as the Assessment Monitoring program for that CCR unit. Additional monitoring wells may be installed within the plume boundaries to monitor the corrective action activities and the effectiveness of the remedy.

Corrective action groundwater monitoring, remedial activities and any interim actions must begin within 90 days of selecting a remedy for a CCR unit. When concentrations of Appendix IV constituents at all groundwater monitoring wells beyond the Detection Monitoring groundwater well system have not statistically exceeded the GWPS for 3 consecutive years, corrective action remediation and corrective action monitoring will be complete. The groundwater monitoring program can then return to the Detection Monitoring program.

The groundwater monitoring system must be operated and maintained throughout the Detection Monitoring Program, the Assessment Monitoring Program, or Correction Action Program. The post-closure care period will last 30 years unless the CCR unit is operating under the Assessment Monitoring Program at that time, then post-closure care continues after the 30 years until the CCR unit returns to the Detection Monitoring Program.

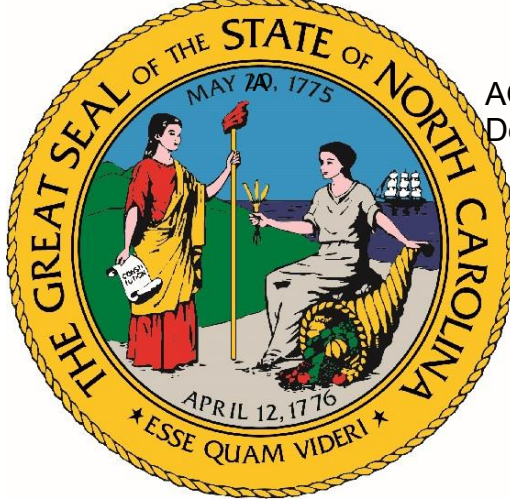
Annual Report

An Annual Groundwater Monitoring and Corrective Action Report will be prepared and placed into the operating record by January 31, 2018 for existing CCR landfills and CCR surface impoundments and annually thereafter, as required by 257.90(e). For new CCR units, this annual report is to be completed and placed into the operating record by January 31 of the following year after the groundwater monitoring system has been established. The annual report must also be posted to the public internet site within 30 days of placing in the operating record.

The annual report must describe the groundwater monitoring activities conducted, key actions, problem resolutions, and plans for the upcoming year. The minimum information required to be included in the annual report, if it is available, is found in 40 CFR 257.90(e). Some of these report elements include a figure showing the CCR unit and the surrounding monitoring well network, new or abandoned wells, a summary of the groundwater data, and the status of the groundwater monitoring program.

REFERENCES:

- [1] Federal Register, 2015. 40 CFR 257 Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, published in 80 FR 21302 – 21501, April 17, 2015.
- [2] Federal Register, 2015. 40 CFR 257 Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments, published in 80 FR 21400, April 17, 2015.
- [3] USEPA Region IV, *Field Branches Quality System and Technical Procedures*, January 2012.
- [4] USEPA, Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, EPA 530/R-09-007, March 2009.



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DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Allen Steam Station

April 1, 2019



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination Allen Steam Station^{/A}

Executive Summary

The Coal Ash Management Act (CAMA) establishes criteria for the closure of coal combustion residuals (CCR) surface impoundments. The CCR surface impoundments located at Duke Energy Carolinas, LLC's (Duke Energy) Allen Steam Station (Allen) in Gaston County, NC have received a low-risk classification. Therefore, according to N.C. Gen. Stat. § 130A-309.214(a)(3), the closure option for CCR surface impoundments is at the election of the North Carolina Department of Environmental Quality (DEQ). CAMA provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C].

In preparing to make its election, DEQ requested information from Duke Energy related to closure options. By November 15, 2018, Duke Energy provided the following options for consideration: closure in place, full excavation, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundments. DEQ held a public information session on January 29, 2019 in Belmont, NC where the community near Allen had the opportunity to learn about options for closing coal ash CCR surface impoundments and to express their views about proposed criteria to guide DEQ's coal ash closure decision making process. To evaluate the closure options, the Department considered environmental data gathered as part of the site investigation, permit requirements, ambient monitoring, groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the CCR surface impoundments at the Allen facility in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from unlined CCR surface impoundments at Allen is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

Duke Energy will be required to submit a final Closure Plan for the CCR surface impoundments at Allen by August 1, 2019. The Closure Plan must conform to this election by DEQ.

DEQ has evaluated the closure options submitted by Duke Energy for the two CCR surface impoundments at the Allen Steam Station. This document describes the CAMA requirements for closure of coal ash CCR surface impoundments, the DEQ evaluation process to make an election under CAMA for the subject CCR surface impoundments at the Allen site, and the election by DEQ for the final closure option.

II. Site History

Duke Energy owns and operates the Allen Steam Station which is located along the west shore of Lake Wylie, a man-made reservoir created by the impoundment of the Catawba River. Allen is a five-unit, 1,140 megawatts, coal-fired generating facility. Allen began commercial operation in 1957 with units 1 and 2. Unit 3 began operation in 1959, unit 4 in 1960, and unit 5 in 1961. Allen historically wet sluiced CCR into two CCR surface impoundments located on the property. These CCR surface impoundments are known as the Retired Ash Basin (RAB) which is also referred to as the Inactive Ash Basin (IAB), and the Active Ash Basin (AAB), which are impounded by the following dams: Retired Ash Basin (GASTO-016) and Active Ash Basin (GASTO-061).

The RAB received CCR products from initial operation in 1957 until 1973, when it reached capacity and was retired. Duke Energy then commissioned the AAB and began wet sluicing CCR products into this new basin. In 2009, Duke Energy replaced its fly ash wet sluicing operation with a dry ash handling system and began placing dry fly ash into a landfill constructed over a portion of the RAB (Permit No. 36- 12). Duke Energy currently wet sluices only bottom ash into the AAB and this operation will cease once the dry bottom ash system becomes operational, which is scheduled to occur in early 2019. The two CCR surface impoundments are subject to the CAMA closure requirements in N.C. Gen. Stat. § 130A-309.214(a)(3).

III. CAMA Closure Requirements

CAMA establishes closure requirements for CCR surface impoundments. The General Assembly has mandated that DEQ “shall review a proposed Coal Combustion Residuals Surface Impoundment Closure Plan for consistency with the minimum requirements set forth in subsection (a) of this section and whether the proposed Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and otherwise complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(b). Similarly, the General Assembly has required that DEQ “shall disapprove a proposed Coal Combustion Residuals Surface Impoundment Closure Plan unless the Department finds that the Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and other complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(c).

CAMA requires DEQ to review any proposed Closure Plan for consistency with the requirements of N.C. Gen. Stat. § 130A-309.214(a). See N.C. Gen. Stat. § 130A-309.214(b). DEQ must disapprove any proposed Closure Plan that DEQ finds does not meet these requirements. See N.C. Gen. Stat. § 130A-309.214(c). Therefore, an approvable Closure Plan must, at a minimum, meet the requirements of N.C. Gen. Stat. § 130A-309.214(a).

Pursuant to N.C. Gen. Stat. § 130A-309.213(d)(1), DEQ has classified the CCR surface impoundments at Allen as low-risk. The relevant closure requirements for low-risk CCR surface impoundments are in N.C. Gen. Stat. § 130A-309.214(a)(3), which states the following:

- Low-risk impoundments shall be closed as soon as practicable, but no later than December 31, 2029;
- A proposed closure plan for a low-risk impoundment must be submitted as soon as practicable, but no later than December 31, 2019; and
- At a minimum, impoundments located in whole above the seasonal high groundwater table shall be dewatered and impoundments located in whole or in part beneath the seasonal high groundwater table shall be dewatered to the maximum extent practicable.

In addition, N.C. Gen. Stat. § 130A-309.214(a)(3) requires compliance with specific closure criteria set forth verbatim below in Table 1. The statute provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C]. For each low-risk impoundment, the choice of the closure pathway in CAMA is at the “election of the Department.”

Table 1: CAMA Closure Options for Low-Risk CCR Surface Impoundments
N.C. Gen. Stat. § ~~130A~~-309.214(a)(3)

At the election of the Department, the owner of an impoundment shall either:

- a. Close in any manner allowed pursuant to subdivision (1) of this subsection; [CAMA Option A]
- b. Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall install and maintain a cap system that is designed to minimize infiltration and erosion in conformance with the requirements of Section .1624 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, and, at a minimum, shall be designed and constructed to (i) have a permeability no greater than 1×10^{-5} centimeters per second; (ii) minimize infiltration by the use of a low-permeability barrier that contains a minimum 18 inches of earthen material; and (iii) minimize erosion of the cap system and protect the low-permeability barrier from root penetration by use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth. In addition, the owner of an impoundment shall (i) install and maintain a groundwater monitoring system; (ii) establish financial assurance that will ensure that sufficient funds are available for closure pursuant to this subdivision, post-closure maintenance and monitoring, any corrective action that the Department may require, and satisfy any potential liability for sudden and nonsudden accidental occurrences arising from the impoundment and subsequent costs incurred by the Department in response to an incident, even if the owner becomes insolvent or ceases to reside, be incorporated, do business, or maintain assets in the State; and (iii) conduct post-closure care for a period of 30 years, which period may be increased by the Department upon a determination that a longer period is necessary to protect public health, safety, welfare; the environment; and natural resources, or decreased upon a determination that a shorter period is sufficient to protect public health, safety, welfare; the environment; and natural resources. The Department may require implementation of any other measure it deems necessary to protect public health, safety, and welfare; the environment; and natural resources, including imposition of institutional controls that are sufficient to protect public health, safety, and welfare; the environment; and natural resources. The Department may not approve closure for an impoundment pursuant to sub-subdivision b. of subdivision (3) of this subsection unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment; [CAMA Option B] or
- c. Comply with the closure requirements established by the United States Environmental Protection Agency as provided in 40 CFR Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities." [CAMA Option C]

By referencing the closure options for *high-risk* CCR surface impoundments in “subdivision (1)” or N.C. Gen. Stat. § 130A-309.214(a)(1), CAMA allows for closure of a *low-risk* CCR surface impoundment in N.C. Gen. Stat. § 130A-309.214(a)(3) through the same removal scenarios:

- “Convert the coal combustion residuals impoundment to an industrial landfill by removing all coal combustion residuals and contaminated soil from the impoundment temporarily, safely storing the residuals on-site, and complying with the requirements for such landfills.” N.C. Gen. Stat. § 130A-309.214(a)(1)a.; or
- “Remove all coal combustion residuals from the impoundment, return the former impoundment to a nonerosive and stable condition and (i) transfer the coal combustion residuals for disposal in a coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill or (ii) use the coal combustion products in a structural fill or other beneficial use as allowed by law.” N.C. Gen. Stat. § 130A-309.214(a)(1)b.

IV. DEQ Election Process

Beginning with a letter to Duke Energy on October 8, 2018, DEQ began planning for a thorough evaluation of the closure options for low-risk CCR surface impoundments before making an election as outlined in Table 1 above. DEQ’s objectives were to receive input on closure options from Duke Energy and to engage with community members near low-risk sites. DEQ outlined the following schedule in the October 8, 2018 letter:

- November 15, 2018 – Duke Energy submittal of revised closure option analyses and related information
- January 29, 2019 – DEQ public meeting near Allen
- April 1, 2019 – DEQ evaluation of closure options
- August 1, 2019 – Duke Energy submittal of closure plan
- December 1, 2019 – Duke Energy submittal of updated corrective action plan for all sources at the Allen site that are either CCR surface impoundments or hydrologically connected to CCR surface impoundments

DEQ received the requested information from Duke Energy by November 15, 2018: closure options analysis, groundwater modeling and net environmental benefits assessment. These materials are posted on the DEQ website. Duke Energy provided the following options for consideration: closure in place, full excavation with either an onsite or offsite landfill, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundment.

In preparing to make its election of the closure option, DEQ considered environmental data contained in the comprehensive site assessment, permit requirements, ambient monitoring, closure options analysis and groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements. The Allen site has extensive amounts of data that have been collected during the site assessment process, and these data were used as part of the evaluation of closure options. DEQ’s evaluation of closure in place and hybrid option based on groundwater monitoring and modeling data is provided in Attachment A. That analysis

demonstrates that the contaminated plume is already beyond the compliance boundary for the site. All of these references are part of the record supporting DEQ's determination.

DEQ conducted a public meeting in Belmont, NC near Allen on January 29, 2019. There were 116 members of the public who attended the meeting. Approximately 1090 comments were received during the comment period, which closed on February 15, 2019. The majority of commenters requested that the coal ash be removed from the CCR surface impoundments and moved to dry lined storage away from waterways and groundwater. Only one commenter specifically requested closure-in-place. No commenters directly addressed the hybrid option. A review and response to comments are included in Attachment B.

V. DEQ Evaluation of Closure Options

DEQ has evaluated the closure options proposed by Duke Energy for the CCR surface impoundments at the Allen facility. The purpose of this evaluation was to determine which closure option or options may be incorporated into an approvable Closure Plan under CAMA.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin and the Retired Ash Basin at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from unlined CCR surface impoundments at Allen is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

DEQ does not elect CAMA Option B for the CCR surface impoundments at Allen. In N.C. Gen. Stat. § 130A-309.214(a)(3)b, the General Assembly mandated that "[t]he Department may not approve closure for an impoundment pursuant to [this] sub-subdivision . . . unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment." N.C. Gen. Stat. § 130A-309.214(a)(3)b. In light of these requirements and based on DEQ's review of the information provided by Duke Energy as well as DEQ's independent analysis, DEQ does not believe that Duke Energy can incorporate CAMA Option B into an approvable Closure Plan for Allen.

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether upon full implementation of the closure plan the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary. To address this question, DEQ considered the current state of the groundwater contamination and reviewed the results of the groundwater modeling submitted by Duke Energy. The evaluation is provided in Attachment A. DEQ's overall conclusion is that

based on the current geographic scope and vertical extent of the groundwater contamination plume, and the modeled extent of the plume. In the future, DEQ does not believe these two closure options can meet the requirements of CAMA Option B for the CCR surface impoundments at Allen.

DEQ does not elect CAMA Option C (i.e., closure under the federal CCR Rules found in 40 CFR Part 257) for the CCR surface impoundments at Allen. DEQ has determined that:

- a. Under the facts and circumstances here, CAMA Option C is less stringent than CAMA Option A. Specifically, DEQ's election of Option A would also require Duke Energy to meet the requirements of the federal CCR Rule (i.e., CAMA Option C) but election of CAMA Option C would not require implementation of CAMA Option A.
- b. Because CAMA Option A adds additional requirements or performance criteria beyond Option C, it advances DEQ's duty to protect the environment (see N.C. Gen. Stat. §§ 279B-2 & 143-211) and the General Assembly's mandate under CAMA that DEQ ensure that any Closure Plan, which must incorporate an approvable closure option, is protective of public health, safety, and welfare, the environment, and natural resources (see N.C. Gen. Stat. § 130A-309.214(b) & (c)).
- c. For the CCR surface impoundments for which the closure option(s) must be determined, CAMA Option A provides a better CAMA mechanism for ensuring State regulatory oversight of the closure process than Option C, as well as greater transparency and accountability.
- d. While the federal CCR Rule was written to provide national minimum criteria for CCR surface impoundments across the country, CAMA was written specifically to address the CCR surface impoundments in North Carolina.
- e. While the federal CCR Rule allows CCR surface impoundment owners to select closure either by removal and decontamination (clean closure) or with a final cover system (cap in place), EPA anticipates that most owners will select closure through the less protective method of cap in place.
- f. There is considerable uncertainty regarding the status and proper interpretation of relevant provisions of the federal CCR Rule. For instance, EPA is reconsidering portions of the federal CCR Rule. Also, the performance standards in 40 CFR 257.102(d) for cap in place closure are the subject of conflicting interpretations (and possible litigation) among industry and state authorities.

VI. Conclusion

The final closure plan is due on August 1, 2019 in accordance with this determination. Based on DEQ's evaluation of the options submitted by Duke Energy, DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin and the Retired Ash Basin at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

While beneficiation is not a requirement of the closure plan, DEQ encourages Duke Energy to consider opportunities for beneficiation of coal ash that would convert coal combustion residuals into a useful and safe product.

ATTACHMENT A

/A

**DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON
GROUNDWATER MONITORING AND MODELING DATA**

DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON GROUNDWATER MONITORING AND MODELING DATA

I. Groundwater Monitoring Summary

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary upon full implementation of the closure plan. Significantly, the contaminated groundwater plume has already extended beyond the compliance boundary in a portion of the CCR surface impoundment. The inferred general extent of groundwater impacts above applicable Background Threshold Values or 2L Standards are shown on Figure ES-1. Additional monitoring and hydrogeological data is available in the Allen Steam Station January 2018 CSA Update Report (available on the DEQ website).

Based on review of data submitted to date in various reports, both soil and groundwater have been impacted by CCR handling activities at the site. Groundwater within the area of the impoundment generally flows from west to east and discharges to the Catawba River (Lake Wylie). Boron concentrations above 2L Standards approximates the leading edge of the CCR plume at the site. Almost all constituents of interest (COIs) are present in the shallow flow layer. The horizontal extent of those COIs are generally within the footprint of the boron plume.

The vertical extent of most COIs is within the shallow and transition flow layers. However, data suggests the bedrock flow layer has been impacted by CCR handling activities at the site. Manganese and strontium concentrations are fairly widespread in the bedrock flow layer. There are isolated occurrences of boron, cobalt, iron, and molybdenum within and downgradient of the ash basins.

DEQ concludes that the contaminated groundwater plume has extended beyond the compliance boundary along the eastern edge of the property on the shore of Lake Wylie. Based on Figure ES-1, this plume extends along the entire length of the RAB and AAB.

II. Groundwater Cross-section Modeling

DEQ evaluated cross-sections of the groundwater modeling results provided by Duke Energy to determine whether Duke Energy's final closure *Option 1: Closure-in-Place* and *Option 2: Hybrid* would meet the criteria of CAMA Option B. DEQ considered whether the proposed closure option would prevent any post closure exceedances of the 2L groundwater quality standards at the compliance boundary upon full closure implementation. Cross sections A-A' and B-B' were evaluated and can be seen in the figures below. These cross sections represent where the boron concentration above the 2L standard of 700 µg/L has crossed the compliance boundary based on groundwater monitoring and modeling.

Next, the model results were evaluated based on the following model simulations:

- current conditions in 2017 when the model was calibrated based on raw field data^{/A}
- upon completion of the final closure-in-place cover system at t=0 years
- closure-in-place option at t=120 years
- upon completion of the hybrid option at t=0 years
- hybrid option at t=120 years

The tables below summarize the results from the model simulations. The boron concentrations depicted in each table represent the maximum boron concentration in any layer (ash, saprolite, transition zone, and bedrock) of the model. The 4,300-foot wide contamination plume depicted in the table spans the entire length of both ash basins, the retired ash basin and active ash basin. The cross sections are cut along the active ash basin dam (A-A' along the northern portion and B-B' along the southern portion).

Allen Modeling Results for Cross-Section A-A'			
Model Simulation	Maximum Concentration of Boron Above 2L (ug/L) Beyond Compliance Boundary	Depth of GW Contamination Above 2L (feet bgs) Beyond Compliance Boundary	Width of Contamination Plume (feet) Beyond Compliance Boundary
Current Conditions	700-4,000	120	4300
Completion of Final Cover (t=0 yrs)	700-4,000	20	4300
Final Cover (t=120 yrs)	700-4,000	70	2000
Completion of Hybrid (t=0 yrs)	700-4,000	140	4300
Hybrid (t=120 yrs)	700-4,000	95	2400

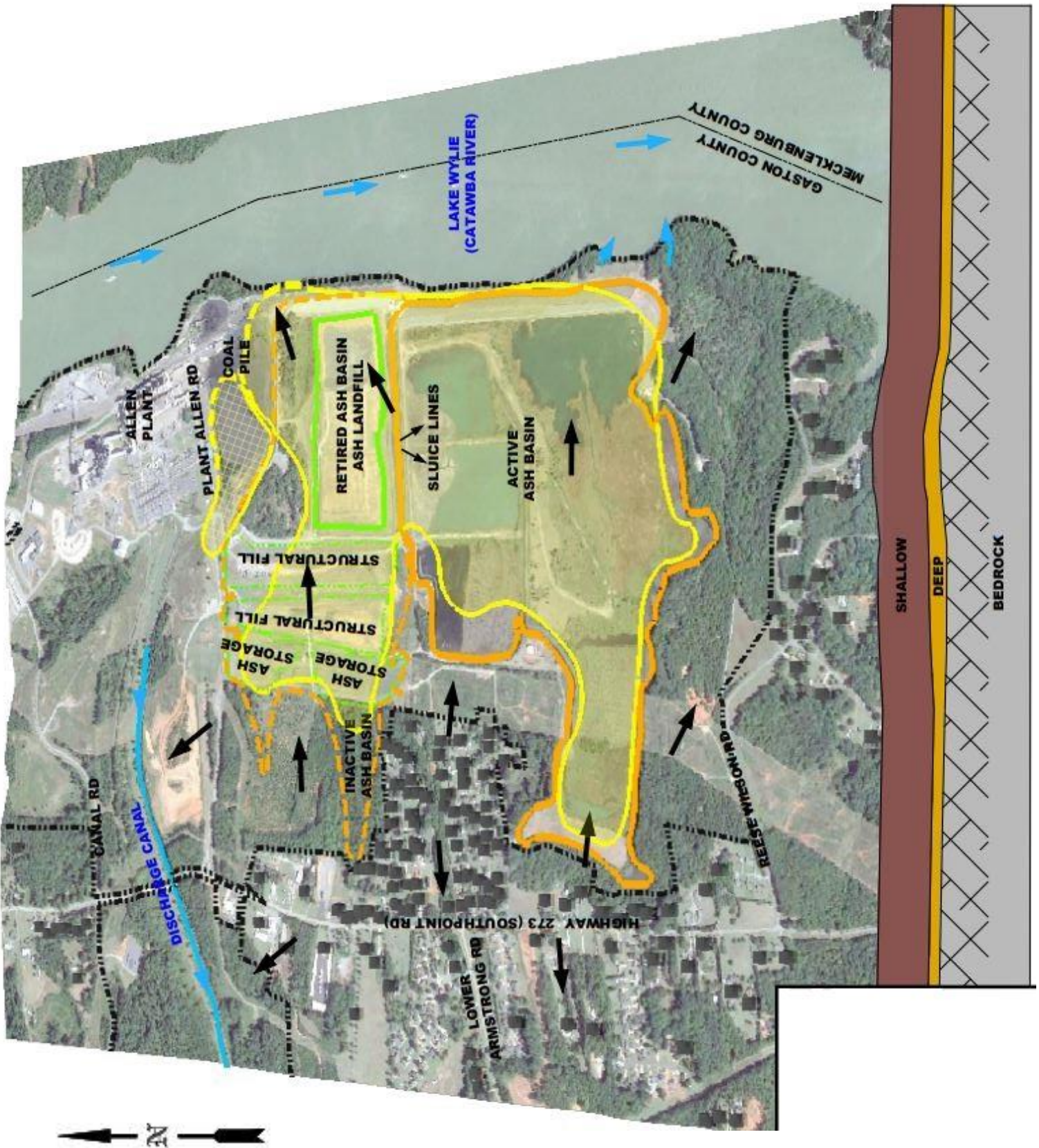
bgs – below ground surface

//A









Allen Modeling Results for Cross-Section B-B'			
Model Simulation	Concentration of Boron Above 2L (ug/L) Beyond Compliance Boundary	Depth of GW Contamination Above 2L (feet bgs) Beyond Compliance Boundary	Width of Contamination Plume (feet) Beyond Compliance Boundary
Current Conditions	700-4,000	95	4300
Completion of Final Cover (t=0 yrs)	700-4,000	100	4300
Final Cover (t=120 yrs)	700-4,000	85	250
Completion of Hybrid (t=0 yrs)	700-4,000	155	4300
Hybrid (t=120 yrs)	700-4,000	85	2400

These data illustrate that after completion of closure with the final cover or hybrid option, the groundwater plume still extends beyond the compliance boundary above the 2L groundwater standard and the area of the plume requiring remediation is immense. Even 120 years beyond completion of closure, the area of the plume requiring remediation remains extensive.

DEQ recognizes that there are no groundwater remediation corrective actions included in the groundwater modeling simulations submitted to DEQ as part of Duke Energy's closure options analysis documentation. However, based on the current geographic scope, vertical extent of the groundwater contamination plume, and future modeled extent of the plume, DEQ does not believe these two closure options can meet the requirements of CAMA Option B.



LEGEND

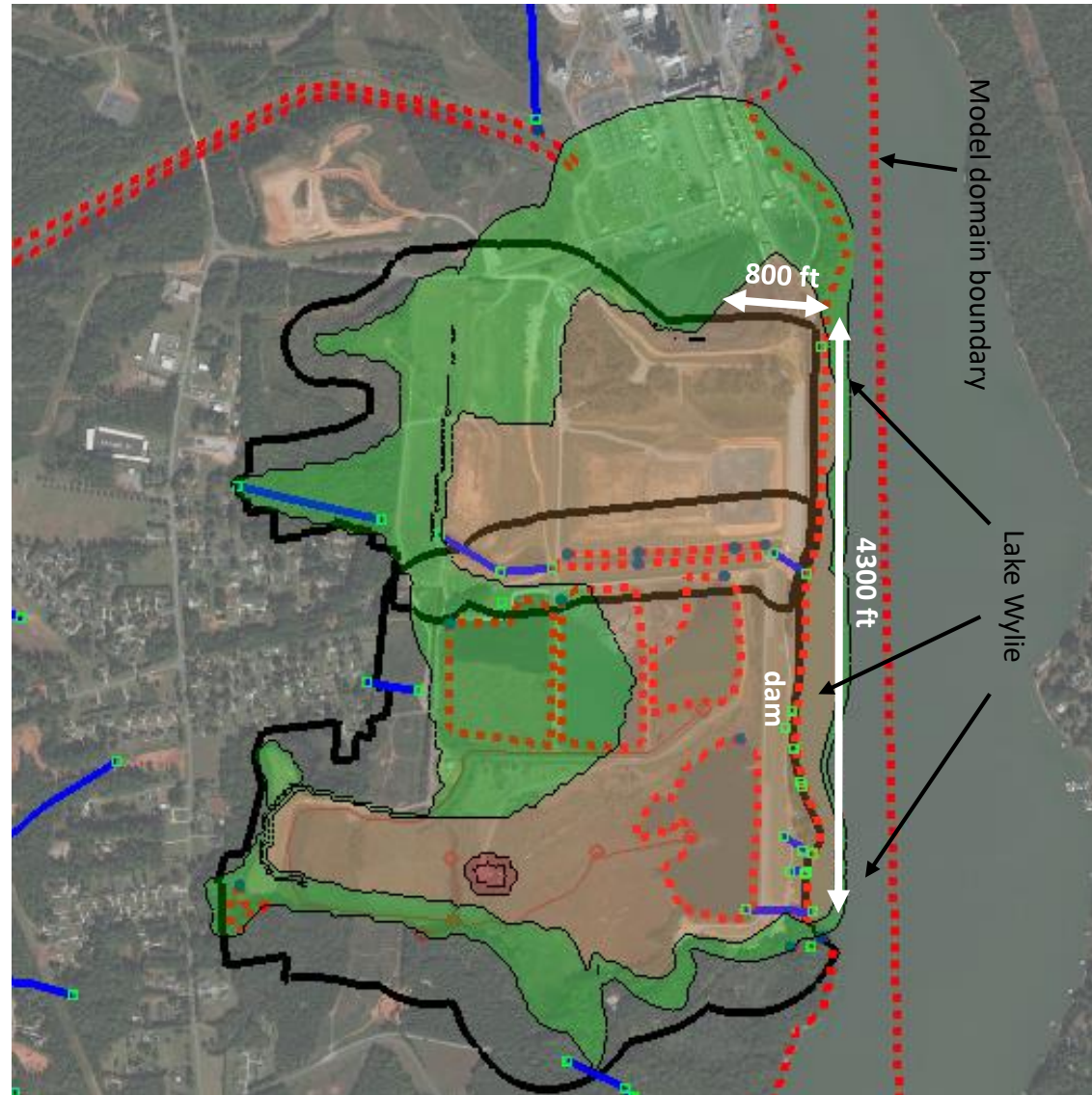
-  AREA OF CONCENTRATION IN GROUNDWATER ABOVE NC2L (SEE NOTE 5)
-  AREA OF CONCENTRATION IN GROUNDWATER ABOVE NC2L POTENTIALLY ATTRIBUTABLE TO THE COAL PILE (SEE NOTE 6)
-  ASH BASIN WASTE BOUNDARY
-  APPROXIMATE LANDFILL WASTE BOUNDARY
-  GENERALIZED GROUNDWATER FLOW DIRECTION
-  WATER SUPPLY WELL LOCATION
-  STREAM WITH FLOW DIRECTION
-  DUKE ENERGY PROPERTY BOUNDARY

NOTE:

1. OCTOBER, 2016 AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON DECEMBER 7, 2017. AERIAL DATED OCTOBER 8, 2016.
2. STREAMS OBTAINED FROM AMEC FOSTER WHEELER NRTR, MAY 2015.
3. GENERALIZED GROUNDWATER FLOW DIRECTION BASED ON SEPTEMBER 11, 2017 WATER LEVEL DATA.
4. PROPERTY BOUNDARY PROVIDED BY DUKE ENERGY.
5. GENERALIZED AREAL EXTENT OF MIGRATION REPRESENTED BY NCAC 02L EXCEEDANCES OF MULTIPLE CONSTITUENTS (BORON AND ARSENIC) IN MULTIPLE FLOW ZONES.
6. GENERALIZED AREAL EXTENT OF MIGRATION REPRESENTED BY NCAC 02L EXCEEDANCES OF MULTIPLE CONSTITUENTS (BERYLLIUM, NICKEL, SULFATE, AND THALLIUM) IN MULTIPLE FLOW ZONES. A SEPARATE ASSESSMENT IS PLANNED FOR THE COAL PILE AREA.

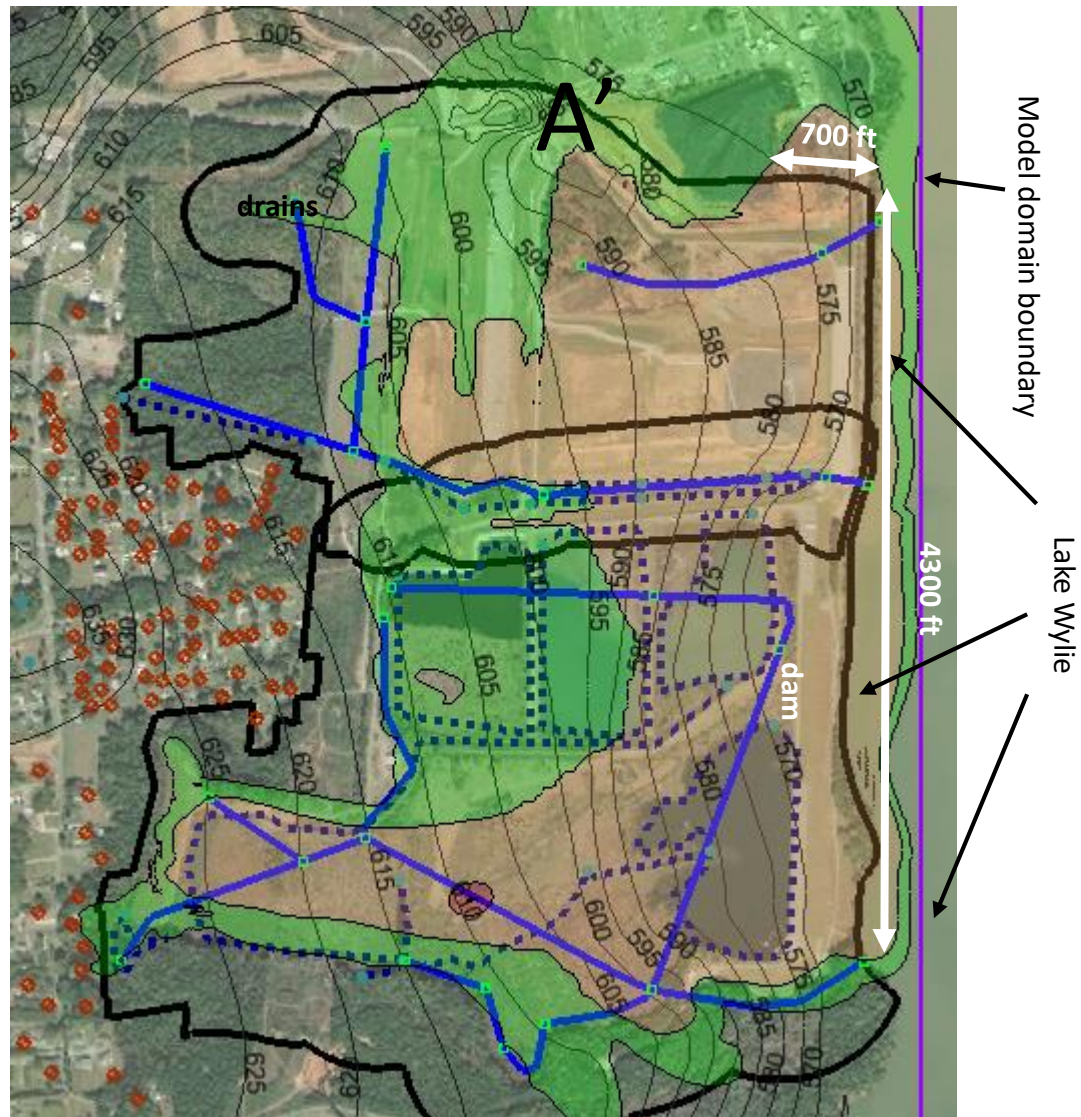
ALLEN **CURRENT CONDITIONS IN 2018**

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000^{/A}



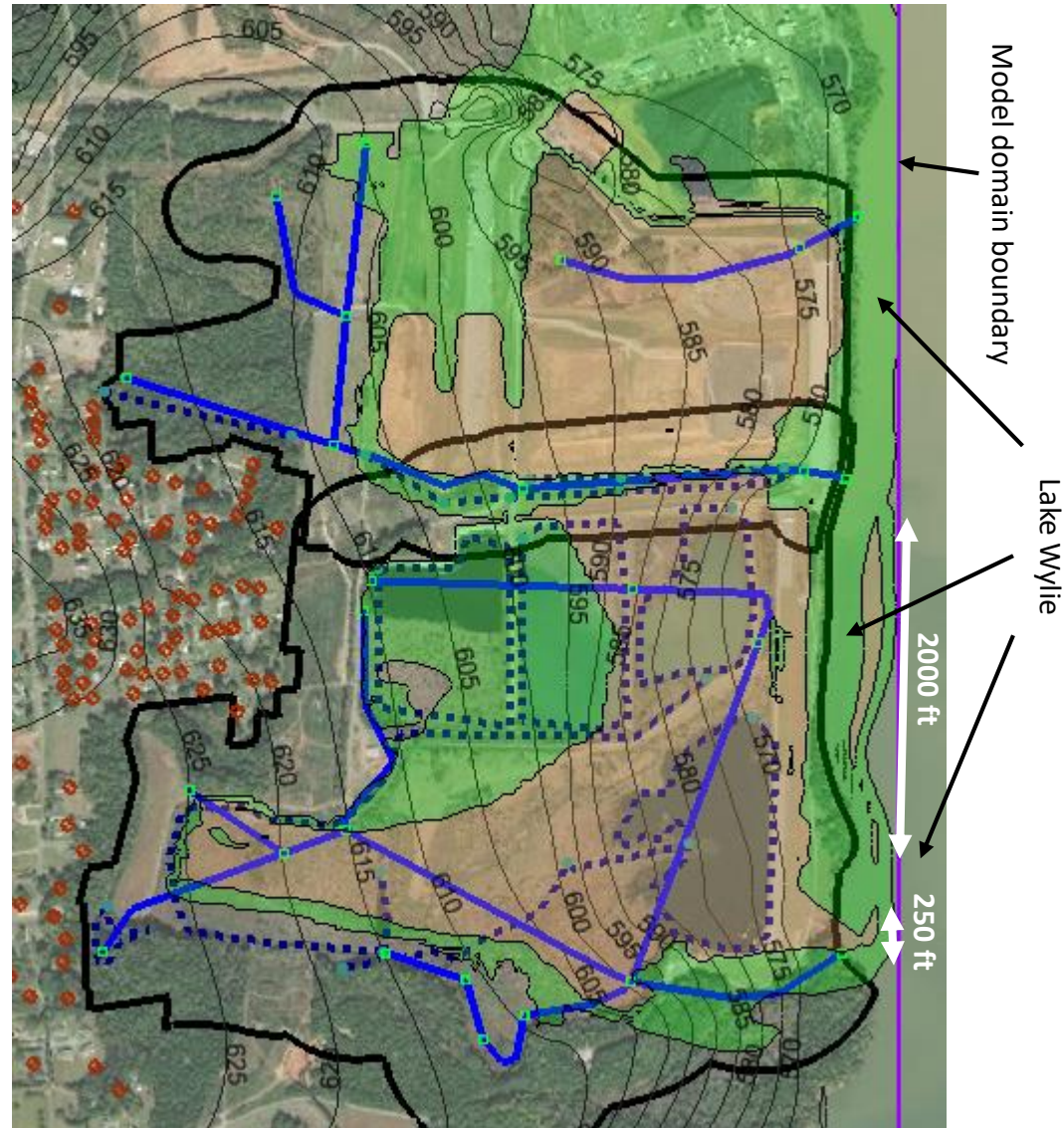
ALLEN **UPON COMPLETION OF FINAL COVER IN 2030, $t = 0$**

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



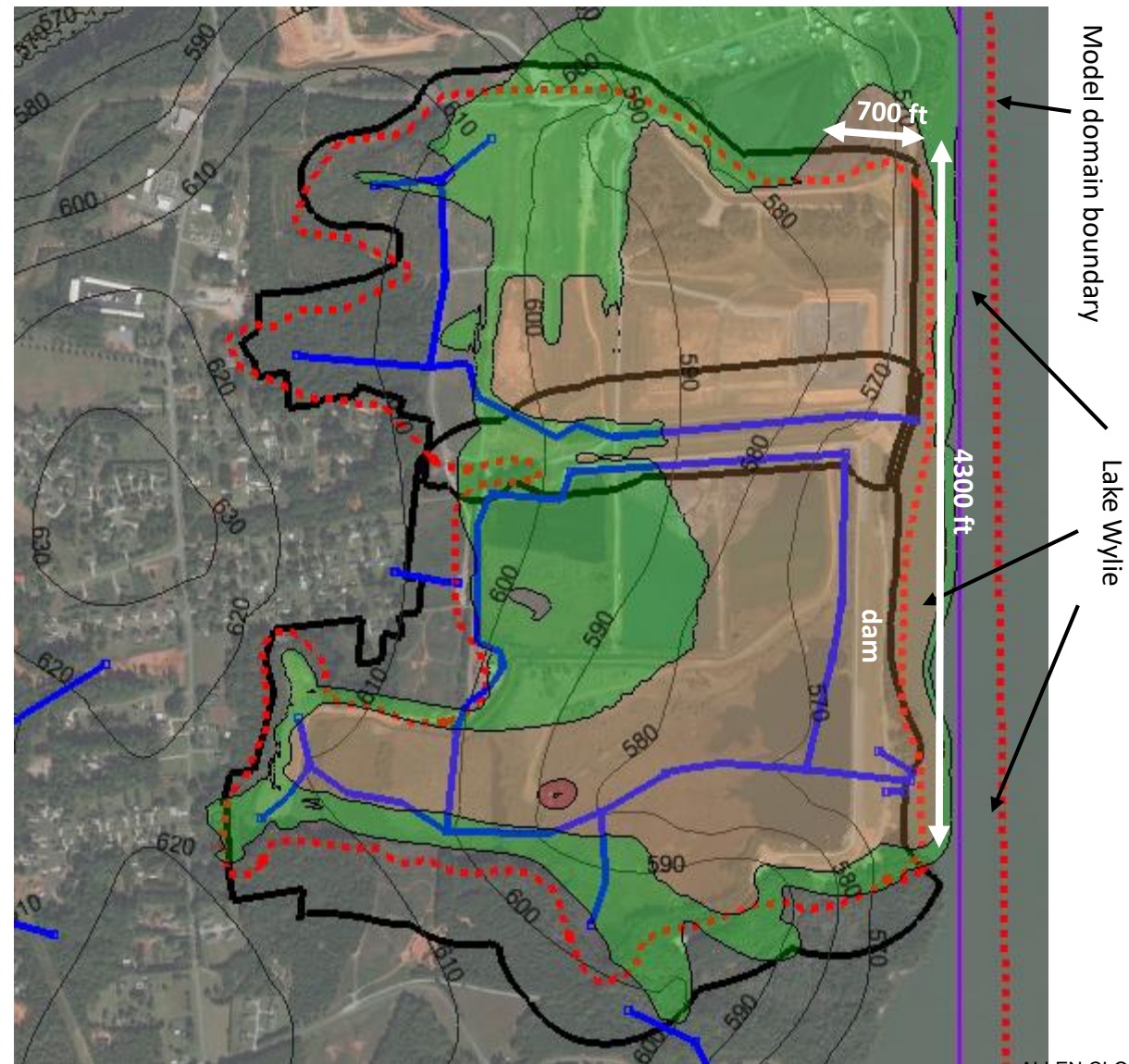
ALLEN **FINAL COVER IN 2150, t = 120 years**

MAX BORON ANY LAYER ^{/A} green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



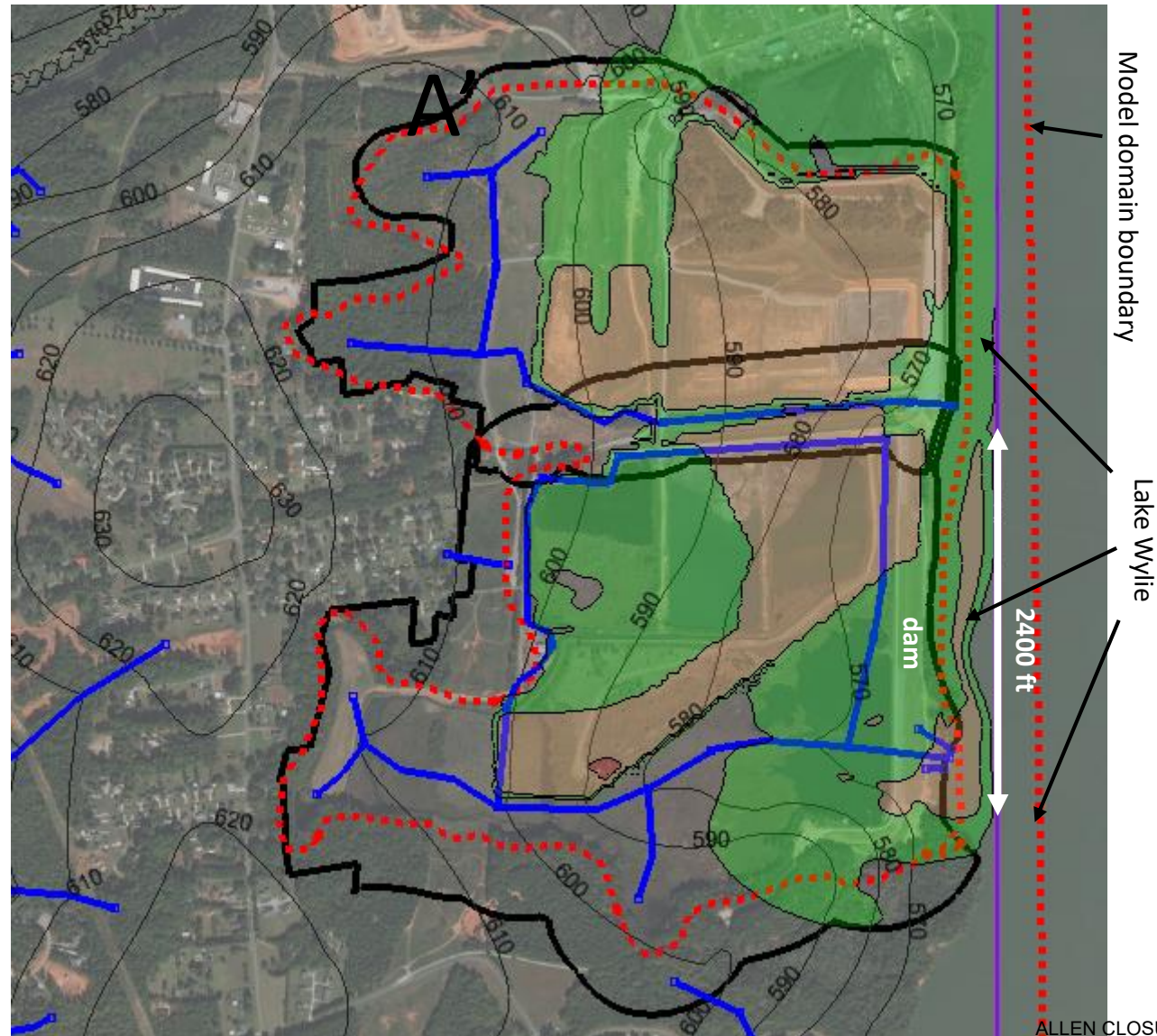
ALLEN **UPON COMPLETION OF HYBRID IN 2030, t = 0**

MAX BORON ANY LAYER mg/kg green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



ALLEN **HYBRID IN 2150, t = 120 years**

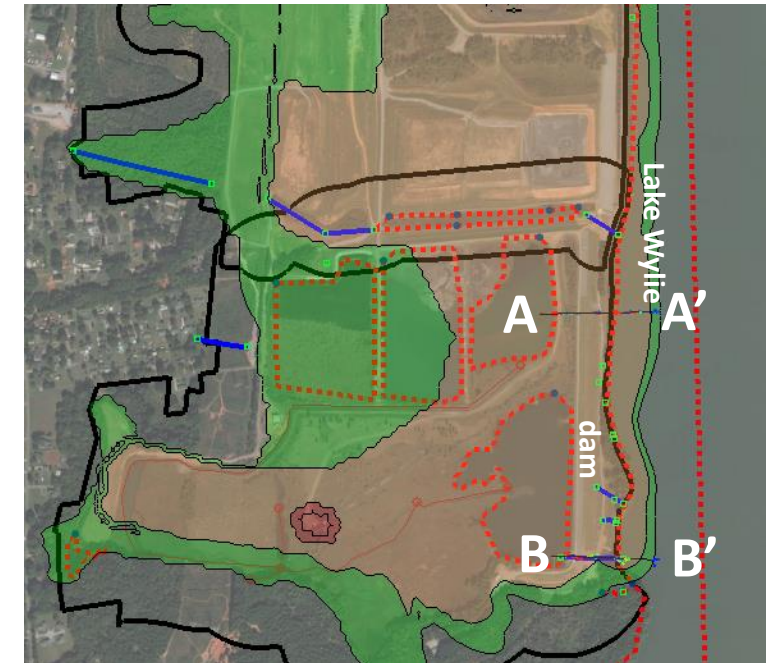
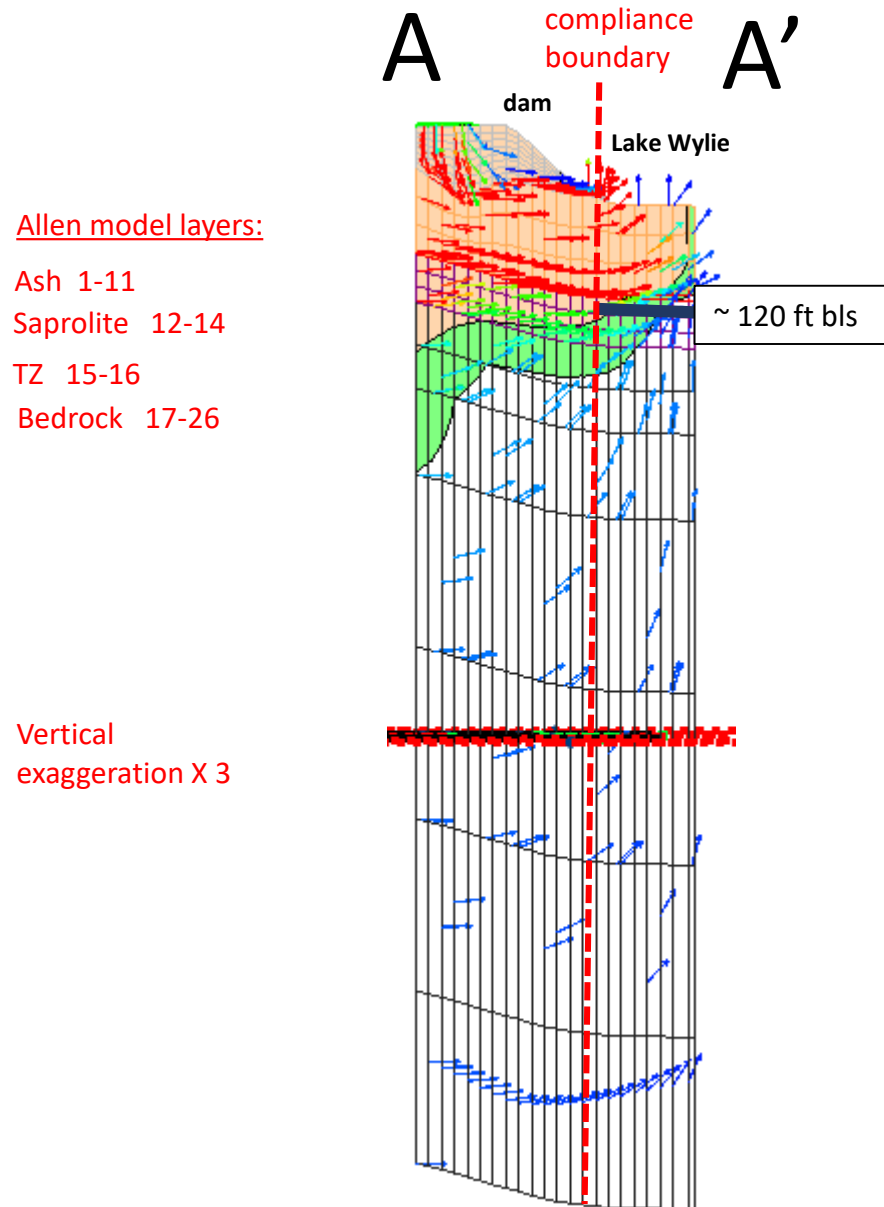
MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



ALLEN **CURRENT CONDITIONS IN 2018**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



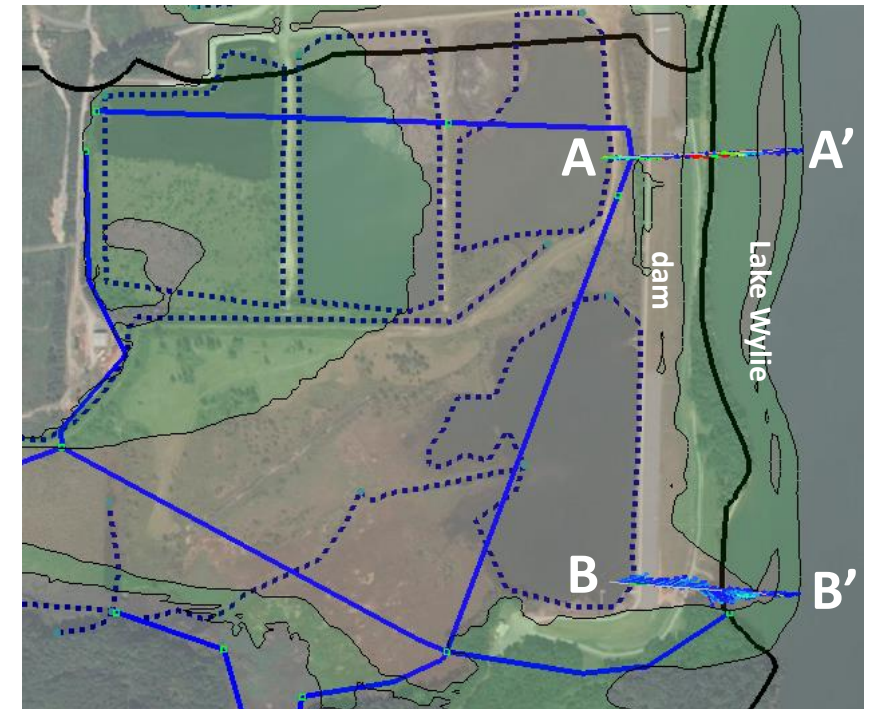
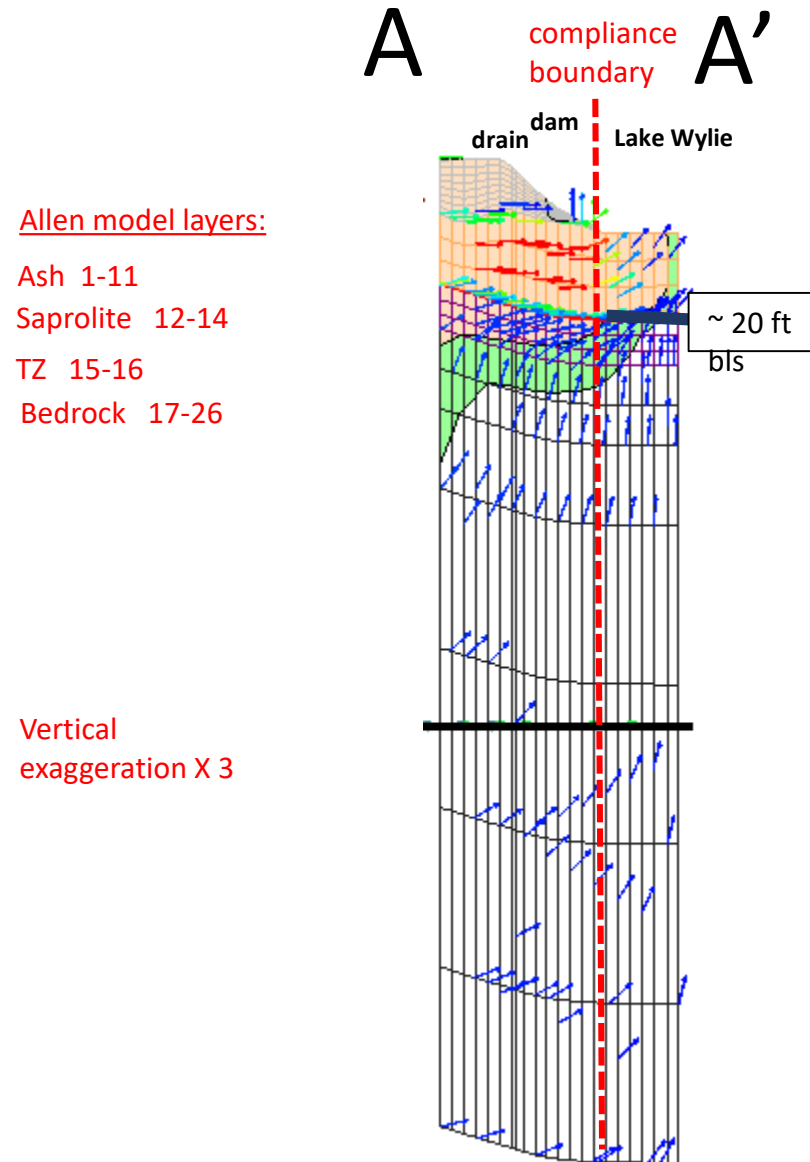
A-A' ~820 ft

B-B' ~730 ft

ALLEN **UPON COMPLETION OF FINAL COVER IN 2030, $t = 0$**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



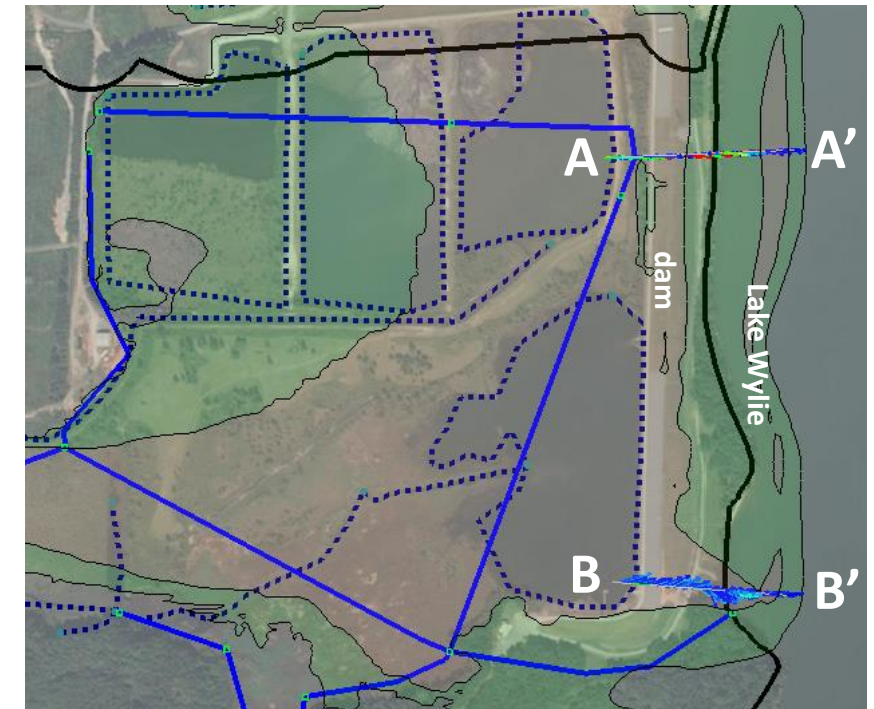
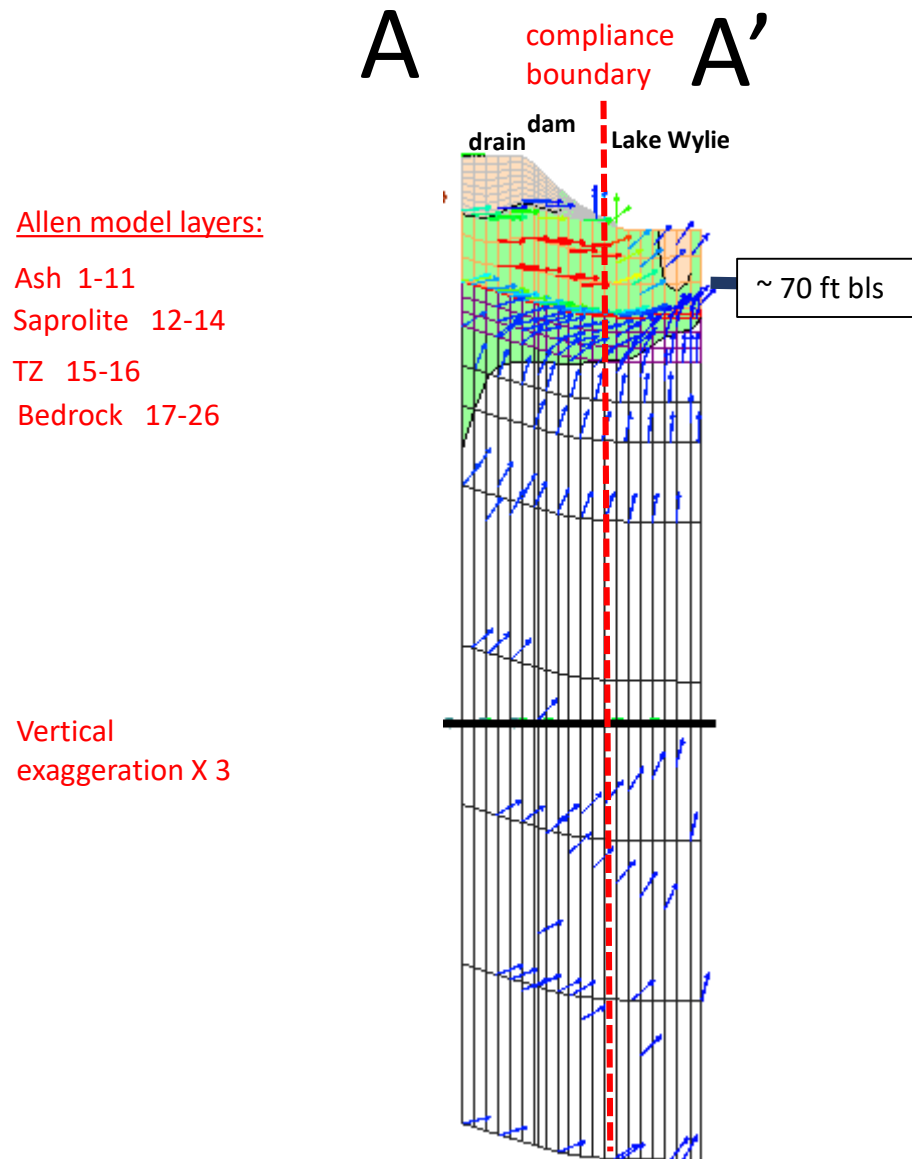
A-A' ~820 ft

B-B' ~730 ft

ALLEN **FINAL COVER IN 2150, t = 120 years**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



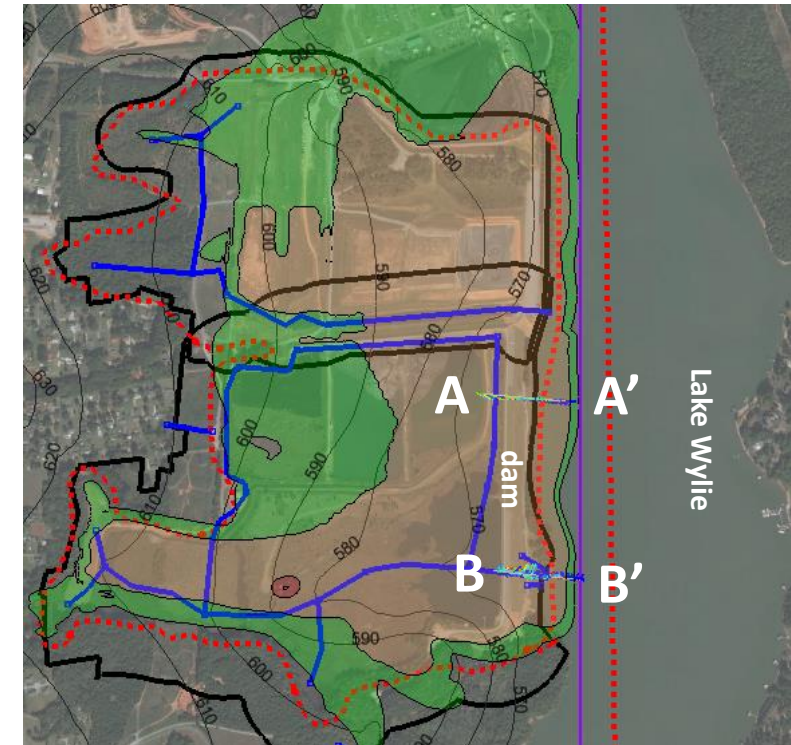
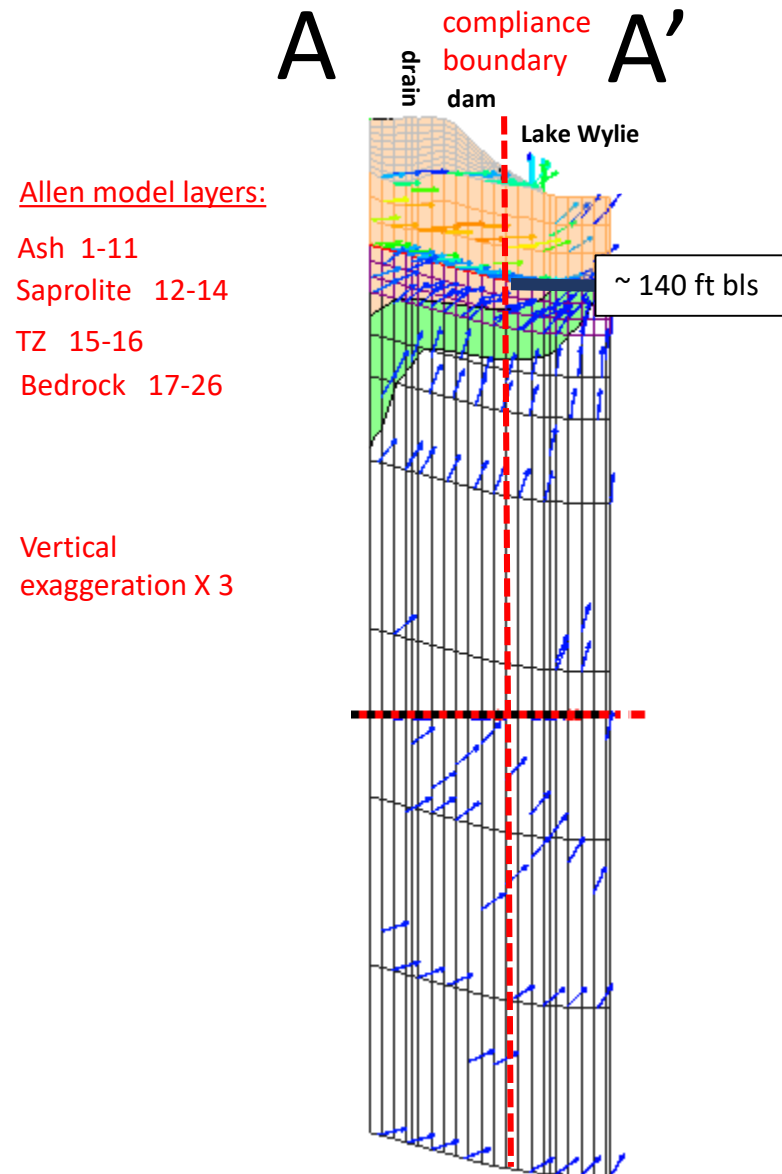
A-A' ~820 ft

B-B' ~730 ft

ALLEN **UPON COMPLETION OF HYBRID COVER IN 2030, $t = 0$**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



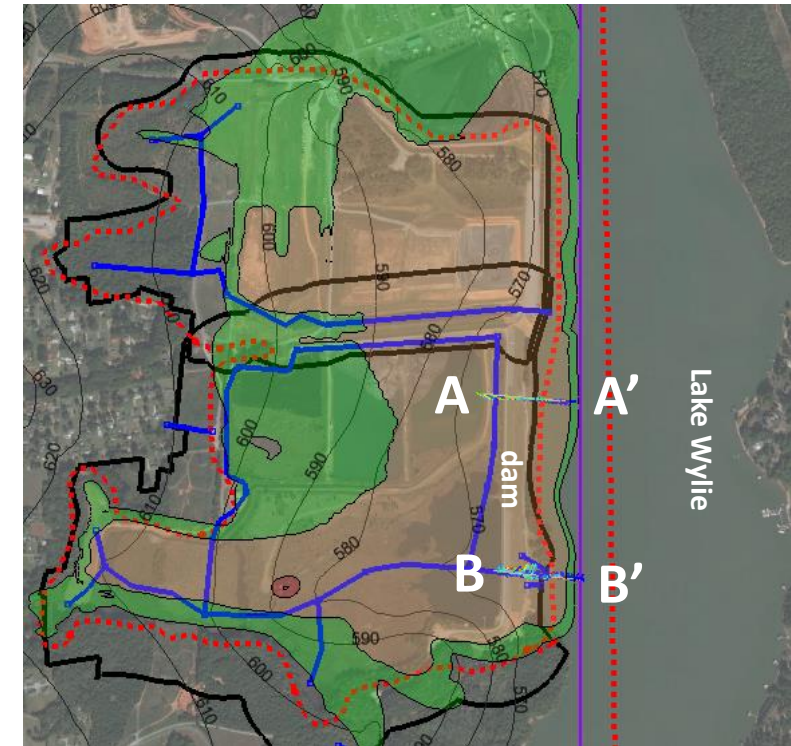
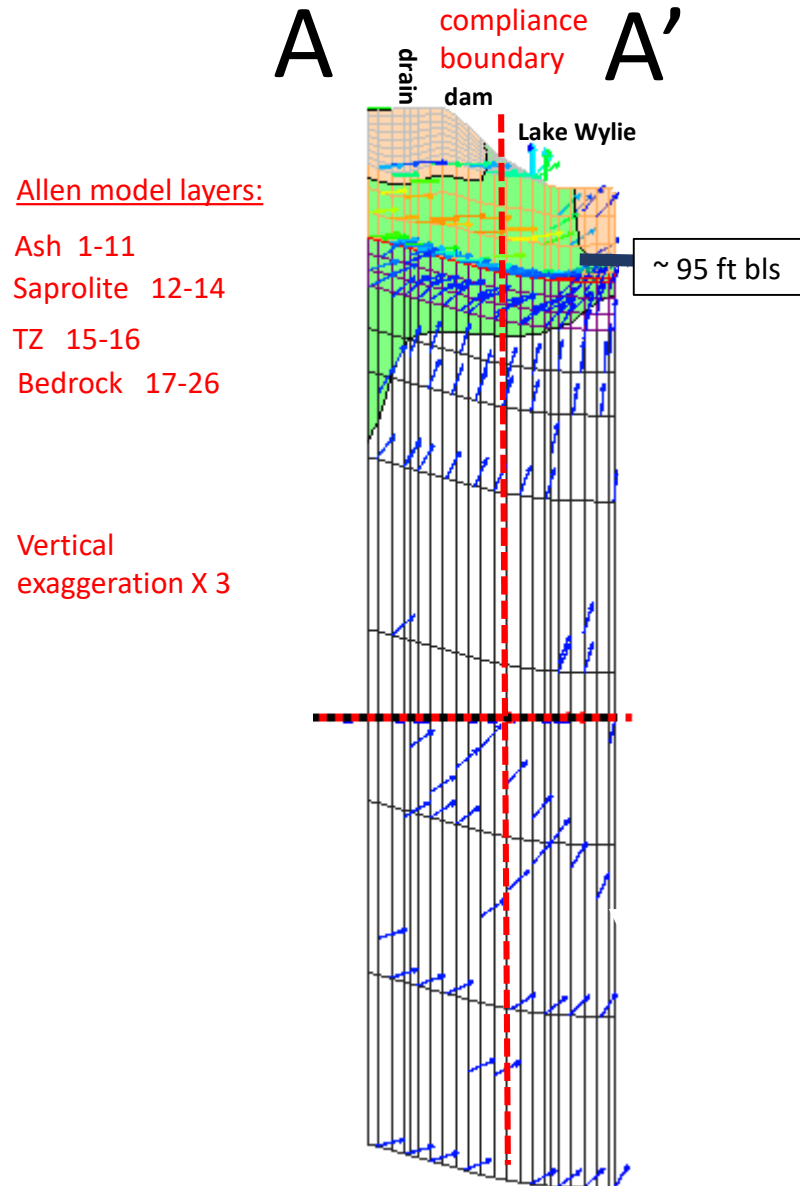
A-A' ~820 ft

B-B' ~730 ft

ALLEN **HYBRID IN 2150, t = 120 years**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



A-A' ~820 ft

B-B' ~730 ft

ALLEN **CURRENT CONDITIONS IN 2018**

CROSS SECTION B-B' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Allen model layers:

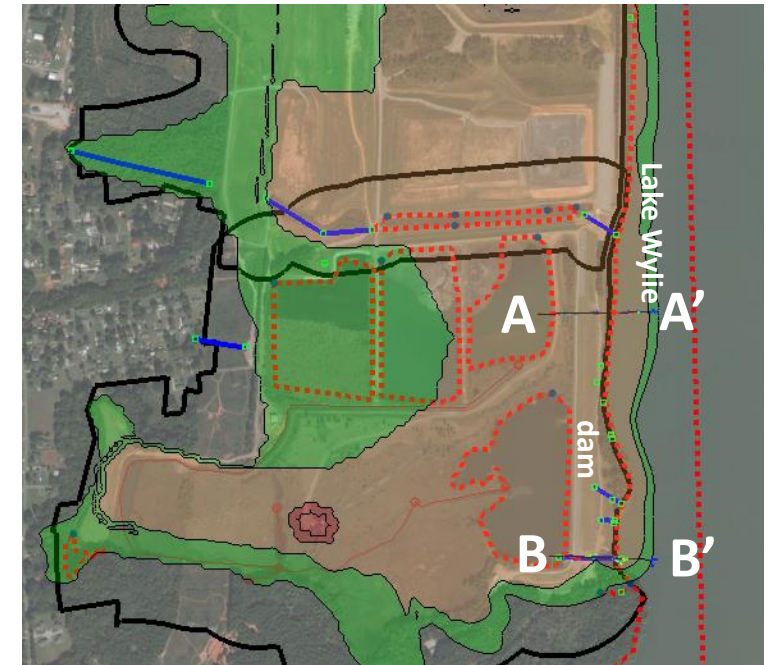
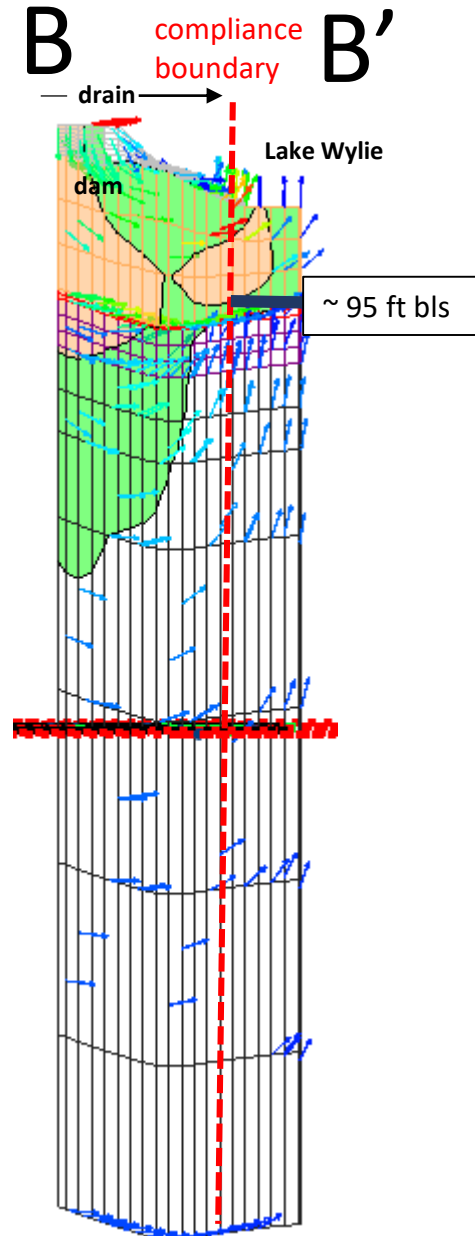
Ash 1-11

Saprolite 12-14

TZ 15-16

Bedrock 17-26

Vertical
exaggeration X 3



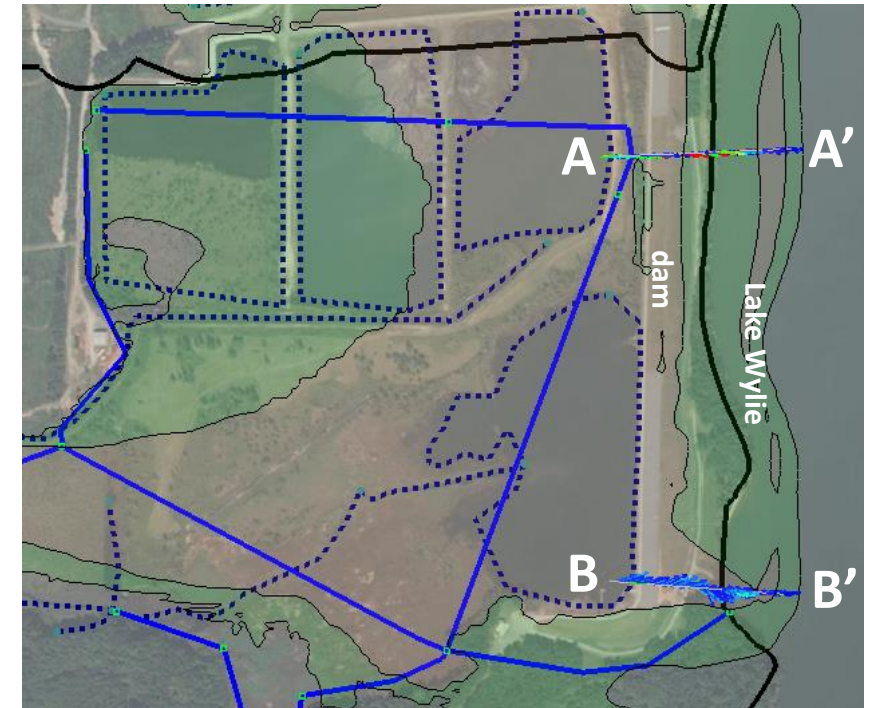
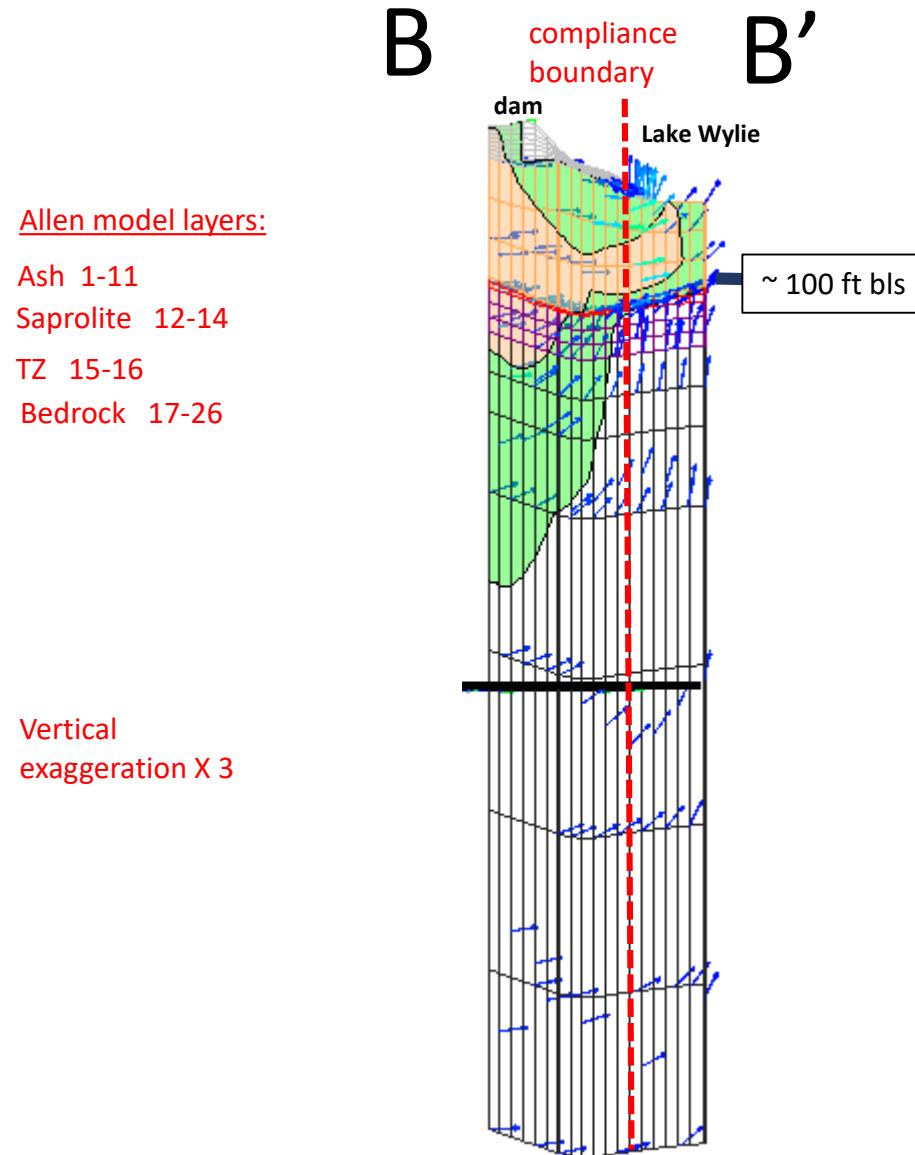
A-A' ~820 ft

B-B' ~730 ft

ALLEN **UPON COMPLETION OF FINAL COVER IN 2030, $t = 0$**

CROSS SECTION B-B' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



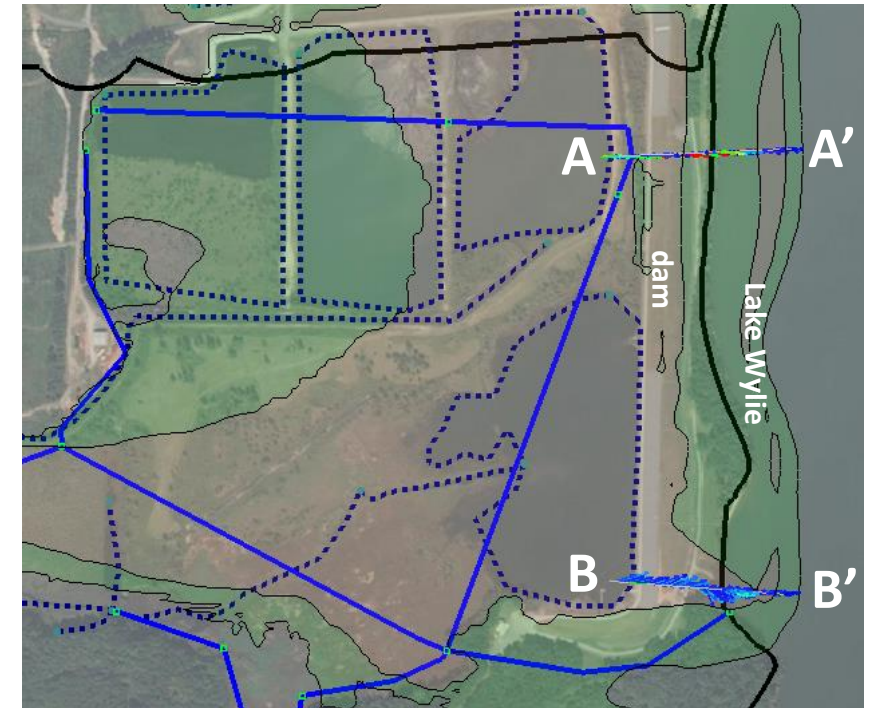
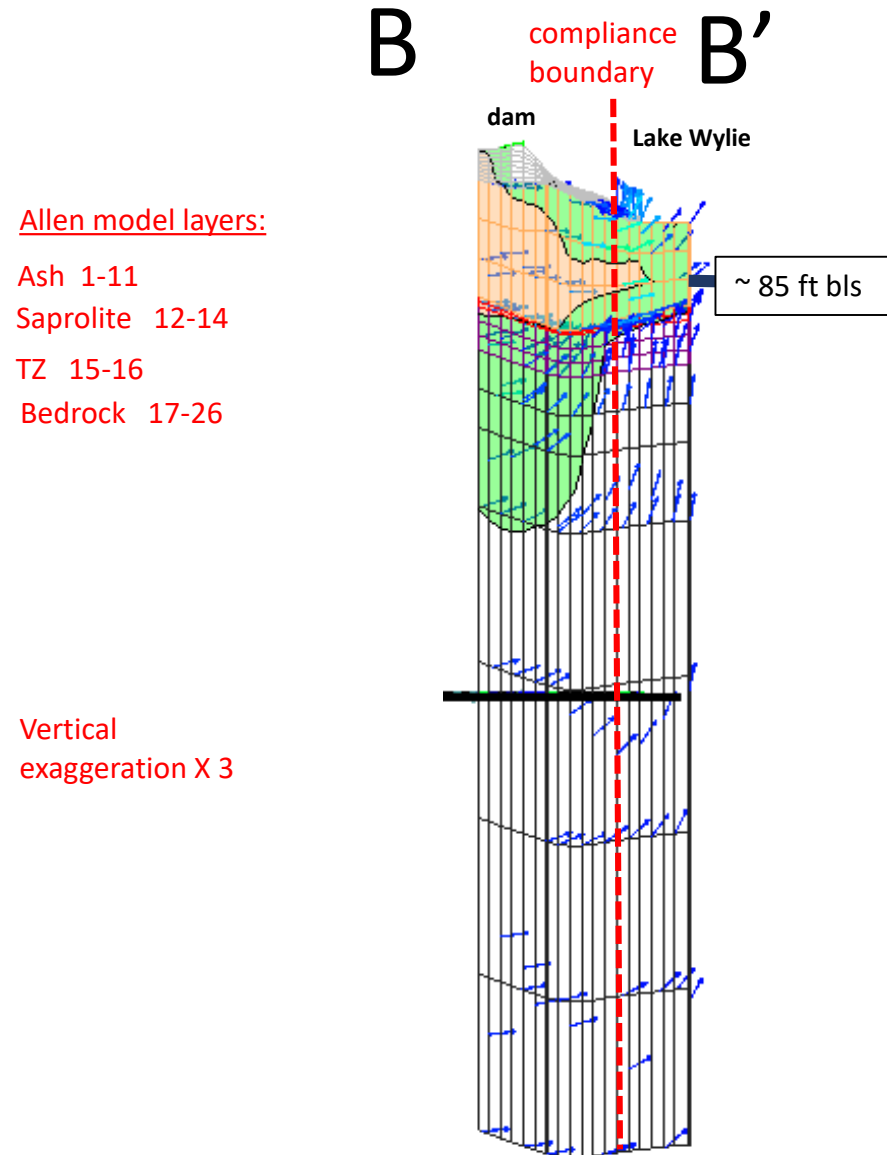
A-A' ~820 ft

B-B' ~730 ft

ALLEN **FINAL COVER IN 2150, t = 100 years**

CROSS SECTION B-B' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



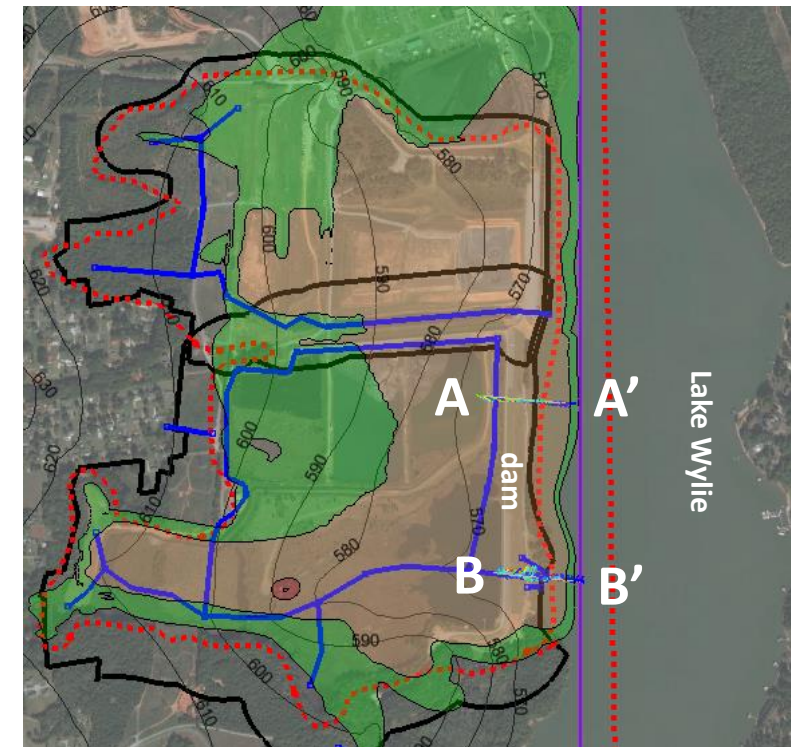
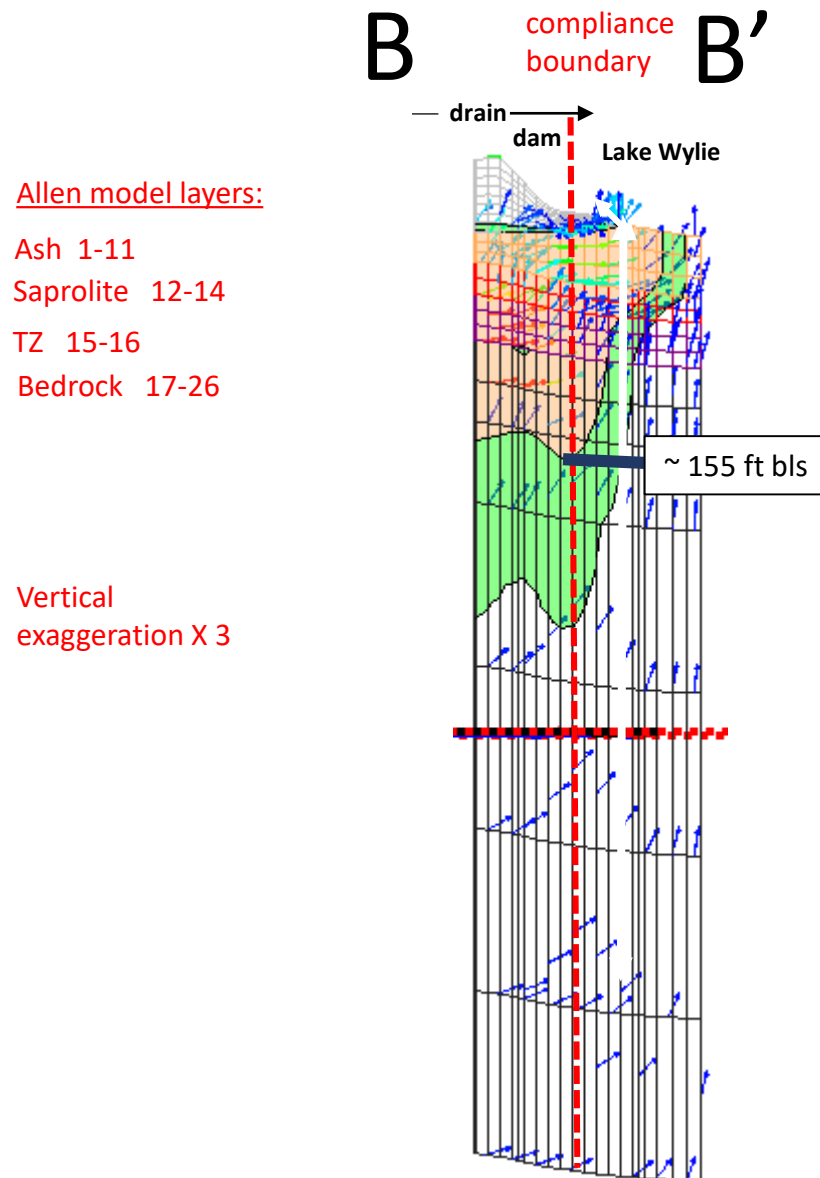
A-A' ~820 ft

B-B' ~730 ft

ALLEN **UPON COMPLETION OF HYBRID COVER IN 2030, $t = 0$**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



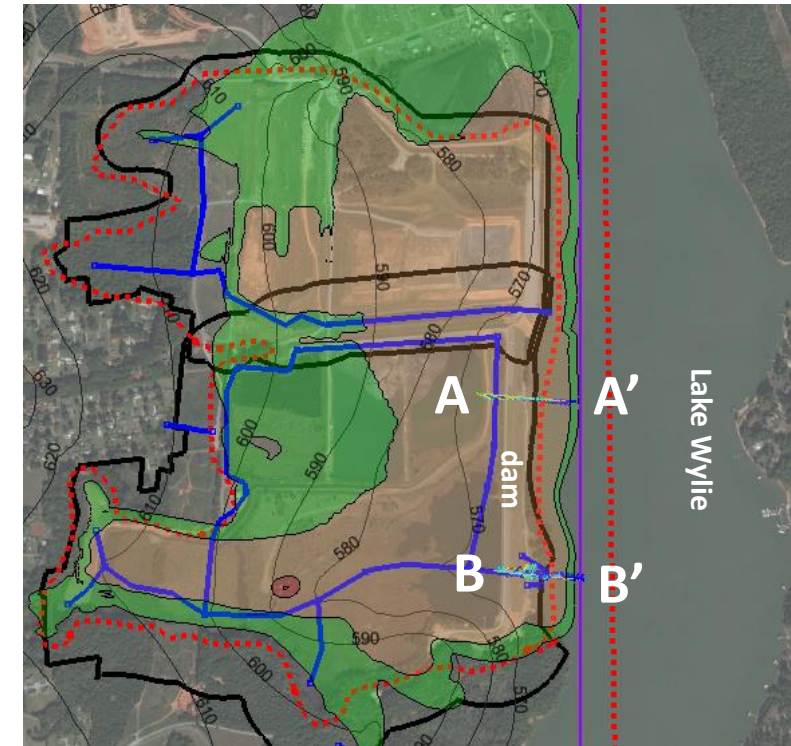
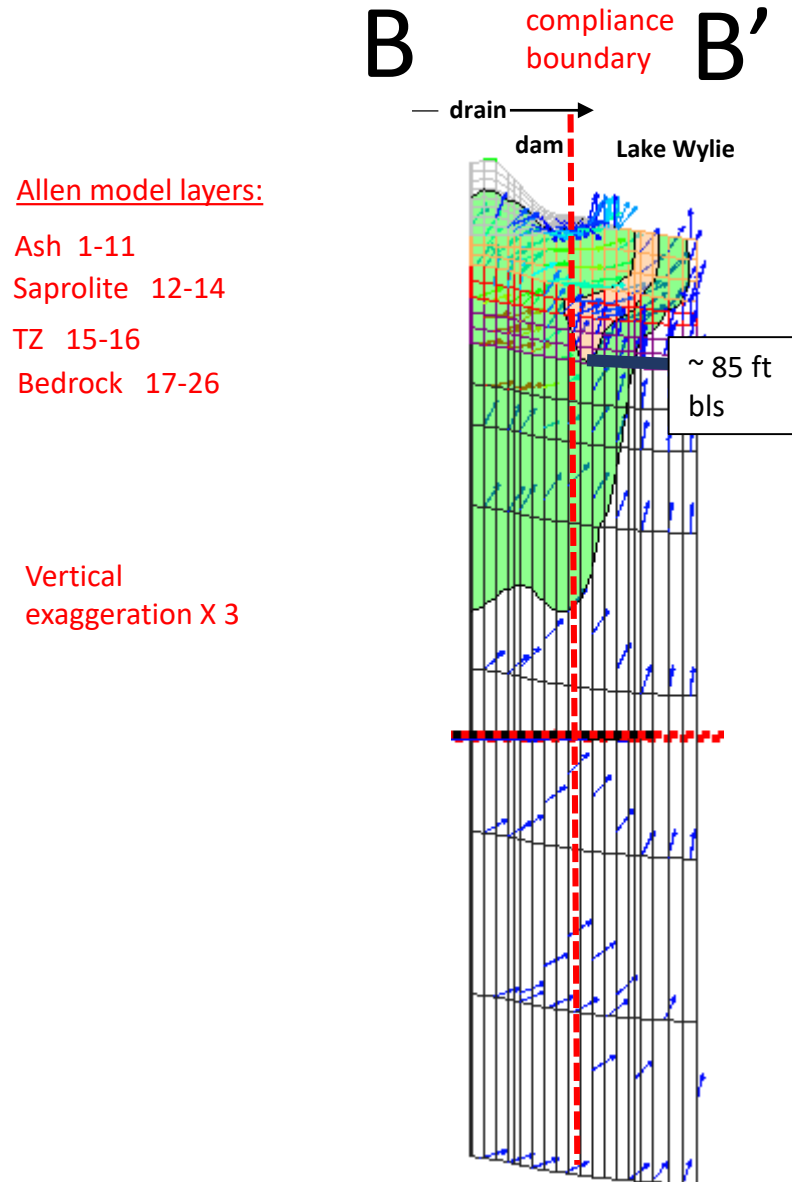
A-A' ~820 ft

B-B' ~730 ft

ALLEN **HYBRID IN 2150, t = 120 years**

CROSS SECTION A-A' (VIEWED FROM SOUTH SIDE OF CROSS SECTION LOOKING NORTH)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



A-A' ~820 ft

B-B' ~730 ft

ATTACHMENT B
/A
RESPONSE TO COMMENTS

I. Summary of Responses to Comments

DEQ received approximately 1,090 comments regarding the four Allen closure options. The overwhelming majority of comments (approximately 960) were submitted via a form email that supported closure by excavation and removal to a new onsite landfill or, alternatively, excavation and removal to an offsite landfill. The email commenters requested that the coal ash be removed from leaking, unlined pits and moved to dry lined storage away from waterways and groundwater. The commenters, however, did not specifically distinguish between moving the coal ash to a new onsite landfill or removal to an offsite landfill. Two other commenters specifically recommended moving the coal ash to a new onsite, lined landfill. Only one commenter specifically requested closure-in-place. A discussion of these and other related comments follows.

II. Detailed Responses to Comments

A. Closure-in-place.

Comment: Only one commenter supported the closure-in-place option. The concern with excavation involved potential dump truck traffic along South Point Road associated with removal activities.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

B. Hybrid

There were no comments that directly addressed the hybrid option.

C. Closure by removal to new onsite landfill.

Comment: As referenced in the “Summary of Responses to Comments” section above, the overwhelming majority of commenters stated in a form email that they were supportive of a closure option which could conceivably include either closure option four or five - closure by removal to a new onsite landfill or, alternatively, removal to an offsite landfill. The comment language in that form email states the following:

“Dear Coal Ash Comment Administrator North Carolina DEQ: Allen,

The North Carolina Department of Environmental Quality (DEQ) should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry lined storage away from our waterways and out of our groundwater. Duke Energy plans to leave its coal ash sitting in the groundwater at six sites in North Carolina, where it will keep polluting our groundwater, lakes, and rivers.

Recent monitoring shows Duke Energy is polluting the groundwater at its coal ash ponds in North Carolina with toxic and radioactive materials. We need cleanup—not coverup!

The communities around the coal ash ponds have come out time after time over the last several years, making clear that we're concerned about pollution from Duke Energy's coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to listen to the communities.

Duke Energy is already required to remove its coal ash at eight other sites in North Carolina and all of its sites in South Carolina—our families and our community deserve the same protections.”

Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

Comment: A commenter urged that the most cautious approach to coal ash management “means complete removal and placement in a lined facility as near as possible to its current location.” The commenter further pointed out that the other options all leave at least some ash in place - a continuation of the original problem which has uncertainty as a long-term viable option. The commenter suggested that evaluation of the potential re-uses of ash such as in roadbeds and an aggressive program of marketing re-use to other jurisdictions.

Response: DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

Comment: Two commenters from the River Lakes neighborhood next to Camp Lakes believed that contaminated water is currently flowing into their home and that they deserve access to clean city water. The commenters suggested a four-lane extension of N.C. Highway 273 across the Catawba River which would save both Duke Power and the North Carolina Department of Transportation (NCDOT) considerable amount of money and time in accessing the site. The commenter suggested an onsite temporary concrete plant that could be utilized to encapsulate coal ash into construction resulting in a large reduction in trucking costs versus moving all coal ash offsite. The commenter further suggested there would be significant material savings to NCDOT using ash as road fill material. The commenters also suggested the possibility of shared construction costs to allow partial disposal using construction and partial entombing of the remaining waste in the lined concrete base of the elevated structure.

Response: DEQ agrees that Duke Energy should evaluate the potential of coal ash for other approved product uses as described in the response to comment ii. above.

D. Closure by removal to an offsite landfill.

Comment: The overwhelming majority of commenters stated in a form email that they were supportive of a closure option which could conceivably include either closure option four or five - closure by removal to a new onsite landfill or, alternatively, removal to an offsite landfill. Reference is made to the specific comment language in paragraph 4i. above.

Response: DEQ agrees and references the response to the comment in paragraph 4i. above.

Comment: One commenter who attended the January 17, 2018, Sherrill's Ford Elementary School meeting stated that Duke Energy needs to remove the coal ash completely from its leaking, unlined pits.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Another commenter, citing to a recent New York Times article ["Data collected by the federal Environmental Protection Agency found that 95 percent of them (unlined coal ash ponds) had leaked, seeping into rivers and groundwater supplies"] rejected the capping proposal and indicated that Duke Energy needed to remedy its own mistakes and remove the coal ash from its current unlined locations, then relocate it to lined landfills.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: A commenter stated the saltstone method of disposal would isolate this hazardous waste for safe and permanent storage. Moreover, Duke Energy should store the coal ash on their own property, and not be allowed to move it across our state as they have in the Moncure area. The commenter also added that coal ash should not be capped in place.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C. The saltstone method of disposal, utilized by the U.S. Department of Energy for isolating hazardous and radioactive waste at a defense nuclear facility in South Carolina, is not permissible under CAMA.

Comment: A commenter who attended the public hearing at Stuart Cramer High School, in rejecting the closure-in-place option, believed that the only acceptable option for dealing with this waste involved excavating all coal ash at the Allen site and moving it to lined containers.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: A researcher who witnessed the aftermath of the largest coal ash spill in the country in 2008 insisted that NCDEQ should require Duke Energy to remove its coal ash from its leaking, unlined impoundments and move it to dry lined storage. There were also concerns for protecting the Catawba River and downstream rivers.

Response: Potential coal ash releases are a significant concern for DEQ and underscore the decision to require Duke Energy to excavate and remove all coal ash from impoundments at the Allen site.

Comment: A commenter stated coal ash stored at the Allen Stream Station should be completely removed and safely stored away from a major water source that thousands drink from.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Another commenter expressed serious concern regarding the closure-in-place option and provided lengthy commentary on why this option was not viable:

“Cap-in-place is unacceptable for any of the coal ash sites in North Carolina. Any ‘solutions’ proposed by Duke Energy that do not excavate and move ash to fully lined, scientifically designed systems that fully encapsulate coal ash must be rejected. Without multiple, sealed bottom, side, and top liners, North Carolina’s groundwater will always be at risk. Due to increases in extreme weather, more frequent hurricanes and massive rainstorms, groundwater models of 100 or 500-year floodplain are obsolete. Given the unpredictable fluctuations in the water tables and groundwater flows, there is no way that surface capping without properly engineered underlying bottom liners can protect groundwater in the coming decades.”

The commenter continued by stating: “DEQ should require Duke Energy’s new landfills to go beyond the minimal mandatory protections provided by current regulations. DEQ must carry out independent studies and obtain recommendations for the best liner technologies, redundant liners, and with multiple long-term safeguards. Scientifically based placements for baseline and ongoing groundwater monitoring wells should be established. These must be thoroughly and constantly monitored – with full, public, transparent, internet accessible, easily available data from the monitoring results. Ground water and surface monitoring should be ongoing for a minimum of 50 years . . . While transporting existing coal ash dumps away from rivers and floodplains is essential, every effort should be taken by DEQ to ensure that the distances coal ash is moved is minimized and that the coal ash destinations are always kept on Duke Energy’s property.

The commenter concluded: “Once constructed, these new lined landfills should represent the best technologies and materials available – not materials that create short-term financial savings. The original existing dumps were disasters for public health, for NC communities, and for our state’s waters. We have this one chance to remediate some of the damages and most importantly, to safeguard future generations from heavy metal coal ash contamination. Our state-wide re-design of storage systems for millions of tons of coal ash must be done right this time.”

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: One commenter, who could not attend one of the Allen site meetings, submitted a comment stating that ground water seepage from cap in place along with potential for natural disasters make the existing locations of coal ash pits a disaster waiting to happen. The commenter continued by stating that best practices are known and have been implemented in

other states by removing the ash to a secure, lined location, where natural disasters can be withstood and implemented quickly before the next spill occurs.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Another commenter, in requesting that all ash lagoons in North Carolina be relocated to 60-millimeter plastic lined landfills, joined in rebuffing closure-in-place: “There are plenty of technical points that argue against your cap in place plan. The most significant to me are that the ponds have been built over stream beds. Even if capped, erosion from the stream flow that travels under the lagoons will continue to carry toxic metals into the river. The site is 60 years old, it’s already leaking, Allen’s dams have failed before and over 114,000 people rely on drinking water intakes immediately downstream. With the ash stacked 75 feet high on the banks of the river I’m worried about a hurricane, earthquake, or 100-year flood that could lead to dam failure.”

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: A commenter opined that Duke Energy should be required to move the coal ash to a safe storage facility off of the Allen Plant location - capping and storing the coal ash at Allen in place and in an unlined basin is not a viable solution because this option will not protect the ground water table and Lake Wylie from the heavy metals that are leaching out of the existing coal ash basins.

Response: DEQ agrees with this comment that coal ash must be excavated and removed from the Allen site impoundments under CAMA Option A requiring movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure.

Comment: One commenter who attended the public hearing at Cramer High School believes that any solution other than excavation and removal of coal ash stored on the property of the Allen steam station is unacceptable. The commenter, focusing on the toxicity and health effects of coal ash, concluded by stating that Duke Energy must excavate and remove the coal ash to an area where it will minimally affect human health and environmental safety.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Another commenter who spent many years researching coal ash contamination stated that unlined ash pits pose threats to public health and environmental quality, even when water is drained and the basin is capped in place. The concern is that toxic metals and other compounds associated with coal ash would still be present without any liner after the basin is drained, and could therefore still leach into the nearby aquifer, affecting well water and surface water nearby. The commenter urged not to allow capping in place of ash at this or any other site in North Carolina.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Similarly, another commenter expressed support for the full excavation of both the Allen and Marshall sites by Duke Energy. The commenter felt that capping the ash in place will continue to contaminate the groundwater and discharge pollutants into Lake Norman and Lake Wylie - with the only safe solution a complete excavation and either recycling or storage in lined landfills.

Response: DEQ agrees that the coal ash must be excavated and removed from the Allen site impoundments.

Comment: A related comment from the Cramer High School meeting echoed those sentiments – the commenter stated that the pits should be excavated as soon as possible to the maximum safe extent with at least twenty-five (25) percent recycled through encasement in cement bricks, concrete and other methods. The remainder of excavated ash should be moved into double-lined landfills away from rivers, lakes and aquifers with monitored leak detection systems. The double-lining would include 2' of clay on the exterior with a durable lining impervious to water.

Response: DEQ agrees with this comment that coal ash must be excavated and removed from the Allen site impoundment under CAMA Option A requiring movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure.

Comment: A small number of other commenters also suggested the material should be recycled into concrete.

Response: DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

Comment: Another commenter suggested using coal ash for construction materials to build or improve South Point Road and/or Parkway Bridge to I-485.

Response: DEQ agrees that Duke Energy could evaluate the potential of coal ash for other approved product uses.

Comment: DEQ received multiple comments opposing capping in place that stated general support for closure by excavation [removal] to dry, offsite lined landfills on property owned by Duke to keep coal ash away from drinking water and recreational water uses near the Catawba, Wateree, Santee and Cooper Rivers and associated chain of lakes including Lake Wylie and the Lake Norman area.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: A former federal wildlife biologist provided extensive commentary concerning excavation and removal: “I respectfully request that The North Carolina Department of Environmental Quality (NCDEQ) require Duke Energy to remove its coal ash from the existing unlined storage pits at the Allen Steam Station location. The excavated coal ash should then be moved to a dry, lined storage-landfill on Duke Energy property, as detailed in *Option #5* of their Allen Steam Station Ash Basin Closure Options Analysis. The existing Allen Ash Basins location is directly adjacent to the Catawba River/Lake Wylie waterways, where groundwaters must be transporting coal ash pollutants (arsenic, beryllium, cadmium, cobalt, lithium, thallium, etc.) directly into those waters . . . I am concerned about the potential for existing water quality degradation and the lack of existing surface water monitoring efforts by NCDEQ in the Allen Steam Station vicinity to document such degradation. Concentrations of coal-ash-related chemicals are known to have negative health impacts on both humans and fish/wildlife residents exposed to them. Removal of those coal ash health hazards from the Allen Ash Basins facility is essential to those residents’ health and well-being and is a solution supported by historical, national clean-up efforts (Superfund sites, etc.).” The commenter also raised several questions regarding ground and surface water pollution and suggested additional testing and monitoring activities.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: One commenter suggested use of a coal train to expedite the removal process and limit the amount of trucking needed to lessen impact on roads.

Response: The Duke Energy Allen site closure plan will likely assess the viability of the various transport options for coal ash excavated from the Allen impoundments.

Comment: Some commentators also suggested that Duke Energy intentionally overestimated trucking traffic concerns related to removal to support a closure-in-place solution.

Response: DEQ takes no position with the suggestion that Duke Energy intentionally overestimated trucking traffic concerns.

Comment: A commenter representing the Catawba Riverkeeper Foundation, MountainTrue, and Waterkeeper Alliance submitted extensive written comments urging DEQ to require the Allen coal ash basins to be excavated to a lined landfill to protect the environment and human health.

The commenter claimed coal ash impoundments at Allen are not eligible for closure-in-place under CAMA. The commenter alleged that closure-in-place violates the North Carolina groundwater rule. The commenter sets out several arguments it believes supports that claim: 1) Duke Energy’s modelling demonstrates it will not meet groundwater standards if it chooses closure-in-place; 2) Duke Energy’s modelling underestimates the extent of contamination; 3) Duke Energy tested groundwater compliance at the wrong location; 4) the groundwater rule prohibits closure-in-place because the coal ash will contribute to violations of the groundwater standard for centuries; and 5) closure-in-place is unavailable because it will not restore groundwater to the legal standard.

The commenter next claimed that coal ash impoundments at Allen are not eligible for closure-in-place under the Coal Combustion Residuals (CCR) rule. The commenter alleged that: 1) the CCR rules' performance standards require separating ash from the groundwater and precluding its future impoundment; and 2) the CCR rules' corrective action requirements preclude closure-in-place.

The commenter continues by asserting that DEQ must base its closure determination on effectiveness and not cost to the polluter. The commenter further maintains that DEQ should reject Duke Energy's "Community Impact Analysis." The commenter claims that Duke's Energy's report downplays well-established pollution risks and exaggerates the impact on communities of excavating and trucking material to offsite landfills. Further, they claim that diesel emissions do not meaningfully distinguish between closure methods and that the report's habitat analysis is flawed. The commenter concludes by questioning the validity of Duke Energy's closure options scoring system - and offers its own analysis to demonstrate why it believes Duke Energy manipulated scores to suit a desired outcome.

Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3).

Comment: The same commenter requested that DEQ ignore a Duke Energy report on estimated greenhouse gas emissions associated with various closure options for the six unresolved coal ash sites (including the Allen site). The commenter claimed DEQ should disregard this submission because it was made after DEQ's deadline for Duke Energy to submit its materials and outside the public comment period, thereby denying the public an opportunity to respond to it. DEQ should also disregard this submission because it is irrelevant to the decision facing DEQ, which is to select a closure method that stops the ongoing pollution and continuing threat to our water resources posed by Duke Energy's leaking coal ash basins.

Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3).

Comment: A commenter from DEQ's Environmental Justice and Equity Board rejected the closure-in-place option in support of excavation and movement into lined landfills: "There is no way to safeguard the health of North Carolinians while leaving harmful toxins to leach into our ground and water. Furthermore, the long-term costs of leaving toxic coal ash in pits alongside our lakes and rivers under a 'cap in place' option, would far outweigh the cost of scientifically sound excavation to lined landfills on Duke's property. This includes maintenance costs, future liability costs, and the too often non-considered cost of human capital when disasters, such as the 2014 Dan River spill, occur."

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: A variety of comments were received in the form of YouTube testimonials following DEQ's Environmental Justice Advisory Board meeting in Wilmington, NC, and from

other entities and individuals regarding the impact of coal ash spills. Links to each these testimonials follow: /A

Caroline Armijo - ACT Member <https://youtu.be/cJag3oPI4qU>
Johnny Hairston - resident in harm's way of basin failure <https://youtu.be/6iK1sbVOO58>
Rev. Gregory Hairston – leader/resident in close proximity <https://youtu.be/IV9crtEyTJY>
John Wagner - ACT Member <https://youtu.be/IV9crtEyTJY>
Frank Holleman - lead attorney of SELC <https://youtu.be/elwPWPYb3Uc>
At What Cost (2014) <https://youtu.be/rraUoadqr8o>
Danielle Bailey-Lash on CNN <https://youtu.be/OCTU-CUoQzQ>
A Time to Sing (Abridged) (August 2018) <https://youtu.be/HQFYKBaf4NQ>
A Day of Prayer (February 2019) https://youtu.be/agRzScT_BEs

Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3).

Comment: A commenter who also serves as an elected official stated that sites containing coal ash should not be capped where they are, since groundwater is invaded by the toxins requiring maintenance and monitoring – toxins that would ultimately end up in surface waters through seepage or breaches. The commenter opined that coal ash be stored in lined landfills which meet federal guidelines. The commenter also had concerns regarding leaching from concrete if the coal ash is mixed into any building materials.

Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3).

Comment: A former North Carolina state legislator submitted comments stating that Duke Energy has investigated numerous options for the safe disposal of coal ash as highlighted in the Duke Energy Coal Combustion Product Management Study Phase 3 (May 2016). The commenter believed that Section 2-4 (“Masonry Units”) of the study can be applied at the Allen Plant and that Duke Energy has investigated all the options in this report. The commenter referenced direction from the General Assembly in the form of CAMA III or CAMA IV. The commenter points out that a company, Nu-Rock, has a long history of using coal ash in cement products and that Nu-Rock’s domestic headquarters is in Charlotte. The commenter believes this is a viable option that has been investigated by both the University of North Carolina (Charlotte) and Virginia Tech University.

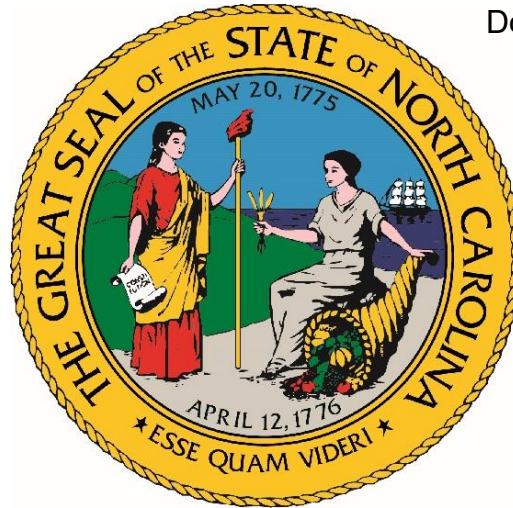
Response: DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the impoundment at Allen in accord with N.C. Gen. Stat. § 130A-309.214(a)(3).

Comment: Several dozen South Carolina residents submitted comments. Many live in the Catawba-Wateree waterway chain. The overwhelming consensus from these comments is to remove coal ash from unlined pits at Allen and move the ash to an area that is safer that will not impact water drawn or used in the Catawba-Wateree chain.

Response: DEQ agrees that coal ash at Allen should be removed from impoundments and placed in a lined landfill. DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

Comment: Two commenters responded by telephone voice message. One commenter was concerned that NCDEQ would chose the least expensive option of capping-in-place. The commenter stated that full evacuation of all coal ash sites, the most protective option, should be chosen for all sites. The second commenter, who lives in Gaston County, stated that there is arsenic and hexavalent chromium (and other contaminants) in the well water and that NCDEQ should fully excavate the coal ash since it can sell to concrete companies to make concrete.

Response: DEQ agrees that coal ash at Allen should be removed from impoundments and placed in a lined landfill. DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Belews Creek Steam Station

April 1, 2019



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Belews Creek Steam Station

Executive Summary

The Coal Ash Management Act (CAMA) establishes criteria for the closure of coal combustion residuals (CCR) surface impoundments. The CCR surface impoundment located at Duke Energy Carolinas, LLC's (Duke Energy) Belews Creek Steam Station (Belews Creek) in Stokes County, NC has received a low-risk classification. Therefore, according to N.C. Gen. Stat. § 130A-309.214(a)(3), the closure option for CCR surface impoundments is at the election of the North Carolina Department of Environmental Quality (DEQ). CAMA provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C].

In preparing to make its election, DEQ requested information from Duke Energy related to closure options. By November 15, 2018, Duke Energy provided the following options for consideration: closure in place, full excavation, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundments. DEQ held a public information session on January 10, 2019 in Walnut Cove, NC where the community near Belews Creek had the opportunity to learn about options for closing coal ash CCR surface impoundments and to express their views about proposed criteria to guide DEQ's coal ash closure decision making process. To evaluate the closure options, the Department considered environmental data gathered as part of the site investigation, permit requirements, ambient monitoring, groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the CCR surface impoundment at the Belews Creek facility in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from unlined CCR surface impoundments at Belews Creek is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

Duke Energy will be required to submit a final Closure Plan for the CCR surface impoundment at Belews Creek by August 1, 2019. The Closure Plan must conform to this election by DEQ.

I. Introduction

DEQ has evaluated the closure options submitted by Duke Energy for the CCR surface impoundment at the Belews Creek Steam Station. This document describes the CAMA requirements for closure of coal ash impoundments, the DEQ evaluation process to make an election under CAMA for the subject impoundment at the Belews Creek site, and the election by DEQ for the final closure option.

II. Site History

Duke Energy owns and operates the Belews Creek Steam Station which is located on Belews Lake Reservoir in Belews Creek, Stokes County, North Carolina. Belews Creek is a two-unit 2,240-megawatts coal-fired generating facility that began commercial operation in 1974. Prior to 1984, Belews Creek wet sluiced coal combustion residuals into one surface impoundment located on the property. The surface impoundment is known as the Active Ash Basin (AAB) and is impounded by dam STOK-116.

In 1984, Belews Creek replaced its fly ash wet sluicing operation with a dry ash handling system and began placing dry fly ash into one of three permitted landfills located on the property: Pine Hall Road Landfill (8503-INDUS-1984, closed), Craig Road Landfill (8504-INDUS, active), and FGD Landfill (8505-INDUS, active). However, the ability to wet sluice to the AAB was still available but limited to certain situations: unit startup/shutdown, equipment maintenance, and service. Currently, a 100% dry ash handling system is being used onsite and no CCR is being sluiced to the AAB. A Flue Gas Desulfurization (FGD) scrubber system is active at Belews Creek where the FGD residuals are beneficially reused for the production wallboard.

III. CAMA Closure Requirements

CAMA establishes closure requirements for CCR surface impoundments. The General Assembly has mandated that DEQ “shall review a proposed Coal Combustion Residuals Surface Impoundment Closure Plan for consistency with the minimum requirements set forth in subsection (a) of this section and whether the proposed Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and otherwise complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(b). Similarly, the General Assembly has required that DEQ “shall disapprove a proposed Coal Combustion Residuals Surface Impoundment Closure Plan unless the Department finds that the Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and other complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(c).

CAMA requires DEQ to review any proposed Closure Plan for consistency with the requirements of N.C. Gen. Stat. § 130A-309.214(a). See N.C. Gen. Stat. § 130A-309.214(b). DEQ must disapprove any proposed Closure Plan that DEQ finds does not meet these requirements. See N.C. Gen. Stat. § 130A-309.214(c). Therefore, an approvable Closure Plan must, at a minimum, meet the requirements of N.C. Gen. Stat. § 130A-309.214(a).

Pursuant to N.C. Gen. Stat. § 130A-309.213(d)(1), DEQ has classified the CCR surface impoundment at Belews Creek as low-risk. The relevant closure requirements for low-risk impoundments are in N.C. Gen. Stat. § 130A-309.214(a)(3), which states the following:

- Low-risk impoundments shall be closed as soon as practicable, but no later than December 31, 2029;
- A proposed closure plan for a low-risk impoundment must be submitted as soon as practicable, but no later than December 31, 2019; and
- At a minimum, impoundments located in whole above the seasonal high groundwater table shall be dewatered and impoundments located in whole or in part beneath the seasonal high groundwater table shall be dewatered to the maximum extent practicable.

In addition, N.C. Gen. Stat. § 130A-309.214(a)(3) requires compliance with specific closure criteria set forth verbatim below in Table 1. The statute provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C]. For each low-risk impoundment, the choice of the closure pathway in CAMA is at the “election of the Department.”

Table 1: CAMA Closure Options for Low-Risk CCR Impoundments
N.C. Gen. Stat. § 130A-309.214(a)(3)

At the election of the Department, the owner of an impoundment shall either:

- a. Close in any manner allowed pursuant to subdivision (1) of this subsection; [CAMA Option A]
- b. Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall install and maintain a cap system that is designed to minimize infiltration and erosion in conformance with the requirements of Section .1624 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, and, at a minimum, shall be designed and constructed to (i) have a permeability no greater than 1×10^{-5} centimeters per second; (ii) minimize infiltration by the use of a low-permeability barrier that contains a minimum 18 inches of earthen material; and (iii) minimize erosion of the cap system and protect the low-permeability barrier from root penetration by use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth. In addition, the owner of an impoundment shall (i) install and maintain a groundwater monitoring system; (ii) establish financial assurance that will ensure that sufficient funds are available for closure pursuant to this subdivision, post-closure maintenance and monitoring, any corrective action that the Department may require, and satisfy any potential liability for sudden and nonsudden accidental occurrences arising from the impoundment and subsequent costs incurred by the Department in response to an incident, even if the owner becomes insolvent or ceases to reside, be incorporated, do business, or maintain assets in the State; and (iii) conduct post-closure care for a period of 30 years, which period may be increased by the Department upon a determination that a longer period is necessary to protect public health, safety, welfare; the environment; and natural resources, or decreased upon a determination that a shorter period is sufficient to protect public health, safety, welfare; the environment; and natural resources. The Department may require implementation of any other measure it deems necessary to protect public health, safety, and welfare; the environment; and natural resources, including imposition of institutional controls that are sufficient to protect public health, safety, and welfare; the environment; and natural resources. The Department may not approve closure for an impoundment pursuant to sub-subdivision b. of subdivision (3) of this subsection unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment; [CAMA Option B] or
- c. Comply with the closure requirements established by the United States Environmental Protection Agency as provided in 40 CFR Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities." [CAMA Option C]

By referencing the closure options for *high-risk* impoundments in “subdivision (1)” or N.C. Gen. Stat. § 130A-309.214(a)(1), CAMA allows for closure of a *low-risk* CCR impoundment in N.C. Gen. Stat. § 130A-309.214(a)(3) through the same removal scenarios:

- “Convert the coal combustion residuals impoundment to an industrial landfill by removing all coal combustion residuals and contaminated soil from the impoundment temporarily, safely storing the residuals on-site, and complying with the requirements for such landfills.” N.C. Gen. Stat. § 130A-309.214(a)(1)a.; or
- “Remove all coal combustion residuals from the impoundment, return the former impoundment to a nonerosive and stable condition and (i) transfer the coal combustion residuals for disposal in a coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill or (ii) use the coal combustion products in a structural fill or other beneficial use as allowed by law.” N.C. Gen. Stat. § 130A-309.214(a)(1)b.

IV. DEQ Election Process

Beginning with a letter to Duke Energy on October 8, 2018, DEQ began planning for a thorough evaluation of the closure options for low-risk impoundments before making an election as outlined in Table 1 above. DEQ’s objectives were to receive input on closure options from Duke Energy and to engage with community members near low-risk sites. DEQ outlined the following schedule in the October 8, 2018 letter:

- November 15, 2018 – Duke Energy submittal of revised closure option analyses and related information
- January 10, 2019 – DEQ public meeting near Belews Creek
- April 1, 2019 – DEQ evaluation of closure options
- August 1, 2019 – Duke Energy submittal of closure plan
- December 1, 2019 – Duke Energy submittal of updated corrective action plan for all sources at the Belews Creek site that are either CCR impoundments or hydrologically connected to CCR impoundments

DEQ received the requested information from Duke Energy by November 15, 2018: closure options analysis, groundwater modeling and net environmental benefits assessment. These materials are posted on the DEQ website. Duke Energy provided the following options for consideration: closure in place, full excavation with an onsite landfill, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing impoundment.

In preparing to make its election of the closure option, DEQ considered environmental data contained in the comprehensive site assessment, permit requirements, ambient monitoring, closure options analysis and groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements. The Belews Creek site has extensive amounts of data that have been collected during the site assessment process, and these data were used as part of the evaluation of closure options. DEQ’s evaluation of closure in place and hybrid option based on groundwater monitoring and modeling data is provided in Attachment A. That analysis

demonstrates that the contaminated plume is already beyond the compliance boundary for the site. All of these references are part of the record supporting DEQ's determination.

DEQ conducted a public meeting in Walnut Cove, NC near Belews Creek on January 10, 2019. Approximately 98 people attended the meeting. Approximately 1052 comments were received during the comment period, which closed on February 15, 2019. Additionally, 275 people signed an attachment to written comments and an additional 340 people signed an on-line petition. A sizeable minority of commenters specifically recommend excavating coal ash and moving it to a lined onsite landfill. A small minority of commenters want the coal ash moved out of state. No commenters support the hybrid closure or closure-in-place option. Several commenters support recycling coal ash for various commercial product uses. A review and response to comments are included in Attachment B.

V. DEQ Evaluation of Closure Options

DEQ has evaluated the closure options proposed by Duke Energy for the CCR impoundment at the Belews Creek facility. The purpose of this evaluation was to determine which closure option or options may be incorporated into an approvable Closure Plan under CAMA.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin at Belews Creek in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from unlined impoundment at Belews Creek is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

DEQ does not elect CAMA Option B for the CCR surface impoundment at Belews Creek. In N.C. Gen. Stat. § 130A-309.214(a)(3)b, the General Assembly mandated that "[t]he Department may not approve closure for an impoundment pursuant to [this] sub-subdivision . . . unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment." N.C. Gen. Stat. § 130A-309.214(a)(3)b. In light of these requirements and based on DEQ's review of the information provided by Duke Energy as well as DEQ's independent analysis, DEQ does not believe that Duke Energy can incorporate CAMA Option B into an approvable Closure Plan for Belews Creek.

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether upon full implementation of the closure plan the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary. To address this question, DEQ considered the current state of the groundwater contamination and reviewed the results of the groundwater modeling submitted by Duke Energy. The evaluation is provided in Attachment A. DEQ's overall conclusion is that based on the current geographic scope and vertical extent of the groundwater contamination plume, and future modeled extent of the plume, DEQ does not believe these two closure options can meet the requirements of CAMA Option B for the CCR surface impoundment at Belews Creek.

DEQ does not elect CAMA Option C (i.e., closure under the federal CCR Rules found in 40 CFR Part 257) for the CCR impoundments at Belews Creek. DEQ has determined that:

- a. Under the facts and circumstances here, CAMA Option C is less stringent than CAMA Option A. Specifically, DEQ's election of Option A would also require Duke Energy to meet the requirements of the federal CCR Rule (i.e., CAMA Option C) but election of CAMA Option C would not require implementation of CAMA Option A.
- b. Because CAMA Option A adds additional requirements or performance criteria beyond Option C, it advances DEQ's duty to protect the environment (see N.C. Gen. Stat. §§ 279B-2 & 143-211) and the General Assembly's mandate under CAMA that DEQ ensure that any Closure Plan, which must incorporate an approvable closure option, is protective of public health, safety, and welfare, the environment, and natural resources (see N.C. Gen. Stat. § 130A-309.214(b) & (c)).
- c. For the CCR impoundments for which the closure option(s) must be determined, CAMA Option A provides a better CAMA mechanism for ensuring State regulatory oversight of the closure process than Option C, as well as greater transparency and accountability.
- d. While the federal CCR Rule was written to provide national minimum criteria for CCR impoundments across the country, CAMA was written specifically to address the CCR impoundments in North Carolina.
- e. While the federal CCR Rule allows CCR impoundment owners to select closure either by removal and decontamination (clean closure) or with a final cover system (cap in place), EPA anticipates that most owners will select closure through the less protective method of cap in place.
- f. There is considerable uncertainty regarding the status and proper interpretation of relevant provisions of the federal CCR Rule. For instance, EPA is reconsidering portions of the federal CCR Rule. Also, the performance standards in 40 CFR § 257.102(d) for cap in place closure are the subject of conflicting interpretations (and possible litigation) among industry and state authorities.

VI. Conclusion

The final closure plan is due on August 1, 2019 in accordance with this determination. Based on DEQ's evaluation of the options submitted by Duke Energy, DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin at Belews Creek in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

While beneficiation is not a requirement of the closure plan, DEQ encourages Duke Energy to consider opportunities for beneficiation of coal ash that would convert coal combustion residuals into a useful and safe product.

ATTACHMENT A

**DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON
GROUNDWATER MONITORING AND MODELING DATA**

I. The Contaminated Plume is Beyond the Compliance Boundary

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary upon full implementation of the closure plan. Significantly, the contaminated groundwater plume has already extended beyond the compliance boundary in a portion of the impoundment. The inferred general extent of groundwater impacts above applicable Background Threshold Values or 2L Standards are shown on Figure ES-1. Additional monitoring and hydrogeological data is available in the Belews Creek Steam Station October 2017 CSA Update Report (available on the DEQ website).

Based on review of data submitted to date in various reports, both soil and groundwater have been impacted by CCR handling activities at the site. Groundwater within the area of the impoundment generally flows north to northwest toward Dan River and south of a topographic ridge that serves as a groundwater divide along Pine Hall Road toward Belews Lake Reservoir. Boron concentrations above 2L Standards approximates the leading edge of the CCR plume at the site. Almost all constituents of interest (COIs) are present in the shallow flow layer. The horizontal extent of those COIs are generally within the footprint of the boron plume.

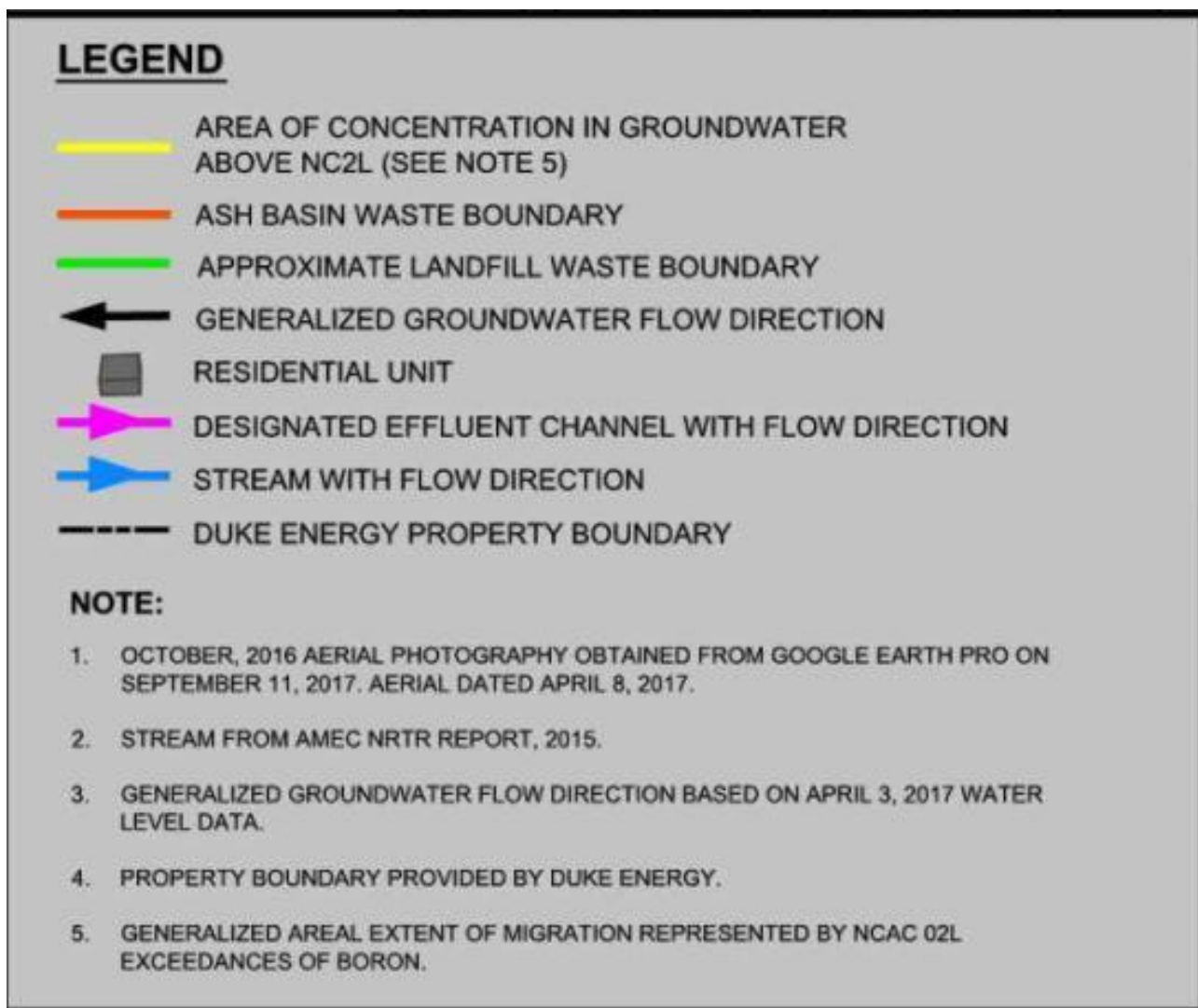
The vertical extent of most COIs is within the shallow and transition flow layers. However, data suggests the bedrock flow layer has been impacted by CCR handling activities at the site. Manganese is the only COI with a significant exceedance of the 2L standard in the bedrock flow layer.

DEQ concludes that the contaminated groundwater plume above 2L standards has extended beyond the compliance boundary along the northern edge of the property. Based on Figure ES-1, this plume extends along the entire length active ash basin.

Figure ES-1: Belews Creek Steam Station October 2017 CSA Update Report



Figure ES-1 Legend: Belews Creek Steam Station October 2017 CSA Update Report



II. Groundwater Cross-section Modeling

DEQ evaluated cross-sections of the groundwater modeling results provided by Duke Energy to determine whether Duke Energy's final closure *Option 1: Closure-in-Place* and *Option 6: Hybrid* would meet the criteria of CAMA Option B. DEQ considered whether the proposed closure option would prevent any post closure exceedances of the 2L groundwater quality standard at the compliance boundary upon full closure implementation. Cross-sections B-B' and C-C' were evaluated and can be seen in the figures below. These cross-sections represent where the boron concentration above the 2L standard of 700 µg/L has crossed the compliance boundary based on groundwater monitoring and modeling.

Next, the model results were evaluated based on the following model simulations:

- current conditions in 2017 when the model was calibrated based on raw field data
- upon completion of the final closure-in-place cover system at t=0 years
- closure-in-place option at t=125 years
- upon completion of the hybrid option at t=0 years and
- hybrid option at t=118 years

The tables below summarize the results from the model simulations. The boron concentrations depicted in each the tables represent the maximum boron concentration in any layer (ash, saprolite, transition zone, and bedrock) of the model.

Belews Creek Modeling Results for Cross-Section B-B'			
Model Simulation	Maximum Concentration of Boron Above 2L Beyond Compliance Boundary (ug/L)	Depth of GW Contamination Above 2L Beyond Compliance Boundary (feet bgs)	Width of Contamination Plume Beyond Compliance Boundary (feet)
Current Conditions	4,000-10,000	140	1200
Completion of Final Cover (t=0 yrs)	4,000-10,000	150	1200
Final Cover (t=125 yrs)	700-4,000	260	700
Completion of Hybrid (t=0 yrs)	4,000-10,000	145	1200
Hybrid (t=118 yrs)	700-4,000	235	900

bgs – below ground surface

Belews Creek Modeling Results for Cross-Section C-C'			
Model Simulation	Maximum Concentration of Boron Above 2L Beyond Compliance Boundary (ug/L)	Depth of GW Contamination Above 2L Beyond Compliance Boundary (feet bgs)	Width of Contamination Plume Beyond Compliance Boundary (feet)
Current Conditions	4,000-10,000	325	650
Completion of Final Cover (t=0 yrs)	4,000-10,000	330	650
Final Cover (t=125 yrs)	700-4,000	550	700
Completion of Hybrid (t=0 yrs)	4,000-10,000	310	700
Hybrid (t=118 yrs)	700-4,000	440	750

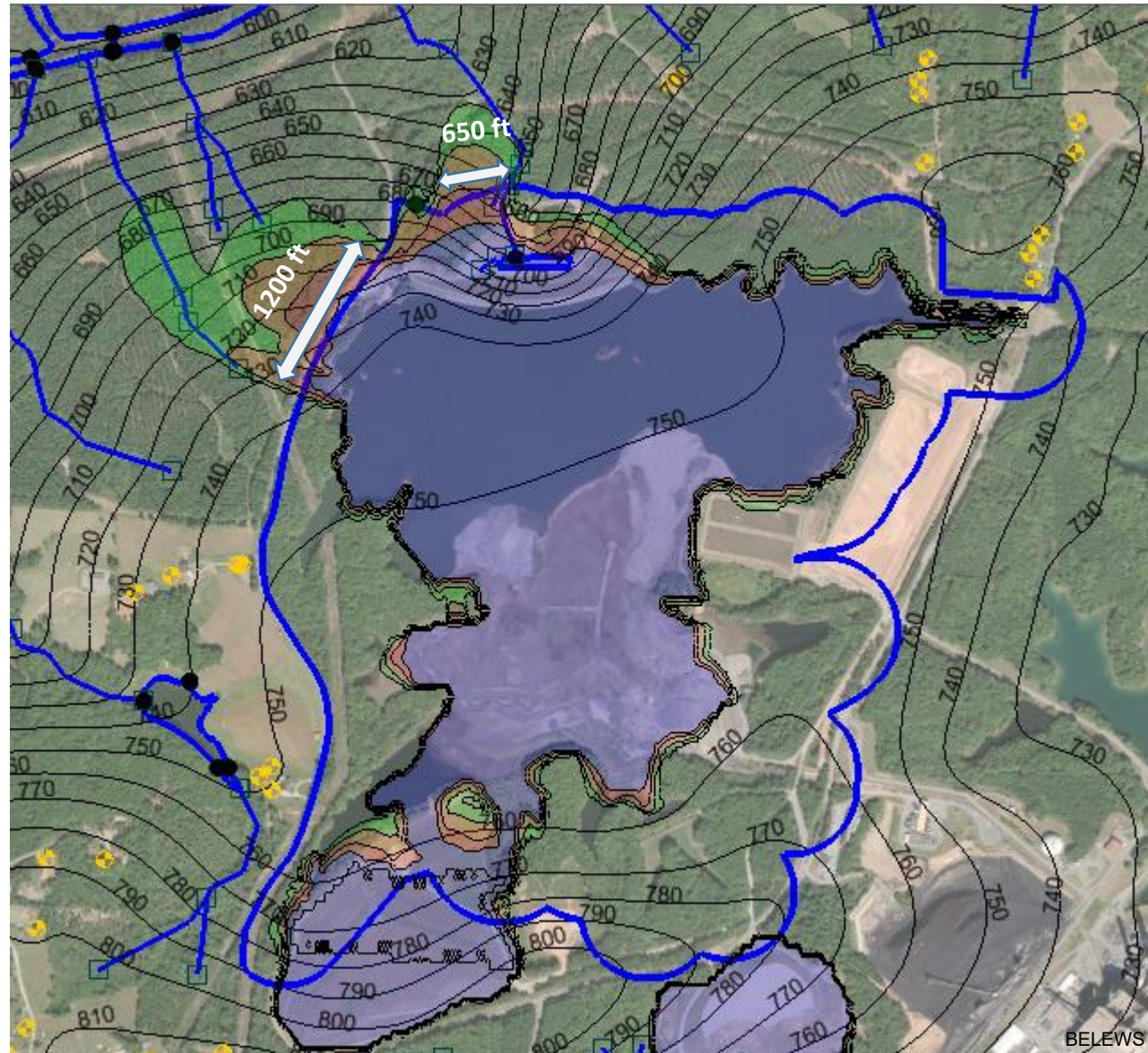
These data illustrate that after completion of closure with the final cover or hybrid option, the groundwater plume still extends beyond the compliance boundary above the 2L groundwater standard and the area of the plume requiring remediation is immense. Even 118 to 125 years beyond completion of closure, the area of the plume requiring remediation remains extensive.

DEQ recognizes that there are no groundwater remediation corrective actions included in the groundwater modeling simulations submitted to DEQ as part of Duke Energy's closure options analysis documentation. However, based on the current geographic scope, vertical extent of the groundwater contamination plume, and future modeled extent of the plume, DEQ does not believe these two closure options can meet the requirements of CAMA Option B.

BELEWS CREEK **CURRENT CONDITIONS IN 2017**

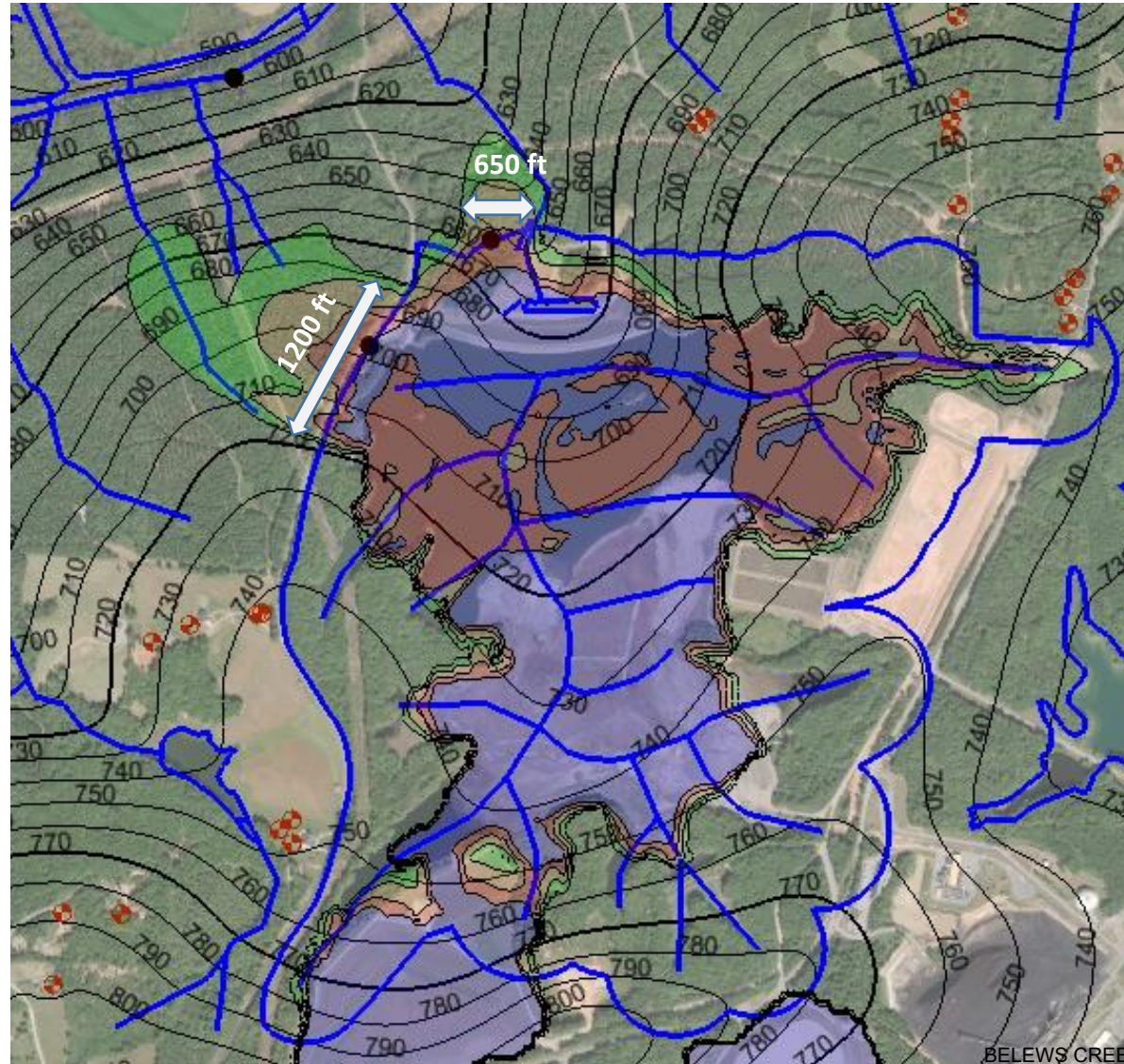
/A

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



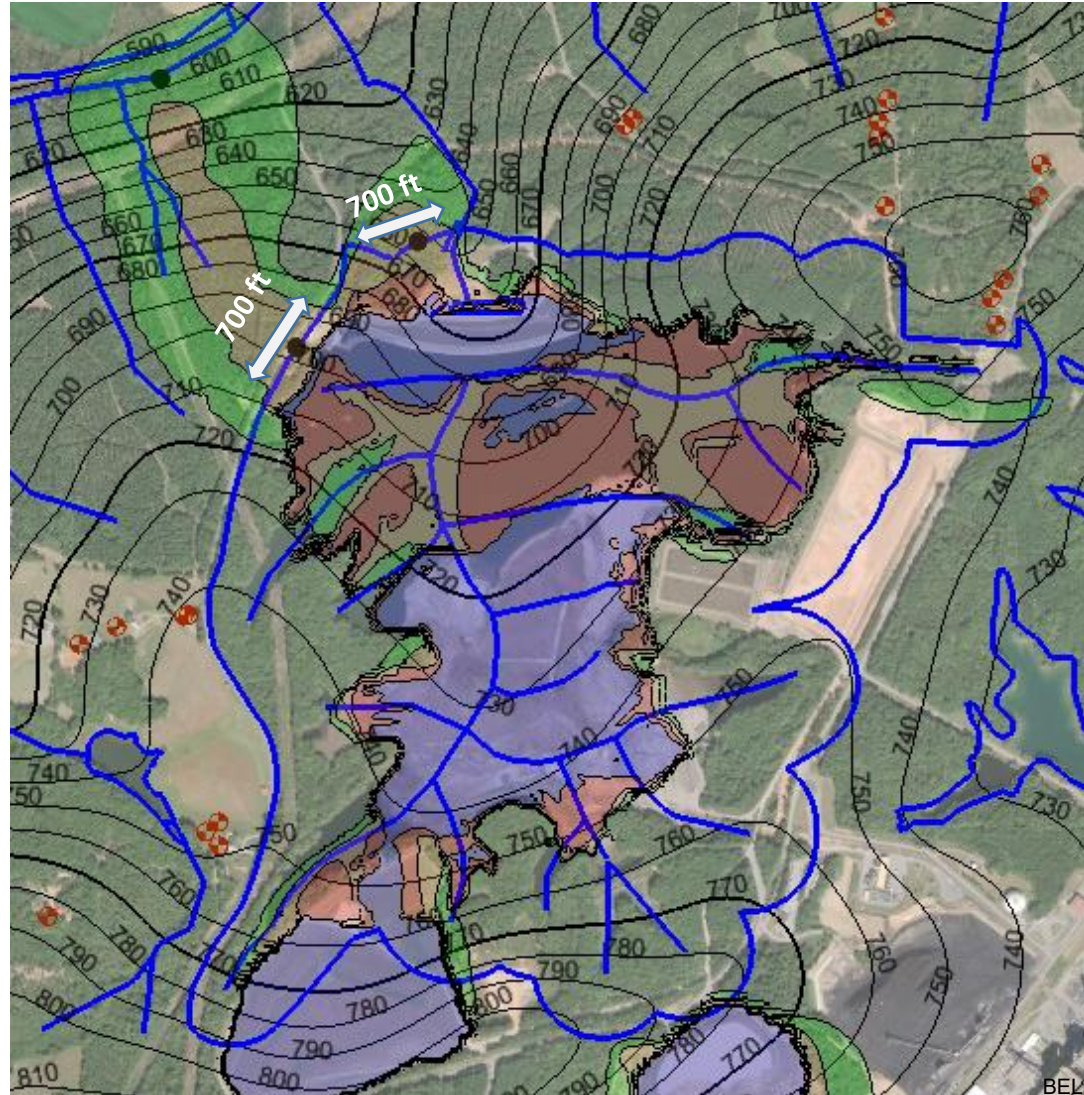
BELEWS CREEK **UPON COMPLETION OF FINAL COVER, 2025 t = 0**

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



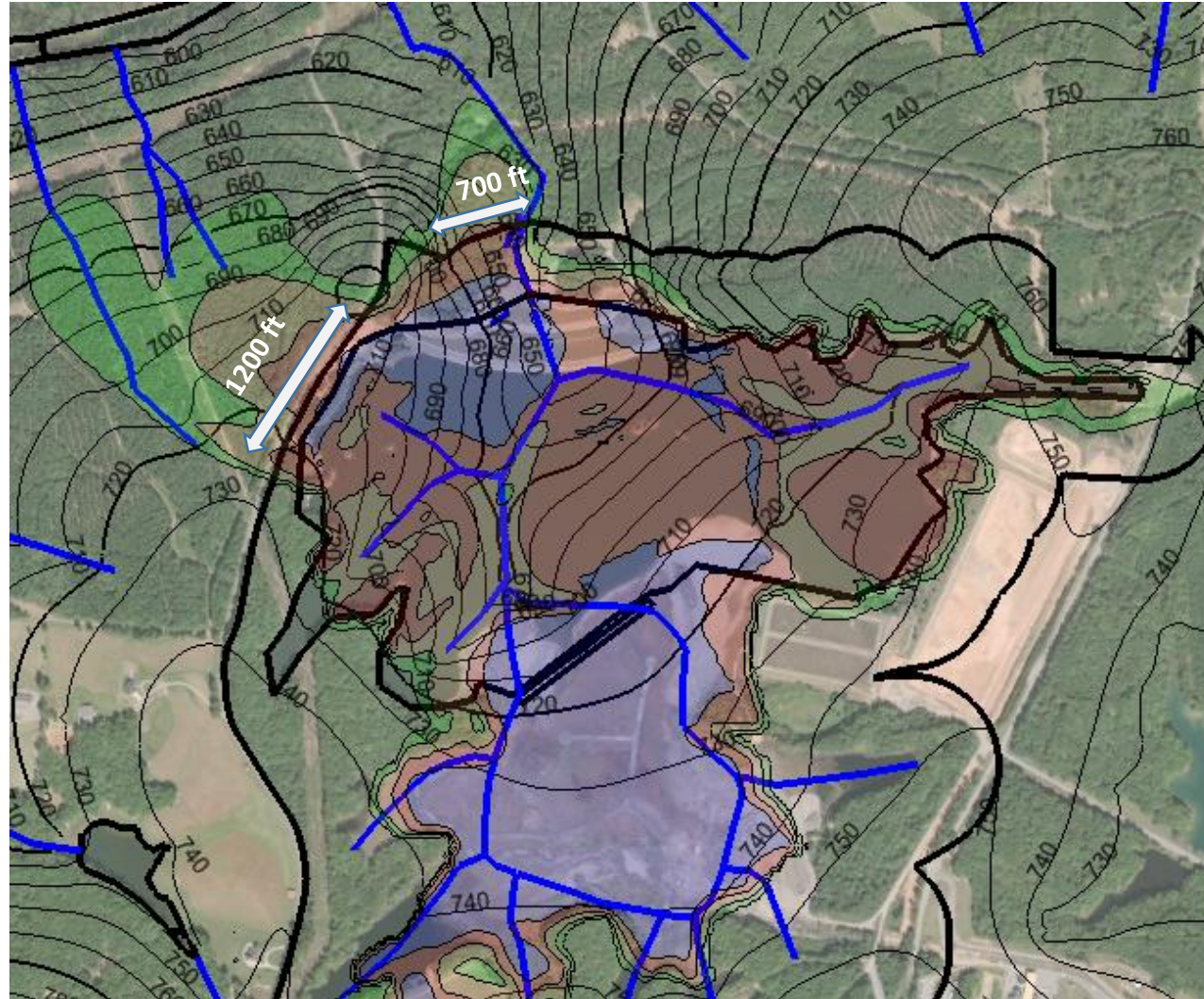
BELEWS CREEK FINAL COVER, 2150, t = 125 years

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



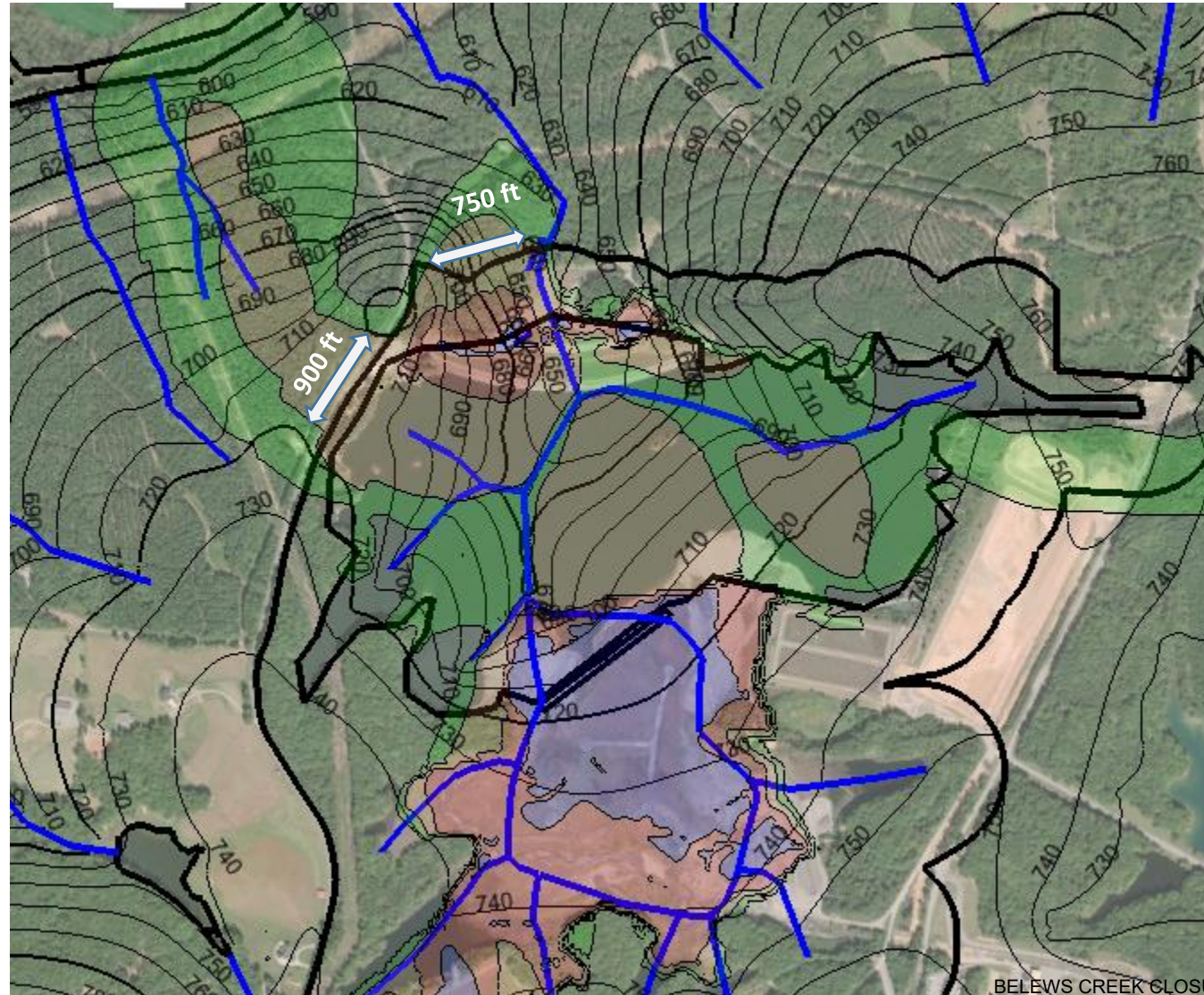
BELEWS CREEK **UPON COMPLETION OF HYBRID IN 2032, ^{/A}t = 0**

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



BELEWS CREEK HYBRID, 2150, t = 118 years

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



BELEWS CREEK **CURRENT CONDITIONS IN 2017**

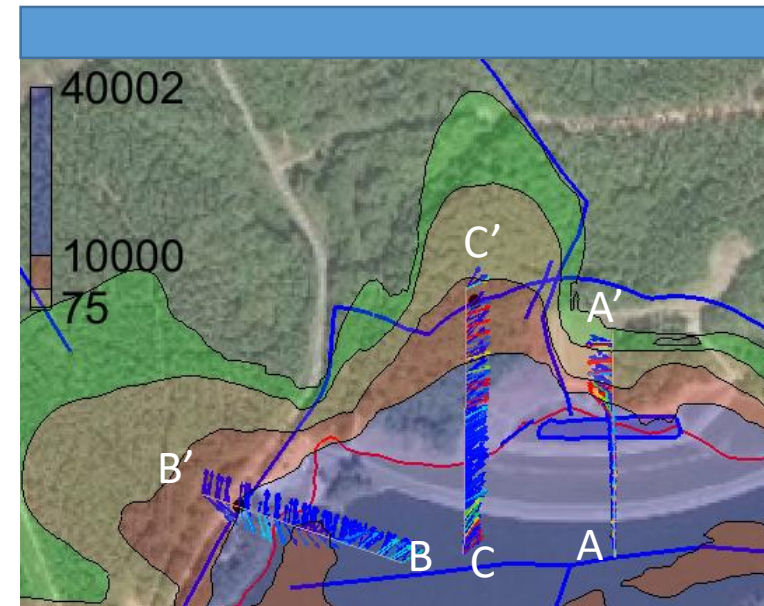
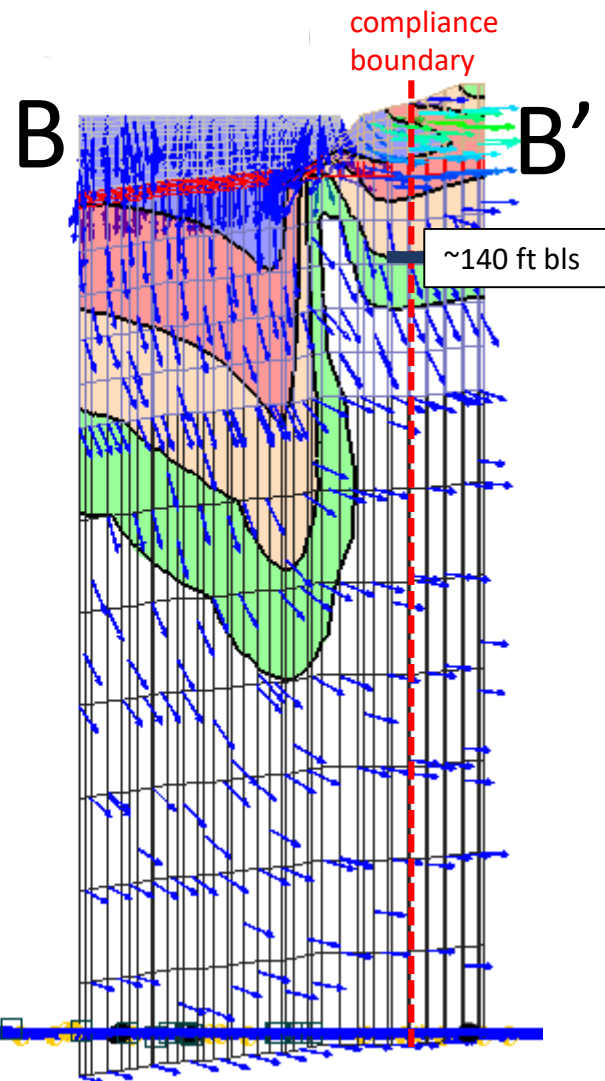
CROSS SECTION B-B' (VIEWED FROM DAM LOOKING SW)^{/A}

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

Ash 1-9
Saprolite 10-14
TZ 15
Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft
B-B' 850 ft
C-C' 1000 ft

BELEWS CREEK **UPON COMPLETION OF FINAL COVER, t = 0**

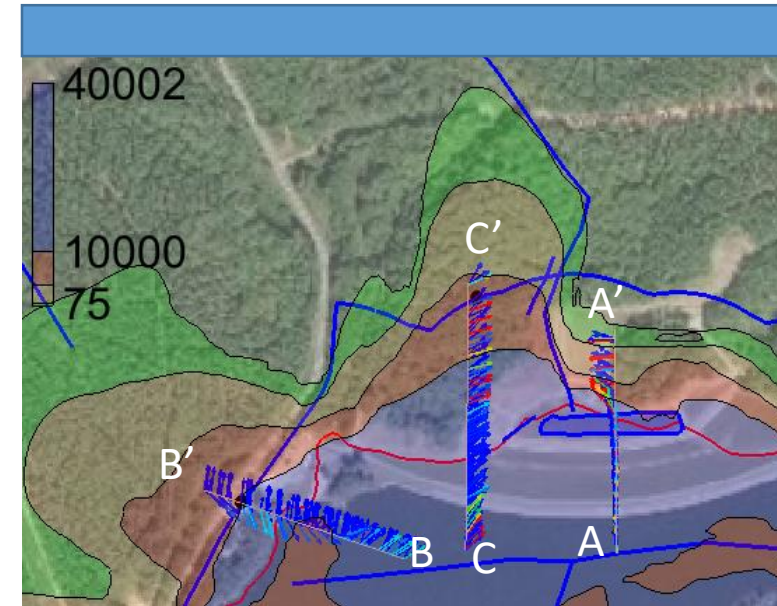
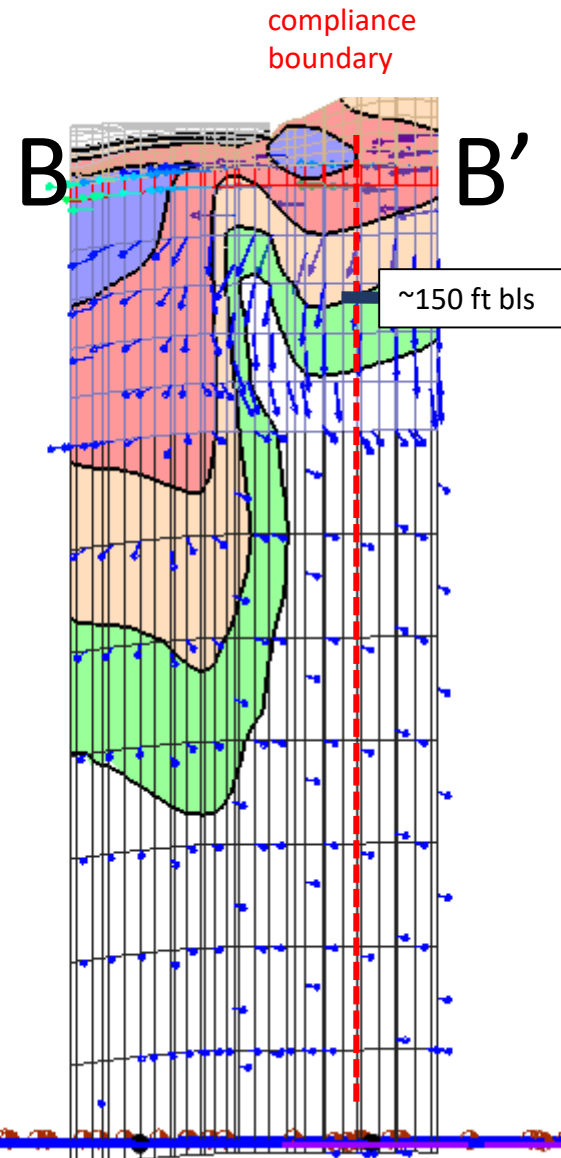
CROSS SECTION B-B' (VIEWED FROM DAM LOOKING SW)^{/A}

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

Ash 1-9
Saprolite 10-14
TZ 15
Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft
B-B' 850 ft
C-C' 1000 ft

BELEWS CREEK **FINAL COVER, t = 125 years**

CROSS SECTION B-B' (VIEWED FROM DAM LOOKING SW)^{/A}

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

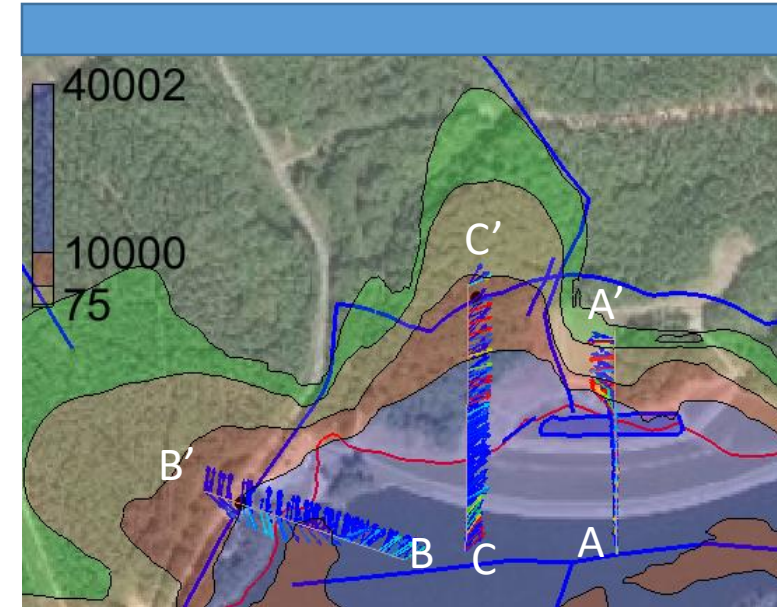
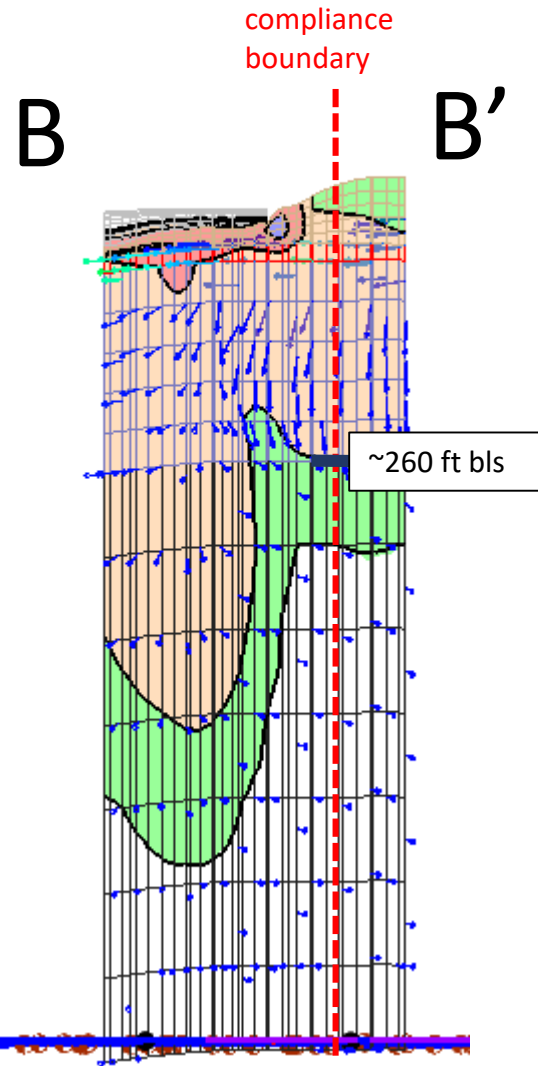
Ash 1-9

Saprolite 10-14

TZ 15

Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft

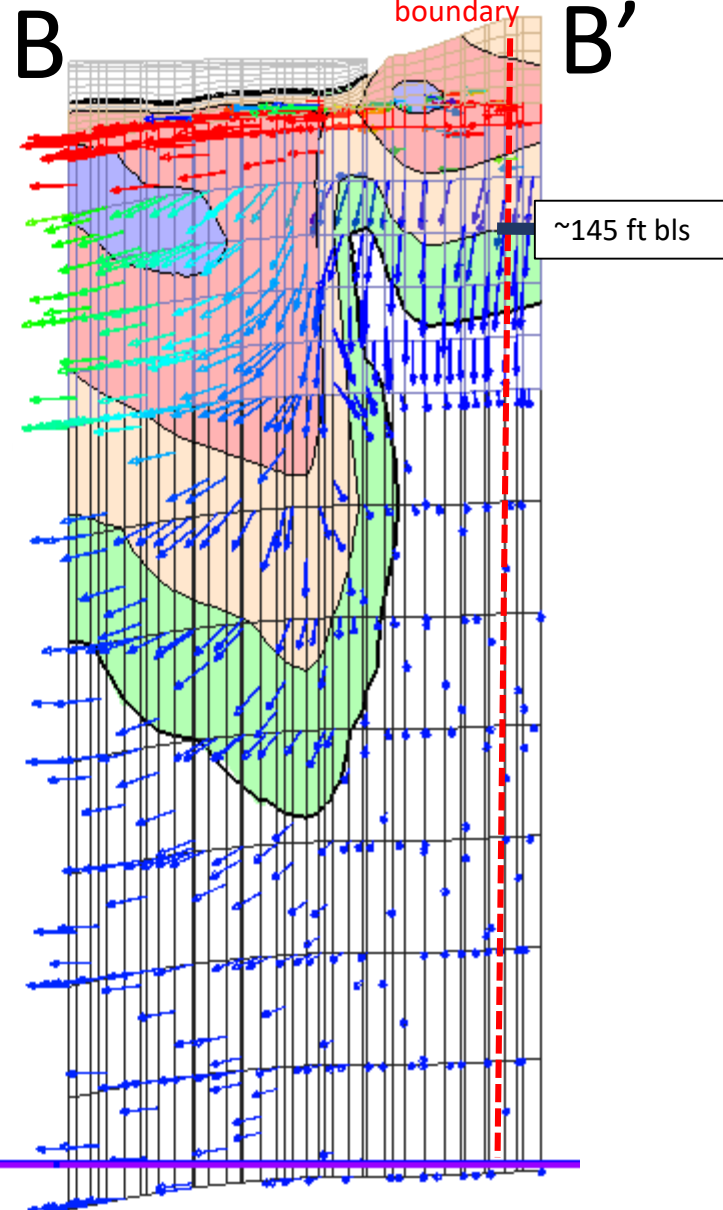
B-B' 850 ft

C-C' 1000 ft

BELEWS CREEK **UPON COMPLETION OF HYBRID, t = 0** CROSS SECTION B-B' (VIEWED FROM DAM LOOKING SW)^{/A}

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

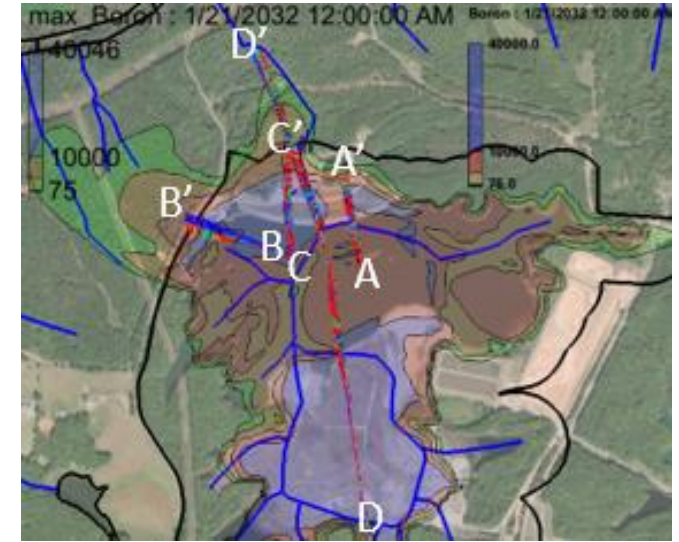
compliance
boundary



Belews Creek model layers:

- Ash 1-9
- Saprolite 10-14
- TZ 15
- Bedrock 16-27

Vertical
exaggeration X 3



- A-A' 850 ft
- B-B' 850 ft
- C-C' 1000 ft
- D-D' 6000 ft

BELEWS CREEK **HYBRID, t = 118 years**

CROSS SECTION B-B' (VIEWED FROM DAM LOOKING SW)^{/A}

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

compliance
boundary

B B'

Belews Creek model layers:

Ash 1-9

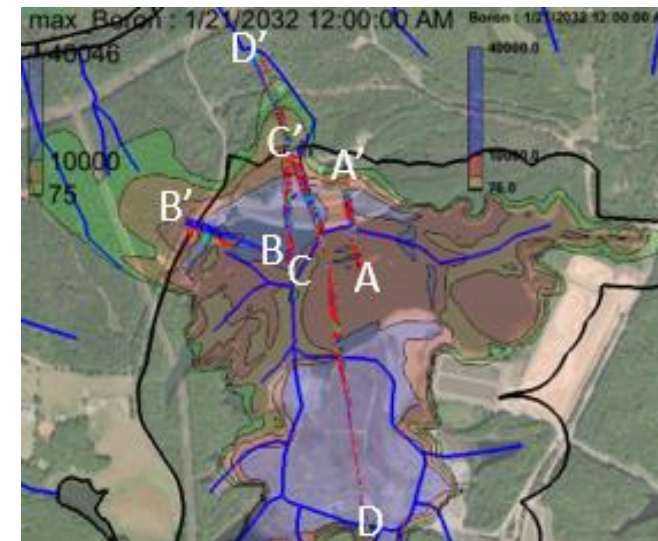
Saprolite 10-14

TZ 15

Bedrock 16-27

Vertical
exaggeration X 3

~235 ft bls



A-A' 850 ft

B-B' 850 ft

C-C' 1000 ft

D-D' 6000 ft

BELEWS CREEK **CURRENT CONDITIONS IN 2017**

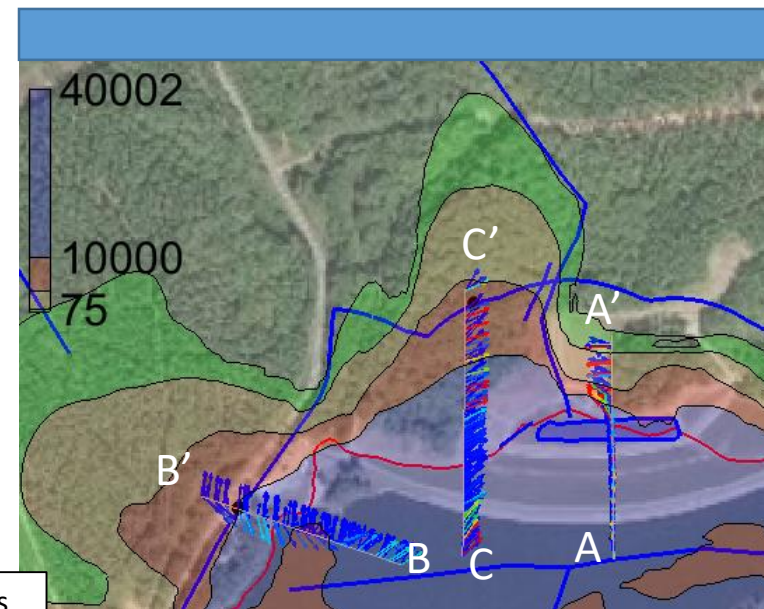
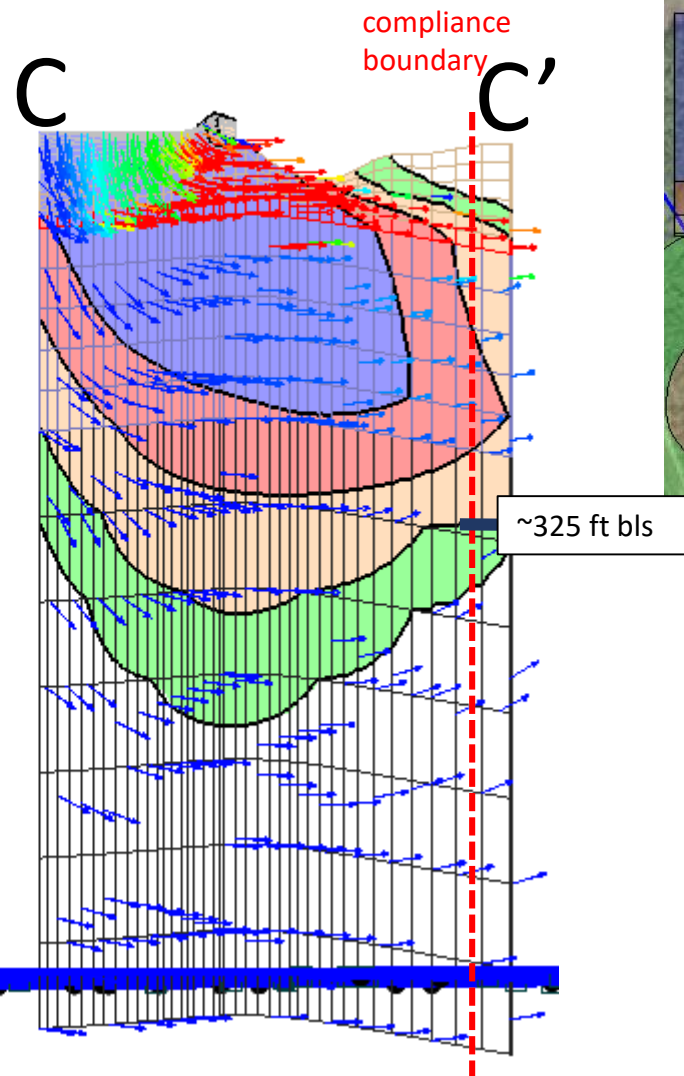
CROSS SECTION C-C' (VIEWED FROM E SIDE OF BLANKET DRAIN LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

Ash 1-9
Saprolite 10-14
TZ 15
Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft
B-B' 850 ft
C-C' 1000 ft

BELEWS CREEK **UPON COMPLETION OF FINAL COVER, $t = 0$**

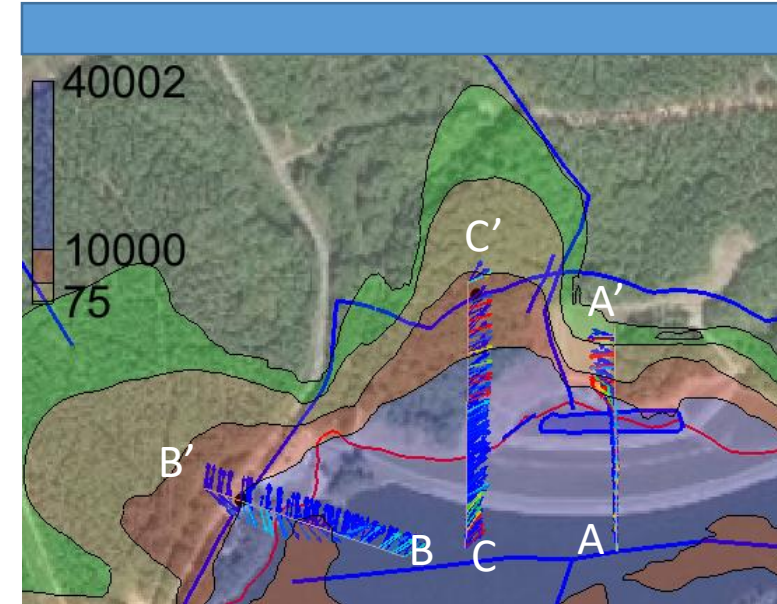
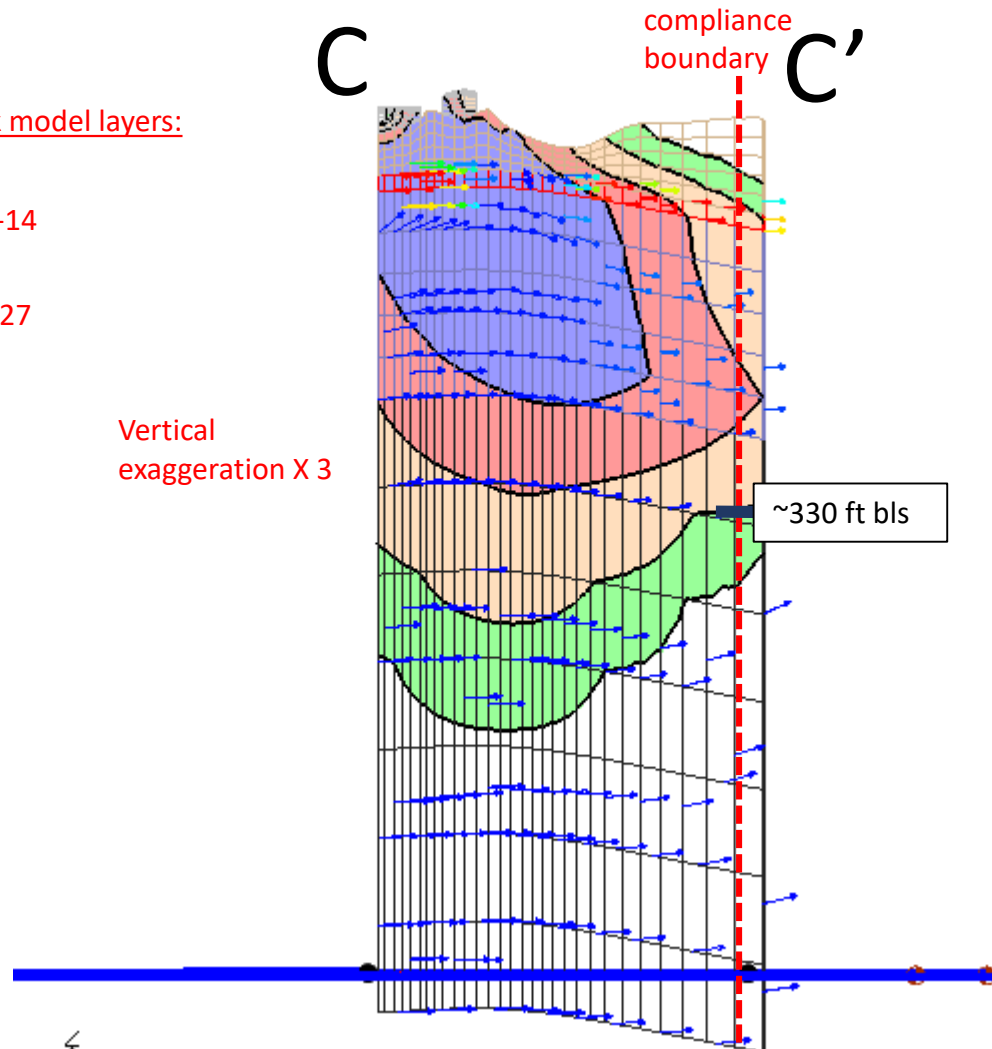
CROSS SECTION C-C' (VIEWED FROM E SIDE OF BLANKET DRAIN LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

Ash 1-9
Saprolite 10-14
TZ 15
Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft
B-B' 850 ft
C-C' 1000 ft

BELEWS CREEK **FINAL COVER, t = 125 years**

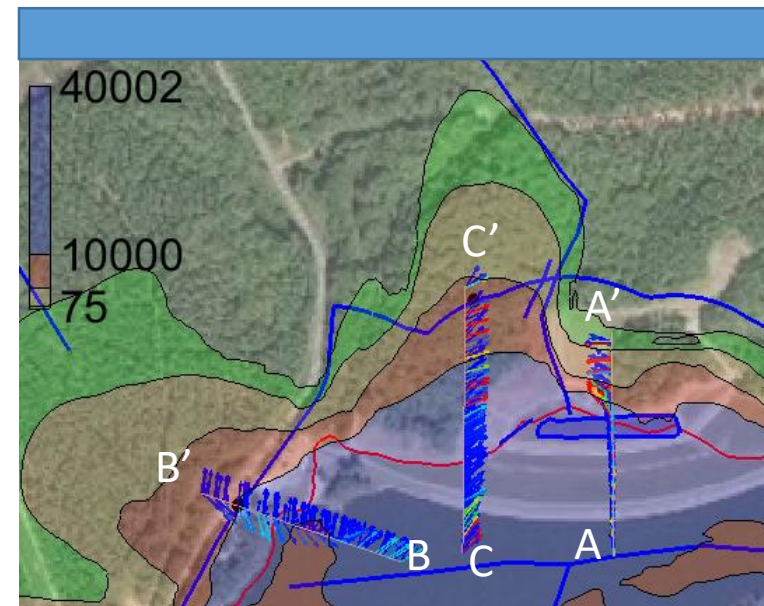
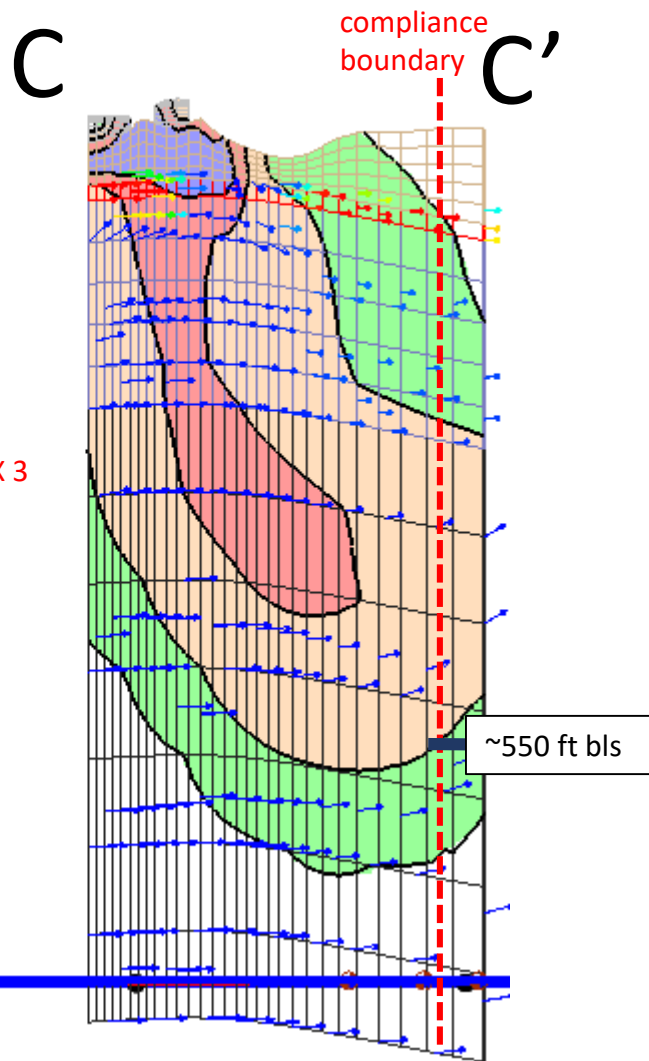
CROSS SECTION C-C' (VIEWED FROM E SIDE OF BLANKET^{/A} DRAIN LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

Ash 1-9
Saprolite 10-14
TZ 15
Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft
B-B' 850 ft
C-C' 1000 ft

BELEWS CREEK **UPON COMPLETION OF HYBRID, t = 0**

CROSS SECTION C-C' (VIEWED FROM E SIDE OF BLANKET DRAIN LOOKING WEST)

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

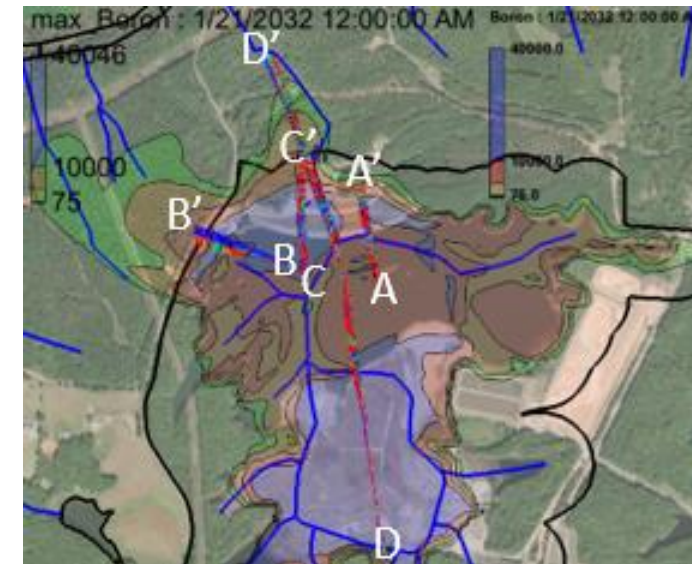
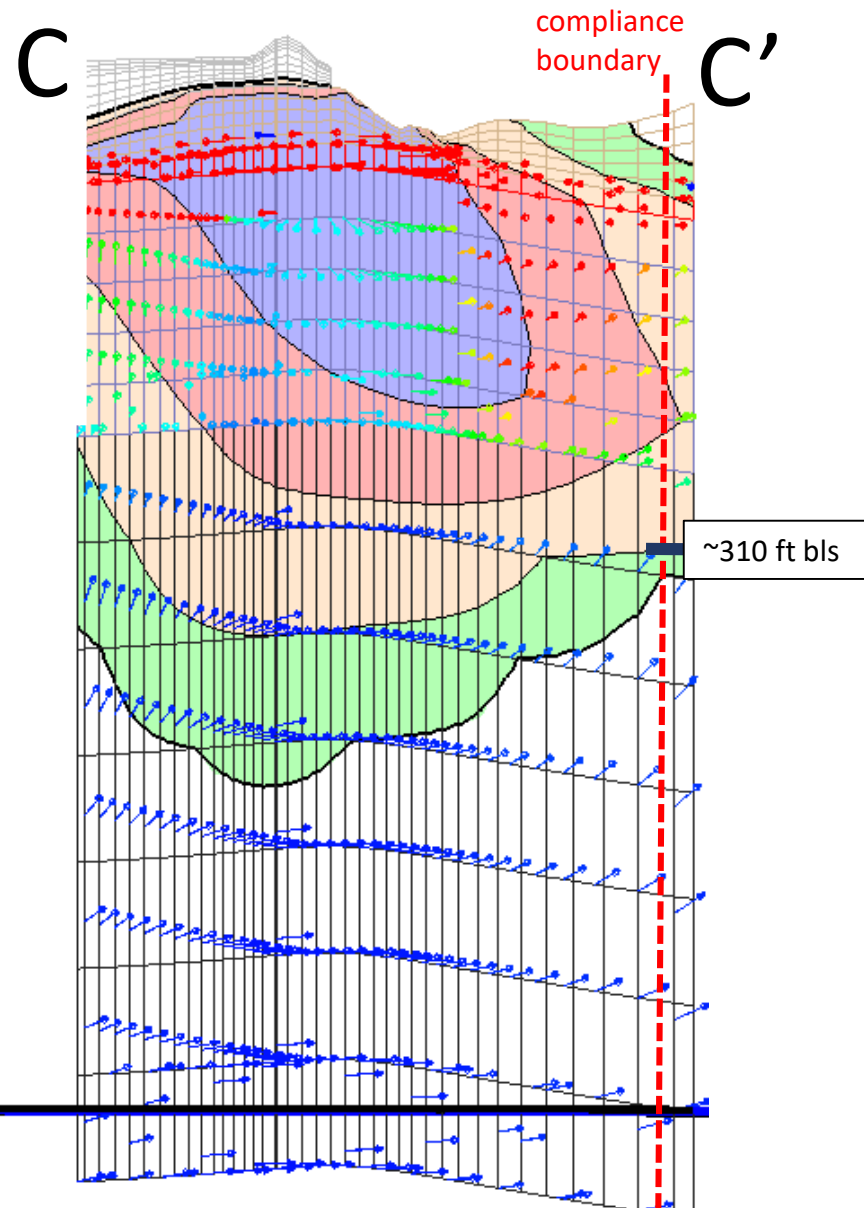
Ash 1-9

Saprolite 10-14

TZ 15

Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft

B-B' 850 ft

C-C' 1000 ft

D-D' 6000 ft

BELEWS CREEK **HYBRID, t = 118 years**

CROSS SECTION C-C' (VIEWED FROM E SIDE OF BLANKET DRAIN LOOKING WEST)

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Belews Creek model layers:

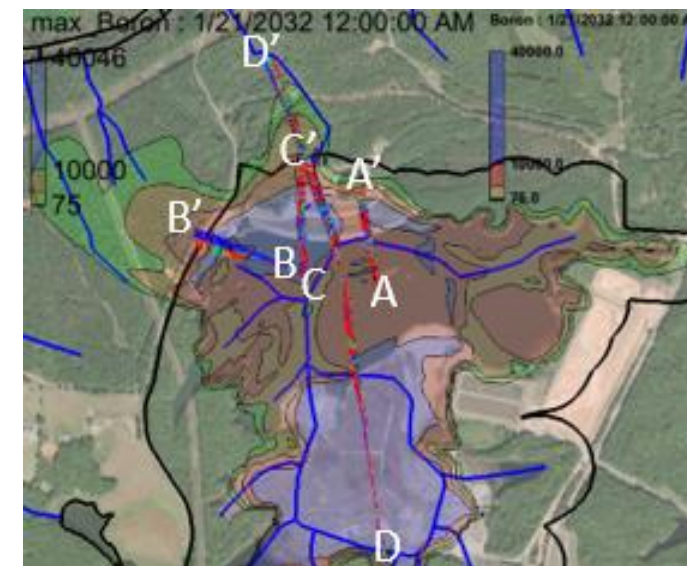
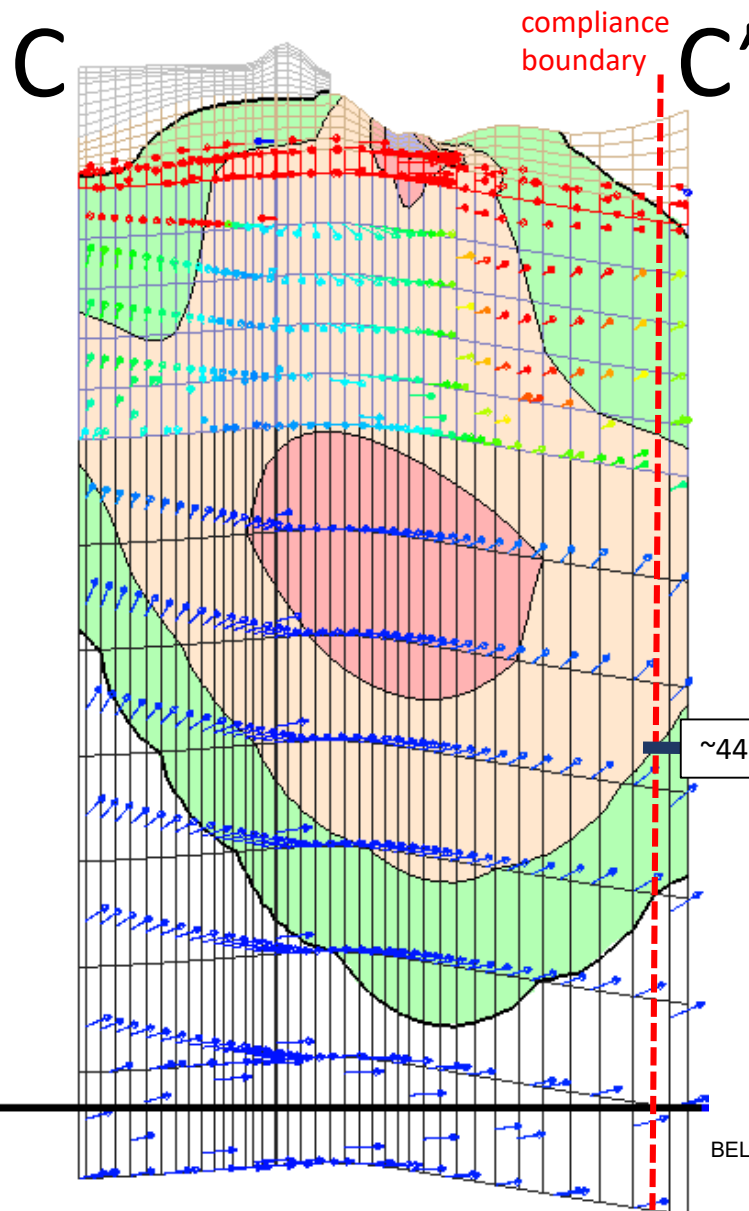
Ash 1-9

Saprolite 10-14

TZ 15

Bedrock 16-27

Vertical
exaggeration X 3



A-A' 850 ft

B-B' 850 ft

C-C' 1000 ft

D-D' 6000 ft

/A

ATTACHMENT B
RESPONSE TO COMMENTS

RESPONSE TO COMMENTS

I. Summary of Responses to Comments

The North Carolina Department of Environmental Quality (NCDEQ) received approximately 1052 public comments regarding the Belews Creek Steam Station Ash Basin Closure Options. Closure options considered at Belews Creek generally include closure-in-place, closure-by-removal and hybrid closure. Comments received by NCDEQ include emails, letters, two petitions (containing 275 and 340 signatures respectively) and video submissions. All but one of the comments support full excavation of all ash materials from the ash basin.

The majority of the comments support closure by removal to a lined landfill without specifying the location of the landfill. A sizeable minority specifically recommend excavating coal ash and moving it to a lined onsite landfill, although one commenter expressed concern about the onsite clear cutting of trees that may be required at Belews Creek to build the landfill. A small minority of commenters want the coal ash moved out of state. No commenter supports the hybrid closure option. No commenter unequivocally supports closure-in-place. However, one commenter registered qualified support for this option. Several commenters support recycling coal ash for various commercial product uses. A discussion of these and other related comments follow.

II. Detailed Responses to Comments

A. Closure-In-Place

No comments were received which unequivocally favored closure-in-place. Of the approximately 1,052 comments received, all but one expressly opposed closure-in-place. Many commenters stated specific reasons for their opposition. The reasons cited in opposition to closure-in-place include: water quality concerns, including concern that portions of the coal ash basin are located in the groundwater below the water table and that the ash basin was built on top of existing streams; concerns about increased risk of adverse health impacts, including cancer, respiratory and other illnesses; concerns regarding Duke Energy's motives for proposing closure-in-place; concerns regarding Duke Energy's credibility (citing Duke Energy's recent history of criminal violations); concerns about climate-related impacts on coal ash closed in place, including hurricanes and tropical storms; concerns for natural resources impacts, including both plant and animal life; concerns about recreational activities involving natural resources such as boating, swimming and fishing; concerns about fair and equal safety protections from the effects of coal ash for the Belews Creek area, citing coal ash removal and storage in lined landfills in South Carolina, Virginia and at eight other coal ash sites in North Carolina; concerns that closure-in-place both violates state and federal statutes and regulations and also grants Duke Energy arbitrary and capricious preferential treatment in a manner that is not granted to anyone else; concerns over the effectiveness and costs of oversight of long-term monitoring; concerns that closure-in-place sends the wrong message to businesses and persons considering relocation to North Carolina by adversely impacting the reputation of North Carolina nationally, including the negative impact on both property values and the desirability of North Carolina as a place for business relocation; concerns about general impacts to future generations, including "kicking the

problem down the road”; concerns about environmental justice issues and adverse impacts on minorities and the poor; concerns that Duke Energy is avoiding a real financial cost of coal generated electricity such that the market cannot make accurate cost comparisons to other energy sources; concerns about adverse effects on tourism; concerns about the adverse impacts on the fisheries industry; concerns about the health and safety risks associated with dam failure; concerns that the overwhelming majority of public comments opposing closure-in-place must be heard and followed.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

One commenter equivocally supported closure-in-place under certain conditions. That comment is summarized below.

Comment: One commenter indicated that closure-in-place could potentially be a viable option, but did not support the specific proposal for closure-in-place presented by Duke Energy. He commented that the Duke Energy closure-in-place option allows for saturated pond ash deposits to remain, thus creating a “wet cap” closure-in-place. He stated his opinion that additional study, monitoring and safeguards would be needed to see if a different closure-in-place option could comply with applicable regulations and be safely utilized. He recommended a potential closure-in-place that steadily dewateres the coal ash impoundment, monitors the results from the dewatering over several months and uses the collected data to verify or update groundwater modeling at the site. The collected data and modeling would determine if closure-in-place is viable and if not, then closure-by-removal could be employed.

Response: NCDEQ rejects the closure-in-place option and elects excavation under CAMA Option A for Belews Creek. The excavated coal ash will be placed in a lined landfill.

B. Hybrid Option

No comments were received supporting the hybrid option. Several comments expressly opposed the hybrid option for many of the reasons cited in opposition to closure-in-place, including but not limited to health and safety concerns, water quality concerns, concerns about the natural environment and concerns that the problem was being left for future generations.

Response: DEQ elects CAMA Option A (excavation and disposal to a lined landfill). DEQ does not elect closure-in-place under CAMA Option B or C.

C. Closure-By-Removal

1. Closure-by-Removal With No Location Specified

Comment: Approximately 956 commenters stated in a form email that they were supportive of closure-by-removal to a dry lined landfill. The comment in that form email states the following:

“The North Carolina Department of Environmental Quality (DEQ) should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry lined storage away from our waterways and out of our groundwater.

Duke Energy plans to leave its coal ash sitting in the groundwater at six sites in North Carolina, where it will keep polluting our groundwater, lakes, and rivers. Recent monitoring shows Duke Energy is polluting the groundwater at its coal ash ponds in North Carolina with toxic and radioactive materials. We need cleanup—not coverup!

The communities around the coal ash ponds have come out time after time over the last several years, making clear that we’re concerned about pollution from Duke Energy’s coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to listen to the communities.

Duke Energy is already required to remove its coal ash at eight other sites in North Carolina and all of its sites in South Carolina—our families and our community deserve the same protections”.

Response: NCDEQ rejects the closure-in-place option and elects excavation under CAMA Option A for Belews Creek.

2. Closure-By-Removal to Lined Onsite Landfill

Comment: Approximately 51 comments were submitted using a second form email. These commenters supported the closure-by-removal of coal ash from unlined pits and placing it in dry, lined storage located on Duke Energy property away from Little Belews Creek and the Dan River:

- DEQ should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry, lined storage on its own property — away from Little Belews Creek and the Dan River.
- Duke Energy plans to leave its coal ash sitting in the groundwater at Belews Creek, where it will keep polluting our groundwater, lakes, streams and rivers. Recent monitoring shows Duke Energy is polluting the groundwater surrounding Belews Creek with toxic materials. We need cleanup—not coverup!
- The community has come out time after time over the last several years, making clear that we’re concerned about pollution from Duke Energy’s coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to remove the ash.
- Duke Energy is already required to remove its coal ash from eight other communities in North Carolina and all of its sites in South Carolina, and the governor of Virginia recently called for all the coal ash to be removed from Dominion’s unlined sites—our families and our community deserve the same protections.

- Duke Energy can dispose all the ash from its leaking ponds onsite in a safe, lined landfill. Ash need not travel through the community or to other communities.
- Duke Energy cannot exaggerate traffic concerns while downplaying the community's real concern: Duke Energy's water pollution. Excavation will not significantly increase offsite trucking if Duke Energy uses an onsite landfill, and only excavation will remove the source of the water pollution.
- Duke Energy's own experts know that even cap-in-place will involve trucking construction materials to the site—just like any other construction project. But even under their estimates, the additional trucking impacts would be minimal. Duke Energy's consultant estimates that 110 trucks currently travel near Belews Creek on community roads every day. Excavation to onsite storage would add only two more trucks on community roads each day, compared to six more trucks on community roads for the duration of the cap-in-place scenario.
- It is past time for DEQ to listen to the community—not Duke Energy's consultants—about what our community needs. We need Duke to clean up its coal ash and stop the water pollution.

Response: NCDEQ has determined that closure-by-removal is the best closure option for Belews Creek. The excavated coal ash will be placed in a lined landfill. The location of the lined landfill will be determined at a later date; landfill location should be addressed in the proposed closure plan which must be submitted by August 1, 2019.

D. Other Comments

1. Comment Addressing Fairness and Consistency

Comment: Many commenters, in form emails, individualized emails, submitted petitions and video submissions, voiced their concern that persons in the Belews Creek area be treated fairly and consistently with other persons both in the state and in the region regarding the risks of coal ash. They noted that coal ash is being removed at eight other sites in North Carolina, all Duke Energy sites in South Carolina and that coal ash is being removed in Virginia. The commenters assert that their community deserves the same protections with respect to the treatment of coal ash.

Response: NCDEQ has determined that closure-by-removal is the best closure option for Belews Creek. The excavated coal ash will be placed in a lined landfill.

2. Comment Addressing Cost and Accountability

Comment: Several commenters stated that Duke Energy should have to pay for all costs associated with the removal and storage of coal ash in dry lined landfill. Commenters pointed to Duke Energy's recent criminal record and Duke Energy's decision to create the situation in the first place. Several commenters stated that Duke Energy created the mess and Duke Energy should clean up the mess. Some commenters supported sharing the costs with taxpayers. Other

commenters emphasized that the coal ash must be removed and that the responsibility for costs was a secondary issue.

Response: NCDEQ has not been granted statutory authority to determine who will pay the costs associated with closure-by-removal at Belews Creek, including costs associated with storage of excavated coal ash in a lined landfill.

3. Comment Addressing the Recycling of Coal Ash

Comment: Several commenters proposed the recycling of coal ash. They proposed various means by which recycling could occur, including encasing in cement bricks, concrete, placing in wall board and other proposed uses. One commenter stated that Duke Energy could extract the usable portion of coal ash, fly ash, and put it to productive use instead of disposing of it. Another commenter stated that Duke Energy's failure to process ash such that it could be recycled has resulted in ash being imported from other countries for use in products in the United States. Another commenter emphasized the importance of researching and developing new uses for recycled ash. One commenter proposed the ash be stored in a lined basin in a manner such that the ash could be accessed for recycling in the future.

Response: The proposed closure plan, which must be submitted not later than August 1, 2019, may provide additional information on several issues involved with closure-by-removal, including whether Duke Energy plans to recycle coal ash excavated at Belews Creek. Pursuant to the requirements of the Coal Ash Management Act, the public will receive notice of the proposed closure plan and given the opportunity to comment.

4. Comments Addressing Landfill Design, Groundwater Monitoring and Safety of Workers Engaged In Removal of Ash and Construction of Lined Landfill

Comment: Several commenters expressed the need for the protection of worker safety during the removal of the coal ash, the construction of a dry lined landfill and during the placement of ash into the new landfill. Commenters proposed that appropriate particulate masks should be worn, removal precautions should be taken, OSHA inspections should be performed and protective suits should be worn as necessary.

Response: Duke Energy will be required to meet all applicable legal statutes and regulations addressing worker safety at Belews Creek. Generally, the statutory authority to regulate worker safety laws is vested in state and federal agencies other than NCDEQ.

Comment: Several commenters emphasized the importance of careful, independent research and analysis of the best options for long term storage, including emphasis on the use of best technologies and not focusing on short term savings. The landfills should be built above minimum standards with long-term safeguards, use of best liner technologies, the inclusion of redundant liners and the placement of the landfill should be based on best science after investigation and ongoing monitoring of groundwater, away from rivers, lakes and aquifers. One commenter proposed double lining to include two feet of clay on the exterior with durable lining impervious to water.

Response: The proposed closure plan, which must be submitted not later than August 1, 2019, may provide additional information on several issues involved with closure-by-removal,

including whether Duke Energy plans to recycle coal ash excavated at Belews Creek. Pursuant to the requirements of the Coal Ash Management Act, the public will receive notice of the proposed closure plan and given the opportunity to comment.

Comment: Several commenters emphasized the importance of ongoing monitoring of groundwater and voiced skepticism regarding the reliability of monitoring by Duke Energy. One commenter proposed that monitoring results should be full, public and transparent, with results accessible by internet and in other ways easy for the public to access. Another commenter proposed independent third-party verification in some instances of data produced by Duke Energy. One commenter proposed that Duke Energy be required to monitor all necessary data without “cherry picking” what to monitor in order to avoid liability.

Response: The proposed closure plan, which must be submitted not later than August 1, 2019, may provide additional information on several issues involved with closure-by-removal, including whether Duke Energy plans to recycle coal ash excavated at Belews Creek. Pursuant to the requirements of the Coal Ash Management Act, the public will receive notice of the proposed closure plan and given the opportunity to comment.

5. Comments Addressing Environmental Justice

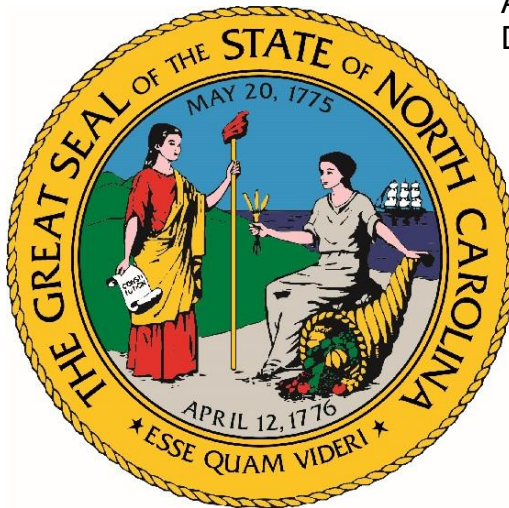
Comment: Several commenters raised concerns regarding environmental justice issues. They were concerned that minorities and poor communities bear a disproportionate amount of the negative health and economic consequences resulting from coal ash. They expressed concern that these negative impacts affect a portion of the population that has the least voice to respond.

Response: NCDEQ has determined that closure-by-removal is the best closure option for Belews Creek. The excavated coal ash will be placed in a lined landfill.

6. Comments Addressing Health, Safety And Natural Resources Damage Associated With Potential Dam Failure At The Belews Creek Ash Basin

Comment: Several commenters expressed concern about the potentially catastrophic health and safety risks associated with dam failure at the Belews Creek ash basin. Commenters expressed concern about the potential loss of human life, destruction of property and the destruction of water quality and natural resources (including both plant and animal life).

Response: The excavated coal ash will be placed in a lined landfill. The proposed closure plan for Belews Creek, which must be submitted not later than August 1, 2019, should provide specific information relevant to this comment, including Duke Energy’s plans to address the Belews Creek ash basin dam. Pursuant to the requirements of the Coal Ash Management Act, the public will receive notice of the proposed closure plan and given the opportunity to comment.



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Rogers Energy Complex/Cliffside Steam Station

April 1, 2019



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Rogers Energy Complex/Cliffside Steam Station

Executive Summary

The Coal Ash Management Act (CAMA) establishes criteria for the closure of coal combustion residuals (CCR) surface impoundments. The CCR surface impoundments located at Duke Energy Carolinas, LLC's (Duke Energy) Rogers Energy Complex/formerly Cliffside Steam Station (Rogers Energy/Cliffside) in Stokes County, NC have received a low-risk classification. Therefore, according to N.C. Gen. Stat. § 130A-309.214(a)(3), the closure option for CCR surface impoundments is at the election of the North Carolina Department of Environmental Quality (DEQ or Department). CAMA provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C].

In preparing to make its election, DEQ requested information from Duke Energy related to closure options. By November 15, 2018, Duke Energy provided the following options for consideration: closure in place, full excavation, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundments. DEQ held a public information session on January 22, 2019 in Forest City, NC where the community near Rogers Energy/Cliffside had the opportunity to learn about options for closing CCR surface impoundments and to express their views about proposed criteria to guide DEQ's coal ash closure decision making process. To evaluate the closure options, the Department considered environmental data gathered as part of the site investigation, permit requirements, ambient monitoring, groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the CCR surface impoundments at the Rogers Energy/Cliffside facility in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from unlined CCR surface impoundments at Rogers Energy/Cliffside is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

Duke Energy will be required to submit a final Closure Plan for the CCR surface impoundments at Rogers Energy/Cliffside by August 1, 2019. The Closure Plan must conform to this election by DEQ.

I. Introduction

DEQ has evaluated the closure options submitted by Duke Energy for the two CCR surface impoundments at Rogers Energy/Cliffside. This document describes the CAMA requirements for closure of CCR surface impoundments, the DEQ evaluation process to make an election under CAMA for the subject CCR surface impoundments at the Rogers Energy/Cliffside site, and the election by DEQ for the final closure option.

II. Site History

Duke Energy owns and operates the Rogers Energy/Cliffside station, which consists of approximately 1,000 acres in Mooresboro, Rutherford and Cleveland Counties, North Carolina. Rogers Energy/Cliffside began operation in 1940 and has a current capacity of 1,381 megawatts.

CCR coal ash residuals and other liquid discharges from coal combustion processes at the site have historically been managed in ash basins, which consist of the Active Ash basin, the Units 1-4 Inactive Ash Basin, and the Unit 5 Inactive Ash Basin. The Units 1-4 Inactive Ash Basin is located immediately east of the retired Units 1-4. It was constructed in 1957 and began operations the same year. The Units 1-4 Ash Basin was retired in 1977 once it reached capacity. However, stormwater ponds were constructed on top of the retired basin and continued to operate until the basin was excavated.

The Unit 5 Inactive Ash Basin is located on the western portion of the site, west and southwest of Units 5 and 6. The Unit 5 Inactive Ash Basin is currently used as a laydown yard for the station. This ash basin was constructed in 1970 (in advance of Unit 5 operations) and received sluiced ash from Unit 5 starting in 1972 until it was retired in 1980 when it reached full capacity. It is currently covered with a layer of topsoil and is stable with vegetation. The Active Ash Basin is located on the eastern portion of the site, east and southeast of Units 5 and 6. Construction of the Active Ash Basin occurred in 1975, and it began receiving sluiced ash from Unit 5. The Active Ash Basin expanded in 1980 to its current footprint and continues to receive sluiced bottom ash from Unit 5 in addition to other waste streams.

There are two CCR surface impoundments at the site: the Active Ash Basin and Unit 5 Inactive Ash Basin. The Units 1-4 Inactive Ash Basin was excavated and is no longer considered a CCR surface impoundment. The Active Ash Basin and the Unit 5 Inactive Ash Basin are approximately 132 acres in size and contain approximately 7,390,000 tons of CCR. The Active Ash Basin and Unit 5 Inactive Ash Basin are subject to the requirements of General Statute § 130A-309.214(a)(3).

III. CAMA Closure Requirements

CAMA establishes closure requirements for CCR surface impoundments. The General Assembly has mandated that DEQ “shall review a proposed Coal Combustion Residuals Surface Impoundment Closure Plan for consistency with the minimum requirements set forth in subsection (a) of this section and whether the proposed Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and otherwise complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(b). Similarly, the General Assembly has required that DEQ “shall disapprove a proposed Coal Combustion Residuals Surface Impoundment Closure Plan unless the Department finds that the Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and other complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(c).

CAMA requires DEQ to review any proposed Closure Plan for consistency with the requirements of N.C. Gen. Stat. § 130A-309.214(a). See N.C. Gen. Stat. § 130A-309.214(b). DEQ must disapprove any proposed Closure Plan that DEQ finds does not meet these requirements. See N.C. Gen. Stat. § 130A-309.214(c). Therefore, an approvable Closure Plan must, at a minimum, meet the requirements of N.C. Gen. Stat. § 130A-309.214(a).

Pursuant to N.C. Gen. Stat. § 130A-309.213(d)(1), DEQ has classified the CCR surface impoundment at Rogers Energy/Cliffside station as low-risk. The relevant closure requirements for low-risk impoundments are in N.C. Gen. Stat. § 130A-309.214(a)(3), which states the following:

- Low-risk impoundments shall be closed as soon as practicable, but no later than December 31, 2029;
- A proposed closure plan for a low-risk impoundment must be submitted as soon as practicable, but no later than December 31, 2019; and
- At a minimum, impoundments located in whole above the seasonal high groundwater table shall be dewatered and impoundments located in whole or in part beneath the seasonal high groundwater table shall be dewatered to the maximum extent practicable.

In addition, N.C. Gen. Stat. § 130A-309.214(a)(3) requires compliance with specific closure criteria set forth verbatim below in Table 1. The statute provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C]. For each low-risk impoundment, the choice of the closure pathway in CAMA is at the “election of the Department.”

Table 1: CAMA Closure Options for Low-Risk CCR Surface Impoundments
N.C. Gen. Stat. § 130A-309.214(a)(3)

At the election of the Department, the owner of an impoundment shall either:

- a. Close in any manner allowed pursuant to subdivision (1) of this subsection; [CAMA Option A]
- b. Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall install and maintain a cap system that is designed to minimize infiltration and erosion in conformance with the requirements of Section .1624 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, and, at a minimum, shall be designed and constructed to (i) have a permeability no greater than 1×10^{-5} centimeters per second; (ii) minimize infiltration by the use of a low-permeability barrier that contains a minimum 18 inches of earthen material; and (iii) minimize erosion of the cap system and protect the low-permeability barrier from root penetration by use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth. In addition, the owner of an impoundment shall (i) install and maintain a groundwater monitoring system; (ii) establish financial assurance that will ensure that sufficient funds are available for closure pursuant to this subdivision, post-closure maintenance and monitoring, any corrective action that the Department may require, and satisfy any potential liability for sudden and nonsudden accidental occurrences arising from the impoundment and subsequent costs incurred by the Department in response to an incident, even if the owner becomes insolvent or ceases to reside, be incorporated, do business, or maintain assets in the State; and (iii) conduct post-closure care for a period of 30 years, which period may be increased by the Department upon a determination that a longer period is necessary to protect public health, safety, welfare; the environment; and natural resources, or decreased upon a determination that a shorter period is sufficient to protect public health, safety, welfare; the environment; and natural resources. The Department may require implementation of any other measure it deems necessary to protect public health, safety, and welfare; the environment; and natural resources, including imposition of institutional controls that are sufficient to protect public health, safety, and welfare; the environment; and natural resources. The Department may not approve closure for an impoundment pursuant to sub-subdivision b. of subdivision (3) of this subsection unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment; [CAMA Option B] or
- c. Comply with the closure requirements established by the United States Environmental Protection Agency as provided in 40 CFR Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities." [CAMA Option C]

By referencing the closure options for *high-risk* CCR surface impoundments in “subdivision (1)” or N.C. Gen. Stat. § 130A-309.214(a)(1), CAMA allows for closure of a *low-risk* CCR impoundment in N.C. Gen. Stat. § 130A-309.214(a)(3) through the same removal scenarios:

- “Convert the coal combustion residuals impoundment to an industrial landfill by removing all coal combustion residuals and contaminated soil from the impoundment temporarily, safely storing the residuals on-site, and complying with the requirements for such landfills.” N.C. Gen. Stat. § 130A-309.214(a)(1)a.; or
- “Remove all coal combustion residuals from the impoundment, return the former impoundment to a nonerosive and stable condition and (i) transfer the coal combustion residuals for disposal in a coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill or (ii) use the coal combustion products in a structural fill or other beneficial use as allowed by law.” N.C. Gen. Stat. § 130A-309.214(a)(1)b.

IV. DEQ Election Process

Beginning with a letter to Duke Energy on October 8, 2018, DEQ began planning for a thorough evaluation of the closure options for low-risk CCR surface impoundments before making an election as outlined in Table 1 above. DEQ’s objectives were to receive input on closure options from Duke Energy and to engage with community members near low-risk sites. DEQ outlined the following schedule in the October 8, 2018 letter:

- November 15, 2018 – Duke Energy submittal of revised closure option analyses and related information
- January 22, 2019 – DEQ public meeting near Rogers Energy/Cliffside
- April 1, 2019 – DEQ evaluation of closure options
- August 1, 2019 – Duke Energy submittal of closure plan
- December 1, 2019 – Duke Energy submittal of updated corrective action plan for all sources at the Rogers Energy/Cliffside site that are either CCR surface impoundments or hydrologically connected to CCR surface impoundments

DEQ received the requested information from Duke Energy by November 15, 2018: closure options analysis, groundwater modeling and net environmental benefits assessment. These materials are posted on the DEQ website. Duke Energy provided the following options for consideration: closure in place, full excavation with an onsite landfill, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing impoundment for the Active Ash Basin. Duke Energy proposed closure in place and full excavation with an onsite landfill for the Unit 5 Inactive Ash Basin.

In preparing to make its election of the closure option, DEQ considered environmental data contained in the comprehensive site assessment, permit requirements, ambient monitoring, closure options analysis and groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements. The Rogers Energy/Cliffside site has extensive amounts of data that have been collected during the site assessment process, and these data were used as

part of the evaluation of closure options. DEQ's evaluation of the closure in place and hybrid option based on groundwater monitoring and modeling data is provided in Attachment A. That analysis demonstrates that the contaminated plume is already beyond the compliance boundary for the site. All of these references are part of the record supporting DEQ's determination.

DEQ conducted a public meeting in Forest City, NC near Rogers Energy/Cliffside on January 22, 2019. There were 28 people who attended the meeting. Approximately 1207 comments were received during the comment period, which closed on February 15, 2019. The majority of the comments supported closure by removal to a lined landfill. A review and response to comments are included in Attachment B.

V. DEQ Evaluation of Closure Options

DEQ has evaluated the closure options proposed by Duke Energy for the CCR surface impoundments at the Rogers Energy/Cliffside facility. The purpose of this evaluation was to determine which closure option or options may be incorporated into an approvable Closure Plan under CAMA.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin and Unit 5 Inactive Ash Basin at Rogers Energy/Cliffside in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from the two unlined impoundments at Rogers Energy/Cliffside is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

DEQ does not elect CAMA Option B for the CCR surface impoundments at Rogers Energy/Cliffside. In N.C. Gen. Stat. § 130A-309.214(a)(3)b, the General Assembly mandated that "[t]he Department may not approve closure for an impoundment pursuant to [this] subdivision . . . unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment." N.C. Gen. Stat. § 130A-309.214(a)(3)b. In light of these requirements and based on DEQ's review of the information provided by Duke Energy as well as DEQ's independent analysis, DEQ does not believe that Duke Energy can incorporate CAMA Option B into an approvable Closure Plan for Rogers Energy/Cliffside.

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B.

Specifically, DEQ attempted to determine whether upon full implementation of the closure plan the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary. To address this question, DEQ considered the current state of the groundwater contamination and reviewed the results of the groundwater modeling submitted by Duke Energy. The evaluation is provided in Attachment A. DEQ's overall conclusion is that based on the current geographic scope and vertical extent of the groundwater contamination plume, and the modeled extent of the plume in the future, DEQ does not believe these two closure options can meet the requirements of CAMA Option B for the CCR surface impoundments at Rogers Energy/Cliffside.

DEQ does not elect CAMA Option C (i.e., closure under the federal CCR Rules found in 40 CFR Part 257) for the CCR surface impoundments at Rogers Energy/Cliffside. DEQ has determined that:

- a. Under the facts and circumstances here, CAMA Option C is less stringent than CAMA Option A. Specifically, DEQ's election of Option A would also require Duke Energy to meet the requirements of the federal CCR Rule (i.e., CAMA Option C) but election of CAMA Option C would not require implementation of CAMA Option A.
- b. Because CAMA Option A adds additional requirements or performance criteria beyond Option C, it advances DEQ's duty to protect the environment (see N.C. Gen. Stat. §§ 279B-2 & 143-211) and the General Assembly's mandate under CAMA that DEQ ensure that any Closure Plan, which must incorporate an approvable closure option, is protective of public health, safety, and welfare, the environment, and natural resources (see N.C. Gen. Stat. § 130A-309.214(b) & (c)).
- c. For the CCR surface impoundments for which the closure option(s) must be determined, CAMA Option A provides a better CAMA mechanism for ensuring State regulatory oversight of the closure process than Option C, as well as greater transparency and accountability.
- d. While the federal CCR Rule was written to provide national minimum criteria for CCR surface impoundments across the country, CAMA was written specifically to address the CCR surface impoundments in North Carolina.
- e. While the federal CCR Rule allows CCR surface impoundment owners to select closure either by removal and decontamination (clean closure) or with a final cover system (cap in place), EPA anticipates that most owners will select closure through the less protective method of cap in place.
- f. There is considerable uncertainty regarding the status and proper interpretation of relevant provisions of the federal CCR Rule. For instance, EPA is reconsidering portions of the federal CCR Rule. Also, the performance standards in 40 CFR § 257.102(d) for cap in place closure are the subject of conflicting interpretations (and possible litigation) among industry and state authorities.

VI. Conclusion

The final closure plan is due on August 1, 2019 in accordance with this determination. Based on DEQ's evaluation of the options submitted by Duke Energy, DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin and Unit 5 Inactive Ash Basin at Rogers Energy/Cliffside in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

While beneficiation is not a requirement of the closure plan, DEQ encourages Duke Energy to consider opportunities for beneficiation of coal ash that would convert coal combustion residuals into a useful and safe product.

ATTACHMENT A

**DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON
GROUNDWATER MONITORING AND MODELING DATA**

DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON GROUNDWATER MONITORING AND MODELING DATA

I. Groundwater Monitoring Summary

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary upon full implementation of the closure plan. To help address this question, DEQ considered the current state of the groundwater contamination.

Figure ES-1 shows the inferred general extent of constituent migration in groundwater based on evaluation of concentrations greater than both the calculated PBTVs, 2L Standards, and/or IMACs. The figure also shows that groundwater within the area of the CCR surface impoundments generally flows from south to north and discharges to the Broad River and to Suck Creek, a perennial stream flowing south to north and discharging to the Broad River. The horizontal extent of contaminant concentrations greater than the PBTv or 2L Standard approximates the leading edge of the CCR-derived plume (yellow shaded area) from the source areas.

The plume near the Active Ash Basin has extended beyond the compliance boundary near the northeast corner of the CCR surface impoundment where a small portion of an adjacent property extends along the Broad River. The plume has also extended beyond the compliance boundary in the area of the ash storage area.

The vertical extent of most constituents of interest is within the shallow and transition flow zones. However, the results of the assessment show that the bedrock aquifer has been impacted by CCR. Arsenic, sulfate, thallium, TDS, and total radium appear to have exceedances in the bedrock north of Unit 5 Inactive Ash Basin and/or near the plant.

DEQ concludes that the contaminated groundwater plume in the area near the Active Ash Basin has extended beyond the compliance boundary near the northeast corner of the impoundment where a small portion of an adjacent property extends along the Broad River. The plume has also extended beyond the compliance boundary in the area of the ash storage area. The horizontal extent of nearly all COIs such as arsenic, chromium, cobalt, iron, manganese, strontium, sulfate, thallium, TDS, vanadium, total uranium, and total radium occur in the shallow flow zone and are generally within the boron plume footprint. Total chromium and cobalt appear to have some exceedances in isolated pockets outside the boron plume near the plant. Strontium and sulfate plumes appear to be slightly more widespread, extending outside the boron plume near the Unit 5 Inactive Ash Basin and the plant.

The Unit 5 Inactive Ash Basin does not have a NPDES or any other agency permit and therefore does not have compliance boundaries. Any exceedance of the 2L Standards in this area, including within the waste boundary is subject to cleanup requirements.

Figure ES-1: Cliffside from 2017 CSA Update

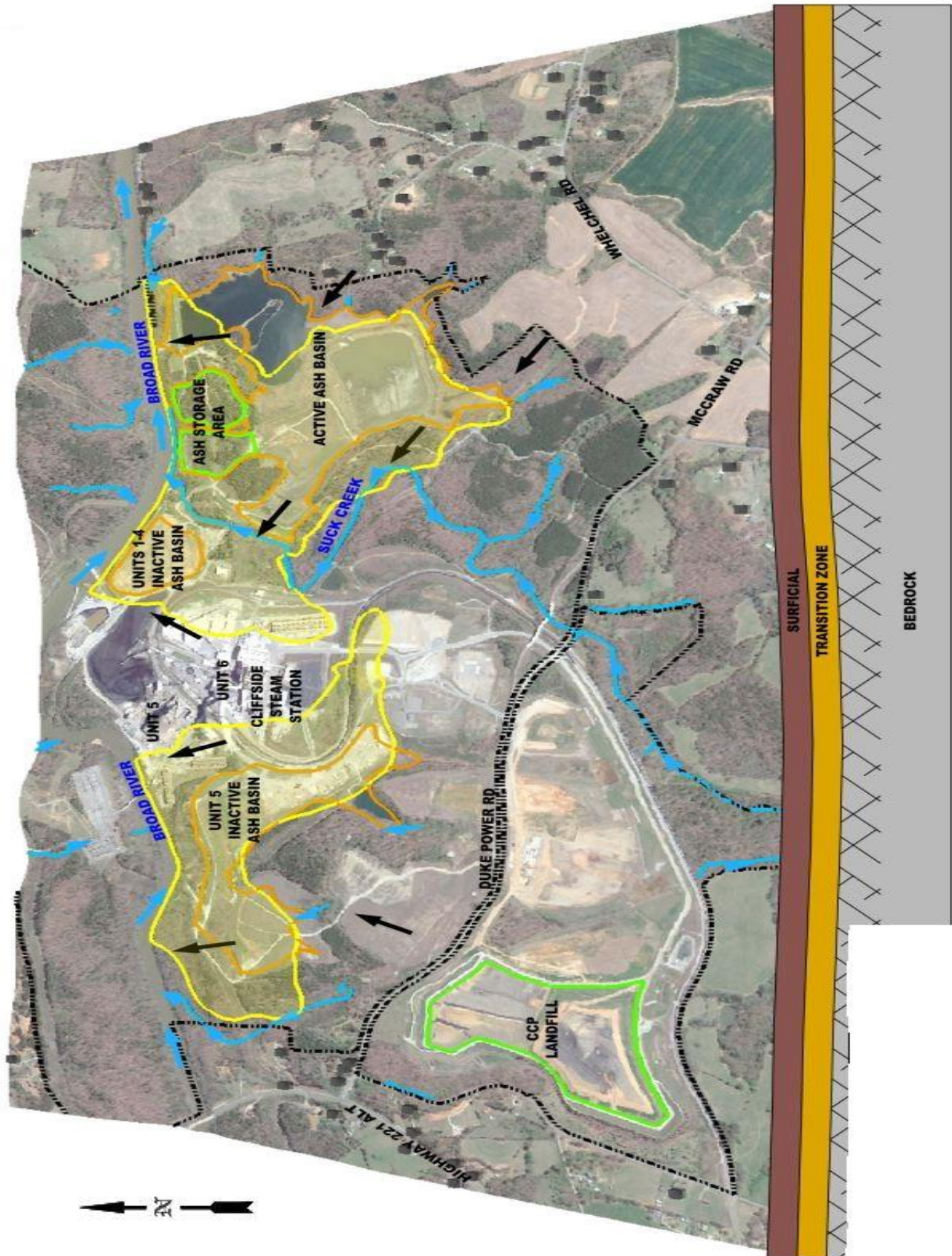
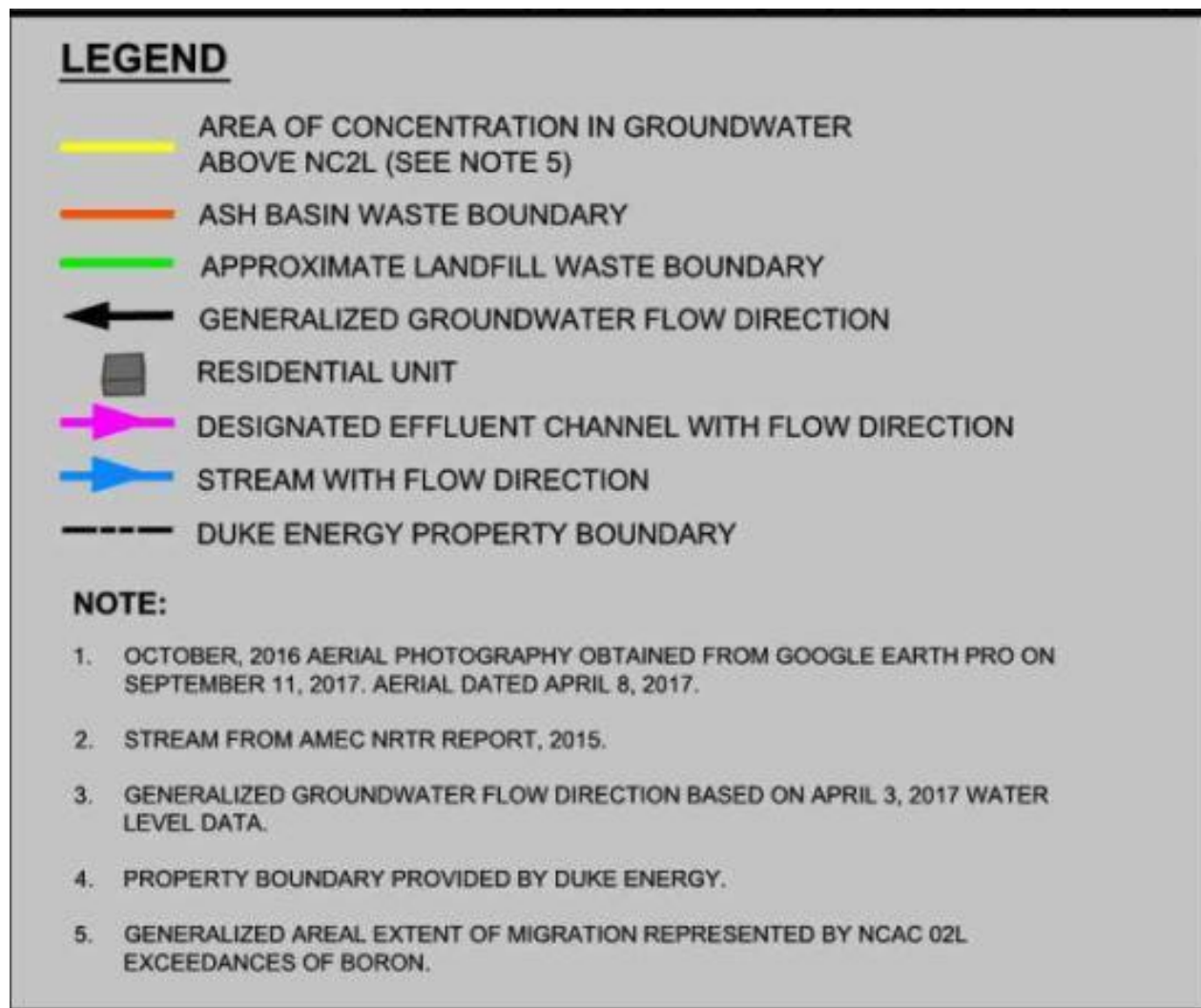


Figure ES-1 Legend: Cliffside from 2017 CSA Update



II. Groundwater Cross-section Modeling

DEQ evaluated cross-sections of the groundwater modeling results provided by Duke Energy to determine whether Duke Energy's final closure *Option 1: Closure-in-Place* and *Option 3: Hybrid* for the Active Ash Basin would meet the criteria of CAMA Option B. DEQ considered whether the agency could conclude that the proposed closure option includes design measures to prevent any post closure exceedances of the 2L groundwater quality standards (15A NCAC 02L) at the compliance boundary upon the plan's full implementation. Cross section A-A' was evaluated and can be seen in the figures below. This cross section represents where the boron concentration above the 2L standard of 700 µg/L has crossed the compliance boundary based on groundwater monitoring and modeling.

Next, the model results were evaluated based on the following model simulations:

- current conditions in 2017 when the model was calibrated based on raw field data
- upon completion of the final closure-in-place cover system at t=0 years
- closure-in-place option at t=100 years
- upon completion of the hybrid option at t=0 years
- hybrid option at t=125 years

The table below summarizes the results from the model simulations. The boron concentrations depicted in the table represent the maximum boron concentration in any layer (ash, saprolite, transition zone, and bedrock) of the model.

Cliffside Modeling Results for Cross-Section A-A'			
Model Simulation	Maximum Concentration of Boron Above 2L Beyond Compliance Boundary (µg/L)	Depth of GW Contamination Above 2L Beyond Compliance Boundary (feet bgs)	Width of Contamination Plume Beyond Compliance Boundary (feet)
Current Conditions	700-4,000	80	600
Completion of Final Cover (t=0 yrs)	700-4,000	80	580
Final Cover (t=100 yrs)	700-4,000	120	175
Completion of Hybrid (t=0 yrs)	700-4,000	80	580
Hybrid (t=125 yrs)	700-4,000	120	100

bgs – below ground surface

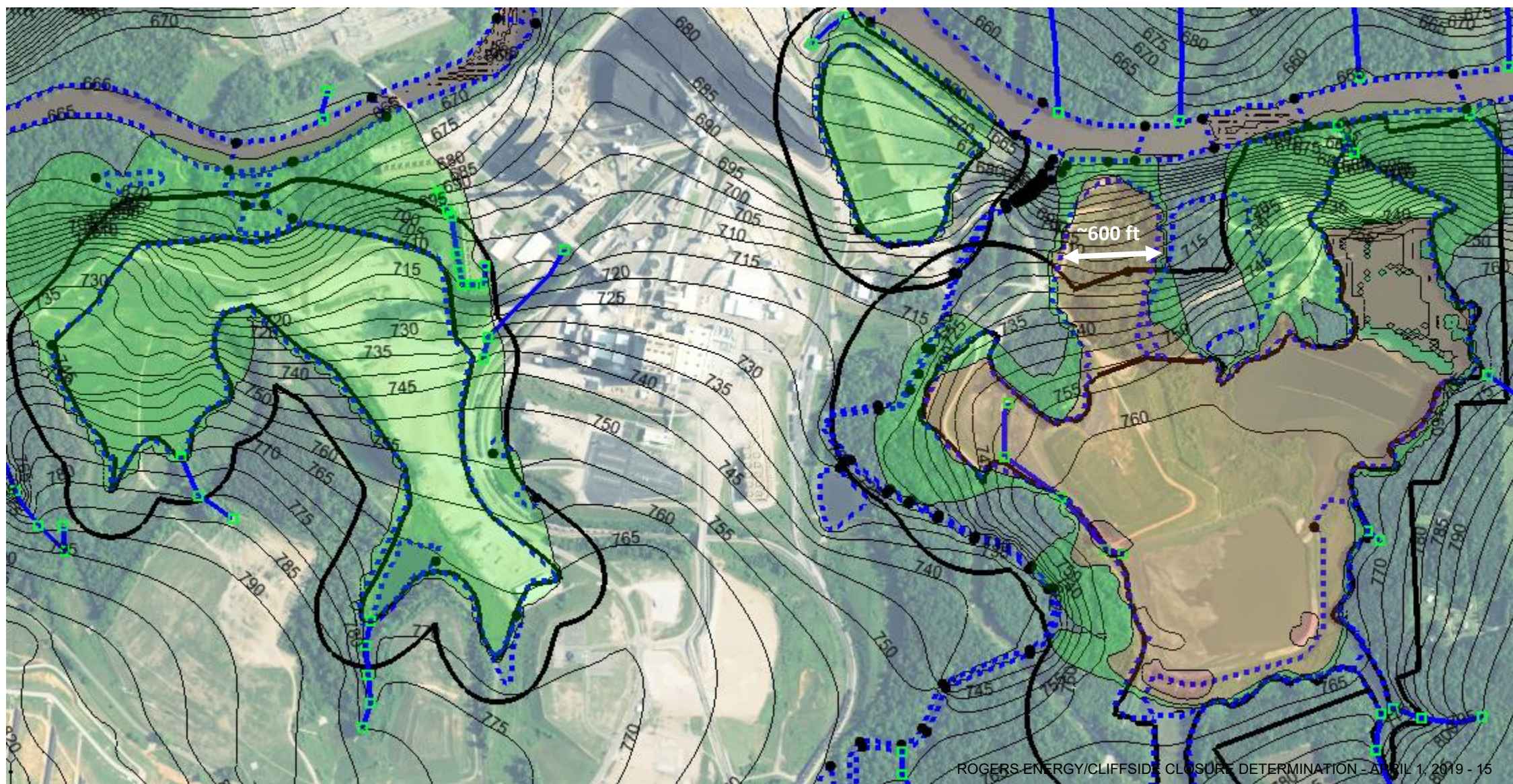
These data illustrate that after completion of closure with the final cover or hybrid option, the groundwater plume still extends beyond the compliance boundary above the 2L groundwater standard and the area of the plume requiring remediation is immense. Even 100 or 125 years beyond completion of closure, the area of the plume requiring remediation remains extensive under these two closure options.

DEQ recognizes that there are no groundwater remediation corrective actions included in the groundwater modeling simulations submitted to DEQ as part of Duke Energy's closure options analysis documentation. However, based on the current geographic scope, vertical extent of the groundwater contamination plume, and future modeled extent of the plume, DEQ does not believe these two closure options can meet the requirements of CAMA Option B for the Active Ash Basin. DEQ also does not believe Duke Energy's *Option 1: Closure-in-Place* for the Unit 5 Inactive Ash Basin can meet the requirements of CAMA Option B, given the extent of the groundwater plume beyond the waste boundary, extending to the Broad River as depicted in ES-1 in Attachment B, and the lack of a compliance boundary for the impoundment.

CLIFFSIDE **CURRENT CONDITIONS IN 2018**

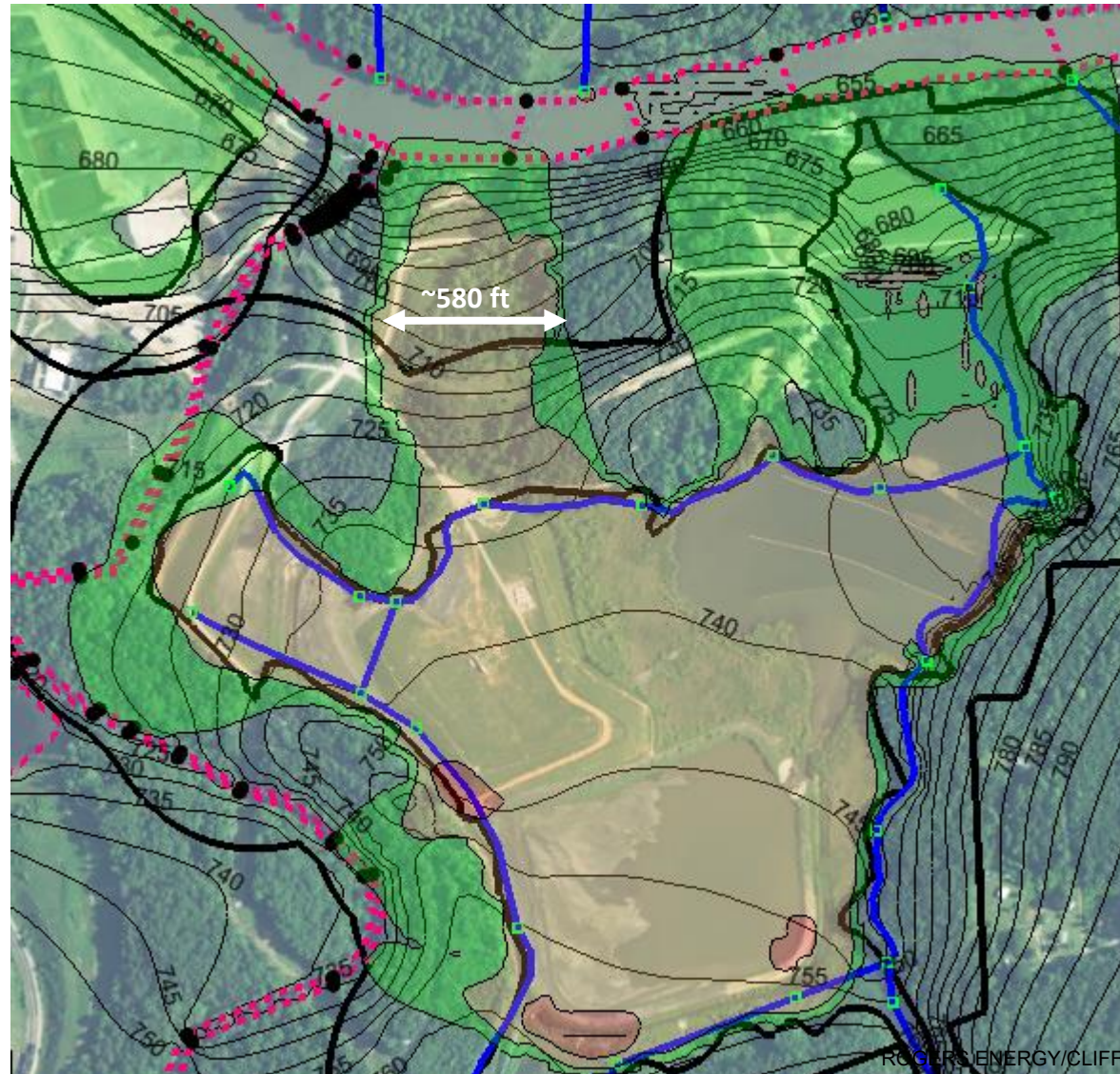
/A

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



CLIFFSIDE **UPON COMPLETION OF FINAL COVER IN 2022**

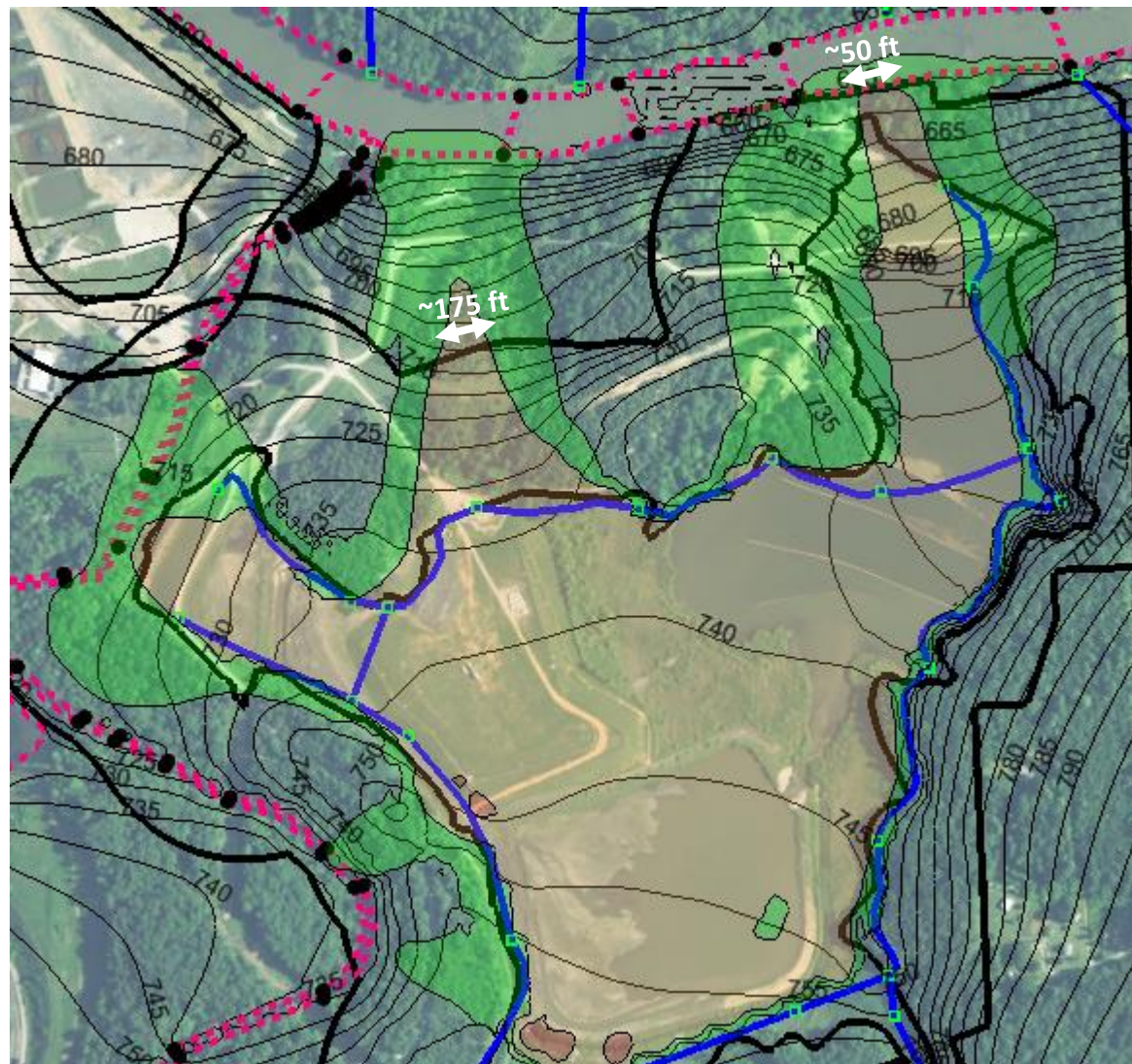
MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



CLIFFSIDE **FINAL COVER IN 2125, t ~ 100 years**

/A

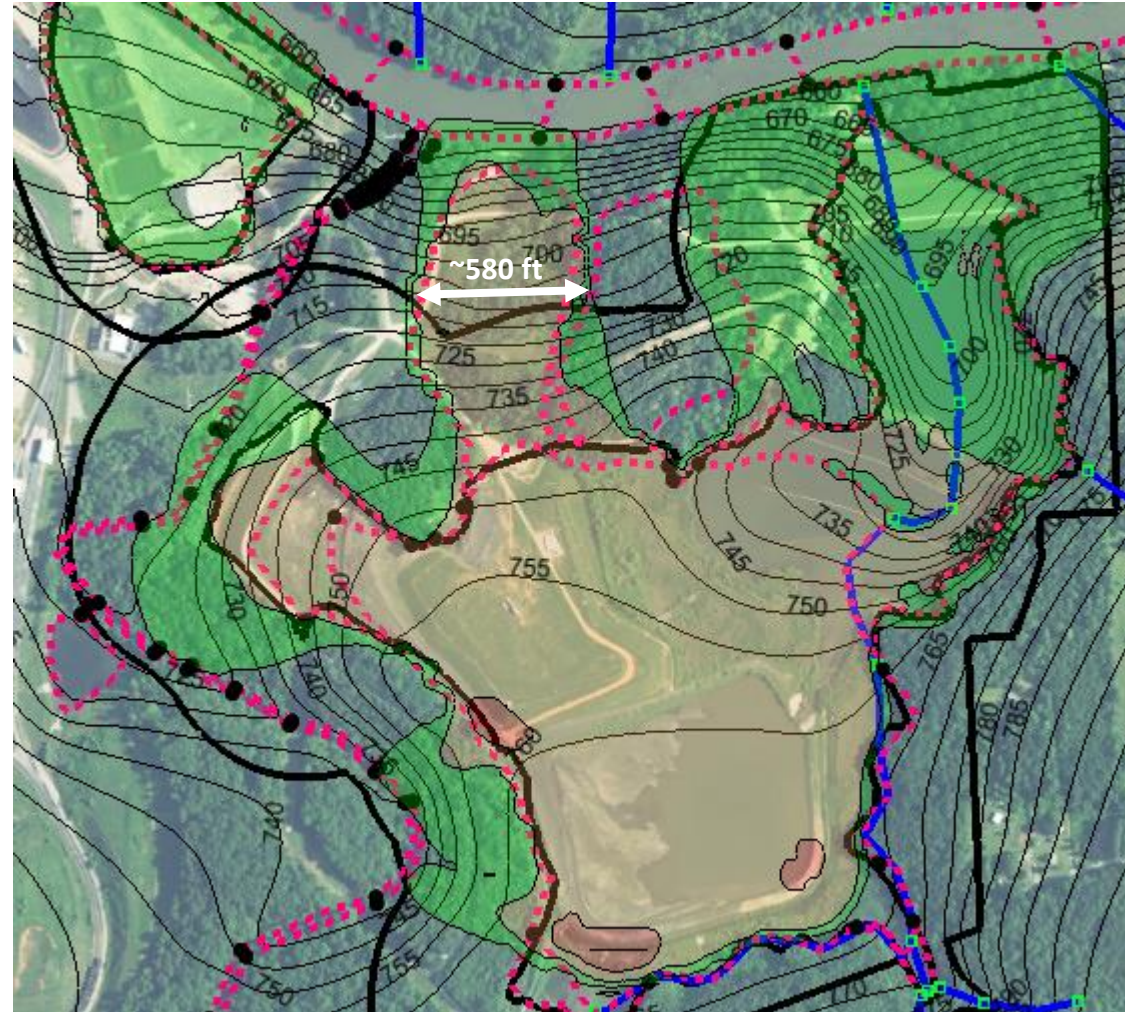
MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



CLIFFSIDE **UPON COMPLETION OF HYBRID IN 2023**

/A

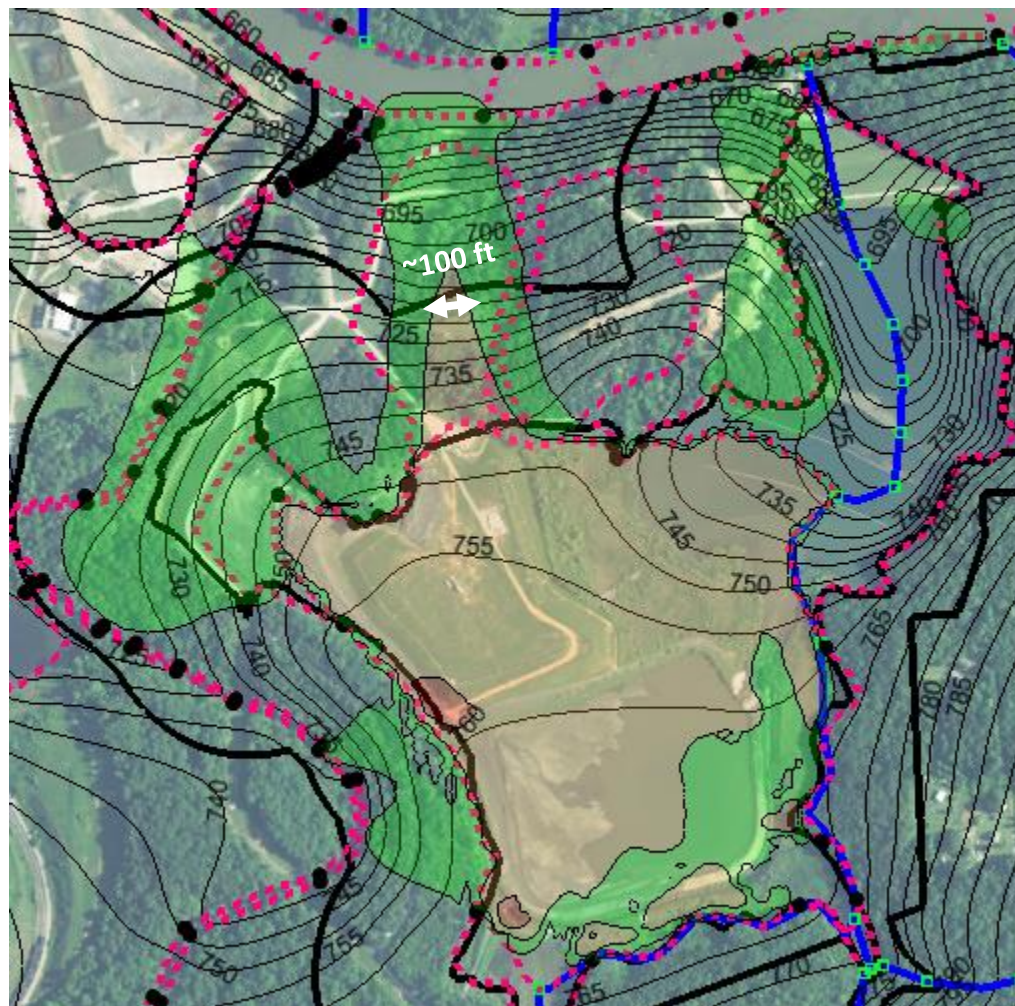
MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



CLIFFSIDE **HYBRID IN 2125, t ~ 100 years**

/A

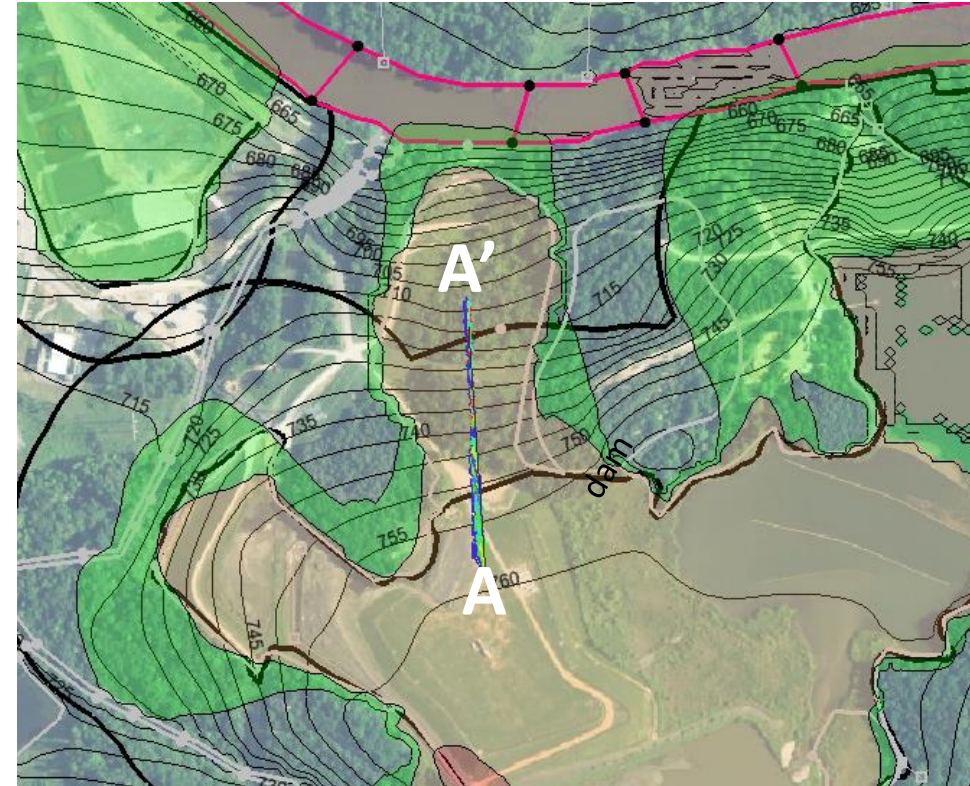
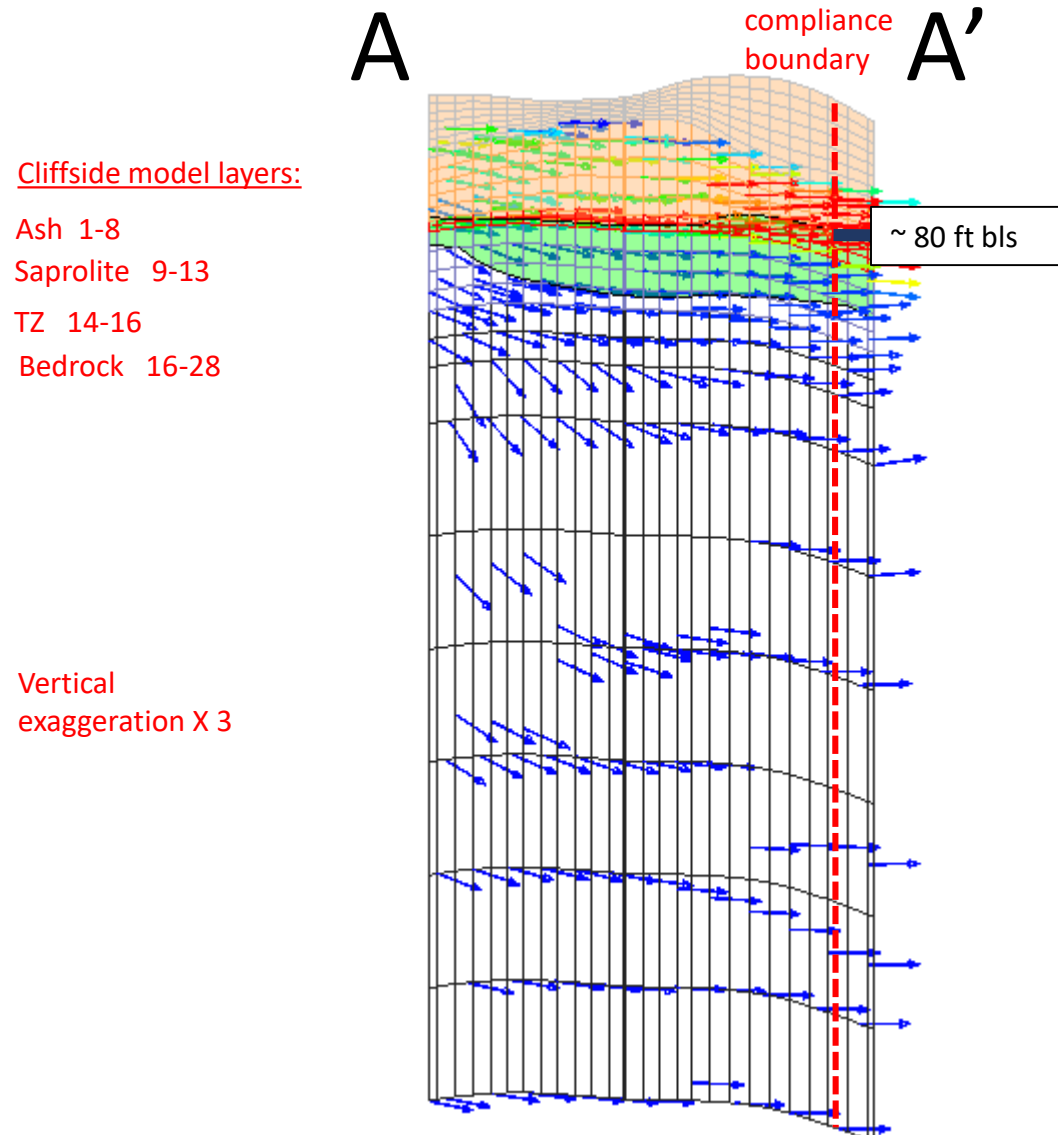
MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



CLIFFSIDE **CURRENT CONDITIONS IN 2018**

CROSS SECTION A-A' (VIEWED FROM EAST SIDE OF CROSS SECTION LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



A-A' ~800 ft

CLIFFSIDE **UPON COMPLETION OF FINAL COVER IN 2022, $t = 0$**

CROSS SECTION A-A' (VIEWED FROM EAST SIDE OF CROSS SECTION LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Cliffside model layers:

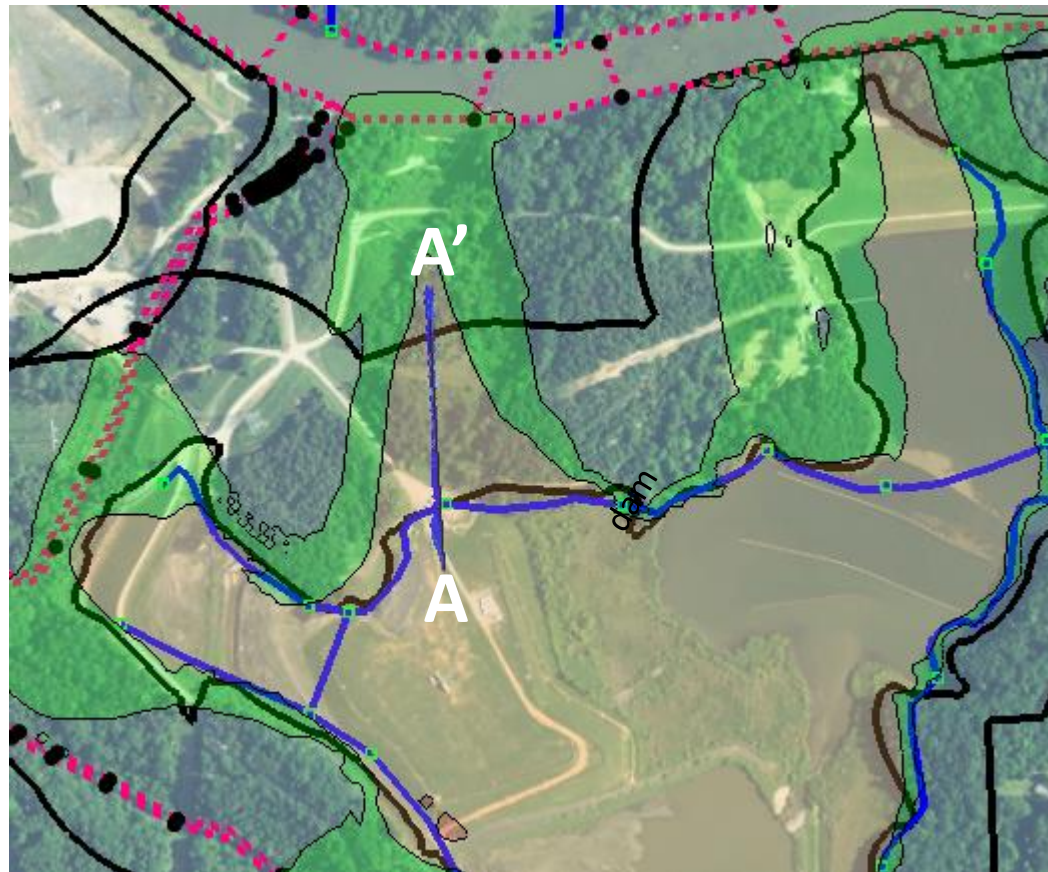
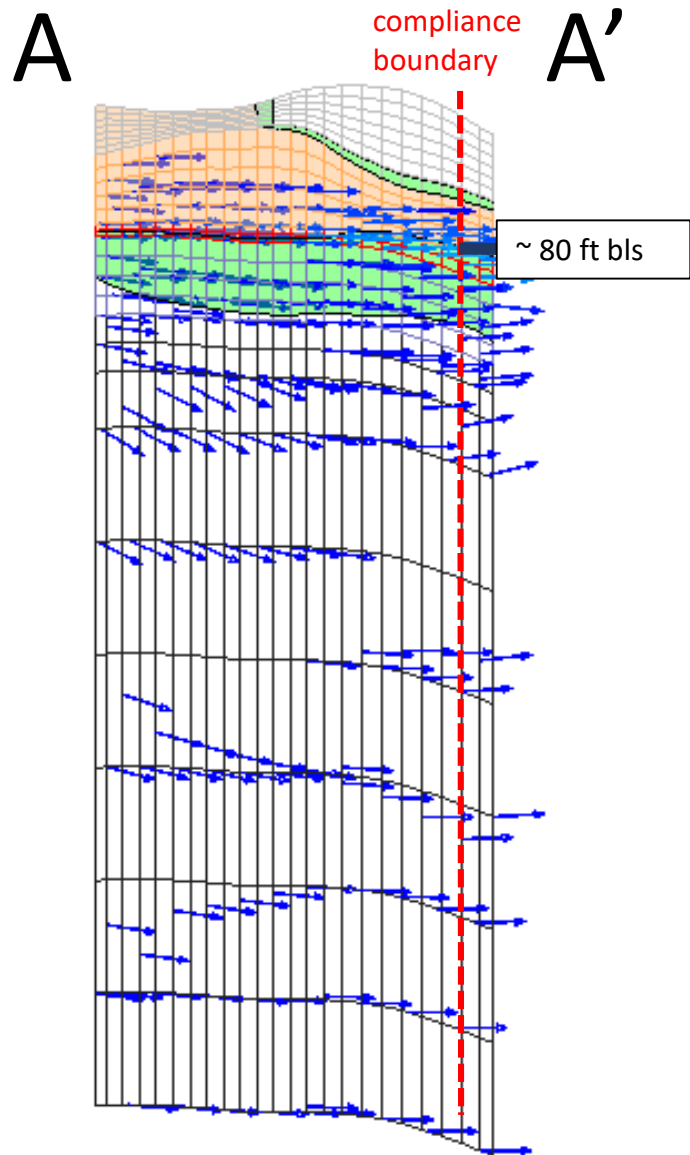
Ash 1-8

Saprolite 9-13

TZ 14-16

Bedrock 16-28

Vertical
exaggeration X 3



A-A' ~800 ft

CLIFFSIDE **FINAL COVER IN 2125, t ~ 100 years**

CROSS SECTION A-A' (VIEWED FROM EAST SIDE OF CROSS SECTION LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Cliffside model layers:

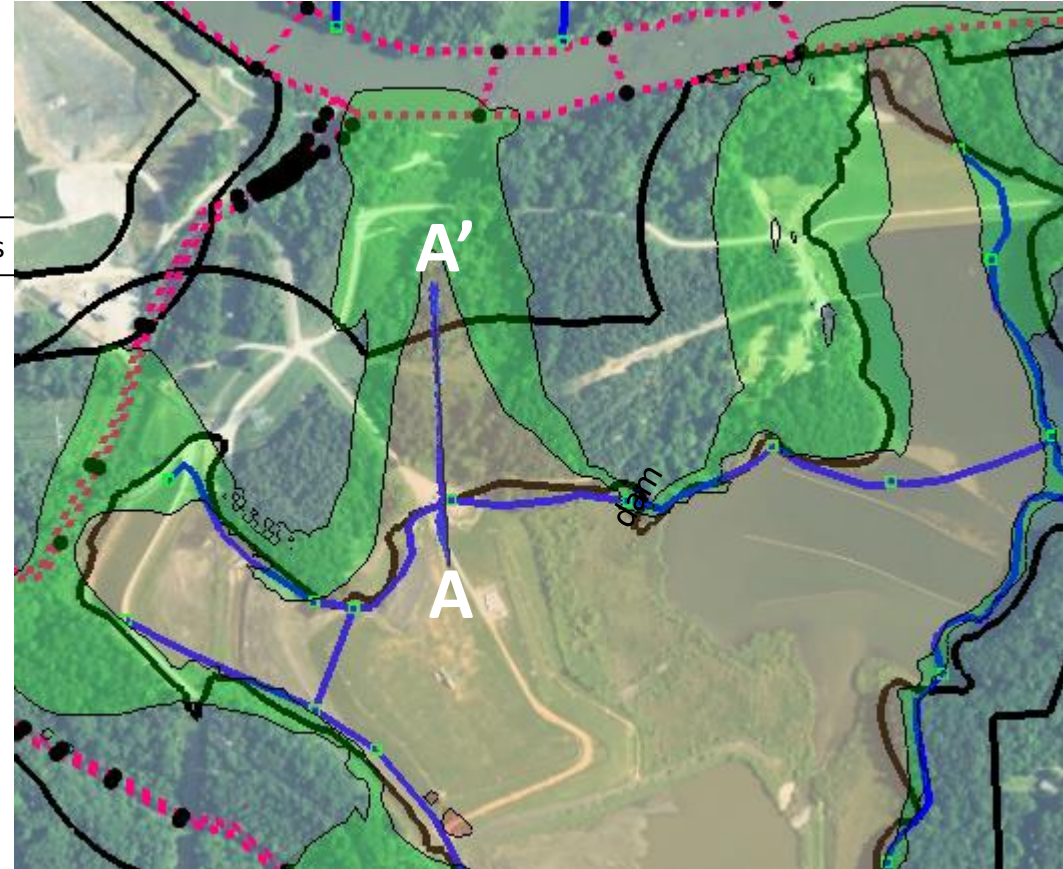
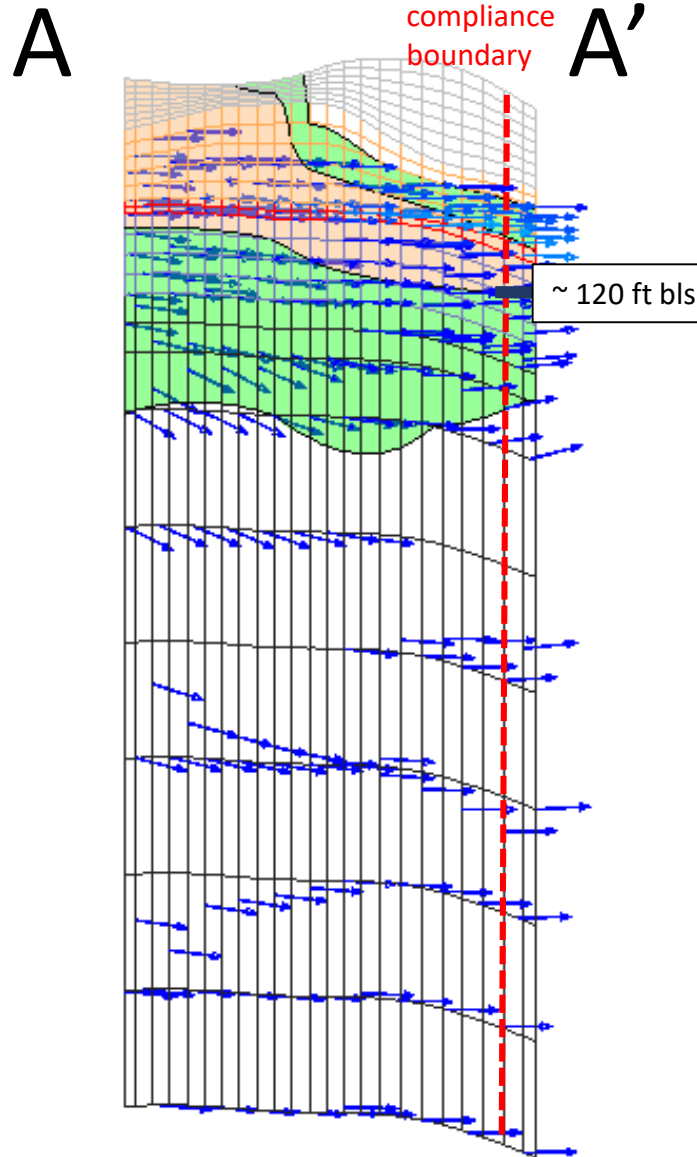
Ash 1-8

Saprolite 9-13

TZ 14-16

Bedrock 16-28

Vertical
exaggeration X 3



A-A' ~800 ft

CLIFFSIDE **UPON COMPLETION OF HYBRID IN 2023, t = 0**_{/A}

CROSS SECTION A-A' (VIEWED FROM EAST SIDE OF CROSS SECTION LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Cliffside model layers:

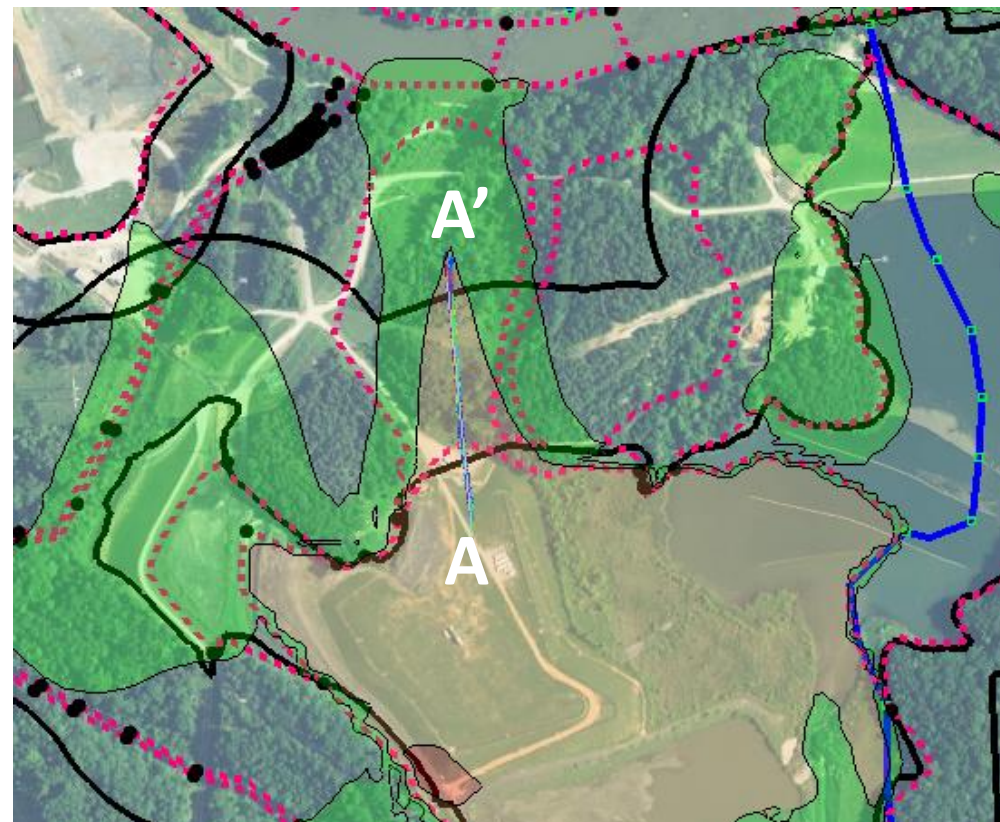
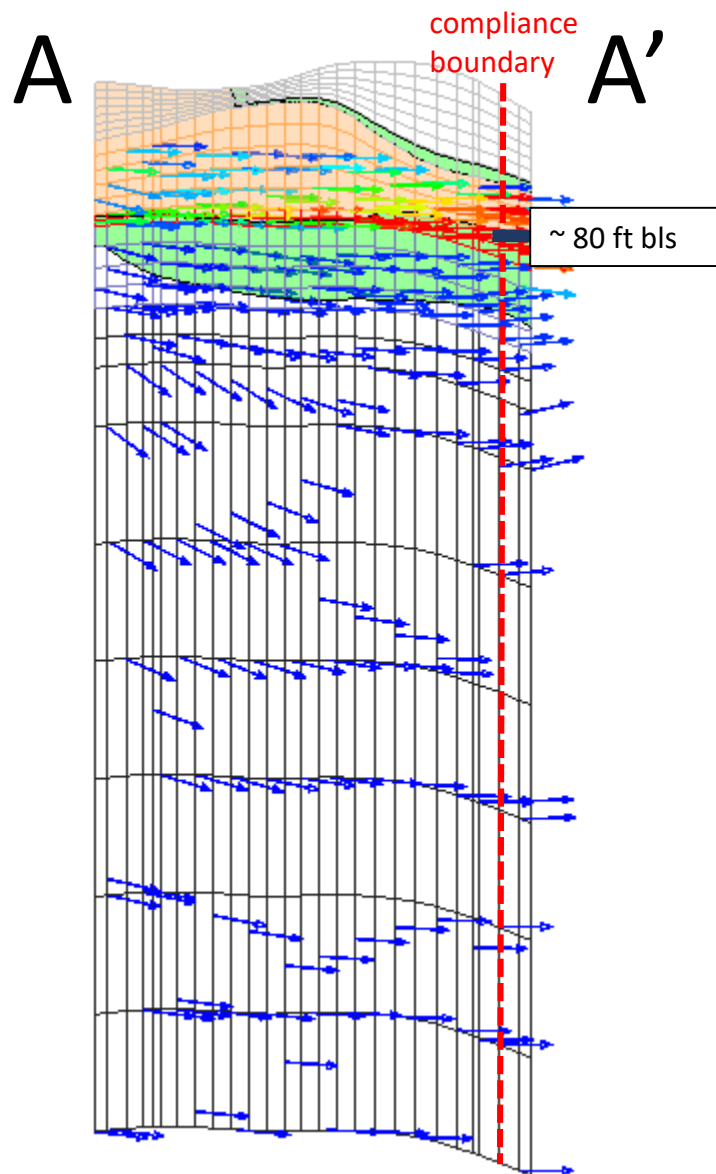
Ash 1-8

Saprolite 9-13

TZ 14-16

Bedrock 16-28

Vertical
exaggeration X 3



A-A' ~800 ft

CLIFFSIDE **UPON COMPLETION OF HYBRID IN 2150, t ~ 125 years**

CROSS SECTION A-A' (VIEWED FROM EAST SIDE OF CROSS SECTION LOOKING WEST)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Cliffside model layers:

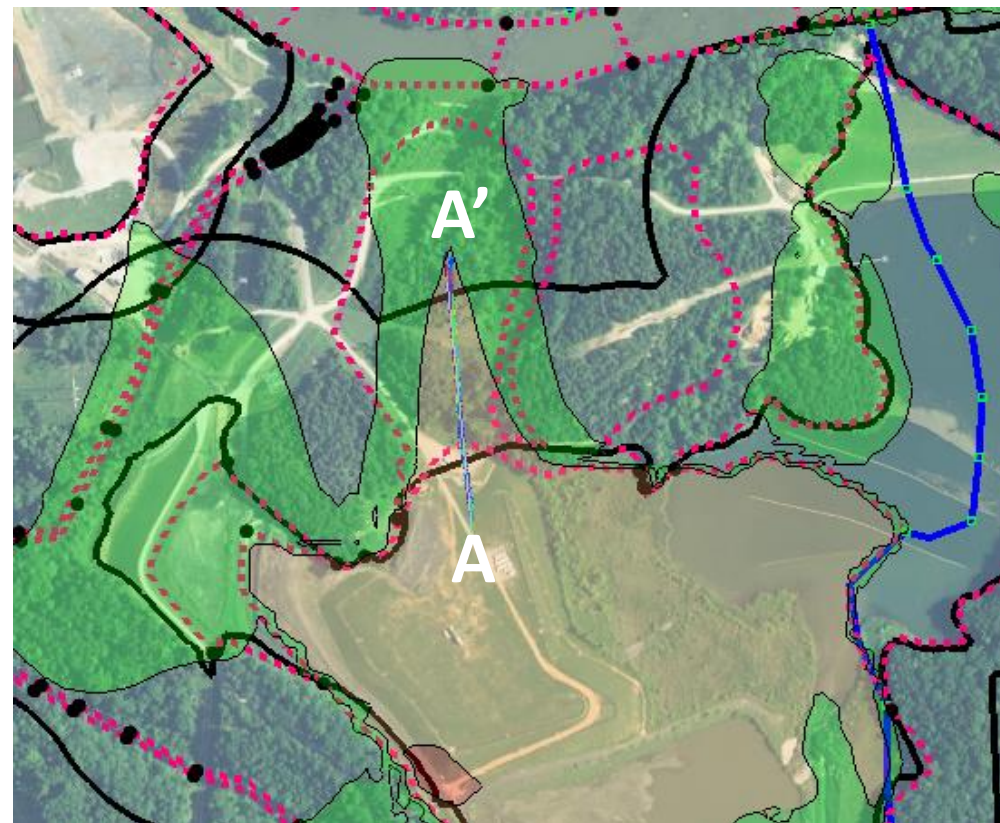
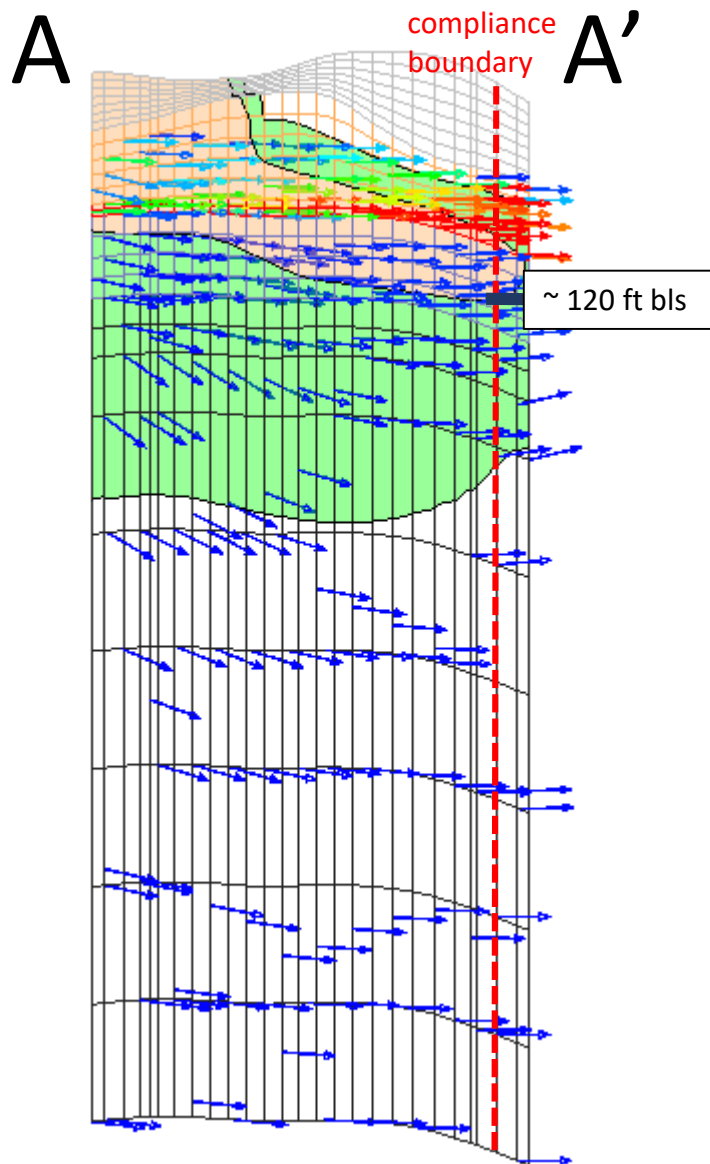
Ash 1-8

Saprolite 9-13

TZ 14-16

Bedrock 16-28

Vertical
exaggeration X 3



A-A' ~800 ft

ATTACHMENT B

RESPONSE TO COMMENTS

RESPONSE TO COMMENTS

I. Summary of Responses to Comments

The North Carolina Department of Environmental Quality (“NCDEQ,” or “Department”) received approximately 1207 comments regarding the five closure options at the Duke Energy Rogers facility. The majority of the comments supported closure by removal to a lined landfill without specifying the location of the landfill. A sizeable minority specifically recommended excavating coal ash and moving it to an onsite landfill. A small minority of commenters either urged for excavation without registering any opinion as to how the excavated coal ash should be handled, or discussed disposal options other than relocation to a lined landfill. No commenters unequivocally supported closure-in-place, however, one commenter registered qualified support for this option. Detailed responses to the comments received by the Department regarding closure options for this site, as well as responses to those comments, are below.

II. Detailed Responses to Comments

A. Closure-in-place

No comments were received which unequivocally favored closure-in-place. Of the more than 1200 comments received, all but two advocated for excavating coal ash from its existing location. A very small number of commenters solely urged for excavation of coal ash without any further specific comment. Similarly, a small number of commenters registered their opposition of cap-in-place, went on to cite specific reasons for their opposition of cap-in-place, but made no specific proposal regarding disposition of excavated coal ash.

Among these commenters, the reasons cited for opposing cap-in-place were: water quality and health concerns, concerns regarding Duke’s motives in proposing this solution, concerns over the effectiveness of long-term monitoring, accountability concerns, and/or general fairness concerns over leaving coal ash in place in some places when it is being excavated at others. One commenter did not specifically address any of the closure options, but, rather expressed his concern with the effects of contamination associated with coal ash. These general concerns are summarized and addressed in this section under the sub-heading “General Opposition of Closure-in-place.” Most commenters expressed some opinion regarding the ultimate disposition of excavated coal ash and are summarized in different sections below. One commenter neither expressly supported closure-in-place, nor opposed the option. A summary of that comment follows:

Comment: One commenter indicated that cap-in-place could potentially be a viable option, but expressed concern regarding the specific proposal for cap-in-place presented by Duke. He stated his opinion that additional study and safeguards would be needed for this option to comply with applicable regulations and be safely utilized.

Response: After review of the comments and other relevant data, the Department will require the removal of all coal ash, which must then be disposed of in lined landfills.

Comment: As noted above, some comments were submitted exclusively registering the commenters' opposition of closure-in-place. Additionally, a small number of commenters registered their opposition of cap-in-place, cited specific reasons for their opposition of cap-in-place, but made no were silent regarding disposition of excavated coal ash. Among these commenters, the chief reasons cited for opposing cap-in-place were: water quality and health concerns, concerns regarding Duke's motives in proposing this solution, concerns over the effectiveness of long-term monitoring, accountability concerns, and/or general fairness concerns over leaving coal ash in place in some places when it is being excavated at others. One commenter did not specifically address any of the closure options, but, rather expressed his general concern with the effects of contamination associated with coal ash.

Response: The Department will require all coal ash at the site to be excavated and disposed of in lined landfills.

B. Hybrid Option

There were no comments directly addressing either hybrid option.

C. Closure by Removal to a Lined Landfill

1. Comments Supporting Closure by Removal to a New Onsite Landfill

Of the approximately 1200 comments North Carolina Department of Environmental Quality (NCDEQ) received regarding the five Rogers closure options, the overwhelming majority of comments were submitted via one of several form emails that supported removal to a lined landfill. The form email commenters asked for coal ash removal from leaking, unlined pits and movement to dry lined storage away from waterways and groundwater. Most of these commenters, however, did not specifically distinguish between moving the coal ash to an onsite landfill or removal to an offsite landfill.

A large number (approximately 238) of commenters supported closure by removal specifically to a new onsite dry lined landfill. The vast majority of commenters supporting this option submitted one of two form letters. Some of these commenters included individualized comments along with the form letter. A small number of commenters supporting this option did not utilize either form letter. Those comments are summarized as follows:

Comment: Roughly 70% of comments supporting closure by removal specifically to an onsite dry lined landfill were submitted using the following form letter:

"I urge you to require Duke Energy to remove the coal ash from their leaking, unlined pits and to move it to dry lined storage, which is already available onsite, away from the Broad River and the groundwater of Cliffside. The Cliffside community has come out time after time over the last several years to make their concerns about this toxic coal ash clear. It is long past time for DEQ to listen."

The coal ash pit at Cliffside extends dozens of feet deep into the groundwater table, violating of federal and state rules. Cap in place in place won't solve these problems; it will just hide them. Duke's own models show that cap in place will continue polluting groundwater for 500 more years!

North Carolinians deserve better. To comply with the law and protect water quality Duke must excavate its coal ash now.

Thank you for your consideration."

Response: The Department will require all coal ash at the site to be excavated and disposed of in a lined landfill. The Department has not yet determined whether disposal shall be at an onsite landfill, or an offsite landfill.

Comment: A smaller number of commenters supporting closure by removal to an onsite dry lined landfill submitted the following form email:

- DEQ should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry, lined storage on its own property — away from the Broad River and out of our groundwater.
- Duke Energy plans to leave its coal ash sitting in the groundwater at Cliffside, where it will keep polluting our groundwater, streams and rivers. Recent monitoring shows Duke Energy is polluting the groundwater surrounding Cliffside with toxic and radioactive materials. We need cleanup—not coverup!
- The community has come out time after time over the last several years, making clear that we're concerned about pollution from Duke Energy's coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to remove the ash.
- Duke Energy is already required to remove its coal ash from eight other communities in North Carolina and all of its sites in South Carolina, and the governor of Virginia recently called for all the coal ash to be removed from Dominion's unlined sites—our families and our community deserve the same protections.
- Duke Energy can dispose all the ash from its leaking ponds onsite in an existing safe, lined landfill. Ash will not travel through the community or to other communities.
- Duke cannot exaggerate traffic concerns while downplaying the community's real concern: Duke Energy's water pollution. None of these plans will have a significant increase in offsite trucking, and only excavation will remove the source of the water pollution.

- Duke Energy's own experts know that even cap-in-place will involve trucking construction materials to the site—just like any other construction project. But even under their estimates, the additional trucking impacts are next to nothing. Duke Energy's consultant estimates that 97 trucks currently travel near Cliffside on community roads every day. Excavation would add only nine more trucks on community roads each day, compared to 13 more trucks on community roads for the duration of the cap-in-place scenario.
- It is past time for DEQ to listen to the community—not Duke Energy's consultants—about what our community needs. We need Duke to clean up its coal ash and stop the water pollution.

Response: The Department will require all coal ash at the site to be excavated and disposed of in a lined landfill. The Department has not yet determined whether disposal shall be at an onsite landfill, or an offsite landfill.

Comment: A comment supported excavation of coal ash and relocation to onsite dry lined storage. They discussed the risks associated with cap-in-place, particularly to vulnerable populations, as well as stated that cap-in-place violated applicable regulations. They also expressed concern regarding the data submitted by Duke in favor of cap-in-place.

Response: The Department will require excavation to a lined landfill, but the location of the landfill has not yet been determined.

Comment: A comment urged the Department to require excavating coal ash and moving it to lined landfills on Duke's property at all of the sites under consideration. In the letter supporting this option, the commenter discusses the risks to human and environmental health associated with cap-in-place, as well as the potential long-term costs of the option.

Response: The Department has determined that excavation to a lined landfill will be required, but has not yet determined the location of the landfill.

2. Comments Supporting Removal to a Lined Landfill, No Location Specified

Comment: The overwhelming majority of commenters stated in a form email that they were supportive of closure by removal to dry lined landfill. The comment in that form email states the following:

"Dear Coal Ash Comment Administrator North Carolina DEQ: Rogers,

The North Carolina Department of Environmental Quality (DEQ) should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry lined storage away from our waterways and out of our groundwater. Duke Energy plans to leave its coal ash sitting in the groundwater at six sites in North Carolina, where it will keep polluting our groundwater, lakes, and rivers.

Recent monitoring shows Duke Energy is polluting the groundwater at its coal ash ponds in North Carolina with toxic and radioactive materials. We need cleanup—not coverup! The communities around the coal ash ponds have come out time after time over the last several years, making clear that we’re concerned about pollution from Duke Energy’s coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to listen to the communities.

Duke Energy is already required to remove its coal ash at eight other sites in North Carolina and all of its sites in South Carolina—our families and our community deserve the same protections.”

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: Several commenters submitted individual comments urging excavation and relocation of coal ash to lined landfills, citing water quality concerns, health concerns, accountability concerns, fairness concerns, and/or concerns relating to Duke’s motives in proposing cap-in-place and/or the data submitted by Duke supporting this option.

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: One commenter urged for excavation and removal to a lined landfill stating that compliance with applicable regulations is not possible without excavation. He went on to state that the locations of coal ash impoundments would never have been permitted as hazardous waste disposal sites. He indicated his belief that classification of these sites as low risk is inappropriate, and cited numerous fairness and accountability concerns.

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: Citing previous experience with a catastrophic coal spill insisted that NCDEQ should require Duke Energy to remove its coal ash from its leaking, unlined impoundments and move it to dry lined storage. There were also concerns for protecting the Catawba River and downstream rivers.

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: Another commenter expressed serious concern regarding the closure-in-place option and provided lengthy commentary on why this option was not viable:

“Cap-in-place is unacceptable for any of the coal ash sites in North Carolina. Any ‘solutions’ proposed by Duke Energy that do not excavate and move ash to fully lined,

scientifically designed systems that fully encapsulate coal ash must be rejected. Without multiple, sealed bottom, side, and top liners, North Carolina's groundwater will always be at risk. Due to increases in extreme weather, more frequent hurricanes and massive rainstorms, groundwater models of 100 or 500-year floodplain are obsolete. Given the unpredictable fluctuations in the water tables and groundwater flows, there is no way that surface capping without properly engineered underlying bottom liners can protect groundwater in the coming decades."

The commenter continued by stating: "DEQ should require Duke Energy's new landfills to go beyond the minimal mandatory protections provided by current regulations. DEQ must carry out independent studies and obtain recommendations for the best liner technologies, redundant liners, and with multiple long-term safeguards. Scientifically based placements for baseline and ongoing groundwater monitoring wells should be established. These must be thoroughly and constantly monitored – with full, public, transparent, internet accessible, easily available data from the monitoring results. Ground water and surface monitoring should be ongoing for a minimum of 50 years . . . While transporting existing coal ash dumps away from rivers and floodplains is essential, every effort should be taken by DEQ to ensure that the distances coal ash is moved is minimized and that the coal ash destinations are always kept on Duke Energy's property."

The commenter expressed significant concern for worker safety while the above referenced work is carried out, stating that "During excavation, construction, and filling of the landfills, all worker safety measures should be taken to prevent a repeat of the serious harms to worker health from the cleanup crews that worked on the TVA spill....worker safety, proper fitting and testing of N95, or better, particulate masks should be required...wherever needed, full protective suits should be provided."

The commenter concluded: "Once constructed, these new lined landfills should represent the best technologies and materials available – not materials that create short-term financial savings. The original existing dumps were disasters for public health, for NC communities, and for our state's waters. We have this one chance to remediate some of the damages and most importantly, to safeguard future generations from heavy metal coal ash contamination. Our state-wide re-design of storage systems for millions of tons of coal ash must be done right this time."

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: Another commenter who supports removal to a lined landfill urged NCDEQ to consider conducting its own independent analysis that identifies the safest closure option.

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: A commenter submitted extensive written comments urging NCDEQ to require the Rogers coal ash basins to be excavated to a lined landfill to protect the environment and human health.

The commenter claimed coal ash impoundments are not eligible for closure-in-place under CAMA because cap-in-place will violate state groundwater Rules and the federal CCR Rules. The commenter sets out the following arguments it believes supports its claim that closure will violate state Groundwater Rules: 1) Duke Energy's modelling demonstrates it will not meet groundwater standards if it chooses closure-in-place; 2) Duke Energy's modelling underestimates the extent of contamination; 3) Duke Energy tested groundwater compliance at the wrong location; 4) the groundwater rule prohibits closure-in-place because the coal ash will contribute to violations of the groundwater standard for centuries; and 5) closure-in-place is unavailable because it will not restore groundwater to the legal standard.

The commenter next claimed that coal ash impoundments at Allen are not eligible for closure-in-place under the Coal Combustion Residuals (CCR) rule. The commenter supported this argument by its assertions that: 1) the CCR rules' performance standards require separating ash from the groundwater and precluding its future impoundment; and 2) the CCR rules' corrective action requirements preclude closure-in-place.

The commenter continues by arguing that NCDEQ must base its closure determination on effectiveness and not cost to the polluter. The commenter further maintains that NCDEQ should reject Duke Energy's "Community Impact Analysis." The commenter claims that Duke's Energy's report downplays well-established pollution risks and exaggerates the impact on communities of excavating and trucking material to offsite landfills. Further, they claim that diesel emissions do not meaningfully distinguish between closure methods and that the report's habitat analysis is flawed. The commenter concludes by questioning the validity of Duke Energy's closure options scoring system - and offers its own analysis to demonstrate why it believes Duke Energy manipulated scores to suit a desired outcome.

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: The same commenter requested that NCDEQ ignore a Duke Energy report on estimated greenhouse gas emissions associated with various closure options for the six unresolved coals ash sites. The commenter claimed NCDEQ should disregard this submission because it was made after NCDEQ's deadline for Duke Energy to submit its materials and outside the public comment period, thereby denying the public an opportunity to respond to it. NCDEQ should also disregard this submission because it is irrelevant to the decision facing NCDEQ, which is to select a closure method that stops the ongoing pollution and continuing threat to our water resources posed by Duke Energy's leaking coal ash basins.

Response: The Department is requiring excavation of coal ash and removal to a lined landfill.

Comment: A commenter stated that the pits should be excavated as soon as possible to the maximum safe extent with at least twenty-five (25) percent recycled through encasement in cement bricks, concrete and other methods. The remainder of excavated ash should be moved into double-lined landfills away from rivers, lakes and aquifers with monitored leak detection systems. The double-lining would include 2' of clay on the exterior with a durable lining impervious to water.

Response: The Department has determined that all coal ash at the site must be excavated and removed to a lined landfill. The Department will consider beneficial use of excavated coal ash, as well as the location of lined landfills for disposal at a later date.

Comment: A small number of other commenters also suggested the material should be at least partially recycled.

Response: The Department has determined that all coal ash at the site must be excavated and removed to a lined landfill. The Department will consider beneficial use of excavated coal ash, as well as the location of lined landfills for disposal at a later date.

Comment: Several comments were received in the form of YouTube testimonials following NCDEQ's Environmental Justice Advisory Board meeting in Wilmington, NC. Links to each these testimonials follow:

Caroline Armijo - ACT Member <https://youtu.be/cJag3oPI4qU>

Johnny Hairston - resident in harm's way of basin failure <https://youtu.be/6iK1sbVOO58>

Rev. Gregory Hairston – leader/resident in close proximity <https://youtu.be/IV9crtEyTJY>

John Wagner - ACT Member <https://youtu.be/IV9crtEyTJY>

Frank Holleman - lead attorney of SELC <https://youtu.be/elwPWPYb3Uc>

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.

Comment: Four additional videos were submitted regarding the impact of coal ash spills:

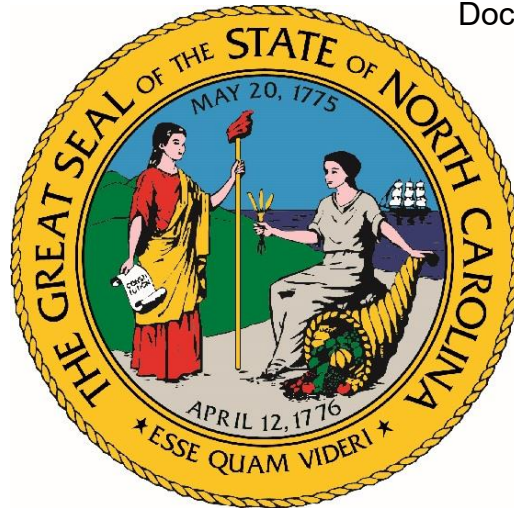
At What Cost (2014) <https://youtu.be/rraUoadqr8o>

Danielle Bailey-Lash on CNN <https://youtu.be/OCTU-CUoQzQ>

A Time to Sing (Abridged) (August 2018) <https://youtu.be/HQFYKBaf4NQ>

A Day of Prayer (February 2019) https://youtu.be/agRzScT_BEs

Response: The Department will require that all coal ash at the site be excavated and relocated to lined landfills.



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Marshall Steam Station

April 1, 2019



DEQ Coal Combustion Residuals Surface Impoundment Closure Determination

Marshall Steam Station

Executive Summary

The Coal Ash Management Act (CAMA) establishes criteria for the closure of coal combustion residuals (CCR) surface impoundments. The CCR surface impoundment located at Duke Energy Carolinas, LLC's (Duke Energy) Marshall Steam Station (Marshall) in Catawba County, NC has received a low-risk classification. Therefore, according to N.C. Gen. Stat. § 130A-309.214(a)(3), the closure option for the CCR surface impoundment is at the election of the North Carolina Department of Environmental Quality (DEQ). CAMA provides three principal closure pathways: (a) closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill [CAMA Option A]; (b) closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill [CAMA Option B]; or (c) closure in accordance with the federal CCR rule adopted by EPA [CAMA Option C].

In preparing to make its election, DEQ requested information from Duke Energy related to closure options. By November 15, 2018, Duke Energy provided the following options for consideration: closure in place, full excavation, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundment. DEQ held a public information session on January 17, 2019 in Sherrills Ford, NC where the community near Marshall had the opportunity to learn about options for closing coal ash CCR surface impoundments and to express their views about proposed criteria to guide DEQ's coal ash closure decision making process. To evaluate the closure options, the Department considered environmental data gathered as part of the site investigation, permit requirements, ambient monitoring, groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin at the Marshall facility in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from the unlined CCR surface impoundment at Marshall is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

Duke Energy will be required to submit a final Closure Plan for the CCR surface impoundment at Marshall by August 1, 2019. The Closure Plan must conform to this election by DEQ.

I. Introduction

DEQ has evaluated the closure options submitted by Duke Energy for the CCR surface impoundment at the Marshall Steam Station. This document describes the CAMA requirements for closure of CCR surface impoundments, the DEQ evaluation process to make an election under CAMA for the subject CCR surface impoundment at the Marshall site, and the election by DEQ for the final closure option.

II. Site History

Duke Energy owns and operates the Marshall Steam Station which is located at 8320 NC Highway 150 East in Terrell, Catawba County, North Carolina. Marshall, including the station and supporting facilities, is approximately 1,446 acres in area. Marshall began operation in 1965 as a coal-fired generating station and currently operates four coal-fired units with 2,090 megawatts of total capacity. Coal combustion residuals consisting of bottom and fly ash material from Marshall have historically been managed in the Marshall ash basin, located north of the station adjacent to Lake Norman. Dry ash has been disposed of in other areas at Marshall, including the dry ash landfill units (Phases I and II) and Industrial Landfill No. 1.

There is one CCR surface impoundment at the site, called the Active Ash Basin. According to the Duke Energy website and data current as of September 30, 2018, the Active Ash Basin is approximately 394 acres in size and contains approximately 16,836,000 tons of CCR. The Active Ash Basin is subject to the requirements of N.C. Gen. Stat. § 130A-309.214(a)(3).

III. CAMA Closure Requirements

CAMA establishes closure requirements for CCR surface impoundments. The General Assembly has mandated that DEQ “shall review a proposed Coal Combustion Residuals Surface Impoundment Closure Plan for consistency with the minimum requirements set forth in subsection (a) of this section and whether the proposed Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and otherwise complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(b). Similarly, the General Assembly has required that DEQ “shall disapprove a proposed Coal Combustion Residuals Surface Impoundment Closure Plan unless the Department finds that the Closure Plan is protective of public health, safety, and welfare; the environment; and natural resources and other complies with the requirements of this Part.” N.C. Gen. Stat. § 130A-309.214(c).

CAMA requires DEQ to review any proposed Closure Plan for consistency with the requirements of N.C. Gen. Stat. § 130A-309.214(a). See N.C. Gen. Stat. § 130A-309.214(b). DEQ must disapprove any proposed Closure Plan that DEQ finds does not meet these requirements. See N.C. Gen. Stat. § 130A-309.214(c). Therefore, an approvable Closure Plan must, at a minimum, meet the requirements of N.C. Gen. Stat. § 130A-309.214(a).

Pursuant to N.C. Gen. Stat. § 130A-309.213(d)(1), DEQ has classified the CCR surface impoundment at Marshall as low-risk. The relevant closure requirements for low-risk

impoundments are in N.C. Gen. Stat. § 130A-309.214(a)(3), which states the following:

- Low-risk impoundments shall be closed as soon as practicable, but no later than December 31, 2029;
- A proposed closure plan for a low-risk impoundment must be submitted as soon as practicable, but no later than December 31, 2019; and
- At a minimum, impoundments located in whole above the seasonal high groundwater table shall be dewatered and impoundments located in whole or in part beneath the seasonal high groundwater table shall be dewatered to the maximum extent practicable.

In addition, N.C. Gen. Stat. § 130A-309.214(a)(3) requires compliance with specific closure criteria set forth verbatim below in Table 1. The statute provides three principal closure pathways: (a) [CAMA Option A] closure in a manner allowed for a high-risk site, such as excavation and disposal in a lined landfill; (b) [CAMA Option B] closure with a cap-in-place system similar to the requirements for a municipal solid waste landfill; or (c) [CAMA Option C] closure in accordance with the federal CCR rule adopted by EPA. For each low-risk impoundment, the choice of the closure pathway in CAMA is at the “election of the Department.”

Table 1: CAMA Closure Options for Low-Risk CCR Surface Impoundments
N.C. Gen. Stat. § 130A-309.214(a)(3)

At the election of the Department, the owner of an impoundment shall either:

- a. Close in any manner allowed pursuant to subdivision (1) of this subsection; [CAMA Option A]
- b. Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall Comply with the closure and post-closure requirements established by Section .1627 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, except that such impoundments shall not be required to install and maintain a leachate collection system. Specifically, the owner of an impoundment shall install and maintain a cap system that is designed to minimize infiltration and erosion in conformance with the requirements of Section .1624 of Subchapter B of Chapter 13 of Title 15A of the North Carolina Administrative Code, and, at a minimum, shall be designed and constructed to (i) have a permeability no greater than 1×10^{-5} centimeters per second; (ii) minimize infiltration by the use of a low-permeability barrier that contains a minimum 18 inches of earthen material; and (iii) minimize erosion of the cap system and protect the low-permeability barrier from root penetration by use of an erosion layer that contains a minimum of six inches of earthen material that is capable of sustaining native plant growth. In addition, the owner of an impoundment shall (i) install and maintain a groundwater monitoring system; (ii) establish financial assurance that will ensure that sufficient funds are available for closure pursuant to this subdivision, post-closure maintenance and monitoring, any corrective action that the Department may require, and satisfy any potential liability for sudden and nonsudden accidental occurrences arising from the impoundment and subsequent costs incurred by the Department in response to an incident, even if the owner becomes insolvent or ceases to reside, be incorporated, do business, or maintain assets in the State; and (iii) conduct post-closure care for a period of 30 years, which period may be increased by the Department upon a determination that a longer period is necessary to protect public health, safety, welfare; the environment; and natural resources, or decreased upon a determination that a shorter period is sufficient to protect public health, safety, welfare; the environment; and natural resources. The Department may require implementation of any other measure it deems necessary to protect public health, safety, and welfare; the environment; and natural resources, including imposition of institutional controls that are sufficient to protect public health, safety, and welfare; the environment; and natural resources. The Department may not approve closure for an impoundment pursuant to sub-subdivision b. of subdivision (3) of this subsection unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment; [CAMA Option B] or
- c. Comply with the closure requirements established by the United States Environmental Protection Agency as provided in 40 CFR Parts 257 and 261, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities." [CAMA Option C]

By referencing the closure options for *high-risk* CCR surface impoundments in “subdivision (1)” or N.C. Gen. Stat. § 130A-309.214(a)(1), CAMA allows for closure of a *low-risk* CCR surface impoundment in N.C. Gen. Stat. § 130A-309.214(a)(3) through the same removal scenarios:

- “Convert the coal combustion residuals impoundment to an industrial landfill by removing all coal combustion residuals and contaminated soil from the impoundment temporarily, safely storing the residuals on-site, and complying with the requirements for such landfills.” N.C. Gen. Stat. § 130A-309.214(a)(1)a.; or
- “Remove all coal combustion residuals from the impoundment, return the former impoundment to a nonerosive and stable condition and (i) transfer the coal combustion residuals for disposal in a coal combustion residuals landfill, industrial landfill, or municipal solid waste landfill or (ii) use the coal combustion products in a structural fill or other beneficial use as allowed by law.” N.C. Gen. Stat. § 130A-309.214(a)(1)b.

IV. DEQ Election Process

Beginning with a letter to Duke Energy on October 8, 2018, DEQ began planning for a thorough evaluation of the closure options for low-risk CCR surface impoundments before making an election as outlined in Table 1 above. DEQ’s objectives were to receive input on closure options from Duke Energy and to engage with community members near low-risk sites. DEQ outlined the following schedule in the October 8, 2018 letter:

- November 15, 2018 – Duke Energy submittal of revised option analyses and related information
- January 17, 2019 – DEQ public meeting near Marshall
- April 1, 2019 – DEQ evaluation of closure options
- August 1, 2019 – Duke Energy submittal of closure plan
- December 1, 2019 – Duke Energy submittal of updated corrective action plan for all sources at Marshall that are either CCR surface impoundments or hydrologically connected to CCR impoundments

DEQ received the requested information from Duke Energy by November 15, 2018: closure options analysis, groundwater modeling and net environmental benefits assessment. These materials are posted on the DEQ website. Duke Energy provided the following options for consideration: closure in place, full excavation with either an onsite or offsite landfill, and a hybrid option that included some excavation with an engineered cap on a smaller footprint of the existing CCR surface impoundment.

In preparing to make its election of the closure option, DEQ considered environmental data contained in the comprehensive site assessment, permit requirements, ambient monitoring, closure options analysis and groundwater modeling provided by Duke Energy and other data relevant to the CAMA requirements. The Marshall site has extensive amounts of data that have been collected during the site assessment process, and these data were used as part of the

evaluation of closure options. DEQ's evaluation of closure in place and hybrid option based on groundwater monitoring and modeling data is provided in Attachment A. That analysis demonstrates that the contaminated plume is already beyond the compliance boundary for the site. All of these references are part of the record supporting DEQ's determination.

DEQ conducted a public meeting in Sherrills Ford, NC near Marshall on January 17, 2019. There were 409 members of the public who attended the meeting. Approximately 1100 comments were received during the comment period, which closed on February 15, 2019. The majority of comments received expressed a preference for excavation and removal to dry-lined storage. The majority of these comments did not specify whether the storage should be on or off-site, but instead requested that it be "away from our waterways and out of our groundwater." A minority of comments expressed support for excavation and specified a preference for on-site disposal in a lined landfill, provided additional feedback on other issues related to the closure process, or expressed additional concerns related to coal ash. A review and response to comments are included in Attachment B.

V. DEQ Evaluation of Closure Options

DEQ has evaluated the closure options proposed by Duke Energy for the CCR surface impoundment at the Marshall facility. The purpose of this evaluation was to determine which closure option or options may be incorporated into an approvable Closure Plan under CAMA.

DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin at Marshall in accord with N.C. Gen. Stat. § 130A-309-214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

DEQ elects CAMA Option A because removing the coal ash from the unlined impoundment at Marshall is more protective than leaving the material in place. DEQ determines that CAMA Option A is the most appropriate closure method because removing the primary source of groundwater contamination will reduce uncertainty and allow for flexibility in the deployment of future remedial measures.

DEQ does not elect CAMA Option B for the CCR surface impoundment at Marshall. In N.C. Gen. Stat. § 130A-309.214(a)(3)b, the General Assembly mandated that "[t]he Department may not approve closure for an impoundment pursuant to [this] sub-subdivision . . . unless the Department finds that the proposed closure plan includes design measures to prevent, upon the plan's full implementation, post-closure exceedances of groundwater quality standards beyond the compliance boundary that are attributable to constituents associated with the presence of the impoundment." N.C. Gen. Stat. § 130A-309.214(a)(3)b. In light of these requirements and based on DEQ's review of the information provided by Duke Energy as well as DEQ's independent analysis, DEQ does not believe that Duke Energy can incorporate CAMA Option B into an approvable Closure Plan for Marshall.

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether, upon full implementation of the closure plan, the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary. To address this question, DEQ considered the current state of the groundwater contamination and reviewed the results of the groundwater modeling submitted by Duke Energy. The evaluation is provided in Attachment A. DEQ's overall conclusion is that based on the current geographic scope and vertical extent of the groundwater contamination plume, and the modeled extent of the plume in the future, DEQ does not believe these two closure options can meet the requirements of CAMA Option B for the CCR surface impoundment at Marshall.

DEQ does not elect CAMA Option C (i.e., closure under the federal CCR Rules found in 40 CFR Part 257) for the CCR surface impoundment at Marshall. DEQ has determined that:

- a. Under the facts and circumstances here, CAMA Option C is less stringent than CAMA Option A. Specifically, DEQ's election of Option A would also require Duke Energy to meet the requirements of the federal CCR Rule (i.e., CAMA Option C) but election of CAMA Option C would not require implementation of CAMA Option A.
- b. Because CAMA Option A adds additional requirements or performance criteria beyond Option C, it advances DEQ's duty to protect the environment (see N.C. Gen. Stat. §§ 279B-2 & 143-211) and the General Assembly's mandate under CAMA that DEQ ensure that any Closure Plan, which must incorporate an approvable closure option, is protective of public health, safety, and welfare, the environment, and natural resources (see N.C. Gen. Stat. § 130A-309.214(b) & (c)).
- c. For the CCR surface impoundments for which the closure option(s) must be determined, CAMA Option A provides a better mechanism for ensuring State regulatory oversight of the closure process than Option C, as well as greater transparency and accountability.
- d. While the federal CCR Rule was written to provide national minimum criteria for CCR surface impoundments across the country, CAMA was written specifically to address the CCR surface impoundments in North Carolina.
- e. While the federal CCR Rule allows CCR surface impoundment owners to select closure either by removal and decontamination (clean closure) or with a final cover system (cap in place), EPA anticipates that most owners will select closure through the less protective method of cap in place.
- f. There is considerable uncertainty regarding the status and proper interpretation of relevant provisions of the federal CCR Rule. For instance, EPA is reconsidering portions of the federal CCR Rule. Also, the performance standards in 40 CFR 257.102(d) for cap in place closure are the subject of conflicting interpretations (and possible litigation) among industry and state authorities.

VI. Final Closure Plan

The final closure plan is due on August 1, 2019 in accordance with this determination. Based on DEQ's evaluation of the options submitted by Duke Energy, DEQ elects the provisions of CAMA Option A that require movement of coal ash to an existing or new CCR, industrial or municipal solid waste landfill located on-site or off-site for closure of the Active Ash Basin in accord with N.C. Gen. Stat. § 130A-309.214(a)(3). In addition, DEQ is open to considering beneficiation projects where coal ash is used as an ingredient in an industrial process to make a product as an approvable closure option under CAMA Option A.

While beneficiation is not a requirement of the closure plan, DEQ encourages Duke Energy to consider opportunities for beneficiation of coal ash that would convert coal combustion residuals into a useful and safe product.

ATTACHMENT A

**DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON
GROUNDWATER MONITORING AND MODELING DATA**

DEQ EVALUATION OF CLOSURE IN PLACE AND HYBRID OPTIONS BASED ON GROUNDWATER MONITORING AND MODELING DATA

I. Groundwater Monitoring Summary

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary upon full implementation of the closure plan. Significantly, the contaminated groundwater plume has already extended beyond the compliance boundary in a portion of the CCR surface impoundment. The inferred general extent of groundwater impacts above applicable Background Threshold Values or 2L Standards are shown on Figure ES-1. Additional monitoring and hydrogeological data is available in the Marshall Steam Station January 2018 CSA Update Report (available on the DEQ website).

The groundwater site assessment at the Marshall Steam Station, as required by CAMA, began in 2015 and is still on-going. Based on review of data submitted to date in various reports, both soil and groundwater has been impacted by CCR handling activities at the site. Groundwater within the area of the CCR surface impoundment generally flows from northwest to southeast and discharges to Lake Norman as depicted on Figure ES-1 (below). The inferred general extent of groundwater impacts above applicable PBTVs or 2L Standards are shown on Figure ES-1 from the January 2018 CSA Update Report below. Boron concentrations above 2L Standards approximates the leading edge of the CCR plume (area shaded yellow) at the site.

The vertical extent of most COIs is within the shallow and transition flow layers. However, data suggests the bedrock flow layer has been impacted by CCR handling activities at the site. Manganese and strontium concentrations are fairly widespread in the bedrock flow layer. There are isolated occurrences of boron, chloride, iron, molybdenum and TDS within and downgradient of the ash basin.

DEQ concludes that the contaminated groundwater plume above 2L groundwater standards has extended beyond the compliance boundary along the northern and eastern edge on the shore of Lake Norman.

II. Groundwater Cross-section Modeling

As DEQ considered the closure options presented by Duke Energy, DEQ evaluated whether the closure in place or the hybrid options met the requirement for CAMA Option B. Specifically, DEQ attempted to determine whether the design would prevent any post-closure exceedances of groundwater standards beyond the compliance boundary upon full implementation of the closure plan. To address this question, DEQ considered the current state of the groundwater contamination and reviewed the results of the groundwater modeling submitted by Duke Energy.

DEQ evaluated cross-sections of the groundwater modeling results provided by Duke Energy to determine whether Duke Energy's final closure *Option 1: Hybrid* and *Option 5: Closure-in-Place* would meet the criteria of CAMA Option B. DEQ considered if the agency could conclude that the proposed closure option includes design measures to prevent any post closure exceedances of the 2L groundwater quality standards at the compliance boundary upon the plan's full implementation. Cross section A-A' was evaluated and can be seen in the figures below. This cross section represents where the boron concentration above the 2L standard of 700 µg/L has crossed the compliance boundary based on groundwater monitoring and modeling.

Next, the model results were evaluated based on the following model simulations:

- current conditions in 2017 when the model was calibrated based on raw field data
- upon completion of the final closure-in-place cover system at t=0 years
- closure-in-place option at t=120 years
- upon completion of the hybrid option at t=0 years
- hybrid option at t=120 years

The table below summarizes the results from the model simulations. The boron concentrations depicted in the table represent the maximum boron concentration in any layer (ash, saprolite, transition zone, and bedrock) of the model.

Marshall Modeling Results for Cross-Section A-A'			
Model Simulation	Maximum Concentration of Boron Above 2L Beyond Compliance Boundary (ug/L)	Depth of GW Contamination Above 2L Beyond Compliance Boundary (feet bgs)	Width of Contamination Plume Beyond Compliance Boundary (feet)
Current Conditions	700-4,000	380	1500
Completion of Final Cover (t=0 yrs)	700-4,000	390	1500
Final Cover (t=120 yrs)	700-4,000	370	1500
Completion of Hybrid (t=0 yrs)	700-4,000	310	1500
Hybrid (t=120 yrs)	700-4,000	360	1600

bgs – below ground surface

These data illustrate that after completion of closure with the final cover or hybrid option, the groundwater plume still extends beyond the compliance boundary above the 2L groundwater standard and the area of the plume requiring remediation is immense. Even 120 years beyond completion of closure, the area of the plume requiring remediation remains extensive.

DEQ recognizes that there are no groundwater remediation corrective actions included in the groundwater modeling simulations submitted to DEQ as part of Duke Energy's closure options analysis documentation. However, based on the current geographic scope, vertical extent of the groundwater contamination plume, and future modeled extent of the plume, DEQ does not believe these two closure options can meet the requirements of CAMA Option B.

Figure ES-1: Marshall Steam Station January 2018 CSA Update Report

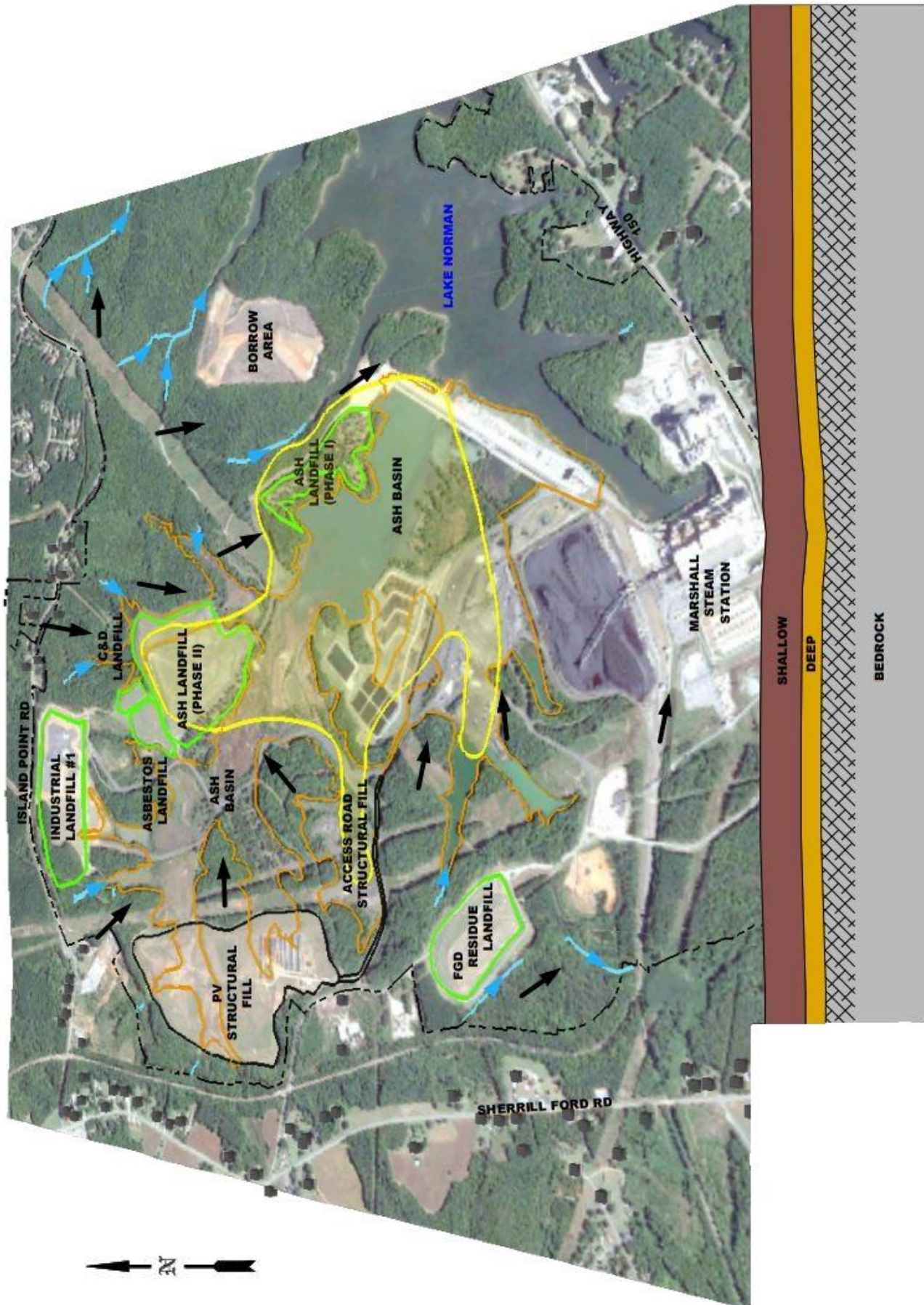



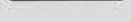






Figure ES-1 Legend: Marshall Steam Station January 2018 CSA Update Report

LEGEND

-  AREA OF CONCENTRATION IN GROUNDWATER ABOVE NC2L (SEE NOTE 5)
-  ASH BASIN WASTE BOUNDARY
-  APPROXIMATE LANDFILL WASTE BOUNDARY
-  APPROXIMATE STRUCTURAL FILL BOUNDARY
-  GENERALIZED GROUNDWATER FLOW DIRECTION
-  WATER SUPPLY WELL LOCATION
-  STREAM WITH FLOW DIRECTION
-  DUKE ENERGY PROPERTY BOUNDARY

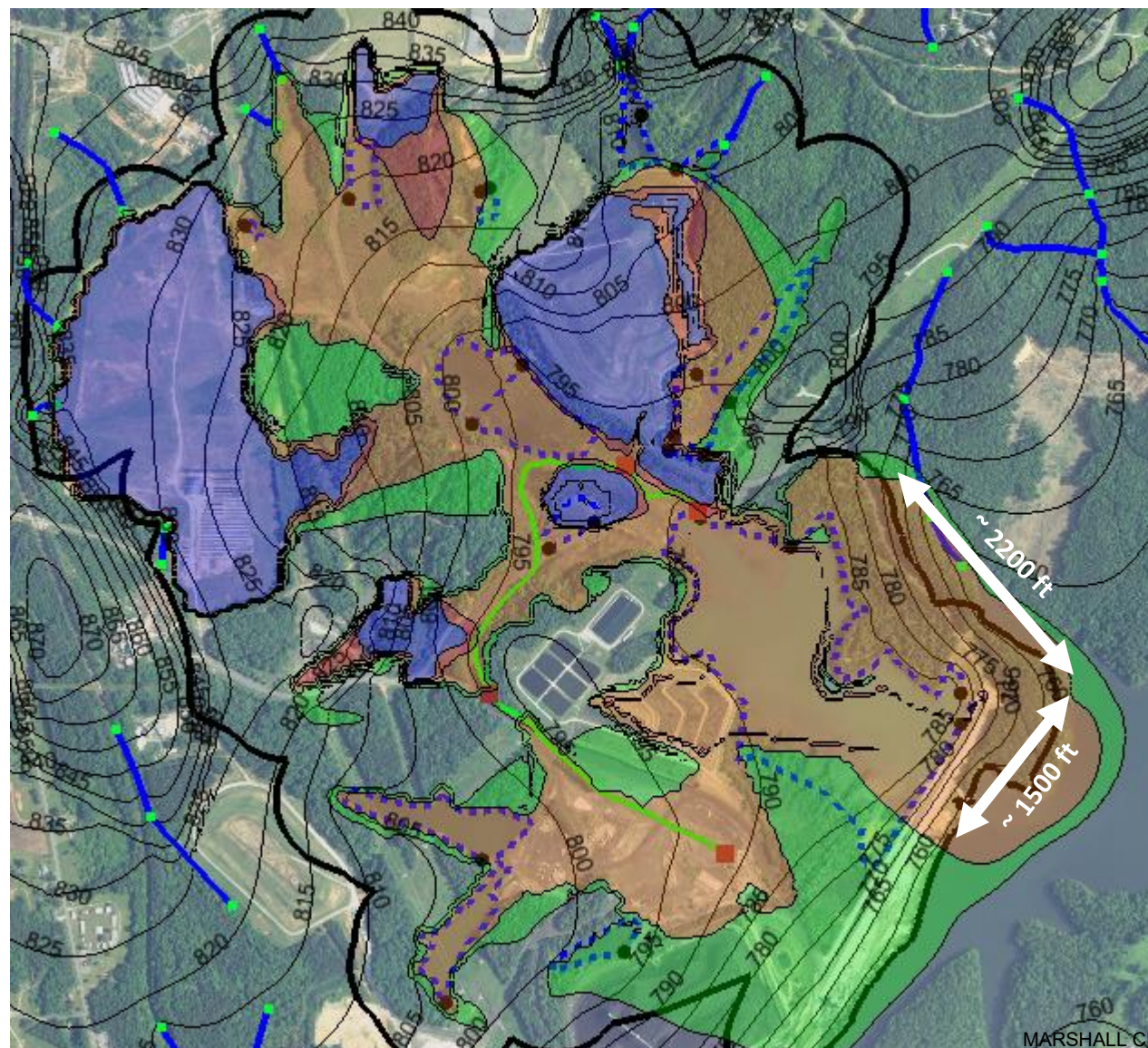
NOTE:

1. OCTOBER, 2016 AERIAL PHOTOGRAPHY OBTAINED FROM GOOGLE EARTH PRO ON SEPTEMBER 18, 2017. AERIAL DATED OCTOBER 28, 2016.
2. STREAMS OBTAINED FROM AMEC FOSTER WHEELER NRTR, MAY 2015.
3. GENERALIZED GROUNDWATER FLOW DIRECTION BASED ON SEPTEMBER 11, 2017 WATER LEVEL DATA.
4. PROPERTY BOUNDARY PROVIDED BY DUKE ENERGY.
5. GENERALIZED AREAL EXTENT OF MIGRATION REPRESENTED BY NCAC 02L EXCEEDANCES OF MULTIPLE CONSTITUENTS IN MULTIPLE FLOW ZONES.

MARSHALL **CURRENT CONDITIONS IN 2018**

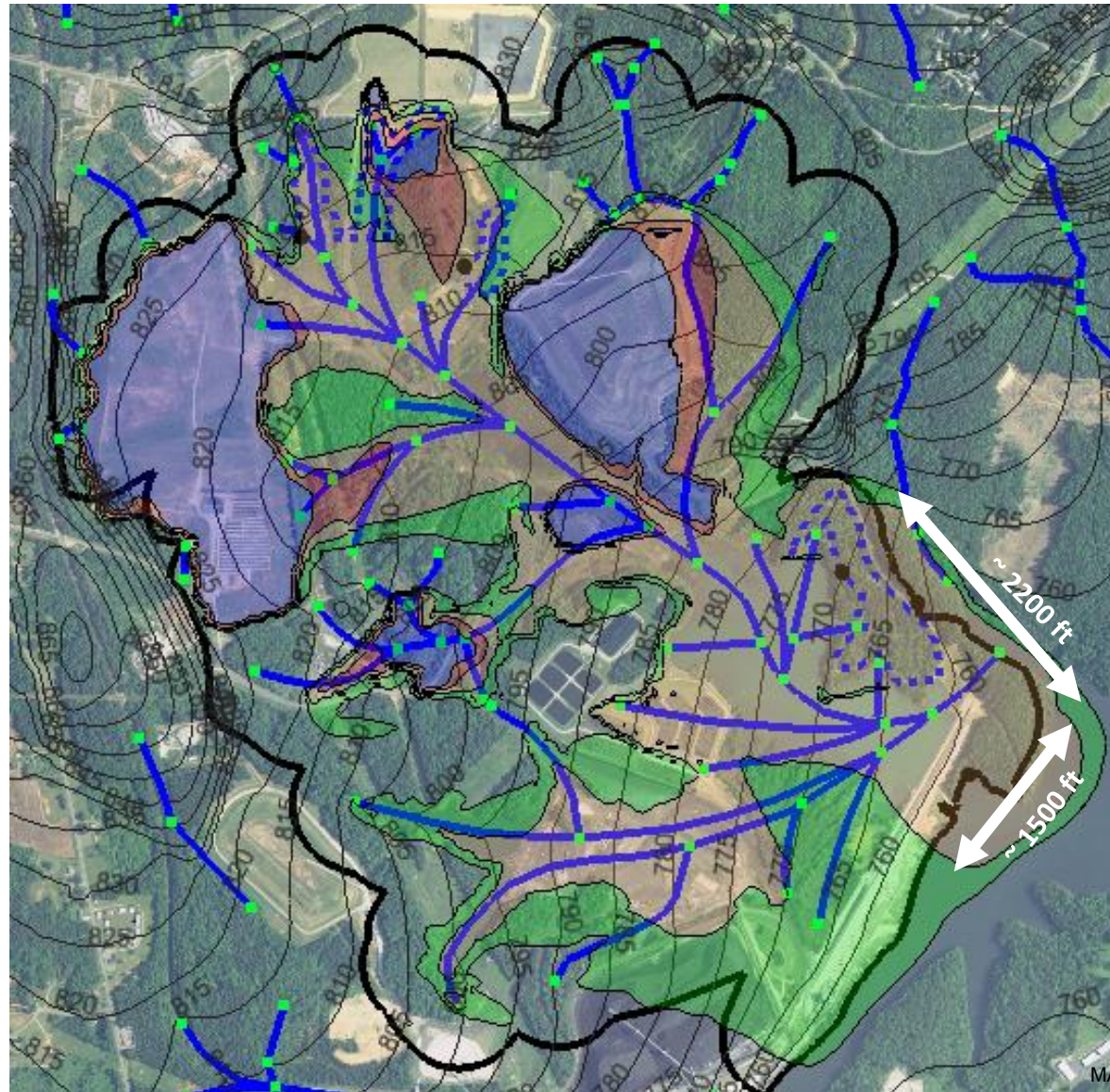
/A

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



MARSHALL **UPON COMPLETION OF FINAL COVER IN 2030, t = 0**

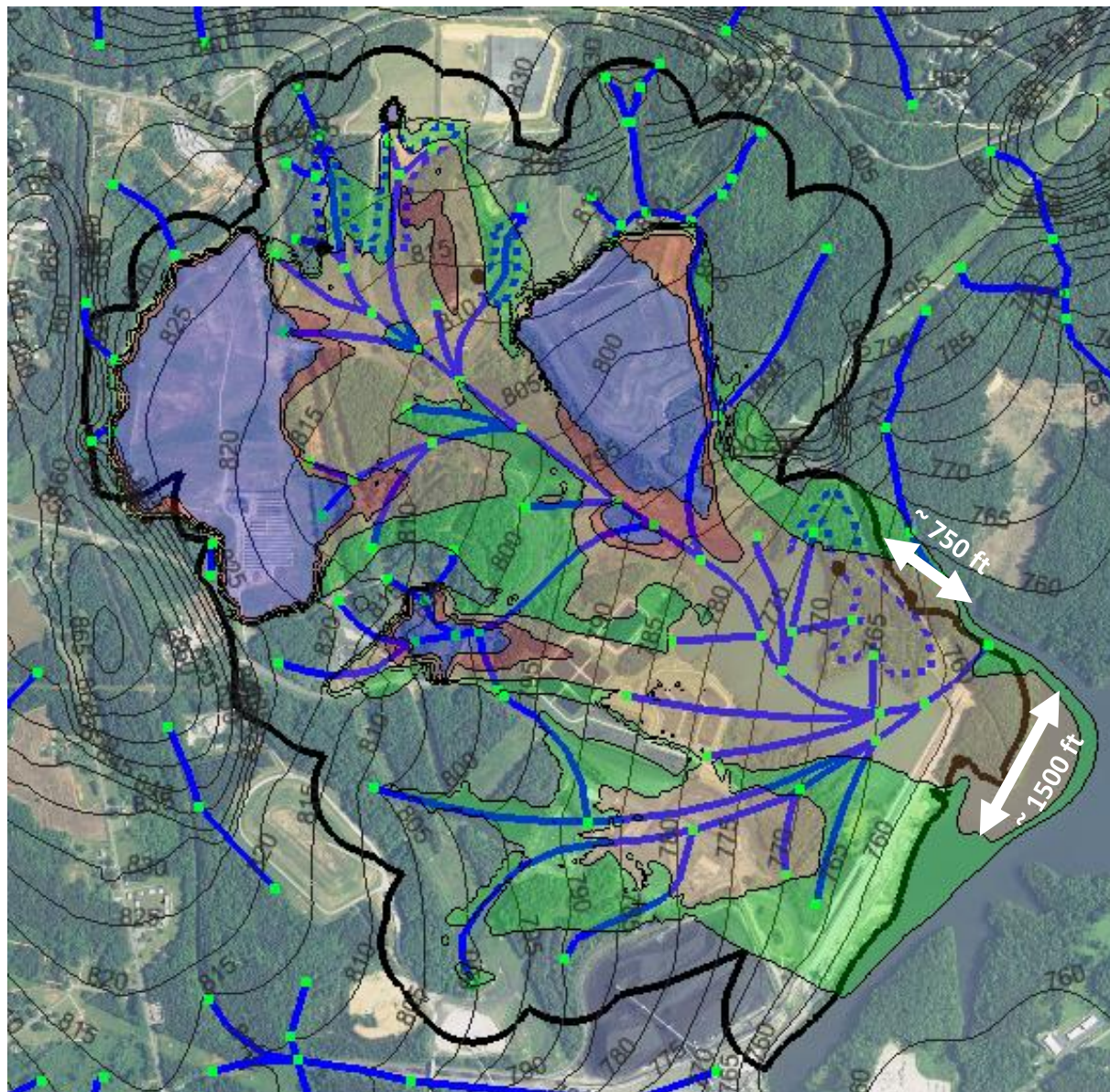
MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



MARSHALL **FINAL COVER, 2150, t = 120 years**

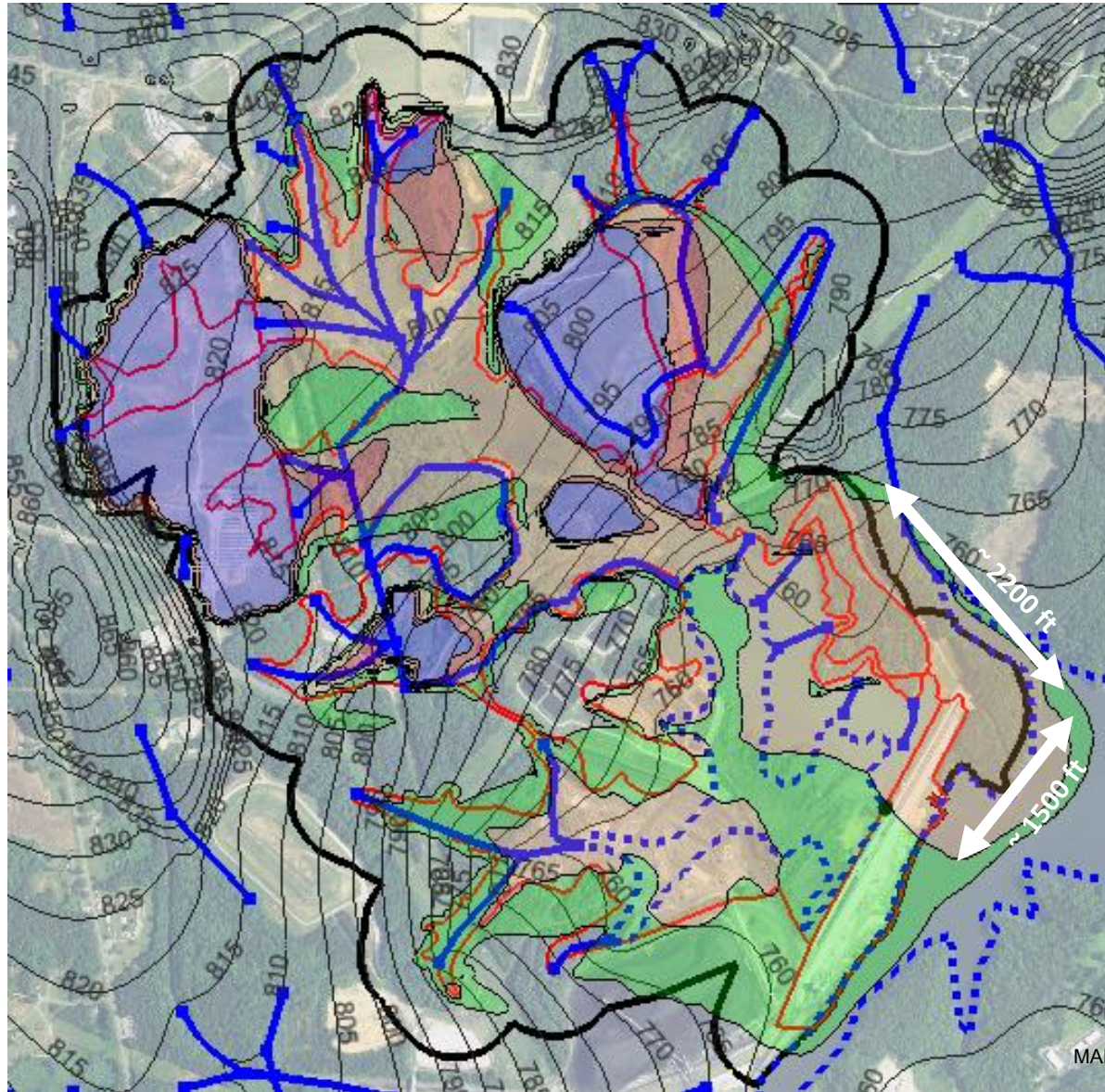
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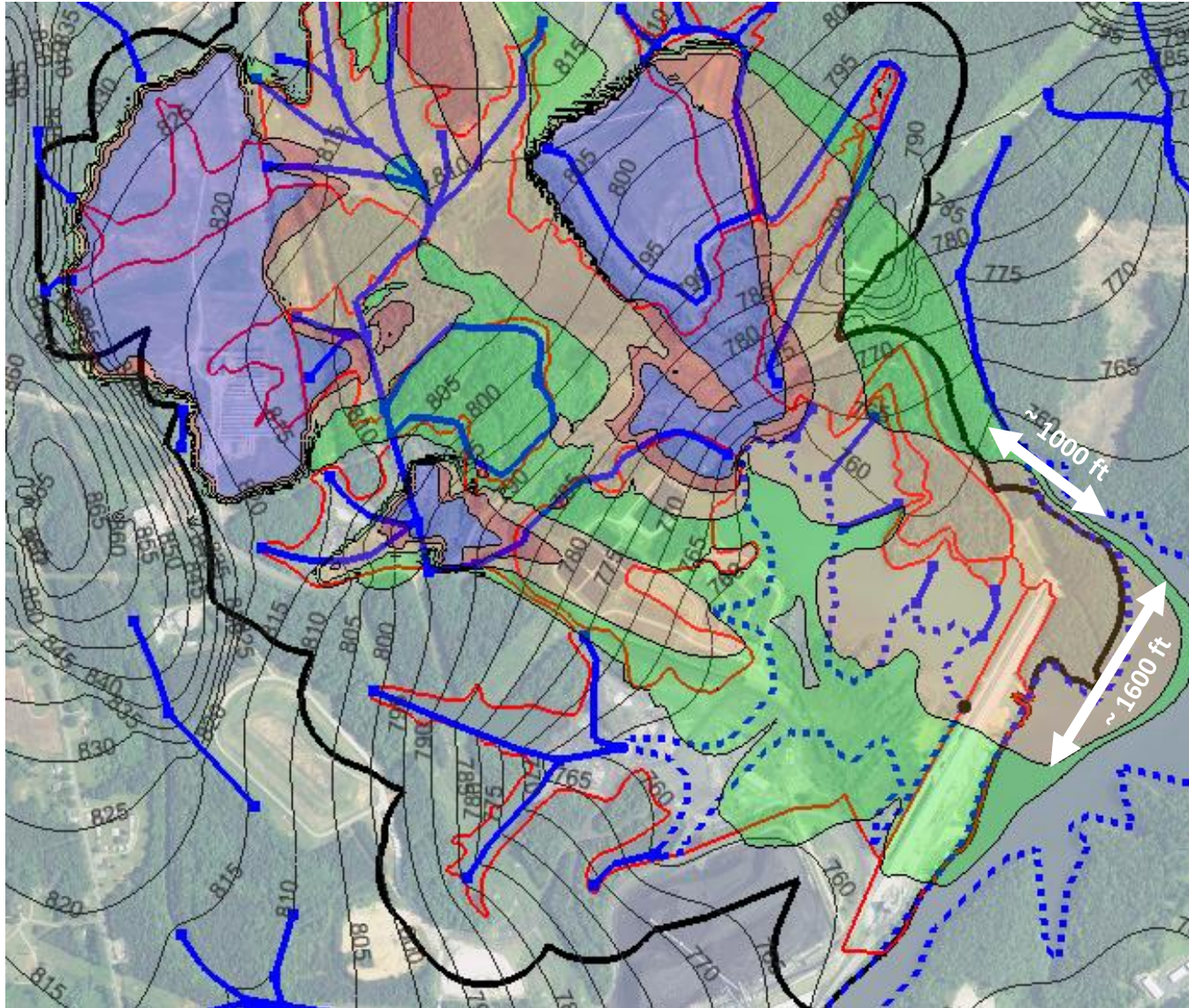
MARSHALL **UPON COMPLETION OF HYBRID IN 2030, $t=0$**

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



MARSHALL **UPON COMPLETION OF HYBRID IN 2150, $t^A = 120$ years**

MAX BORON ANY LAYER (ug/L) green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000



MARSHALL CURRENT CONDITIONS IN 2018

CROSS SECTION A-A' (VIEWED FROM SW SIDE OF DAM LOOKING NE)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Marshall model layers:

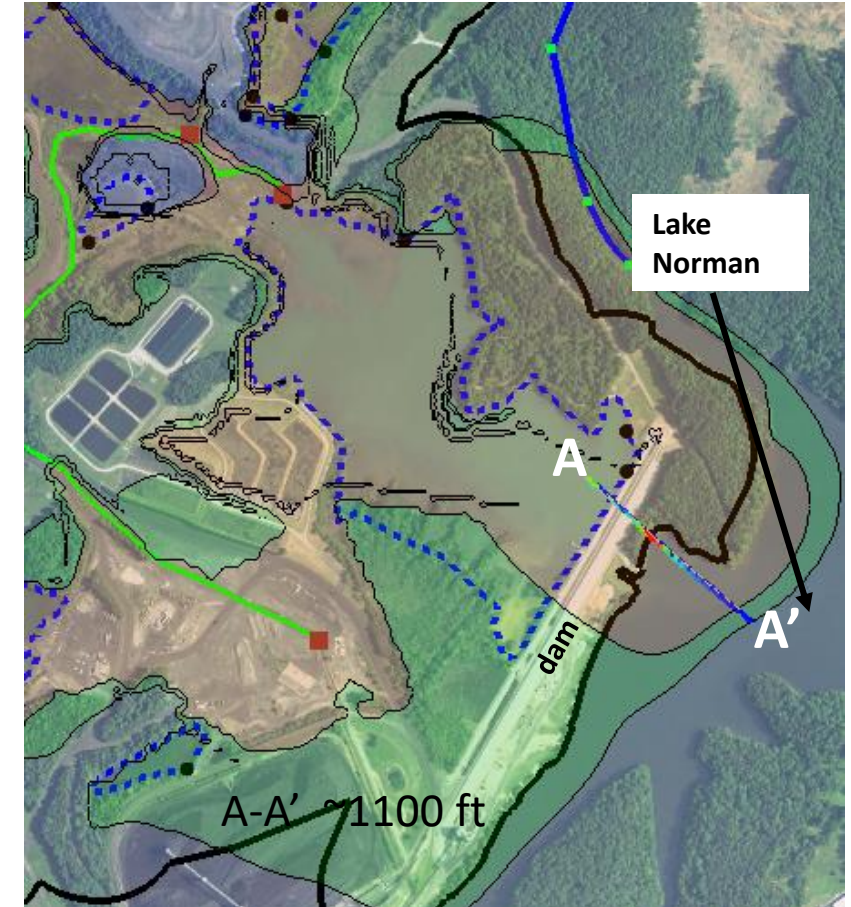
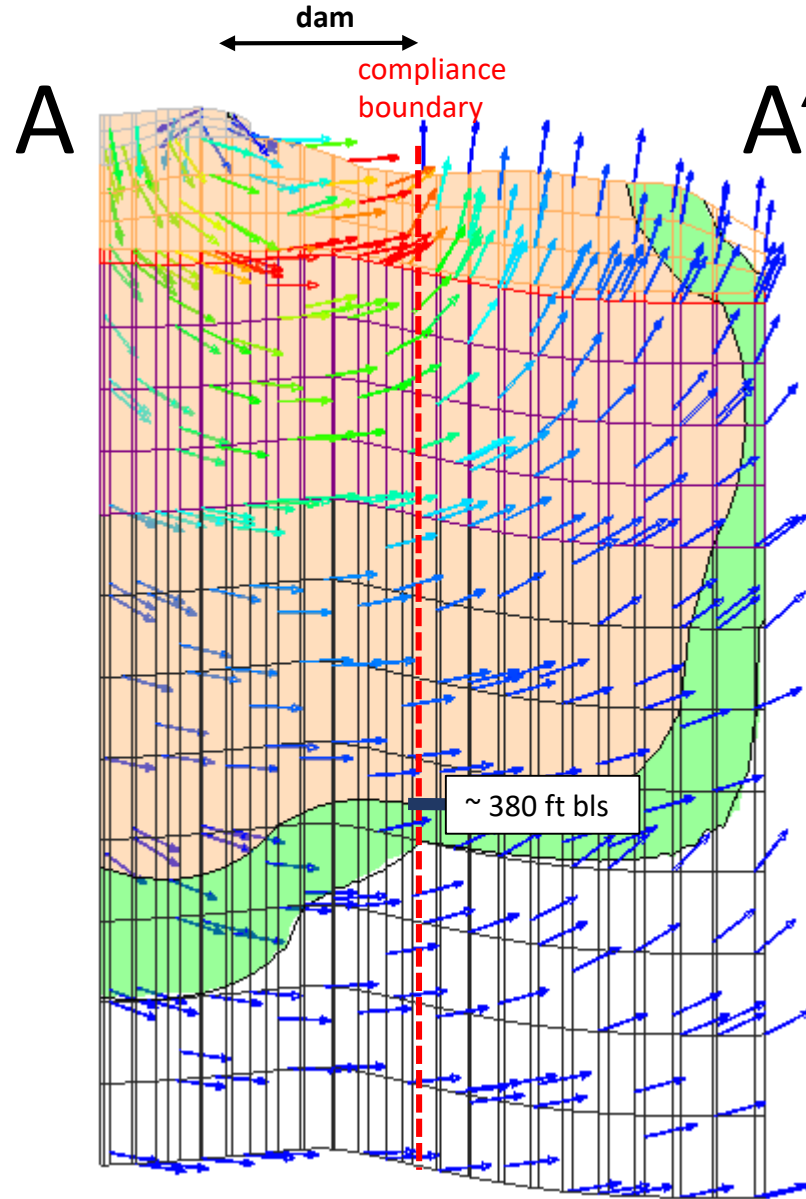
Ash 1-4

Saprolite 5-7

TZ 8

Bedrock 9-20

Vertical
exaggeration X 3



MARSHALL **UPON COMPLETION OF FINAL COVER IN 2030, t = 0**

CROSS SECTION A-A' (VIEWED FROM SW SIDE OF DAM LOOKING NE)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Marshall model layers:

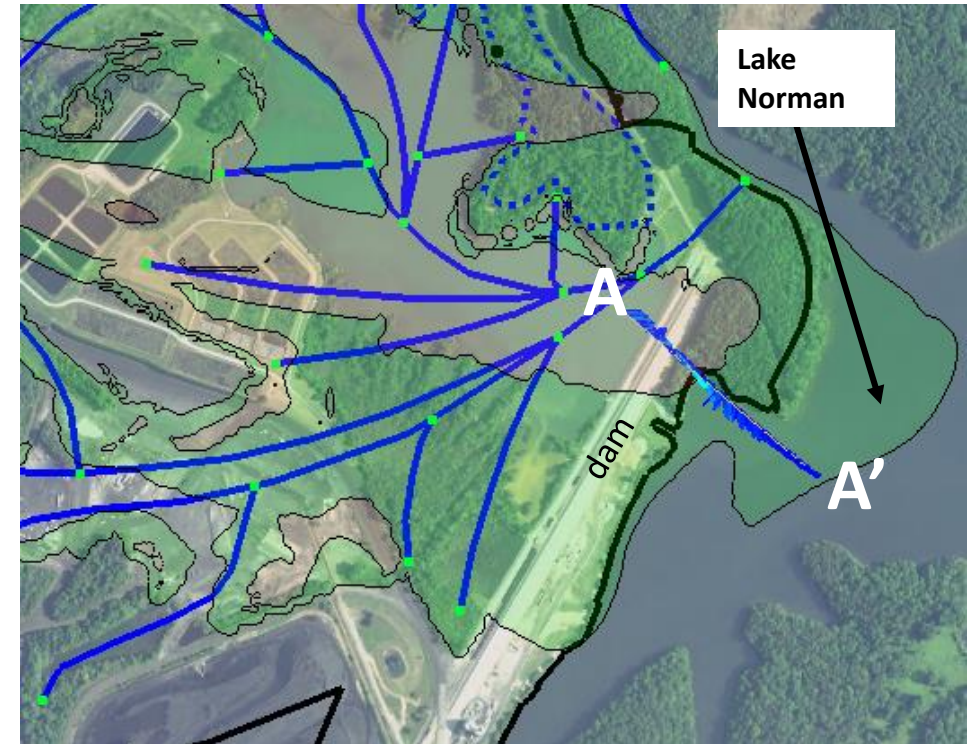
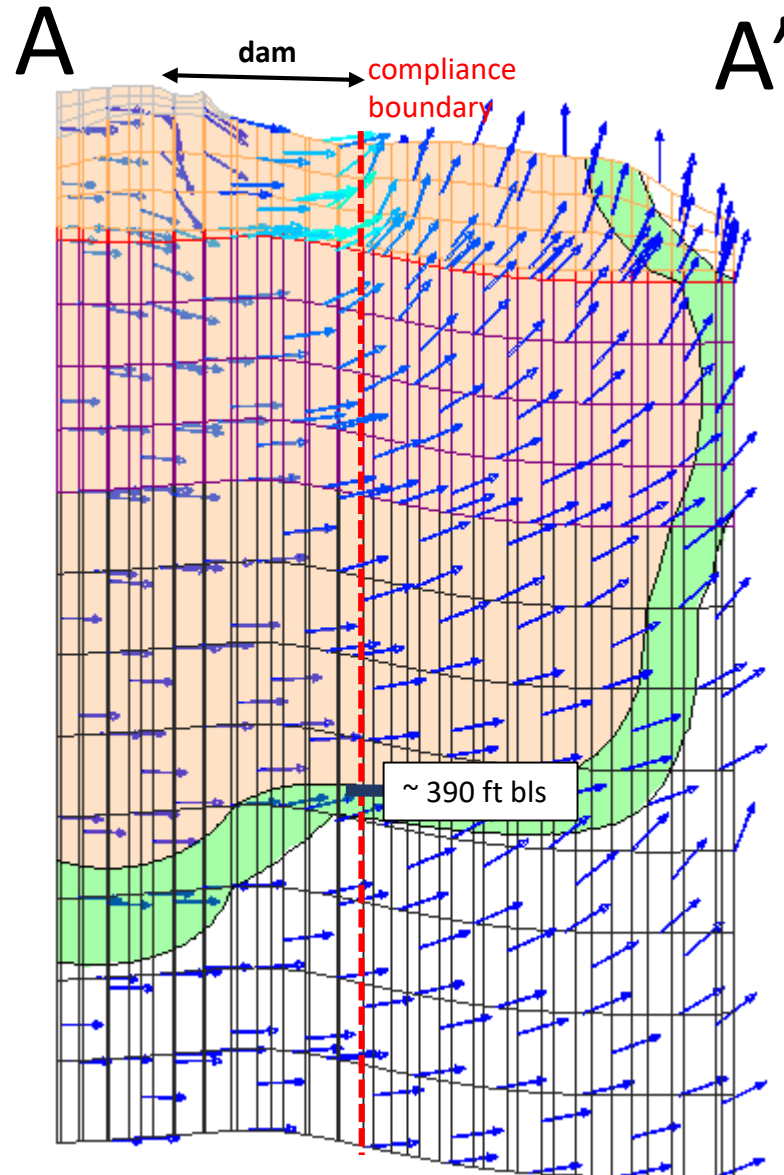
Ash 1-4

Saprolite 5-7

TZ 8

Bedrock 9-20

Vertical
exaggeration X 3



A-A' ~1200 ft

MARSHALL **UPON COMPLETION OF FINAL COVER IN 2150, t = 120 years**

CROSS SECTION A-A' (VIEWED FROM SW SIDE OF DAM LOOKING NE)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Marshall model layers:

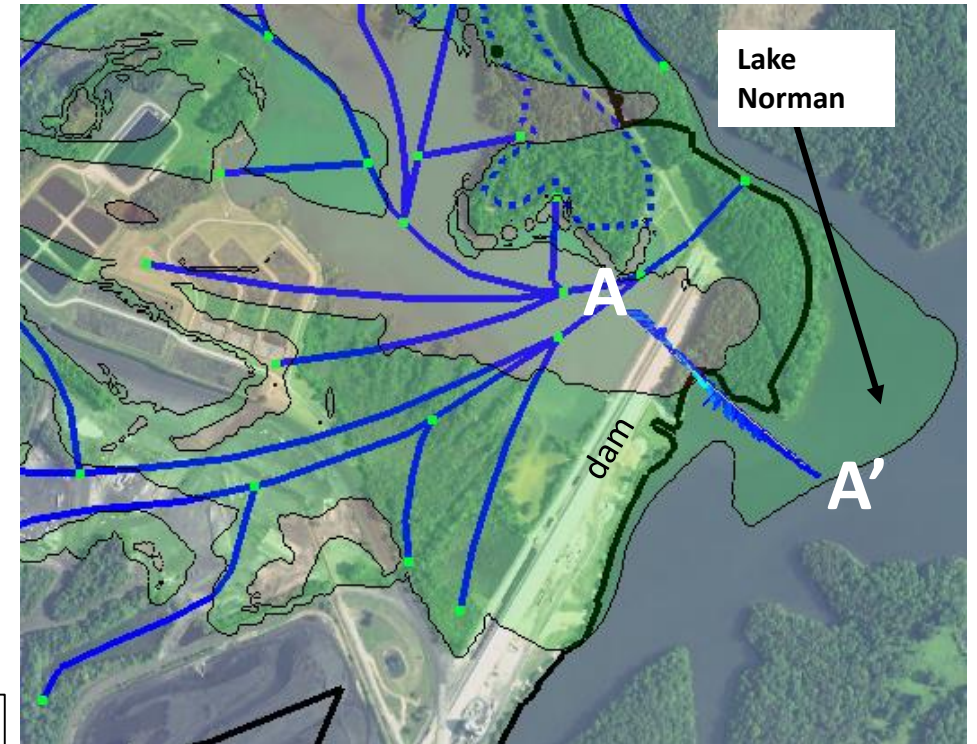
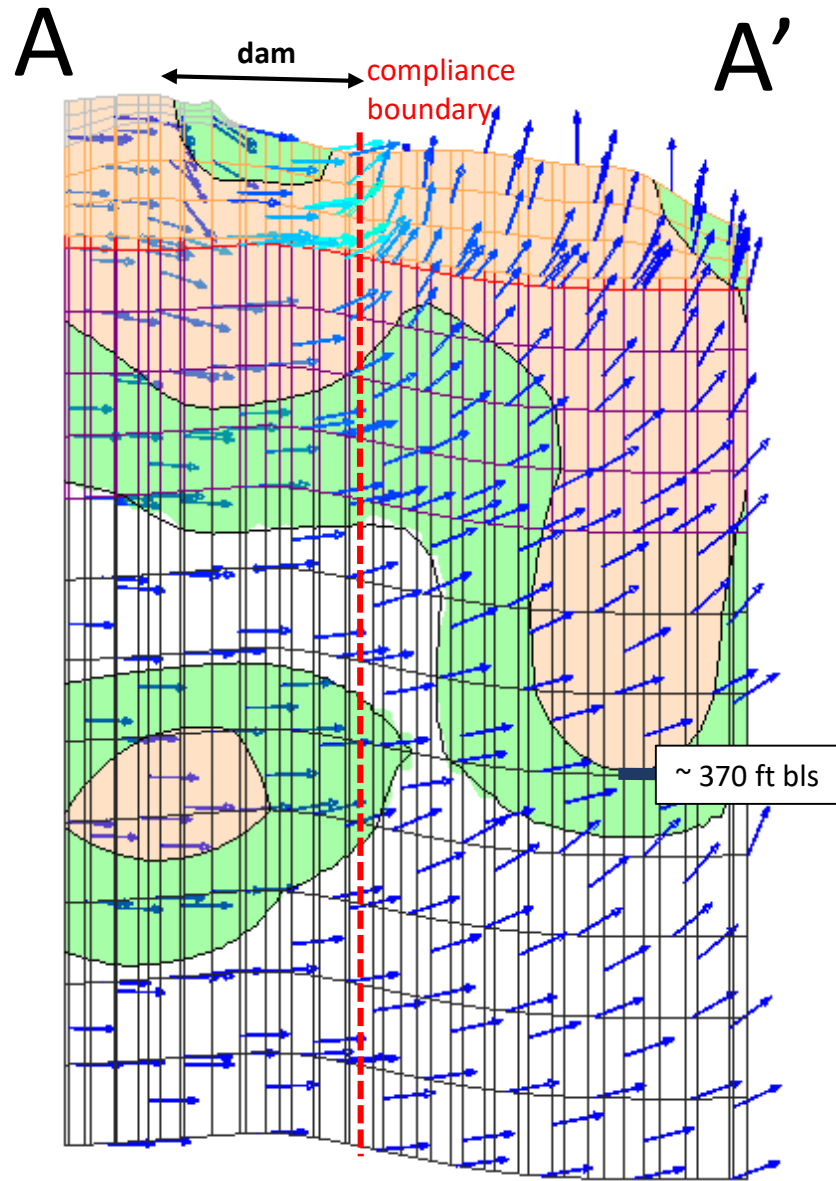
Ash 1-4

Saprolite 5-7

TZ 8

Bedrock 9-20

Vertical
exaggeration X 3



A-A' ~1200 ft

MARSHALL **UPON COMPLETION OF HYBRID IN 2030, $t = 0$**

CROSS SECTION A-A' (VIEWED FROM SW SIDE OF DAM LOOKING NE)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Marshall model layers:

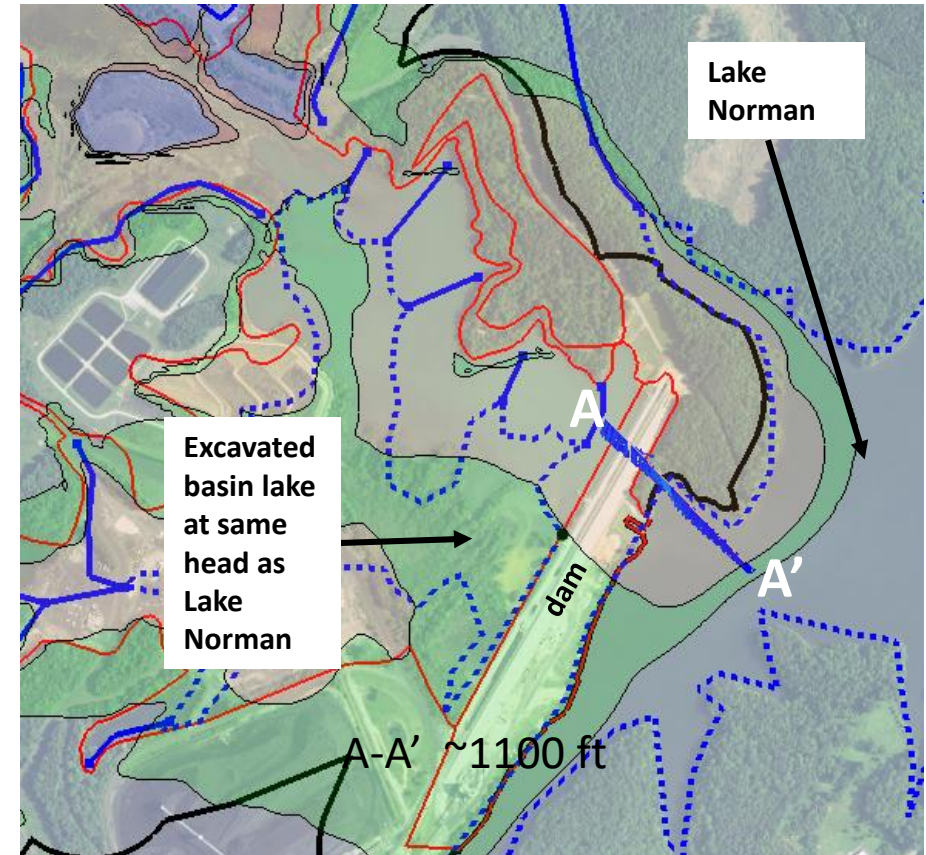
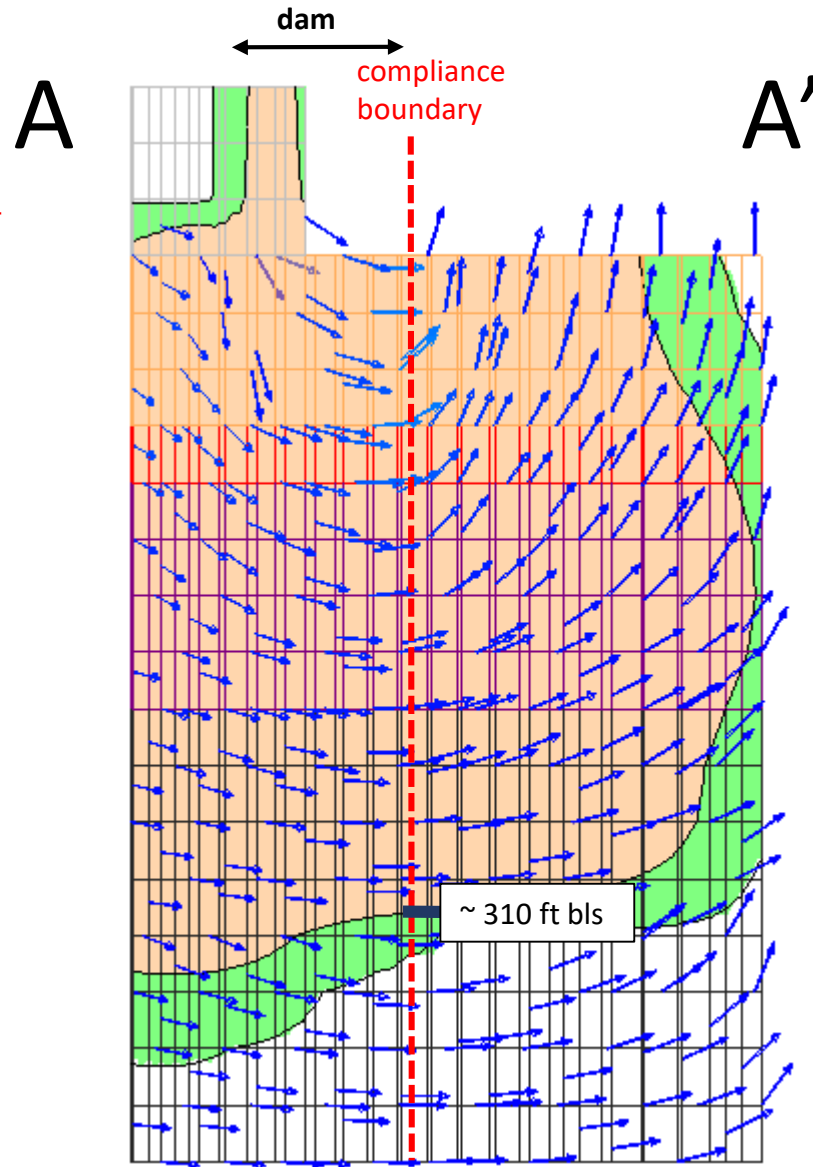
Ash 1-4

Saprolite 5-7

TZ 8

Bedrock 9-20

Vertical
exaggeration X 3



MARSHALL **HYBRID IN 2150, t = 120 years**

CROSS SECTION A-A' (VIEWED FROM SW SIDE OF DAM LOOKING NE)

MAX BORON ANY LAYER green = 75-700, tan = 700-4000, red = 4000-10,000, blue = 10,000-40,000

Marshall model layers:

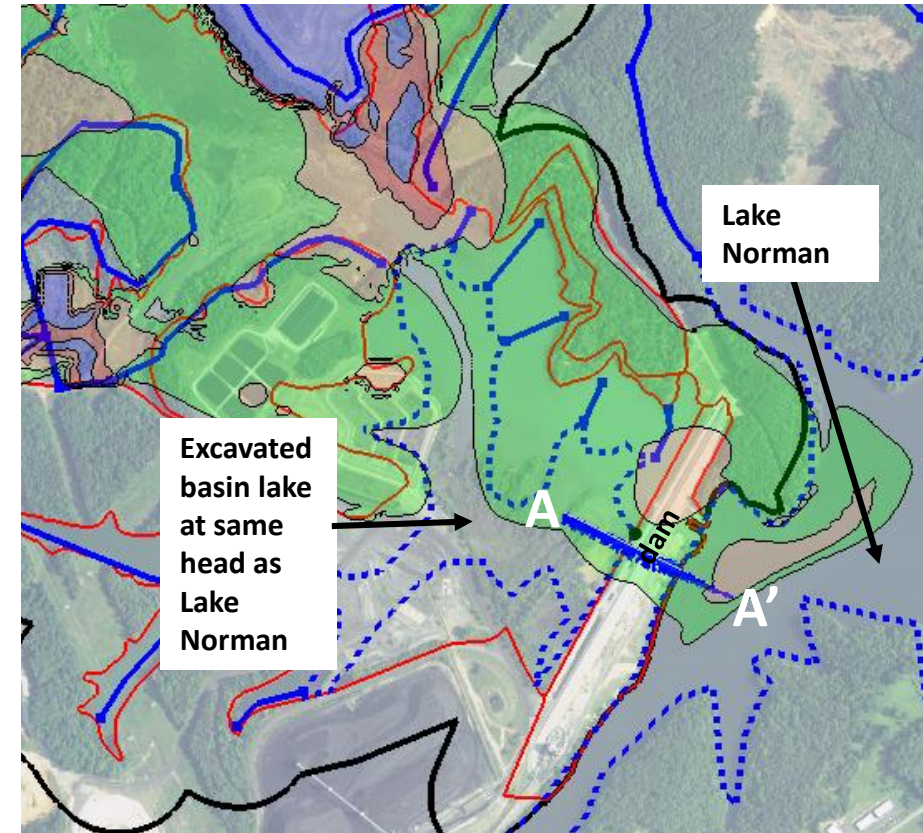
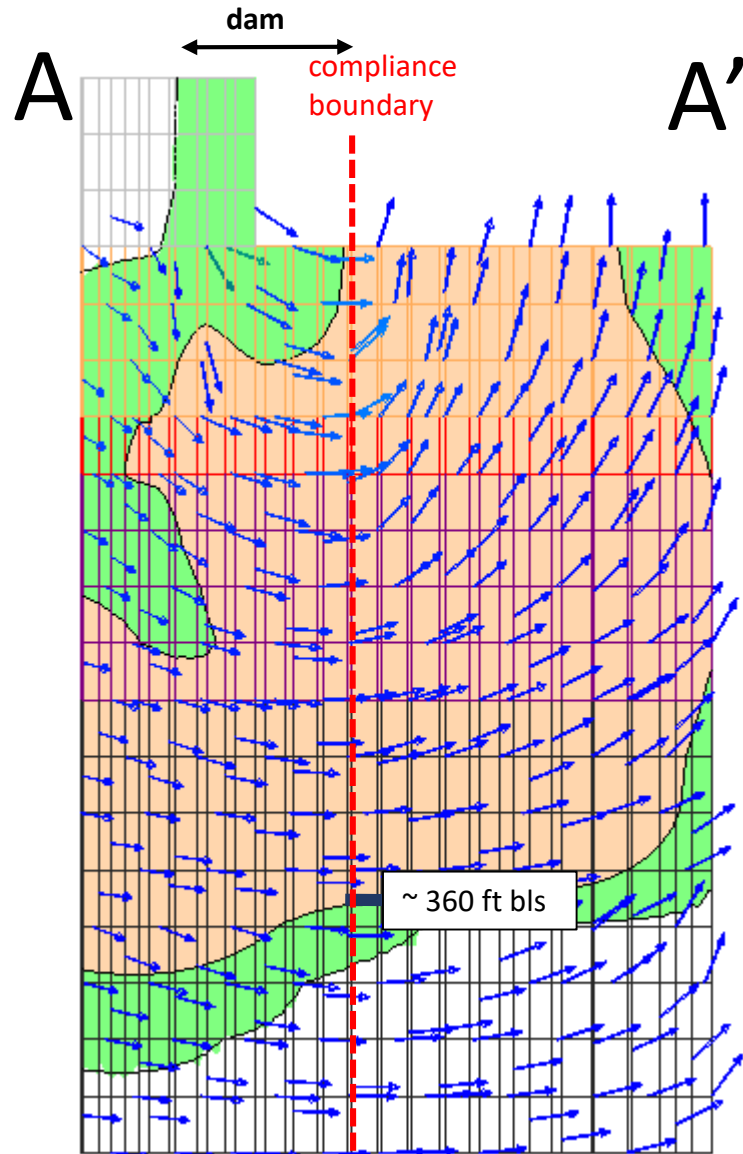
Ash 1-4

Saprolite 5-7

TZ 8

Bedrock 9-20

Vertical
exaggeration X 3



A-A' ~1200 ft

ATTACHMENT B

RESPONSE TO COMMENTS

RESPONSE TO COMMENTS

I. Summary of Responses to Comments

The North Carolina Department of Environmental Quality (DEQ) received approximately 1,100 public comments regarding the closure options for coal combustion residuals (CCR) surface impoundments at Duke Energy's Marshall Steam Station. The overwhelming majority of comments received expressed a preference for excavation and removal to dry-lined storage. The majority of these comments did not specify whether the storage should be on or off-site, but instead requested that it be "away from our waterways and out of our groundwater." A minority of comments expressed support for excavation and specified a preference for on-site disposal in a lined landfill, provided additional feedback on other issues related to the closure process, or expressed additional concerns related to coal ash.

II. Detailed Responses to Comments

A. Comments Opposing Cap in Place

Comment: Many comments opposed allowing Duke Energy to cap the existing ash in its current location and supported excavation.

Response: DEQ agrees with these concerns and has determined that the CCR surface impoundments at Marshall must be excavated.

Comment: One comment opposed "cap in place" and requested that DEQ perform an independent analysis that "identifies the safest closure option for the long-term protection of water supplies."

Response: DEQ agrees with these concerns and has determined that the CCR surface impoundments at Marshall must be excavated.

Comment: One comment opposed "cap in place" and stated that professionals recommend storage in lined landfills. This comment also raised concerns about a lack of research regarding future impacts from beneficial reuse in building materials and expressed an opinion that Duke Energy should not be able to pass cleanup costs on to consumers.

Response: DEQ understands these concerns and has determined that the CCR surface impoundments at Marshall must be excavated. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act. Analysis and evaluation of beneficial reuse may be included in the closure plan. The issue of cost is not within the purview of DEQ. Instead, this issue rests with the North Carolina Utilities Commission.

Comment: A commenter submitted an extensive written comment urging DEQ to require the Marshall coal ash basins to be excavated to a lined landfill to protect the environment and human health.

The commenter claimed coal ash impoundments at Marshall are not eligible for closure-in-place under CAMA. The commenter alleged that closure-in-place violates the North Carolina groundwater rule. The commenter sets out several arguments it believes support that claim: 1) Duke Energy's modelling demonstrates it will not meet groundwater standards if it chooses closure-in-place; 2) Duke Energy's modelling underestimates the extent of contamination; 3) Duke Energy tested groundwater compliance at the wrong location; 4) the groundwater rule prohibits closure-in-place because the coal ash will contribute to violations of the groundwater standard for centuries; and 5) closure-in-place is unavailable because it will not restore groundwater to the legal standard.

The commenter next claimed that coal ash impoundments at Marshall are not eligible for closure-in-place under the Coal Combustion Residuals (CCR) rule. The commenter alleged that: 1) the CCR rules' performance standards require separating ash from the groundwater and precluding its future impoundment; and 2) the CCR rules' corrective action requirements preclude closure-in-place.

The commenter continues by asserting that DEQ must base its closure determination on effectiveness and not cost to the polluter. The commenter further maintains that DEQ should reject Duke Energy's "Community Impact Analysis." The commenter claims that Duke's Energy's report downplays well-established pollution risks and exaggerates the impact on communities of excavating and trucking material to offsite landfills. Further, they claim that diesel emissions do not meaningfully distinguish between closure methods and that the report's habitat analysis is flawed. The commenter concludes by questioning the validity of Duke Energy's closure options scoring system - and offers its own analysis to demonstrate why it believes Duke Energy manipulated scores to suit a desired outcome.

Response: DEQ understands these concerns and has determined that the CCR surface impoundments at Marshall must be excavated.

B. Comments Supporting Excavation

Comment: Many comments supported excavation but did not express a preference for final disposition of the excavated materials.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station.

Comment: One comment supported excavation and implementation of a requirement to publicly disclose the presence of contaminants and associated risks to current residents as well as potential new residents/buyers.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. The Department is not aware of legal authority that would enable it to require Duke Energy to provide the type of notice requested in this comment.

Comment: Several comments supported excavation and secure disposal of the excavated materials but did not express a preference for what secure disposal would entail.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station.

Comment: One comment expressed support for excavation and legislative action to prevent Duke Energy from escaping liability for future problems associated with the site.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. As an executive branch agency, DEQ does not have the ability to implement legislative action.

Comment: One comment expressed support for excavation as a long term solution, while expressing the opinion that the other options would only serve as short term solutions.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station.

Comment: Multiple comments expressed support for excavation, but expressed concern over the timeframe for completion or compliance.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. However, the North Carolina General Assembly has set forth the timeframe for completion of this process through the Coal Ash Management Act.

Comment: One comment expressed support for excavation, but expressed concern over pre-existing structural fills that utilized ash.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act. Analysis and evaluation of preexisting structural fill sites will occur separate and apart from the current proceedings.

Comment: One comment expressed support for excavation and removal to an unpopulated area outside of North Carolina.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. The Department does not have the legal authority to require Duke Energy to dispose of coal ash in an “unpopulated area outside of North Carolina.”

Comment: Two comments expressed support for excavation and testing of removed material.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: One comment expressed support for total excavation, including the construction of a road through the property, but requested that total deforestation be avoided.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

C. Comments Supporting Excavation and Transport to Dry Lined Storage

Comment: The overwhelming majority of comments requested excavation to dry lined storage away from waterways and groundwater using the following form letter, or a derivation that was substantially similar.

"Dear Coal Ash Comment Administrator North Carolina DEQ: Marshall,

The North Carolina Department of Environmental Quality (DEQ) should require Duke Energy to remove its coal ash from its leaking, unlined pits and move it to dry lined storage away from our waterways and out of our groundwater.

Duke Energy plans to leave its coal ash sitting in the groundwater at six sites in North Carolina, where it will keep polluting our groundwater, lakes, and rivers. Recent monitoring shows Duke Energy is polluting the groundwater at its coal ash ponds in North Carolina with toxic and radioactive materials. We need cleanup—not coverup!

The communities around the coal ash ponds have come out time after time over the last several years, making clear that we're concerned about pollution from Duke Energy's coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to listen to the communities.

Duke Energy is already required to remove its coal ash at eight other sites in North Carolina and all of its sites in South Carolina—our families and our community deserve the same protections."

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will continue to take this and future

comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: Many (non-form letter) comments also requested excavation to dry lined storage or landfills away from waterways.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: Many comments requested excavation to off-site dry lined storage. One specific comment went into significant detail about the commenters concerns regarding the usage of existing on-site storage options.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ has not yet made a decision regarding location for final disposition. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

D. Comments Supporting Excavation and Removal to On-Site Dry Lined Storage

Comment: One comment expressed support for excavation and transport to dry lined storage on Duke Energy property but requested that the distance the ash is moved be minimized.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ has not yet made a decision regarding location for final disposition. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: Numerous commenters submitted the following form letter requesting excavation and on-site dry lined storage, or a derivation that was substantially similar.

Marshall Steam Station Comments

N.C. Department of Environmental Quality

RE: Public Comment on the Marshall Coal Ash Cleanup

- DEQ should require Duke Energy to remove its coal ash from its leaking, unlined pit and move it to dry, lined storage on its own property — away from Lake Norman and out of our groundwater.
- Duke Energy plans to leave its coal ash sitting in the groundwater at Marshall, where it will keep polluting our groundwater, streams and rivers. Recent monitoring shows Duke Energy is polluting the groundwater surrounding Marshall with toxic and radioactive materials. We need cleanup—not coverup!

- The community has come out time after time over the last several years, making clear that we're concerned about pollution from Duke Energy's coal ash and want Duke Energy to get its coal ash out of its unlined, leaking pits. It is long past time for DEQ and Duke Energy to remove the ash.
- Duke Energy is already required to remove its coal ash from eight other communities in North Carolina and all of its sites in South Carolina, and the governor of Virginia recently called for all the coal ash to be removed from Dominion's unlined sites—our families and our community deserve the same protections.
- Duke Energy can dispose all the ash from its leaking pond onsite in safe, dry, lined storage. Ash will not travel through the community or to other communities.
- Duke cannot exaggerate traffic concerns while downplaying the community's real concern: Duke Energy's water pollution. None of these plans will have a significant increase in offsite trucking, but only excavation will remove the source of the water pollution.
- Duke Energy's own experts know that even cap-in-place will involve trucking construction materials to the site—just like any other construction project. But even under their estimates, the additional trucking impacts are minimal. Excavation would cause only a 4% increase in daily truck traffic on community roads compared to a 7% increase for the duration of the cap-in-place scenario.
- It is past time for DEQ to listen to the community—not Duke Energy's consultants—about what our community needs. We need Duke to clean up its coal ash and stop the water pollution.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ has not yet made a decision regarding location for final disposition. DEQ will continue to take this and other comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

E. Comments in Support of Beneficial Reuse

Comment: Several comments supported excavation of ash to a lined landfill or being recycled into concrete or other building materials.

Response: DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ agrees that it is proper for Duke Energy to consider possible methods to beneficiate coal ash into a product.

Comment: One comment requested the ash be recycled into concrete but did not express any opinions on other closure plans.

Response: DEQ agrees that it is proper for Duke Energy to consider possible methods to beneficiate coal ash into a product.

F. Other Comments

Comment: Numerous comments cited concerns or personal experiences with thyroid cancer and other risks, stating that it was DEQ's responsibility to protect the public. Most comments citing these concerns expressed a preference for excavation.

Response: DEQ understands and appreciates the need for a remedy that addresses adverse impacts to water quality, human health, and the environment. DEQ will require Duke Energy to comply with all applicable laws and regulations during the closure process. At this time, DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station.

Comment: Several comments expressed concerns with Duke Energy passing on removal costs to consumers or requested that Duke Energy pay all costs of the cleanup.

Response: This issue is not within the purview of DEQ. Instead, this issue rests with the North Carolina Utilities Commission.

Comment: Several comments expressed concerns with or complaints regarding the public meeting process (preparedness, information presented, brevity of presentation, lack of answers to questions) or requested that DEQ provide additional information to the public.

Response: DEQ will take this feedback into account for future public meetings.

Comment: One comment requested additional information regarding effective filtration systems.

Response: DEQ does not typically identify or require specific filtration systems or products.

Comment: Several comments did not express a preference for a specific closure option but requested that DEQ clean up, or make sure that Duke Energy cleans up, the Marshall Steam Station site.

Response: DEQ will require Duke Energy to comply with all applicable laws and regulations during the closure process.

Comment: Several comments requested cleanup of a potential ash site near Lake Norman High School.

Response: DEQ has been made aware of this concern and will investigate.

Comment: Several comments expressed concern with Duke Energy clearcutting forest during the cleanup process.

Response: DEQ understands this concern and will continue to protect the natural resources of the State of North Carolina. DEQ will require Duke Energy to comply with all applicable laws and regulations during the closure process. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: Several comments expressed concerns with ancillary impacts of closure, including air quality and traffic.

Response: DEQ will require Duke Energy to comply with all applicable laws and regulations during the closure process. DEQ will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: One comment provided an in-depth analysis regarding options pertaining to different types of capping in place and expressed an opinion that, if a site were capped in place, an evaluation of all technologies available for dewatering should be considered.

Response: DEQ appreciates the information presented and will continue to take this and future comments into consideration when evaluating closure plans submitted by Duke, as required by the Coal Ash Management Act.

Comment: Several comments raised concerns regarding worker safety in and around ash basins.

Response: DEQ appreciates this concern and will take these comments into consideration when it reviews Duke Energy's closure plans.

Comment: One comment requested that DEQ ignore a Duke Energy report on estimated greenhouse gas emissions associated with various closure options for the six unresolved coal ash sites. The comment claimed DEQ should disregard this submission because it was made after DEQ's deadline for Duke Energy to submit its materials and outside the public comment period, thereby denying the public an opportunity to respond to it. The comment also claimed that DEQ should disregard this submission because it is irrelevant to the decision facing DEQ, which is to select a closure method that stops the ongoing pollution and continuing threat to our water resources posed by Duke Energy's leaking coal ash basins.

Response: At this time, DEQ has determined that coal ash must be excavated and removed from CCR surface impoundments at the Marshall Steam Station. DEQ will require Duke Energy to comply with all applicable laws and regulations during the closure process.

- Doc. Ex. 3898 -

Attorney General's Office Kerin Direct Cross Exhibit

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I/A

* Per DEC, this
is NOT confidential.
(vol. 14 pg. 250)
ctm



Environmental Management Program for Coal Combustion Products

May 29, 2007

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SUBJECT TO PROTECTIVE ORDER

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Environmental Management Program for Coal Combustion Products

1.0	PURPOSE.....	1
2.0	GENERAL PHILOSOPHY	1
3.0	INTRODUCTION.....	1
3.1	Regulatory Status.....	2
3.2	Participation in Voluntary Action Plan.....	2
4.0	MANAGING RISK.....	2
5.0	MILL REJECTS MANAGEMENT	4
6.0	COAL COMBUSTION PRODUCTS MANAGEMENT	5
6.1	North Carolina	5
6.1.1	Use as a Raw Material	5
6.1.2	Agricultural Applications	5
6.1.3	Disposal in Landfills	6
6.1.4	Engineered Fills.....	7
6.1.5	Disposal in Surface Impoundments	8
6.2	South Carolina.....	10
6.2.1	Use as a Raw Material	10
6.2.2	Agricultural Applications	10
6.2.3	Disposal in Landfills	11
6.2.4	Engineered Fills.....	11
6.2.5	Disposal in Surface Impoundments	12
6.3	Indiana	13
6.3.1	Use as a Raw Material	13
6.3.2	Agricultural Applications	14
6.3.3	Disposal in Landfills	15
6.3.4	Engineered Fills.....	15
6.3.5	Disposal in Surface Impoundments	16
6.4	Ohio	17
6.4.1	Use as a Raw Material	17
6.4.2	Agricultural Applications	18
6.4.3	Disposal in Landfills	19
6.4.4	Engineered Fills.....	20
6.4.5	Disposal in Surface Impoundments	20

- Doc. Ex. 3900 -

6.5	Kentucky	22
6.5.1	Use as a Raw Material	22
6.5.2	Agricultural Applications	22
6.5.3	Disposal in Landfills	23
6.5.4	Engineered Fills	23
6.5.5	Disposal in Surface Impoundments	24

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Environmental Management Program for Coal Combustion Products

1.0 Purpose

The purpose of this document is to describe the environmental program for the management of coal combustion products (CCP), including ash and flue gas desulfurization (FGD) gypsum, at Duke Energy (Duke). Past practices have involved a number of different management strategies and have been governed by a range of regulations and regulatory policies. This document provides a basis for developing future management strategies for all CCP, including fly ash, bottom ash, boiler slag, and FGD materials.

2.0 General Philosophy

Duke is committed to CCP management and disposal strategies which comply with all applicable state and federal regulations, are protective of human health and the environment, and reduce future risk associated with groundwater contamination. This compliance includes not only the specific requirements contained in the applicable regulations, environmental statutes, and environmental permits, but also the general regulatory requirement to ensure that ash re-use and disposal activities do not contribute to future exceedances of surface water or groundwater standards.

Management of CCP generated now and in the future will require diligent attention to ensure both regulatory compliance and operational flexibility. There are two primary variables associated with the disposal and re-use of CCP. First, the regulatory environment is becoming increasingly stringent, particularly with respect to groundwater quality standards. Second, the chemistry of the CCP is becoming increasingly variable. The variability is predominately due to operational changes, such as fuel supply and the addition of air pollution control equipment. Therefore, it is imperative that CCP re-use and disposal options be selected to maximize future operational flexibility and fuel flexibility within the constraints of environmental regulations.

Duke will consider cost-effective methods to provide engineering controls that ensure regulatory compliance, while providing flexibility to operate. Duke encourages and promotes the beneficial reuse of CCP when economically feasible and when the practice is environmentally sound. The program encourages the consideration of reuse options before committing to disposal.

3.0 Introduction

Duke operates coal-fired power plants in multiple states with differing regulatory requirements for the various management options in each state. As discussed above, the chemical and physical characteristics of CCP will vary with the chemical constituents of the coal combusted in a boiler and the associated emission control equipment on each unit. These varying characteristics and the varying geology in each of the states will dictate the level of engineering controls (e.g., siting restrictions, liners, and impermeable caps) that are necessary to minimize the risk of adversely impacting groundwater and surface water quality.

3.1 Regulatory Status

CCPs are exempt from federal hazardous waste regulation, but they must be managed under the state non-hazardous waste programs and the state NPDES water programs, unless they are beneficially reused. Some states have a regulatory framework for the beneficial reuse of CCP and some do not. Those states that do not have any regulatory framework in place may have policy or guidance documents in lieu of regulation.

3.2 Participation in Voluntary Action Plan

EPA found, in its Year 2000 Regulatory Determination, that fossil fuel combustion wastes (CCP) were being managed in a manner that did not warrant managing these wastes under the federally enforceable hazardous waste program. However, EPA did identify three areas of concern, or what they referred to as "gaps," in some state regulatory programs.

- Lack of groundwater monitoring at active surface impoundments and landfills.
- Continued placement of CCP in sand and gravel pits without appropriate engineering controls.
- Insufficient consideration given to dry handling technology prior to constructing a new or expanded surface impoundment.

To respond to these concerns, the Utilities Solid Waste Activities Group (USWAG) developed a voluntary program (the Voluntary Action Plan) to address EPA's concerns. The utility industry is working to improve its regulatory record by addressing these gaps in regulations to demonstrate that EPA need not promulgate prescriptive standards for the states to adopt into their solid waste regulatory programs.

In 2007, Duke committed to implementing the Voluntary Action Plan to evaluate the environmental impact of current CCP disposal practices and to assess the associated long-term risk. In addition, implementing the Voluntary Action Plan will provide information to improve future disposal practices.

4.0 Managing Risk

The management/disposal options selected by Duke for each site are substantial factors in determining the long-term legal, environmental, and financial risks associated with CCP. In the case of beneficial use applications which supply CCP to a third party, receipt of revenue is one criterion that reduces the level of liability associated with the application. There is minimal long-term liability involved with supplying CCP for use as a raw material when Duke receives net positive revenue for the material. Net positive revenue is defined as the total of all cash payments received in exchange for the material less any subsidies (i.e. trucking), payments, or other consideration. Subsidizing beneficial use projects may eliminate the "Useful Product Defense" exposing Duke to greater long-term risk. Projects which do not produce positive revenue may be acceptable; however, they require more detailed review and evaluation by Environmental.

- Engineered fills represent a significant long-term legal and environmental risk to Duke Energy- particularly offsite fills. These risks are more pronounced in North Carolina

- Doc. Ex. 3903 -

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Mar 29 2018

than in Indiana and Kentucky due to hydrogeologic differences. (Engineered fills are generally not allowed in Ohio and South Carolina.)

When the engineered fill option is chosen, certain actions can be considered to reduce the associated risk. These actions include the following:

- Implement the appropriate land use restrictions on the property prior to placing any ash. These restrictions will be determined by Environmental based on site-specific factors and may include a prohibition on any site drinking water wells, limitation on agricultural activities, limitation on residential development, and limitation on activities which would require excavation below the cap.
- Providing ash to projects developed by others should only be considered when there is a high probability of project success based on the project specifics and the quality of the developer. This will increase the probability that the fill will be capped in a timely manner to reduce the likelihood of contaminating groundwater with the ash leachate.
- Include language in all contracts for offsite structural fills requiring that the contractor comply with all applicable local, state, and federal environmental regulations.

When considering CCP disposal options (i.e., landfills and impoundments), the use of Best Available Technologies (BAT) and engineering controls reduces legal, financial, and environmental risks in the long term. New management/disposal facilities typically have operational lives as short as 3 years to as long as 50 years, followed by post-closure environmental monitoring requirements that extend up to 30 years. Therefore, to reduce long-term risk, new facilities should be designed with a view to the future, and technologies should be used that will provide operational flexibility and regulatory compliance for the long term.

BAT for purposes of this document is the design criteria found in 40 CFR 258, Subtitle D non-hazardous waste regulations. These federal standards were developed as the minimum design criteria necessary to protect groundwater for managing non-hazardous wastes in a municipal landfill. EPA has not promulgated standards for managing non-hazardous industrial waste but issued a guidance document entitled "Guide for Industrial Waste Management" which has similar design standards. In states where the current default landfill design requirements are more stringent than the 40 CFR 258 requirements, the more stringent state requirements should be followed. BAT in 40 CFR 258 can generally be described as follows:

- Composite liner consisting of 30 mil flexible membrane liner (FML) and 2 feet of clay with a permeability of 1.0×10^{-7} cm/sec or an equivalent alternative system.
- Leachate collections system.
- An impermeable cap that is 1.5 feet of clay with a permeability of 1.0×10^{-5} cm/sec or a synthetic cap that includes 6 inches of topsoil for vegetative cover or alternative system that is equivalent.

In order to ensure the long-term operating flexibility of the generating station and accommodate the necessary timeframe for siting and permitting of new facilities, sufficient disposal capacity should be provided to ensure future operations are not jeopardized. A minimum of 10 years permitted disposal capacity should be maintained due to the uncertainty surrounding the regulatory permitting process and construction lead times.

- Doc. Ex. 3904 -

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Mar 29 2018

As new air regulatory programs are implemented, it is imperative that the management of residues from new emission control equipment is addressed in the long-term planning strategies. The new, complex emission control technologies are designed to remove additional air pollutants and toxics which result in significant impacts on the chemical and physical characteristics of the CCP. The impacts to the CCP thus require additional controls on the waste management units where they are disposed. Recent industry studies recommend that flyash from units with sorbent injection technology for mercury control be managed dry in landfills to reduce the potential to re-release the mercury. With the addition of new FGD Systems and SCR on coal-fired units, additives are injected into the flue gas to reduce acid formation. These additives are usually high alkaline materials that have a significant impact on the chemical characteristics of CCP. As a consequence, it is recommended that the residues be managed dry in landfills to reduce long-term risk.

The succeeding portions of this program document are broken down into a series of chapters – one for each state in which Duke is primarily operating. It is necessary to provide a program for each state, because there are significant differences among the states in regulatory requirements, regulatory guidance, and geologic settings. The chapters identify the various CCP management practices and the regulatory requirements associated with that practice.

Within each state chapter, the options are ranked from most preferable to least preferable, based on consideration of station operational flexibility and long-term legal, financial, and environmental risk.

The ranking listed below is intended to support planning and management decisions. It does not preclude a detailed evaluation of each new application based on project-specific operational, economic, legal and environmental criteria.

1. Use as a Raw Material (lowest risk)
2. Agricultural Application
3. Landfills
4. Engineered Fills
5. Disposal in Surface Impoundments (highest risk)

5.0 Mill Rejects Management

In addition to general CCP management, mill rejects or pyrites must be managed in a manner that reduces the potential for the oxidation of the pyritic material. Managing these materials in a non-oxidizing environment will eliminate or significantly reduce the potential for the release of trace elements from the pyrites.

USWAG and the Electric Power Research Institute (EPRI) have developed a guidance document for the proper management of pyrites. This information can be found in the EPRI report titled "Guidance for the Comanagement of Mill Rejects at Coal Fired Power Plants" TR-108994, June 1999. Duke is committed to managing pyrites in a manner that is identified in the EPRI guidance document. The following practices are approved for managing mill rejects or pyritic materials.

- Co-manage mill rejects with alkaline flyash in a dry landfill or structural fill. The pyritic materials and flyash must be managed in the fill in a manner that reduces the infiltration of stormwater.
- Co-manage mill rejects with alkaline flyash in a surface impoundment. The pyritic materials and flyash must be managed below the surface and completely submersed in water.
- Collect and spread the mill rejects on the coal pile in an area that is actively feeding coal into a boiler. This will reprocess the materials a second time and will likely burn them as originally designed.

6.0 Coal Combustion Products Management

6.1 North Carolina

6.1.1 Use as a Raw Material

Definition

Use of CCP as a raw material to make a product, such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard

Applicable Statutes and Regulations

- 15A NCAC 13A Section .1700 – Requirements for Beneficial Use of Coal Combustion By-Products
- NCDENR Permit No. WQ0000452 Duke Energy Ash Distribution Program – Distribution of Residual Solids

Program

Ash may be utilized in beneficial products such as Portland cement, concrete, or flowable fill where the ash is contained in a cementitious material. Gypsum may be utilized for wallboard manufacturing. These applications have been determined to have little or no long-term risk when positive revenues are gained from the sale of the CCP. All other applications where the CCP is a raw material feed stock without positive revenues must go through internal Environmental review.

Rationale

Use of ash in the production of cementitious material is acceptable because the binder utilized in the manufacture of the material is considered to be adequate to prevent leaching of chemicals in harmful quantities. Use of ash in the production of other materials may also be acceptable; however, the specifics of these uses would need to be analyzed on a case-by-case basis to ensure their acceptability.

Use of gypsum in the manufacture of wallboard is acceptable, provided the gypsum meets the specifications provided by the wallboard manufacturer. This is acceptable because the gypsum is bound up in the manufacturing process.

6.1.2 Agricultural Applications

Definition

Use of CCP for agricultural benefit

Applicable Regulations

- 15A NCAC 13A Section .1700 – Requirements for Beneficial Use of Coal Combustion By-Products
- NCDENR Permit No. WQ0000452 Duke Energy Ash Distribution Program – Distribution of Residual Solids

Program

Gypsum may be applied to the soil in agronomical amounts in accordance with the required land application permits when net positive revenue is derived. All other applications without net positive revenues must go through internal Environmental review. Other CCP may be used for agricultural purposes in accordance with the applicable regulations with review by Environmental.

Rationale

The land application of synthetic gypsum when applied in agronomic amounts has been determined to have little or no long-term risk when positive revenues are gained from the sale of the synthetic gypsum for agricultural applications. The use of gypsum as a soil amendment in agricultural applications is acceptable when applied to the soil for reducing soil erosion, as a nutrient addition, to mitigate acid and sodic soils, and as an additive to fertilizer and composting materials. These applications provide significant agricultural benefits with minimal risk to human health and the environment.

6.1.3 Disposal in Landfills

Definition

Placement of CCP into a permitted landfill

Applicable Regulations

- 15A NCAC 13B Section .0500 Solid Waste Management
- Site landfill permit

Program

CCP may be placed in landfills without restrictions other than those provided in the landfill permit and the state solid waste regulations. Generally, new landfills should be designed with BAT or equivalent as defined by the state solid waste regulations (e.g., composite liner/leachate collection and surface cap). Exceptions may be considered by Environmental in some limited cases to accommodate facility operational constraints.

Any CCP generated at a Duke facility destined for disposal at a municipal solid waste landfill (MSWLF) must first be reviewed and approved by Environmental. Environmental will conduct an audit of the construction and operating practices of the MSWLF as part of the approval process to protect the company's long-term risk of disposal at a site owned and operated by a third party.

Rationale

Lined landfills are more protective of soil, surface water, and groundwater than unlined CCP fills. While in some limited cases the landfill can, with delays and some difficulty, be permitted without a liner or with the minimum engineering controls to meet current regulation, it is highly recommended that the BAT be applied in the design of all new landfills and expansions of existing ones. Landfills are designed with 3 to 50 years of storage capacity, and long-term, post-closure requirements dictate that these facilities must maintain groundwater protection for an additional 30 years. Installing the best liner and cap designs currently available for non-hazardous waste will provide future operational flexibility, while reducing long-term risk. This flexibility includes the ability to dispose of future ash, which might have very different leachate chemistry than current ash. This flexibility also allows the potential for expanding the waste stream to include other CCP (e.g., FGD material, wastewater sludge) in the future.

6.1.4 Engineered Fills**Definition**

A fill or embankment with a projected beneficial end use which is designed and constructed utilizing specified compaction methods. An engineered fill also includes road base applications.

Applicable Regulations

- 15A NCAC 13A Section .1700 – Requirements for Beneficial Use of Coal Combustion By-Products
- NCDENR Permit No. WQ0000452 Duke Energy Ash Distribution Program – Distribution of Residual Solids

Program

The use of CCP in engineered fills on-site or off-site must have a beneficial end use as defined in the applicable regulations and permits. Before any fill project is initiated, it must be reviewed and approved by Environmental. A site-specific environmental assessment must be performed which may include CCP leachate testing, site soil evaluation, infiltration cap design review, groundwater modeling, comparison to soil cleanup standards, wetlands assessment, surface water evaluation, rare and endangered species review, archaeological assessment, and regulatory status review. Present and future land use will also be considered in the assessment. To facilitate this site-specific assessment, it is necessary to define the proposed project in substantial detail prior to initiating the Environmental review.

Rationale

Varying site conditions and ash chemistry necessitate a site-specific assessment for all fill projects. Engineered fill projects are limited to projects where the ash will be effectively capped in a timely manner. This limitation is necessary to restrict the volume of water which percolates through the ash. Leachate concentrations from the ash are likely to cause exceedances of groundwater standards if excessive infiltration is permitted through the ash. Therefore, infiltration into engineered fills must be minimized by the rapid placement of an effective surface cap. A generalized analysis of a "typical" fill indicates that a soil thickness of approximately six feet between the ash and groundwater is adequate to accommodate the leachate that is expected during a typical two-year construction period. (Additional soil thickness might allow a longer construction period with site-specific analysis.)

Ash management pursuant to the Distribution of Residual Solids Permit requires that groundwater standards be met at the compliance boundary (typically 250 feet from the ash). In contrast, the Section .1700 rules have no provision for a compliance boundary; thus, groundwater standards must be met at all points in the aquifer. This makes ash management pursuant to the Section .1700 rules more restrictive than ash management pursuant to the Distribution of Residual Solids Permit.

Use of bottom ash as a base in roadway construction is acceptable because the finished pavement provides an effective cap over the ash. In addition, the road base thickness is typically less than two feet. Also, bottom ash does not generally leach contaminants in concentrations sufficient to cause groundwater contamination.

6.1.5 Disposal in Surface Impoundments

Definition

Wet disposal of CCP by sluicing fly ash, bottom ash, boiler slag and pyrites into surface impoundments commonly known as ash ponds

Applicable Statutes and Regulations

- 15A NCAC 2H – Procedures for Permits
- Site NPDES permit

Program

The regulation of active surface impoundments (ash ponds) is under the jurisdiction of the Division of Water Quality. The discharge is regulated by the NPDES program. Any placement of coal combustion products into these ash ponds must be in the form of a wastewater. The placement of solid waste into a surface impoundment is prohibited by regulation. The expansion or modification of an existing ash pond to increase capacity cannot be done without state approval. The permits typically have conditions that once the solids or residues are removed from the pond, they must be managed in accordance with all state and federal solid waste regulations.

The construction of a new ash pond, or the horizontal expansion of an existing ash pond, is permissible (with the proper permits), but the facility must conduct an evaluation using the appropriate site selection criteria that considers environmental, social and economic concerns. Before expansion or construction of a new ash pond, the conversion to dry handling with placement in a landfill must be evaluated. This conversion will reduce the risk of impact to groundwater quality in the long term.

All new construction or horizontal expansion of an existing ash pond must be constructed using the appropriate engineering controls (e.g., liners) to ensure that the facility does not contribute to an exceedance of groundwater standards.

The closure and post-closure activities for an ash pond or surface impoundment are subject to the Division of Water Quality requirements. NCDENR does not have specific requirements for the final closure of an ash pond. Closure of an ash pond or a surface impoundment will be subject to

requirements at the regulatory agency's discretion. The owner/operator must provide the agency with a closure plan and a post-closure maintenance/groundwater monitoring plan if clean closure is not conducted. Clean closure is considered to be the complete removal of all solids and residues (CCP) and disposal in a permitted landfill.

Rationale

Current ash ponds or surface impoundments are generally unlined and have a large, constant hydraulic head. As a result, this management practice has a greater potential to impact groundwater than dry handling options. The risk for impact is greatest while in operation when the ash sluicing process provides a continuing supply of sluice water and source material. These impacts can be mitigated through the use of liners that utilize BAT for new ash ponds or surface impoundments. In addition, sluicing ash followed by removal and landfilling requires "double handling" of the ash, increasing site O&M costs.

6.1.5.1 Dry Stacking**Definition**

Placement of sluiced ash by dry means within the ash basin to facilitate improved wastewater treatment

Applicable Regulations

- 15A NCAC 2H – Procedures for Permits
- Site NPDES permit

Program

Ash may be managed within the ash basin boundary without limitation (other than those provided in the NPDES permit and the applicable state regulations). The boundaries of the current ash basins at the North Carolina stations were not defined as part of the original basin permitting process. Absent a precise regulatory delineation, there have been varying interpretations of the basin boundaries within Duke. For planning purposes, it is reasonable to assume that the working basin boundary is equal to the full pond elevation contour. A specific boundary determination regarding a particular pond will be made by Environmental on a site-specific basis.

Any use of dry stacking in new projects that does not facilitate improved wastewater treatment should be considered only in the short term to provide time to implement other disposal options, and may be approved by Environmental as an exception to this program on a case-by-case basis. Any dry stacking project should include a low permeability cap (i.e., equivalent to two feet of 1×10^{-5} cm/sec material).

In managing ash within the basin, appropriate practices should be employed to control fugitive dust.

Rationale

Moving ash within the full pond contour of the ash basin is considered to be routine management of wastewater residuals and is allowed under the existing NPDES permits, provided that these changes in ash placement within the basin boundary are performed to facilitate wastewater

treatment, not as a disposal option. Placement of ash within the ash basin boundary does not present additional environmental impacts (soil, surface water, and groundwater), whether the ash is placed by wet means (sluicing) or by dry means (stacking).

6.2 South Carolina

6.2.1 Use as a Raw Material

Definition

Use of CCP as a raw material to make a product, such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard

Applicable Regulations

- South Carolina R 61-107 - Solid Waste Management

Program

Ash may be utilized in beneficial products only after a case-by-case determination rendered by the South Carolina Department of Health and Environmental Control (SCDHEC).

Rationale

Use of ash in the production of cementitious material is environmentally acceptable because the binder utilized in the manufacture of the material is considered to be adequate to prevent leaching of chemicals in harmful quantities. However, there is no general provision in South Carolina regulations which permits this (or any other) use. Therefore, beneficial uses of ash may only be pursued after a case-by-case approval is provided by SCDHEC.

6.2.2 Agricultural Applications

Definition

Use of CCP for agricultural benefit

Applicable Regulations

- South Carolina Regulations - R.61-107.15 - Land Application of Solid Waste

Program

Gypsum may be applied to the soil in agronomical amounts in accordance with the required land application permits when net positive revenue is derived. All other applications without net positive revenues must go through internal Environmental review. Other CCP may be used for agricultural purposes in accordance with the applicable regulations with review by Environmental.

Rationale

The land application of synthetic gypsum when applied in agronomic amounts has been determined to have little or no long-term risk when positive revenues are gained from the sale of the synthetic gypsum for agricultural applications. The use of gypsum as a soil amendment in agricultural applications is acceptable when applied to the soil as an amendment for reducing soil erosion, as a nutrient addition, to mitigate acid and sodic soils, and as an additive to fertilizer and

composting materials. These applications provide significant agricultural benefits with minimal risk to human health and the environment.

6.2.3 Disposal in Landfills

Definition

Placement of CCP into a permitted landfill

Applicable Regulations

- South Carolina R.61-107.16 - Industrial Solid Waste Landfills

Program

CCP may be placed in landfills without restrictions other than those provided in the landfill permit and the state solid waste regulations. Generally, new landfills should be designed with BAT or equivalent as defined by state solid waste regulations (e.g., composite liner/leachate collection and surface cap). Exceptions may be considered by Environmental in some limited cases to accommodate facility operational constraints.

Any CCP generated at a Duke facility destined for disposal at an MSWLF must first be reviewed and approved by Environmental. Environmental will conduct an audit of the construction and operating practices of the MSWLF as part of the approval process to protect the company's long-term risk of disposal at a site owned and operated by a third party.

Rationale

Lined landfills are more protective of soil, surface water, and groundwater than unprotected CCP fills. While in some limited cases, the landfill can be permitted without a liner or with the minimum engineering controls to meet current regulation, it is highly recommended that the BAT be applied in the design of all new landfills and expansions of existing ones. Landfills are designed with 3 to 50 years of storage capacity, and long-term, post-closure requirements dictate that these facilities must maintain groundwater protection for an additional 30 years. Installing the best liner and cap designs currently available for non-hazardous waste will provide future operational flexibility, while reducing long-term risk. This flexibility includes the ability to dispose of future ash, which might have very different leachate chemistry than current ash. This flexibility also allows the potential for expanding the waste stream to include other CCP (e.g., FGD material, wastewater treatment sludge) in the future.

6.2.4 Engineered Fills

Definition

A fill or embankment with a projected beneficial end use which is designed and constructed utilizing specified compaction methods

Applicable Regulations

- South Carolina Solid Waste Regulations

Program

Utilization of ash in engineered/structural fills is not currently allowed under South Carolina regulations.

Rationale

There are no general provisions in South Carolina regulations which allow the use of ash in engineered/structural fills. Although on-site fills have been approved in the past, SCDHEC has determined that CCP engineered/structural fills are not currently allowed.

6.2.5 Disposal in Surface Impoundments**Definition**

Wet disposal of CCP by sluicing fly ash, bottom ash, boiler slag and pyrites into surface impoundments commonly known as ash ponds

Applicable Statutes and Regulations

- South Carolina R.61-9 – Water Pollution Control Permits
- South Carolina R.61-68: Water Classifications and Standards
- South Carolina R.61-58 Drinking Water Standards
- Site NPDES Permit

Program

The regulation of active surface impoundments (ash ponds) is under the jurisdiction of the SCDHEC Bureau of Water Quality. The discharge is regulated by the NPDES program. Any placement of CCP into these ash ponds must be in the form of a wastewater. The placement of solid waste into a surface impoundment is prohibited by regulation. The expansion or modification of an existing ash pond to increase capacity cannot be done without state approval. The permits typically have conditions that once the solids or residues are removed from the pond, they must be managed in accordance with all state and federal solid waste regulations.

The construction of a new ash pond, or the horizontal expansion of an existing ash pond, is permissible (with the proper permits), but the facility must conduct an evaluation using the appropriate site selection criteria that considers environmental, social and economic concerns. Before expansion or construction of a new ash pond, the conversion to dry handling with placement in a landfill must be evaluated. This conversion will reduce risk of impact to groundwater quality in the long term.

All new construction or horizontal expansion of an existing ash pond must be constructed using the appropriate engineering controls (e.g., liners) to ensure that the facility does not contribute to an exceedance of groundwater standards.

Once an ash pond or surface impoundment is no longer operational and the NPDES permit is removed, the closure and post-closure activities of the remaining solid waste or CCP are subject to the Bureau of Waste Management requirements. SCDHEC does not have specific requirements for the final closure of an ash pond. Closure of an ash pond or a surface impoundment will be subject to requirements at the regulatory agency's discretion. The owner/operator must provide the agency with a closure plan and a post-closure maintenance/groundwater monitoring plan if clean closure is not conducted. Clean closure is considered to be the complete removal of all solids and residues (CCP) and disposal in a permitted landfill.

Rationale

Current ash ponds or surface impoundments are generally unlined and have a large, constant hydraulic head. As a result, this management practice has a greater potential to impact groundwater than dry handling options. The risk for impact is greatest while in operation when the ash sluicing process provides a continuing supply of sluice water and source material. These impacts can be mitigated through the use of liners that utilize BAT for new or expanded ash ponds or surface impoundments. In addition, once a pond reaches maximum capacity and is no longer in service, decanting and closure by capping in place will further reduce the potential to have an impact on ground water quality.

6.2.5.1 Dry Stacking**Definition**

Placement of sluiced ash by dry means within the ash basin (as defined by the full pond elevation)

Applicable Regulations

- South Carolina Regulations - R.51, R.61-9, R.61-68, R.61-81
- Site NPDES permit

Program

Ash may be managed within the ash basin boundary (as defined by the full pond elevation) without limitation (other than those provided in the NPDES permit and the applicable state regulations). However, appropriate control should be utilized to control fugitive dust. Dry stacking outside the boundary of the ash basin is not permitted.

Rationale

Moving ash within the full pond contour of the ash basin is considered to be routine management of wastewater residuals and is allowed under the existing NPDES permits, provided that these changes in ash placement within the basin boundary are performed to facilitate wastewater treatment, not as a disposal option. Placement of ash within the ash basin boundary does not present additional environmental impacts (soil, surface water, and groundwater), whether the ash is placed by wet means (sluicing) or by dry means (stacking). However, placement of ash outside the ash basin boundary increases the ash footprint, resulting in additional potential impacts to soil, groundwater, and possibly surface water (runoff, erosion, etc.).

6.3 Indiana**6.3.1 Use as a Raw Material****Definition**

Use of CCP as a raw material to make a product, such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard

Applicable Statutes and Regulations

- IC 13-19-3-3 - Prohibited Areas of Regulation

Program

CCP may be utilized as a raw material in the manufacture of a product such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard. These applications have been determined to have little or no long-term risk when positive revenues are gained from the sale of the CCP. All other applications where the CCP is a raw material feed stock without positive revenues should go through internal Environmental review. These uses of a solid waste (CCP) are either exempted from regulation by statute or have received the approval of the commissioner of the Indiana Department of Environmental Management (IDEM). These approvals are based on the Commissioner's determination that the use is a legitimate use and that the legitimate use does not pose a threat to human health and the environment.

Rationale

Use of CCP in the production of cementitious material is environmentally acceptable because the binder utilized in the manufacture of the material is considered to be adequate to prevent leaching of chemicals in harmful quantities.

6.3.2 Agricultural Applications**Definition**

Use of gypsum as a soil amendment for agricultural benefit

Applicable Statutes and Regulations

- 327 IAC 6.1 Land Applications of Biosolids, Industrial Waste Product, and Pollutant-bearing Water.
- IC 13-9-3-3 - Prohibited areas of regulation.
- IC 13-30-2-1 Specific Acts Prohibited.
- 327 IAC 2-11 Ground Water Quality Standards.

Program

All CCP are exempt from solid waste regulations by statute but are required to fully comply with the land application of industrial waste regulations promulgated by the Water Board. All applications must first go through internal review by Environmental, and then the appropriate permits must be obtained from the IDEM. The sale of synthetic gypsum must be accompanied with an MSDS and a User Information Sheet. The use of CCP other than gypsum for land applications in agriculture must go through internal review by Environmental.

Rationale

The land application of synthetic gypsum when applied in agronomic amounts has been determined to have little or no long-term risk when positive revenues are gained from the sale of the synthetic gypsum for agricultural applications. The use of gypsum as a soil amendment in agricultural applications is acceptable when applied to the soil for reducing soil erosion, as a nutrient addition, to mitigate acid and sodic soils, and as an additive to fertilizer and composting materials. These applications provide significant agricultural benefits with minimal risk to human health and the environment. The alkaline nature and neutralizing potential of flyash can improve acidic soils but there is a potential to release trace elements that would be available to plant for uptake.

6.3.3 Disposal in Landfills

Definition

Placement of CCP into a permitted landfill

Applicable Regulations

- 329 IAC Article 10 Solid Waste Disposal

Program

All CCP may be placed in permitted Restricted Waste (RW) Type I landfills without restrictions other than those provided in the landfill permit and the state solid waste regulations. CCP placed in permitted RW Type II through IV landfills must first undergo waste characterization and receive IDEM approval before placement in the landfill. All new RW landfills or RW landfill expansion locations must be selected based on an evaluation matrix using the appropriate site selection criteria that considers environmental, social and economic concerns. Generally, new landfills should be designed with BAT or equivalent as defined by state solid waste regulations (e.g., composite liner/leachate collection and surface cap). Exceptions may be considered by Environmental in some limited cases to accommodate facility operational constraints.

Any CCP generated at a Duke facility destined for disposal at an MSWLF must first be reviewed and approved by Environmental. Environmental will conduct an audit of the construction and operating practices of the MSWLF as part of the approval process to protect the company's long-term risk of disposal at a site owned and operated by a third party.

Rationale

Lined landfills are more protective of soil, surface water, and groundwater than unlined CCP fills. While in some limited cases the landfill can, with delays and some difficulty, be permitted without a liner or with the minimum engineering controls to meet current regulation, it is highly recommended that the BAT be applied in the design of all new landfills and expansions of existing ones. Landfills are designed with 3 to 50 years of storage capacity, and long-term, post-closure requirements will mean these facilities must maintain groundwater protection for an additional 30 years. Installing the best liner and cap designs currently available for non-hazardous waste will provide future operational flexibility, while reducing long-term risk. This flexibility includes the ability to dispose of future ash, which might have very different leachate chemistry than current ash. This flexibility also allows the potential for expanding the waste stream to include other CCP (e.g., FGD material, wastewater sludge) in the future.

6.3.4 Engineered Fills

Definition

A fill or embankment with a projected beneficial end use which is designed and constructed utilizing specified compaction methods. An engineered fill will also include road base applications.

Applicable Statutes and Regulations

- IC 13-19-3-3 - Prohibited areas of regulation
- IC 13-30-2-1 Specific Acts Prohibited
- 329 IAC 10-2-183 "Structural Fill" defined

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- 329 IAC 10-3-1 (16) Exclusions; general
- 327 IAC 2-11 Groundwater Quality Standards

Program

The use of CCP in engineered fills on-site or off-site must have a beneficial end use as defined in the applicable statute or regulations. Before any fill project is initiated, it must be reviewed and approved by Environmental. In addition, any reuse applications not specifically exempted by IC-13-19-3-3 must also receive pre-approval from the IDEM before the start of the project. The site-specific environmental assessment may include CCP leachate testing, site soil evaluation, infiltration cap design review, groundwater modeling, comparison to soil cleanup standards, wetlands assessment, surface water evaluation, rare and endangered species review, archaeological assessment, and regulatory status review. Present and future land use will also be considered in the assessment. To facilitate this site-specific assessment, it is necessary to define the proposed project in substantial detail prior to initiating the Environmental review.

Rationale

The reuse of CCP as a raw material feed in the production of cementitious products is environmentally acceptable; however, if CCP is placed on the land replacing a natural resource, additional steps must be taken to ensure protection of human health and the environment.

Varying site conditions and ash chemistry necessitate a site-specific assessment of all fill projects. All engineered fill projects shall be engineered and constructed to ensure that the CCP is effectively capped in a timely manner. This will limit the volume of water which percolates through the ash significantly reducing the potential to impact groundwater. Therefore, infiltration into engineered fills must be minimized by the rapid placement of an effective surface cap.

Use of bottom ash as a base in roadway construction is acceptable because the finish pavement provides an effective cap over the ash. In addition, the road base thickness is typically less than two feet. Also, bottom ash does not generally leach contaminants in concentrations sufficient to cause groundwater contamination.

6.3.5 Disposal in Surface Impoundments**Definition**

Wet disposal of CCP is defined as sluicing flyash, bottom ash, boiler slag and pyrites into a surface impoundment commonly known as an ash pond

Applicable Regulations

- 327 IAC Article 15 NPDES General Permit by Rule Program
- EPA Region V Ten States Construction Standards for New Ponds
- 329 IAC 10-2 -173 "Solid waste" defined
- 329 IAC 10-2-185 "Surface Impoundment" defined
- 329 IAC 10-3-1 (8), (9), (10) Exclusions; General
 - This regulation exempts the operation of the ash ponds from the solid waste regulations except during closure and when solids or combustion residues are removed from the ponds.

Program

The regulation of active surface impoundments (ash ponds) is under the jurisdiction of the Office of Water Quality. The discharge is regulated by the NPDES program. Any placement of coal combustion products into these ash ponds must be in the form of a wastewater. The dry placement of CCP into a surface impoundment is prohibited by regulation, unless CCP is placed for beneficial purposes such as dike construction or berm repair. The expansion of existing impoundments to increase capacity can be done without state approval, as long as the base footprint is not expanded and the outfall is not changed or modified. The NPDES permits all have conditions that once the solids or residues are removed from the pond, they must be managed in accordance with all state and federal solid waste regulations.

Before the construction of new or expanded ash ponds or impoundments can be approved internally, conversion to dry handling must be evaluated utilizing appropriate site selection criteria that consider environmental, social and economic concerns. Construction of new ponds or impoundments or the horizontal expansion of an existing ash pond or impoundment must be constructed using BAT to ensure compliance with the state groundwater quality standards.

Once an ash pond or surface impoundment is no longer operational and the NPDES permit is terminated, the closure and post-closure activities of the remaining solid waste or CCP are subject to the Office of Land Quality requirements. IDEM does not have specific requirements for the final closure of an ash pond. Therefore, closure of an ash pond or a surface impoundment will be subject to requirements at the regulatory agency's discretion. The owner/operator must provide the agency with a closure plan and a post-closure maintenance/groundwater monitoring plan if clean closure is not conducted. Clean closure is considered the complete removal of all solids and residues (CCP) and disposal in a permitted landfill. Facilities that are closed-loop and do not have NPDES permits associated with the operation of the ponds would follow the same process for closure and post-closure.

Rationale

Current ash ponds or surface impoundments are generally unlined and have a large, constant hydraulic head. As a result, this management practice has a greater potential to impact groundwater than dry handling options. The risk for impact is greatest while in operation when the ash sluicing process provides a continuing supply of sluice water and source material. These impacts can be mitigated through the use of liners that utilize BAT for new or expanded ash ponds or surface impoundments. In addition, once a pond reaches maximum capacity and is no longer in service, decanting and closure by capping in place will further reduce the potential to have an impact on ground water quality.

6.4 Ohio**6.4.1 Use as a Raw Material****Definition**

Use of CCP as a raw material to make a product, such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard

Applicable Statutes and Regulations

- Ohio EPA has rescinded the beneficial use policy, and there are no current mechanisms to approve a project not specifically defined above, except by project specific internal review, application submittal to Ohio EPA, and receipt of permit to install.
- Ohio State Statute 6111.03 Powers of director of environmental protection.
Note: This is the generic statute that prohibits any industrial activity (beneficial reuse of CCP) from creating an impact that would exceed the state groundwater quality standards.
- Currently, Ohio EPA regulates all CCP excluding FGD solids under the Surface Water Regulations. Non-Toxic CCP are defined as those CCP with leachate concentrations less than 30 times the drinking water Maximum Contamination Levels (MCL). FGD solids are regulated under the Solid Waste Program and are classified as Residual Wastes.

Program

These applications have been determined to have little or no long-term risk when positive revenues are gained from the sale of the CCP. All other applications not listed above where the CCP is a raw material feed stock without positive revenues should go through internal Environmental review. Other projects will have to be submitted, reviewed, and approved by the Ohio EPA Division of Surface Water. Due to the proximity of the plants to the states of Kentucky and Indiana, CCP shipped to those states for beneficial reuse must follow the guidance and policies for those states.

Rationale

Use of CCP in the production of cementitious material is environmentally acceptable because the binder utilized in the manufacture of the material is considered to be adequate to prevent leaching of chemicals in harmful quantities.

6.4.2 Agricultural Applications**Definition**

Use of CCP for agricultural benefit

Applicable Statutes and Regulations

- Ohio EPA has rescinded the beneficial use policy. There are no current mechanisms to approve these reuse applications.
- Ohio State Statute 6111.03 Powers of Director of Environmental Protection.
Note: This is the generic statute that prohibits any industrial activity (beneficial reuse of CCP) from creating an impact that would exceed the state groundwater quality standards.

Program

All agricultural applications must first go through internal review by Environmental, and then the appropriate permits must be obtained from the Ohio EPA. The sale of synthetic gypsum must be accompanied with an MSDS and a User Information Sheet. The use of CCP other than gypsum for land applications in agriculture must go through internal review by Environmental.

Rationale

The land application of synthetic gypsum when applied in agronomic amounts has been determined to have little or no long-term risk when positive revenues are gained from the sale of the synthetic gypsum for agricultural applications. The use of gypsum as a soil amendment in agricultural applications is acceptable when applied to the soil for reducing soil erosion, as a nutrient addition, to mitigate acid and sodic soils, and as an additive to fertilizer and composting materials. These applications provide significant agricultural benefits with minimal risk to human health and the environment. The alkaline nature and neutralizing potential of flyash can improve acidic soils but this there is a potential to release trace elements that would be available to plant for uptake.

6.4.3 Disposal in Landfills**Definition**

Placement of CCP into a permitted landfill

Applicable Regulations

- Ohio Administrative Code 3745 -30 Residual Waste Disposal

Program

CCP may be placed in landfills without restrictions other than those provided in the landfill permit and the state solid waste regulations. Generally, new landfills should be designed with BAT or equivalent as defined by state solid waste regulations (e.g., composite liner/leachate collection and surface cap). Exceptions which are regulatory compliant but less stringent may be considered by Environmental given facility operational constraints, projected facility life, and financial considerations.

Any CCP generated at a Duke facility destined for disposal at an MSWLF must first be reviewed and approved by Environmental. Environmental will conduct an audit of the construction and operating practices of the MSWLF as part of the approval process to protect the company's long-term risk of disposal at a site owned and operated by a third party.

Rationale

Lined landfills are more protective of soil, surface water, and groundwater than unlined CCP fills. While, in some limited cases, the landfill can, with delays and some difficulty, be permitted without a liner or with the minimum engineering controls to meet current regulation, it is highly recommended that the BAT be applied in the design of all new landfills and expansions of existing ones. Landfills are often designed with 3 to 50 years of storage capacity, and long-term post-closure requirements will mean these facilities must ensure groundwater protection for an additional 30 years. Installing the best liner and cap designs currently available for non-hazardous waste will provide future operational flexibility while reducing long-term liability. This flexibility includes the ability to dispose of future ash which might have very different leachate chemistry than current ash. This flexibility also allows the potential for expanding the waste stream to include other CCP (e.g., FGD material, wastewater sludge) in the future.

6.4.4 Engineered Fills

Definition

A fill or embankment with a projected beneficial end use which is designed and constructed utilizing specified compaction methods. An engineered fill will also include road base applications.

Applicable Statutes and Regulations

- Ohio EPA has rescinded the beneficial use policy and there are not current mechanisms to approve a project except by project specific internal review, application submittal to Ohio EPA, and receipt of permit to install.
- Ohio State Statute 6111.03 Powers of director of environmental protection.

Note: This is the generic statute that prohibits any industrial activity (beneficial reuse of CCP) from creating an impact that would exceed the state groundwater quality standards.

Program

The use of CCP in engineered fills on-site or off-site must have a beneficial end use as defined in regulations. Before any fill project is initiated, it must be reviewed and approved by Environmental and then submitted to Ohio EPA for approval. The site-specific environmental assessment may include CCP leachate testing, site soil evaluation, infiltration cap design review, groundwater modeling, comparison to soil cleanup standards, wetlands assessment, surface water evaluation, rare and endangered species review, archaeological assessment, and regulatory status review. Present and future land use will also be considered in the assessment. To facilitate this site-specific assessment, it is necessary to define the proposed project in substantial detail prior to initiating the Environmental review.

Rationale

The reuse of CCP as a raw material feed in the production of cementitious products is environmentally acceptable; however, if CCP is placed on the land replacing a natural resource, additional steps must be taken to ensure protection of human health and the environment.

Varying site conditions and ash chemistry necessitate a site-specific assessment of all fill projects. All engineered fill projects shall be engineered and constructed to ensure that the CCP is effectively capped in a timely manner. This will limit the volume of water which percolates through the ash significantly reducing the potential to impact groundwater. Therefore, infiltration into engineered fills must be minimized by the rapid placement of an effective surface cap.

Use of bottom ash as a base in roadway construction is acceptable because the finish pavement provides an effective cap over the ash. In addition, the road base thickness is typically less than two feet. Also, bottom ash does not generally leach contaminants in concentrations sufficient to cause groundwater contamination.

6.4.5 Disposal in Surface Impoundments

Definition

Wet disposal of CCP is defined as sluicing flyash, bottom ash, boiler slag and pyrites into a surface impoundment commonly known as an ash pond.

Applicable Regulations

- Ohio R1501 Chapter 21 Division of Water
 - This is the regulation of dikes, dams, and levees
- Ohio Administrative Code 3745 – 042 Wastewater Permit to Install

Program

The regulation of active surface impoundment (ash ponds) is under the jurisdiction of the Division of Water. The discharge is regulated by the NPDES program. Any placement of coal combustion products into these ash ponds must be in the form of a wastewater unless specifically approved by Ohio EPA. The expansion or modification of the existing impoundments to increase capacity cannot be done without state approval. The NPDES permits all have conditions that once the solids or residues are removed from the pond, they must be managed in accordance with all state and federal solid waste regulations.

Before construction of a new ash pond or the expansion of the footprint of an existing ash pond can be approved internally, an evaluation using the appropriate site selection criteria that considers environmental, social and economic concerns must be conducted. As part of that evaluation, the conversion to dry handling and placement in a landfill must be considered. Construction of new ponds or impoundments, or the horizontal expansion of an existing ash pond or impoundment must be constructed using BAT to ensure compliance with the state groundwater quality standards.

Once an ash pond or surface impoundment is no longer operational and the NPDES permit is terminated, the closure and post-closure activities of the remaining solid waste or CCP is subject to the Division of Surface Water requirements. Ohio EPA does not have specific requirements for the final closure of an ash pond. Closure of an ash pond or a surface impoundment will be subject to requirements at the regulatory agency's discretion. This is accomplished by filing a "permit to install" application. The owner/operator must provide the agency with a closure plan and a post-closure maintenance/groundwater monitoring plan if clean closure is not conducted. Clean closure is considered the complete removal of all solids and residues (CCP) and disposal in a permitted landfill.

Rationale

Current ash ponds or surface impoundments are generally unlined and have a large, constant hydraulic head. As a result, this management practice has a greater potential to impact groundwater than dry handling options. The risk for impact is greatest while in operation when the ash sluicing process provides a continuing supply of sluice water and source material. These impacts can be mitigated through the use of liners that utilize BAT for new or expanded ash ponds or surface impoundments. In addition, once a pond reaches maximum capacity and is no longer in service, decanting and closure by capping in place will further reduce the potential to have an impact on ground water quality.

6.5 Kentucky

6.5.1 Use as a Raw Material

Definition

Use of CCP as a raw material to make a product such as ready-mix concrete, Portland cement, concrete block, paving material, or wallboard.

Applicable Regulations in the Kentucky Administrative Code

- 401 KAR 45:070 Special waste registered permit - by - rule

Program

CCP may be reused in ready mix concrete, production of Portland cement, flowable fill, as a lightweight aggregate in block or brick, and to manufacture wallboard without prior internal review or approval. These applications have been determined to have minimal risk when positive revenues are gained from the sale of the CCP. All other applications where the CCP is a raw material feedstock without positive revenues should go through internal Environmental review.

Rationale

Use of CCP in the production of cementitious material is acceptable because the binder utilized in the manufacture of the material is considered to be adequate to prevent leaching of chemicals in harmful quantities. Use of ash in the production of other materials may also be acceptable; however, the specifics of those uses would need to be analyzed on a case-by-case basis to ensure their acceptability.

6.5.2 Agricultural Applications

Definition

Use of CCP for agricultural benefit

Applicable Regulations

- 401 KAR 45 Subchapter 100 Landfarming and composting of special waste

Program

Gypsum may be applied to the soil in agronomical amounts in accordance with the required land application permits when net positive revenue is derived. All other applications without net positive revenues must go through internal Environmental review. Other CCP may be used for agricultural purposes in accordance with the applicable regulations with review by Environmental.

Rationale

The land application of synthetic gypsum when applied in agronomic amounts has been determined to have little or no long-term risk when positive revenues are gained from the sale of the synthetic gypsum for agricultural applications. The use of gypsum as a soil amendment in agricultural applications is acceptable when applied to the soil to reduce soil erosion, as a

nutrient addition, to mitigate acid and sodic soils, and as an additive to fertilizer and composting materials. These applications provide significant agricultural benefits with minimal risk to human health and the environment.

6.5.3 Disposal in Landfills

Definition

Placement of CCP into a permitted landfill

Applicable Regulations

- 401 KAR 45 Special Waste
- 401 KAR 47 Solid Waste Facilities
- 401 KAR 48 Standards for Solid Waste Facilities

Program

All CCP may be placed in permitted Special Waste landfills without restrictions, other than those provided in the landfill permit and the state solid waste regulations. Generally, new landfills shall be designed with BAT or equivalent as defined by state solid waste regulations (e.g., composite liner/leachate collection and surface cap). Exceptions may be considered by Environmental in some limited cases to accommodate facility operational constraints, projected facility life, and financial considerations. All new SW landfills or SW landfill expansion locations must be selected based on an evaluation matrix using the appropriate site selection criteria that consider environmental, social and economic concerns.

Any CCP generated at a Duke facility destined for disposal at a MSWLF must first be reviewed and approved by Environmental. Environmental will conduct an audit of the construction and operating practices of the MSWLF as part of the approval process to protect the company's long-term risk of disposal at a site owned and operated by a third party.

Rationale

Lined landfills are more protective of soil, surface water, and groundwater. While in some limited cases the landfill can, with delays and some difficulty, be permitted without a liner or with the minimum engineering controls to meet current regulation, it is highly recommended that the BAT be applied in the design of all new landfills and expansions of existing ones. Landfills are designed with 3 to 50 years of storage capacity and long-term, post-closure requirements will mean these facilities must maintain groundwater protection for an additional 30 years. Installing the best liner and cap designs currently available for non-hazardous waste will provide future operational flexibility while reducing long-term risk. This flexibility includes the ability to dispose of future ash which might have very different leachate chemistry than current ash. This flexibility also allows the potential for expanding the waste stream to include other combustion by-products (e.g., FGD material, wastewater sludge) in the future.

6.5.4 Engineered Fills

Definition

A fill or embankment with a projected beneficial end use which is designed and constructed utilizing specified compaction methods. An engineered fill will also include road base applications.

Applicable Regulations

- 401 KAR 45:060 Special waste permit-by-rule

Program

The use of CCP in engineered fills on-site or off-site must have a beneficial end use as defined in the applicable regulations and permits. Before any fill project is initiated, it must be reviewed and approved by Environmental. A site-specific environmental assessment must be performed which may include CCP leachate testing, site soil evaluation, infiltration cap design review, groundwater modeling, comparison to soil cleanup standards, wetlands assessment, surface water evaluation, rare and endangered species review, archaeological assessment, and regulatory status review. Present and future land use will also be considered in the assessment. To facilitate this site-specific assessment, it is necessary to define the proposed project in substantial detail prior to initiating the Environmental review.

Rationale

The reuse of CCP as a raw material feed in the production of cementitious products is environmentally acceptable; however, if CCP is placed on the land replacing a natural resource, additional steps must be taken to ensure protection of human health and the environment.

Varying site conditions and ash chemistry necessitate a site-specific assessment of all fill projects. All engineered fill projects shall be engineered and constructed to ensure that the CCP is effectively capped in a timely manner. This will limit the volume of water which percolates through the ash significantly reducing the potential to impact groundwater. Therefore, infiltration into engineered fills must be minimized by the rapid placement of an effective surface cap.

Use of bottom ash as a base in roadway construction is acceptable because the finish pavement provides an effective cap over the ash. In addition, the road base thickness is typically less than two feet. Also, bottom ash does not generally leach contaminants in concentrations sufficient to cause groundwater contamination.

6.5.5 Disposal in Surface Impoundments**Definition**

Wet disposal of CCP is defined as sluicing flyash, bottom ash, boiler slag and pyrites into surface impoundments commonly known as ash ponds

Applicable Regulations

- 401 KAR 5 Water Quality
- 401 KAR 45 Special Waste

Program

The regulation of active surface impoundments (ash ponds) is under the jurisdiction of the Division of Water. The discharge is regulated by the NPDES program. The expansion or modification of the existing impoundments to increase capacity cannot be done without state approval. The NPDES permits all have conditions that once the solids or residues are removed

- Doc. Ex. 3925 -

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Mar 29 2018

from the pond, they must be managed in accordance with all state and federal solid waste regulations.

Before the construction of a new ash pond or the expansion of the footprint of an existing ash pond can be approved internally, an evaluation using the appropriate site selection criteria that considers environmental, social and economic concerns must be conducted. As part of that evaluation, the conversion to dry handling and placement in a landfill must be considered. This will reduce the risk of impact to groundwater quality in the long term. Construction of new ponds or impoundments, or the horizontal expansion of an existing ash pond or impoundment must be constructed using BAT to ensure compliance with the state groundwater quality standards.

Once an ash pond or surface impoundment is no longer operational and the NDPES permit is terminated, the closure and post-closure activities of the remaining solid waste or CCP are subject to the Division of Waste Management requirements. KDEP does not have specific requirements for the final closure of an ash pond. Closure of an ash pond or a surface impoundment will be subject to requirements at the regulatory agency's discretion. The owner/operator must provide the agency with a closure plan and a post-closure maintenance/groundwater monitoring plan if clean closure is not conducted. Clean closure is considered the complete removal of all solids and residues (CCP) and disposal in a permitted landfill.

Rationale

Current ash ponds or surface impoundments are generally unlined and have a large, constant hydraulic head. As a result, this management practice has a greater potential to impact groundwater than dry handling options. The risk for impact is greatest while in operation when the ash sluicing process provides a continuing supply of sluice water and source material. These impacts can be mitigated through the use of liners that utilize BAT for new or expanded ash ponds or surface impoundments. In addition, once a pond reaches maximum capacity and is no longer in service, decanting and closure by capping in place will further reduce the potential to have an impact on ground water quality.