

PLACE: Held via Videoconference

DATE: Thursday, September 17, 2020

TIME: 10:00 A.M. - 1:24 P.M.

DOCKET NO.: E-7, Sub 1214

E-7, Sub 1213

E-7, Sub 1187

BEFORE: Chair Charlotte A. Mitchell, Presiding

Commissioner Tolola D. Brown-Blair

Commissioner Lyons Gray

Commissioner Daniel G. Clodfelter

Commissioner Kimberly W. Duffley

Commissioner Jeffrey A. Hughes

Commissioner Floyd B. McKissick, Jr.

IN THE MATTER OF:

DOCKET NO. E-7, SUB 1214

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

DOCKET NO. E-7, SUB 1213

Petition of Duke Energy Carolinas, LLC,
for Approval of Prepaid Advantage Program

DOCKET NO. E-7, SUB 1187

Application of Duke Energy Carolinas, 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 27

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T A B L E O F C O N T E N T S
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P R O C E E D I N G S

CHAIR MITCHELL: All right. Good morning, everyone. It's 10:00. Let's go on the record, please. Before we get started this morning, I just want to announce an order was issued yesterday afternoon in E-2, Sub 1219 setting the DEP hearing to begin on September 29th at 9:00 in the morning. Just want to make sure you-all are aware that that scheduling order has been issued. So we begin DEP September 29th, which is a Tuesday, at 9:00 in the morning. All right.

Any motions or preliminary items from counsel before we begin?

MR. ROBINSON: Chair Mitchell, Camal Robinson. Yes, I have a few things.

CHAIR MITCHELL: All right, Mr. Robinson.

MR. ROBINSON: Sure. So first I wanted to provide a status update on our outstanding late-filed exhibits for the record. So late-filed Exhibits Numbers 1 and 2, I believe, which are the scenarios that Commissioners Duffley and Clodfelter requested asking for the impact on the Company's revenue requirement if EDIT was used to offset the

1 Company's CCR compliance costs as one scenario, and
2 the accelerated depreciation of coal plants as the
3 second scenario.

4 On September 9th, the Public Staff and
5 the Company filed a request for clarification with
6 the Commission to ensure we included the right and
7 correct assumptions in those scenarios. Once we
8 receive that clarification, we will complete that
9 exercise.

10 CHAIR MITCHELL: All right. Thank you,
11 Mr. Robinson.

12 MR. ROBINSON: Sure. Late-filed Exhibit
13 Number 6, which was, Chair Mitchell, your request
14 for the ARO journal entries. We are working on
15 that now, and we anticipate filing that by early
16 next week.

17 CHAIR MITCHELL: All right. Sounds
18 good, Mr. Robinson.

19 MR. ROBINSON: Late-filed Exhibit
20 Number 7, which was Commissioner Brown-Blair's
21 request yesterday for the list of current employees
22 that witness Bednarcik spoke with as she prepared
23 to testify in this case, we are in the process of
24 pulling that together, and we will provide that as

1 soon as it's available.

2 CHAIR MITCHELL: Okay.

3 MR. ROBINSON: And late-filed Exhibit
4 Number 8, which was Commissioner Clodfelter's
5 request yesterday for a record of coal ash-related
6 documents. We understand that we are waiting on a
7 written request from the Commission on this, which
8 we understand will be forthcoming.

9 CHAIR MITCHELL: All right.

10 MR. ROBINSON: And based on our records,
11 I think all other late-filed exhibits have been
12 already provided. So if that is inconsistent with
13 your records, please let us know.

14 CHAIR MITCHELL: That is consistent with
15 my records, Mr. Robinson.

16 MR. ROBINSON: Thank you. Next thing,
17 so as of now, Chair Mitchell, the witness panel
18 coming on next are the last witnesses the Company
19 intends to present in the DEC case. However, as we
20 have not moved to excuse Ms. Jane McManeus, our
21 revenue requirement witness who previously
22 testified on a few occasions in the hearing, I
23 wanted to check with you, Chair, and the
24 Commissioners to see if there were any outstanding

1 questions that you may have for her since she last
2 testified for which you would like her to reappear
3 and testify to today. If that is the case,
4 Ms. McManeus is available today and ready and
5 willing to testify to those matters; if not, then
6 we will move to excuse her.

7 CHAIR MITCHELL: All right. Well,
8 Mr. Robinson, let me consult with my colleagues and
9 the Commission staff, and I will let you know when
10 we return from our morning break.

11 MR. ROBINSON: Thank you. And then last
12 thing, at this time, Chair Mitchell, the Company
13 would move to excuse Mr. Steven De May.

14 CHAIR MITCHELL: All right. Hearing no
15 objection from any party to your motion to excuse
16 Mr. De May, I will allow your motion. Mr. De May
17 may be excused.

18 MR. ROBINSON: Thank you,
19 Chair Mitchell. That's all I have.

20 CHAIR MITCHELL: All right. Any
21 additional preliminary matters for my
22 consideration?

23 (No response.)

24 CHAIR MITCHELL: All right. Hearing

1 none, Mr. Marzo, you may proceed. Call your
2 witnesses.

3 MR. MARZO: Thank you, Chair Mitchell.
4 We would call -- Duke Energy Carolinas would call
5 Jim Wells and Marcia Williams to the stand.

6 CHAIR MITCHELL: All right. Mr. Wells,
7 Ms. Williams. Ms. Williams, thank you for joining
8 us so early in the morning. I know it's early out
9 where you are.

10 Whereupon,

11 JAMES WELLS AND MARCIA E. WILLIAMS,
12 having first been duly affirmed, were examined
13 and testified as follows:

14 CHAIR MITCHELL: All right. Thank you.
15 Mr. Marzo, you may proceed.

16 MR. MARZO: Thank you, Chair Mitchell.
17 DIRECT EXAMINATION BY MR. MARZO:

18 Q. Mr. Wells, would you please state your name
19 and your business address for the record?

20 A. (James Wells) Jim Wells. 526 South Church
21 Street, that's Charlotte, North Carolina.

22 Q. And by whom are you employed and in what
23 capacity?

24 A. Duke Energy Business Services, vice president

1 EHS programs and environmental sciences.

2 Q. Thank you, Mr. Wells. And, Mr. Wells, on
3 March 4, 2020, did you cause to be prefiled in this
4 case, rebuttal testimony consisting of 52 pages?

5 A. I did.

6 Q. Do you have any changes or corrections to
7 your prefiled rebuttal testimony?

8 A. No changes.

9 Q. Okay. If I asked you the same questions
10 today, would your answers be the same?

11 A. They would.

12 Q. Do you also have caused to be prefiled in
13 this rebuttal testimony, Wells Rebuttal Exhibits 1 and
14 2 to your rebuttal testimony?

15 A. I did.

16 Q. Do you have any changes or corrections to
17 your prefiled rebuttal exhibits?

18 A. I do not.

19 MR. MARZO: Chair Mitchell, at this
20 time, I'd move that Mr. Wells' prefiled testimony,
21 his rebuttal testimony, be entered into the record
22 as if given orally from the stand, and that
23 Mr. Wells' Rebuttal Exhibits 1 and 2 be premarked
24 for identification.

1 CHAIR MITCHELL: All right. Mr. Marzo,
2 hearing no objection to your motion, Mr. Wells'
3 prefiled rebuttal testimony will be copied into the
4 record as if given orally from the stand. The two
5 exhibits to that prefiled testimony will be marked
6 for identification as they were when prefiled.

7 MR. MARZO: Thank you, Chair Mitchell.

8 (Wells Rebuttal Exhibits 1 and 2 were
9 identified as they were marked when
10 prefiled.)

11 (Whereupon, the prefiled rebuttal
12 testimony of James Wells was copied into
13 the record as if given orally from the
14 stand.)
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I. INTRODUCTION

Q. PLEASE STATE YOUR NAME, OCCUPATION, TITLE, AND BUSINESS ADDRESS.

A. My name is James Wells. My business address is 526 South Church Street, Charlotte, North Carolina 28202. I am employed by Duke Energy Business Services, LLC, and my current title is Vice President – Environmental Health and Safety (“EHS”), Programs and Environmental Sciences. I have held this position since 2018.

Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS REBUTTAL TESTIMONY?

A. I am submitting this rebuttal testimony on behalf of Duke Energy Carolinas, LLC (“DE Carolinas,” or the “Company”).

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I have a B.S. in Technology from Regents College at the University of the State of New York, an M.S. in Nuclear Engineering from the University of Cincinnati, and a J.D. from the Salmon P. Chase College of Law at Northern Kentucky University. Following law school, I clerked for the Honorable William O. Bertelsman, Senior Judge, Federal District Court, Eastern District of Kentucky. I then worked as an environmental lawyer in a Cincinnati law firm providing compliance counseling and legal representation to industrial and commercial clients, and later served as in-house environmental counsel for the General Electric Company. I left General Electric and came to Duke Energy in

1 2009 as an Environmental Health and Safety attorney. I transferred from the
2 legal department to EHS in 2015 as Vice President, EHS Coal Combustion
3 Products, then to my current role in 2018. Prior to entering the legal profession,
4 I attended Navy Nuclear Power School and served as a reactor operator in the
5 U.S. Navy's nuclear submarine service. I also worked in various technical
6 capacities for Westinghouse and later Fluor Daniel at the Fernald
7 Environmental Management Project, a former feed material production facility
8 in the U.S. Department of Energy's nuclear weapons complex.

9 **Q. PLEASE DISCUSS THE PURPOSE OF YOUR TESTIMONY.**

10 A. The purpose of my rebuttal testimony is to address several issues raised by the
11 testimony of Public Staff witness Charles M. Junis ("Junis"), Sierra Club
12 Witness Mark Quarles ("Quarles"), and Attorney General Office ("AGO")
13 witness Steven C. Hart ("Hart"). More specifically, my testimony is intended
14 to rebut allegations by these witnesses related to the Company's compliance
15 with industry standards and environmental laws pertaining to the management
16 of coal combustion residuals ("CCR").

17 **Q. ARE YOU SPONSORING ANY EXHIBITS WITH YOUR REBUTTAL**
18 **TESTIMONY?**

19 A. Yes. I am sponsoring the following exhibits, which were prepared at my
20 direction and under my supervision:

21 **Wells Rebuttal Exhibit 1** – Public Staff Responses to DE Carolinas'
22 Data Requests; and

23 **Wells Rebuttal Exhibit 2** – Attorney General's Office Responses to
24 DE Carolinas' Data Requests.

1 **Q. WERE EXHIBITS 1 AND 2 PREPARED OR PROVIDED HEREIN BY**
2 **YOU, UNDER YOUR DIRECTION AND SUPERVISION?**

3 A. Yes.

4 **Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.**

5 A. With respect to the Company's compliance with industry and environmental
6 standards for CCR management, the testimonies of witnesses Junis, Quarles,
7 and Hart raise contested issues that were decided by the North Carolina Utilities
8 Commission ("Commission") in Docket No. E-7, Sub 1146.¹ Therefore, my
9 rebuttal testimony largely mirrors my rebuttal testimony filed in the Company's
10 2017 Rate Case in Docket No. E-7, Sub 1146 ("2017 Rate Case"), as described
11 below.

12 My rebuttal testimony is organized into three primary sections:

13 • First, I will begin by summarizing the recent orders that were
14 issued by this Commission relating to the recovery of CCR costs.
15 Specifically, I will discuss the Commission's rejection of the Public
16 Staff's theory that "culpability" for environmental violations and other
17 acts or omissions, for example the existence of seeps and groundwater

¹ Testimony of Charles M. Junis, Docket No. E-7, Sub 1214, at 12, 31, 37, 43 (February 18, 2020) (incorporating by reference the Public Staff's testimony and exhibits in the Company's last case regarding (1) the development of state and federal regulations applicable to CCR management; (2) the legal actions filed against the Company for its management of coal ash, (3) historic academic, industry, regulatory, and utility documents, (4) what the Public Staff knew of the Company's environmental compliance up to the date of witness Junis' testimony in the Company's 2017 Rate Case).

1 exceedances, justifies an “equitable sharing” disallowance of CCR
2 costs.²

3 Like Mr. Junis, the AGO and Sierra Club offered the testimony
4 of Hart and Quarles, respectively, to criticize the Company’s past CCR
5 management practices. However, no intervenor witness, including Mr.
6 Junis, could identify any specific imprudently incurred CCR cost that
7 was incurred due to any alleged mismanagement by the Company. (*See*
8 *Junis Direct T.*, at 65:12-3 (“quantification of costs directly resulting
9 from the acts or omissions would be speculative”) (E-7, Sub 1214)). My
10 testimony will show that the Commission has consistently found that
11 the hindsight criticisms that are being directed at the Company, without
12 any connection to discrete and identifiable imprudent costs, are not
13 bases for findings of imprudence.

14 • The second part of my testimony will respond to intervenors’
15 allegations that DE Carolinas failed to take, or should have taken,
16 different actions with respect to its historical management of CCR.

17 I will also explain how intervenors are improperly attempting to
18 supplant the expertise and judgment of DE Carolinas’ state
19 environmental regulators, the North Carolina Department of
20 Environmental Quality (“DEQ”) and the South Carolina Department of

² The Public Staff most recently proposed equitable sharing of CCR costs in Dominion Energy North Carolina’s (“DENC”) 2019 rate case, Docket No. E-22, Sub 562 (“DENC 2019 Rate Case”). In DENC’s 2019 Rate Case, the Public Staff relied on the testimony of Public Staff witness Junis that was submitted in DE Carolinas’ 2017 rate case.

1 Health and Environmental Control (“DHEC”). Intervenors’ positions,
2 if accepted by the Commission, would invade the authority of the
3 Company’s environmental regulators and promote inefficiency and
4 inconsistency within the utility industry. The Public Staff’s positions
5 are especially problematic because the Public Staff has consistently
6 acknowledged that it is not an environmental regulator. Nevertheless,
7 Mr. Junis replaces DEQ’s and DHEC’s judgment and decisions,
8 spanning four decades, with his own.

9 • Third, my testimony will rebut Mr. Junis’ contention that
10 impacts to groundwater and the existence of seeps in the vicinity of the
11 Company’s ash basins are an indicator of culpability and
12 mismanagement. Like I demonstrated in the Company’s 2017 Rate
13 Case, my testimony will show that impacts to groundwater and seeps
14 were expected and known by federal and state environmental regulators
15 at these sites for decades, and regulators continued to permit the
16 Company to operate these basins under existing regulations. I will also
17 explain that under DEQ’s past policy and now CAMA, the North
18 Carolina groundwater rules as applied to ash basins are intended to
19 ensure corrective action where groundwater impacts are detected; they
20 are not intended to be punitive unless the permittee fails to cooperate
21 with the DEQ to determine appropriate actions. Throughout its history
22 of CCR management, the Company has worked in lock-step with its
23 regulators to site, construct, and operate ash basins in compliance with

1 industry and regulatory standards. When deemed necessary to address
2 environmental conditions at its sites, the Company coordinated with
3 regulators to develop a remedial response, including further
4 groundwater monitoring and assessment. DE Carolinas also
5 participated in voluntary efforts to help the industry and its regulators
6 better understand the potential impacts of ash basins on the
7 environment. These actions are affirmative evidence of prudence, as
8 affirmed by the DE Carolinas' 2017 Rate Case Order.³

9 • Fourth, I will respond to Mr. Junis' testimony alleging that DE
10 Carolinas has caused significant new violations of North Carolina's
11 groundwater standards since its 2017 Rate Case, which I believe to be
12 misleading. My testimony will demonstrate that data Mr. Junis cites
13 represents further assessment under DEQ's direction to assist with the
14 development and implementation of closure strategies and is not
15 evidence of continued or additional wrongdoing by the Company.

16 • Lastly, I will summarize DE Carolinas' achievements since the
17 Company's 2017 Rate Case to comply with the CCR Rule and CAMA.

³ *Order Accepting Stipulation, Deciding Contested Issues, and Requiring Revenue Reduction*, Docket No. E-7, Sub 1146, Finding of Fact 70 (June 22, 2018) ("2017 DE Carolinas Rate Case Order").

1 **II. INTERVENORS CANNOT SHOW THAT ANY IMPRUDENT ACTION**
2 **OR INACTION BY THE COMPANY HAS RESULTED IN**
3 **QUANTIFIABLE CCR COSTS.**

4 **Q. DOES THE PUBLIC STAFF TAKE SIMILAR POSITIONS ABOUT DE**
5 **CAROLINAS' COMPLIANCE HISTORY AS IT DID IN THE**
6 **COMPANY'S 2017 RATE CASE?**

7 A. Yes. As it did in the Company's 2017 Rate Case, in this case the Public Staff
8 has proposed an "equitable sharing" of the Company's CCR costs, which would
9 result in a 50 percent disallowance of the Company's reasonably and prudently
10 incurred CCR costs. Mr. Junis argues that existence of seeps and groundwater
11 exceedances at DE Carolinas' CCR impoundments are evidence of the
12 Company's "culpability" with respect to CCR management that warrant
13 "equitable sharing".

14 **Q. DID THE COMMISSION ACCEPT THE PUBLIC STAFF'S POSITION**
15 **IN THE COMPANY'S 2017 RATE CASE?**

16 A. No. The Commission did not accept the Public Staff's "equitable sharing"
17 disallowance theory, as a whole, and specifically rejected Mr. Junis'
18 "culpability" theory in support of such a disallowance. *See* 2017 DE Carolinas
19 Rate Case Order, at 274.

20 **Q. DID THE PUBLIC STAFF RELY ON THE SAME CULPABILITY**
21 **THEORY WHEN IT PROPOSED AN "EQUITABLE SHARING"**
22 **DISALLOWANCE OF CCR COSTS IN DENC'S 2019 RATE CASE?**

23 A. Yes. The Public Staff proffered the testimony of Jay Lucas in DENC's 2019
24 Rate Case, who incorporated by reference the testimony of Mr. Junis from DE

1 Carolinas' 2017 Rate Case. Mr. Lucas similarly argued that DENC's
2 "culpability" for environmental impacts relating to its past CCR management
3 practices justified an "equitable sharing" disallowance of DENC's CCR costs.
4 *See Order Accepting Public Staff Stipulation in Part, Accepting CIGFUR*
5 *Stipulation, Deciding Contested Issues, and Granting Partial Rate Increase,*
6 *Docket No. E-22, Sub 562, at 94-5 (Feb. 24, 2020) ("2019 DENC Rate Case*
7 *Order").*

8 **Q. DID THE COMMISSION ACCEPT THE PUBLIC STAFF'S**
9 **"CULPABILITY" THEORY AND ADOPT THE PUBLIC STAFF'S**
10 **"EQUITABLE SHARING" DISALLOWANCE?**

11 A. No. The Commission did not accept the Public Staff's "culpability" standard
12 as a basis for disallowing prudently incurred CCR costs.

13 **Q. DOES ANY INTERVENOR WITNESS ATTEMPT TO QUANTIFY**
14 **DISCRETE CCR COSTS THAT ARE ATTRIBUTABLE TO ANY**
15 **ALLEGED IMPRUDENCE BY THE COMPANY?**

16 A. No. As discussed above, Mr. Junis acknowledged that he could not quantify
17 costs because it would be too speculative. Mr. Quarles' testimony also makes
18 no attempt to quantify imprudent costs beyond speculatively asserting that
19 "[c]osts associated with excavation and groundwater monitoring likely would
20 be lower if the Company had converted to dry disposal in lined landfills
21 sooner." (Direct. T. Quarles, at 34:2-3 (E-7, Sub 1214)). Mr. Hart testified that
22 "DEC's costs are higher today than they would have been had it undertaken
23 reasonable and prudent actions and practices in a timely manner to address

1 storage and disposal of CCR and closure of its coal ash basins before the Dan
2 River spill occurred in 2014.” (Direct T. Hart, at 12:4-13 (E-7, Sub 1214)).
3 Therefore, no witness has quantified a single, discrete cost that was imprudently
4 incurred or that DE Carolinas could have avoided through different CCR
5 management practices in the past.

6 **III. DE CAROLINAS HAS MANAGED CCR CONSISTENT WITH**
7 **INDUSTRY STANDARDS AND ENVIRONMENTAL REGULATIONS.**

8 **Q. HOW HAVE INTERVENORS’ WITNESSES CHARACTERIZED THE**
9 **COMPANY’S HISTORICAL CCR MANAGEMENT PRACTICES?**

10 A. Intervenor’s have relied on hindsight bias to unfairly judge and criticize the
11 Company’s management of coal ash, specifically its use of unlined
12 impoundments. Those criticisms can be condensed into two general categories:

13 A. The Company knew or should have known about the risks of unlined
14 impoundments.

15 B. In response to evidence of actual groundwater impacts, the Company
16 should have conducted more comprehensive groundwater monitoring,
17 should have not used the ash basins to treat other site-generated
18 wastewaters, should have converted to dry ash handling to mitigate
19 potential groundwater impacts, should have ceased using the CCR
20 basins altogether, should have closed its unlined ash basins, or should
21 have taken some other unspecified corrective action to mitigate
22 environmental impacts.

23 My testimony will address each of those general criticisms below.

A. DE Carolinas' Response to Intervenor's Allegations that It Knew or Should Have Known About the Risks of Operating Unlined Impoundments.

Q. AS A THRESHOLD MATTER, WAS IT REASONABLE AND PRUDENT FOR THE COMPANY TO CONSTRUCT AND USE UNLINED BASINS TO TREAT ASH TRANSPORT WATER?

A. Yes. Not only was the construction of unlined ash basins reasonable and prudent at the time, their continued operation and use after 2010 was also reasonable and prudent. Unlined ash basins, or impoundments, were the accepted approach employed across the power industry at the times when the basins were built. The Company's first ash basin was constructed in 1956, and its last basin was constructed in 1982. As this Commission has found with respect to DE Carolinas' utilization of unlined impoundments, "the use of ash impoundments as a storage location for coal ash and other CCR was in accordance with industry standards and then-applicable regulations." 2017 DE Carolinas Rate Case Order, at 285.⁴ State and federal environmental regulators have consistently reached the same conclusion, as Company witness Marcia Williams will explain in more detail in her rebuttal testimony.⁵ Initially, ash

⁴ Compare 2019 DENC Rate Case Order, at 124-25 ("[U]nlined impoundments were the accepted repositories for storing CCRs prior to adoption of the CCR Rule, and compliance with the Clean Water Act and NPDES permits for water discharges was generally accepted as meeting the expectations of environmental regulators. Although the Commission does not view regulatory compliance as being prudence *per se*, such compliance is nonetheless evidence that could support a determination of prudence.").

⁵ Development Document for Effluent Limitations Guidelines and New Source Performance Standards for the Steam Electric Power Generating Point Source Category, EPA 440/1-74 029-a (October 1974) at 149 ("Disposal of this quantity of solids from the waste water stream has prompted most utilities to install some sedimentation facility. In many cases, ash settling ponds are used. A typical ash pond is illustrated in Figure A-V-9, which is located in plant no. q211. However, in some cases, because of unavailability of land, aesthetics, or some other reason, utilities have installed more sophisticated materials-handling systems based on the sedimentation process."); Development Document for Final

1 basins were not regulated under federal or state solid waste laws. After the
2 passage of the Clean Water Act in 1972, ash basins began to be regulated as
3 wastewater treatment units. Under this new authority granted by Congress, the
4 EPA began implementing various pollution control programs, which included
5 setting wastewater discharge standards for industry and water quality standards
6 for contaminants in surface waters. However, these regulations did not apply
7 to groundwater.

8 Under delegated authority from EPA, DEQ and DHEC issued NPDES
9 permits to the Company. These NPDES permits authorized the Company to
10 collect CCR-containing water and other wastewaters from the site in surface
11 impoundments and then, after settling, discharge water from the impoundments
12 directly to surface waters. DEQ and DHEC renewed NPDES permits
13 approximately every five years.

14 Even before ash basins came under the regulatory purview of EPA and
15 state environmental regulators, state utility regulators were well aware of, and
16 allowed, the continued use of unlined ash basins to store CCR. From 1967 until
17 2009, the Commission had the sole authority to regulate utility dams, including
18 all of the dams that formed DE Carolinas' ash basins. The Commission did not
19 ignore its responsibility and created a docket (Docket No. E-100, Sub 23) to
20 receive and review inspection reports for each of the Company's ash basins in
21 North Carolina every five years. The inspections were performed by

Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Steam Electric Point Source Category, EPA 440/1-82 029 (November 1982) at 376 ("Wet, once-through systems with ponding are commonly used for ash handling.").

1 independent engineering consultants with the primary purpose of evaluating the
2 stability and relative safety of each basin. An important part of each inspection
3 was identifying, characterizing, and monitoring seeps that may be emanating
4 from the ash basins. As was the Commission's practice, it would send the
5 inspection reports for review and comment to DEQ, which possessed the
6 requisite expertise. Not once during that time did the Commission or the Public
7 Staff ever determine or opine that the continued use of surface impoundments
8 to store CCR was imprudent.

9 **Q. HOW DO YOU RESPOND TO INTERVENORS' CONTENTION THAT**
10 **DE CAROLINAS KNEW OR SHOULD HAVE KNOWN THAT**
11 **UNLINED ASH BASINS POSED A POTENTIAL RISK TO**
12 **SURROUNDING GROUNDWATER AND SURFACE WATER**
13 **QUALITY BY THE 1980s?**

14 A. I do not believe that knowledge of potential impacts is evidence of
15 mismanagement. Certainly, the Company and its environmental regulators
16 were aware that unlined impoundments, in concept, had the potential to impact
17 surrounding groundwater and surface water in the 1980s. But that general
18 knowledge of potential for impacts does not resolve the crucial issue of whether
19 DE Carolinas' impoundments actually posed a significant risk of environmental
20 harm. Only one of DE Carolinas' ash basins was commissioned after 1980 –
21 the Additional Primary Basin at Buck in 1982. What was also widely accepted
22 at the time was that most impacts were insignificant, if they had materialized at
23 all, and largely depended on regional and other factors. Studies performed in

1 the late 1970s and through the 1980s that were applicable to DE Carolinas' ash
2 basins showed that impacts from its ash basins followed this trend. Given the
3 absence of evidence of, or the likelihood of significant harm, I disagree with
4 intervenors' implication that DE Carolinas should have taken drastic and
5 expensive measures in response to the *potential* for impacts alone. As I discuss
6 further in Section III.B below, I believe that Mr. Junis, Mr. Hart, and Mr.
7 Quarles are wrong to suggest that the appropriate response to uncertain and
8 speculative future risks was to take costly or expensive measures to remove
9 unlined ash basins from service, construct alternate wastewater treatment
10 systems, convert to dry fly ash and bottom ash handling, build solid waste
11 landfills, install groundwater monitoring well networks at all sites, or proceed
12 immediately to groundwater corrective action. In my opinion, it would not have
13 been a proportionate response to a potential risk, especially given the "evolving
14 body of scientific knowledge" regarding CCR management and disposal. (*See*
15 *Junis Direct T.*, at 40:11 (E-7, Sub 1214)). Instead, DE Carolinas took a
16 proportionate and transparent response by providing information to regulators
17 regarding dam stability, groundwater, and surface water, and taking action in
18 response to actual, known environmental impacts.

1 **Q. DO YOU BELIEVE ANYTHING IS MISSING FROM INTERVENORS’**
2 **TESTIMONY, AND, IF SO, HOW SHOULD THOSE OMISSIONS**
3 **INFORM THE COMMISSION’S ASSESSMENT OF INTERVENORS’**
4 **RECOMMENDATIONS?**

5 A. Yes. Their testimony lacks context and perspective. As Company witness
6 Williams discusses in her testimony, intervenors imply that DE Carolinas was
7 operating in a vacuum when it decided to construct and continue operating
8 unlined impoundments. For example, intervenors downplay that DE Carolinas’
9 environmental regulators, utility regulators, and intervenors themselves were
10 participants in the Company’s long history of coal-fired generation in the
11 Carolinas. Intervenors also do not seem to account for the fact that certain
12 actions that they have proposed would have impacted DE Carolinas’ ability to
13 reliably generate electricity to meet demand and other economic impacts. The
14 Company is at all times balancing multiple – sometimes competing – interests,
15 as well as an ever-changing regulatory environment.

16 The environmental regulatory regime has evolved as scientific
17 knowledge and regulatory priorities have changed. This context is important
18 when evaluating activities spanning decades into the past through today’s lens.
19 This evolution is most evident with EPA’s approach to regulating CCR, which
20 has ranged from no involvement before the 1970s to its final promulgation of
21 the comprehensive CCR Rule in 2015, over 30 years after it began to study
22 CCR. Company witness Williams provides a detailed discussion of EPA’s and
23 states’ history of regulating CCR.

1 **Q. DO YOU HAVE ANY EXAMPLES OF HOW INTERVENORS HAVE**
2 **TAKEN EVIDENCE OUT OF CONTEXT TO REACH MISLEADING**
3 **AND IMPROPER CONCLUSIONS?**

4 A. Yes, I do. Intervenors cherry-pick statements from three reports to argue that
5 DE Carolinas should have known by the early 1980s that wet storage of CCR
6 posed a risk to groundwater and surface water to suggest that the Company
7 improperly managed its ash basins. Evaluating those documents in their proper
8 context reveals that DE Carolinas responsibly evaluated the potential risks
9 identified by the reports as it made decisions about its operations.

10 First, Mr. Junis and Mr. Quarles cite to the 1979 report “Health and
11 Environmental Impacts of Increased Generation of Coal Ash and FGD Sludges”
12 written by researchers from Arthur D. Little, Inc. and USEPA’s Industrial
13 Environmental Research Laboratory. Although the paper identifies potential
14 risks associated with CCR management, the paper is clear about its conclusions:

15 Environmental impacts are dependent on the characteristics of
16 the disposal site, characteristics of the coal ash and FGD wastes,
17 control method and the degree of control employed. Impacts are
18 site-specific and cannot be easily generalized over a region.
19 Furthermore, the existing regulatory framework, if successfully
20 implemented, should prevent or minimize significant adverse
21 impacts.

22 The paper reiterates that “site-specific impacts could be significant and need to
23 be evaluated on a case by case basis.”

24 In a follow-up to this paper, two of the report’s authors, Chakra J.
25 Santhanam and Charles B. Cooper, performed a site-specific evaluation at Allen
26 as part of the report titled “Full-Scale Field Evaluation of Waste Disposal From

1 Coal-Fire Electric Generating Plants” (also known in this proceeding as the
2 Arthur D. Little study). That report concluded that “[d]ata from the study
3 suggest that no major environmental effects have occurred at any of the six
4 sites[,]” including Allen. From this, I conclude that the recommendations of
5 the 1979 Arthur D. Little report were followed at DE Carolinas’ sites, resulting
6 in the conclusion that the potential impacts identified in the 1979 report had not
7 materialized.

8 Mr. Junis and Mr. Quarles also cite the 1981 EPRI publication, “Coal
9 Ash Disposal Manual, Second Edition.” (*See* Junis Direct. T., at 38:4-39:2,
10 40:6-16 (E-7, Sub 1214); Quarles Direct T., at 12:1-14:27 (E-7, Sub 11214)).
11 This forward-looking document was designed to aid with the development of
12 new CCR management facilities. It does not call for the removal or closure of
13 existing, unlined ash basins. DE Carolinas’ practice was consistent with this
14 manual: when the Company constructed new CCR management units after the
15 early 1980s, the Company constructed landfills – not unlined ash basins.

16 The third document cited by Mr. Junis is the 1982 EPRI publication,
17 “Manual for Upgrading Existing Disposal Facilities.” While the 1982 manual
18 does provide alternatives to the use of surface impoundments, it does not
19 recommend immediate changes to site waste disposal practices. As stated there,

20 Regulations governing the disposal of utility wastes are in a state
21 of suspension at this time. Congress in the 1980 Amendments to
22 RCRA requested a detailed study of the effects of utility waste
23 disposal practices, and the EPA has a multimillion dollar project
24 under way to address some of the questions. The answers are
25 not expected to be known until late 1983. Until that time there
26 will be no firm design or performance standards applicable to
27 utility waste disposal that can be applied with confidence by the

1 industry. At the present time state standards for nonhazardous
2 wastes, which are also undergoing change, apply to utility waste
3 disposal. *For these reasons it may be premature for any utility*
4 *to embark on a program to update their existing disposal*
5 *facilities.*

6 It is expected that within two or three years, when the federal
7 and state regulations have been put in place, this manual will
8 need to be extensively revised. At that time it may be possible
9 to assess the impact of a given disposal operation using
10 groundwater monitoring results and modeling techniques and to
11 compare the results with specific disposal site performance
12 standards. *Today it is not possible.*

13 (*Id.*) (emphasis added).

14 Several years *after* the last of the above-cited reports were published,
15 DEQ requested that DE Carolinas perform an evaluation of potential
16 groundwater impacts from the unlined ash basins at Riverbend (“1987
17 Riverbend Study”). (Quarles Direct T. Ex. 2 (E-7, Sub 1214)). The 1987
18 Riverbend Study showed that CCR at the site had the potential to impact
19 groundwater but concluded that those impacts would likely be minor. The 1987
20 Riverbend Study provided further support for the Company’s decision to
21 continue operating its existing, unlined impoundments.

22 **B. DE Carolinas’ Response to Intervenor’s Allegations that the**
23 **Company Should Have Been More Proactive in Evaluating and**
24 **Responding to Groundwater Impacts from Its Ash Basins By**
25 **Taking Remedial Actions Earlier.**

26 **Q. HOW DID DE CAROLINAS’ ENVIRONMENTAL REGULATORS**
27 **RESPOND TO POTENTIAL RISKS FROM UNLINED ASH BASINS?**

28 A. As I mentioned above, DEQ developed groundwater monitoring rules for North
29 Carolina in 1979, but those rules were not specific to ash basins. When the 2L
30 rules’ corrective action requirements were later promulgated in 1984, North

1 Carolina developed a process by which historical treatment ponds, such as ash
2 basins, would be phased in to corrective action when necessary. This approach
3 is expressly stated in the Hearing Officer's Report⁶ associated with the adoption
4 of the relevant corrective action requirements, which states:

5 3. Will Pits, Ponds, and Lagoons that are part of an NPDES
6 permitted facility be in violation of these regulations?

7 Our NPDES permittees overall do a good job of mitigating their
8 environmental impacts, and we have no reason to suspect that
9 wholesale violations of the standards exist in these facilities.
10 However, it is probable that some violations do exist where
11 facility construction predated the groundwater standards. When
12 NPDES permits come up for renewal, their groundwater impacts
13 will be analyzed, and some facility modifications may be
14 required. In the interim, we will work with these and other
15 groundwater dischargers through the compliance schedule
16 procedure.

17 Throughout the next two decades, DE Carolinas expanded its
18 groundwater monitoring program to other sites, both voluntarily and as required
19 by DEQ- and DHEC-issued NPDES permits. Consistent with DEQ's phased
20 approach to implementing groundwater monitoring assessments, monitoring
21 was not required at all sites at the same time.

22 **Q. WHAT ACTIONS HAS THE COMPANY TAKEN OVER TIME TO**
23 **EVALUATE POTENTIAL GROUNDWATER IMPACTS FROM ITS**
24 **ASH BASINS?**

25 The Company took measured steps, in coordination with its environmental
26 regulators, to assess the potential risks from its ash basins and then made
27 decisions on the basis of the information it developed. Groundwater regulations

⁶ Hearing Officer's Report and Recommendations: Groundwater Regulations, at 8 (1983).

1 did not come into effect in South Carolina until 1977 and in North Carolina
2 until 1979. DE Carolinas' ash basins had been properly and legally operating
3 for years, and in some cases decades, before the adoption of any regulatory
4 requirements related to groundwater corrective action.

5 That said, the Company did not ignore the risk of groundwater
6 contamination. In 1978, a year before North Carolina promulgated
7 groundwater regulations, Duke Energy voluntarily and proactively partnered
8 with EPA to study groundwater quality at Allen. (*See* Hart Direct T. Ex. 24 (E-
9 7, Sub 1214)). The purpose of the monitoring program was not solely to
10 characterize site conditions at Allen, but also "to evaluate the performance of
11 Duke's ash basins, and their effect on groundwater movement and water
12 quality" across its system. (*Id.* at 14). Around this time, the Company also
13 began to conduct leachate tests on ash from all of the sites to determine the
14 concentrations of constituents with the potential to migrate to groundwater. The
15 Company recognized that data that was being collected and studied by EPA
16 may not necessarily be applicable to the Company's service area. So, it
17 collected this monitoring data with the express purpose of aiding regulators in
18 developing future groundwater standards that could be used at the regional or
19 state level. (*Id.* at 15).

20 Additional groundwater monitoring was conducted at Allen on behalf
21 of EPA beginning in 1981. Arthur D Little, Inc., acting as a contractor for EPA,
22 conducted a series of groundwater quality investigations at several
23 representative utility sites. Allen "was selected as being representative of the

1 Piedmont region and the combined ponding of fly and bottom ash. The site was
2 also selected to investigate Duke Power's practice of treating boiler cleaning
3 waste in the ash basin." (*Id.* at 31). The EPA later relied on Arthur D Little,
4 Inc.'s report and DE Carolinas' scientific contributions to support its findings
5 and conclusions in its 1988 "Report to Congress, Wastes from the Combustion
6 of Coal by Electric Utility Power Plants" ("1988 EPA Report"). The 1988 EPA
7 Report is discussed in greater detail in Section III.B below and in Company
8 witness Williams' rebuttal testimony.

9 Both DE Carolinas' internal study and Arthur D Little, Inc.'s study at
10 Allen for EPA concluded that wet disposal of coal ash had no significant impact
11 on groundwater at DE Carolinas sites, all of which are located in Piedmont soils.
12 Adding to that body of knowledge, DE Carolinas' 1987 Riverbend Study
13 provided additional support for the conclusion that groundwater impacts from
14 the Company's ash basins were considered minimal. Thus, while the Company
15 may have been aware in the 1980s that unlined impoundments, in general, could
16 potentially impact groundwater, there was no substantial evidence showing that
17 there was significant impacts resulting from *DE Carolinas' facilities*. It was
18 therefore reasonable for DE Carolinas' to await further guidance from its
19 environmental regulators, as opposed to hastily reacting to 1981 and 1982 EPRI
20 reports cited by intervenors. Any reflexive reaction to the EPRI reports would
21 have also been premature, given EPA's conclusion in 1988 "that current waste
22 management practices [including unlined ash basins] appear to be adequate for
23 protection of human health and the environment." (1988 EPA Report, at 7-11).

1 Following the 1988 EPA Report, the Company began monitoring
2 groundwater around unlined ash landfills at Belews Creek and Marshall, as
3 required by DEQ, in 1989. Although the monitoring did indicate some
4 exceedances of groundwater standards, they were primarily the standards
5 associated with naturally occurring conditions—iron, manganese, and pH. The
6 data did not reflect a pattern of ash constituents migrating out from the landfills.

7 In 1993, groundwater monitoring requirements were added to the
8 NPDES permits for Dan River and W.S. Lee Steam Stations. At Dan River,
9 monitoring indicated exceedances for pH, iron, and manganese, all of which
10 can occur naturally, and which were seen in the site's background well. At
11 W.S. Lee, to the extent monitoring indicated exceedances of standards, it was
12 for South Carolina secondary maximum contaminant levels, which are
13 regulated for aesthetics such as taste and odor and not health concerns (e.g., pH,
14 iron, total dissolved solids, and manganese). These data sets did not indicate
15 that the basins were materially impacting groundwater or presenting a risk to
16 public health or the environment. In the mid-2000s, the Company began again
17 to voluntarily monitor groundwater quality. Initial sampling at Allen reflected
18 exceedances of only the standards for pH, iron and manganese, which, as stated
19 above, are frequently derived from natural sources. Initial sampling at Buck
20 and Marshall in 2007 and at Riverbend in 2010 reflected exceedances of those
21 parameters plus boron. Around 2009, the Department began systematically
22 adding groundwater requirements to NPDES permits as they were reissued or
23 modified. As additional data became available and both the Company's and

1 DEQ's understanding of groundwater impacts matured, the Department issued
2 a policy memo, dated June 17, 2011, titled "The Policy for Compliance
3 Evaluation of Long-Term Permitted Facilities with No Prior Groundwater
4 Monitoring Requirements" ("2011 DEQ Policy").⁷ The memo included a
5 detailed flow chart dictating the steps to be taken by the Department and the
6 utilities upon the identification of a groundwater exceedance near a coal ash
7 pond. Those steps included, but were not limited to: (1) verifying the accuracy
8 and significance of the results of the groundwater testing; (2) determining
9 whether and to what extent the identified substance could be naturally
10 occurring; and (3) evaluating other possible sources of the identified
11 substance.⁸ *After* these steps were completed, and it was determined that a
12 particular exceedance may have been caused by migration of water from coal
13 ash ponds, the 2011 DEQ Policy dictated that the parties work together to
14 develop a corrective action plan in accordance with 15A N.C.A.C. 2L .0106.⁹
15 DE Carolinas continued working with the Department under this policy until it
16 was eventually superseded by CAMA's groundwater assessment and corrective
17 action procedures.

⁷ N.C. Dept. of Env't and Nat'l Res., Policy for Compliance Evaluation of Long-Term Permitted Facilities with No Prior Groundwater Monitoring Requirement (June 17, 2011).

⁸ *Id.*

⁹ *Id.*

1 **Q. DO YOU AGREE WITH INTERVENORS' CRITICISM THAT THE**
2 **COMPANY DID NOT DO ENOUGH TO EVALUATE**
3 **GROUNDWATER IMPACTS RESULTING FROM ITS ASH BASINS?**

4 A. No. I will note that intervenors' testimony on this issue was all over the map.¹⁰
5 Mr. Junis argued that the Company should have implemented comprehensive
6 groundwater monitoring at all of its sites in the 1980s but did not do so until
7 after 2000. (Junis Direct T., at 42:8-12 (E-7, Sub 1214)). Mr. Hart, on the other
8 hand, argues that DE Carolinas should have implemented comprehensive
9 monitoring at all of its sites by 2006, citing to the USWAG Action Plan. (Hart
10 Direct T., at 9:10-18 (E-7, Sub 1214)). Mr. Quarles testified that the Company
11 should have performed additional groundwater monitoring but did not provide
12 any timeframe for when the Company should have taken such action. (Quarles
13 Direct T., at 5:20-25 (E-7, Sub 1214)).

14 As discussed above, DE Carolinas voluntarily initiated a groundwater
15 and leachate study at a representative site, Allen, beginning in 1979, followed
16 by an EPA study that collected additional groundwater data beginning in 1981.
17 The results of those investigations showed that groundwater near DE Carolinas'
18 ash basins did not present a significant risk that warranted expansive monitoring
19 at Allen. The Allen studies later informed the findings of DE Carolinas'
20 investigations performed at the request of DEQ at Riverbend. The 1987

¹⁰ See 2017 DE Carolinas Rate Case Order, at 317-18 ("The Commission deems the various Intervenor theories for remediation cost disallowance "all over the map" and deficiently inconsistent. With so much disagreement over what DEC should have done or is doing to comply with EPA requirements and CAMA, the Commission determines that insurmountable obstacles exist to quantify the alleged offsets that are a fundamental element to Intervenor's disallowance theory.")

1 Riverbend Study concluded that risks of contamination did not warrant
2 conducting groundwater monitoring at that site.

3 Notwithstanding its regulatory authority – and with this same
4 information and data in hand – DEQ *did not* impose a blanket groundwater
5 monitoring requirement for all of DE Carolinas’ sites. Instead, DEQ *gradually*
6 added groundwater monitoring requirements to the Company’s NPDES permits
7 over a span of two decades, beginning in 1993. Groundwater sampling data
8 was submitted to DEQ, and DEQ possessed the expertise to evaluate that data
9 and the authority to require additional monitoring or other corrective action, if
10 deemed necessary. Had DEQ determined that DE Carolinas’ should have
11 begun groundwater monitoring at all of its sites earlier, DEQ certainly had the
12 regulatory authority to include groundwater monitoring as a condition in all of
13 DE Carolinas’ NPDES permits at any time after 1984. Instead, monitoring
14 requirements were first added to the Company’s NPDES permits at 1993, and
15 it was not until 2013 that DEQ included groundwater monitoring as a
16 requirement in all of the Company’s NPDES permits. This was the same
17 position that was adopted by the Commission in the 2017 DE Carolinas Rate
18 Case:

19 Determining the number and placement of monitoring wells, not an
20 inexpensive endeavor (Tr. Vol. 26, p. 92), is an inexact science. The
21 prevalent and cost-effective process is to install monitoring wells
22 iteratively to best identify harmful groundwater contamination. Tr.
23 Vol. 26, pp. 92-93.

24 2017 DE Carolinas Rate Case Order, at 264.

1 Considering the results of the Company's participation in voluntary
2 studies and given that DEQ was still developing its groundwater monitoring
3 regime as of 1984, it is not reasonable for Mr. Junis to suggest that the Company
4 should have implemented groundwater monitoring networks at all of its sites in
5 the 1980s, or at some undefined point in time as Mr. Quarles suggests. DEQ's
6 iterative approach to implementing groundwater monitoring requirements, as
7 well as the findings in the Arthur D. Little, Inc. report, particularly in the context
8 of the evolving body of law, scientific understanding, and public policy, support
9 my position that implementing system-wide groundwater monitoring all at once
10 would have been unreasonable.

11 Even if this Commission disregards DEQ's expertise and judgment
12 based on available information at that time, both Mr. Junis' and Mr. Quarles'
13 hindsight positions are flawed because they do not provide sufficient standards
14 or guidelines with which to establish what type of monitoring program should
15 have been established. Mr. Junis admits that developing a "well network for
16 each site depends on the specific characteristics of that site." (Wells Rebuttal
17 Ex. 1, Public Staff Response to DR (E-7, Sub 1214)). Neither witness explains
18 precisely when nor to what extent the Company should have taken further
19 action to monitor groundwater, such as:

- 20 • How would one determine which ponds would be subject to
21 monitoring?
- 22 • How many monitoring wells would need to be installed?
- 23 • How many background wells would need to be installed?

- 1 • Should the installation of wells be tied to the existence of receptors in
2 the vicinity of the CCR facility?
- 3 • Where would the wells need to be installed?
- 4 • At what depth would the wells be installed?
- 5 • What constituents would be monitored?
- 6 • When should each well have been installed?
- 7 • How often should the wells be tested?
- 8 • How long would the Company be required to continue monitoring?
- 9 • Who would determine the sufficiency of the monitoring program?
- 10 • What is an acceptable cost for the monitoring program?

11 Mr. Hart faults the Company for not achieving a *voluntary* goal to
12 implement groundwater monitoring at all of its sites by 2006 as part of its
13 participation in the USWAG Action Plan. (Hart Direct T., at 9:10-18; Ex. 13
14 (E-7, Sub 1214)). The USWAG Action Plan was a partnership between the
15 utility industry and the EPA to implement a voluntary groundwater monitoring
16 program to help federal and state regulators expand their knowledge of potential
17 groundwater impacts from unlined ash basins. While it is true that the Company
18 had not monitored all of its sites under the USWAG Action Plan by 2008, the
19 Company had conducted other groundwater monitoring at all of its sites by
20 2006. Mr. Hart also fails to point out that, by achieving monitoring at all of its
21 sites by 2008, DE Carolinas actually exceeded its commitment under the
22 USWAG Action Plan. Participants in the USWAG Action Plan, at the earliest,
23 were required to implement a groundwater monitoring program within three

1 years, or by 2009. The Company has consistently sought opportunities like the
2 USWAG Action Plan and the Arthur D Little, Inc. study to voluntarily work
3 with its regulators to ensure that its operations are protective of human health
4 and the environment. DE Carolinas should not be punished for taking
5 responsible and proactive action, even if it was not able to meet a self-imposed
6 deadline of 2006.

7 I further disagree with Mr. Hart's criticisms of DE Carolinas' evaluation
8 of the data it collected from its voluntary efforts. Hart acknowledges that the
9 primary constituents of concern were originally iron and manganese. He
10 understands that these two constituents were listed by USEPA as secondary
11 MCLs, meaning that they were of concern primarily due to aesthetic
12 considerations (e.g. taste and odor). He then asserts that this fact is irrelevant
13 to North Carolina's 2L groundwater standards. He is correct that their status as
14 secondary MCLs does not have bearing on whether the North Carolina
15 groundwater standard is exceeded, but he is incorrect in suggesting that this
16 status was irrelevant to the decision-making process. They are clearly relevant
17 to the risk profile associated with the basins and the urgency with which those
18 exceedances needed to be addressed. Migration around the basins of
19 ubiquitous, naturally occurring groundwater constituents identified by USEPA
20 as secondary MCLs did not pose a high risk of injury to human health or the
21 environment. It follows that they did not call for the same type of approach that
22 might have been justified for a different type of constituent.

1 I would also note that Mr. Hart's review of historical groundwater trends
2 was only possible because DE Carolinas collected so much groundwater
3 monitoring data, first voluntarily and later in collaboration with DEQ. The
4 trends that Mr. Hart identified in the data can be seen in the complete data set,
5 but it took time to develop that data set. It took time to review the data and
6 determine which wells were best suited for use as background wells, and it took
7 time for DE Carolinas and DEQ to decide where to put additional wells to
8 develop the kind of information that would ultimately be useful for a trend
9 analysis. For that reason, I disagree with the implication in Mr. Hart's
10 testimony that DE Carolinas should have reached in 2005 all of the conclusions
11 he reached in 2020.

12 **Q. DO INTERVENORS IDENTIFY GENERAL ACTIONS THE**
13 **COMPANY SHOULD HAVE TAKEN IN RESPONSE TO THE**
14 **POTENTIAL FOR OR EVIDENCE OF GROUNDWATER IMPACTS**
15 **FROM THE COMPANY'S ASH BASINS?**

16 A. Yes, but in my view the intervenors' criticisms are extreme, inconsistent, and
17 non-specific. Mr. Junis' testimony cites studies from the 1980s and contends
18 that the Company "failed to modernize its practices despite the available
19 knowledge..." (Junis Direct T. at 42:6-7 (E-7, Sub 1214)). However, Mr. Junis
20 does not articulate the specific actions the Company should have taken, other
21 than vague "comprehensive" groundwater monitoring, where the Company
22 should have taken those actions, or when the Company should have acted.

1 Mr. Hart identifies actions that he contends could have been taken to
2 minimize groundwater contamination, including “converting to dry fly ash and
3 bottom ash handling (if not done already), removing ash from the basin on a
4 frequent basis, eliminating wastewater streams and hydraulic loading from non-
5 coal ash sources, removing the ash and installing a bottom liner, lowering the
6 water level and/or dewatering the pond to decrease hydraulic loading, and
7 ultimately pond closure.” (Hart Direct T., at 70:9-14 (E-7, Sub 1214)). Like
8 Mr. Junis, Mr. Hart’s testimony does not state where or when the Company
9 should have taken any or some of these.

10 Mr. Quarles takes the position that it was unreasonable to *even operate*
11 an unlined basin after the 1980s (Quarles Direct T., at 25:15-26:1 (E-7, Sub
12 1214)), and that it should have begun “transitioning away from wet handling
13 and disposal of ash much sooner.” (*Id.* at 26:5-8). Singling out Allen, Mr.
14 Quarles contends that the Company should have stopped sending CCR to the
15 Active and Inactive Ash Basins and converted to dry ash handling at that facility
16 in the 1980s or 1990s. (*Id.* at 32). Like Mr. Junis and Mr. Hart, Mr. Quarles
17 does not identify with enough specificity discrete actions or omissions that
18 constitute mismanagement by the Company.

1 **Q. DO INTERVENORS SUBSTITUTE THEIR JUDGMENT FOR THE**
2 **EXPERTISE AND INFORMED DECISIONS OF DE CAROLINAS’**
3 **ENVIRONMENTAL REGULATORS?**

4 A. Yes. Mr. Junis, Mr. Hart, and Mr. Quarles argue that DE Carolinas should have
5 ignored the expertise of its environmental regulators and its consultants to
6 varying degrees by prematurely installing extensive groundwater monitoring
7 wells at all sites, converting to dry ash handling, ceasing operation of ash basins,
8 installing liners, installing alternative wastewater treatment, building landfills,
9 and/or other measures to overhaul its CCR management practices. Throughout
10 the decades in question, DE Carolinas was open and transparent with its
11 regulators, sharing its findings and conclusions, and worked with them to
12 continue to provide reliable, efficient, and cost-effective electricity. I disagree
13 that intervenors’ hindsight opinions in this case should be substituted for the
14 judgment of the environmental regulators charged with such oversight,
15 particularly without the requisite expertise, experience, or knowledge that the
16 regulatory agencies possessed.

17 Regarding groundwater monitoring, Public Staff admits that its theory
18 substitutes its judgment for that of DE Carolinas’ environmental regulators:

Request:

2-56. Please state whether it is the Public Staff’s contention that DEC should have installed groundwater monitoring wells beyond those required in its various permits. If so, please state the basis for this contention.

Response:

19 Yes, it is. Please see Junis Testimony pages 49-53.

1 (Wells Rebuttal Ex. 1, Public Staff Response to DE Carolinas' DR). The Public
2 Staff takes this position even though it is not an environmental regulator. In
3 short, the Public Staff is not only advocating for the Commission to take a "fresh
4 look" at the Commission's own decisions, it is advocating for the Commission
5 to take a fresh look at the decisions of separate, independent regulatory
6 agencies.

7 Mr. Hart argues that the Company should have made sweeping changes
8 to its ash basins, yet I did not see in his testimony or his discovery responses
9 where he has experience in CCR ash basin management, including designing,
10 recommending, or implementing the changes for which he advocates.¹¹

11 Likewise, Mr. Quarles argues that sweeping changes regarding the
12 management of CCR should have occurred in the past, yet cites to no prior
13 experience, other than his involvement in the Company's recent rate cases,
14 where he has studied the management of CCR in ash basins or potential
15 environmental impacts resulting therefrom.

16 I do not see where intervenors contend that DE Carolinas, North
17 Carolina, or South Carolina were outliers by using or permitting the use of
18 unlined basins, nor could such contentions be reasonably made given well-
19 published facts about coal power generation practices at that time.

¹¹ (Wells Rebuttal Ex. 2, AGO Response to DE Carolinas' DR 2-1).

1 **Q. WOULD IT HAVE BEEN REASONABLE FOR DE CAROLINAS TO**
2 **TAKE ANY OF THESE OTHER DRASTIC REMEDIAL MEASURES**
3 **SUGGESTED BY INTERVENORS AT ALL OF ITS SITES?**

4 A. No. A one-size-fits-all approach to CCR management was never the industry
5 or regulatory standard in North Carolina or South Carolina. In the absence of
6 any environmental or regulatory justification at a particular site and given the
7 information before the Company over the time period in question, overhauling
8 its operations at all of its sites would not have been economically justified or
9 reasonable.

10 **Q. DO YOU AGREE THAT THE COMPANY SHOULD HAVE**
11 **CONVERTED ALL OF ITS SITES TO DRY ASH HANDLING**
12 **EARLIER?**

13 A. No, because this recommendation ignores the regulatory context, as well as
14 Duke Energy's efforts to understand and manage environmental risks
15 associated with these sites. From a regulatory perspective, in November 1982,
16 EPA promulgated effluent limitations guidelines for the steam electric point
17 source category. As reflected in the associated Development Document, EPA
18 considered requiring power plants to install dry fly ash and bottom ash handling
19 equipment but decided against it for existing plants. With respect to fly ash
20 handling, EPA concluded that "the high cost of retrofitting [did] not justify the
21 additional pollutant reductions."¹² As stated above, North Carolina

¹² *Development Document for Final Effluent Limitations Guidelines, New Source Performance Standards, and Pretreatment Standards for the Steam Electric Point Source Category*, Effluent Guidelines Division, Office of Water and Waste Management, USEPA, at 496 (1982).

1 promulgated rules for groundwater corrective action but publicly stated that it
2 did not expect significant groundwater contamination around ash basins. The
3 Department's position was consistent with information available to DE
4 Carolinas, including the monitoring at Allen in the early 1980s and the later
5 analysis conducted for Riverbend in 1987. Moreover, for most of the 1980s,
6 the industry expected EPA to take some action to regulate CCR under RCRA,
7 although the nature of that action was unknown. In 1988, EPA issued its report
8 concluding that regulation of CCR was not called for at the time. That report
9 was followed by formal regulatory action in 1993. Given the lack of a
10 regulation requiring dry ash handling or evidence indicating actual, significant
11 impacts from ash basins, there was no point during this period at which it would
12 have made sense for DE Carolinas to take on the significant expense of
13 switching to dry fly ash or dry bottom ash handling at all facilities.

14 That said, DE Carolinas did convert to dry ash handling when it was
15 warranted by evidence of environmental impacts. For example, Belews Creek
16 converted to dry fly ash handling in 1984 as part of an effort to address surface
17 water quality impacts in Belews Lake.

18 By 2000, EPA was again considering the need for regulation of CCR
19 under RCRA Subtitle D, but the direction was unclear. EPA was working with
20 the industry, as represented by the Utility Solid Waste Action Group, to
21 determine whether the agency's concerns could be addressed through a non-
22 regulatory approach. As reflected in the USWAG Action Plan, the agency's
23 concern at the time was that "the utility industry consider dry handling

1 technology prior to constructing new landfills or surface impoundments to
2 manage fly ash.” DE Carolinas participated in the Action Plan in part by joining
3 the voluntary initiative to install groundwater monitoring around the basins.
4 EPA eventually finalized these regulations in the form of the CCR Rule in 2015.
5 It would not have made sense for DE Carolinas to take on the cost and effort of
6 converting to dry fly ash and dry bottom ash handling, which would have
7 required the construction of a landfill to receive the ash, at a time when EPA
8 was still developing the requirements both for the continued use of ash basins
9 and the construction of new landfills.

10 **Q. DO YOU AGREE WITH THE CONTENTION THAT THE COMPANY**
11 **SHOULD NOT HAVE USED THE ASH BASINS TO TREAT OTHER**
12 **WASTEWATERS AT THE SITE?**

13 A. No. Mr. Hart criticizes the Company’s use of ash basins to treat other process
14 wastewater generated at its facilities, suggesting that these wastewaters
15 increased groundwater contamination. (Hart Direct T., at 9:3-9 (E-7, Sub
16 1214)). I believe that Mr. Hart’s criticisms are without merit for several
17 reasons.

18 First, the effect of Mr. Hart’s argument here is that the Company should
19 not be able to rely on the NPDES permits that were issued by DEQ and DHEC.
20 As Mr. Hart acknowledges, the Company’s introduction of waste streams, in
21 addition to sluiced CCR, to its unlined ash basins was only done after it received
22 explicit authorization from DEQ and DHEC to do so. (*Id.* at 41:18-42:22). The
23 waste streams placed in the basins were classified by EPA as “low volume

1 wastes.” Under the effluent limitations guidelines in place before 2015, surface
2 impoundments were classified as “Best Available Technology” for this waste
3 stream. As reflected in EPA’s 2013 proposed rule amending the effluent
4 limitation guidelines, handling of these waste streams was the common practice
5 in the industry. EPA’s data indicate that 54 percent of the power plants that
6 generated FGD wastewater at the time used surface impoundments as the sole
7 treatment technology for the wastewater, while an unstated percentage above
8 that used surface impoundments in conjunction with another treatment method.
9 Most of the 54 percent combined their FGD wastewater with other waste
10 streams.

11 Second, Mr. Hart fails to give due consideration to the fact that several
12 waste streams were introduced to the Company’s ash basins as a direct result of
13 compliance with other environmental regulations. For example, the Company
14 installed various air pollution control devices to comply with increasingly
15 stringent air emissions standards under the Clean Air Act at certain facilities.
16 Mr. Hart does not suggest an alternative to complying with emissions standards,
17 nor does he suggest how the additional waste streams resulting from the control
18 devices should have been handled differently.

19 Finally, Mr. Hart fails to demonstrate how groundwater conditions
20 would be different at any site or how the Company’s closure strategy under
21 federal or state law would be any different had the Company not introduced
22 those waste streams to the ash basins as permitted.

1 **Q. DO YOU AGREE THAT THE COMPANY SHOULD HAVE CEASED**
2 **USING OR CLOSED ITS UNLINED ASH BASINS EARLIER?**

3 A. No, and this is another example of intervenors substituting their judgment for
4 that of DE Carolinas' environmental regulators. There was no environmental
5 impetus to stop using or close the Company's ash basins at an earlier date. As
6 Company witness Williams discusses in her testimony, the regulatory
7 uncertainty created by the EPA's draft CCR Rule in 2010 meant that closure
8 before 2014 would have been premature and financially irresponsible.

9 Far from operating in a vacuum, DE Carolinas' CCR facilities have been
10 actively regulated by DEQ and DHEC to minimize potential impacts to human
11 health and the environment. This has included reviewing decades-worth of
12 surface and groundwater data from DE Carolinas' sites and other CCR
13 facilities. Neither DEQ nor DHEC ever ordered DE Carolinas to cease using
14 or to close any of its ash basins before 2014. Nor did the agencies require DE
15 Carolinas to complete any of the following less sweeping measures:

- 16 • DE Carolinas' environmental regulators did not require the Company
17 to retrofit its existing impoundments with liners;
- 18 • DE Carolinas' environmental regulators did not require the Company
19 to close impoundments that no longer received CCR, and,
- 20 • DE Carolinas' environmental regulators did not require the Company
21 to excavate CCR from its existing impoundments.

22 DE Carolinas' environmental regulators, equipped with the same data and
23 studies that have been produced to and which are available to intervenors in this

1 case, did not see a sufficient environmental justification for requiring the
2 Company to overhaul its CCR management practices or cease operating unlined
3 basins altogether. To the contrary, DE Carolinas' regulators continued
4 authorizing the Company to operate its unlined ash basins.

5 **Q. DO YOU AGREE WITH WITNESS HART'S CONTENTION THAT**
6 **LACK OF CONFIDENCE IN THE COMPANY "PROMPTED**
7 **REQUIREMENTS THAT DEC TAKE MORE EXTENSIVE AND HIGH**
8 **COST APPROACHES, SUCH AS THE HIGH-COST BENEFICIATION**
9 **REQUIREMENT"?**

10 A. No. I am not aware of any statement by regulators or members of the General
11 Assembly that the requirement to beneficiate coal ash was prompted by a lack
12 of confidence by regulators and the public. Based on my reading of CAMA
13 and the beneficiation report produced by the Coal Ash Management
14 Commission, beneficiation was considered a positive opportunity to recycle
15 coal ash as a marketable product and to divert it from landfills. CAMA's
16 beneficiation requirement is also consistent with EPA's decision not to regulate
17 CCR as hazardous waste in the CCR Rule in order to encourage recycling
18 opportunities.

19 North Carolina is not alone in its support for beneficiation opportunities.
20 Last year, Virginia passed legislation that will require DENC to beneficiate a
21 percentage of the CCR that will be excavated from its basins. Well before
22 CAMA was passed, South Carolina utilities installed the same beneficiation
23 technology that is now being deployed at Buck. Considering this context, I do

1 not see how CAMA's beneficiation requirement could be viewed as a
2 punishment to the Company.

3 **IV. THE EXISTENCE OF GROUNDWATER EXCEEDANCES AND SEEPS**
4 **NEAR ASH BASINS IS NOT EVIDENCE OF MISMANAGEMENT.**

5 **Q. DO YOU AGREE WITH MR. JUNIS' CONCLUSION THAT**
6 **EXCEEDANCES OF GROUNDWATER STANDARDS ARE AN**
7 **INDICATION THAT DE CAROLINAS HAS MISMANAGED ITS ASH**
8 **BASINS?**

9 A. No. Impacts to groundwater around ash basins are not the result of
10 mismanagement. The existence of groundwater exceedances at or beyond the
11 compliance boundaries at these sites is a function of where these sites are on
12 the timeline of groundwater assessment and corrective action under modern
13 laws that have changed the way that unlined basins are viewed. As these views
14 have changed, the Company has taken every action required by the DEQ and
15 DHEC to address groundwater impacts as they have been identified. Further,
16 in studying ash basins and developing the CCR Rule, the EPA was aware that
17 the design of ash basins had resulted in groundwater concerns throughout the
18 industry; however, EPA determined that immediately closing basins, which
19 would require shutting down operating coal plants, would be more harmful to
20 the human health and environment than taking a measured approach.¹³

¹³ See 80 Fed. Reg. 21302, 21423 (Apr. 17, 2015) (recognizing that "the risks to the wider community from the disruption of power over the short-term outweigh the risks associated with the increased groundwater contamination from continued use of leaking or improperly sited CCR units").

1 Under the 2L rules, an owner/operator must report an exceedance and
2 work with DEQ to determine whether it was due to permitted activity, assess
3 the extent of the exceedance, and undertake corrective action. A violation of a
4 2L standard and exceedances, in and of themselves, are not evidence of
5 mismanagement, wrongdoing, or environmental harm. The existence of past
6 and present groundwater exceedances reflects historical construction practices
7 and the evolution of groundwater assessment and corrective action under
8 modern laws. An exceedance is a data point that informs whether and to what
9 extent further study is required to assess potential risk. This is a complex and
10 highly technical task that takes into account many different factors and simply
11 triggers additional investigation and potential corrective action. The Company
12 has worked with DEQ and complied with this process, and the Commission
13 agreed in the 2017 Rate Case Order that “compliance with this process is not
14 mismanagement and should not be held against DEC with respect to cost
15 recovery.” 2017 Rate Case Order at 299.

16 A better way to measure the severity of groundwater contamination is
17 to look at the impacts to human health and safety and the environment. By
18 those measures, groundwater contamination around DE Carolinas’ ash basins
19 is not severe. Groundwater contamination at these sites does not threaten
20 human health and safety. It has not migrated to drinking water wells and there
21 is no pathway to human exposure. Groundwater contamination does not
22 threaten wildlife or create a risk of harm to adjacent rivers and lakes. Surface
23 water assessments were conducted as part of the site assessment/corrective

1 action process. Finally, groundwater contamination has not caused damage to
2 property. The exceedances are almost entirely confined to DE Carolinas'
3 property, close to the basins.

4 **Q. WAS THE EXISTENCE OF SEEPS AT DE CAROLINAS' ASH BASINS**
5 **INDICATIVE OF MISMANAGEMENT?**

6 A. No. All earthen dams, including those that create ash basins, are prone to the
7 movement of liquid through porous features within those structures through a
8 process known as seepage. Such seepage is common, expected, and, to a
9 degree, necessary to maintain the stability of an earthen dam or dike wall;
10 otherwise they become saturated, which may reduce margins of safety with
11 respect to their structural integrity. Certain of DE Carolinas' CCR
12 impoundments feature engineered toe drains within the dam structures to collect
13 seepage. Where these toe drains discharge to surface waters, DE Carolinas
14 included these discharges in its 2014 NPDES permit applications. The
15 characteristics of these wastewater flows are similar to those discharging from
16 other permitted outfalls for ash basin effluent, although the flows are orders of
17 magnitude lower. Each of DE Carolinas' coal ash wastewater treatment
18 facilities also exhibit areas of wetness at locations adjacent to, but beyond the
19 confines of, the coal ash basins where seepage, often intermixed with
20 groundwater, has reached the land surface, and sometimes flows from that area.
21 These areas of wetness can be manifested as isolated stagnant areas, the point
22 of origin of a stream feature, the contribution of flow to a permitted outfall or

1 historical stream feature, or flow to an existing surface water. Such seeps often
2 exhibit no or low flow volume and may be both transient and seasonal in nature.

3 **Q. PLEASE EXPLAIN THE HISTORY OF STATE AND FEDERAL**
4 **REGULATION OF SEEPAGE FROM DE CAROLINAS' CCR**
5 **IMPOUNDMENTS.**

6 A. DEQ and the Commission were aware of seeps from DE Carolinas' ash basins
7 since well before the development of the CCR Rule and the passage of CAMA.
8 DEQ dam safety regulations specifically address seepage.¹⁴ However, DEQ
9 did not consider them to be a priority for NPDES permitting. In his deposition
10 as DEQ's Rule 30(b)(6) witness on surface water permitting, Sergei Chernikov
11 explained DEQ's decision not to devote resources to permitting seeps:

12 [T]he decision was made in terms of the resource allocation
13 whether or not the effort to permit [seeps] would give enough
14 return in terms of the protection of the environment. The seep
15 permitting present unique challenge that we have encountered
16 during the last several years and many states have as well. All
17 the NPDES programs are still struggling on this issue.

18 The decision was made that it was not high priority since the
19 composition of the seeps is similar to the effluent from the ash
20 ponds, but the concentration of the constituents is substantially
21 lower because of the filtering through the dam and typically the
22 combined seep discharge from the ash ponds.

23 We are trying to evaluate and protect the entire receiving water
24 body. The most impact is from the ash pond that has anywhere
25 from 5 million gallons per day to 18 million gallons per day. If
26 there is some additional discharges that are less than one percent
27 of that the representative discharge from the ash pond would
28 basically present the entire impact for the given facility on the
29 environment.¹⁵

¹⁴ 15A NCAC 02K .0207 Seepage Control.

¹⁵ Transcript, Deposition of Sergei Chernikov, State of North Carolina v. Duke Energy Progress, LLC,
No. 13-CVS-11032 (Wake County Superior Ct. Nov. 27, 2016), at 34-35.

1 In 2010, the EPA instructed states with delegated authority to issue
2 NPDES permits that seeps from earthen impoundments should be addressed as
3 part of the NPDES permitting process. Subsequently, DE Carolinas engaged
4 with DEQ to determine the appropriate approach to address seeps, and the
5 Company began including them in permit applications. However, there did not
6 appear to be agreement between EPA and DEQ on how to do so until well after
7 2014. Mr. Chernikov explained the challenge DEQ faced:

8 North Carolina is probably one of the first – if not the first – states
9 in the nation that is trying to permit seeps. It presents a very
10 unique challenge to regulators that have very substantial
11 implications to the entire NPDES wastewater program as seeps
12 exist in numerous states. Setting a precedent requires a
13 substantial effort and consultation with EPA. There have been a
14 lot of discussions trying to come up with a strategy to
15 accommodate seeps into NPDES wastewater permits.

16 Lagoons are used as wastewater discharge systems by many
17 industries. We have agriculture which uses lagoons. Most of
18 them are non-discharge systems. We have some municipalities
19 that still have lagoons; although our state do [sic] not have many
20 of those – relatively few. Many of the states have a significant
21 number of such lagoons. There are water treatment plants that
22 have lagoons to treat sludge or temporary storage sludge. We
23 believe that many of those lagoons would have seeps. If we are
24 required to permit seeps for Duke Energy we might have to
25 permit seeps for other facilities and that's one of the reasons why
26 EPA have been involve to a great extent because the decision and
27 guidance they give us might force them to give similar guidance
28 to other states that will require very substantial effort on the part
29 of the states and EPA if we have to permit all the seeps.¹⁶

30 In 2014, DE Carolinas conducted a survey (as required by CAMA) of
31 each coal-fired generation station to identify potential unauthorized discharges
32 from seepage from the coal ash surface impoundments. Given the difficulty in

¹⁶ *Id.* at 39, 44-45.

1 discerning which, if any, of the identified seeps were point source discharges
2 and the need for regulatory clarity, DE Carolinas conservatively included all
3 areas of wetness (“AOWs”) identified around the basins and submitted
4 applications to include those AOWs in NPDES permits. Beginning in 2015,
5 DE Carolinas implemented semi-annual surveys to identify any new seep
6 discharges. Additional areas of wetness have been observed and documented
7 during these surveys and reported to DEQ pursuant to a Discharge Identification
8 Plan. Further, additional investigation determined that not all of areas identified
9 in 2014 are seeps.

10 **Q. HAVE DEQ AND THE COMPANY REACHED AGREEMENT AS TO**
11 **HOW TO ADDRESS SEEPAGE FROM THE IMPOUNDMENTS IN**
12 **CONNECTION WITH THE NPDES PERMITTING PROGRAM?**

13 A. Yes. Some of DE Carolinas’ coal ash impoundments contain engineered
14 features on or within the dam structures (such as toe drains or filter blankets) to
15 collect seepage. This wastewater is conveyed via a pipe or a constructed
16 channel directly to a receiving water. DEQ determined that these discrete,
17 identifiable, point source discharges are or will be covered and regulated by the
18 respective NPDES permits and designated as outfalls therein, and all are now
19 covered in the more recently issued permits. The characteristics of these
20 wastewater flows are similar to those discharging from other permitted outfalls
21 for ash basin effluent. Such features are referred to as “engineered seeps” or
22 “constructed seeps.” Seeps that do not convey wastewater via a pipe or

1 constructed channel directly to a receiving stream are referred to as “non-
2 engineered” or “non-constructed” seeps.

3 DEQ and DE Carolinas have now entered into a series of special orders
4 by consent (“SOCs”) to address seeps at DE Carolinas’ stations acknowledging
5 that:

6 Non-engineered seeps at the Duke Energy Facilities often exhibit
7 low flow volume and may be both transient and seasonal in
8 nature, and may, for example, manifest as an area of wetness that
9 does not flow to surface waters, a point of origin of a stream
10 feature, or flow to an existing stream feature. These
11 circumstances of the non-engineered seeps make them difficult to
12 discern, characterize, quantify and/or monitor as discrete point
13 source discharges. This creates challenges in permit development
14 and compliance monitoring because it is difficult to accurately
15 monitor for flow and discharge characterization.¹⁷

16 Because decanting (i.e., removal of the free water on the surface of the coal ash
17 basins), which is required before ash basins can be closed, is expected to
18 substantially reduce or eliminate the seeps, the SOC provides regulatory clarity
19 and certainty as to the appropriate monitoring frequency, parameters to be
20 sampled and limits with respect to the non-engineered seeps, while requiring
21 the Company to accelerate the schedule for decanting water from the basins.
22 After completion of decanting, any remaining seeps will be addressed in the
23 corrective action or closure plans under CAMA.

¹⁷ Special Order by Consent, EMC SOC WQ S17-009 (April 18, 2018) (covering Allen, Marshall, and Cliffside). This language also appears in the SOC for the Company’s other sites.

1 V. MR. JUNIS HAS MISCHARACTERIZED THE NUMBER OF 2L
2 VIOLATIONS THAT THE COMPANY HAS RECEIVED SINCE THE
3 COMPANY'S 2017 RATE CASE.

4 Q. MR. JUNIS ALLEGES THAT "THE NUMBER OF 2L VIOLATIONS
5 HAS INCREASED BY 7,849, OR 254%, SINCE MY TESTIMONY IN
6 THE LAST DEC RATE CASE." DO YOU AGREE WITH THIS
7 CHARACTERIZATION?

8 A. No. As I explained earlier in my testimony, the number of measured
9 exceedances, even if upon assessment they constitute violations, are not
10 indicative of mismanagement or imprudence. Instead, sample data indicating
11 violations trigger corrective action to further analyze or address the
12 groundwater impacts. Under the CCR Rule and CAMA, closure of all of the
13 Company's ash basins had already been triggered before the 2017 Rate Case
14 was filed and the triggering factor was not groundwater impacts.

15 Mr. Junis' allegation regarding an additional number of 2L violations is
16 disingenuous, because he implies that these "violations" are a result of actions
17 or inactions by the Company since the 2017 Rate Case. In other words, Mr.
18 Junis suggests that DE Carolinas' compliance record has gotten worse since
19 2017. This is misleading.

20 The increase in sample results that Mr. Junis deems "violations" is the
21 result of the fact that intensive monitoring at the sites has continued since 2017.
22 In some cases, new wells have been installed since 2017. Additionally, the
23 location of compliance boundaries has changed, so that some wells were
24 reclassified as being located "at or beyond a compliance boundary." The

1 purpose of the ongoing monitoring is to help the Company and its regulators
2 better understand site specific conditions to develop appropriate corrective
3 actions. The additional wells have achieved that purpose. For example, DE
4 Carolinas retained the consulting firm Arcadis to perform trend analysis on the
5 wells at these sites. The trend analysis used several different methods to
6 determine whether concentrations of constituents in individual wells are
7 increasing, decreasing, or stable. Based on this evidence, the characteristics of
8 groundwater contamination around the ash basin remains similar to what we
9 saw in 2017.

10 Furthermore, merely counting the number of exceedances does not
11 provide an accurate picture of what is happening at the site. Using Allen as an
12 example, in 2017, DEC provided the Public Staff with data for 173 sampling
13 events from 18 monitoring wells. The 2019 data reflects 1,491 sampling events
14 from 248 wells—an increase of 230 wells. The new wells were often added in
15 areas already known or suspected to be within a groundwater plume. This is
16 standard practice and was done intentionally to more precisely delineate the
17 plume boundary. Both old and new wells were sampled repeatedly in this two-
18 year period; in some cases, the same wells were sampled twice in one day.
19 When the same well is resampled during the same day or even months later,
20 and both results are above the groundwater standard, it does not mean that
21 conditions have worsened. Similarly, a site that samples the same well two
22 times a year is not two times worse than if it sampled that well just once a year.
23 Rather than indicating mismanagement, DE Carolinas' comprehensive

1 assessment demonstrates responsible actions that enable the Company and its
2 regulators to better understand the impacted areas and drive appropriate
3 corrective action. Mr. Junis' position leaves the Company in an untenable
4 position. He seeks to punish the Company for prudently meeting its CCR Rule
5 and CAMA obligations to collect groundwater samples to characterize
6 groundwater impacts. If the Company had not complied with the CCR Rule
7 and CAMA by reducing the number of wells drilled or samples collected to
8 avoid Mr. Junis' criticism, the Company would be vulnerable to legal
9 challenges for violating those regulations.

10 **Q. DO YOU AGREE WITH MR. JUNIS' COMPARISON OF THE**
11 **COMPLIANCE RECORDS OF DE CAROLINAS AND DENC?**

12 A. No, I do not. I do not have an opinion about DENC's compliance record, and I
13 do not have a basis for comparing it with DE Carolinas. However, Mr. Junis'
14 testimony suggests he is equally unjustified in offering an opinion. First, his
15 conclusion is explicitly based on his lack of understanding of DENC's
16 environmental record. As he states on page 74, lines 14 through 18 of his
17 testimony, "the Public Staff has evidence of thousands of groundwater
18 violations for DEC, whereas the number of Dominions groundwater
19 exceedances is lower, and evidence of violations is less clear due to a different
20 state regulatory framework and poor recordkeeping on the part of Dominion."
21 From this statement, it appears Mr. Junis is basing his opinion on the number
22 of DE Carolinas violations and DENC violations of which the Public Staff has
23 evidence. However, he acknowledges that the Public Staff does not have

1 complete evidence, partly because the Public Staff does not clearly understand
2 the Virginia regulatory framework and partly because the Public Staff purports
3 to not have complete information about DENC's environmental record. By this
4 logic, DE Carolinas' compliance record could have been improved if DE
5 Carolinas had done a poorer job with recordkeeping or performed less
6 comprehensive monitoring.

7 Second, a direct comparison between DE Carolinas and DENC is
8 clearly inappropriate. The two companies have a different number of power
9 plants and ash basins and have installed a different number of wells. Under
10 these circumstances, comparing the number of exceedances provides very little
11 information about historical compliance with environmental laws and
12 regulations. In my opinion, it does not justify the conclusion Mr. Junis reaches.

13 **VI. THE COMPANY IS DILIGENTLY WORKING WITH STATE**
14 **REGULATORS TO IMPROVE ENVIRONMENTAL CONDITIONS AT**
15 **ITS CCR FACILITIES.**

16 **Q. HOW HAVE CONDITIONS AROUND THE ASH BASINS CHANGED**
17 **SINCE YOUR LAST TESTIMONY IN 2017?**

18 A. Since 2017, DEC has made substantial progress to address seeps and
19 groundwater around the ash basins. The effort has transformed the way the coal
20 sites look and operate and provided a unique insight into environmental
21 conditions at these sites. The success of this effort is something about which
22 the Company is rightfully proud.

23 The Company has gained its long-sought regulatory clarity and
24 coverage by addressing seeps through NPDES permits and SOC's with the

1 Department of Environmental Quality. NPDES permits for Allen (issued July
2 13, 2018), Belews Creek (issued March 21, 2019), Buck (issued September 17,
3 2018), and Cliffside (issued July 13, 2018) authorize discharges from
4 constructed seeps (e.g., toe drains). Those sites and Marshall are all covered by
5 SOC's that provide compliance schedules for addressing the remaining non-
6 constructed seeps by accelerating the timeline for removal of water from the
7 basins.

8 In accordance with CAMA and the schedule in the SOC's, DE Carolinas
9 completed the conversion to dry bottom ash handling at Allen by March 31,
10 2019, at Belews Creek by May 9, 2019, Cliffside by May 24, 2018, and at
11 Marshall by October 26, 2018. DE Carolinas has also begun decanting¹⁸ at all
12 of these sites.

13 In another significant development, last December, DE Carolinas
14 submitted to DEQ groundwater Corrective Action Plans ("CAPs") for Allen,
15 Belews Creek, Cliffside, and Marshall. The CAPs were the culmination of a
16 major effort to describe the important aspects of these sites. The CAPs include
17 extensive descriptions of site conditions, major modelling efforts for each site,
18 determinations of background threshold values (BTVs), Human Health and
19 Ecological Risk Assessments, and evaluations of potential surface water
20 impacts, among other things. In light of this substantial body of work, we have

¹⁸ Under the approach developed by DEQ and DEC, "decanting" is the removal of standing water in the basin. Although there is variability from site to site, decanting typically ends when the water level in the basin reaches three feet above the ash. After that point, further removal of water is called "dewatering" and is subject to additional restrictions because the water has been in closer contact with settled ash.

1 great confidence in our understanding of site groundwater dynamics and in our
2 ability to address groundwater conditions through appropriate corrective action.

3 Another very significant milestone in the coal ash arena was DE
4 Carolinas' submission of closure plans in December and the settlement
5 agreement announced by Duke Energy, DEQ, and environmental groups in
6 early January. Closure plans are not the primary subject of my testimony and
7 are addressed by Company witness Bednarcik's in her testimony. I mention
8 them here because basin closures are a significant milestone evidencing the
9 great progress the Company is making in conjunction with the efforts of its
10 environmental regulators and other stakeholders.

11 Finally, since 2017, DE Carolinas has completed the excavation and
12 closure of basins at Riverbend and Dan River. At Riverbend, dewatering and
13 CCR removal were completed in March 2019, four months ahead of the CAMA
14 deadline of August 1. DEQ confirmed timely closure on July 25. As part of
15 excavation at Riverbend, DE Carolinas removed approximately 5.35 million
16 tons of ash. At Dan River, dewatering and CCR removal were completed on
17 May 20, 2019, two months ahead of the CAMA deadline. DEQ confirmed
18 timely closure on July 25. Dan River involved the removal of approximately
19 3.99 million tons of ash.

20 In short, DE Carolinas is addressing basin closure and groundwater
21 assessment/corrective action as anticipated by CAMA and the CCR Rule. This
22 process has demonstrated why premature closure or retrofitting of basins would
23 have been unreasonable without sufficient regulatory guidelines or impetus.

1 Ash basins are large, permitted wastewater treatment units, and DE Carolinas
2 operated its ash basins consistent with its permits for decades. They served
3 power plants with very little leeway for downtime, meaning that efforts to
4 transition to new ash handling equipment and treatment units had to be carefully
5 planned and executed. Changes to NPDES permits were carefully planned and
6 coordinated with DEQ to accommodate developing construction schedules.
7 Assessment of groundwater in association with closure requires installation of
8 a large number of wells, as well as an understanding of groundwater flow and
9 contaminant fate and transport over a large area. After the passage of CAMA
10 and even with decades of earlier data, it took DE Carolinas and DEQ over five
11 years of sustained effort to decide what kinds of information were necessary to
12 support decision-making, and to collect the information and present it in the
13 form of corrective action plans. DE Carolinas has been successful in this effort
14 because it had a clear mandate in the CCR Rule and CAMA, dedicated and
15 skilled employees, and financeable and regulatory stability.

16 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

17 A. Yes.

1 Q. Mr. Wells, did you also prepare a summary of
2 your testimony?

3 A. I did.

4 MR. MARZO: Okay. Chair Mitchell, the
5 summary was provided to the Commission and parties
6 to this docket as required by the Commission's
7 order, and I'd ask that that summary of Mr. Wells
8 be entered into the record as if given orally here
9 today.

10 CHAIR MITCHELL: All right. Mr. Marzo,
11 hearing no objection to that motion, summary
12 provided by Mr. Wells of his rebuttal testimony
13 will be copied into the record as if given orally
14 from the stand.

15 MR. MARZO: Thank you, Chair Mitchell.

16 (Whereupon, the prefiled summary of
17 testimony of James Wells was copied into
18 the record as if given orally from the
19 stand.)
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Duke Energy Carolinas, LLC
Summary of Rebuttal Testimony of James Wells
Docket No. E-7, Sub 1214

I am the Vice President – Environmental Health and Safety Programs and Environmental Sciences for Duke Energy Carolinas, LLC. The purpose of my rebuttal testimony is to respond to the testimonies of the Public Staff witness Charles Junis, Attorney General’s Office witness Steven Hart, and Sierra Club witness Mark Quarles.

Intervenors are seeking punishment, not just and reasonable rates. Clouded by hindsight bias, intervenors’ testimonies criticize the Company’s historical coal ash management practices and second-guess the decisions of and permits issued by environmental regulators. Resting on their attempts to establish that the Company was a “bad actor”, intervenors then shoehorn disallowances that are untethered to discrete or identifiable imprudently incurred costs. This Commission should reject intervenors’ attempt to tarnish this proceeding with punitive and arbitrary proposed disallowances.

My rebuttal testimony demonstrates that the Company has appropriately responded to the evolving scientific developments and knowledge regarding the management and regulation of coal ash. The Company has consistently and transparently worked with its environmental regulators to manage coal ash in compliance with regulatory and industry standards. The Company has engaged in voluntary efforts to aid the industry’s and regulators’ understanding of environmental conditions at coal ash sites. At the same time, the Company has balanced its obligation to provide reliable, cost-effective energy for its customers. These actions are affirmative evidence of prudence.

The Company is proud of the substantial progress it has made to address environmental conditions at its coal ash sites. The Company has completed excavation and closure of its basins at Riverbend and Dan River. As a result of the Company’s settlement agreement with DEQ and environmental groups, the Company finally has a clear path forward for closing its ash basins at its remaining sites in North Carolina. The Company’s efforts to transform the way coal ash is

managed and conduct environmental assessments did not happen overnight. This iterative process has demonstrated why prematurely closing or retrofitting ash basins without sufficient regulatory guidelines or impetus would have been irresponsible and unreasonable. Ash basins are large, permitted wastewater treatment units that served the power plants with very little leeway for downtime. Therefore, the transition to new ash handling equipment and treatment units had to be carefully planned and executed over time. Even after the passage of CAMA and the CCR Rule, and armed with decades of historical data, it took the Company and DEQ over five years of sustained effort to decide what information was necessary to support and develop corrective action plans for its coal ash sites. The Company has been successful in this effort because it has clear regulatory mandates and guidance, dedicated and skilled employees, effective and knowledgeable regulators in DEQ and DHEC, and financial and regulatory stability. This concludes my summary of my rebuttal testimony.

1 Q. Ms. Williams, would you please state your
2 name and business address for the record.

3 A. (Marcia E. Williams) Yes. Marcia Williams,
4 and my address 2029 Century Park East, Suite 1080,
5 Los Angeles, California 90067.

6 Q. And by whom are you employed and in what
7 capacity?

8 A. I'm employed by Nathan Advisors, which is an
9 international consulting firm, and I'm senior vice
10 president.

11 Q. Thank you, Ms. Williams. Now, Ms. Williams,
12 on March 4, 2020, did you cause to be prefiled in this
13 docket, rebuttal testimony consisting of 98 pages and
14 one exhibit?

15 A. Yes, I did.

16 Q. Do you have any changes or corrections to
17 your prefiled rebuttal testimony?

18 A. I had two small typos that I -- wording
19 changes that I caught afterwards.

20 MR. MARZO: Okay. And, Chair Mitchell,
21 that errata was provided to the Commission and to
22 parties per the Commission's order.

23 Q. And with those changes, Ms. Williams, if I
24 asked you the same questions today, would your answers

1 be the same?

2 A. Yes, they would.

3 Q. And do you have any changes or corrections to
4 your prefiled rebuttal exhibit?

5 A. No.

6 Q. Now, Ms. Williams, on May 4, 2020, did you
7 also cause to be prefiled in this docket, supplemental
8 rebuttal testimony consisting of 12 pages?

9 A. Yes, I did.

10 Q. Do you have any changes or corrections to
11 your prefiled supplemental rebuttal testimony?

12 A. No, I don't.

13 Q. And if I asked you the same questions today,
14 would your answers be the same?

15 A. Yes.

16 MR. MARZO: Chair Mitchell, at this time
17 I would move that Ms. Williams' prefiled rebuttal
18 testimony, as well as her supplemental rebuttal
19 testimony be are entered into the record as if
20 given orally here today. And that her Exhibit 1 to
21 her rebuttal testimony be premarked for
22 identification.

23 CHAIR MITCHELL: All right. Mr. Marzo,
24 hearing no objection to your motion, the rebuttal

1 testimony and the supplemental rebuttal testimony
2 prefiled by witness Williams will be copied into
3 the record as if given orally from the stand. And
4 the one exhibit to her prefiled rebuttal testimony
5 will be marked for identification as it was when
6 prefiled.

7 MR. MARZO: Thank you, Chair Mitchell.

8 (Williams Rebuttal Exhibit 1 was
9 identified as it was marked when
10 prefiled.)

11 (Whereupon, the prefiled rebuttal and
12 errata and supplemental rebuttal
13 testimony of Marcia E. Williams were
14 copied into the record as if given
15 orally from the stand.)
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1 **Q. PLEASE STATE YOUR NAME, AFFILIATION, AND BUSINESS**
2 **ADDRESS.**

3 A. My name is Marcia E. Williams. I am a Senior Vice President at Nathan
4 Associates, Inc., an international consulting firm, where I specialize in
5 environmental, health, and safety matters. My business address is 2029 Century
6 Park East, Suite 1080, Los Angeles, CA 90067.

7 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING YOUR TESTIMONY?**

8 A. I am submitting this testimony before the North Carolina Utilities Commission
9 (“Commission”) on behalf of Duke Energy Carolinas, LLC (“DE Carolinas” or
10 the “Company”).

11 **Q. PLEASE SUMMARIZE YOUR EDUCATION QUALIFICATIONS.**

12 A. I graduated from Dickinson College, Carlisle, PA with a B.S. in Math and
13 Physics in 1968. I graduated summa cum laude and was a member of Phi Beta
14 Kappa. I subsequently performed graduate work in physics at the University of
15 Maryland.

16 **Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.**

17 A. I have had (so far) an almost 50-year career centered on environmental
18 protection and regulation, spanning government service with the United States
19 Environmental Protection Agency (EPA, or the Agency) (over 17 years), a
20 senior management position in the waste management industry (approximately
21 3 years), and consulting work (almost 30 years) in which I have been a
22 consultant to both private industry and government agencies on a wide range of
23 environmental matters, with a particular focus on compliance with the Resource

1 Conservation and Recovery Act (RCRA), the Comprehensive Environmental
2 Response, Compensation, and Liability Act (CERCLA, commonly known as
3 Superfund), the Clean Water Act, and the Toxic Substances Control Act
4 (TSCA), as well as their state equivalents.

5 **Q. PLEASE SUMMARIZE ASPECTS OF YOUR EPA EXPERIENCE**

6 A. My EPA service began from the Agency's inception in 1970 and continued
7 through February 1988. I held numerous positions at EPA and was a charter
8 member of the Senior Executive Service, beginning in 1979. Senior
9 management positions, in reverse chronological order, were Director, Office of
10 Solid Waste (OSW) with national responsibility for EPA's solid and hazardous
11 waste program; Deputy Director, Office of Pesticides and Toxic Substances
12 (OPTS); Acting Director and Deputy Director, Office of Toxic Substances
13 (OTS); and Division Director, Office of Special Pesticide Review, Office of
14 Pesticide Programs (OPP). Earlier positions included Chief, Statistical
15 Evaluation Staff; Special Assignment to the Senate Public Works Committee;
16 and various management and technical positions within the Office of Mobile
17 Source Air Pollution Control and the Office of Research and Development. The
18 following paragraphs describe some of my EPA experience that is relevant for
19 this matter in more detail.

20 In my position as Chief, Statistical Evaluation Staff, Office of Planning
21 and Evaluation, which I held from March 1978 through April 1979, I developed
22 and led a new EPA office responsible for reviewing all major EPA regulations
23 to ensure these regulations were adequately supported with data. My office

1 played a core role in EPA's implementation of Executive Order 12044,
2 *Improving Government Regulations*. The office also provided statistical
3 consulting support to other EPA program offices, including consulting support
4 on developing Clean Water Act water quality criteria, consulting support on the
5 design of PCB enforcement strategies, and participation in the early
6 development of EPA's risk assessment and risk management methodologies.

7 From May 1979 through September 1985, I held senior management
8 positions in the Office of Pesticides and Toxic Substances. This office evaluated
9 whether the risks associated with the uses of individual pesticides and toxic
10 substances exceeded the benefits of use. Where information was inadequate to
11 make necessary determinations, EPA collected additional data. Where data
12 demonstrated that risks of use exceeded benefits of use, EPA took actions to
13 control the risks. In the case of pesticides, this could involve cancellation of the
14 pesticide for some or all use applications. During my tenure in these positions,
15 I participated in the development of EPA's first groundwater protection
16 strategy. EPA used its full range of available statutory authorities to develop and
17 implement a national groundwater protection strategy.

18 Starting in September 1985, I served as Director of the Office of Solid
19 Waste (OSW), a position I held until I left the Agency in February 1988. As
20 OSW Director, I led EPA's 250 person, \$40 million annual program to
21 implement RCRA and the 1984 amendments to RCRA, also known as the
22 Hazardous and Solid Waste Amendments (HSWA). These Amendments

1 fundamentally restructured and strengthened the federal hazardous and solid
2 waste management programs.

3 During this period, my office developed and issued over 40 proposed
4 and final rules relating to solid and hazardous waste. These regulations included
5 the “land disposal restrictions,” a set of new requirements that significantly
6 curtailed the amount and types of untreated hazardous waste which could be
7 disposed of in land-based management units such as landfills, waste piles, and
8 surface impoundments. These regulations also expanded the definition of
9 hazardous waste and addressed waste management requirements for waste
10 generators, transporters, certain recyclers, and entities that managed waste in
11 treatment, storage, or disposal facilities (TSDFs). These new regulations
12 enhanced controls for various hazardous waste management units including
13 surface impoundment, landfills, and tanks. The new regulations also
14 strengthened solid waste management standards for certain types of units
15 including municipal landfills.

16 OSW provided national leadership and oversight for the RCRA
17 permitting program (both operating and post-closure permits) at over 5,000
18 individual hazardous waste facilities nationwide as well as the facility-wide
19 corrective action cleanup program at those facilities, a Superfund-like remedial
20 program that was imposed under the 1984 HSWA amendments to RCRA and
21 developed under my leadership. We also oversaw the delegation of the RCRA
22 program to state agencies and oversaw state agency performance.

1 As the national program manager for RCRA, my office developed
2 detailed guidance documents on many of the complex issues covered by the
3 RCRA regulations including groundwater monitoring, permitting, and technical
4 design issues associated with operating and closing hazardous waste units. The
5 guidance documents provided EPA regions, states, regulated entities, and other
6 interested parties with further detail as to how EPA intended that affected parties
7 implement EPA's waste regulations.

8 Also during my tenure as its Director, OSW worked on completing the
9 various reports to Congress on "special wastes" required by amendments to
10 RCRA that were enacted in 1980, including the Bevill Amendment. Among
11 other things, the Bevill Amendment exempted fossil fuel combustion waste
12 from the "hazardous waste" category pending further study by the Agency, and
13 required EPA to submit a formal report to Congress regarding its findings. The
14 1988 Report to Congress entitled Wastes from the Combustion of Coal by
15 Electric Utility Power Plants was finalized and published by EPA at the end of
16 my tenure as OSW Director. During my tenure we were also completing a multi-
17 year effort to characterize the almost 200,000 non-hazardous waste surface
18 impoundments and over 15,000 landfills in the U.S. from the perspective of
19 environmental design and operational controls. This 1988 Report on Solid
20 Waste Disposal in the United States, which summarized the work performed by
21 the Agency over the previous four years, was issued shortly after I left EPA.
22 During this time my office also worked on federal procurement policies, as

1 required by RCRA, that encouraged the use of byproduct materials such as coal
2 ash.

3 While at EPA, I had considerable direct interaction with Congress. In
4 1976, while employed with EPA, I undertook a special assignment to the Senate
5 Public Works Committee during a time period when several major
6 environmental laws, including RCRA, were being debated and finalized. In my
7 senior management positions at EPA, I was generally responsible for tracking
8 legislative developments within Congress in order to monitor how new
9 legislation might affect existing EPA programs I was managing. I also routinely
10 provided EPA input to Congress on specific legislative issues. In my senior
11 management capacity, I was also responsible for meeting with congressional
12 aides to inform them of the status of the implementation of congressional
13 mandates, addressing congressional concerns. These meetings often involved
14 discussions of congressional intent. I testified on numerous occasions before
15 House and Senate committees and subcommittees. After leaving EPA, I
16 continued to provide testimony at congressional hearings at the invitation of
17 congressional subcommittees, including testimony on RCRA and CERCLA.

18 **Q. PLEASE SUMMARIZE ASPECTS OF YOUR EXPERIENCE AFTER**
19 **YOUR TENURE WITH EPA.**

20 A. When I left the Agency I became the Divisional Vice President - Environmental
21 Policy and Planning for Browning-Ferris Industries (BFI), a position I held until
22 I left BFI in August 1991. In that role, I established an environmental regulatory
23 and legislative program for the company on issues such as waste compliance,

1 interstate movement of waste, rate regulation of the waste industry, state solid
2 waste planning, recycling, and disposal fees. I was responsible for analyzing
3 and forecasting environmental trends affecting the commercial waste industry
4 and for assisting operating managers in resolving environmental conflicts in
5 relation to permit hearings, siting decisions, regulatory interpretations, and
6 enforcement actions.

7 During 1988 and 1989, I also held the position of Vice President of
8 Environmental Compliance for CECOS, BFI's hazardous waste subsidiary. In
9 that capacity, I addressed numerous issues associated with the proper
10 characterization of solid and hazardous waste, the management of these wastes,
11 the permitting of hazardous waste and TSCA PCB waste facilities, groundwater
12 monitoring of hazardous waste sites, and the closure and remediation of waste
13 sites. My staff was responsible for auditing the company's existing hazardous
14 waste facilities, performing due diligence on new business acquisitions,
15 obtaining needed facility RCRA and non-RCRA environmental permits, and
16 managing facility cleanups and closure.

17 Following my tenure at BFI I started my own consulting company,
18 assisting both private sector and governmental clients¹ on a wide range of
19 environmental matters. After 6 years, I folded my consulting firm into a larger

¹ Government clients have included U.S. Department of Energy, Bonneville Power Administration, State of Illinois, City of Los Angeles, City of Phoenix, King County Washington, government of Mexico, and government of Canada. Private sector clients have covered a wide range of industries including the aircraft industry, the petroleum industry, the aluminum industry, the automotive industry, the tanning industry, the semi-conductor and electronics industry, the telecommunications industry, the paper products industry, the chemical industry, the waste industry, and the general manufacturing industry.

1 firm. I have helped entities evaluate and strengthen their compliance and risk
2 management programs. I have also helped regulated entities resolve ongoing
3 compliance issues and incorporate environmental planning into future business
4 planning.

5 As a consultant I have advised on numerous projects related to remedial
6 actions under both RCRA and CERCLA and state-equivalent statutes, including
7 engagements where I was asked to consult on the application of federal and
8 state waste regulations and both voluntary and mandatory state remedial
9 programs. I have also been engaged to consult on the historical evolution of
10 environmental information and regulations in order to evaluate the
11 environmental performance and compliance of regulated entities in a historical
12 context.

13 In addition to consulting work, I have been engaged to provide expert
14 opinions and testimony related to the evolution of knowledge and regulations
15 applicable to waste, chemical management, and environmental remediation
16 across a range of industrial sectors. I have provided expert testimony at
17 deposition and at trial. Areas of testimony include – the federal regulatory
18 development process, risk assessment and risk management frameworks
19 applied to environmental decision-making, standard of care applied to various
20 environmental practices and remedial activities over different timeframes,
21 evolution of knowledge with regard to chemical and waste handling activities,
22 evolution and role of environmental management systems, application of
23 federal waste and chemical regulations to fact-specific situations, and

1 consistency of remedial actions when compared against the National
2 Contingency Plan.

3 A recap of my professional and educational background, including a list
4 of my testimony in prior cases, is included as Exhibit 1 to my testimony.

5 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION**
6 **OR OTHER STATE PUBLIC UTILITY COMMISSIONS?**

7 A. No.

8 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
9 **PROCEEDING?**

10 A. The purpose of my testimony is to respond to the testimony of various
11 intervenor witnesses by providing important context on the development of
12 federal environmental regulations for coal ash management and discuss the
13 uncertainty associated with regulatory outcomes during the regulatory
14 development process, describing how this uncertainty would affect an electric
15 utility's decision on the timing of upgrading or closing ash ponds. I have also
16 been asked to provide rebuttal testimony, within my areas of expertise, in
17 response to the testimony of Mr. Quarles, Mr. Hart, and Mr. Junis. Based on
18 my almost 50 years of environmental experience including almost two decades
19 at EPA, these individuals have expressed opinions regarding the timing
20 surrounding knowledge of risks to groundwater from coal ash ponds that are
21 inconsistent with the weight of evidence regarding how that knowledge evolved
22 over time.

1 **Q. PLEASE PROVIDE AN OVERVIEW OF YOUR TESTIMONY.**

2 A. My testimony begins with an overview of the federal government's study and
3 regulation of coal combustion residuals, starting over four decades ago and still
4 ongoing today. My testimony explains the federal regulatory process and the
5 important reasons why owners and operators of coal ash ponds in North
6 Carolina faced significant uncertainty regarding regulatory requirements for
7 operating and closing coal ash ponds and the impact of that uncertainty on
8 making ash pond upgrade or closure decisions while both knowledge of risks
9 and final requirements remained in flux.

10 In providing rebuttal testimony to Mr. Quarles, Mr. Hart, and Mr. Junis,
11 I provide a summary of the understanding of the groundwater resource in the
12 1970s and 1980s, the types of site-specific factors that were understood to be
13 important in protecting the groundwater resource, the evolving knowledge of
14 the impacts from industrial landfills and surface impoundments, the evolution
15 of groundwater monitoring as an important tool for tracking the impacts of
16 waste management units, and the ways in which waste management has
17 changed when compared with earlier practices deemed protective at the time
18 they were utilized.

19 Mr. Quarles, Mr. Hart, and Mr. Junis conclude that DE Carolinas' ash
20 pond practices, going back to the late 1970s and 1980s, were inconsistent with
21 what was understood to be necessary to protect groundwater. They also
22 conclude that had DE Carolinas taken different actions many decades ago, its
23 coal ash pond closure costs would be lower today. Based on my experience and

1 knowledge of this field, I conclude that DE Carolinas' ash pond management
2 was consistent with what was understood to be protective of groundwater in the
3 1970s and 1980s. The Company's tailored analysis of the potential for its ash
4 ponds to result in groundwater environmental harm in the 1980s supported a
5 determination that its ponds would not be expected to result in environmental
6 harm. And its installation of groundwater wells between 1993 and 2008, for the
7 purpose of monitoring groundwater impacts, was consistent with the
8 requirements and the evolving knowledge required to install such systems. It
9 was also consistent with the general industry practices.

10 Had DE Carolina's made changes in its ash management systems in the
11 late 1970s through early 1980s, it is unclear whether or not those changes would
12 have resulted in costs that would have been lower or higher than the Company's
13 current cost estimates. It is a completely hypothetical analysis that not only
14 depends upon what changes they would have made but how they would have
15 designed new units and addressed old units back in that earlier time period.
16 Again, one can't use today's 20/20 hindsight to know precisely what changes
17 would have been implemented based only on knowledge from over three
18 decades ago. If old ponds continued to be used for some waste streams, they
19 would have remained open and potentially impacted groundwater. If old ponds
20 closed with liquid in place, they could have potentially impacted groundwater.
21 If new landfills were built in the early 1980s, it is likely they would have been
22 constructed without synthetic liners. Thus, because this type of analysis is
23 fraught with assumptions, its conclusions have limited value.

1 **Q. FOR BACKGROUND PURPOSES, WOULD IT BE USEFUL TO HAVE**
2 **AN OVERVIEW OF THE HISTORY OF COAL COMBUSTION**
3 **RESIDUALS REGULATION?**

4 A. Yes. The history of CCR regulation is lengthy and complex. Providing an
5 overview of CCR regulation is important to give context to the more detailed
6 opinions presented in my testimony.

7 **Q. PLEASE PROVIDE AN HISTORICAL OVERVIEW OF FEDERAL**
8 **REGULATION OF COAL COMBUSTION RESIDUALS.**

9 A. Because the regulatory history is lengthy and complex, I have organized this
10 section of my testimony topically and chronologically, starting with CCR
11 regulation prior to the passage of RCRA in 1976 and moving forward to the
12 promulgation of EPA's final CCR Rule in 2015.

13 1. Regulation of CCR prior to the passage of RCRA

14 Prior to the passage of RCRA, the regulation of coal ash ponds as well
15 as other industrial waste disposal was exclusively the province of states, not the
16 federal government. Many states, including North Carolina, typically regulated
17 coal ash ponds² under water quality laws, with a particular focus on discharges
18 from the ponds to surface water, such as streams, rivers, and lakes.

19 2. The 1976 RCRA law and early regulations

20 Congress passed RCRA in 1976. The law required EPA to establish a
21 cradle-to-grave federal regulatory program for the management of wastes

² Throughout this report, I use the terms ash or coal ash ponds, ash or coal ash basins, and surface impoundments interchangeably.

1 designated as hazardous as well as a set of minimum national criteria for the
2 protective management of non-hazardous, “solid wastes.” While the details of
3 the hazardous waste program were to be specified by EPA, the details of
4 implementing the non-hazardous waste program was left to the states.

5 a. Regulation of CCR as a hazardous waste under RCRA

6 A critical component of the RCRA regulatory program was designating
7 which wastes would be considered hazardous and therefore subject to new
8 stringent cradle-to-grave regulations. The law provided considerable flexibility
9 to EPA in designing both this classification system and the regulations for those
10 entities managing hazardous wastes.

11 EPA issued the first set of proposed RCRA regulations in late 1978.³ In
12 that proposal, EPA established the basic framework that, while greatly expanded
13 over the years, generally remains in place today. EPA utilized a two-prong
14 approach to identify which wastes would classify as hazardous. First, EPA
15 identified specific types of wastes as hazardous and listed those, by narrative
16 definition, in the regulations (“listed wastes”). Some of the listed wastes are
17 industry-specific while others are common across industries or are chemical-
18 specific. For the remaining wastes, generators are required to determine if their
19 waste meets one of four characteristics (toxicity, reactivity, corrosivity, or
20 ignitability) at the point of waste generation. If the waste meets any one of these
21 characteristics, it is classified as hazardous. EPA also proposed detailed
22 regulations governing the handling of hazardous wastes by generators,

³ 43 Federal Register 58946 (December 18, 1978).

1 transporters, and by facilities accepting wastes for treatment, storage, or
2 disposal and, in some circumstances, for recycling.

3 In the 1978 proposed regulations, EPA did not “list” CCR as a hazardous
4 waste, but it did not exempt CCR from regulation either. CCR, therefore, could
5 be classified as hazardous if it met one of the four general characteristics.
6 However, EPA at the time recognized that the regulations it was proposing for
7 hazardous waste disposal facilities would not make sense for certain large
8 volume wastes including CCR. EPA stated the following in the preamble to its
9 1978 proposed regulations:

10 The Agency has very little information on the composition,
11 characteristics, and the degree of hazard posed by these wastes,
12 nor does the Agency yet have data on the effectiveness of
13 current or potential waste management technologies or
14 economic practicability of imposing ... [the proposed
15 standards for hazardous waste facilities] on facilities managing
16 such waste.

17 The limited information the Agency does have indicates that
18 such waste occurs in very large volumes, that the potential
19 hazards posed by the waste are relatively low, and that the
20 waste generally is not amenable to the control techniques
21 developed in ... [the proposed standards for hazardous waste
22 facilities].⁴

23 Consequently, EPA designated CCR and other similar large volume wastes as
24 “special wastes” and proposed a more limited set of regulations for these
25 wastes.

26 In the final rule issued in May 1980, however, EPA excluded CCR from
27 the hazardous waste regulations, pointing to legislation Congress was

⁴ 43 Federal Register 58946, 58991 (December 18, 1978).

1 considering that would likely repeal or suspend EPA's authority to regulate
2 these wastes without further study.⁵ Indeed, Congress did amend RCRA later
3 that year, exempting large volume wastes generated from combustion of coal or
4 other fossil fuels and requiring EPA to conduct "a detailed and comprehensive
5 study and submit a report on the adverse effects on human health and the
6 environment, if any, of the disposal and utilization of fly ash waste, bottom ash
7 waste, slag waste, flue gas emission control waste, and other byproduct
8 materials generated primarily from the combustion of coal or other fossil
9 fuels."⁶

10 Congress gave EPA two years from the date of enactment of the
11 amendments to complete the study and six months after submitting the study to
12 make a determination on whether to regulate CCR as a hazardous waste based
13 on the results of the study. In 1984, Congress amended the RCRA law again
14 and added a provision allowing EPA, if it decided to regulate wastes from fossil
15 fuel combustion under the hazardous waste regulations, to take into account the
16 special characteristics of the waste and tailor or modify the regulations
17 accordingly as long as the regulations were protective.⁷

⁵ See 45 Federal Register 33153, 33175 (May 19, 1980) for a discussion of this exclusion. At the time EPA finalized this regulation, both the House and Senate were moving forward with legislation to delay any classification of CCR as hazardous waste.

⁶ Public Law 96-482 (October 21, 1980).

⁷ Public Law 98-616 (November 8, 1984). The amendment added a new subsection (x) to Section 3004 of the law as follows: "If (1) solid waste from the extraction, beneficiation or processing of ores and minerals, including phosphate rock and overburden from the mining of uranium, (2) fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels, or (3) cement kiln dust waste, is subject to regulation under this subtitle, the Administrator is authorized to modify the requirements of subsection (c), (d), (e), (f), (g), (o), and (u) and section 3005(j), in the case of landfills or surface impoundments receiving such solid waste, to take into account the special characteristics of such wastes, the practical difficulties associated

1 b. Regulation of CCR as solid waste under RCRA

2 Under RCRA, Congress assigned the primary responsibility for
3 regulating non-hazardous waste facilities to the states. However, Congress also
4 banned the existence of “open dumps,” and required EPA to issue criteria for
5 determining whether or not a solid waste facility classified as an “open dump.”
6 To ensure open dumps were closed or upgraded in a timely manner, Congress
7 allowed citizens to file lawsuits against persons engaged in the act of open
8 dumping if those facilities were not subject to, and complying with, state-issued
9 compliance orders designed to upgrade any facility that classified as an open
10 dump.

11 EPA finalized minimum protective criteria for solid waste facilities in
12 September 1979 and they were effective October 15, 1979.⁸ The criteria
13 addressed the following eight topics, providing descriptions of practices that
14 were considered necessary to achieve environmental protection: (1)
15 floodplains, (2) endangered species, (3) surface water, (4) groundwater beyond
16 the facility boundary currently used or potentially used for drinking water, (5)
17 application to land used for the production of food-chain crops, (6) disease, (7)
18 air, and (8) safety. These criteria were applicable to both municipal and non-
19 municipal non-hazardous waste disposal units, including all types of units that
20 accepted CCR.

with implementation of such requirements, and site-specific characteristics, including but not limited to the climate, geology, hydrology and soil chemistry at the site, so long as such modified requirements assure protection of human health and the environment.”

⁸ 44 Federal Register 53438 (September 13, 1979).

1 2. The 1988 CCR Report to Congress and EPA's decision that CCR does
2 not warrant regulation as a hazardous waste

3 Even though it was required to issue the study within two years of the
4 1980 RCRA amendments, EPA did not complete the required report to Congress
5 on the regulation of CCR as a hazardous waste until February 1988.⁹ The report
6 concluded that most previous studies of coal combustion wastes found they do
7 not meet any of the four hazardous waste characteristics. The report also found
8 that while there were some observed instances of groundwater contamination
9 above primary drinking water standards downgradient of sites where coal
10 combustion wastes were managed, it was not always possible to connect the
11 presence of CCR to these exceedances. EPA also concluded that "the actual
12 potential for exposure to human and ecological populations is likely to be
13 limited, however, since ground water in the vicinity of utility waste disposal
14 sites is not typically used for drinking water; the concentrations of contaminants
15 in the ground water also tend to be diluted in nearby surface water bodies."¹⁰

16 EPA reached these conclusions with the understanding that the current
17 management of CCR in surface impoundments rarely included the use of liners
18 or leachate collection and that most facilities managing CCR did not have

⁹ U.S. Environmental Protection Agency, Report to Congress: Wastes from the Combustion of Coal by Electric Utility Power Plants (February 1988) (hereinafter "1988 CCR Report to Congress"). This report only covered combustion wastes from coal-fired power plants. A separate report on combustion wastes from utility and non-utility facilities combusting other fossil fuels was not issued until 1999 (U.S. Environmental Protection Agency, Report to Congress: Wastes from the Combustion of Fossil Fuels (March 1999)).

¹⁰ 1988 CCR Report to Congress, p. ES-5. Chapter 7 of the same report expanded this discussion including: "Groundwater contamination does not appear to be widespread;" "When groundwater contamination does occur, the magnitude of the exceedance is generally not large;" "Human populations are generally not directly exposed to the groundwater in the vicinity of utility coal combustion waste management sites."

1 groundwater monitoring. The report found that 80 percent of CCR was disposed
2 on the land (i.e., in surface impoundments, landfills, or other land-based
3 units).¹¹ Of the 483 surface impoundments in use at the time, only 45 were
4 known to be lined while 303 were unlined and the liner status of 135 were
5 unknown.¹² In EPA's Region IV, which includes North Carolina, only 3 of the
6 195 surface impoundments were lined, while 153 were unlined and the liner
7 status of 39 were unknown.¹³ Whether the liners in use at the time were clay or
8 synthetic was not known to EPA.

9 In the February 1988 CCR Report to Congress, EPA stated its intent not
10 to regulate coal combustion wastes from electric utilities under the RCRA
11 hazardous waste regulations. EPA concluded that "*current waste management*
12 *practices appear to be adequate for protecting human health and the*
13 *environment.*"¹⁴ (Emphasis added) While EPA was required to issue a decision
14 on whether to regulate CCR as a hazardous waste six months after submitting
15 the report, EPA did not formalize this decision until 1993, noting in the
16 preamble that it did not publish this determination by the statutory deadline
17 "because of other priorities."¹⁵ In finalizing this decision, EPA relied on both

¹¹ 1988 CCR Report to Congress, p. 4-10.

¹² 1988 CCR Report to Congress, Exhibit 4-6.

¹³ 1988 CCR Report to Congress, Exhibit 4-6.

¹⁴ 1988 CCR Report to Congress, p. 7-11.

¹⁵ 58 Federal Register 42466, 42467 (August 9, 1993). EPA issued a similar decision for other fossil fuel combustion wastes on May 22, 2000 (65 Federal Register 32214). I note that the "other priorities" were the over 70 individual rulemaking deadlines that Congress had imposed on EPA between 1985 and the very early 1990s.

1 the information in the February 1988 CCR Report to Congress as well as
2 additional information it collected after that report was issued. EPA stated that
3 regulating CCR as a hazardous waste was unwarranted because “of the limited
4 risk posed by them [CCR] and the existence of generally adequate State and
5 Federal regulatory programs. The Agency also believes that the potential
6 damage from these wastes is often most determined by site- or region-specific
7 factors and that the current State approach to regulation is thus appropriate.”¹⁶

8 In 2000 EPA issued a similar decision for other combustion wastes (i.e.,
9 oil and natural gas combustion wastes, non-utility coal combustion wastes)
10 determining that such wastes did not warrant regulation under the hazardous
11 waste regulatory framework.¹⁷ In that decision, EPA also revisited the issue of
12 coal combustion wastes (at both utilities and non-utilities), and announced its
13 intention to develop national regulations under RCRA Subtitle D, the non-
14 hazardous RCRA program, when CCR is disposed in landfills or surface
15 impoundments. EPA noted in the preamble that public comments and other
16 analyses, including the variability in state programs, had made it reconsider the
17 need for national regulations. It noted that while improvements had been made
18 to the management of CCR and in state regulatory programs, there was evidence
19 that adequate controls may not be in place and pointed to the fact that 62 percent
20 of existing utility surface impoundments do not have groundwater monitoring.
21 EPA also noted, however, that “some waste management units may not warrant

¹⁶ 58 Federal Register 42466 (August 9, 1993).

¹⁷ 65 Federal Register 32214 (May 22, 2000).

1 liners and/or groundwater monitoring, depending on site-specific
2 characteristics.”¹⁸

3 3. The 2010 proposed federal CCR Rule

4 After announcing its intent to develop national regulations for CCR
5 disposed in landfills and surface impoundments under the federal non-
6 hazardous waste program, EPA initiated the regulatory development process by
7 collecting additional information on CCR that would inform its rulemaking. In
8 2007, EPA made some of that information available to the public in a formal
9 Notice of Data Availability.¹⁹ The information included:

- 10 • A joint EPA-U.S. Department of Energy report on CCR management
11 practices in landfills and surface impoundments constructed or expanded
12 between 1994 to 2004;²⁰
- 13 • A draft risk assessment on CCR managed in landfills and surface
14 impoundments;²¹
- 15 • A report on CCR damage cases;²²

¹⁸ 65 Federal Register 32214, 32216 (May 22, 2000).

¹⁹ 72 Federal Register 57572 (October 10, 2007).

²⁰ U.S. Environmental Protection Agency and U.S. Department of Energy, Coal Combustion Waste Management at Landfills and Surface Impoundments, 1994-2004 (August 2006). This report evaluated surface CCR surface impoundments and landfills built or expanded from 1994 to 2004. Among its findings were that almost all new surface impoundments and landfills have liners.

²¹ RTI, Human and Ecological Risk Assessment of Coal Combustion Wastes – Draft, prepared for the U.S. Environmental Protection Agency (August 6, 2007)

²² U.S. Environmental Protection Agency, Coal Combustion Waste Damage Case Assessments (July 9, 2007). This report documented 24 “proven” cases in which CCR management resulted in damage, sixteen of which were damage to groundwater and eight were damage to surface water. Of the groundwater damage cases, five were from unlined surface impoundments while the others were from either landfills or unlined sand and gravel pits. EPA also identified another 43 cases that were determined to be “potential damages” to groundwater or surface water.

- 1 • An action plan by the electrical utility industry for the management of
- 2 CCR;²³ and
- 3 • A proposal by a number of citizen's groups on a national regulation for
- 4 CCR.²⁴

5 Finally, in 2010 EPA issued a proposed rule for the national regulation
6 of CCR. In the proposed rule, EPA offered three different options for a final
7 regulation:

- 8 1. Even though EPA had previously announced its intent to regulate CCR
9 under the non-hazardous waste program, EPA included the option of
10 regulating CCR as a "special waste" under Subtitle C, the hazardous waste
11 regulations. Under this option, generators of CCR would be subject to
12 stringent controls on the storage and handling of CCR. Surface
13 impoundments and landfills accepting CCR would be subject to similar
14 requirements to hazardous waste facilities with some slight modifications
15 (e.g., composite liners instead of double liners).
- 16 2. EPA also proposed tailored regulations for the disposal of CCR under
17 RCRA Subtitle D, the non-hazardous waste regulations. Under this
18 proposal, CCR generators would not be subject to storage and handling

²³ Utility Solid Waste Activities Group, Utility Industry Action Plan for the Management of Coal Combustion Products (October 2006). The action plan represented a voluntary initiative by the utility industry and included establishing groundwater performance standards and a groundwater monitoring program and location restrictions on the placement of CCR in sand and gravel pits.

²⁴ Earthjustice et al., Proposal of the Federal Regulation of Coal Combustion Waste (January 31, 2007). The proposal included a ban on the construction of any new CCR disposal in surface impoundments and the closing of all existing surface impoundments within two years. It also included provisions addressing (1) location restrictions; (2) design criteria for new landfills similar to those for municipal solid waste landfills, (3) requirements for groundwater monitoring and corrective action; (4) closure and post-closure care requirements; and (5) financial assurance requirements.

1 requirements, but landfills and surface impoundments would require
2 composite liners and groundwater monitoring and would be subject to
3 closure and post-closure requirements. Existing surface impoundments
4 without liners would have to retrofit within five years or close.

- 5 3. The third option, which EPA referred to as “D prime” was the same as the
6 Subtitle D option but existing surface impoundments would not be required
7 to close or install composite liners but could continue to operate for their
8 useful life.

9 Note that the first option, regulation under Subtitle C, would be a federally
10 enforceable national regulation. The two options under Subtitle D would be
11 issued as federal criteria. Under RCRA, EPA cannot enforce the Subtitle D non-
12 hazardous waste federal criteria directly, but the expectation was states would
13 adopt the criteria in their regulations and provide enforcement as part of their
14 non-hazardous waste programs.²⁵

15 Finally, in addition to these three options, EPA also requested comment
16 on other approaches – including essentially a no action approach in which CCR
17 would continue to be regulated at the state level under existing authority.²⁶

- 18 4. The 2015 final federal CCR Rule and subsequent litigation and
19 amendments

²⁵ In addition, the Subtitle D criteria could be indirectly enforced by EPA using its general authority to abate conditions that “may present an imminent and substantial endangerment to health or the environment” under section 7003 of RCRA. In addition, states and citizens can enforce using the citizen suit provision of section 7002 of RCRA.

²⁶ 75 Federal Register 35128, 35223 (June 21, 2010).

1 EPA published its final CCR rule on April 17, 2015.²⁷ The final rule
2 established national criteria under the non-hazardous Subtitle D program. It
3 required all new surface impoundments to have composite liners. The rule
4 allowed existing surface impoundments to continue to operate without a
5 composite liner if they met certain location standards, demonstrated through
6 groundwater monitoring that specified constituents were not in the groundwater
7 above groundwater protection standards,²⁸ and met structural stability
8 requirements. Therefore, the final rule allowed a subset of surface
9 impoundments without liners to continue to operate.

10 The final rule also required the installation of groundwater monitoring
11 systems and mandated corrective action to clean up contamination above
12 groundwater protection standards caused by a CCR unit. The rule included
13 closure and post-closure requirements specifying the steps and timeframes and
14 options for completing the closure of a surface impoundment, or other unit, and
15 for monitoring following closure. As noted above, under the rule, closure can
16 be triggered if a surface impoundment cannot meet the location criteria or
17 structural integrity standards. The final rule also required an unlined surface
18 impoundment to close if contamination above groundwater protection standards
19 is detected. Inactive surface impoundments at active sites (i.e., impoundments

²⁷ 80 Federal Register 21302 (April 17, 2015).

²⁸ The set of constituents covered by the groundwater monitoring requirement are listed in Appendix III and IV of 40 CFR Part 257. The groundwater protection standard is the MCL or background, whichever is higher. Constituents without MCLs are evaluated against background. I note that some compounds in North Carolina's 2L standards were not included in these appendices including manganese, iron, and zinc.

1 not receiving CCR after the effective date of the CCR rule but containing
2 liquids) are also subject to the closure requirements unless dewatering and
3 capping of the impoundment occurs within three years of the rule.

4 Both environmental and industry groups immediately challenged the
5 final rule. Among other items, environmental groups challenged the provision
6 allowing unlined surface impoundments to continue to operate as well as the
7 exemption from the closure requirements for inactive surface impoundments if
8 they dewater and cap within three years. Industry groups challenged EPA's
9 authority to regulate inactive impoundments at all. Environmental petitioners
10 further challenged EPA's failure to regulate legacy impoundments (i.e., inactive
11 impoundments at inactive sites). Settlement was reached on certain items and
12 the DC Court of Appeals granted EPA's request to modify the regulation to
13 address these settled issues.²⁹ EPA proposed amendments to the final CCR rule
14 on March 15, 2018, addressing the settled issues as well as other items.³⁰ EPA
15 finalized some of these amendments on July 30, 2018.³¹

16 The court reached a decision on the remaining challenges to the CCR
17 rule on August 21, 2018.³² The court vacated the provision allowing unlined
18 surface impoundments that meet certain criteria to continue to operate, the
19 exemption of legacy impoundments from rule applicability, and the
20 classification of unlined impoundments with two feet of compacted clay as

²⁹ Utility Solid Waste Activities Group, et al., v. Environmental Protection Agency (June 14, 2016).

³⁰ 83 Federal Register 11584 (March 15, 2018).

³¹ 83 Federal Register 36435 (July 30, 2018).

³² Utility Solid Waste Activities Group, et al., v. Environmental Protection Agency (August 21, 2018).

1 “lined” units. Since that decision, EPA has issued two proposed rules to both
2 address items stemming from the court decision and to make other changes to
3 the requirements.³³

4 **Q. ARE THERE OTHER FEDERAL LAWS OR REGULATIONS (OR**
5 **PROPOSED REGULATIONS) THAT IMPACT CCR MANAGEMENT?**

6 A. Yes. Two in particular merit consideration: (1) the Clean Water Act effluent
7 guidelines, and (2) the Water Infrastructure Improvements for the Nation
8 (WIIN) Act.

9 1. Clean Water Act effluent guidelines

10 At the same time EPA was developing regulations for CCR under
11 RCRA, it was also considering revisions to the effluent guidelines for electric
12 utilities under the Clean Water Act. Effluent guidelines establish limits on
13 discharges of wastewater to surface water bodies such as streams, rivers, lakes,
14 or oceans. The effluent guidelines directly affect ash ponds as overflow water
15 is typically discharged from the ponds and is subject to these limits through the
16 imposition of permits.

17 EPA proposed revisions to the effluent guidelines in 2013 and finalized
18 them on November 3, 2015.³⁴ The new guidelines establish a zero-discharge
19 limit for fly ash transport water and bottom ash transport water, the water used
20 to sluice ash into ash ponds, and for flue gas desulfurization wastewater. As
21 some discharge is inevitable in a wet system, the zero-discharge limit essentially

³³ 84 Federal Register 40353 (August 14, 2019), 84 Federal Register 65941 (December 2, 2019).

³⁴ 78 Federal Register 34432 (June 7, 2013); 80 Federal Register 67838 (November 3, 2015).

1 mandates that utilities switch to dry ash handling systems. The new effluent
2 limitations are imposed when a facility renews its NPDES permit under the
3 Clean Water Act. Under the 2015 final rule, the zero-discharge limits could go
4 into effect at a facility any time between November 1, 2018 and December 31,
5 2023.

6 Various groups filed petitions to have EPA review and reconsider the
7 2015 rule. In response, EPA extended the deadlines for compliance with the
8 limitations and then, on November 22, 2019, proposed to amend the 2015
9 regulations.³⁵ The 2019 proposal, which has yet to be finalized, would remove
10 the zero-discharge requirement for bottom ash transport water and flue gas
11 desulfurization wastewater.

12 2. Water Infrastructure Improvements for the Nation Act

13 On December 16, 2016, Congress passed the WIIN Act. The Act
14 included provisions that modify the Solid Waste Disposal Act and RCRA,
15 requiring that the coal ash regulations be implemented through a permit
16 program.³⁶ The provision requires states to demonstrate they have a program
17 that is at least as protective as the federal CCR rule and a permit program to
18 implement the rule in order to receive federal approval to implement the
19 program in lieu of EPA. The law also requires EPA, if appropriations are
20 available, to implement a federal permit program in a state that does not apply
21 for EPA approval.

³⁵ 84 Federal Register 64620 (November 22, 2019).

³⁶ Public Law 114-322 (December 16, 2016).

1 **Q. DID YOU ALSO CONSIDER NORTH CAROLINA LAWS AND**
2 **REGULATIONS IN YOUR REVIEW OF THE HISTORICAL**
3 **CONTEXT OF CCR REGULATION?**

4 **A. Yes. In particular, I considered North Carolina's Coal Ash Management Act**
5 **(CAMA) and its 2L groundwater regulations, as follows:**

6 1. CAMA, as amended

7 In 2014, the North Carolina General Assembly passed CAMA.³⁷ The
8 law required all facilities to convert to dry fly ash management by December
9 31, 2018 and dry bottom ash management by December 31, 2019. It also
10 required that a groundwater assessment be conducted at each facility with a coal
11 ash surface impoundment. CAMA also required the North Carolina Department
12 of Environmental Quality (DEQ), to classify all coal ash surface impoundments
13 in the state not deemed "high-priority" by the General Assembly³⁸ as either
14 high-, intermediate-, or low-risk and specified closure dates for impoundments
15 in each risk category (2019 for high-risk, 2024 for intermediate-risk, and 2029
16 for low-risk).³⁹ The law requires the submittal of a site-specific plan to DEQ
17 for approval and provides several options for how each category of
18 impoundments can be closed. The law also provides that in approving closure,

³⁷ Coal Ash Management Act of 2014, Session Law 2014-122.

³⁸ Section 3. (b) of CAMA deemed the CCR surface impoundments at four sites as high-priority and mandated their closure by August 1, 2019.

³⁹ I have used DEQ in this testimony to refer to the North Carolina Department of Environmental Quality, including its predecessor agencies such as the North Carolina Department of Environment and Natural Resources.

1 DEQ “may require implementation of any other measure it deems necessary to
2 protect health, safety and welfare; the environment; and natural resources”⁴⁰

3 CAMA was amended in 2016. The amendments extended the deadlines
4 for submitting site-specific closure plans and allowed closure for some
5 impoundments to occur in accordance with the federal closure requirements
6 promulgated by EPA in 2015. The amendments also modified the criteria under
7 which DEQ would classify impoundments as high-, intermediate-, or low-risk.

8 2. North Carolina groundwater classification and standards (“2L
9 standards”)

10 In the early 1980s, North Carolina adopted regulations for classifying
11 different waters of the state and establishing groundwater standards for different
12 classifications.⁴¹ Over time, the regulations also instituted requirements to
13 address contamination through corrective action when the contamination is
14 found to be sourced from the CCR management unit and to exceed the
15 groundwater standards at the compliance boundary. The regulations and
16 standards have been amended several times, expanding the number of
17 constituents covered by the regulations as well as the associated chemical-
18 specific standards.

⁴⁰ North Carolina General Statutes, Part 21, Article 9, § 130A-309.214(a)(3)(b).

⁴¹ 15A NCAC 02L.0100. The law requiring the development of these standards was passed in 1979.

1 **Q. WITH THIS HISTORICAL CONTEXT IN MIND, HAVE YOU COME**
2 **TO ANY CONCLUSIONS REGARDING CCR REGULATION AND**
3 **THE COMPANY’S ACTIVITIES IN CONNECTION WITH CCR?**

4 **A. Yes. As noted above in the overview of my testimony, I have come to a number**
5 **of conclusions, as follows:**

6 First, under the federal regulatory process governed by the
7 Administrative Procedure Act, it is difficult to predict the exact nature of future
8 regulatory requirements until a final rule has been issued. Even then, for any
9 given regulation, additional uncertainty can remain as to the costs of rule
10 compliance although regulated entities must move forward at that point to
11 implement rule requirements.

12 Second, in North Carolina, owners and operators of coal ash basins
13 faced significant uncertainty regarding the regulatory requirements for
14 managing CCR until the passage of CAMA and the promulgation of EPA’s final
15 CCR Rule. Even after CAMA/CCR Rule became law, uncertainty remained as
16 to the exact methods, timeframe, and costs associated with the closure of ash
17 ponds until site-specific clarity was obtained from implementing regulators (in
18 North Carolina, the DEQ). Site-specific clarity for the Company was not
19 achieved until court approval of the settlement of the Company’s challenge to
20 DEQ’s April 2019 direction that CCR in all of the Company’s ash basins be
21 excavated and landfilled. Approval of this settlement occurred on February 5,
22 2020.

1 Third, in light of these uncertainties, owners and operators of coal ash
2 ponds were acting prudently by waiting until after CAMA and the CCR Rule
3 became law to take specific actions to upgrade or close ash ponds as long as
4 they were working cooperatively with environmental officials to address any
5 site-specific environmental issues.

6 Fourth, prior to the enactment of CAMA and promulgation of the final
7 CCR Rule, an accurate estimate of the costs associated with ash pond closure
8 (even assuming that closure would have been required) would have been
9 extremely difficult with a high likelihood for significant over- or under-
10 estimation. Even with those regulations, fully known and measurable estimates
11 required completion of recently finalized site-specific closure agreements.

12 In the remainder of my testimony I provide detailed support and reasons
13 for my opinions.

14 **Q. PLEASE PROVIDE ADDITIONAL DETAIL FOR YOUR OPINION**
15 **RELATING TO REGULATORY UNCERTAINTY UNTIL A FINAL**
16 **RULE IS ISSUED.**

17 A. Under many of the major federal environmental statutes utilized for CCR,
18 including RCRA and the Clean Water Act, Congress establish a decision
19 framework and objectives for addressing a particular environmental concern,
20 directing EPA to promulgate the specific implementing regulations and often
21 allowing EPA considerable leeway in determining the level and nature of the

1 controls required to achieve the statutory objectives.⁴² Therefore, the passage
2 of a federal statute often provides only limited information on what an eventual
3 regulation will mandate.

4 The regulatory development process EPA must follow is governed by
5 the Administrative Procedures Act (APA).⁴³ The APA requires federal agencies,
6 such as EPA, to keep the public informed concerning its “organization,
7 procedures, and rules” and to provide for public participation in the rulemaking
8 process. While there are several options for promulgating rules under the APA,
9 the most common is the notice-and-comment procedure, which requires an
10 initial notice of a proposed rulemaking (i.e., a proposed rule) that informs the
11 public of the intention to develop a rule, the legal authority to do so, the
12 substance of the proposal, and the Agency’s support for the proposal.⁴⁴ EPA
13 must then allow the public adequate time to provide any comments, data, or
14 other information relevant to the rule and this information must be considered
15 by EPA before publishing a final rule. In promulgating a final rule, EPA must

⁴² While many federal statutes provide such broad leeway to EPA, others are more prescriptive. For example, the coal ash related provisions in the WINN are an example of more prescriptive statutory provisions that provided Congressional input on how EPA’s CCR regulation, recently promulgated, would be implemented and enforced.

⁴³ Public Law 79-404 (1946).

⁴⁴ In order to ensure that it meets its obligations to keep the public informed during the rulemaking process, EPA will also often publish and Advance Notices of Proposed Rulemaking (ANPRM) prior to publishing a proposed rule to inform the public of its intention to initiate a rulemaking process. In addition, EPA will often inform the public of new data it has collected or received relevant to a rulemaking in a Notice of Data Availability published in the Federal Register.

1 consider and respond to the significant comments submitted on the proposed
2 rule.⁴⁵

3 The APA also provides a framework for the judicial review of a final
4 regulation. Under the APA, a court can find unlawful, or set aside, a final rule
5 for several reasons.⁴⁶ Among these reasons are finding the rule “arbitrary and
6 capricious,” a broad standard providing that courts determine if the federal
7 agency considered the relevant factors when issuing a rule. The court can also
8 set aside a final rule if the federal agency did not follow the rulemaking
9 procedures under the APA or if the rule is in excess of statutory jurisdiction, in
10 violation of the constitution, or unwarranted by the evidence or facts.

11 In significant environmental rulemakings involving complex technical
12 issues with major potential administrative and economic impacts, the outcome
13 of the rulemaking process under the APA is inevitably uncertain. This
14 uncertainty is due in part as noted above, to the considerable leeway EPA has
15 under environmental statutes to develop the nature and scope of regulatory
16 content. Frequently, the underlying laws simply do not provide a roadmap on
17 where the final regulation will end up. This uncertainty is compounded by
18 numerous additional factors.

⁴⁵ For a more detailed description of requirements under the APA and subsequent court decisions regarding the APA, see Congressional Research Service, A Brief Overview of Rulemaking and Judicial Review (March 27, 2017).

⁴⁶ 5 U.S.C. §§ 701-706.

1 **Q. PLEASE EXPAND UPON THE FACTORS THAT COMPOUND**
2 **UNCERTAINTY IN PREDICTING THE ULTIMATE SHAPE OF EPA**
3 **REGULATION.**

4 **A.** This is not necessarily an exhaustive list, but I have identified seven such
5 factors:

6 Factor 1: Participation of Diverse Interests

7 Federal regulations are not developed in a vacuum. Various interests are
8 almost always engaged in the process, reviewing and commenting on proposals
9 and providing new information to EPA during the process. These interests
10 typically include, but are not limited to, representatives of the entities being
11 regulated, environmental organizations, state and local governments, and local
12 community organizations. Because of the open nature of the regulatory
13 development process under the APA, EPA must take into consideration input
14 from these parties and this input can change the direction of a regulation. For
15 example, an industry group may provide technical information on the
16 operations of its members that causes EPA to reconsider whether a particular
17 regulatory option is feasible. An interested party may collect and provide
18 environmental data that changes how EPA understands the risk of a particular
19 activity. In addition, states can provide comments asserting that that as written,
20 they will not have the resources to implement the proposed approach in a timely
21 manner. All of this can change the eventual regulatory outcome.

1 Factor 2: The Length and Complexity of the Process

2 From start to finish, developing a new major regulation typically
3 requires years and can sometimes extend over a decade. The process is long
4 because it generally requires EPA to first collect detailed national information
5 to support any proposal. This includes collecting environmental information
6 (e.g., data on pollutants in soil, water, or air), information on instances of
7 environmental harm from the activities to be regulated, information on the
8 industry being regulated including how the regulated entities operate, and
9 information on the set of technical options available to control or prevent
10 pollution. In addition, EPA will often develop complex models to predict the
11 risk associated with existing operations and how that risk might be reduced
12 under various regulatory options as well as complex models to estimate the
13 economic impacts of different regulatory options.⁴⁷

14 The process also typically involves meeting with interested groups or
15 holding public meetings to gather information. Following the issuance of a
16 proposed rule, the drafting of which also requires considerable effort, EPA is
17 required to consider and respond to all significant comments on that proposal
18 from interested parties. This new information must be taken into consideration
19 when drafting a final rule. In the end, this extended process, because of its
20 length, creates additional opportunities for EPA to change the direction of a

⁴⁷ EPA must develop detailed cost information even though the decision framework in the statute may require EPA to base its regulatory decision solely on technology or risk considerations. Cost effectiveness is always relevant among equally acceptable options under any decision framework.

1 regulatory process and end up with an outcome that is quite different from
2 where the Agency started.

3 Factor 3: Collection of New Information

4 As noted above, EPA can receive significant new information
5 throughout the regulatory development process, either information it collected
6 itself or information provided from outside parties. This new information can
7 modify the approach EPA takes to developing a final rule as it can change what
8 is known about risk, technology, costs, and other factors. Depending on the
9 significance of the new information, EPA may issue public notices on the
10 availability of the new information to ensure that all interested rulemaking
11 participants can update their comments.

12 Factor 4: Additional Analyses Required by Executive Orders

13 In addition to adhering to the APA, EPA must also comply with a variety
14 of Executive Orders that have been issued since the early 1970s that require
15 additional analysis and review of proposed regulations before they are made
16 final.⁴⁸ Under these orders, EPA must conduct detailed cost-benefit analyses
17 for all significant rulemakings justifying that the benefits exceed the costs and
18 must also submit rules to the Office of Management and Budget (OMB) for
19 their review before publishing either a proposed or final rule.⁴⁹ These

⁴⁸ See for example Executive Order No. 12866, 58 Federal Register 51735 (October 4, 1993); Executive Order No. 13563, 76 Federal Register 3821 (January 21, 2011).

⁴⁹ Other examples of analyses that EPA is required to perform include, but are not limited to: (1) the economic impact of the rule on small entities pursuant to the Regulatory Flexibility Act, (2) the requirements of the rule with regard to information collection pursuant to the Paperwork Reduction Act, (3) the impact of the rule on state, local, or tribal governments under the Unfunded Mandates Reform Act, (4) Executive Order 13211 that requires an evaluation of the rule on energy supply, distribution, or use, (5) Executive Order 12898 on the rule's conformance with environmental justice executive policy,

1 additional required analyses and the review by OMB can have important
2 impacts on the eventual final rule adopted.⁵⁰

3 Factor 5: Changes in Administration

4 Presidential administrations have different priorities when it comes to
5 environmental regulations. Therefore, a change in administration during an
6 ongoing regulatory development process can materially change the outcome of
7 that process. I witnessed several such changes during my time at the U.S.
8 Environmental Protection Agency and such changes continue to occur
9 following each Presidential cycle.

10 As a recent example, EPA under the Obama administration spent several
11 years developing a detailed proposed rule to impose insurance requirements to
12 fund the cleanup of contamination at mining facilities. The proposed rule was
13 issued in the last week before the Trump administration took office.⁵¹ EPA,
14 under the new administration, reconsidered the need for the proposal and
15 eventually determined the risk did not justify the rule and made a determination
16 not to issue a final rule.⁵²

17 Changes in administration can result in such wholesale decisions to
18 issue or not to issue a rule, and can also result in changes in how stringent a

Executive Order 13045 on the protection of children from environmental health and safety risks, (6) conformance of the rule with the National Technology Transfer and Advancement Act that directs EPA to use certain voluntary consensus standards.

⁵⁰ OMB also has responsibility for considering and addressing interagency impacts as EPA regulations can impact other federal agencies.

⁵¹ 82 Federal Register 3388 (January 11, 2017)

⁵² 83 Federal Register 7556 (February 21, 2018).

1 final rule is—either more or less stringent depending on the new
2 administration’s priorities. Because complex rulemaking processes often take
3 so long, there is a good probability a change of administration will occur during
4 a rulemaking. In addition, a change in administration can also change how a
5 rule is implemented at a site-specific level. For example, a new administration
6 may have different priorities for how a particular regulation will be enforced.

7 Factor 6: Court challenges

8 As noted above, the APA provides a framework for the judicial review
9 of a final regulation, allowing the court to strike down provisions in a final rule
10 for several reasons. Almost all significant environmental rules are immediately
11 challenged in courts, typically by both environmental and industry
12 organizations. These challenges are often successful in remanding or vacating
13 all or part of a rule. Prominent examples of this for major EPA rulemakings,
14 including RCRA rulemakings, include:

- 15 • The 1991 court decision vacating RCRA’s “mixture” and “derived from”
16 rule, finding that EPA did not provide adequate notice of either rule.⁵³
- 17 • The 2014 court decision vacating all of a rule that would allow hazardous
18 waste to be exempt from RCRA regulation when used as a fuel under certain
19 circumstances.⁵⁴

⁵³ Shell Oil Co. v. U.S. Environmental Protection Agency (December 6, 1991). This decision required EPA to re-promulgate the rules and precluded effective enforcement of the rule prior to the date of the new regulation.

⁵⁴ Natural Resources Defense Council and Sierra Club v. EPA (June 27, 2014).

- 1 • The 2017 court decision vacating certain provisions of a RCRA rule that
- 2 were found to exceed EPA's authority to regulate hazardous waste
- 3 recycling.⁵⁵
- 4 • The 2017 court decision recently vacating EPA's Significant New
- 5 Alternatives Policy (SNAP) rule, finding that EPA lacked authority to
- 6 regulate HFCs that were used as replacements for ozone-depleting
- 7 substances.⁵⁶

8 Therefore, while a regulated entity must plan for complying with a final

9 rule after it is promulgated, there still remains uncertainty regarding the extent

10 to which a final rule will stand until these challenges are decided. In addition,

11 if a particular rule or provision is remanded or vacated, EPA will often initiate

12 the regulatory process again and develop a new proposal for response and

13 comment, to address the remanded or vacated provisions. The judicial review

14 process continues to create considerable uncertainty, although once the rule is

15 final, regulated entities are required to move forward with compliance.⁵⁷

16 Factor 7: Federal/State interface

17 Congress established the RCRA regulatory framework, as well as other

18 federal programs such as the Clean Water Act, as federal-state partnerships and

⁵⁵ API v. U.S. Environmental Protection Agency, Docket No. 09-1038 (July 7, 2017). This decision struck down portions of EPA's 2015 Definition of Solid Waste Rule, including one of the factors EPA proposed to distinguish between "legitimate recycling" and "sham recycling." It also struck down requirements EPA imposed on recyclers of hazardous secondary materials.

⁵⁶ Mexichem Flour, Inc., v. U.S. Environmental Protection Agency, Docket 15-1328 (August 8, 2017).

⁵⁷ This same circumstance exists when after finalizing a regulation, EPA decides to make modifications to that regulation based on a petition or any number of other reasons. Once final, regulated entities must comply with a rule until such time it is modified.

1 this creates uncertainty on how and when a federal regulation will be adopted
2 and implemented at the state level. Under this framework of cooperative
3 federalism, once EPA issues a rule, states can be the primary implementer and
4 enforcer of the regulation if they develop state regulations that are no less
5 stringent than the federal regulations and their program is approved by EPA.
6 Importantly, the federal framework allows states to develop regulations that are
7 either more stringent and/or broader in scope than federal regulations. Many
8 states will use the federal regulation as a starting point and make changes or
9 modification to the regulation before promulgating a state regulation.⁵⁸ So a
10 regulated entity in a particular state may not know the exact requirements that
11 it will have to comply with until the state has issued the companion regulations
12 and been approved by EPA to implement them.⁵⁹

13 **Q. DOES THE PROMULGATION OF A RULE BRING AN END TO**
14 **REGULATORY UNCERTAINTY?**

15 A. Not always. While some regulations are straightforward and self-implementing,
16 others may allow for a range of regulatory approaches depending on site-
17 specific conditions. Regulations also may be implemented through the issuance
18 of site-specific permits or agreements and permitting authorities are often
19 granted leeway to impose additional requirements beyond what is in the

⁵⁸ Some states, including North Carolina, have statutes that preclude them from implementing state RCRA regulations that are more stringent than the companion federal regulations.

⁵⁹ Note that there are situations under RCRA where both federal regulations and state regulations on the same topic may be enforceable. One example is when a state chooses to adopt regulations but not apply to EPA for authorization to implement the federal RCRA program. This has happened in various states with regard to state underground storage tank requirements. In these cases, regulated entities are subject to both the federal and state regulations.

1 regulations. For example, RCRA provides what is called an “omnibus
2 authority” to permit writers for hazardous waste facilities. This authority
3 explicitly allows permit writers to impose additional site-specific permit
4 conditions into RCRA permits if necessary to protect human health and the
5 environment.⁶⁰

6 **Q. PLEASE SUMMARIZE YOUR THOUGHTS ON REGULATORY**
7 **UNCERTAINTY.**

8 A. Simply put, with respect to complex environmental regulations, it is very
9 difficult to predict the final outcome. While the issuance of a proposed rule may
10 provide some guidance to those being regulated as to the potential scope of a
11 final rule, major changes can and do occur before a final rule is issued. In some
12 cases, a final rule is never issued at all. Major changes to a proposed rule as
13 well as the failure in some cases to finalize a rule are due to many of the factors
14 discussed above—new information, stakeholder comments, OMB reviews,
15 changes in administrations. In addition, EPA sometimes proposes multiple
16 regulatory options in a proposed rule without indicating which option will be
17 selected in the final rule. In those cases, a proposed rule is only a limited guide
18 in understanding a final rule. And even following promulgation, court
19 challenges, the federal/state interface in terms of rule implementation, and site-
20 specific implementation by the implementing authority (often the state) all
21 combine to make the process even more uncertain.

⁶⁰ Section 3005(c)(3) of RCRA, codified at 40 CFR 270.32(b)(2).

1 Ultimately, trying to predict the precise shape, reach, and impact of
2 pending EPA actions is a problematic exercise, where one can easily guess
3 wrong. When significant dollars are at stake, it is reasonable to wait for more
4 certainty.

5 **Q. APPLYING THE CONCEPTS OUTLINED ABOVE, PLEASE**
6 **PROVIDE ADDITIONAL DETAIL FOR YOUR OPINION RELATING**
7 **TO THE UNCERTAINTIES FACED BY OWNERS AND OPERATORS**
8 **OF COAL ASH BASINS IN NORTH CAROLINA PRIOR TO PASSAGE**
9 **OF CAMA AND THE ADOPTION OF THE CCR RULE.**

10 A. For many of the reasons I have described above, electric utilities faced
11 considerable uncertainty as to the future regulation of their ash ponds, including
12 the technical requirements that might be imposed on ponds and whether older
13 ponds would require closure and, if so, what closure would entail.

14 Following the passage of RCRA in 1976, the uncertainty initially
15 centered on whether EPA would regulate CCR under the hazardous waste
16 regulations. That uncertainty was seemingly resolved in 1993 when EPA
17 announced its decision not to do so and its conclusion that existing regulations
18 at the state level were generally adequate. However, the uncertainty re-emerged
19 in 2000 when EPA announced its intent to develop tailored national regulations
20 under the non-hazardous, Subtitle D program.

21 When EPA made this announcement in 2000, there was little guidance
22 on what such national regulations for CCR might look like. EPA's conclusion
23 that some form of national regulation was warranted was based on the fact that

1 under certain conditions, EPA was concerned that CCR could pose risks and
2 that EPA's existing information raised questions as to whether state regulatory
3 programs were sufficiently comprehensive in requiring protective controls on a
4 site-specific basis. The only similar regulations EPA had developed under the
5 Subtitle D program were for municipal solid waste landfills that accepted
6 hazardous waste from exempt generators. These regulations did not address any
7 type of surface impoundments containing solid waste. In addition, the focus on
8 impacts to groundwater covered the same wide range of organics and inorganics
9 that were addressed in EPA's hazardous waste regulations.

10 EPA used its hazardous waste landfill regulations as a starting point for
11 considering which requirements were appropriate for these municipal waste
12 landfills. The information available on ash ponds at the time showed
13 constituents limited to certain inorganics and evidence of damage to the
14 environment was limited. Additionally, in this same general time period, EPA
15 completed a study of non-hazardous waste industrial surface impoundments
16 and found little potential for risk:

17 Specifically, EPA examined the universe of impoundments that
18 manage non-hazardous wastewaters; characterized the
19 pollutants of concern, likely releases, and pathways from these
20 impoundments; and assessed potential risks to human health
21 and the environment. Little risk was found and, such as it is,
22 any risk is not widespread.⁶¹

23 Therefore, at the beginning of the CCR regulatory development process in
24 2000, a utility would have only minimal guidance on the likely outcome.

⁶¹ U.S. Environmental Protection Agency, Industrial Surface Impoundments in the United States (March 2001), p. 5-2 and 5-9.

1 **Q. DID EPA’S ISSUANCE IN 2010 OF A PROPOSED CCR RULE**
2 **ELIMINATE REGULATORY UNCERTAINTY?**

3 A. No. To the contrary, EPA’s issuance of a proposed federal CCR rule in 2010
4 included a range of possible regulatory outcomes and, therefore, did not create
5 any certainty as to the eventual scope or timing of new CCR requirements, and
6 did not remove the uncertainty around the future regulation of ash ponds.

7 The proposed rule offered regulatory options that varied significantly in
8 how they would address existing ash ponds. One of the options would regulate
9 CCR as a special waste under the hazardous Subtitle C regulations (the Subtitle
10 C Option). Existing ash ponds would be required to meet similar requirements
11 to hazardous waste surface impoundments or go through formal closure.
12 Another option would establish standards for ash ponds under the non-
13 hazardous Subtitle D regulations (the Subtitle D Option). Under this option
14 existing ash ponds would also need to meet new technical standards, including
15 composite liners, or close. However, EPA also offered a third option it called
16 “D prime.” This option was the same as the Subtitle D option, except that
17 existing unlined ash ponds would not have to close or install composite liners
18 but could continue to operate for their existing life.⁶² Therefore, the proposal
19 left open whether existing ash ponds would be required to upgrade or close or
20 could continue to operate as is and whether CCR would be regulated as a
21 hazardous waste or as non-hazardous waste.

⁶² 75 Federal Register 35128, 35134 (June 21, 2010).

1 In addition to the D prime option, EPA's proposal offered additional
2 uncertainty as to how existing ash ponds would be regulated. In the preamble,
3 EPA requested comment on another approach where existing surface
4 impoundments would not be phased out, but EPA would establish and fund a
5 program for conducting structural stability assessments for these impoundments
6 if warranted by their U.S. Army Corps of Engineers hazard potential rating.⁶³
7 It also suggested that there was at least a possibility it would not finalize any
8 proposal at all and allow CCR to continue to be regulated at the state level:

9 Some commenters have suggested that EPA not promulgate
10 any standards, whether they be RCRA subtitle C or D, but
11 continue to rely on the states to regulate CCRs under their
12 existing or new state authorities. The Agency solicits comment
13 on such an approach.⁶⁴

14 Accordingly, EPA's 2010 proposal left very much open whether the regulations
15 would force the closure of existing surface impoundments prior to the end of
16 their useful life and, if so, in what timeframe and under what conditions.

17 The proposed regulation also created uncertainty as to the requirements
18 that would be imposed during ash pond closure as well as the requirements for
19 any new unit (landfills, impoundments, or other unit) that might replace a closed
20 ash pond. Under the Subtitle C option, surface impoundments would have to
21 meet the existing closure requirements for hazardous waste impoundments at
22 40 CFR parts 264/265 which requires an approved closure plan or closure
23 permit and specific technical standards such as a permeability requirement for

⁶³ 75 Federal Register 35128, 35210 (June 21, 2010).

⁶⁴ 75 Federal Register 35128, 35223 (June 21, 2010).

1 caps. Under the Subtitle D option, as proposed, a closure permit would not be
2 necessary and the closure standards would allow for either a closure-in-place,
3 where liquids are removed and a final cover system is installed, or a closure by
4 removing CCR from the unit and decontaminating areas affected by past
5 releases when necessary to protect health or the environment.⁶⁵

6 The standards for a new unit (either landfill or surface impoundment)
7 that might replace a closed unit also differed. Both options included siting and
8 location restrictions, but there were differences. The Subtitle D option included
9 additional restrictions (including restrictions related to the proximity to water
10 tables and wetlands) that did not exist under the Subtitle C option. Both options
11 would require the installation of similar composite liner systems, but under the
12 Subtitle D option, EPA indicated it would consider the option of allowing
13 alternative liners that met the same performance standards:

14 In the absence of a strong state oversight mechanism, such as
15 a permit, EPA is reluctant to allow facilities to modify this key
16 protection. Nevertheless, EPA would be interested in receiving
17 data and information that demonstrates whether under other
18 site conditions, an alternative liner would be equally
19 protective.”⁶⁶

20 Similarly, under the Subtitle C option, EPA suggested it was open to considering
21 clay liners as an option:

22 Although EPA has not confirmed damage cases involving the
23 failure of clay liners, it is not proposing to allow new disposal
24 units to be built solely with clay liners. EPA’s modeling in its
25 risk assessment indicated that clay liners could be of concern;
26 EPA also believes that composite liners reflect today’s best
27 practices for new units, and, as such can therefore be feasibly

⁶⁵ 75 Federal Register 35128, 35352 (June 21, 2010).

⁶⁶ 75 Federal Register 35128, 35203 (June 21, 2010).

1 implemented. Nevertheless, EPA solicits comments on
2 whether clay liners should be allowed under EPA's
3 regulations.⁶⁷

4 In addition, the Subtitle C approach would impose a variety of other
5 restrictions, such as land disposal restrictions that require CCR to meet certain
6 treatment standards before being disposed of in a landfill or surface
7 impoundment, regardless of whether the CCR was going into a lined landfill or
8 surface impoundment, as well as standards limiting the storage time for CCR.
9 These land disposal restrictions requirements did not exist under the Subtitle D
10 or D prime option.

11 These differences in the proposed regulatory options—in the standards
12 for existing surface impoundments, for the closure of units, for the siting and
13 standards for units to replace those that close, and in other important areas—
14 left electric utilities with little certainty as to the most likely eventual regulatory
15 outcome. Indeed, given EPA's express invitation for comment on what
16 amounted to a "no action" approach, some possibility existed, even if small, for
17 EPA not to issue any regulation at all.

18 **Q. BEYOND THE VARIOUS OPTIONS FOR COAL ASH MANAGEMENT**
19 **IN THE PROPOSED CCR RULE, ARE THERE OTHER SOURCES OF**
20 **REGULATORY UNCERTAINTY FACED BY ELECTRIC UTILITIES?**

21 **A.** Yes, and particularly in two respects: CCR beneficial use and the development
22 of new effluent guidelines for the electric industry.

⁶⁷ 75 Federal Register 35128, 35175 (June 21, 2010).

1 Beneficial use of CCR includes the reuse of CCR in various
2 applications, including as a raw material in cement manufacturing, in
3 manufacturing wallboard, or as structural fill. Beneficial use can reduce the
4 amount of CCR being stored in ash ponds and can create alternatives to the
5 disposal of CCR during ash pond closure. Since the 1980s, EPA has been a
6 proponent of beneficial coal ash reuse because the practice can reduce the use
7 of virgin resources, lower greenhouse gas emissions, reduce the cost of coal ash
8 disposal, and add improved strength and durability to product materials. Thus,
9 the availability of markets for beneficial reuse was understood to have an
10 important effect on closure costs. In its February 1988 Report to Congress, EPA
11 estimated that approximately 27 percent of all CCR was beneficially used.⁶⁸ In
12 its 2000 regulatory determination, in announcing its intention to develop
13 national criteria for CCR under Subtitle D, EPA concluded that federal
14 regulation was not warranted for beneficial uses, citing the lack of risk
15 information and lack of damage cases and therefore exempted such uses from
16 regulation.⁶⁹

⁶⁸ 1988 CCR Report to Congress, p. 4-45.

⁶⁹ 65 Federal Register 32214, 32221 (May 22, 2000). “The Agency has concluded that no additional regulations are warranted for coal combustion wastes that are used beneficially (other than for minefilling) and for oil and gas combustion wastes. We do not wish to place any unnecessary barriers on the beneficial use of fossil fuel combustion wastes so that they can be used in applications that conserve natural resources and reduce disposal costs.” And, “We support increases in these beneficial uses, such as for additions to cement and concrete products, waste stabilization, and use in construction products such as wallboard.”

1 By 2008 the beneficial use of CCR had grown and the industry
2 estimated 37 percent of CCR was beneficially used in some capacity.⁷⁰
3 However, in its 2010 proposal, EPA hinted that it would consider regulatory
4 restrictions on certain types of beneficial reuse. Specifically, EPA requested
5 comments on whether the exemption from regulation should apply to what it
6 called “unencapsulated uses,” uses of CCR in which the CCR is not bound in
7 some way, such as using as structural fill.⁷¹ It also solicited information on
8 approaches it could take to defining beneficial use in order to describe more
9 clearly which uses would be regulated and which would not. Therefore, the
10 proposal created further uncertainty as to whether and how beneficial use might
11 be regulated. In the final rule, EPA did, in fact, promulgate a definition of
12 beneficial use designed to restrict those uses that would be exempt from CCR
13 regulation and to specifically limit certain unencapsulated uses. However, until
14 EPA completed its analysis as to what constituted beneficial use, the volume of
15 CCR that would require disposal in the future, as well as the options available
16 at ash pond closure, remained uncertain, impacting accurate evaluation of
17 closure alternatives and timeframes.

18 EPA’s effluent guidelines rulemaking created additional uncertainty as
19 it was proceeding in parallel with the CCR rulemaking. EPA first proposed
20 revisions to the effluent guidelines in 2013, after the proposed CCR rule, but

⁷⁰ Congressional Research Service, Managing Coal Combustion Waste (January 12, 2010), p. 18. In the final CCR rule, EPA estimated that as of 2012, the amount of beneficial reuse was approximately 40 percent of CCR generated. (80 Federal Register 21302, 21303, 21309 (April 17, 2015).

⁷¹ 75 Federal Register 35128, 35160 (June 21, 2010). The one exception EPA identified was minefilling, which EPA believed did warrant regulation.

1 before the final CCR rule. The effluent guidelines proposal included several
2 options, some of which would establish zero discharge for both fly ash and
3 bottom ash transport water (i.e., the water used to sluice ash to impoundments),
4 and therefore force the closure of most ash ponds; other options were less
5 stringent.⁷²

6 The proposal also left open the question of the timing of implementation
7 of the new effluent guidelines and how those deadlines might interact with
8 compliance deadlines under the CCR rule.⁷³ EPA also noted in the preamble to
9 the effluent guidelines proposal that it had collected information for the
10 rulemaking that might affect the outcome of the CCR rulemaking:

11 However, it is also possible that the requirements established
12 under a final ELG rule could affect the development of any
13 final CCR rule more broadly. Since the close of the comment
14 period on the CCR rule, EPA has received significant new data
15 obtained from a 2010 Information Collection Request (ICR)
16 conducted by EPA's Office of Water for the development of
17 the ELG [effluent limitations guidelines], which have the
18 potential to affect the risk assessment for the CCR rule.⁷⁴

19 Therefore, the effluent guidelines rulemaking created additional
20 uncertainty as to whether existing ash ponds would be required to close, how
21 the requirements would be coordinated with the CCR rule, and whether the
22 CCR rule would change because of the effluent guidelines rulemaking.

⁷² 78 Federal Register 34432 (June 7, 2013). The proposal included several options for the revised effluent limitations. Under all of the proposals, the zero-discharge limit would have applied to fly ash, while only some of the options would apply a zero-discharge limitation for bottom ash.

⁷³ See 78 Federal Register 34432, 34442 (June 7, 2013) for a discussion of these implementation timing issues.

⁷⁴ 78 Federal Register 34432, 34442 (June 7, 2013).

1 **Q. DID THE ENACTMENT OF CAMA AND PROMULGATION OF THE**
2 **FINAL CCR RULE CREATE CERTAINTY AS TO THE CLOSURE OF**
3 **ASH PONDS AND THE GENERAL PROCESS FOR DOING SO?**

4 A. It did create certainty that closure of unlined ash ponds would be required and
5 that regulated utilities should begin planning for such closure. CAMA required
6 the conversion to a dry ash management system, specified the closure dates for
7 coal ash ponds at four facilities, and established a schedule for the closure of
8 other ash ponds dependent on the risk classification of the ponds by DEQ. In
9 addition, the federal CCR rule, as initially promulgated, mandated the closure
10 of unlined ash ponds that could not meet specified location and other standards.
11 Depending upon the specific ash pond, CAMA or the CCR rule could result in
12 a more stringent closure date. Therefore, while CAMA and the federal CCRA
13 rule did not resolve all regulatory uncertainties regarding the exact timing or
14 requirements for closure, as described in more detail below, they did clarify the
15 need to plan for the closure of ash ponds.

16 **Q. WHAT REGULATORY UNCERTAINTY REMAINED EVEN AFTER**
17 **PASSAGE OF CAMA AND THE CCR RULE?**

18 A. With the passage of CAMA and the final federal CCR regulations, DE
19 Carolinas would understand that existing ash ponds would be required to close.
20 However, the details for closure were still uncertain. Under both CAMA and
21 the CCR rule, as well as the effluent guidelines, the timing of closure for many
22 ash ponds was not certain. Furthermore, the specific requirements for pond

1 closure at a specific location were also not known and would not be determined
2 without site-specific regulatory clarity from DEQ.

3 **Q. PLEASE EXPAND.**

4 A. CAMA provides for several options for the closure of an ash pond, depending
5 on the classification of the pond as either high-, intermediate-, or low-risk. The
6 statute required DEQ to propose classifications of all CCR surface
7 impoundments in the state not already deemed high-priority by the General
8 Assembly in CAMA itself, with the classification due by the end of 2015. The
9 2014 statute included a list of information DEQ was required to consider in
10 making these risk classifications, but these criteria were removed from the
11 statute with the 2016 amendments.⁷⁵ The closure options for a pond classified
12 as either high or intermediate risk are limited and require the removal of all
13 CCR from the pond. The options for closing a low risk pond are more varied
14 and include either the removal of all CCR or closure by capping-in-place.⁷⁶

15 Accordingly, at CAMA's passage, with the exception of the surface
16 impoundments deemed high-priority under the statute, when an ash pond would
17 be required to close and whether it would be required to remove all CCR was
18 uncertain. That uncertainty would not be resolved until DEQ classified the

⁷⁵ § 130A-309.213. In addition, the 2016 amendments directed DEQ to classify all impoundments where an alternative water supply has been established and where the impoundments are in compliance with dam safety requirements to be classified as low-risk; all other remaining impoundments were classified as intermediate-risk (§ 130A-309.213(d)).

⁷⁶ Closure-in-place requires a cap system designed in conformance with state and federal regulations and the maintenance of a leachate collection system, installation and maintenance of a groundwater monitoring system, and establishment of financial insurance to ensure there are sufficient funds to maintain the closed pond and for corrective action, if there are releases from the pond. CAMA also allows low-risk ponds to close in compliance with the federal CCR rule, which also offers the option of either removal of CCR or closure-in-place.

1 remaining surface impoundments as either high, intermediate, or low-risk and
2 then, for those classified as low-risk, made a final determination on which
3 closure option would be selected. Even then, the options available for closure
4 under CAMA, particularly for a surface impoundment classified as low-risk,
5 range significantly in scope and potential cost. The biggest range is between a
6 closure-in-place system, with a cap, and a closure involving the excavation of
7 all CCR. In fact, the timing of closure remained uncertain for low priority ash
8 ponds until a location-specific analysis was performed against the CCR location
9 criteria.

10 On April 1, 2019 DEQ issued an order requiring Duke Energy to
11 excavate coal ash at six plants it has classified as low risk: four DE Carolinas
12 plants (Allen, Belews Creek, Cliffside, Marshall) and two DEP plants (Mayo,
13 and Roxboro). DE Carolinas challenged these orders and on December 31, 2019
14 entered into a settlement agreement with DEQ and community and
15 environmental groups. That settlement agreement required Duke Energy to
16 excavate the majority of the coal ash remaining in the ash ponds, but allowed
17 some coal ash to remain in certain portions of the ash ponds under specified
18 conditions.

1 **Q. IN LIGHT OF THE REGULATORY UNCERTAINTY YOU HAVE**
2 **TESTIFIED TO, IN YOUR OPINION WOULD A COMPANY HAVE**
3 **BEEN ACTING IMPRUDENTLY IN WAITING UNTIL AFTER CAMA**
4 **AND THE CCR RULE BECAME LAW TO TAKE SPECIFIC ACTIONS**
5 **WITH RESPECT TO CCR IN ITS COAL ASH BASINS?**

6 A. No. Companies with ash ponds did not act imprudently by waiting for
7 regulatory clarity as long as they continued to work with regulatory agencies to
8 address any site-specific environmental risks, including structural issues,
9 associated with ash basin operation. EPA had studied this issue since the late
10 1970s, collecting data and continuing to review state regulatory frameworks
11 that had been implemented to address site-specific risks. Had EPA's
12 information supported an unacceptable general risk across the large number of
13 unlined ash ponds, it would have been able to act to finalize requirements much
14 sooner than it did. As I noted previously, even with the issuance of the 2015
15 CCR rule, it did not require the closure of all unlined ash ponds.

16 **Q. WHAT IS THE BASIS OF THIS OPINION?**

17 A. Closing or upgrading an ash basin before issuance of the final requirements
18 could easily lead to actions that would, a relatively short time later when the
19 rules were finalized, be either insufficiently rigorous or overly stringent. In
20 either case, this could lead to expenditures that would be imprudent absent a
21 situation where environmental damage would occur or be exacerbated if the ash
22 pond was not upgraded or closed prior to the deadlines in the final CAMA/CCR
23 rule. For most ash ponds in the United States, that situation did not exist. That

1 is, it was reasonable and prudent to wait until the regulations were final and
2 comply with deadlines in those regulations. Such continued operation without
3 upgrading or closure was consistent with common industry practices and the
4 general and available knowledge about the risk of operating unlined CCR ash
5 basins.

6 EPA has been studying the characteristics, management, and risk of
7 CCR since the passage of RCRA in 1976 and therefore was, and is today, a
8 reliable authority on these matters. EPA's initial study resulted in the 1988 CCR
9 Report to Congress and subsequent 1993 determination not to regulate CCR
10 under RCRA. The Report to Congress did not identify risks from the current
11 management of CCR that warranted additional federal regulation.⁷⁷ As I
12 previously summarized, EPA found that based on most studies, CCR generally
13 did not meet any of the four hazardous waste characteristics and while EPA did
14 note a limited number of instances of groundwater contamination downgradient
15 of CCR sites, they could not always connect these exceedances to the
16 management of CCR. In terms of risk, EPA concluded that "the actual potential
17 for exposure to human and ecological populations is likely to be limited,
18 however, since ground water in the vicinity of utility waste disposal sites is not
19 typically used for drinking water; the concentrations of contaminants in the

⁷⁷ In terms of the CCR management at that time, EPA found that: (1) 80 percent of utilities employed some type of ash pond; (2) there were a total of 483 surface impoundments in the United States, 195 of them in EPA's Region IV, which includes North Carolina; (3) of the 483 surface impoundments in the United States, only 45 were known to have liners—information on whether those were clay or synthetic liners was not available; (4) In Region IV, only three of the 195 surface impoundments were known to have any type of liner at that time. The report also found that approximately 65 percent of all utilities did not have groundwater monitoring (1988 CCR Report to Congress), Chapter 4.

1 ground water also tend to be diluted in nearby surface water bodies.”⁷⁸ EPA’s
2 conclusion was that “current waste management practices appear to be adequate
3 for protecting human health and the environment.”⁷⁹ EPA reached this
4 conclusion even though it understood that current management practices
5 included the vast majority of surface impoundments operating without liners or
6 leachate collection systems. Further, the Report’s conclusions section (Chapter
7 7) states the following: (1) “Groundwater contamination does not appear to be
8 widespread”; (2) “When groundwater contamination does occur, the magnitude
9 of the exceedance is generally not large”; and (3) “Human populations are
10 generally not directly exposed to the groundwater in the vicinity of utility coal
11 combustion waste management sites.”

12 EPA continued to study CCR after the report to Congress, collecting
13 additional information before making its final hazardous/non-hazardous
14 decision. In justifying its decision not to regulate CCR as a hazardous waste,
15 EPA stated that regulating CCR was unwarranted because “of the limited risk
16 posed by ... [CCR] and the existence of generally adequate State and Federal
17 regulatory programs. The Agency also believes that the potential damage from
18 these wastes is often most determined by site- or region-specific factors and that
19 the current State approach to regulation is thus appropriate.”⁸⁰ Consequently,
20 in the absence of site-specific information to the contrary, it is my opinion that

⁷⁸ 1988 CCR Report to Congress, p. ES-5.

⁷⁹ 1988 CCR Report to Congress, p. 7-11.

⁸⁰ 58 Federal Register 42466 (August 9, 1993).

1 it would be reasonable and prudent in this pre-2000 period for an owner of an
2 existing ash pond without liners or without an ongoing groundwater monitoring
3 system to continue to operate the ash pond.

4 When EPA decided to reconsider the federal regulation of CCR in 2000,
5 it initiated additional studies to further evaluate the risk associated with existing
6 CCR management. By 2010, as I have discussed, EPA proposed options for
7 establishing minimum national standards for CCR management. If EPA had the
8 risk and other data necessary to proceed with defensible regulations for CCR
9 management, its rulemaking would have been completed far more quickly than
10 what occurred. For example, if EPA had data showing that a high percentage of
11 unlined ponds resulted in off-property impacts to groundwater above drinking
12 water standards, proceeding with liner requirements for existing ponds would
13 have been straightforward. However, the data did not demonstrate this. As a
14 result, EPA faced challenges in finalizing a defensible RCRA rule without the
15 collection of additional information. Under RCRA, a good and defensible
16 rulemaking needs to find a solution that protects health and the environment
17 without causing regulated parties and the public to incur significant unnecessary
18 costs. In other words, EPA's choice of approach should be among the most cost-
19 effective ways to achieve the necessary protection of health and the
20 environment.

21 While EPA recognized that some ash ponds could result in risks to
22 groundwater or surface water, most operating ash ponds were not known to be
23 resulting in these risks. That included ash ponds that were unlined. In 2000,

1 EPA had identified 14 proven damage cases and 36 “potential” damage cases
2 from CCR disposal in both landfills and ash ponds.⁸¹ This was a very small
3 number compared with the very large number of CCR waste management units.
4 Even as late as 2007, despite EPA’s significant effort to identify and evaluate
5 damage incidents with significant inputs from interested environmental groups,
6 relatively few confirmed damage cases were known. EPA’s 2007 Notice of Data
7 Availability noted 24 damage cases and 43 potential damage cases. With regard
8 to groundwater, seventeen of the damage cases were to groundwater and five or
9 six of those were determined to be from unlined ash ponds. That is against a
10 universe of over 600 ash ponds, the large majority of which were over 25 years
11 old. And, as of 2004, EPA estimated that 62 percent of ash ponds were unlined.
12 Against this number of unlined ash ponds, the number of confirmed pond
13 damage cases to groundwater from these units was quite small.

14 In part to deal with the lack of data on all unlined ponds, EPA performed
15 a groundwater risk assessment in advance of the proposed rule. While this risk
16 assessment predicted groundwater risks outside of EPA’s traditional protective
17 risk range for compounds like arsenic, present in unlined ponds, EPA
18 recognized that there were numerous remaining uncertainties in the ability of
19 this risk assessment to accurately predict these groundwater risks. EPA noted that
20 the current version of its risk assessment was unable to compensate for the
21 location of many ash ponds near surface water bodies, a fact that would

⁸¹ In its 2015 final CCR rule, EPA explained that potential damage cases involved situations where groundwater contamination had been found on the facility property but had not yet been found beyond the facility boundary.

1 potentially reduce the impacts on drinking water sources from any CCR
2 leachate leaving the ponds. EPA also noted that the leach tests it was using as
3 inputs to its risk assessment were highly uncertain in their ability to predict the
4 actual leachability of the mixed CCR streams in ponds and landfills.

5 Thus, based on the extensive evaluation by EPA to quantify the risks of
6 unlined ash ponds at the time of the 2010 proposal, the number of known
7 damage cases was a very small percent of operating ash ponds. However, as of
8 2010, EPA found that 58 percent of ash ponds lacked groundwater monitoring
9 and that many states still did not require groundwater monitoring, a protection
10 EPA concluded “is a minimum for any credible regulatory regime.”⁸² Waiting
11 until EPA finalized its final rule was prudent as long as entities took steps to
12 install groundwater monitoring so that any site-specific risks would be able to
13 be identified and properly evaluated during the time that it took to finalize new
14 CCR rules and obtain a final closure decision for low risk ash ponds under
15 CAMA. Additionally, EPA had performed structural assessments at most ash
16 ponds and to the extent structural deficiencies had been identified, it would have
17 been prudent to proceed to address them without waiting for a final CCR rule.

⁸² 75 Federal Register 35128, 35149 and 35152 (June 21, 2010).

1 **Q. DID YOU SEE ANY EVIDENCE THAT DE CAROLINAS EVALUATED**
2 **WHETHER THE CONTINUED OPERATION OF ITS UNLINED ASH**
3 **PONDS WERE PROTECTIVE OF GROUNDWATER?**

4 A. Yes, I did. DE Carolinas began studying the composition of its coal ash leachate
5 in the late 1970s and early 1980s. It evaluated ash constituents and ash leachate
6 using appropriate and EPA-sanctioned testing methods. It performed, and
7 worked with others to perform, detailed groundwater monitoring studies of its
8 Allen facility ash ponds, starting in 1978 and going through the early 1980s.
9 The Allen facility was selected because it represented the extremes in utilization
10 and reclamation life cycle of Duke's ash basins. The purpose of the study was
11 "to evaluate the performance of Duke's ash basins and their effect on
12 groundwater movement and water quality." The work was intended to allow
13 the prediction of the effects of ash basin leachates on the physical and chemical
14 quality of adjacent groundwater. These studies indicated that groundwater at
15 Allen met EPA's solid waste criteria for protection of groundwater. Detailed
16 analyses were performed on the likely future impact of ash ponds on
17 groundwater in the Piedmont soils of the Allen plant. Some of the key data and
18 conclusions on the Allen plant resulted from a detailed study conducted for EPA
19 by A.D. Little, that examined that facility and five other coal ash site in detail.⁸³

⁸³ The A.D. Little report entitled Full Scale Field Evaluation of Waste Disposal from Coal-Fired Electric Generating Plants was issued in June 1985 with the completion of groundwater data collection by 1983. The Allen facility was one of 6 facilities evaluated. Of significance at the Allen site, A.D. Little concluded that while arsenic was present in the leachate at relatively high concentrations, it was tied up in the Piedmont soils and did not adversely impact groundwater.

1 In December 1984, DE Carolinas summarized the Allen groundwater
2 data, the leachate data from its 8 plants, and information it had collected on
3 Piedmont soils, performing an analysis on the likelihood of groundwater
4 impacts from its unlined ash ponds. This study concluded that none of Duke's
5 ash classified as RCRA hazardous waste. It also concluded that given the nature
6 of Piedmont soils underlying the ash basins and its high ion exchange capacity,
7 Duke's disposal of wet coal ash would have no significant impact on
8 groundwater or surface water that received that groundwater.⁸⁴

9 In 1987, Duke engaged consultants to perform a detailed analysis of the
10 potential for adverse groundwater impacts at its Riverbend facility from ash
11 basins. This analysis was performed at the request of North Carolina regulators
12 and evaluated both the impact on groundwater near the ash basin and the
13 potential groundwater contribution of contaminants to nearby surface water.
14 This evaluation again concluded that the ash basins would not have an adverse
15 impact over the operating life of the basins. "It appears highly unlikely that any
16 subsurface or surface water quality problems exist as a result of the ash pond as
17 demonstrated by the absence of a detectable increase in any metals downstream
18 from the Riverbend Plant." Groundwater was also not expected to reach the
19 nearby river for fifty years.⁸⁵

⁸⁴ See Investigations of Coal Ash Disposal and Its Impact Upon Groundwater, by Roche, Gniska and Harwood for Duke Power, December 1984. Note that at the time of this study, both Marshall and Belews Creek were in the process of switching from the use of ash ponds for fly ash to the disposal of dry fly ash. Also see the 1985 A.D Little Report, prepared for EPA and referenced earlier, that performed detailed evaluation of the Allen Plant.

⁸⁵ See Evaluation of Effect of Ash Disposal at Riverbend Plant on Groundwater and Surface Water Quality, prepared by Kilkelly Environmental Associates for Duke Power, December 1987. I note that

1 These were precisely the types of groundwater and surface water
2 evaluations that EPA recognized as one appropriate way to demonstrate
3 compliance with the EPA solid waste criteria, issued in 1979. These criteria
4 defined what constituted indicia of protective solid waste management practices
5 with respect to groundwater. At this time, there was very limited groundwater
6 monitoring at waste management units, including coal ash ponds, and research
7 was just beginning on effective and protective ways to monitor groundwater.⁸⁶
8 In light of these types of Duke Energy studies, along with the results presented
9 in EPA's 1988 Report to Congress, Duke reasonably and prudently would have
10 believed that its unlined ash basins would not result in groundwater
11 contamination at levels that would result in damage.

12 As part of NPDES permitting, DE Carolinas installed a groundwater
13 monitoring system and began routine groundwater monitoring at Dan River and

this report was completed by environmental hydrogeologists with national reputations (e.g., Heath and LeGrand).

⁸⁶ In EPA's 1977 Report to Congress on the impact of waste disposal practices on groundwater, EPA found that "effective monitoring of potential sources of groundwater contamination was almost non-existent." (U.S. Environmental Protection Agency, Report to Congress: Waste Disposal Practices and Their Effects on Groundwater, January 1977.) EPA's 1983 study on surface impoundments showed that extremely low numbers of industrial surface impoundments had any groundwater monitoring. In North Carolina, less than 10 percent of over 300 waste surface impoundments across the state had any groundwater monitoring and only about 1 percent of almost 250 municipal impoundments had any groundwater monitoring. (U.S. Environmental Protection Agency, Surface Impoundment Assessment National Report, December 1983, Figures 4.14 and 4.15) In 1986, EPA found that 8.6% of industrial waste impoundments nationally had groundwater monitoring and only 3.8% of the nation's almost 200,000 surface impoundments had groundwater monitoring of some kind. (U.S. Environmental Protection Agency, Subtitle D Phase I Report, October 1986, Table 4-18) The lack of early groundwater monitoring nationwide was consistent with the lack of detailed guidance on the appropriate number of wells, location of wells, depth of wells, and monitoring parameters to effectively monitor large, complex sites. It should also be viewed with the context that there was considerable concern at the time that siting groundwater wells through or too close to waste management units could result in transferring contamination into the groundwater that was the subject of the monitoring.

1 WS Lee in 1993. The installation of groundwater monitoring systems occurred
2 at Allen and routine sampling began in late 2004. Other DE Carolinas plants
3 began sampling between 2006 and 2008.⁸⁷ Thus, Duke had implemented
4 groundwater monitoring at all of its plants before EPA issued its 2010 proposed
5 CCR rule. It is my opinion that Duke's decision to continue to operate its ash
6 ponds while waiting for the finalization of the CCR rule, and CAMA, was
7 reasonable and prudent. It was consistent with the performance of many other
8 utilities that continued to operate unlined ash ponds, as noted in EPA's proposed
9 rule.

10 During the time after Duke installed its groundwater monitoring system,
11 it reported its data to DEQ as required. Evaluating groundwater data and
12 reaching conclusions as to appropriate corrective action steps is typically a
13 complex and iterative process. It may include consideration of numerous factors
14 including whether any exceedances of 2L standards in groundwater wells are
15 the result of background or other potential sources. One key factor is often an
16 evaluation of whether the exceedance is resulting in actual or likely exposures
17 to human or environmental receptors at levels constituting environmental harm.
18 Only after this type of thorough evaluation can the regulatory agency determine
19 an appropriate corrective action.

⁸⁷ See DEC Late Filed Exhibit – Response to Request for Groundwater Monitoring Information, filed March 21, 2018 in Docket No. E-7, Sub 1146.

1 **Q. PLEASE SUMMARIZE YOUR OPINION REGARDING THE**
2 **COMPANY’S PRUDENCE.**

3 A. In sum, with respect to the period prior to the enactment of CAMA and the
4 promulgation of the final CCR Rule, the Company took steps to evaluate the
5 potential impacts of its ash ponds on groundwater and surface water. I did not
6 see any evidence that the Company was presented with a compelling
7 environmental reason to act differently with respect to its management of CCR
8 for which it is requesting recovery of its costs. Moreover, there are examples
9 where, upon the existence of data indicating an environmental problem, such as
10 the surface water situation at Belews Creek Steam Station, Duke worked with
11 North Carolina regulators to take appropriate action.⁸⁸

12 **Q. PLEASE PROVIDE YOUR OPINION WITH RESPECT TO**
13 **ESTIMATING ASH BASIN CLOSURE COSTS.**

14 A. My final opinion is that prior to the enactment of CAMA and promulgation of
15 the final CCR Rule, an accurate estimate of the costs associated with ash pond
16 closure (even assuming that closure would have been required) would have
17 been extremely difficult with a high likelihood for significant over- or under-

⁸⁸ My information is based upon a paper entitled “Coal Ash Disposal and Water Quality: A Case Study,” authored by Cumbie, Roche, and McCabe and presented at a 1985 symposium sponsored by ASCE. It is included in Water Quality Issues at Fossil Fuel Plants, proceedings of the symposium, a document that is an exhibit in a former DE Carolinas rate case. Sluice water from an ash settling pond at Belews Creek plant was discharged into Belews Lake. This resulted in a drastic decline in Belews Lake fish populations due to the presence of dissolved selenium and arsenic that entered the lake from the ash pond discharge. After evaluating options, the plant converted to a dry fly ash handling system, sending its dry fly ash to an on-site landfill. Remaining ash pond sluice water was controlled for selenium and discharged to a newly constructed channel to the Dan River.

1 estimation. Even with those regulations, fully known and measurable estimates
2 required completion of recently finalized site-specific closure agreements.

3 **Q. WHAT IS THE BASIS OF THIS OPINION?**

4 A. For the many reasons I have discussed above, accurately estimating costs prior
5 to the passage of CAMA and the final CCR Rule and prior to reaching site-
6 specific agreements is highly problematic. The difficulties and uncertainties
7 associated with doing so would, in my opinion, make the inclusion of such costs
8 in overall estimates of facility decommissioning cost estimates speculative. As
9 a result, such cost estimates might have difficulty meeting the criteria for
10 recovery of costs that are known and measurable. This is particularly the case
11 in light of guidance (or lack thereof) from the Company's environmental
12 regulator, DEQ, regarding the criteria and parameters for ash pond closure.
13 Accordingly, while it may not have been imprudent to include an estimate if
14 one were available, it is certainly not imprudent not to include such estimates
15 in light of the circumstances prevailing at the time.⁸⁹

⁸⁹ A review of surface impoundment closure planning for facilities surveyed by EPA in its 2010 dam safety report and located in the neighboring states of Virginia, South Carolina, and Georgia show that most of these impoundments did not develop a closure plan until after the finalization of the CCR rule. Many have not yet begun the closure construction process. (See Geosyntec Consultants, Inc., Coal Ash Pond Summary Table, February 19, 2020.) The information in this Geosyntec summary table is instructive in putting the November 2004 EPRI Decommissioning Handbook for Coal-Fired Power Plants in context. While this EPRI handbook included a limited number of case summaries of ash pond closure projects, most southeastern ash pond closure plans were not developed in this timeframe. Ash pond closure plans developed in this time period frequently were associated with plants that were closing in situations where utilities were working directly with their regulators to provide for land reuse after full plant closure.

1 **Q. HAVE YOU FAMILIARIZED YOURSELF WITH THE TESTIMONY**
2 **OF MR. JUNIS, MR. QUARLES, AND MR. HART IN THIS MATTER,**
3 **DATED FEBRUARY 18, 2020?**

4 A. Yes, I have.

5 **Q. DO YOU HAVE ANY OPINIONS TO OFFER RELATED TO THEIR**
6 **TESTIMONY?**

7 A. Yes, I do. Based on my experience, I have some general opinions that apply
8 across all three of the testimonies and some specific opinions on each.

9 **Q. CAN YOU ELABORATE ON THOSE GENERAL OPINIONS**
10 **APPLICABLE TO MR. QUARLES', MR. JUNIS', AND MR. HART'S**
11 **TESTIMONY?**

12 A. Yes. I have two such general opinions. First, in assessing whether DE
13 Carolinas' historic actions regarding its management of CCR were reasonable
14 and prudent, all three fail to use an appropriate methodology that considers all
15 relevant information and factors. Second, all three fail to give appropriate
16 weight to the role of DEQ in overseeing the Company's historic management
17 of CCR.

18 **Q. CAN YOU EXPAND ON YOUR FIRST GENERAL OPINION**
19 **REGARDING THE METHODOLOGY FOR ASSESSING WHETHER**
20 **DEC CAROLINAS' HISTORIC ACTIONS REGARDING ITS**
21 **MANAGEMENT OF CCR WERE REASONABLE?**

22 A. Yes. This is an area in which I have considerable experience. For numerous
23 legal proceedings over the last twenty-five years, I have been asked to weigh

1 the reasonableness of an entity's historic actions for the purpose of evaluating
2 whether those actions would have been expected to result in environmental
3 harm at the time the activities were taking place. Reaching such a determination
4 requires me to understand and evaluate the range of information available in the
5 contemporaneous time that the actions were ongoing; it is critical to guard
6 against applying today's knowledge to actions from the past or letting today's
7 knowledge color the interpretation of information available in the past. The
8 types of information that are important to evaluate include (1) available
9 knowledge at the time with respect to the action at issue, (2) the state of
10 regulations related to the historic activities being evaluated, and (3) the
11 practices of others in the same or similar industries.

12 When considering available knowledge, it is important to include not
13 only the knowledge of the entity who is controlling the actions (i.e., DE
14 Carolinas in this proceeding) but also the knowledge of government public
15 health and environmental officials, the entities charging with protecting the
16 environment. Taken as a whole, federal, state, and local government officials
17 across agencies have access to significant amounts of information on the impact
18 of chemical and waste management practices on the environment. In
19 performing this task, it is key to recognize that a single research study or
20 statement in a report does not represent consensus that a particular activity is or
21 is not reasonable. In my review of testimony provided by these three witnesses
22 (i.e., Hart, Quarles, and Junis), each selectively refers to various documents,
23 without, in my opinion, weighing the broader set of available knowledge on the

1 topic at issue during the contemporaneous time period. A weight of evidence
2 approach is the method I and other regulators used at EPA in evaluating whether
3 or not an activity warranted federal regulation and should be the approach used
4 when examining the historic reasonableness of a company's activities.⁹⁰

5 The three witnesses also appear to downplay or overlook the role of
6 regulations. CCR management had been studied extensively by EPA and
7 overseen for decades by state regulators. The fact that neither federal or state
8 regulations mandated either the use of liners at surface impoundments or the
9 installation of groundwater monitoring systems is an important input in
10 assessing the reasonableness of DE Carolinas' historic activities, but I saw no
11 indication that these three witnesses considered this factor.

12 Finally, the three witnesses do not assess in any detail the state or
13 industry practices in either the utility industry or in other waste-generating
14 industries. Whether a company's practices are outside the norm of other
15 industry practices in the same timeframe is a relevant and important factor in
16 assessing whether a company operated reasonably. In my almost 50 years of
17 environmental experience, even in the absence of regulations, it is very unusual
18 to see large parts of an industry continue to handle waste in a manner likely to
19 lead to environmental harm once knowledge of that environmental harm is
20 generally confirmed.

⁹⁰ When I use the term "weight of evidence," I mean the integrated assessment of available information and data on a given topic. This approach involves the consideration of available information on a topic in order to determine the most probable result, after consideration of any conflicted and/or inconsistent data. It can be applied to toxicity data, exposure data, and other types of risk management data.

1 **Q. YOU STATED THAT ALL THREE WITNESSES IGNORED THE**
2 **ROLE OF DEQ IN OVERSEEING DE CAROLINAS' HISTORIC**
3 **MANAGEMENT OF CCR. CAN YOU EXPAND ON THIS?**

4 A. Yes, I can. DEQ had regulatory authority over all of DE Carolinas' ash ponds
5 for decades including during the late 1970s through the 1980s. They issued and
6 renewed permits for these ash ponds for decades. They conducted inspections
7 of the Company's operations for decades. By no later than the late 1980s, DEQ
8 also had the authority to require groundwater monitoring and to require
9 additional investigation or corrective action based on groundwater monitoring.
10 DEQ also had authority to modify NPDES permits as necessary to protect the
11 environment – including modifications to the design or operation of permitted
12 ash ponds.

13 EPA worked closely to obtain state input into its 1988 CCR Report to
14 Congress and into its work between 2000 and 2015 to evaluate minimum
15 national protections for CCR. During these collaborative efforts, I am unaware
16 that North Carolina indicated that it did not possess adequate authorities to
17 protectively regulate CCR management. Moreover, DEQ had the ability to
18 request that EPA use its authorities, if needed, to address any imminent and
19 substantial endangerment. That DEQ did not require DE Carolinas to modify
20 the design of its ash ponds by requiring liners, did not require the ponds to close,
21 or did not mandate groundwater monitoring earlier than they did, is a strong
22 indication that DE Carolinas' operations were considered to be reasonable and
23 protective by the Agency charged with protecting the North Carolina

1 environment. Yet, the role of DEQ and its decisions do not seem to factor into
2 the opinions reached by these three witnesses.

3 **Q. IN ADDITION TO YOUR TWO GENERAL OPINIONS, DO YOU HAVE**
4 **ANY ADDITIONAL OPINIONS SPECIFICALLY RELATED TO MR.**
5 **QUARLES' TESTIMONY?**

6 A. Yes, I do.

7 **Q. CAN YOU ELABORATE ON THOSE OPINIONS?**

8 A. Yes. Mr. Quarles asserts that various historical documents “demonstrate that
9 the environmental risk associated with the disposal of coal ash in unlined
10 surface impoundments was understood by the electric utility industry in the late
11 1970s and early 1980s” and that DE Carolinas’ operation of unlined surface
12 impoundments in this timeframe “was unreasonable and could be expected to
13 result in the introduction of CCR constituents to surface and groundwater.”⁹¹

14 Essentially, Mr. Quarles is asserting that because of this knowledge he
15 claims existed as of the late 1970s and early 1980s, DE Carolinas was
16 unreasonable and imprudent in the way it operated at that time. In my opinion,
17 based on my experience as an EPA official in this precise time period and based
18 on my private consulting practice, where I have assessed the reasonableness of
19 many different company’s operations during this time period and earlier and
20 later time periods, Mr. Quarles’ methodology in reaching this conclusion is
21 significantly flawed.

⁹¹ Testimony of Mark Quarles (February 18, 2020), p. 5; hereafter “Quarles Testimony.”

1 To assess the level of knowledge at a particular time, one must evaluate
2 the weight of evidence regarding the information available at the time, not only
3 a limited number of isolated reports, or parts of those reports, that discuss some
4 “potential” for risk. While I was at EPA, the Agency was specifically charged
5 with the collection of all available information regarding coal ash and with
6 making a regulatory determination regarding that risk. That determination, as
7 issued in 1993, and as I have summarized throughout my testimony, concluded
8 the risk from CCR management did not warrant establishing minimum national
9 regulations—regulations that would have modified the manner in which DE
10 Carolinas was managing its coal ash under the oversight of North Carolina
11 regulatory agencies.

12 EPA based its 1993 determination, a decade after the time period
13 covered by Mr. Quarles opinion statement, on its review of available
14 information on coal ash, including, certainly, the reports cited by Mr. Quarles
15 from the late 1970s to early 1980s as well as significant additional information
16 not cited by Mr. Quarles. EPA also made its risk-based determination after a
17 thorough review of state regulatory authorities and, as I have previously stated,
18 with the full knowledge that most surface impoundments were operating
19 without liners and without groundwater monitoring. I can assure the
20 Commission that if EPA’s information did demonstrate a risk that was generally
21 not being addressed by existing state regulatory authorities, EPA would have
22 moved forward well before the final 2015 CCR regulations with a
23 recommendation for national minimum standards requiring liners and

1 groundwater monitoring, as it did with hazardous waste surface impoundments
2 and landfills, and, somewhat later, with municipal waste landfills.

3 I would also point out that if the knowledge about potential groundwater
4 contamination was as well understand as Mr. Quarles contends by the early
5 1980s, we would not have had 80 percent of 16,000 industrial surface
6 impoundments nationwide operating without liners and 70 percent of 125,000
7 oil and gas waste impoundments operating without liners as of the mid-1980s.
8 Nor would 90 percent of the industrial surface impoundments and 99 percent of
9 the oil and gas impoundments have operated without groundwater monitoring
10 during that timeframe.⁹²

11 Mr. Quarles not only ignores EPA's 1993 coal ash pond conclusion, he
12 also ignores the fact that regulators in North Carolina, as I have already noted,
13 approved the operation of all DE Carolinas' ash ponds and it was not until the
14 passage of CAMA that the operation of an unlined ash pond in North Carolina
15 was prohibited. DEQ was routinely visiting the Company's facilities for
16 inspections and when writing NPDES permits for its ash ponds. The fact that
17 DEQ did not require DEC to modify its operational practices or its use of ash
18 ponds during this time period is important in any evaluation of whether DE
19 Carolinas operated reasonably, a key point that is seemingly ignored by Mr.
20 Quarles.

⁹² See U.S. Environmental Protection Agency, Subtitle D Phase I Report, October 1986, Tables 4-17 and 4-18.

1 Furthermore, in evaluating whether a company operated reasonably it is
2 certainly appropriate to compare that company to others in the same or similar
3 industries. As I have noted, EPA's 1988 CCR Report to Congress found that of
4 the 483 CCR surface impoundments in the United States less than 10% (45)
5 were found to be lined and of the 195 surface impoundments in the Southeastern
6 United States (EPA's Region 4), less than 2% (3) were found to be lined.⁹³ EPA
7 conducted a broader study across all industries in 2001 and found that only 18
8 percent of all industrial surface impoundments had either a flexible membrane
9 liner or composite liner (flexible membrane and clay liner).⁹⁴ This includes
10 impoundments used by the chemical, petroleum, and paper industries that
11 contained a wide range of common contaminants.

12 Over time, the use of liners became more common in the construction
13 of new surface impoundments, but surface impoundments already in use
14 continued to be commonly operated without liners in full compliance with
15 federal and state regulations and with the knowledge of state regulators. When
16 EPA issued the proposed 2010 CCR rule, it found that 62 percent of surface
17 impoundments at that time operated without liners.⁹⁵ To accept Mr. Quarles
18 position, one would have to assert that all of these facilities, including over 90%
19 of all CCR facilities in the mid-1980s and the significant majority of facilities

⁹³ 1988 CCR Report to Congress, Exhibit 4-6.

⁹⁴ U.S. Environmental Protection Agency, Industrial Surface Impoundments in the United States (March 2001), Table 2-10.

⁹⁵ 75 FR 35128, 35151 (June 21, 2010).

1 in 2010, as well as thousands of other industrial facilities that operated unlined
2 impoundments, all operated unreasonably.

3 Similarly, groundwater monitoring was not commonly employed at the
4 time EPA issued the CCR Report to Congress in 1988. EPA estimated at the
5 time that 65 percent of utility facilities did not have groundwater monitoring
6 systems.⁹⁶ EPA's broader study of industrial surface impoundments across all
7 industries in 2001 found that 67% of all surface impoundments did not employ
8 groundwater monitoring systems.⁹⁷ Again, to accept Mr. Quarles position, one
9 would have to assert that all of these facilities, operated unreasonably.

10 In fact, the knowledge regarding groundwater contamination generally
11 and the impact of managing CCR in surface impoundments specifically evolved
12 slowly over time, including both the timeframe while I was at EPA and
13 subsequently. As this knowledge evolved well beyond the early 1980s, it was
14 understood that an assessment of the need for liners was dependent upon site-
15 specific conditions. State agencies such as DEQ were in the best position to
16 determine those situations where existing units needed to upgrade to liners or
17 needed to install groundwater monitoring systems.

⁹⁶ 1988 CCR Report to Congress, p. 4-35.

⁹⁷ U.S. Environmental Protection Agency, Industrial Surface Impoundments in the United States (March 2001), p. 2-26. It is useful to note that the existence of most ash ponds near rivers or lakes further complicated the question of how and where to perform groundwater monitoring. The main purpose of groundwater monitoring is to ensure that any release of contaminants from waste units will not have any reasonable potential to affect drinking water sources. There were rarely any drinking water sources located between the ash pond and the surface water body. And, even with a contaminant release, the surface water body usually would intercept and dilute the release before it could impact a source of drinking water. EPA recognized this issue in discussing its efforts to model groundwater impacts from ash ponds in its 2010 preamble discussion to the CCR regulation.

1 **Q. DO YOU DISAGREE WITH MR. QUARLES' USE OF DOCUMENTS**
2 **THAT HE CITES TO SUPPORT HIS OPINION REGARDING THIS**
3 **EARLY KNOWLEDGE OF DE CAROLINAS AND THE ELECTRIC**
4 **GENERATING INDUSTRY?**

5 A. Yes, I do. My view of many of these early documents differs from his.

6 **Q. CAN YOU ELABORATE?**

7 A. The following are examples of reports I believe Mr. Quarles has incorrectly
8 relied upon to support his opinion.

9 1. 1979 Arthur D. Little, Inc./EPA Report on “ Health and Environmental
10 Impacts of Increased Generation of Coal Ash and FGD Sludges.”

11 Mr. Quarles states that the 1979 Arthur D. Little/EPA report “identified
12 groundwater and surface water contamination as major ‘impact issues’
13 associated with the storage or disposal of coal ash in unlined impoundments.”
14 This paper was written in 1979 prior to the time EPA finalized its 1980
15 hazardous waste regulations and prior to the time that Congress adopted the
16 Bevill amendment. The purpose of the paper is to focus on potential impacts of
17 coal ash and FGD wastes with increased use of coal, looking at 1985 and 2000.
18 The paper notes that RCRA and related federal and state laws provide “a
19 sufficient statutory basis for preventing significant adverse health and
20 environmental impacts from coal ash and FGD waste disposal.” It goes on to
21 note that much of the regulatory development had not yet been completed. It
22 also notes that the potential environmental impacts of disposal “are dependent
23 on the characteristics of the disposal site, characteristics of the coal ash and

1 FGD wastes, control method and the degree of control employed” and that
2 “Impacts are site-specific and cannot be easily generalized over a region.” Its
3 conclusion on water-related impacts, based on existing information, was that
4 “On a regional basis, hydrologic impacts are expected to be quite small” It also
5 concluded that because of the availability of existing regulatory authorities,
6 “impact on groundwater quality should be minimal.” (p. 133 in December 1979
7 EHP publication)⁹⁸ And, it notes that “Both Federal and privately-funded
8 programs are developing additional data and information on disposal of FGD
9 sludges and coal ash. Continuation of these programs will provide additional
10 vital information in the future.” This paper does not conclude that all ash ponds
11 should be lined or that all ash ponds require groundwater monitoring to prevent
12 environmental harm to groundwater.

13 2. 1981 EPRI “Coal Ash Disposal Manual”

14 Mr. Quarles (p. 12), as well as Mr. Junis, cite to a 1981 Electric Power
15 Research Institute (EPRI) Manual as a basis to argue that leachate from ash
16 disposal sites is “of concern” due to the “possibility” that heavy metals present
17 in the ash can enter the groundwater and contaminate drinking water. This is a
18 relatively weak statement, indicating the absence of data and knowledge, not
19 the certainty of it. Mr. Quarles notes that this EPRI Manual was based on EPA’s
20 solid waste disposal guidelines and that it recommended location criteria and
21 that a groundwater monitoring system be installed (p. 4-12 and 4-14 of the

⁹⁸ This paper notes that “...in an environment where accessible groundwater is useful for potable or irrigation supply, it is likely that either: (1) the disposal sites would be lined or have adequate impermeability and soil attenuative capacity to protect groundwater quality ...” (p. 140)

1 Manual). However, a careful reading of this document shows that it is written
2 as guidance for designing new disposal facilities, not applicable to existing
3 operating facilities. In fact, the Manual states that “The prediction of ash
4 leachate quality is not possible at this time” and, on page 2-17, that:

5 Evidence is still inconclusive as to the degree of hazard of the
6 ash materials. EPA, recognizing that CCPs are of relatively low
7 concern, has defined coal ashes as being non-hazardous while
8 they conduct a site monitoring and evaluation program, which
9 is designed to assess the potential hazards associated with ash
10 disposal.⁹⁹

11 Further, the Manual references a proposed EPA rule as support for the
12 guidance despite the fact that the cited proposed rule was aimed at landfills only,
13 not surface impoundments.¹⁰⁰ The Manual, and Mr. Quarles, also fail to note
14 that this EPA proposed rule, on which the Manual relies, was never finalized
15 and in its final solid waste criteria, issued in September 1979 and cited earlier
16 in my testimony, EPA did not require or recommend location standards or
17 groundwater monitoring for ash disposal ponds.

18 3. 1982 EPRI “Manual for Upgrading Existing Disposal Facilities”

19 Similarly, Mr. Quarles also references an August 1982 EPRI Manual that
20 focused on upgrading existing disposal facilities. The Manual stated: “The

⁹⁹ On page 3-3, the 1981 Manual noted that “The possibility of groundwater pollution by ash leachates may, in the future, lead to regulations requiring the siting of ash basins in impermeable soils or the installation of liners.” It also noted in a case study of Duke’s Allen Plant, that “both the old and new ponds are underlain by relatively impermeable soils similar to constructed clay liners” (p. 6-15).

¹⁰⁰ Mr. Quarles states (p. 12) acknowledges that the EPA proposed regulations, which he does not correctly note were never finalized, applied only to landfills and not ash ponds. However, he states, without support, that the risk of groundwater contamination from unlined ash ponds and landfills are comparable. In fact, studies that EPRI later performed indicated that landfill leachate had higher constituents than leachate from ash ponds. (See 2006 EPRI Study on Characterization of Field Leachates at Coal Combustion Product Management Sites, p. vi).

1 regulations governing the disposal of utility wastes are in a state of suspension
2 at this time.” And, it noted that until at least 1983, there would be no firm
3 design or performance standards applicable to ash disposal. In fact, the Manual
4 stated: “For these reasons, it may be premature for any utility to embark on a
5 program to update their existing disposal facilities.” (p. vi) There are numerous
6 other statements in this Manual that provide appropriate context for general
7 knowledge on coal ash disposal as of 1982.¹⁰¹ This document also relies heavily
8 on cited federal documents which, like the 1981 EPRI Manual, have been mis-
9 cited.¹⁰² Again, most of the cited federal documents address landfills, not
10 surface impoundments. In addition, one of the key EPA reliance documents
11 cited by EPRI was issued in proposed form and never finalized.

12 4. 1985 Arthur D. Little study on Full-Scale Field Evaluation of Waste
13 Disposal from Coal-Fired Electric Generating Plants, prepared for EPA
14 and found as Quarles Exhibit 3.

15 Mr. Quarles’ testimony characterizes this report by suggesting that it
16 pointed out a potential future groundwater problem at the Allen facility and

¹⁰¹ For example, there is a section of the Manual that discusses limitations of the Manual. It states that “Decision making with the context of this Manual is difficult,” given that EPA is still pursuing field research. (p. 1-5) And, although the Manual intentionally highlights some worst case scenarios to increase awareness, it stated that “In practice, however, there is no documented case of environmental health problems directly attributable to fly ash or FGD sludge disposal.” (p. 2-2) In the groundwater section, this Manual notes that most fly ash has a high pozzolanic activity and tends to be self-sealing when wet.

¹⁰² Importantly, the Manual references the federal solid waste criteria but incorrectly notes the status of the federal groundwater guidelines and continues to confuse EPA’s proposed guidelines for landfills with the finalized 1979 solid waste criteria which did not require groundwater monitoring. In fact, the 1980 guidance issued by EPA leaves the question of whether groundwater monitoring for any type of solid waste is appropriate to state regulatory agencies since the decision is highly site dependent.

1 supports his view that continued groundwater monitoring was appropriate at the
2 Allen facility at the time the report was issued. It is certainly a strained reading
3 of this report to reach such a conclusion. This was a detailed three-year study
4 on groundwater at 6 coal ash plants including DE Carolinas' Allen facility. The
5 report concluded that no major environmental effects had occurred at any of the
6 six sites. The report noted that groundwater wells downgradient of disposal sites
7 is typically less than primary drinking water standards.

8 Many of the other references Mr. Quarles cites to support his opinion as
9 to the need for liners and groundwater monitoring systems prior to the 1990s
10 also, in my opinion, do not accurately portray the overall content of these
11 documents. That includes the 1988 CCR Report to Congress and the December
12 1984 DE Carolinas' Groundwater Report, and the 1987 DE Carolinas'
13 Riverbend report. I have discussed these reports already and will not repeat my
14 views about them here. However, I again emphasize that it is not appropriate to
15 rely upon individual sentences in a report without provided a weight of evidence
16 evaluation of the material in the report.

17 **Q. LET'S MOVE TO MR. HART. DO YOU HAVE ANY OPINIONS TO**
18 **OFFER, IN ADDITION TO YOUR GENERAL OPINIONS, RELATED**
19 **SPECIFICALLY TO MR. HART'S TESTIMONY?**

20 A. Yes, I do.

21 **Q. CAN YOU ELABORATE ON THOSE OPINIONS?**

22 A. Mr. Hart testified that "the utility industry, including DE Carolinas, knew about
23 the potential for contamination of groundwater from coal ash basins as early as

1 the 1980s.”¹⁰³ This statement by Mr. Hart, in my opinion, is of little value in
2 evaluating whether DE Carolinas operated with prudence, as it does not inform
3 as to what actions should or should not have been taken at any particular facility.

4 The word “potential” here is overbroad and not useful. Virtually any
5 waste management unit, regardless of its design or operational practices, has
6 the “potential” to release constituents to groundwater under some
7 circumstances. A waste management unit that has a one-in-a-billion chance of
8 causing a release to groundwater, can still be said to have the “potential” to
9 contaminate groundwater. Further, asserting that DE Carolinas knew ash ponds
10 generally had the “potential” to contaminate groundwater, even if true, does not
11 tell you anything about what DE Carolinas did or did not know about the
12 likelihood for any particular ash pond it operated to contaminate groundwater
13 at levels that were understood, at the time, to equate to environmental harm.¹⁰⁴
14 Such an assessment is necessarily site-specific as a host of factors including the
15 permeability of soils, the vertical distance between the waste and the aquifer,
16 the amount and type of waste being managed, the depth and direction of
17 groundwater can all affect the potential of an ash pond to leach to groundwater.

¹⁰³ Direct Testimony of Steven C. Hart, PG (February 18, 2020), pp. 8-10; hereafter “Hart Testimony.”

¹⁰⁴ Further, the word “contamination” in Mr. Hart’s statement is also not precise or particularly useful. There is an important distinction between groundwater contamination and groundwater harm. Contamination is any level above background. This could include low levels of nitrates in groundwater below farm properties as a result of fertilizer use. Environmental harm is levels of contamination above some type of health-based level that results in exposures to receptors that come in contact with that groundwater, whether from drinking water use or another beneficial use.

1 The location of receptors can impact the extent to which contamination could
2 result in environmental harm.

3 In addition, as with Mr. Quarles, Mr. Hart supports his opinion by
4 selectively referencing several government and trade association reports. My
5 opinions of this approach as described above in my response to Mr. Quarles'
6 testimony is relevant in assessing Mr. Hart's testimony. It is also worth noting
7 that only one of the reports cited by Mr. Hart was issued in the early 1980s. He
8 consistently uses these reports in a similar fashion, pointing to a particular
9 statement or finding that he believes demonstrates there was an awareness of
10 the potential for ash ponds to cause groundwater contamination. In doing so, he
11 often fails to acknowledge the general conclusions reached in these reports and,
12 more importantly, he fails to put them in context of the overall information and
13 understanding at that time.

14 **Q. CAN YOU ELABORATE ON THESE REPORTS REFERENCED BY**
15 **MR HART?**

16 A. Yes, Mr. Hart refers to the following reports from the 1980s and 1990s,
17 prepared by either government agencies or trade associations. I use these reports
18 as examples of Mr. Hart's failure to utilize these reports appropriately:

19 1. March 1980 EPA and TVA Report, Effects of Coal-Ash Leachate on
20 Ground Water Quality

21 This report focused on two ash ponds operated by the Tennessee Valley
22 Authority. It was a preliminary research study and was not intended, nor did it
23 conclude, that the management of coal ash in ponds presented an unreasonable

1 environmental risk. Instead, the report reach various conclusions about the
2 characteristics of leachate. The only conclusion related to environmental impact
3 was that the “flux of metals from coal-ash leachate was found negligible when
4 compared of the mass of metals discharged by the ash pond surface
5 overflow.”¹⁰⁵

6 2. 1988 Report to Congress on CCR

7 Mr. Hart notes that the 1988 Report to Congress discussed the use of
8 liners, leachate collection and groundwater monitoring systems.¹⁰⁶ He fails to
9 note that the report, as I previously discussed, also confirms that the use of
10 liners, leachate collection, and groundwater monitoring were not common. In
11 addition, as Mr. Hart does acknowledge, North Carolina, similar to many states,
12 did not generally require owners or operators of existing surface impoundments
13 to install liners or leachate collections systems or groundwater monitoring prior
14 to 1988 when this EPA report was issued. Further, and most significantly, EPA
15 concluded after its extensive review, that this current level of state regulation
16 was adequate and additional federal regulations were not warranted. Mr. Hart
17 ignores this important and relevant conclusion.

18 3. November 1991 EPRI Report

19 The study Mr. Hart cites was of a single facility, intended to determine
20 whether there was an impact from the co-management of low volume wastes

¹⁰⁵ U.S. Environmental Protection Agency and Tennessee Valley Authority, Effects of Coal-ash Leachate on Ground Water Quality, March 1980.

¹⁰⁶ Hart Testimony, p. 51.

1 with higher-volume coal combustion residuals. Mr. Hart points to the report's
2 finding that calcium, magnesium, strontium, and sulfate were found in wells
3 downgradient of the ash pond in higher concentrations than upgradient.
4 Importantly, Mr. Hart fails to cite the report's conclusion that of these
5 constituents "only SO₄ currently has published water quality secondary
6 standards for drinking water" and that the "mean SO₄ concentrations measured
7 downgradient of the ash pond were approximately half the water quality
8 limits."¹⁰⁷ He also fails to note the report's conclusion that trace metals were
9 not detected in downgradient wells and that "[r]esults from the southeastern site
10 study confirm that the comanagement option is a technically viable
11 environmentally acceptable practice, if appropriately carried out."¹⁰⁸

12 **Q. IN REFERENCING THESE DOCUMENTS IN THE WAY HE DOES,**
13 **DO YOU BELIEVE MR. HART IS IMPLYING AN UNDERSTANDING**
14 **OF THE RISK ASSOCIATED WITH ASH PONDS THAT DID NOT**
15 **EXIST AND, IF SO, HOW WOULD YOU CHARACTERIZE THE**
16 **UNDERSTANDING OF RISK AT THE TIME?**

17 A. Yes. I do believe the implication in Mr. Hart's testimony and his use of these
18 documents is that there was general understanding of the impact of CCR
19 management that is different from what, in fact, existed at the time. Again, my
20 opinions regarding the state of knowledge in my response to Mr. Quarles's

¹⁰⁷ Electric Power Research Institute, Comanagement of Coal Combustion By-Products and Low-Volume Wastes: A Southeastern Site (November 1991), p. S-2.

¹⁰⁸ Electric Power Research Institute, Comanagement of Coal Combustion By-Products and Low-Volume Wastes: A Southeastern Site (November 1991), Report Summary.

1 testimony is relevant here. In addition, it is important to understand that
2 concern about the impact of industrial waste management on groundwater
3 emerged over time as did the knowledge of what specific industrial activities
4 i.e., (e.g., ponds, landfills, product and waste piles on the ground) involving
5 what chemicals in what hydrogeologic conditions would result in
6 environmental harm to groundwater.

7 The evolution of concern regarding the potential for ash ponds to impact
8 groundwater, therefore, must be viewed in the context of this general evolution
9 of knowledge and understanding regarding groundwater environmental harm.
10 Within that context, it becomes clearer why, despite the existence of some
11 literature that may point to a "potential" for land disposal of waste to result in
12 environmental harm, there was not a general awareness that most unlined ash
13 ponds would result in environmental harm to groundwater. This is why both
14 federal and state government authorities continued to allow the continued
15 operation of most unlined surface impoundments until the implementation of
16 the federal CCR rule or state laws such as CAMA.

17 There was a significant lack of information about industrial waste
18 management and the subsurface environment well into the 1980s. In 1981, the
19 federal General Accounting Office summarized this lack of information on
20 waste disposal sites and environmental harm as follows:

21 Little conclusive information is available concerning how
22 chemical compounds leave disposal sites and what happens to
23 them as they migrate through the environment to reach human
24 populations. The Director of EPA's Environmental Services
25 Research Laboratory in Research Triangle Park and several
26 other laboratory officials stated that it is difficult to predict how

1 fast pollutants may travel; if their chemical structures will be
2 altered into more- or less-hazardous forms; whether they will
3 pose a threat to humans or the environment; and how long the
4 threat will last.¹⁰⁹

5 In addition, prior to 1981, environmental regulators focused primarily
6 on highly soluble compounds such as phenols, chlorides, brines, bacteria,
7 nitrates, phosphates, and sulfates and not on relatively insoluble metal
8 compounds like many of those commonly found in coal ash such as selenium,
9 manganese, many boron compounds, arsenic, cadmium, and trivalent
10 chromium.¹¹⁰

11 Over time, this view of the earth's general ability to absorb and
12 essentially render harmless most industrial wastes significantly evolved.
13 However, this change occurred slowly as the complexity of the issue was
14 recognized and more and more public and private resources were dedicated to
15 studying the subsurface environment and the range of factors that affected
16 protective land-based disposal.

17 In addition, beginning around 1980, EPA began collecting information
18 on instances of environmental damage from various types of industrial waste

¹⁰⁹ U.S. General Accounting Office, Hazardous Waste Sites Pose Investigation, Evaluation, Scientific, and Legal Problems (April 24, 1981), p. 22. The report cited the large number of chemicals, each with different migratory characteristics, as well as the complexities of chemical interactions, the wide variations in disposal sites and environmental conditions, and the "largely unknown physical, chemical, and biological transformations that occur as pollutants change and are changed by natural processes as they move in the environment."

¹¹⁰ As more information became known about the range of individual metal compounds in coal ash, the extent of solubility associated with these metal compounds evolved.

1 management, including those that involved groundwater contamination.¹¹¹ It
2 issued one of the first reports summarizing damage information in February
3 1980.¹¹² This report included descriptions of approximately 250 sites where
4 damages have actually occurred “or threaten to do so.” Of these, none involved
5 coal ash ponds. Two did involve coal ash, but one was the illegal dumping of
6 fly ash into a marsh resulting in contamination of a wetlands and the other
7 involved the piling of fly ash next to a road leading to a landfill. Consequently,
8 the information collected in this report would not have indicated to either
9 environmental or public health officials or utility owners, that the operation of
10 coal ash ponds was leading to environmental harm.

11 EPA then conducted a more comprehensive effort to collect damage case
12 information at locations where CCR was managed as part of the 1988 CCR
13 Report to Congress. It found a relatively small number of damage cases and
14 even a smaller number of damage cases that involve contamination of
15 groundwater from coal ash ponds. To the extent the damage cases indicated an
16 exceedance of a drinking water standard, EPA noted that “the total number of
17 exceedances is quite small compared to the total number of monitoring wells
18 and samples gathered.”¹¹³

¹¹¹ Damage cases also included instances of surface water damage, land or soil damage, air releases of concern, explosive concerns, and others.

¹¹² U.S. Environmental Protection Agency, Damages and Threats Caused by Hazardous Material Sites (February 1980).

¹¹³ 1988 CCR Report to Congress, p. 5-67.

1 As I previously noted, EPA concluded in the 1988 CCR Report to
2 Congress both that it was not always possible to connect the presence of CCR
3 to these exceedances and that the actual potential for exposure to human and
4 ecological populations was likely to be limited because ground water in the
5 vicinity of utility waste disposal sites is not typically used for drinking water
6 and the contaminants tend to be diluted in nearby surface water bodies.¹¹⁴ This
7 led to EPA's conclusion in the report that "current waste management practices
8 appear to be adequate for protecting human health and the environment" and its
9 1993 decision not to regulate CCR manage under the federal hazardous waste
10 program.¹¹⁵

11 **Q. ARE THERE OTHER ASPECTS OF MR. HART'S TESTIMONY YOU**
12 **HAVE OPINIONS ON AND, IF SO, CAN YOU ELABORATE?**

13 A. Yes, Mr. Hart asserts that after installing groundwater monitoring wells at its
14 ash ponds, DE Carolinas submitted groundwater monitoring data to DEQ
15 "without evaluation or responsible action" while the Company "should have
16 worked with the regulatory agency to further assess conditions and, as needed,
17 develop corrective action programs."¹¹⁶ Mr. Hart strongly implies that DE
18 Carolinas somehow acted imprudently by merely submitting the monitoring
19 data to DEQ. This is inconsistent with my experience as a government
20 regulator. The prompt and complete submission of monitoring data is indicative

¹¹⁴ 1988 CCR Report to Congress, p. ES-5.

¹¹⁵ 1988 CCR Report to Congress, p. 7-11; 58 Federal Register 42466 (August 9, 1993).

¹¹⁶ Hart Testimony, p. 9.

1 of a prudent company. The timely submission of data allows the regulatory
2 authority, in this case DEQ, to review the data and make any additional requests
3 for additional information or investigation as necessary. Any further action a
4 prudent company would take in response to the monitoring data would
5 inevitably involve consultation and cooperation with regulatory authorities in
6 an iterative process. In my experience, it is entirely appropriate for a company
7 to submit data and wait until the regulatory agency has had the time to review
8 it to begin such an interaction, and commonly an iterative process, to determine
9 how to proceed.

10 **Q. ARE THERE ANY OTHER POINTS YOU WANT TO MAKE ON THE**
11 **TESTIMONY OPINIONS PROVIDED BY MR. HART?**

12 A. Yes. Mr. Hart also concludes that “DEC’s costs are higher today than they
13 would have been had the Company undertaken reasonable and prudent actions
14 and practices in a timely manner to address storage and disposal of CCR and
15 closure of its coal ash basins before the Dan River spill occurred in 2014.” His
16 assessment of costs appears to ignore the potentially significant unwarranted
17 costs DE Carolinas or any utility may have incurred if it conducted closure
18 activities prior to the having the regulatory certainty that came with CAMA and
19 the federal CCR rule.

20 While the regulatory process was unfolding and there was uncertainty
21 as to its outcome, it is my opinion that it was reasonable and prudent for an
22 electric utility to wait until there was more clarity before closing or upgrading
23 existing ash ponds that otherwise served a useful business function and met the

1 design and operational performance requirements established by the state
2 regulatory agency. Without more certainty than existing prior to the final
3 CAMA and CCR regulations, a utility could undertake a closure that was less
4 stringent than would eventually be required under the final regulations. This
5 could require the closure to be modified or redone and the expenditure of more
6 resources than if the closure had been done in compliance with the final rules
7 the first time. For example, if an ash pond were closed by capping before the
8 regulations were in place and the final regulations required the removal of all
9 ash prior to closure, significant extra costs would be incurred as the initial cap
10 would prove unnecessary and expensive to remove. Even the development of
11 detailed closure plans, which can be costly to prepare, can be rendered obsolete
12 as the final requirements might dictate a different approach.

13 Conversely, closing before the final CCR requirements are in place can
14 lead to a closure that is more stringent than an option in the final rule, an option
15 that has been determined by regulators to be protective. Again, this can lead to
16 unnecessary expenditures, such as the removal of all ash from a pond when the
17 final rules allow for a pond, or part of a pond, to be dewatered and capped-in-
18 place. Even if a closure conducted before the final rule is in general compliance
19 with the type of closure required under the final rule, the manner in which the
20 closure is approved and documented may not comply. This may result in a
21 reevaluation of the closure and the expenditure of additional costs. Again,
22 planning for a closure that is more stringent than eventually required might be

1 imprudent as it may lead, for example, to the purchase of land or equipment that
2 is unnecessary.

3 Mr. Hart also included a related opinion (p. 10-11), that suggests that
4 DE Carolinas should have taken action sooner to convert its wet ash
5 management system to a dry ash system and that this would have led to lower
6 costs today:

7 It is evident from my analysis that, as a result of groundwater
8 monitoring data and increased concern with groundwater
9 contamination from coal ash basins, DEC should have taken
10 responsive action sooner and initiated a systematic plan to
11 address its coal ash basins by converting facilities to dry ash
12 handling, eliminating other wastewater streams, closure
13 planning, and evaluating methods to reduce environmental
14 impact while the basins were still operational. This would have
15 required an expenditure of funds earlier, but would have
16 reduced long term risks and liabilities which would have
17 certainly led to lower costs being request at this time.

18 I note that Mr. Quarles also stated that dry ash handling systems could have
19 been considered as early as the early 1980s, citing the 1981 and 1982 EPRI
20 reports as support for the early availability of this approach.¹¹⁷

¹¹⁷ The 1981 EPRI Manual noted a trend towards dry ash handling systems for fly ash, not bottom ash. The 1982 EPRI Manual, which focused on existing coal ash management units, noted that dry ash conversion for fly ash was a “promising upgrading technique.” This was based on the 1982 effluent guidelines for newly constructed coal plants that prohibited the discharge to surface water of any pollutants from fly ash transport water. While conversion to dry handling systems did becomes more common, the conversions occurred primarily with fly ash and not bottom ash. When developing its recent revisions to the effluent guidelines, EPA found that only 28 percent of coal and petroleum coke-fired steam electric units used dry handling systems for bottom ash. The Agency also estimated that only three to seven percent of plants had converted their bottom ash handling to a dry system between 2000 and 2009. (See U.S. Environmental Protection Agency, Technical Development Document for Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category, September 2015, Tables 4-9 and 4-10.)

1 To the extent a utility converted to dry management for fly ash in the
2 1980s, particularly the early 1980s as discussed by Mr. Quarles,¹¹⁸ it was
3 certainly possible it would have constructed a landfill without a synthetic liner
4 to accept the dry ash as most industrial landfills at that time were still being
5 built without liners. Therefore, any environmental benefit of converting would
6 have been more limited and the potential future compliance costs, when landfill
7 liners were required, could be more significant as the landfill would either have
8 to be retrofitted or closed. As noted above, there were many uncertainties as to
9 the final requirements that would be adopted for either new landfills or surface
10 impoundments, including requirements for siting such units and their technical
11 design. If a new landfill, for example, were installed without meeting these
12 requirements, it would either need to be relocated or retrofitted to meet technical
13 design standards, resulting in significant unnecessary costs.

14 It is my opinion that the potential savings from taking earlier actions to
15 upgrade or close its ash ponds would have been speculative at best. At worst,
16 such early actions could have resulted in the overall expenditure of higher costs.

17 **Q. DO YOU HAVE ANY SPECIFIC OPINIONS TO OFFER RELATED TO**
18 **MR. JUNIS' TESTIMONY?**

19 **A. Yes, I do.**

¹¹⁸ See Quarles testimony, p. 14, lines 22-25.

1 **Q. CAN YOU ELABORATE ON THOSE OPINIONS?**

2 A. Yes. Mr. Junis offers the position that “DEC has accumulated a record of
3 significant environmental violations caused by leaking coal ash basins, which
4 have resulted in unlawful releases of regulated contaminants to groundwater
5 and surface water.”¹¹⁹ In particular, he points to seeps from ash basins as
6 violations of DE Carolinas’ NPDES permits and to groundwater exceedances
7 “in violation of the state’s 2L rules.”¹²⁰ I cannot offer an opinion on whether
8 these items, in particularly the groundwater exceedances, by themselves are in
9 fact violations of North Carolina law, but I can offer perspective on how
10 groundwater standards and remediation laws like North Carolina’s 2L standards
11 are viewed and the important differences between such laws and laws that
12 address ongoing operational performance activities.

13 **Q. AND WHAT IS THAT PERSPECTIVE?**

14 A. Environmental laws and regulations can be divided into two types: (1)
15 compliance obligations addressing facility/waste unit design and operational
16 performance requirements and (2) remedial requirements based on exceedances
17 of protective environmental media standards.

18 1. Compliance laws and regulations seek to prevent facility operational and
19 waste management activities from resulting in harm to the environment.

20 They include laws and regulations that regulate specific performance

¹¹⁹ Testimony of Charles Junis, Public Staff – North Carolina Utilities Commission (February 18, 2020), p. 7; hereafter “Junis Testimony.”

¹²⁰ Junis Testimony, p. 7.

1 aspects of waste and chemical management, air emissions, and water
2 discharges. They include many of the provisions of RCRA governing the
3 storage, handling, and disposal of wastes as well as the specific
4 effluent/emission limits included in permit requirements under the Clean
5 Water Act, Clean Air Act, and their state equivalents. They can include
6 various types of performance monitoring requirements and information
7 collection and reporting.

- 8 2. Remedial or response laws and regulations seek to address environmental
9 harm that is resulting from past or ongoing activities. Such laws may
10 require investigation to determine if harm exists, or is likely to exist in the
11 future, as well as remedial action to remedy the harm. At the federal level,
12 examples of remedial laws include CERCLA or Superfund and the
13 corrective action provision in RCRA and its implementing regulations.
14 Other examples include the Clean Water Act water quality criteria as well
15 as the Clean Air Act ambient air standards. While these media-specific
16 environmental quality guidelines or standards are used as one basis to
17 develop the limits in operational discharge permits, they are also used to
18 identify situations where environmental response actions may be
19 appropriate. In North Carolina, the Groundwater Classification and
20 Standards (NC Administrative Code 15A NCAC 02L.0100 et. seq.)
21 sometimes referred to as the 2L standards are another example of water
22 quality remedial requirements. The 2L regulations classify groundwater
23 in the state and establish groundwater quality standards based on those

1 classifications (see Section .0200). The regulations also require persons
2 whose activities have resulted in exceedances of the applicable
3 groundwater standards to investigate and undertake corrective actions
4 where necessary. (15 NCAC 02L.0106).

5 **Q. WHY IS THIS DISTINCTION IMPORTANT?**

6 A. It is important because the class of remedial requirements, including North
7 Carolina's 2L requirements, recognize that environmental contamination,
8 including contamination that constitutes environmental harm, can result when
9 an entity is in full compliance with all operational performance requirements.
10 That is, a company may operate a facility in compliance with all waste and
11 chemical management design and operating laws and regulations and still have
12 releases to the environment that require either investigation or remediation
13 under remedial laws.

14 The practical reasons for this distinction are obvious. Operational
15 performance requirements including specific permit conditions, while designed
16 and intended to prevent environmental harm, are not fail-proof. These
17 requirements may not adequately address all activities or all chemicals with the
18 potential to result in environmental harm, in part because our understanding and
19 knowledge regarding how to achieve protection is constantly evolving.

20 As importantly, it is also often difficult, if not impossible, to determine
21 when environmental harm being found today occurred. Yet such timing
22 knowledge is necessary to understand the operational performance
23 requirements that were in place at the time and whether, or not, an entity was in

1 compliance with these operational requirements. In many instances, the
2 contamination being addressed occurred years or decades earlier. Assessing
3 today whether an entity operated in compliance at the time of a release to the
4 subsurface decades earlier is fraught with problems.

5 This is why remedial laws are typically designed to compel
6 investigation and remediation without requiring a determination of compliance
7 or negligence. Congress explicitly recognized this in establishing “strict”
8 liability under CERCLA. That is, liability under CERCLA does not distinguish
9 between parties who intentionally, knowingly, or negligently caused
10 contamination and those who did not. Nor does the statute distinguish between
11 parties whose past disposal was in violation of laws and regulations and those
12 who were in full compliance with all applicable standards at the time of the
13 release. EPA, in implementing CERCLA, has reiterated this point on numerous
14 occasions:

15 Liability under CERCLA is strict, joint and several. Strict
16 liability is liability without regard to fault; it holds a
17 responsible party liable for any harm caused, without regard to
18 whether the party exercised due care or acted with
19 negligence.¹²¹

20 Similarly,

21 . . . strict liability is the assessment of legal responsibility
22 without regard to fault or negligence. To hold a party strictly
23 liable, the government must prove only that the PRP
24 [Potentially Responsible Party] meets the statutory definition
25 of liability, regardless of the party’s intent, knowledge, or
26 purpose. The government does not have to prove that the PRP

¹²¹ U.S. Environmental Protection Agency, Superfund Enforcement Strategy and Implementation Plan, September 26, 1989; OSWER Directive 9800.0.

1 acted in a negligent manner; the government needs only prove
2 that the PRP is in one of the four statutory classes of liable
3 parties. . .¹²²

4 In fact, EPA recognized that if a party is required to investigate or clean
5 up under CERCLA, it might result in unintended and unwarranted perceptions
6 that a party was somehow at fault. But the intent of the law is to compel cleanup,
7 not to punish:

8 Citizens sometimes want PRPs to be punished for the
9 Superfund sites they have created. However, parties may be
10 liable under CERCLA without having violated any regulatory
11 statutes. Thus, the primary purpose of the liability scheme is to
12 compel cleanup.¹²³

13 CERCLA and most state remedial laws I am familiar with have a similar
14 framework that does not seek to punish an entity for the presence of a release,
15 but rather to compel responsible parties to investigate and, if necessary,
16 remediate. Again, this is a recognition that releases may and do occur when
17 companies make every effort to be in full compliance with all prospective laws
18 and regulations and is a recognition that releases may have occurred years or
19 decades earlier, well before the existence of requirements that reflect today's
20 knowledge.

21 I am not offering a legal opinion on the application of North Carolina's
22 2L requirements. I am, however, offering my view that the practical application

¹²² U.S. Environmental Protection Agency, RCRA, Superfund & EPCRA Hotline Training Module: Superfund Liability, Enforcement, and Settlements (Updated February 1998), June 1998, OSWER 9205.5-13A.

¹²³ U.S. Environmental Protection Agency, Superfund Enforcement Strategy and Implementation Plan, September 26, 1989; OSWER Directive 9800.0.

1 of the 2L requirements is similar to other similar remedial laws and regulations
2 that identify what constitutes a protective standard in one or more
3 environmental media. That is, upon discovery of a release resulting in an
4 exceedance of the 2L standards, parties with responsibility for the release are
5 compelled to investigate and, if necessary, remediate the release. They are not
6 typically punished or penalized for the exceedance itself. In fact, the practical
7 exercise of doing so would be very problematic. Mr. Junis cites to “10,940
8 groundwater exceedances confirmed by DEC’s own groundwater monitoring
9 data, in violation of the state’s 2L rules.”¹²⁴ Without confirming whether each
10 of his alleged exceedances are accurate, he arrives at this number by counting
11 each sample of each substance that exceeded a standard. This number is entirely
12 dependent on how frequently the Company conducted groundwater sampling.
13 That is, if the Company sampled daily the number of exceedances would be
14 significantly higher than if it sampled weekly. Such an approach would create
15 disincentives for entities to sample frequently or comprehensively across a wide
16 range of contaminants. This is an important reason why such exceedances are
17 not typically treated as violations with associated penalties, but instead are used
18 to trigger the required investigation and potential remediation. Penalties and
19 violations are assessed if a party does not comply with the requirement to
20 investigate or remediate as required by the regulatory agency.

¹²⁴ Junis Testimony, p. 7.

1 **Q. DO YOU HAVE ANY OTHER OPINIONS ON MR. JUNIS'**
2 **TESTIMONY?**

3 A. Yes. Mr. Junis cites to several documents as evidence that “by the early 1980s,
4 the electric generating industry knew or should have known that the wet storage
5 of CCR in unlined surface impoundments posed a serious risk to the quality of
6 surrounding groundwater and surface water.”¹²⁵ These included a 1979 report
7 by Arthur D. Little, Inc. and EPA’s Industrial Research Laboratory and a 1982
8 EPR Manual. I have already discussed these two documents in my response to
9 Mr. Quarles and those comments equally apply to Mr. Junis’ use of these
10 documents to support his position regarding available knowledge on ash ponds
11 and groundwater in the early 1980s. Additionally, on p. 52 of his testimony,
12 Mr. Junis discusses the need for DE Carolinas to take proactive action to
13 respond to its groundwater monitoring independent on what DEQ required.
14 Again, I have discussed my response to Mr. Quarles views on a similar point
15 and these responses are equally applicable to this aspect of Mr. Junis’
16 testimony.

17 **Q. DOES THIS CONCLUDE YOUR PRE-FILED REBUTTAL**
18 **TESTIMONY?**

19 A. Yes.

¹²⁵ Junis testimony, p. 39.

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

DOCKET NO. E-7, SUB 1214

In the Matter of:)	
)	DUKE ENERGY CAROLINAS,
Application of Duke Energy Carolinas, LLC)	LLC’S CORRECTIONS TO THE
For Adjustment of Rates and Charges Applicable)	REBUTTAL TESTIMONY OF
to Electric Service in North Carolina)	MARCIA E. WILLIAMS
)	
)	
)	

CORRECTIONS TO THE REBUTTAL TESTIMONY OF MARCIA E. WILLIAMS

Duke Energy Carolinas, LLC provides the following Corrections to the Rebuttal Testimony of Marcia Williams:

1. Page 58, Line 10 Change the phrase “over 600 ash ponds” to
“approximately 600 ash ponds”
2. Page 82, Line 4 Change the phrase “compared of the mass” to
“compared to the mass”

1 **Q. PLEASE STATE YOUR NAME, AFFILIATION, AND BUSINESS**
2 **ADDRESS.**

3 A. My name is Marcia E. Williams. I am a Senior Vice President at Nathan
4 Associates, Inc., an international consulting firm, where I specialize in
5 environmental, health, and safety matters. My business address is 2029 Century
6 Park East, Suite 1080, Los Angeles, CA 90067.

7 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING YOUR TESTIMONY?**

8 A. I am submitting this supplemental testimony before the North Carolina Utilities
9 Commission (“Commission”) on behalf of Duke Energy Carolinas, LLC (“DE
10 Carolinas” or the “Company”) in response to the supplemental testimony filed
11 by Steven Hart on behalf of the Attorney General’s Office.

12 **Q. DO YOU HAVE OPINIONS REGARDING THE SUPPLEMENTAL**
13 **TESTIMONY OFFERED BY MR. HART?**

14 A. Yes, I do.

15 **Q. WILL YOU SUMMARIZE THOSE OPINIONS?**

16 A. Yes, Mr. Hart’s supplemental testimony attempts to estimate the reduction in
17 costs if DE Carolinas had initiated actions earlier to address its ash basin
18 practices. I find the underlying bases for his assumption that “DEC’s inattention
19 to problems and delay in responsive actions increased the costs today” to be
20 unsupported.¹ Similarly, his attempt to estimate costs relies on faulty

¹ Hart DEC Supplemental Testimony, p. 127.

1 assumptions and is entirely speculative. Mr. Hart also ignores a variety of
2 potential scenarios that could have increased overall costs.

3 **Q. WHAT ARE THE UNDERLYING BASES FOR MR. HART'S**
4 **ANALYSIS AND WHY DO YOU FIND THEM PROBLEMATIC?**

5 A. Mr. Hart lists several reasons why he believes costs would have been less. First,
6 he states that "DEC's actions and failure to take actions before the Dan River
7 spill prompted the adoption of environmental requirements that imposed
8 accelerated schedules to address coal ash basin problems, particularly at Dan
9 River and Riverbend, and costs for accelerated actions are almost always
10 greater than costs under non-accelerated timeframes."² It is entirely speculative
11 that any action DE Carolinas did or did not take resulted in requirements that
12 imposed an accelerated schedule. Further, Mr. Hart offers no evidence that
13 undertaking actions on an accelerated schedule "almost always" costs more. In
14 fact, in my experience, tighter timeframes for projects can sometimes lead to
15 efficiencies, including expedited regulatory review times, that reduce project
16 costs.

17 Second, he asserts that "DEC's admission that it was criminally negligent
18 in how it managed some sites likely prompted a lack of confidence by regulators
19 and the public that less costly actions would be effective, and prompted
20 requirements that DEC take more extensive and high-cost approaches, such as
21 the high-cost beneficiation requirement."³ This too is entirely speculative. Mr.

² Hart Supplemental Testimony, p. 127.

³ Hart Supplemental Testimony, p. 127.

1 Hart provides no examples of the types of “less costly actions” that he believes
2 regulators and the public would have found effective but for DEC’s actions. It
3 also implies that regulators were unnecessarily imposing higher cost options.
4 Based on my extensive government experience, regulators make decisions
5 based on what they believe to be protective based on a weight of evidence
6 analysis using available information. Information changes over time. In this
7 case, the decisions regulators made about the manner in which DE Carolinas’
8 ash ponds should be closed were based on an assessment of what they believed
9 would be protective at the time of closure. If regulators “lacked confidence that
10 less costly actions would be effective,” it was because they compared the less
11 costly actions against more costly actions and determined that the more costly
12 actions provided additional, necessary protection. Regulators do not make such
13 decisions to be punitive. Importantly, these same regulators may have made
14 very different decisions 10 or 15 years ago based on what would have been a
15 different set of available information.

16 Third, he states that most of the expenditures DE Carolinas seeks to
17 recover were incurred at retired coal plants and he states that “by engaging in
18 reasonable monitoring and taking adequate responsive action, some of the costs
19 would have been included in the cost of service for customers while the coal
20 plants and ash ponds were in use.”⁴ He provides no definition or timeframe for
21 “engaging in reasonable monitoring.” What exact date would the installation of

⁴ Hart Supplemental Testimony, p. 127-128.

1 monitoring wells have constituted “reasonable monitoring?” How many wells
2 would have constituted reasonable monitoring? Similarly, he provides no
3 definition of “adequate responsive action.” Further, costs being incurred earlier,
4 as he suggests should have occurred, are not relevant to whether costs would
5 have been less, which is the thrust of his argument.

6 Fourth, he notes that costs are higher today due to inflation. While I am
7 not an expert in finance, the impact of inflation seems irrelevant in assessing
8 whether the costs incurred are more or less. Indeed \$1,000 buys less today than
9 it did twenty years ago. But the cost to the rate payer remains the same as both
10 are equally affected by inflation.

11 Fifth, he disqualifies the costs associated with the CAMA requirement to
12 provide alternative water to nearby residents by saying that cost was likely due
13 to DE Carolinas’ failure to address groundwater contamination much earlier. In
14 my experience, this is entirely speculative. From my years working with
15 Congress as it developed federal environmental legislation, there are many
16 examples where legislators take proactive future steps based on current
17 information. Those decisions are not usually based on a punitive rationale. It is
18 my view that it would be a serious mistake to assume that this result would have
19 changed if the groundwater assessment process at DE Carolinas had occurred
20 more quickly. Full investigation and remediation of groundwater at industrial
21 properties can commonly take a very long time to reach completion.

1 **Q. WHY DID YOU FIND HIS ATTEMPT TO ESTIMATE COSTS TO BE**
2 **ENTIRELY SPECULATIVE?**

3 A. Because there is no way to predict what would have or could have been done at
4 an earlier date and how the cost of those activities would compare to the actions
5 the Company has undertaken more recently. Mr. Hart, in fact, admits this when
6 he says “The analysis of specific costs that DEC would have incurred had it
7 responded earlier to the presence of groundwater impacts at its coal ash basins
8 is difficult. This is because it is difficult at this point in time to retroactively
9 determine what costs would have been incurred 10 or more years ago and
10 because some of the costs would have resulted in additional costs that would
11 also have to be accounted for.”⁵

12 I entirely agree with this statement. It is difficult to make such estimates
13 and, as Mr. Hart presents with his example and I have expanded on with
14 additional examples in my report, one cannot predict whether the costs would
15 have been less or more. It is difficult because guessing what might or might not
16 have been done decades ago is entirely speculative. One not only needs to make
17 a fundamental assumption about what initial step DE Carolinas would have
18 taken at each facility at an arbitrary timeframe between the late 1980s and 2010
19 but also make assumptions about actions subsequent to the initial action. This
20 includes actions taken by DE Carolinas, actions taken by the Commission, and

⁵ Hart Supplemental Testimony, pps. 128-129

1 actions taken by DEQ. The number of options that would need to be analyzed
2 using some type of expected value analysis would be extremely large.

3 Mr. Hart does not attempt such an analysis and instead presents a
4 simplified calculation that, without justification, removes one category of costs
5 entirely and adjusts the remaining costs for inflation. In the first step of his
6 analysis, he removes the costs of a permanent water supply connection. As I
7 noted above, it is speculative and not supported by evidence or experience that
8 an earlier action by DE Carolinas would have led to a different remedial
9 outcome in North Carolina, including the requirement to provide an alternative
10 water supply. Therefore, it is entirely arbitrary to remove this cost. In the second
11 step of his analysis, Mr. Hart assumes that the remaining activities that are the
12 subject of this rate request (i.e., all activities except provision of an alternative
13 water supply) if hypothetically conducted at an earlier time (e.g., ten or fifteen
14 or more than twenty years earlier) would be precisely the same as those
15 remedial activities DE Carolinas actually performed (or will perform). He then
16 discounts these costs to various past dates to account for inflation and calculates
17 the difference between the discounted costs and actual costs.

18 As I have noted, adjusting for inflation is not relevant in evaluating
19 whether costs expended at an earlier date are in fact more or less than costs
20 expended today. Further, by making this assumption, Mr. Hart has not solved
21 his underlying problem that predicting what might have happened earlier is
22 difficult and entirely uncertain. First, Mr. Hart relies on four different past dates
23 to discount the costs: (1) 1989, when he claims groundwater contamination was

1 first documented at a DE Carolinas facility; (2) 1993, which is when he claims
2 groundwater contamination was detected at two additional facilities (Dan River
3 and WS Lee) and just prior to notification of insurance carriers that groundwater
4 contamination existed above standards at Allen, Belews Creek, Dan River,
5 Marshall, and WS Lee; (3) 2003, when he claims DE Carolinas had internal
6 documents demonstrating knowledge of groundwater contamination issues as
7 well as the need to modify its practices of sluicing ash to basins; and, (4) 2010,
8 the date Mr. Hart claims that DEQ intervened to require DE Carolinas to collect
9 additional groundwater data “DEQ’s intervention to groundwater data collected
10 by DEC as part of the USWAG action plan).

11 Given how Mr. Hart uses the 1989 date in his cost analysis, Mr. Hart
12 seems to imply that the detection of any groundwater contamination as of that
13 date at one or more DE Carolinas’ ash ponds should have led to the closure of
14 all DE Carolinas’ ash ponds by 1989. This is entirely inconsistent with the
15 general knowledge at this time and with the normal process that would occur
16 after groundwater contamination was initially detected at a facility. By selecting
17 a 1989 closure date, Mr. Hart concludes that without any further assessment of
18 site-specific groundwater conditions or remedial options, DEQ would have
19 concluded that full closure of all DE Carolinas’ ash ponds was the appropriate
20 remedy. Use of a 1989 date is certainly not defensible.

21 Mr. Hart’s 1993 date is equally problematic for the same reasons. And
22 his reference to DE Carolinas’ notification to its insurance carriers occurred in
23 1997, not 1993. Moreover, using the date when an entity notified its insurance

1 carriers is unrelated to knowledge of any specific remedial action. I have been
2 involved in numerous environmental insurance recovery matters. Based on my
3 experience, depending upon the requirements of the policies, the date of initial
4 notification to the insurers for groundwater contamination is often very early,
5 long before there is a full understanding of the need to undertake any corrective
6 action much less the scope of that corrective action. Certainly, there was no
7 evidence that DE Carolinas reasonably believed, or that DEQ had determined,
8 there was a need to close all of the DE Carolinas' ash ponds as of 1993 or even
9 as of 1997, the date of the insurance carrier notification.

10 Mr. Hart's use of 2003 as one of the dates includes virtually no supporting
11 basis. It ignores entirely the fact that EPA had just started a long process to
12 determine what additional management practices might be imposed at ash
13 basins and ash landfills. It also ignores the existing NPDES permits covering
14 each of the DE Carolinas' facilities that were silent on any required
15 groundwater corrective action or the need to close any of the existing ash ponds.

16 Mr. Hart's final date selection is 2010. He appears to base this on the
17 fact that in 2010, DE Carolinas received a DEQ letter asking for certain
18 groundwater monitoring enhancements at individual facilities. The letter
19 utilized the groundwater data that DE Carolinas had been generating to further
20 expand the monitoring system at each facility. This letter said nothing about
21 closing operational ash ponds. It also reached no conclusions about the need to
22 undertake any specific corrective action.

1 Additionally, if DE Carolinas had proceeded with closure of one or more
2 ash ponds between 1989 and 2010, it is virtually certain that DE Carolinas
3 would not have closed these ponds by excavating them and switching to dry
4 bottom and fly ash handling. Of considerable importance, Mr. Hart fails to
5 recognize that the costs could very well have been more if DE Carolinas had
6 initiated some type of closure action earlier, action that would have been based
7 on far less information, including less available information demonstrating the
8 need for such action.

9 **Q. HOW MIGHT HAVE THE COSTS BEEN MORE?**

10 A. I addressed this in my March 4, 2020 testimony. Taking action in advance of
11 the regulatory certainty that came with CAMA, The CCR rule, and the Effluent
12 Guidelines final rule could lead to work having to be redone or modified once
13 those laws and regulations came into place, increasing the overall costs.

14 **Q. CAN YOU PROVIDE SOME EXAMPLES?**

15 A. Yes, although I recognize that such examples are speculative. Part of the
16 uncertainty is due to an inability to recreate the information available at the time
17 and determine what actions would have been deemed reasonable and prudent
18 by the Commission in a much earlier time period. However, an obvious
19 example is that at some earlier date, DE Carolinas closes an ash pond by
20 capping-in-place with a low permeability soil cover. After the passage of
21 CAMA and the CCR rule, it is determined that excavation of the CCR is
22 required due to its location. Under this scenario, DE Carolinas would have
23 expended costs on the construction of the cap as well as various post-closure

1 monitoring costs in addition to the costs of excavating and re-disposing CCR
 2 from the pond and the cap itself once CAMA and the CCR rule were in place.
 3 DE Carolinas would therefore have spent the same amount it has been required
 4 to spend on its current closure plus the additional costs required to remove and
 5 dispose of the cap material and the dollars expended earlier to cap and conduct
 6 post-closure care.⁶

7 Under this same example, in closing the ash pond earlier and converting
 8 to dry ash, DE Carolinas would likely have constructed a landfill to accept the
 9 dry ash. If this landfill did not meet the CCR rule/CAMA location standards,
 10 first finalized in 2015, it might need to be retrofitted or closed which would
 11 add additional costs to the project over the what DE Carolinas spent by waiting
 12 for the regulatory certainty under the CCR rule and CAMA. A similar situation
 13 could have occurred if the landfill's liner did not meet the requirements in the
 14 finalized CCR rule.

15 As another example, if DE Carolinas had acted to close ash ponds
 16 earlier, it could have decided to remove ash for some type of beneficial reuse,
 17 such as structural fill. The final CCR rule requires that when using CCR as
 18 structural fill over specified volume amounts, a demonstration must be made
 19 that it will not impact soil or groundwater. Such a demonstration was not

⁶ I note that this is not entirely a hypothetical example, as the Unit 5 Inactive Ash Basin at the James E. Rogers Energy Complex had been covered with soil and vegetation after it was taken out of service in 1980 and now is being excavated under the current closure plan. See DEQ Coal Combustion Residuals Surface Impoundment Closure Determination, Rogers Energy Complex/Cliffside Steam Station (April 1, 2019), p.3 through p. 5. https://files.nc.gov/ncdeq/Coal%20Ash/2019-april-decision/cliffside-rogers/Cliffside_FINAL_ImpoundmentClosureDeterminationReport_20190401.pdf

1 required before finalization of the CCR rule. DE Carolinas could have used ash
2 from ponds it closed at an earlier date for structural fill at one of its plants and
3 then years later be required to remove that material after the passage of the CCR
4 rule/CAMA.

5 These examples I offer are of course speculative, as it is impossible to
6 recreate what exactly might have occurred, particularly as one goes back further
7 in time. They do demonstrate, however, that there are several plausible
8 scenarios in which the overall costs in today's dollars could have exceeded what
9 DE Carolinas is seeking recovery for in this proceeding.

10 **Q. DOES THIS CONCLUDE YOUR SUPPLEMENTAL REBUTTAL**
11 **TESTIMONY?**

12 **A. Yes.**

1 Q. Ms. Williams, did you also prepare a summary
2 of your testimony?

3 A. Yes, I did.

4 MR. MARZO: Chair Mitchell, that summary
5 was provided to the Commission and to all parties
6 as required by the Commission's order, and I'd ask
7 that it be entered into the record as if given
8 orally here today.

9 CHAIR MITCHELL: All right. Hearing no
10 objection, that motion is allowed.

11 (Whereupon, the prefiled summary of
12 testimony of Marcia E. Williams was
13 copied into the record as if given
14 orally from the stand.)
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Duke Energy Carolinas, LLC
Summary of Rebuttal Testimony of Marcia Williams
Docket No. E-7, Sub 1214

My testimony brings my 50-year career in environmental protection and regulation to bear on crucial questions regarding the Company's recovery in this case of coal ash compliance costs. Having worked at EPA from its 1970 inception through February 1988, I have provided the Commission with a unique historical perspective regarding EPA's intensive investigation of coal combustion residuals throughout the 1980s as well as subsequent years and decades. Indeed, it was my office at EPA, the Office of Solid Waste, that produced the 1988 EPA Report to Congress that many intervenors in this case have used (I would say mis-used) in their attempts to portray the Company as being unresponsive to environmental concerns. I have come to the opposite conclusion, based upon my review of their testimony and the historical documents upon which they rely, as well as my experience with and general knowledge of environmental protection and regulation acquired over the course of my entire career.

The opinions I provide in my testimony are as follows: First, it is difficult to predict the exact scope of future regulatory requirements until a final rule has been issued, and even once issued, a Company's compliance costs can remain uncertain. Second, until the passage of CAMA and promulgation of the CCR Rule, the Company faced significant uncertainty regarding the regulatory requirements for managing CCR; even then, uncertainty remained as to the exact timeframe, methods, and costs applicable to site-specific closure of ash ponds until clarity was obtained from the implementing regulator (in North Carolina, the DEQ). Third, in light of these uncertainties, the Company acted prudently in waiting until after CAMA and the CCR Rule became law to take specific actions to upgrade or close ash ponds, while it worked cooperatively with DEQ to address any site-specific environmental issues. Fourth, prior to CAMA/CCR Rule, an accurate estimate of the costs associated with ash pond closure (even assuming that closure would have been required, an unknown outcome at that time) would have been extremely difficult

Duke Energy Carolinas, LLC
Summary of Rebuttal Testimony of Marcia Williams
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to estimate with a high likelihood for significant over- or under-estimation. Fully known and measurable estimates required completion of recently finalized site-specific closure agreements.

My testimony also critiques intervenor testimony from Messrs. Hart, Quarles and Junis, all of whom assert that the Company's ash pond practices were inconsistent with what was understood to be necessary to protect groundwater, and therefore imprudent. All three point to a handful of documents to support their view that there was widespread understanding, as early as the late 1970s or early 1980s, that the operation of DEC's ash ponds was not protective of groundwater. They also conclude that had DEC taken different actions many decades ago, its coal ash pond closure costs, including groundwater cleanup costs, would be lower today. However, the intervenors do not agree on what the company should have done, when any action should have been done, and how much the action would have cost,

I disagree with the intervenors' conclusions for a number of reasons. First, an understanding of the risks being addressed today from the operation of ash ponds did not evolve until well after the late 1970s and 1980s. The intervenors' assertion that these risks were understood earlier is directly contradicted by the weight of evidence, including EPA's findings, and is not supported by the documents they cite. Hindsight is always 20/20, but it is improper to use today's knowledge to interpret documents written decades ago. Second, as EPA initiated a regulatory process in the 2000s to establish national standards for CCR, the outcome of that process was highly uncertain and a utility taking action prior to that process concluding risked being found to be imprudent if those actions ended up being inconsistent with the final regulations, potentially leading to the incurrence of unnecessary or higher costs. At the time, knowledge as to whether early actions would have been more or less costly would have been speculative. Third, during EPA's expansive evaluation of ash ponds and their potential impacts on groundwater and surface

Duke Energy Carolinas, LLC
Summary of Rebuttal Testimony of Marcia Williams
Docket No. E-7, Sub 1214

water, the Company undertook specific early steps to assess its ash ponds impact on groundwater, monitor releases to groundwater and surface water consistent with its permits, and alert regulatory authorities of any impacts. Intervenor completely ignore the role of DEQ in overseeing the Company's historic management of CCR, and by doing so they present a distorted picture that fails to recognize the important relationship between a regulated entity and its regulator. That DEQ did not require DEC to modify the design of its ash ponds by requiring liners, did not require the ponds to close, or did not mandate groundwater monitoring earlier than they mandated, is a strong indication that the Company's operations were, based on knowledge at the time, considered to be reasonable and protective by the Agency charged with protecting the North Carolina environment. Importantly, DEQ issued and renewed permits for continued operation of the ash ponds throughout the period in question. Yet, the role of DEQ and its decisions do not seem to factor into the opinions reached by the intervenor witnesses.

In sum, it was reasonable and prudent for DEC to wait until final rules and laws were in place before initiating major modifications or closure of ash ponds while working with DEQ on any site-specific environmental issues. Further, the Company's actions with respect to groundwater were taken in conjunction with DEQ and followed DEQ's direction, which is entirely consistent with the manner in which a regulated entity should operate in a groundwater monitoring, assessment, and remediation process. Groundwater monitoring is a complex tool whose use has evolved significantly since the 1980s. Similarly, the ability to accurately assess the subsurface and evaluate risks from the presence of low levels of contaminants has also seen dramatic improvements. As a result, the time needed to reach appropriate decisions on groundwater remedies and implement them has typically taken decades at sites in North Carolina and nationally.

1 MR. MARZO: With that, Chair Mitchell,
2 the witnesses are available for cross examination.

3 CHAIR MITCHELL: All right. Thank you,
4 Mr. Marzo. Public Staff, you may proceed.

5 MS. LUHR: Thank you. This is
6 Nadia Luhr with the Public Staff. I will begin
7 with some questions for Ms. Williams.

8 CROSS EXAMINATION BY MS. LUHR:

9 Q. Good morning, Ms. Williams.

10 A. (Marcia E. Williams) Good morning.

11 Q. I'd like to start out very quickly on page 29
12 of your testimony.

13 CHAIR MITCHELL: Ms. Luhr, we're getting
14 a little feedback on the line. So everyone confirm
15 that they are on mute when not speaking. We'll see
16 if this resolves as we move forward.

17 All right. You may proceed, Ms. Luhr.

18 MS. LUHR: Thank you.

19 Q. Ms. Williams, on page 29 of your testimony,
20 I'm looking at lines 10 through 12, you state that:

21 "In the early 1980s, North Carolina adopted
22 regulations for classifying different waters of the
23 state and establishing groundwater standards for
24 different classifications."

1 And here you're referring to the 2L rules; is
2 that correct?

3 A. Yes, I am. And I know they were initially
4 passed in 1979, but some significant changes were made
5 in the early '80s, including some of the information on
6 compliance boundaries.

7 Q. Okay. So you realize that they were adopted
8 in 1979, and so that's when the prohibition on
9 exceedances began?

10 A. I do understand they were initially passed in
11 1979.

12 Q. Okay. Thank you. And on pages 93 to 97 of
13 your testimony, you discuss the 2L rule as a remedial
14 requirement. Now, Ms. Williams, is the 2L rule simply
15 a remedial requirement, or is it also a requirement to
16 prevent groundwater contamination?

17 A. So I would call it -- I would call it an
18 environment performance standard. And as an
19 environmental performance standard, it -- and I'm
20 speaking from my experience not only in this matter but
21 certainly my federal experience. Environmental
22 performance standards have generally been used to
23 ensure that, whether it's groundwater or whether it's
24 surface water or sediments, they've been developed over

1 time, they've been expanded dramatically over time,
2 both in terms of what constituents get covered, but
3 also in terms of the levels that are deemed protected.
4 Because as more and more information is developed on
5 the fate, and transport, and the toxicity of different
6 compounds, the environmental performance standards
7 change. Typically more stringently, occasionally less
8 stringent.

9 And so those standards are the best
10 indication of what is protective in the environment.
11 But the requirements that help ensure -- that are
12 prospective and proactive -- that ensure that the
13 environment's protected, are design standards,
14 construction standards, operational standards. So
15 those are the standards that get put into regulations,
16 those are the standards that get put in permits as to
17 how facilities are required to operate.

18 And what happens, obviously, is you're
19 hopeful -- both the government is hopeful when they
20 issue permits and the entities are hopeful when they
21 build and design their plants, that they're going to
22 meet those environmental performance standards, which,
23 as I said, are a changing set of standards often
24 implemented many years after the original facility was

1 built, designed, and permitted.

2 And so what the federal government considers
3 is that those standards, if they are exceeded at an
4 appropriate boundary and with appropriate -- if there's
5 excessive risk, then what the federal government
6 assumes and acts on is that you need to address that
7 contamination. But it's also a check to tell you that
8 the design and operational standards that the facility
9 was permitted to operate under are not as adequate as
10 what had been believed or understood at the time the
11 permits were issued.

12 So I call that a remedial standard. That's,
13 I think, the most general way to describe it. It's
14 certainly a regulation, it's a requirement, you have to
15 meet it, but it's an after-the-fact assessment. You
16 can't really design for an environmental performance
17 standard, particularly if it's not even in place at the
18 time that you're permitted to construct and operate the
19 facility.

20 Q. Understood. So once the regulations, the 2L
21 rule -- once the 2L rule was adopted in 1979 and these
22 groundwater standards were in place, would you agree
23 that the Company, at that point, had a responsibility
24 to assess whether or not it was meeting those

1 groundwater standards and to take action based upon
2 that knowledge?

3 A. No, I wouldn't really agree with it as you
4 stated. I think it was a joint responsibility. And,
5 in fact, it was a responsibility of the regulatory
6 agency. If they believed that the design and
7 operational requirements of facilities that existed
8 were inadequate to meet those standards, then the
9 permits really should have included additional
10 requirements.

11 So, for example, if there was a need or
12 belief that the specific facilities would likely, you
13 know, or highly likely or reasonably likely to result
14 in groundwater contamination exceeding the standards,
15 the general -- in my experience, the general way that
16 would have been addressed is there would have either
17 been a requirement put into a permit to monitor
18 groundwater, or there would have been a requirement to
19 modify some aspect of design or operation. That could
20 be identified by the Company, that could be identified
21 by the regulators, but regulators normally don't issue
22 permits if they believe there's some unprotective
23 situation associated with the permit they're getting
24 ready to issue.

1 Q. So it sounds like you're saying that Duke's
2 coal ash basins and its obligation to comply with
3 regulations was -- was a responsibility of DEQ rather
4 than Duke Energy Carolinas; is that what you're saying?

5 A. I'm saying that when Duke -- when a
6 regulatory agency issues a permit, it looks at all the
7 information that's available. And it can issue that
8 permit if it believes that permit is protective.
9 Regulatory agencies are not typically in a position
10 where they -- and I'm going to speak for federal. You
11 cannot issue a federal permit if you have information
12 to suggest that that permit will not protect health in
13 the environment.

14 So it's a joint -- it's a joint
15 responsibility, but it is my experience, working in
16 many states and federally, that the existence of a
17 performance standard like the North Carolina 2L
18 standards, normally, if groundwater monitoring was an
19 expected requirement, it would be written either into
20 the regulations or more likely written into each of the
21 individual permits.

22 And so that was not the case with 2L. It
23 certainly was not the case with the federal subtitle D
24 regulations criteria that did apply to the Duke Energy

1 facilities.

2 Q. So I -- I can point to some of your testimony
3 which is along these lines, and I have a few additional
4 questions. On page 69, I think it would be on line 19,
5 you say that the lack of regulatory action on the part
6 of DEQ is, quote, a strong indication that DE
7 Carolinas' operations were considered to be reasonable
8 and protective by the agency charged with protecting
9 the North Carolina environment.

10 And I think that's what that's what you've
11 been saying just now.

12 A. Let me -- if I could just supplement for a
13 minute. In this particular time frame, in the time
14 frame of 1979 to 1981, the federal government was
15 giving large amounts of money to every state, okay, to
16 implement the subtitle D criteria. This is a set of
17 guidance/criteria -- they're sometimes called criteria,
18 they're sometimes called regulations -- that EPA put
19 out in 1979 to define what was a protective solid waste
20 facility. And one of those criteria had do with
21 groundwater.

22 And EPA was giving significant grant money
23 out in this time frame to the states, and asked the
24 states, please identify solid waste facilities that did

1 not meet these criteria. And states did all different
2 types of things in response to that. But all states
3 were required to put together what was called an open
4 dump inventory that listed all their solid waste
5 facilities that they believe did not meet the criteria.
6 And Duke's facilities were not on North Carolina's open
7 dump list. In fact, coal ash surface impoundments and
8 landfills were generally not on any state's open dump
9 list in the window of time between 1979 and 1985, which
10 is when the inventory stopped being put together.

11 Q. Understood. So going back to your language
12 on page 69, is it -- is it your position that the
13 absence of regulatory action on the part of DEQ is an
14 endorsement of the Company's -- of the Company's
15 practices?

16 A. I think -- I think that what it is, is an
17 indication of what the knowledge base was at the time.
18 And we've heard a lot of discussion here today about
19 whether people are using today's knowledge to interpret
20 what was going on back in many decades ago. You know,
21 there's not a lot of advantages to being an old person,
22 but the one advantage I can tell you is I lived through
23 this. And so I can tell you that the level of
24 knowledge and the level of thinking on groundwater, and

1 the potential risks from groundwater contamination, and
2 which types of facilities were understood to be the
3 highest likelihood of causing issues in this exact time
4 frame is extremely different than what everybody knows
5 today. And that's a good thing, because we expect
6 knowledge to improve, and it has improved on all kinds
7 of topics.

8 So what I'm trying to share with you is what
9 the knowledge was at that time. I'm trying to explain
10 it so that you and others hopefully will recognize that
11 the knowledge at that time was not sufficient to say
12 those coal ash basins were understood that they were
13 going to result in contamination of groundwater above
14 2L standards or above health protective levels.

15 And the reason that that matters, okay, is
16 that you have to realize that, in this time frame,
17 North Carolina and every state was dealing with
18 hundreds to thousands of facilities that they were
19 trying to identify which were the ones which were most
20 important to address, to deal with the potential -- and
21 I underline the word potential -- the potential for
22 groundwater contamination. And both Congress and EPA
23 both believed that the most important thing was to
24 identify those that were -- that would be designated as

1 hazardous waste facilities. And the second thing would
2 be to identify those that were identified as open dumps
3 and get them upgraded.

4 And those were the priorities back then. So
5 I'm not being critical of North Carolina. I'm trying
6 to share with you what the focus was and what the level
7 of information was and how people were looking at
8 generalized requirements in that time frame. And if
9 they expected them to apply to a particular facility,
10 they normally put them into a permit in some kind of
11 fashion as a requirement.

12 Q. Understood. And we'll discuss historical
13 knowledge in a little bit. But first, you know, I want
14 to go back to the fact that we're looking at
15 North Carolina. And we're not looking at federal
16 regulations right now, we're talking about the 2L
17 rules, and the fact that those did prohibit groundwater
18 exceedances beginning in 1979, correct?

19 A. They identified in 19 -- I think I would say
20 what they did is they identified the levels of
21 contamination that would be acceptable in different
22 classifications of groundwater in the state of
23 North Carolina. And they're very similar to just like
24 saying the federal government had primary drinking

1 water standards that were effective anywhere that you
2 were dealing with drinking water. And other states had
3 similar kinds of standards at that time.

4 Q. And you stated, I believe, that coal ash
5 impoundments may not have been a priority given other
6 issues at the time. Regardless of whether or not they
7 may have been a priority, they still had to comply with
8 the law; isn't that right?

9 A. I think I've already said they had to comply
10 with -- certainly, they had to comply with regulations
11 and permits that were specific to their facilities.
12 And clearly, if they violated those standards, they
13 would have had to address -- working with the
14 regulator, they would have had to address what needed
15 to be done if they exceeded the standards. As I say,
16 in 1979 I don't believe there were any compliance
17 boundaries, but they would have had to address it. But
18 addressing an exceedance is different than saying they
19 were required to monitor the groundwater.

20 MS. LUHR: At this time, Chair Mitchell,
21 I would ask that Public Staff Cross Exhibit 65 be
22 identified as Public Staff Wells/Williams Rebuttal
23 Cross Examination Exhibit Number 1.

24 CHAIR MITCHELL: All right. Ms. Luhr, I

1 just want to confirm that we're all looking at the
2 some document. Is this a letter from NC DENR dated
3 August 28, 2014?

4 MS. LUHR: That's correct.

5 CHAIR MITCHELL: Okay. The document
6 will be marked as Public Staff Wells/Williams
7 Rebuttal Cross Examination Exhibit Number 1.

8 MS. LUHR: Thank you.

9 (Public Staff Wells/Williams Rebuttal
10 Cross Examination Exhibit Number 1 was
11 marked for identification.)

12 Q. And, Ms. Williams, if you can refer to this
13 document, and it's addressed from Donald (sound
14 failure) -- with DEQ at the time, and if you look --

15 (Reporter interruption due to sound
16 distortion.)

17 CHAIR MITCHELL: Yes. Ms. Williams, I
18 believe we're getting a bit of an echo from your
19 line, so when you complete an answer, would you
20 mute? I know that's difficult to remember, but
21 just try to keep your line muted when you're not
22 speaking. Thank you.

23 Q. So, Ms. Williams, if you see that the letter
24 was addressed from Donald van der Vaart with DEQ at the

1 time, if you look at the very last page, you'll see
2 that he was at the time deputy secretary of DEQ; do you
3 see that?

4 A. Give me a second, I'm just scrolling to the
5 end.

6 (Witness peruses document.)

7 I have looked at this, and that is my memory,
8 yes.

9 Q. Okay. Thank you. And if you would turn to
10 the very first page of the letter and read for me
11 beginning with the sentence that begins "within 90 days
12 of coming into office."

13 A. "Within 90 days of coming into office under
14 the leadership of Secretary John E. Skvarla," I'm not
15 sure if I have that right, "and through the vigorous
16 efforts of DENR engineers and scientists, this
17 administration has undertaken enforcement action to
18 address the long-ignored environmental problems
19 associated with coal ash ponds in the state of
20 North Carolina."

21 Do you want me to keep going?

22 Q. Yes, please, one more sentence.

23 A. "These problems, ranging from unauthorized
24 discharges to groundwater contamination, have all --

1 have been well known and well documented for decades,
2 yet virtually no initiative was undertaken by any
3 nongovernmental organization or governmental agency to
4 address these problems until quite recently."

5 Q. Thank you. And so, you know, this letter is
6 dated 2014. At that point, the state's environmental
7 agency acknowledged that not only were the problems
8 associated with the Company's coal ash ponds well known
9 for decades, but that they had been ignored; isn't that
10 right?

11 A. Well, I mean, I think this letter says what
12 this letter says. It clearly was issued at a change of
13 administration. And in my experience, having been
14 through many of those at the federal level, you get all
15 kinds of things change -- written at changes of
16 political administration. So I'm not going to comment
17 on that. But I would point out that 2014 is a very
18 different time frame than 1981, which is what you and I
19 were having a discussion about, and what was known and
20 thought about in 1981.

21 Q. And let's move on and talk about some of this
22 historical knowledge that you've mentioned. Let's
23 begin with the EPRI manuals. And we can turn to those
24 if we need to. We may not need to. But my first

1 question:

2 Would you agree that the EPRI manuals
3 discussed by Mr. Junis in his testimony represent the
4 state of industry knowledge at the time they were
5 published?

6 A. I would not characterize them that way. In
7 fact, I spent a fair amount of time looking, well, at
8 both of the manuals, but I looked at the 1981 manual,
9 which was supposedly projecting what the requirements
10 were going to be for coal ash ponds. And that manual
11 was premised on utilizing a proposed rule that EPA had
12 actually issued based on statutory authority that was
13 pre the Resource Conservation and Recovery Act, which
14 came out in 1976.

15 Those rules were designed for landfills, they
16 were not designed for surface impoundments or ash
17 ponds. They were never finalized. And, in fact, when
18 EPA went back and, under the Resource Conservation and
19 Recovery Act, developed its -- the solid waste
20 regulations that I did talk about, the subtitle D
21 criteria, they looked completely different.

22 So I think that that manual was an attempt to
23 share information with the industry about where things
24 could be going, but I do not think it was an accurate

1 representation of everything that was known in that
2 time frame. In fact, I think it actually did not do a
3 good job of summarizing the full amount of information
4 that was existing at the time with regard to what was
5 known about groundwater contamination and the potential
6 for various kinds of units to result in groundwater
7 contamination, which I would be happy to talk about in
8 more detail.

9 Q. Well, so first of all, I mean, the EPRI
10 manuals were published as manuals, correct, in the
11 sense that industry was intended to use them as
12 guidance; is that right?

13 A. I'm not -- I mean, I'm not -- I can't -- I'm
14 not going to speak for EPRI, but I had worked with EPRI
15 both when I was in EPA, and I have utilized EPRI
16 material since leaving EPA. And trade associations and
17 research groups like EPRI typically provide
18 information -- obtain information from their members
19 and share information with their members.

20 So I think the guidance manual has enough
21 information in it, both the '81 and even more so the
22 '82 manual that was designed not for new facilities but
23 for existing facilities, has a lot of information in it
24 that indicates that this is a time of significant flux.

1 And EPRI is just trying to share the information as to
2 what could potentially be happening. This is not a
3 regulation. It is not a guidance that says -- and, in
4 fact, if you read particularly the '82 manual, that is
5 the manual that addresses existing facilities, it does
6 not say every existing facility needs to do A, B, C, D,
7 E. It says here's a bunch of information that may be
8 relevant to your existing facilities, and as we
9 understand better where EPA is going to go, as it
10 continues to evaluate and collect information on coal
11 ash landfill and ponds, you may want to upgrade certain
12 things. But we don't know yet what that's going to be.

13 So I think that that manual is really quite
14 clear as it's applied to existing facilities. But I
15 would also point out that that manual does make the
16 statement -- or the manuals make a statement that
17 groundwater monitoring is required. It was not
18 required by EPA's federal regulations, and it was not
19 required in any of the permits.

20 And in my experience -- and I'd be happy to
21 discuss the statistics, I guess, I would tell you that
22 I believe are relevant in evaluating Duke's performance
23 in this precise time frame against other ash ponds in
24 this time frame. Because, in this time frame, a very

1 small number of ash ponds or ash landfills had liners,
2 and a very small number, less than 10 percent, had
3 groundwater monitoring. And that did not change
4 dramatically. It did not change dramatically for ponds
5 all the way through until you get post 2010.

6 In fact, Duke -- Duke was way ahead of the
7 industry in terms of the fact that it had groundwater
8 monitoring in all of its ash ponds by 2010. And when
9 you contrast that with the industry, the industry, as
10 of 2010, I believe, had groundwater monitoring in
11 42 percent of its ponds.

12 So you have to go back and look at both the
13 knowledge, which is very different than what I've heard
14 summarized here over the last week, and you have to go
15 back and look at the specifics of the individual
16 facilities in light of a broader context.

17 Q. Thank you. And going back -- going back to
18 my first question, and, you know, it sounds like from
19 the explanation you just gave, I mean, the EPRI
20 manuals, when they were published, represented
21 knowledge the industry had at the time; would you
22 disagree with that?

23 A. Well, I would. Because I think if you look
24 at the 1981 EPRI manual, it says we're basing this on a

1 proposed rule that EPA wrote quite a long time ago,
2 whereas EPA, in fact, as of the date of that EPRI
3 manual, had finalized its subtitle D requirements. So,
4 I mean, I don't think it's adequately characterized.

5 And I would put into -- you know, into
6 context, another thing. EPA started looking at coal
7 ash ponds in the late 1970s and did a lot of work on
8 coal ash ponds. EPA issued its 1988 report to Congress
9 during my tenure. I managed that operation and
10 production of that report. And that report looked at,
11 I think -- I'm going to give an approximate number, but
12 there were at least 75 reference documents utilized by
13 EPA, and -- I should say cited by EPA in the
14 development of that report.

15 The two -- there are a bunch of EPRI reports
16 that are utilized by EPA, and a lot of information that
17 EPRI collected that was utilized by EPA in the
18 development of the 1988 report to Congress. But those
19 two EPRI manuals were not utilized. And they were not
20 utilized because I think, at the time, EPA felt the
21 same way about them as what I'm trying to share with
22 you today. They were an attempt -- and a good attempt;
23 I'm not being critical of EPRI -- to try and share
24 information with its membership as to what might be

1 happening. But it didn't represent either industry
2 standards or what ultimately was deemed necessary to
3 happen to protect groundwater at that time based on
4 information at that time.

5 Q. And I'd like to go back to something you
6 said. You said that the EPRI manual stated that
7 groundwater monitoring was a requirement. And I just
8 wanted to confirm that you didn't mean a legal or
9 regulatory requirement, you meant that the EPRI manual
10 stated that -- that facilities -- well, I can quote,
11 that groundwater monitoring was necessary to provide
12 convincing proof of a safe disposal practice; is that
13 correct?

14 A. I don't have it in front of me, but it sounds
15 similar to what the EPRI -- so subject to check, I will
16 accept that. But what I want to make sure I explain
17 here is that that was not the viewpoint of the Federal
18 Environmental Protection Agency as to the way to
19 address which facilities had the potential to adversely
20 impact groundwater.

21 EPA had put out various guidance documents,
22 they had shared information with the states on how you
23 might go about looking at site specific, both ponds and
24 landfills. Because I need to emphasize to folks, in

1 this time frame, EPA was equally worried about
2 landfills as they were about ponds. And there were
3 equally many more, actually, examples of groundwater
4 contamination events that were known at that time from
5 landfills than from ponds. And so EPA looked at the
6 kind of factors that were relevant to consider. And
7 it's a large range of factors. And EPA provided this
8 guidance to the states on how you might look at
9 individual sites to identify those that were most
10 important.

11 But they did not advise putting in
12 groundwater monitoring wells at every facility. And
13 part of that was because the state of groundwater
14 monitoring was in its infancy. And I say regulatory
15 groundwater monitoring. The kind of groundwater
16 monitoring that would be useful to a regulator to come
17 to a conclusion as to how to apply that information in
18 the regulation of a particular facility. So
19 groundwater monitoring today is a very different animal
20 than what existed and was capable of back then.

21 And I'd be happy to walk through that history
22 but -- if that's useful to you or the members of the
23 Commission as to the evolution of groundwater
24 monitoring and many of the issues the agencies,

1 including my agency at the time, the federal EPA, were
2 trying to address with regard to groundwater
3 monitoring.

4 Q. That's all right, Ms. Williams. I have a few
5 more questions I'd like to get to. So you're -- you
6 stated, essentially, that, you know, groundwater
7 monitoring wasn't necessarily required by EPA at the
8 time; is that -- is that generally what you were
9 saying?

10 A. Groundwater monitoring was required by EPA
11 for what EPA considered the highest -- the
12 high-priority facilities. Which, at that time, were
13 those facilities that EPA defined as hazardous waste
14 land-based facilities. So hazardous waste landfills,
15 hazardous waste surface impoundments, hazardous waste
16 land treatment facilities. Groundwater monitoring was
17 required at that set of facilities starting between
18 1980 and 1982. There were variances available, and
19 the -- what EPA found in putting a huge amount of
20 effort at that point is that the ability to get
21 groundwater monitoring into those roughly 1,500
22 facilities was extremely challenging.

23 So it was required for some facilities. It
24 was not required for solid waste facilities, including

1 coal ash ponds and landfills.

2 Q. Okay. And you -- just very, very briefly, I
3 want to confirm that the 1981 manual does provide
4 guidance with respect to establishing a groundwater
5 monitoring system, correct? They provide
6 considerations for determining the location and depth
7 of wells, how to determine the direction of groundwater
8 flow, well location, monitoring analysis parameters. I
9 mean, they lay out guidance for facilities to follow;
10 isn't that right?

11 A. Again, you say they're laying out guidance
12 for facilities to follow. It was guidance, that's
13 number one. Number two, the 1981 EPRI manual was
14 targeted toward new facilities. It was not targeted
15 towards Duke's facilities that were existing facilities
16 and. And number three, EPA recognized that the
17 guidance that was available, including guidance like
18 the type that EPRI put out and others tried to put out.
19 When they tried to apply that kind of guidance for how
20 to do a groundwater monitoring system to real
21 facilities -- and I use as real facilities the
22 hazardous waste facilities that everybody agreed were
23 extremely high priority to get groundwater monitoring
24 in at -- what EPA realized is that guidance was -- and

1 I'm just going to use this word, it was naive. It was
2 not capable of easily being translated to how you put a
3 groundwater system in to these complex situations.

4 So once EPA realized that -- because EPA got
5 hundreds of questions from people. Well, what do you
6 mean by this, that, and the other thing. Things that
7 the EPRI manual thought it had answered, okay? But it
8 didn't answer it. So when you went into the field and
9 you tried to do this, it didn't turn out to be as
10 straightforward as you seem to suggest the EPRI manual
11 suggested it was.

12 And so EPA went out to 60 of those
13 high-priority facilities with a team of, like, 15
14 people on a specialized task force and worked to figure
15 out what could be learned about how you do groundwater
16 monitoring at complex -- at these facilities. And the
17 answer EPA came up with was published for the first
18 time in 1986 in a guidance manual on how to put
19 groundwater wells in to either a surface impoundment or
20 landfill facility that would give meaningful results
21 for decision-makers. And that guidance manual was
22 250 pages long.

23 And my agency got brought up in front of
24 Congress a couple of years later and asked

1 specifically, why isn't everybody -- you've now put out
2 the guidance, why isn't everybody already doing
3 groundwater monitoring perfectly, and they were asking
4 about hazardous waste facilities. And the answer that
5 came back is that the government accountability office
6 had looked at this and they said they were still
7 missing things from EPA's 250-page manual. And EPA had
8 to update that manual, which it finally did by 1992.
9 And by the mid-'90s, I was -- over 80 percent of
10 hazardous waste facilities had been able to put in
11 really decent groundwater monitoring systems.

12 But that's the evolution of this. And so to
13 go back, and when I hear Mr. Junis say, well, Duke
14 should have put in a comprehensive groundwater
15 monitoring system in 1981, that just isn't the way
16 anything was functioning back then. And when I hear
17 Mr. Quarles say, you were supposed to put your wells in
18 1984 in the perch zone, you weren't supposed to put
19 those wells in the uppermost aquifer. EPA had dealt
20 with that issue for five years, okay, saying some perch
21 zone -- but they tried to define a perch zone that
22 would be part of the aquifer that would be considered
23 for groundwater monitoring, and they couldn't do it.

24 They started out trying to do that in 1978,

1 and by 19 -- by 1986 when they did this comprehensive
2 guidance manual, they say some perch zones can be part
3 of the uppermost aquifer, but only if they generate
4 sufficient water. And you need to work with your
5 agency on that issue.

6 So you have to understand that the
7 environmental field was different back then. And it's
8 wonderful that we're in a different place today, but it
9 isn't where we were then.

10 Q. Thank you. Let's -- let's move on to a
11 slightly different topic. I'm looking at page 61 of
12 your testimony, lines 1 through 5. And here you state
13 that the 1984 study conducted for Duke Energy Carolinas
14 concluded that, quote, none of Duke's ash classified as
15 RCRA hazardous waste.

16 And, Ms. Williams, did Duke Energy Carolinas
17 believe at the time that coal ash had to be classified
18 as hazardous waste in order to contaminate groundwater?

19 CHAIR MITCHELL: Ms. Williams, I'm going
20 to interrupt you.

21 Ms. Luhr, would you please restate the
22 page that you're referring to? I missed it, I
23 apologize.

24 MS. LUHR: Sure. Page 61, lines 1

1 through 5.

2 CHAIR MITCHELL: All right. Thank you.

3 Ms. Williams, you may proceed.

4 THE WITNESS: Thank you, Commissioner.

5 Look, I -- Jim Wells can speak for Duke. I can't
6 speak for Duke in terms of what Duke thought, but I
7 can say that absolutely not. You did not need to
8 be a hazardous waste to have a potential impact on
9 groundwater. But the reason I'm emphasizing
10 hazardous waste and all the effort that was put
11 into it is EPA spent, at Congress' direction, a lot
12 of time identifying what constituted a hazardous
13 waste because, if you were going to start to fix
14 problems that might be out there, the understanding
15 was that those facilities classified as a hazardous
16 waste had the highest likelihood of causing
17 problems to groundwater.

18 So, of course, hazardous constituents
19 that are not in -- that are not classified as
20 hazardous waste, or I should say waste streams that
21 contain hazardous constituents can cause
22 groundwater contamination. But we're dealing with
23 probabilities and potential. And that's why EPA
24 provided guidance that dealt with concentrations,

1 distance to drinking water wells, distance to
2 groundwater, permeability of soils, and all kinds
3 of other factors that would be considered in
4 deciding what -- what nonhazardous waste facilities
5 were high priority for installation of groundwater
6 monitoring.

7 Q. And later on that same page, page 61, I'm
8 looking at lines 5 through 8, you're still discussing
9 the 1984 study, and you state that it concluded that:

10 "Given the nature of Piedmont soils
11 underlying the ash basins and its high ion exchange
12 capacity, Duke's disposal of wet coal ash would have no
13 significant impact on groundwater or surface water that
14 received that groundwater."

15 And, Ms. Williams, this study, it only
16 included groundwater monitoring data from one of Duke
17 Energy Carolinas' sites, Allen; isn't that right?

18 A. That's correct. It had actually, you know, a
19 significant number of wells that had been put in over
20 time at the Allen facility. And then it did leachate
21 analysis at other facilities so that Duke could
22 understand the variability of leachate. And it -- I
23 think Ms. Bednarci k discussed this.

24 I mean, the individuals involved in that

1 study; and again, in the A. D. Little study, which was
2 also when EPRI was involved in that as well; and in the
3 1987 River Bend study, looked specifically at the
4 differences, for example, in soils at River Bend versus
5 soils at Allen. But the knowledge at that time was
6 that the Piedmont soils were providing significant
7 attenuation capability for coal ash pond -- coal ash
8 leachate.

9 So again, I'm urging you to look back at what
10 the knowledge was then, and I think these were -- both
11 of those studies these were very thorough studies.

12 Q. And you say in your testimony, you stated, I
13 believe, today several times that the impacts of coal
14 ash disposal at a specific site are site specific;
15 isn't that right?

16 A. Yes, they are site specific, but that doesn't
17 mean that you can't take information. And, in fact,
18 that's exactly what people were doing, was taking
19 information about one site and then looking to see if
20 other sites were similar. That's exactly what was
21 going on. So the Piedmont soils were considered to be
22 similar.

23 And I think, if you look at the 1987 River
24 Bend study, which Mr. Wells, I'm sure, could give you

1 more detail on, but if you look at that study, you'll
2 see they looked at -- for potential differences between
3 the soils, but they're Piedmont soils, and they fit
4 within a certain class of materials. That's why Duke
5 did leachate studies, to see if the ash at the
6 different facilities might look different.

7 So yes, you do site specific, and then you
8 look at a set of factors. But many of the factors that
9 you look at are similar between the set of DEC
10 facilities that were all located in similar geology.

11 Q. And we'll discuss the leachate tests in just
12 a moment. But first, I mean, the factors you list
13 yourself in your testimony include the vertical
14 distance between the waste and the aquifer, the amount
15 and type of waste being managed, and the depth and
16 direction of groundwater.

17 So those go beyond just the type of Piedmont
18 soil, which itself, you know, soil does differ from
19 site to site; isn't that right?

20 A. Yes. I gave a very small set of factors.
21 There are many other factors besides the ones that I
22 put in here and the ones that you just read. And
23 again, knowledge of that changed over time. So what we
24 have to do today to model or monitor -- particularly to

1 model the fate and transport of these contaminants in
2 groundwater is very much more sophisticated than what
3 was capable of being done in the early 1980s.

4 So yes, you looked at those factors. But the
5 reason the EPA was able to provide generalized guidance
6 to do site specific is they wanted to be able to
7 distinguish a site that was in an environment like
8 Piedmont with perhaps surface water relatively close to
9 the ash ponds from a situation where you're in
10 California and you have perhaps extremely sandy in some
11 places with very deep groundwater.

12 And so the concept was you would identify
13 patterns among categories of types of sites, and that's
14 one of the reasons -- I believe I was asked in an
15 information request, well, how in the world can you
16 possibly know what's going on if you don't put
17 groundwater wells in. And the answer is not only did
18 you have certain other types of information that could
19 indicate that there could be an issue, such as let's
20 say you could have problems with fish in a river, or in
21 a pond, or in a stream, because, in fact, you are
22 having some kind of excess amount of contaminants
23 leaching there.

24 So that's an indication that you can detect

1 without monitoring. But not only that, you take
2 information of the type that EPA recommended that all
3 the states used to look at their individual facilities,
4 and you figure out, based on where you have seen
5 issues, what other types of sites may require putting
6 in groundwater monitoring, and that's how we did it
7 back then.

8 Q. So, you know, I'm glad you mentioned that,
9 you know you -- when the Company tested Allen, it did
10 find exceedances; did it not?

11 A. The conclusion that I recall from -- I
12 don't -- again, I would defer to Mr. Wells on this.
13 But the conclusion of that study was that there were
14 not exceedances downgradient that were above the 2L --
15 2L standards. Arsenic was one they looked at very
16 carefully because arsenic was a compound that EPA was
17 most concerned about at this time frame as a risk
18 driver. And they did say that it was not yet -- that
19 the ash pond had not yet reached a steady state with
20 the groundwater. And so, over time, there could be
21 some additional contamination. But they projected that
22 to be, I think, either below or right about at the
23 secondary standard in the future, not now.

24 So I do believe they had some high readings

1 on some of the background wells for manganese, but,
2 again, I may not be remembering precisely, and I would
3 urge to ask Mr. Wells on that.

4 A. (James Wells) And I'd be happy to answer
5 questions on that as well. And that is my
6 understanding. I mean, there was no downgradient -- I
7 think we'll have to have some discussion about what you
8 mean by exceedance. But in any event, you have an
9 established compliance boundary around the basin.
10 There's nothing exceeds a 2L standard outside of
11 compliance boundary that's built into that report.

12 There are some values that exceed what were
13 the background -- what were the published standards for
14 various contaminants, including manganese and iron,
15 which have a naturally occurring contribution. At the
16 time there was no establishment of a background level.
17 But in any event, what the report was really concluding
18 is that there was no downgradient migration of those
19 contaminants above the drinking water level standard,
20 with a real focus on the primary MCLs, and even more
21 specific to arsenic. And trying to determination
22 whether it was a migration that ultimately could hit a
23 receptor or present a risk to the public health or to
24 the environment.

1 And it concluded, as Ms. Williams already
2 indicated, it did conclude that the prediction with
3 respect to the potential to exceed an arsenic standard,
4 which was, again, a primary focus at that time, it
5 would be 50 years and up to 100 years before an arsenic
6 standard would be exceeded if the plant retired as it
7 was anticipating in the future.

8 And that was even after acknowledging the
9 concept that there was still an equilibrium left to be
10 reached. So it acknowledged that it had potential for
11 additional time before a full equilibrium is reached,
12 and even in light of that, given the attenuation
13 studies they did, and the time travel, and
14 understanding the science as a whole, that was the
15 prediction they landed on. That you were at 50 to
16 100 years before you'd see an arsenic limit exceedance
17 at the Lake Wylie level.

18 A. (Marcia E. Williams) And I will just
19 supplement. I think you can look at EPA's 1988 report
20 to Congress which summarized both the report and the
21 results at the Allen plant and did not find groundwater
22 issues problematic to EPA in the review of the results
23 of that study or the Allen plant.

24 Q. And, Mr. Wells, since we're talking about

1 Allen now, I had a few more questions I can go ahead
2 and ask you. You had mentioned that manganese and iron
3 are naturally occurring.

4 And are you aware that the Arthur D. Little
5 1985 study stated that, regarding tracer constituents,
6 elevations of concentrations versus background
7 concentrations were evident at some of the downgradient
8 wells?

9 A. (James Wells) I would -- I mean, I'd
10 certainly prefer to see the page and see what it says
11 and --

12 Q. I can refer you to it if you'd like.

13 A. That would be good. I am familiar with the
14 document, and I'm familiar with the statement you're
15 referring to.

16 Q. Okay. So I'm looking --

17 A. But I would like to look at the page, if
18 you -- I mean, I would prefer that, so we could look at
19 it.

20 Q. Sure. So we're looking at Joint Exhibit 10.
21 And I don't know if you have the paper copy or the PDF,
22 but if you're on paper, it's page 5-21.

23 A. I'm sorry, can you repeat the page?

24 Q. 5-21.

1 A. (Witness peruses document.)

2 Okay. I'm there.

3 Q. Okay. And let's see, this is the last -- if
4 you look at the last bullet on the page and that first
5 dash, it states that:

6 "Elevations of concentrations versus
7 background concentrations were evident at some of the
8 downgradient wells."

9 A. Okay.

10 Q. So that would indicate that, although
11 manganese and iron are constituents that occur
12 naturally, that there were elevated levels of some of
13 these tracer constituents in downgradient wells; isn't
14 that right?

15 A. Well, I mean, recognize that could mean a lot
16 of things. When you're dealing something like iron and
17 manganese, the variation of what's natural is very
18 significant, and it can be very significant. And, I
19 mean, again, I would also recognize a big part, if
20 you're going -- we're talking about 1980, in this case
21 '81, '82 time frame, and what the focus here is on is
22 the concept of whether or not it's presenting a risk to
23 the public health.

24 So there was a primary focus on the primary

1 MCLs. And the iron and manganese, while I indicate
2 they're background -- you know, they're background
3 concentrations that vary both upgradient and
4 downgradient and whether or not you're within or out,
5 the best statistical variation. That's some additional
6 analysis that would be applicable. But also the fact
7 that those -- both iron and manganese were second --
8 are secondary standards and were secondary standards at
9 the time and not being regulated based on public health
10 at that point. It was the esthetic and other type
11 concerns associated with secondary.

12 Q. And, you know, despite -- despite these
13 exceedances, the Company discontinued the use of those
14 wells in 1982; isn't that right?

15 A. I don't know when those wells would have been
16 discontinued. What you see here is, you know, probably
17 just a couple things. That when you refer to
18 exceedances here, remember there's a compliance
19 boundary around this, you know. So what this report is
20 recognizing is that there is an impact to groundwater
21 within the vicinity of the basin, and there's many
22 wells, as you can see, inside the basin and right at
23 the boundary of the basin. And it's indicating there's
24 an impact at or near the basin. I think that's what

1 the conclusion is.

2 But it's not indicating that it's CM
3 migration. And there's nothing in this report that
4 indicates there's an exceedance or a violation of the
5 2L standard in the sense of outside the compliance
6 boundary that is above an established background level,
7 established pursuant process set forth in 2L.

8 So what I'm indicating is here, this report
9 on its -- concludes that there's no significant impact
10 to groundwater. And it's based on the data that is set
11 forth within it. And the fact that this report, as
12 well as the other reports that follow, and the data
13 that is used within it to support those conclusions,
14 all of those are indicating. And it's indicated in the
15 final conclusions and in their final recommendation
16 that there is no significant impact to the groundwater.

17 And to the extent it's predicting whether
18 there will be -- now, granted, it's focusing a great
19 deal on arsenic, because that's what that primary MCL
20 concept was what was so important at the time. To the
21 extent they're predicting it, they're predicting you
22 will not see an issue for 50 to 100 years, long after
23 retirement.

24 A. (Marcia E. Williams) I would point out

1 that --

2 A. (James Wells) Excuse me?

3 A. (Marcia E. Williams) I was just going to
4 point out that, actually, EPA attributed the good
5 control of arsenic to the high presence of iron and
6 manganese as background contaminants in the soils. So
7 I thought that was relevant, and I apologize, Jim, for
8 disrupting.

9 A. (James Wells) No. And, I mean -- and I
10 would also add, I mean, if you look at -- the report
11 also provides the background levels of iron and
12 manganese in soil as well as the levels of iron and
13 manganese in the ash. So all of that. I mean, again,
14 I know we're doing a significant hindsight review here
15 of what would have been the experts at the time that
16 were doing this work, and were evaluating a data point,
17 and seeking to draw a broad conclusion suggesting, you
18 know, the work was flawed.

19 So, in truth, even today, any monitoring
20 network is looked at holistically. Not -- any single
21 well is a data point that informs what's going on
22 conceptually site-wide. And that's how it's reviewed.
23 And as you pull these wells, you take multiple samples,
24 and there are many things that affect that sample, all

1 have to be considered as part of the holistic analysis.

2 For instance, you may get a high
3 concentration of something in a well. Then you look at
4 other factors, there may be a high turbidity that you
5 find with the well. Or you may see something that's
6 wrong -- a pH that suggests something is off. That
7 tells you the high concentration you think you're
8 seeing isn't a function of a groundwater contamination.
9 For instance, a pH indication may tell you that you've
10 got groundwater contamination of wells. So you need to
11 consider that when you evaluate what that data's
12 telling you.

13 If you've got high turbidity, you may be
14 detecting, through your sampling technique, you can be
15 contaminating that sample with sediment. And that can
16 give you some numbers that will drive it off.

17 But my point is this: There are -- you put a
18 network in for a reason. You evaluate all the well
19 data; you take multiple samples, over multiple seasons,
20 and over multiple years to create that picture. And
21 then you take the appropriate action based on what you
22 find. And it does -- it is iterative, and you continue
23 to analyze with time to drive the appropriate decisions
24 based on what you're seeing.

1 Now, having said that, the one thing I would
2 tell you is, if -- throughout that iterative process,
3 if you're beginning to see something that suggests a
4 risk to the public health, then you move on that
5 quickly. You move and take action. And that's what
6 the Company has done throughout these years. However,
7 if you are in that realm of things that aren't
8 presenting a risk to the public health -- we have an
9 impact of the basin, we have an impact within the
10 vicinity of this basin, there's no question. But is it
11 migrating? Is it impacting receptors, being neighbors'
12 wells? Is it impacting a downstream surface water body
13 in a way that's impacting water quality or the fishery
14 in a negative way? If you're seeing any of that, you
15 take action and you take it quick. As quick as you can
16 to mitigate. All these things move relatively --
17 it's -- groundwater moves slow is a concept that's used
18 in the industry. It's just because it takes -- it is
19 very complex.

20 But in any event, if you see a risk, you take
21 action. What you're seeing with these sites, I mean,
22 the common theme you will see -- and I'm sure we'll
23 walk through all the data, but you'll see from the '70s
24 through the present time, that what we're seeing is

1 typically iron, manganese, pH, and that there are
2 background concentrations of these type things that
3 vary significantly. And there's published data that
4 you can refer to that will show that that is.

5 Are we seeing a risk? No. If we did, we
6 would take action. But we're taking -- we are taking
7 appropriate action to continue to understand whether or
8 not it's presenting a risk, one; and 2, working with
9 the regulator to understand what, if any, more action
10 we need to be taking in response. And now I will tell
11 you, I know the response that I think I'm hearing
12 throughout this -- what I've been hearing for the last
13 couple of weeks is the suggestion that there's been
14 this violation of the groundwater standard since 1978,
15 or whenever we first put our first well in. And again,
16 there's the -- there's a -- we're not in violation of
17 the standard until we begin to see an impact outside
18 the compliance boundary.

19 So that's a big part of what the analysis has
20 been over the last 10 years, is to understand that
21 level of impact. And then if you are outside the
22 compliance boundary, what's the regulatory response?
23 Always recognizing risk would drive everything.

24 Q. And the compliance boundary was not

1 established in 1979, correct? Those were established
2 several years later?

3 A. In '84. So remember, 2L -- first groundwater
4 standards established in 2L, 1971. There was a handful
5 of contaminants that are identified there for us. And,
6 of course, more have been added over the years. I
7 think it started with a double digit-type number and
8 ended up with a triple digit where we are today. So
9 they've evolved, the concentrations evolved over time,
10 as you would expect, and the perimeter of compliance
11 was established in the -- I think it was in either '83,
12 '84 revision. So this is when the Allen groundwater is
13 being evaluated. So it established then explicitly
14 that there was this accountability to the compliance
15 boundary.

16 And that was further refined with further
17 developments of 2L, and then further interpretations of
18 2L that have occurred over time as far as how that
19 compliance boundary applied.

20 Q. And so we've -- we've -- you know, I asked
21 you whether the Company discontinued the use of its
22 wells in 1982, I think you said subject to check.

23 A. No. I said I don't know absolutely as to
24 '82. I know post-Allen studies, the internal '84

1 study, which I think has been in the record, and after
2 the A. D. Little study, which of course was done by
3 EPA's contractor who installed additional wells. After
4 that, and based on the findings of those, there was a
5 strong basis, particularly back in those years, if you
6 were sitting in that seat and you're reviewing this
7 conclusion that there is no risk, that we do not
8 anticipate arsenic movement for 50 to 100 years, which
9 is a big focus what they were evaluating.

10 That supported what they were seeing with
11 respect to removal of the groundwater monitoring wells.
12 It's not uncommon in the environmental realm even today
13 that you may start monitoring to determine if you have
14 issues, and if you're not seeing them, which is where
15 they were at that time, they determined they weren't
16 seeing issues. That was supported not just with a Duke
17 study, it was supported by the A. D. Little study. And
18 it was ultimately relatively known by the '88 report to
19 Congress.

20 So it wasn't Duke being -- relying on
21 something and a question of whether they should or
22 should have known. What they should have known,
23 A. D. Little and that entire staff should have known,
24 the EPA '88 report to Congress, all those folks should

1 have known -- the River Bend study which, you know, we
2 refer to Harry LeGrand who I've heard referred to as,
3 in essence, the father Duke of hydrogeology in the
4 Carolinas, authored the '87 report, and we're
5 suggesting that even he was incompetent.

6 I mean, it goes -- so the concept here is
7 these reports on the whole indicate, based on the
8 attenuation study, based on groundwater monitoring that
9 was done by both Duke and A. D. Little, that there was
10 not a significant impact to the groundwater. And that,
11 in the future, it was not anticipated that there would
12 be, based on what they were looking at and how they
13 were prioritizing at the time. Again, 40 years ago.

14 But that conclusion by Duke is supported by
15 that, and I find that to be very reasonable. And for
16 what it's worth, even today that's the type data that
17 we see, that attenuation. That concept of attenuation
18 is there. That we -- our plume today is just -- it
19 sits there. As it moves, it attenuates, it's not a
20 growing plume, it's not -- that plume is sitting
21 beneath the basin and is extended outside the
22 compliance boundary in certain areas, and it's -- but
23 it's sitting, and it's stable, and our multiple models
24 say it will continue to do so for hundreds of years, as

1 we see it, if we take no further action.

2 But that's consistent with what was being
3 discussed in those documents. So even 40 years later,
4 much more sophisticated work, much more sophisticated
5 modeling, still largely consistent with what they had
6 found back then.

7 And the other point I want to make, because
8 this has been lost, all of this was voluntary. You
9 know, if you look at the '78 study, there are data --
10 there are things out there suggesting there's a
11 potential for groundwater impact. So what does Duke
12 do. They've got six, seven sites, they take what they
13 believe to be a representative of site, and they
14 initiate, voluntarily, all this. So the reason we can
15 cherry-pick a well here or two and do a 20/20 hindsight
16 is because Duke did that voluntary study. It wasn't a
17 DEQ directive, it wasn't an EPA directive. They did
18 it.

19 The reason you can question all their data is
20 because they did such a good job documenting what they
21 did, and where they put the wells, the depth they put
22 them. They didn't -- went below the perch water. If
23 you read it, it says below the perch water. The first
24 reference to the perched water sample indicates it went

1 below the perched water because that was the first
2 place they could get adequate sample volume.

3 So we now have a witness cherry-picking and
4 saying they went below the perched water. I'm not
5 sure, I won't opine as to whether they did that
6 intentionally.

7 MS. LUHR: Chair Mitchell, I'm sorry, I
8 think he's gone beyond the question that I asked.

9 MR. MARZO: Chair, I'd ask that -- I'd
10 ask that the witness be allowed to complete his
11 answer.

12 CHAIR MITCHELL: All right. Mr. Wells,
13 we'll let you -- I'm going to overrule the
14 objection. Let's proceed with your answer. And
15 please just do your best to stay on track and
16 respond to the question that you're asked just in
17 the interest of moving the hearing along
18 efficiently. Thank you, sir.

19 THE WITNESS: Very well. I will. I was
20 emphasizing that this was voluntary. This was Duke
21 that volunteered to do the wells. There was also a
22 voluntary effort to share with A. D. Little in a
23 sense that A. D. Little did -- out of the 500, 600,
24 I don't know how many ash ponds ultimately were

1 determined, A. D. Little -- Duke was one of six
2 sites out of all of those that did that level of a
3 study that ultimately culminated in hundreds and
4 hundreds of pages report that included Duke.

5 So Duke's doing this voluntarily, and
6 doing this to assist with the development of the
7 understanding of groundwater impacts. And the key
8 conclusion, not just from Duke's internal voluntary
9 work with A. D. Little work, was the same. And
10 that is the impacts were localized, they weren't
11 seeing a risk, they weren't seeing a significant
12 impact. All of that supported Duke's determination
13 as to what, if any, additional groundwater
14 monitoring needed to do in that area going forward.
15 There were no recommendations in any of those
16 reports suggesting further groundwater monitoring,
17 including the A. D. Little report.

18 Q. Thank you. And do the soils surrounding coal
19 ash impoundments have an infinite attenuation capacity?

20 A. I would refer you to the reports, and the
21 studies, and the ongoing documents that have been filed
22 with the state with respect to that very issue. I will
23 say the '80s studies talked about it, they considered
24 it, and still concluded that migration, they were 50 to

1 100 years before you'd see anything with respect to
2 arsenic at the Lake Wylie level.

3 So there are -- the localized soils had some
4 attenuative capacity. And by the way, I did want to
5 clear the one point that I heard, I think one of the
6 witnesses referred to. There was this bad assumption
7 that any -- I think it was another reference to the
8 level of expertise within the folks in the '80s who
9 had -- referencing the -- there was an assumption of
10 some sort that it was clay, it was all clay, or that it
11 was high -- predominantly clay. The attenuation
12 studies that were done and that were ultimately relied
13 on, and it's evidenced by the A. D. Little report as
14 well as the '84 report, indicates that those
15 attenuation studies didn't assume a percentage of clay.
16 They actually pulled a sample at the basin at that well
17 and used -- did an analysis of what the percent clay,
18 percent sand, percent sandy clay, percent sandy level,
19 all the various geology-type terms. They laid out what
20 that percentages are as to clay. They declared -- I
21 think it was 27 -- 20 percent clay and 1 sand. They
22 did actual attenuative studies then on that actual
23 material.

24 So there wasn't an assumption of it's clay,

1 and therefore it will attenuate. It was actual
2 material at the site with an attenuative study that
3 resulted in a conclusion that these soils, based on the
4 analysis we did of these soils, had attenuative
5 capacity. And then they drew -- and then they
6 developed conclusions based on that. So it wasn't an
7 assumption of clay, it was an actual data.

8 Q. All right. I'm going to move back to my
9 questions for Ms. Williams. Just give me one moment.
10 Okay.

11 Ms. Williams, you had mentioned -- when you
12 were discussing the Allen study, you had mentioned that
13 leachate studies were conducted using leachate from
14 each of Duke Energy Carolinas' coal ash impoundments or
15 facilities.

16 Is it your opinion that leachate testing is
17 as effective for assessing the risk of groundwater
18 contamination as groundwater monitoring?

19 A. (Marcia E. Williams) Well, they're not --
20 they're not the exact same thing, but I guess each has
21 its own purpose. The purpose of leachate testing is to
22 understand how -- how likely it is that the
23 contaminants in the waste will leave the waste under
24 whatever the scenario is of the leachate test. And in

1 the early test EPA was using both an acidic-type leach
2 test as well as a more neutral pH leach test when they
3 were evaluating coal ash, but the EPA test method at
4 the time uses a more acidic leach test, which will
5 leach a number of the metals out more aggressively.

6 So you get one piece of information from a
7 leach test. You get another set of information by
8 looking at the kinds of factors that will explain how
9 that material moves. So Mr. Wells was talking about,
10 you know, information about the soils. You mentioned
11 the question of ion exchange capability. So there's
12 other factors, okay? And if you want to get a picture
13 of, again, whether or not a particular site would be
14 likely to cause groundwater contamination, you need to
15 look at that whole set of things.

16 But the starting point is typically a leach
17 test because the higher the results are in the leach
18 test, the more problematic it is potentially likely to
19 be that you could have a problem in the subsurface. So
20 you really need -- you really need both.

21 As for the second part of that question,
22 which is, is it better than groundwater monitoring, I
23 think the answer to that is it's really just different.
24 But groundwater monitoring, as I tried to explain in a

1 previous answer, and I won't repeat, was at a very
2 early stage of sophistication. And what you have to
3 realize you're trying to do in groundwater monitoring
4 is you have a body of water that does not look like a
5 bath tub, it is not flat. You have a highly variable
6 groundwater aquifer, or an aquifers underneath the
7 surface, and you're trying to punch some holes in, and
8 then you're trying to figure out from that whether
9 you've got the likelihood of a problem.

10 And as I say, today we're just so much better
11 at that. But at the beginning, EPA's advice was, for
12 the hazardous waste facilities, put one upgradient well
13 in and put three downgradient wells, or two
14 downgradient wells. And if you didn't get those wells
15 in the right place, which, of course, was very
16 difficult to do on the first try, you weren't going to
17 learn anything useful.

18 And, in fact, I will tell you -- and again,
19 I'm going to go back to hazardous waste, because that's
20 where we put a lot of time into monitoring surface
21 impoundments at hazardous waste facilities -- what you
22 would find is you would be in detection monitoring.
23 You'd be looking at a smaller set of indicator
24 parameters around the surface impoundment, and suddenly

1 you would find a hit. And so we would then have to
2 say, okay, now you go into assessment monitoring,
3 meaning many more compounds. And what we found is that
4 sites were going back and forth constantly between
5 detection monitoring, a small number of indicator
6 parameters, and assessment monitoring, because of
7 nothing but the variability of the sampling.

8 And so we have accommodated many of those
9 things in the way we do groundwater monitoring and the
10 way we do sampling and analysis today. But back in the
11 early '80s, even in the time of the A. D. Little study,
12 we were dealing with all that.

13 Q. Okay. And, you know, with respect to
14 leachate testing -- and I can refer you to the page if
15 necessary, or I can just read out the quote, but this
16 is from the 1981 EPRI manual. And EPRI, in that
17 manual, stated, with respect to leachate tests that,
18 quote:

19 The variation and test results among the
20 laboratories performing this same extraction procedure
21 on the same waste sample can be great.

22 And this was in 1981. Are you aware of that?

23 A. I mean, depending on where you want to go
24 with this, I would like to take a look at the rest of

1 the context of the quote. But I can tell you that EPA
2 did a tremendous amount of testing between 1978 and
3 when it finalized its particular leach test it was
4 using in 1980. So we understood what the variability
5 of the test was. And yes, you can always get
6 variability in a test. And it depends not only on the
7 variability in the actual leach -- the leaching
8 situation, which is highly specified in this test, but
9 it can also depend on the sample and the variability of
10 the underlying sample that you're taking.

11 So even if you take a sample and you do a
12 split sample, and you send half of it to one lab and
13 half of it to another lab, those may not be fully equal
14 samples.

15 So yes, we understand that. But I would tell
16 you that the variability in a leach test is far less
17 than the variability in groundwater monitoring results.

18 Q. And I believe this will be my last question
19 for you on Allen. But given, you know, even -- and
20 both you and Mr. Wells have discussed those results and
21 what you believe them to mean.

22 But given even the potential for
23 contamination, wouldn't it have been prudent for the
24 Company to continue testing just to ensure that it was

1 handling its coal ash safely?

2 A. (James Wells) Well, I mean, to begin with,
3 again, look at the recommendations of the findings and
4 they're trying to determine whether they should
5 continue doing it. I would imagine they may be asking
6 should we continue to do additional groundwater
7 monitoring. They are doing monitoring. You know,
8 they're doing -- what have they learned? They've
9 learned the groundwater is flowing away from the
10 receptor. They've learned that we're not finding
11 migration beyond the boundary, beyond the basin. And
12 they've learned that there's no potential risk to the
13 surface waters. So that's what this comprehensive
14 report is telling us.

15 Now -- so what does Duke do with that? Well,
16 they do additional monitoring, they are -- I have an
17 ongoing monitoring program of the surface waters. The
18 groundwater flow is not changing. So the conclusions
19 with respect to the groundwater is solid, and the
20 surface water monitoring is continuing to confirm that.
21 So they have a check in place for any potential
22 impacts.

23 And when I talk about surface water
24 monitoring, I'm talking about any of the receiving --

1 the receiving water bodies that would be impacted if
2 something was starting to show. And it's not looking
3 for something after the fact. There were also fishery
4 studies in place. So it's not just sampling to see if
5 water quality suddenly starts to peak up, which didn't
6 happen and hasn't happened. But also looking at the
7 fishery, looking at the reproduction capacity of the
8 fishery. Looking for any indication that there's
9 potential risk to this fishery. All that's going on,
10 and those studies would be early indicators of
11 something that might be amiss. And none of that is
12 happening.

13 So there is some ongoing monitoring, and then
14 a whole lot that's at force, additional groundwater
15 monitoring at that time. And remember, what they've
16 done to this point is entirely voluntary, from '78 up
17 to this point where we're making a decision. So they
18 have a great data that supports that there's no need
19 for further groundwater monitoring at this time.

20 Q. Okay. Let's go ahead and move on.

21 Ms. Williams, I'm looking at page 56 of your testimony,
22 and I'm on line 19 going through page 57. And I'll
23 just read this out loud. You state:

24 "Consequently, in the absence of

1 site-specific information to the contrary, it is my
2 opinion that it would be reasonable and prudent in this
3 pre-2000 period for an owner of an existing ash pond
4 without liners or without an ongoing groundwater
5 monitoring system to continue to operate the ash
6 ponds. "

7 And, Ms. Williams, how -- how would the
8 Company have discovered site-specific environmental
9 issues, such as groundwater contamination, without
10 groundwater monitoring at each site?

11 A. (Marcia E. Williams) Well, I think that I
12 tried to explain that earlier. The way in which a
13 company might identify it are some of the issues that
14 Mr. Wells just talked about. You might see increases
15 in surface water; you might see impacts on --
16 potentially on fish health in surface water if
17 groundwater were reaching surface water and adversely
18 impacting it; you might see vegetation impacts; you
19 might find that you have a nearby or even an on-site
20 well that is there for, let's say, drinking water that
21 ends up with some taste and odor problems. So I'm
22 trying to put you back in that window and tell you how
23 were people identifying them. They were getting
24 identified.

1 The second thing that happened is that, if
2 there was any pattern of what was getting identified,
3 then, typically, the regulatory agencies would say, you
4 know, we see multiple sets of issues when we see these
5 kind of situations. And they'll say therefore, we
6 might want a groundwater monitor put in -- monitoring
7 well put in.

8 But you have to understand that, in the
9 window of time -- and I'll just give you some 1986
10 numbers, because these are numbers out of one of the
11 reference documents that I cite. In 1986, the EPA did
12 a very large study of every type of solid waste
13 facility across the country, and they looked at how
14 many of those had groundwater monitoring systems. And
15 what they found at that time was 9 percent of surface
16 impoundments -- industrial surface impoundments all
17 across the country had a groundwater monitoring system.
18 And 17 percent of industrial landfills all across the
19 country -- not municipal, industrial -- had a
20 groundwater monitoring system.

21 So they were not common. And the reason they
22 weren't common wasn't because if they worked as well as
23 they worked today, it might not have been useful, but
24 they didn't work as well as they work today. And so

1 there wasn't a tremendous effort to get people to go
2 punch holes in the ground everywhere to get information
3 that at the time was still not entirely helpful to
4 regulatory decision-making.

5 And I would say, in fact, in the early years,
6 we even had examples where people were putting
7 groundwater monitoring wells in too close to the waste.
8 And, in fact, we ended up causing groundwater
9 contamination through the installation of groundwater
10 wells.

11 So all I'm saying is you have to look at the
12 value of what you are going to get. And for many of
13 the reasons that I think Mr. Wells and I have tried to
14 share with you, it's not clear, in that early time
15 frame, that punching tons of additional wells would
16 have provided the kind of information that you're
17 hoping that Duke could have gotten from that.

18 Q. And to go back to the beginning part of your
19 answer, you brought up a couple of ways, other than
20 groundwater monitoring, to detect groundwater
21 contamination. And I would like to refer you to Public
22 Staff Cross Exhibit 64.

23 CHAIR MITCHELL: Ms. Luhr, before we
24 begin with your examination on this document, we're

1 going to take our morning break for the court
2 reporter. We will go off the record. We will be
3 back on at 11:45. Please turn off your cameras and
4 your microphones.

5 (At this time, a recess was taken from
6 11:31 a.m. to 11:46 a.m.)

7 CHAIR MITCHELL: All right. Let's go
8 back on the record, please. Ms. Luhr, would you
9 please identify the document one more time just so
10 we're all on the same page?

11 MS. LUHR: Yes. So I have Public Staff
12 Cross Exhibit 64, and it is a Duke Energy Carolinas
13 response to a Public Staff Data Request Number 177.

14 CHAIR MITCHELL: All right. Let's go
15 ahead and mark the document.

16 Q. And, Ms. Williams, before we took a break --

17 CHAIR MITCHELL: Ms. Luhr, let's mark
18 this document for purposes of the record.

19 MS. LUHR: Oh, I apologize. We would
20 ask that Public Staff Cross Exhibit 64 be
21 identified as Public Staff Wells/Williams Rebuttal
22 Cross Examination Exhibit 2.

23 CHAIR MITCHELL: All right. The
24 document will be marked Public Staff Wells/Williams

1 Cross Examination Exhibit Number 2.

2 (Public Staff Wells/Williams Rebuttal
3 Cross Examination Exhibit 2 marked for
4 identification.)

5 MS. LUHR: Thank you.

6 Q. And, Ms. Williams, I had asked you how the
7 Company would have discovered site-specific
8 environmental issues without conducting groundwater
9 monitoring at each site, and you listed a few methods
10 in your response. And I also wanted to direct you to
11 this exhibit, which was a data request response
12 received from Duke Energy Carolinas with respect to
13 this very question.

14 And we don't -- we don't need to read through
15 the whole thing, but it does discuss two methods which
16 you summarize in your response. The first is
17 identification of environmental issues, such as fish
18 kills or dead vegetation. And the second method is
19 essentially having those environmental issues
20 identified by regulatory officials based on detecting
21 contamination.

22 Is that an accurate summary of this document?

23 A. No, I don't think it's completely accurate.

24 I mean, I tried to answer the question of before we had

1 widespread monitoring, how was it that people
2 identified issues with environmental contamination.
3 And I think the method one where I gave a bunch of
4 examples, including, you know, dead vegetation and
5 identifying contamination in some -- you know, in a
6 nearby well, or odor, for example, in a well that a
7 farmer might be using for irrigation. I mean, those
8 were all methods.

9 And I will tell you that, in 1980 when EPA
10 finalized its hazardous waste regulations, we had about
11 300 damage cases that we had identified. And I don't
12 think a single one -- I mean, maybe there was one, but
13 by and large, those 300 damage cases were identified
14 using methods -- examples of the types of methods that
15 I list in my first example, which is there are ways to
16 understand that something is causing a problem.

17 Under method two what I said is, over time,
18 patterns and practices that lead to certain kinds of
19 problems become more apparent. And when that happens,
20 my experience is that regulators, whether you're
21 talking at the state or federal level, will often issue
22 guidance, and -- general guidance to regulated parties
23 and to other regulators, and issue guidance for their
24 permit riders that say, if you're dealing with a

1 facility that fits in these kinds of situations, we
2 recommend that you do require groundwater monitoring.

3 So those were the two ways that it was being
4 done site specifically before groundwater monitoring
5 became more common. And as I said, it was not more
6 common in the 1980s at solid waste or industrial waste
7 facilities.

8 Q. And these methods that you list and that
9 you've discussed, these identify contamination only
10 after it's had an impact on surrounding areas; isn't
11 that right?

12 A. The first method is result -- the first
13 generalized method, which is you have some indication
14 of an issue, may or -- yes. I mean, it's after you've
15 detected something. It may or may not be anything that
16 equated to a human harm or environmental harm, but
17 you've detected something. So -- and the second method
18 is not that. It's using a set of information that
19 you've gotten and you've integrated. And then you
20 utilize that information to say, if I have other
21 situations that are like this, I want to go ahead and
22 require something different right now. And it could be
23 groundwater monitoring, and it could be a different
24 type of soil monitoring. I mean, it would depend on

1 the circumstance, but in other words, proactively
2 something else is done based on the analysis of the
3 kinds of damage cases that have been identified.

4 And one of the reasons, by the way, on coal
5 ash basins, you know, EPA looked very hard for damage
6 cases, and they started looking for damage cases in the
7 same window of time that they were looking for general
8 damage cases for hazardous waste. But even at the time
9 that they published the 1988 report to Congress, there
10 were very few damage cases with regard to groundwater
11 contamination at coal ash landfills or surface
12 impoundments.

13 And as I mentioned to you, there were not
14 lots of groundwater monitoring wells then. It was
15 roughly, you know, less than 10 percent. But EPA used
16 about 100 facilities and had its contractors for the
17 1988 report, look at that data and understand what that
18 data was telling about groundwater contamination. And
19 what that data was saying about groundwater
20 contamination was that less than 5 percent of the
21 samples that had been taken at coal ash surface
22 impoundments and landfills were exceeding a primary
23 drinking water sample. And it went on to say that,
24 even when it did exceed it, it might not have

1 consistently exceeded it, or it didn't -- and it didn't
2 exceed it by very much.

3 So that was the conclusion of taking a look,
4 as of 1988, of the set of data that existed from at
5 least around 100 facilities.

6 Q. And in order to identify which cases were
7 considered damage cases, the EPA did need groundwater
8 monitoring data; isn't that right?

9 A. That is not correct, no.

10 Q. No --

11 A. EPA defined damage cases broadly to be any
12 plausible risk-based problem. So surface water was a
13 significant issue; direct contact was an issue;
14 destruction or problems in a wetlands was an issue. So
15 no, it was not limited to groundwater, but certainly
16 groundwater was one of the factors.

17 Q. Okay. Thanks for that clarification. And
18 we'll discuss groundwater damage cases as found by the
19 EPA later on in the 2000s in a little bit, but I have
20 some other questions for you before we get there.
21 Let's see.

22 So very briefly, on page 57 of your
23 testimony, you state that:

24 "If the EPA had the risk and other data

1 necessary to proceed with defensible regulations for
2 CCR management, its rulemaking would have been
3 completed far more quickly than what occurred."

4 And, Ms. Williams, is it --

5 A. Can you just give me the line number as to
6 where you are?

7 Q. Yes. One moment. I am on line 7.

8 A. Okay. Thank you.

9 Q. Uh-huh. Okay. Now, Ms. Williams --

10 MR. MARZO: Chair Mitchell, I'm sorry, I
11 was going to say I think we lost the video.

12 CHAIR MITCHELL: Ms. Williams, we are
13 unable to see your video. Would you just
14 double-check your connection, please? There are
15 you. Okay.

16 THE WITNESS: Thank you. Sorry, I don't
17 know what happened.

18 Q. Ms. Williams, is it fair to say that
19 sometimes the rulemaking process is not 100 percent
20 science based but instead gets delayed by political and
21 legal pressures?

22 A. I think I went through a fair amount of
23 discussion in my -- in my filed testimony that did talk
24 about all the things that can affect regulation. And

1 so yes, I certainly would not eliminate the items that
2 you suggested, and I think I identified many more items
3 that can affect regulation.

4 But I do think, in this particular
5 rulemaking, if you read carefully all of the documents
6 that EPA has issued, starting from its 1993 regulatory
7 determination that was based on the 1988 report and
8 follow it through with the documents that were issued
9 in 1999, 2000, 2007, 2010, I think what you will see in
10 there is that, regardless of all the other issues,
11 there was a tremendous challenge in trying to reach
12 accurate information on what the actual probability of
13 risks were from different operating scenarios. And
14 that included the ability to do accurate risk
15 assessment on ash ponds, specifically because their
16 nearness to surface water bodies made it much more
17 challenging to develop accurate risk assessment
18 predictions for these.

19 So, you know, I think there were many
20 reasons. And the point of my comment was just to say
21 all rules, if you look at the average EPA rule, you
22 will find that it typically will take easily 6 to
23 10 years to get a rule finalized if there are lots of
24 interested parties. This rule took 35 years. That is

1 highly unusual at EPA. And the reason I believe -- and
2 this is an opinion -- that it took so long is because
3 the data were not definitive as to what the right thing
4 to do was as EPA was moving through this process. And
5 they certainly got a lot more information in the
6 post-2010 time frame. And it moved pretty quickly
7 between 2010 and 2015.

8 Q. But the continued study of the issue for all
9 that time, that was an indication of the concern and
10 the potential for impacts from the coal ash
11 impoundments; was it not?

12 A. It showed that there was continued -- well,
13 again, you have two periods of time. You have a period
14 of time that I think starts in the late 1970s, and is
15 pretty much closed out in 1988 with the report to
16 Congress, that EPA concluded that the risks -- the
17 potential for risks was adequately being managed at the
18 state level having looked at state approaches and
19 having looked at data from coal ash management units.
20 And then what EPA did is they went back after that and
21 they had to do additional study both for two factors.
22 They had two scenarios.

23 They had to do -- Congress required EPA to
24 look at coal residuals -- coal combustion residuals at

1 non-utility waste sites. And EPA needed to do specific
2 work on the low-volume waste streams that were being
3 co-managed in most cases with the four major coal ash
4 waste streams. And so EPA started again to look at the
5 issue in 19 -- in 2000 based on its results of looking
6 at these other things that hadn't been included in the
7 1988 report to Congress.

8 And at that time EPA said we're no longer
9 certain that the current regulatory framework will be
10 protected, we need to look at it again. And that
11 process started again in 2000, and it took EPA until
12 2010 to put a proposed rule. And the difference
13 between the proposed rule and final rule was fairly
14 significant in terms of the changes that occurred
15 between those two rules. So that's a brief summary of
16 the timeline.

17 Q. And part of the reason that timeline took so
18 long was because the EPA did not have -- it took a
19 while for them to have the sufficient amount of
20 groundwater monitoring data they needed; isn't that
21 right?

22 A. I would not agree with that as you've stated
23 it. All additional information is always helpful in a
24 rulemaking. But EPA had a significant amount of

1 groundwater information at the time it did its '88
2 report. It had looked at, again, whether the
3 authorities were there for site-specific determinations
4 to be made. And it wasn't actually until -- I'm trying
5 to think of the exact date, but it wasn't until the
6 '90s when EPA had developed the kinds of fate and
7 transport modeling that could use information to begin
8 to better project facilities that might, in fact, have
9 issues based on monitoring data that they did have.

10 So it wasn't -- EPA was not delayed
11 specifically because of the lack of groundwater
12 monitoring data. And I can tell you this. EPA had
13 felt that -- that during my tenure -- I'll speak for
14 during my tenure. If EPA had felt that the reason it
15 couldn't do a rulemaking was because it didn't have
16 adequate groundwater monitoring data, it would have
17 made a request to the states. And it would have said,
18 we would like you to please proceed to collect --
19 require this data to be collected. So I don't think
20 that's a fair assessment.

21 I think what is a fair assessment is that the
22 data they had, and the risk assessments they were able
23 to do, and the damage cases that they were looking at
24 was not supportive. And for two years of my EPA career

1 in the 1980s, I was heading up an office that was
2 required to review the quality of the information that
3 EPA had in order to issue its rules and to assure both
4 the EPA and the office of management and budget that we
5 had adequate data support for a rulemaking. That's a
6 requirement that the federal government needs to meet
7 before it can issue a rule. We weren't there at that
8 time.

9 Q. So I'd like to ask you several questions that
10 deal with your testimony regarding damage cases.

11 MS. LUHR: And, Chair Mitchell, I'd like
12 to go ahead and mark two exhibits. And the first
13 is -- let's see, Public Staff Cross Exhibit 66, and
14 this is the 2007 notice of data availability. And,
15 Chair Mitchell, we would ask that this document be
16 identified as Public Staff Wells/Williams Cross
17 Examination Exhibit 3.

18 CHAIR MITCHELL: All right. The
19 document will be marked Public Staff Wells/Williams
20 Cross Examination Exhibit Number 3.

21 (Public Staff Wells/Williams Cross
22 Examination Exhibit 3 was marked for
23 identification.)

24 MS. LUHR: Thank you. And we would also

1 ask that Public Staff Cross Exhibit 67, which is
2 titled "Coal Combustion Waste Damage Case
3 Assessments," be identified as Public Staff
4 Wells/Williams Cross Examination Exhibit 4.

5 CHAIR MITCHELL: All right. The
6 document will be marked Public Staff Wells/Williams
7 Cross Examination Exhibit Number 4. Actually, I'm
8 going to correct that. It will be -- it will be
9 marked as Wells/Williams Rebuttal Cross Examination
10 Exhibit Number 4.

11 MS. LUHR: Apologies. Yes. Thank you.

12 (Public Staff Wells/Williams Rebuttal
13 Cross Examination Exhibit 4 was marked
14 for identification.)

15 CHAIR MITCHELL: And just for purposes
16 of the record, we will mark what had been marked as
17 Public Staff Wells/Williams Cross Examination
18 Exhibit Number 3 as Public Staff Wells/Williams
19 Rebuttal Cross Examination Exhibit Number 3.

20 MS. LUHR: Thank you. I believe the
21 other two were marked correctly.

22 (Public Staff Wells/Williams Cross
23 Examination Exhibit Number 3 was
24 remarked as Public Staff Wells/Williams

1 Rebuttal Cross Examination Exhibit
2 Number 3.)

3 CHAIR MITCHELL: All right. You may
4 proceed, Ms. Luhr.

5 Q. Okay. Ms. Williams, do you have these two
6 document in front of you?

7 A. I have the first -- the notice in front of
8 me, and I will try and bring up -- do you want them
9 both up at the same time?

10 Q. Yeah. If you could go ahead and get them
11 both open, just --

12 A. Okay. Can you just give me, I'm sorry, the
13 exhibit number for the second one, was it 60?

14 Q. 67.

15 A. 67.

16 (Witness peruses document.)

17 I have them open.

18 Q. Thank you. If you could turn to page 58 of
19 your testimony.

20 A. (Witness peruses document.)

21 I'm there.

22 Q. Okay. And I'm going to ask you to read a few
23 lines, and then I'll ask you some questions about what
24 you're about to read. But if you could read lines 6

1 through 13 of your testimony, which is the second half
2 of that first paragraph, starting with "EPA's 2007
3 notice of data availability."

4 A. "EPA's 2007 notice of data availability noted
5 24 damage cases and 43 potential damage cases. With
6 regard to groundwater, 17 of the damage cases were to
7 groundwater, 5 or 6 of those were determined to be from
8 unlined ash ponds. That is against the universe of" --
9 and this says over 600 ash ponds. One of my
10 corrections was to say approximately 600 ash ponds --
11 "a large majority of which were over 25 years old. And
12 as of 2004, EPA estimated that 62 percent of ash ponds
13 were unlined. Against this number of unlined ash
14 ponds, the number of confirmed pond damage cases to
15 groundwater from these units was quite small."

16 Q. Thank you. So I'd like to address several
17 parts of what you just read. And the first is your
18 testimony that five or six of the damage cases were
19 determined to be from unlined ash ponds. Now, I'm
20 looking at the 2007 notice of data availability, which
21 was Public Staff Cross Exhibit 66, the first document.
22 And I can refer you to page 49718 and give you a second
23 to get there.

24 A. (Witness peruses document.)

1 Okay.

2 Q. Okay. So here, in the very right-hand column
3 at the bottom, I'll read:

4 "The overwhelming majority of the damage
5 cases reflect management in unlined units. That is all
6 but one of the 24 proven damage cases involved unlined
7 CCW management units, including 6 cases involving
8 disposal of CCW in unlined sand and gravel pits."

9 Now -- so according to this document, 23 of
10 the 24 proven damage cases involved unlined units
11 whether they were impoundments or some other type of
12 disposal unit; is that right?

13 A. Yes, that's correct. Some of them were -- I
14 mean, they included not only impoundments, they
15 included unlined landfills. They included a number of
16 sand and gravel pits. I can't remember, but there were
17 quite a few.

18 (Reporter interruption due to sound
19 failure.)

20 THE WITNESS: I just -- I just wanted to
21 say that they did include unlined surface
22 impoundments, but they also included unlined
23 landfills, unlined sand and gravel pits, and even
24 some situations where ash had been beneficially

1 reused that had resulted in groundwater
2 contamination.

3 Q. Thank you. And in your next line, you had
4 stated that 24 damage cases and the 43 potential damage
5 cases were out of a universe of over 600 ash ponds.
6 But I wanted to clarify that.

7 Is it correct that about 300 of those of
8 approximate 600 units were coal ash impoundments, while
9 the other 300 were landfills? And I can refer you to
10 the document if that would be helpful.

11 A. I think that it was actually ash ponds. But
12 if you want to refer me to something, I'm happy to look
13 at it. There are different sets of numbers and
14 different documents, and so perhaps I wasn't there.
15 But no, I'm pretty sure it was ash ponds. And it
16 should have said approximately 600. My memory is it
17 was 590-something.

18 Q. Yes, there's definitely a lot to unpack in
19 these documents. But I can refer you to the same
20 document, the 2007 notice of data availability, and
21 still page 49718. And let me get there myself. Okay.

22 So I'm in the far right column in the middle
23 paragraph. And this, of course, is referring to the
24 2000 regulatory determination, but EPA was looking at

1 this same set of -- basic set of units when it did its
2 2007 assessments. So it says here:

3 "For the May 2000 regulatory determination,
4 the agency determined there were approximately 300 CCW
5 landfills and 300 CCW surface impoundments used by 440
6 coal-fired utilities"; is that right?

7 A. That is what this document says, but I don't
8 actually believe that that's the correct number. And
9 it would take me a little bit of time to go back and
10 find whether it was from the 1988 report to Congress.
11 I think the final rule actually talks about 753 ash
12 basins, I believe, and I think the number is
13 590-something in this general time frame. So that's my
14 memory, and I could -- I'd be happy to go back and
15 verify it during a lunch break.

16 Q. That would be helpful, but again, this is the
17 2007 notice of data availability that does discuss the
18 damage cases; isn't that right?

19 A. This document says what this document says,
20 but that's one of the important factors why it's useful
21 to look at the full set of documents. In any rate, I'm
22 not sure it would change the point I'm making here
23 either way.

24 Q. Okay. And we'll get to the rest. Let's see.

1 And you did acknowledge in your testimony as well, and
2 I just wanted to confirm this, that out of this
3 universe of 600 units, whatever they may be, some were
4 lined and some were unlined; isn't that right?

5 A. Are you talking about the total universe --
6 you're talking about the entire universe?

7 Q. Yes.

8 A. Yes, but for ash ponds, quite a small -- a
9 very small percentage -- a very small percentage were
10 lined, of ash basins.

11 Q. Okay. So you say in your testimony, as of
12 2004, EPA estimated that 62 percent of ash ponds were
13 unlined.

14 So 38 percent would have been lined, correct?

15 A. There's different numbers in different
16 studies. So if I gave a citation, then for that study,
17 that's correct. But again, the '88 report to Congress,
18 at the time that EPA looked at the liner status,
19 87 percent of the existing ponds that were -- where
20 liner status was known, 87 percent of those ponds were
21 unlined.

22 And even if you go, you know, to the most
23 recent data that EPA had, in the April 2015 final rule,
24 63 percent of existing units were unlined. So even

1 over time as pond -- as existing units retired, there
2 was still a very large number of existing ponds that
3 were unlined.

4 Q. Understood. But in 2007, which is the date
5 of this damage case assessment you discuss in your
6 testimony, the number would be around 38 percent,
7 correct, that were lined?

8 A. In the June 2010 proposed rule, EPA's numbers
9 were that 74 percent of existing units were unlined,
10 and 40 percent of new units that were being constructed
11 in the -- starting I think in the '90s, but I may be
12 incorrect on the precise date -- that 40 percent of the
13 new units were still being constructed online.

14 Q. That's understood. And again, I just want to
15 focus on the damage case assessment, and we can move on
16 to the next question.

17 So in conducting its damage case assessment,
18 did the EPA review groundwater data for all 600 units?

19 A. No, they did not, because there was not
20 groundwater data for all 600 units.

21 Q. In fact, isn't it true that the EPA only
22 gathered or received information on 135 cases?

23 A. EPA receives damage cases from all kinds of
24 different sources, and as I tried to explain earlier,

1 those damage cases could be based on groundwater
2 monitoring wells if those wells existed; they could be
3 based on other information, including the kinds that I
4 had explained earlier. So EPA tries to gather, as
5 broadly as it can, examples of damage cases. Then it
6 sorts through those damage cases in order to understand
7 how many of those can be confirmed as damage cases
8 versus ones that it either wouldn't consider because
9 the data are not supportive, or where EPA has
10 insufficient information to know for certain. In which
11 case, they often consider that an alleged damage case.
12 So that's how EPA goes about the process.

13 Q. Right. And of the 135 potential damage cases
14 that the EPA gathered or received information on, it
15 only evaluated 85 of those cases; isn't that right?
16 And I can refer you to the specific language if that
17 would be helpful.

18 A. Sorry, I just had a brief connection problem.
19 Okay. Yes. Could you give me the page number where
20 you are in the damage cases?

21 Q. Sure. So this is actually in the second
22 document, which was Public Staff Cross Exhibit 67, the
23 2007 CCW damage case assessments. And I am on page 7
24 of this document.

1 A. (Witness peruses document.)

2 Okay. I'm there.

3 Q. Okay. Let me make sure I'm on the right
4 page. Okay. And I should clarify, it's page 7 of the
5 document and page 12 of the PDF. So in the
6 second-to-last -- or I'm sorry. In the second full
7 paragraph, it reads:

8 "In summary, EPA gathered or received
9 information on 135 possible damage cases and has
10 evaluated 85 of those cases"; do you see that?

11 A. Yes, I see that. And it goes on to explain
12 why it didn't evaluate the rest of them, which is that
13 44 of them weren't evaluated because there was little
14 or no supporting information. And six of them
15 weren't -- weren't evaluated because they were
16 mine-filled damage cases, and that was outside of the
17 scope of what EPA was considering in this rule.

18 Q. That's right. And so out of the 85 cases the
19 EPA actually reviewed, 24 were proven damage cases and
20 43 were potential damage cases, correct?

21 A. That's what it says.

22 Q. Okay. So that's approximately 79 percent of
23 the cases the EPA reviewed. That's pretty significant;
24 is it not?

1 A. No, I wouldn't consider it significant,
2 because you're missing the point of what EPA was trying
3 to do. EPA was trying to go out, and they were trying
4 specifically to identify damage cases. And so they
5 were looking at every possible way or -- and taking all
6 the data they could. Some of those damage cases, there
7 was just insufficient information to evaluate. But
8 when you look at what they -- when you look at the
9 conclusions that EPA made, the proper way to analyze it
10 is to look at how many damage cases they found and
11 compare it to the universe, not compare it to other
12 damage cases. It's not an appropriate comparison.

13 Q. All right. Well, let's look at one more
14 document, and this is the preamble to the CCR rule,
15 which is Public Staff Cross Exhibit 68.

16 MS. LUHR: And, Chair Mitchell, we would
17 ask that Public Staff Cross Exhibit 68 be
18 identified as Public Staff Wells/Williams Rebuttal
19 Examination Exhibit 5.

20 CHAIR MITCHELL: All right. The
21 document will be marked as Public Staff
22 Wells/Williams Rebuttal Cross Examination Exhibit
23 Number 5.

24 (Public Staff Wells/Williams Rebuttal

1 Cross Examination Exhibit Number 5 was
2 marked for identification.)

3 Q. And, Ms. Williams, if you would turn to page
4 21455 of this document.

5 A. (Witness peruses document.)

6 Q. And just let me know when you're there.

7 A. Okay. I'm there.

8 Q. Okay. So this is the preamble to the CCR
9 rule, and I'll just read -- I'll go ahead and read this
10 paragraph out. And this is in the middle column, and,
11 let's see, beginning with "even assuming." So:

12 "Even assuming that only proven damage cases
13 were relevant" --

14 A. Hold on. Just give me a second to find where
15 you are.

16 Q. Absolutely.

17 A. (Witness peruses document.)

18 Q. It's about 10 lines from the bottom.

19 A. (Witness peruses document.)

20 Sorry, I'm having a little trouble finding
21 it. So it's page 21445?

22 Q. Oh, 21455. I apologize if I misspoke.

23 A. No, I might have misheard you, but thank you,
24 I have it now.

1 Q. All right. So that middle paragraph close to
2 the bottom, about eight or nine lines from the bottom,
3 it says:

4 "Even assuming that only proven damage cases
5 were relevant, to date, EPA has confirmed a total of 40
6 proven damage cases, which is hardly sparse. And when
7 potential damage cases are considered, the totals rise
8 to 157. This is the largest number of damage cases in
9 the history of the RCRA program. Further, these
10 numbers likely underestimate the true number of cases
11 in which CCR units are contaminating groundwater. In
12 reality, the damage case record represents only a
13 subset of those CCR waste units that have effective
14 groundwater monitoring."

15 So, Ms. Williams, based on the EPA's
16 statement here, would you agree that the EPA believes
17 the number of damage cases, as of 2015, and the
18 relevance of that is significant?

19 A. I agree absolutely that EPA felt, by the time
20 it got to 2015, it could support the basis of this rule
21 based on a set of things, which included the damage
22 cases, but also included its risk assessment of work
23 that it had continued to refine starting in pre-2007,
24 which needed -- it was refined quite significantly in

1 that time period. So yes, by the time it got to this
2 stage, I'm not disagreeing with that at all.

3 But I am saying that this does not represent
4 what was known in 1985. And I think if you try and
5 apply this knowledge back to what was known in the
6 1980s, that's probably the best example I could think
7 of of using today's information to interpret, with that
8 knowledge, how you should think about something that
9 was happening decades earlier, because this information
10 wasn't available decades earlier.

11 Q. Well, again, Ms. Williams, we're discussing
12 your testimony on the 2007 damage case assessment; is
13 that correct?

14 A. The 2007 damage case assessment did not have
15 this number of damage cases, as we just discussed.
16 You're talking about the 2015 final rule damage case
17 analysis.

18 Q. That's right. And the EPA believes that the
19 significance of damage cases is a relevant factor in
20 considering what the history of coal ash impoundments
21 has been, correct?

22 A. With all due respect, I think that's a
23 question that's -- you're reaching a conclusion that I
24 think is improper. What EPA has always said is damage

1 case are relevant, and EPA looked at them. And they
2 looked at them in the context of coal ash and -- when
3 it did its 1988 report. They looked at them when it
4 did its 2000 and 2007 documents, and it continued to
5 try and collect this information and looked at them
6 again to support the final rule.

7 And so you're reading to me something from a
8 final rule when EPA had done far more work and received
9 far more information and cases to analyze. And telling
10 me that my statement, which is based on what they had
11 in 2007, which was not 40 potential -- 40 proven damage
12 case and 157 damage cases, to try and get me to tell
13 you that damage cases are important. I didn't tell you
14 they were not important. They are important. But you
15 have to look at the information that EPA had at
16 different points in time.

17 So you're really misusing what EPA is putting
18 here to try and argue that something I wrote is
19 incorrect, and I didn't write what you're suggesting.

20 Q. Let's move on. More generally, are you --
21 and again, we can look at the language if you'd like.
22 Are you aware that the preamble to the CCR rule which
23 we were just looking at also indicated that once more
24 groundwater monitoring is put in place for coal ash

1 impoundments, quote, new damage cases quickly emerge?

2 A. I don't know that you quoted it precisely
3 right, but I know that is the -- that has been the
4 experience, and that has been EPA's view. Again, I
5 don't -- I think what you seem to be asking me is, just
6 because it turned out to be a problem, everything I'm
7 saying and everything I'm trying to explain to you
8 about what was known in the past must mean that if you
9 just looked hard enough, you knew it was a problem back
10 then. And what I'm trying to say to you is, we know a
11 lot today that we didn't know back then, but it doesn't
12 change what we knew in 1981, and what we knew in 1985,
13 and what we knew in 1995, and what Duke knew in 2010
14 when it put groundwater wells in every one of its DEC
15 impoundments before it was ever required by anybody to
16 do that.

17 Q. I just have a few more questions for you
18 before moving on to Mr. Wells.

19 MS. LUHR: Chair Mitchell, would you
20 like me to proceed, or is this a good time for a
21 lunch break?

22 CHAIR MITCHELL: No. We're going to
23 continue on. Please continue on. I think we're
24 going to wait on a lunch break until about 1:15.

1 MS. LUHR: Okay. Great.

2 Q. All right. Ms. Williams, on page 97 of your
3 testimony, you discuss the groundwater exceedances
4 presented in Mr. Junis' testimony. And I'll give you a
5 second to get there.

6 A. (Witness peruses document.)

7 I'm on that page. If you want to give me
8 line numbers, I'll look at those.

9 Q. Okay. On lines 9 to 11 you state that:

10 "Without confirming whether each of his
11 alleged exceedances are accurate, he arrives at this
12 number by counting each sample of each substance that
13 exceeded a standard."

14 Now, Ms. Williams, the data that Mr. Junis
15 cites in his testimony, that came directly from the
16 Company; did it not?

17 A. Yes. To my understanding that Duke provided
18 data, but that's not really the point I'm making. What
19 my point is not -- my point is that I did not go back
20 and check every sampling determination to determine if
21 it was an exceedance at a compliance boundary, past a
22 compliance boundary, or whether it was an exceedance
23 within a compliance boundary. That's all that sentence
24 means. So the point of what I'm explaining here is

1 that I don't think it's appropriate to count up the
2 number of samples that exceed -- even if you want to
3 say it exceeds a standard at the compliance boundary,
4 just counting the number of samples is a very
5 misleading thing to do.

6 You can -- if I take 20 more samples, if I
7 put in 20 more wells, well, then, I'm going to have
8 tons more exceedances. And I believe Mr. Mehta was
9 asking Mr. Junis about this, and I think it is a very
10 serious flaw in this analysis. And I would just say
11 that Mr. Junis tried to explain that it wasn't a flaw
12 because groundwater is constantly moving, and
13 therefore, every new -- every exceedance is a new
14 example of where the groundwater has moved and
15 contaminated a different -- additional clean
16 groundwater.

17 But that actually isn't how groundwater
18 behaves. And groundwater plumes typically or often --
19 let me put it that way -- often will stabilize, and
20 they stabilize for all kinds of reasons. And so
21 just -- unless you know whether you're taking from
22 within the stabilized plume or not, you have no idea
23 whether these are new exceedances or new violations.
24 You're just counting, and that's not a meaningful thing

1 to do.

2 Q. And just to go back to something you said at
3 the very beginning of your answer. You said that you
4 would have to go back and look at whether each sample
5 was at or beyond the compliance boundary.

6 Are you aware that the data given to
7 Mr. Junis by the Company actually made that
8 determination itself and added up each of those
9 exceedances at or beyond the compliance boundary over
10 backgrounds in the response to the Public Staff?

11 A. I mean, I probably looked at it at the time.
12 As I'm sitting here today, I don't have that
13 recollection. I'm certainly prepared to accept it. It
14 really is not relevant to the point I'm trying to make,
15 which is it's not the right way to analyze whether
16 there's -- whether there's any movement of a plume of
17 groundwater contamination that exists in the field.

18 Q. And for the sake of efficiency, I think we
19 can -- I think Mr. Junis has testified to that, and I
20 believe some Duke witnesses have as well, so we can
21 move on from that. Okay. And I just have one last
22 line of questions and then I'll move on to Mr. Wells.

23 And, Ms. Williams, this relates to something
24 we were discussing earlier that I'd like to go back to

1 very briefly. You had mentioned in your -- when we
2 were talking about leachate -- leachate testing in one
3 of your responses to me -- and please let me know if
4 I'm mischaracterizing anything you said -- but you had
5 noted that there was some variants between the EPA and
6 ASTM leachate methodologies. And one of the excerpts I
7 read to you from the 1981 EPRI manual had also noted
8 that there was some variance even within one method in
9 the same laboratory.

10 And as you said, leachate tests, they're just
11 projections, right? You -- I guess one of my questions
12 is, isn't groundwater monitoring the way to verify
13 those projections?

14 A. I thought I already answered that question
15 last time. I'm happy to try and repeat my answer, but
16 it sounds like the same question to me.

17 Q. Well, I guess to be specific, Ms. Williams, I
18 don't think I asked you this same question, which is,
19 is groundwater monitoring a way or the way to verify
20 the projections that you would get from leachate
21 testing?

22 A. It's apples and oranges. It doesn't have
23 anything to do with it. The leachate -- and I thought
24 this was what I had tried to explain before. The

1 leachate sampling is intended to determine, under a
2 certain type of field condition, whether or not
3 hazardous constituents will leach out of the waste.
4 Okay? That's what its intention is. And, obviously,
5 EPA, when it decides which test method it's going to
6 use, specifies a particular test method, because it
7 believes that test method is -- simulates a field
8 situation that is relevant for that waste.

9 So the leach tests that were used back in the
10 '80s for EPA, the EPA leach tests, were simulating the
11 same kind of scenario that was simulated for hazardous
12 waste, which was management co-disposed with municipal
13 waste. Which is not an accurate scenario necessarily
14 for coal ash, okay, unless you're disposing of it in a
15 municipal landfill. But it's an aggressive leach test.

16 The ASTM method was a different method. It
17 simulated a different scenario in the field. And the
18 scenario that EPA is using today in the final CCR rule
19 is also a different type of leach test that came out of
20 doing a lot of extra work.

21 So that's the background on leach tests. You
22 do not confirm a leach test result with groundwater
23 sampling. With groundwater sampling, you are
24 determining not only the extent to which the waste will

1 leach, you're determining the extent to which the soil
2 will attenuate and modify the contaminants in the
3 leachate as it moves both through the -- what's called
4 the unsaturated zone, the part of the ground below the
5 unit without groundwater, and as it moves in the
6 groundwater. So groundwater monitoring is detecting
7 something different than just leachate.

8 And as I explained or tried to explain
9 earlier, groundwater monitoring is highly variable
10 because the groundwater is highly variable. Even --
11 you know, can vary from one well to the next well; it
12 can vary from one time that you monitor it to the next
13 time that you monitor it. So you have a lot of
14 variability in groundwater. And then you're, of
15 course, having to compare downgradient groundwater
16 quality with upgradient groundwater quality in order to
17 understand whether the unit is, in fact, what's
18 affecting the groundwater.

19 So both have variability. Of the two, the
20 leachate tests have less variability than the
21 groundwater sampling does, but they're not really a
22 substitute for each other.

23 Q. And you also discussed your testimony, you
24 testified that with respect to groundwater monitoring

1 in this -- in this early 1980s period, you characterize
2 groundwater monitoring as -- you know, you said they
3 didn't really have -- it wasn't advanced enough. They
4 didn't have the requisite knowledge needed at that
5 point in time.

6 Is that an accurate restatement of what you
7 said?

8 A. I'm not sure who "they" is in your question.
9 I tried to explain to you --

10 Q. Industry.

11 A. I tried to provide a picture for you of all
12 of the things that were still open issues at that time
13 with regard to groundwater monitoring, and why it took
14 so much time for EPA to be able to put together its
15 first really comprehensive monitoring guidance, okay?
16 And why you have to interpret results in that time
17 frame in the context of many unanswered questions and
18 many things that were being done differently.

19 For example, this question of whether you do
20 or don't filter samples when you're doing a metals
21 assessment. And so today there's definitive guidance
22 on that, but in the 1980s there was not, and people
23 were doing it all different ways. And EPA's regional
24 experts were recommending different ways. And so I'm

1 just trying to paint this picture for you as to what
2 was understood and all the open questions that existed
3 in that time frame. And so I think that's the
4 background in which you have to think about it.

5 And the other thing I tried to lay out was,
6 because of this, it was not a highly used technique for
7 these types of units in that window of time. Not just
8 Duke. Duke was ahead of most of the other companies in
9 putting in groundwater monitoring. It was not
10 particularly used at most ash facilities at this time
11 frame. So that's what I was trying to share.

12 Q. I understand. And with respect to the Allen
13 study, the groundwater monitoring that took place at
14 the Allen study took place in the late 1970s and early
15 1980s. And it -- as I believe was in your testimony
16 and testimony of several other parties, you know, that
17 was the basis of the Allen study in 1985, that was the
18 basis of the River Bend study; they used the
19 groundwater monitoring data from Allen. As you noted,
20 the 1988 EPA conclusion cited to the Allen study. And
21 it seems, you know, Duke Energy Carolinas didn't re- --
22 didn't begin monitoring again at Allen until 2004.

23 So, you know, it seems that the Company
24 relied on this early groundwater monitoring data to

1 indicate that there was no potential for contamination
2 at this site for over two decades. So I'm -- my
3 question to you is, you know, if it's your contention
4 that groundwater monitoring was not as sophisticated
5 enough yet, why did the Company rely on it for so long?

6 A. Well, I'm not sure if I completely understand
7 what you're asking me. But I think the study -- the
8 study that was done at Allen was about as complete a
9 study that was being done at any kind of facility in
10 that window of time. And the conclusions from that
11 study were deemed important to EPA when it wrote its
12 1988 report. And it wasn't just the Allen results, it
13 was the results from the other five study -- five
14 facilities that were studied in depth. And it was also
15 EPA's data collection from all -- I won't say all, from
16 roughly 100 other plants where there was at least some
17 amount, probably nothing like the Allen plant, of
18 groundwater data that existed.

19 And so that informed a set of decisions in
20 the 1988 time frame. It's -- you know, Duke put
21 additional groundwater wells in at some of its plants,
22 particularly, I think, two of them that had moved to
23 some fly ash drive handling in '80 -- in the late '80s.
24 And so Duke was collecting additional information at

1 those plants. So -- and Duke, as I say, voluntarily in
2 2004 started up groundwater monitoring at Allen, and
3 started up groundwater monitoring, as Mr. Wells has
4 said, voluntarily between 2006 and 2008 at all the rest
5 of the ponds.

6 So, I mean, I think Duke was reading what was
7 going on in this record and realizing that it made
8 sense before either North Carolina or before EPA
9 determined that groundwater monitoring was a necessity.
10 EPA didn't require it until 2015. In fact, they didn't
11 require it until sometime after the final rule. But I
12 think if you wanted to read the tea leaves of EPA's
13 proposed rule in 2010, you could say EPA has finally
14 reached a point, after studying this for a period of
15 time -- long period of time, that we really do think we
16 need to require groundwater monitoring. But, of
17 course, it wasn't required at that point. But Duke had
18 already put those wells in at all of its DEC
19 facilities.

20 So I think Duke was in advance of what you
21 were seeing, both in the Southeast and other entities
22 operating unlined ponds in the Southeast and
23 nationally. And one of the reasons, again, that cite
24 to some of these other broader documents, like the 2001

1 survey that EPA did specifically to look at industrial
2 impoundments that managed hazardous constituents that
3 were covered in many of EPA's hazardous waste sites,
4 EPA looked at those facilities to understand what was
5 going on with groundwater.

6 And it found two things in that study. First
7 of all, it found that 59 percent of those industrial
8 surface impoundments were unlined. It found that only
9 33 percent of them had groundwater monitoring
10 nationwide. And it found, when it looked at the data
11 at that time -- and to my knowledge this is still the
12 case -- that they did not feel for those impoundments
13 that additional regulation was necessary because they
14 were not seeing exceedances in the 33 percent that were
15 monitoring that would indicate that the problem
16 required further regulatory intervention.

17 So I think you have -- that's why I'm trying
18 to paint this story for you that shares with you kind
19 of that there's a lot of information on ash ponds, much
20 of which has not come before the Commission, and was
21 included in the '88 report to Congress specifically on
22 coal ash. And there's a much broader set of
23 information on surface impoundments and landfills,
24 lined and unlined, across the country that is relevant

1 to interpreting the context for evaluating Duke's
2 behavior. So I will stop, and if you have another
3 follow-up on that, I'd be happy to answer it.

4 Q. No, thank you. I believe those are actually
5 all the questions that I have for you, Ms. Williams.

6 A. Thank you.

7 Q. So, Mr. Wells, let me just organize myself
8 really quickly.

9 (Pause.)

10 Q. Okay. All right, Mr. Wells. I think we
11 can -- taken care of a few of your questions already,
12 so just start in the middle here.

13 I'm on page 21 of your testimony where you
14 state that:

15 "While the Company may have been aware in the
16 1980s that unlined impoundments, in general,
17 potentially impact groundwater, there was no
18 substantial evidence showing that there were
19 significant impacts resulting from DE Carolinas'
20 facilities."

21 A. (James Wells) That's correct.

22 Q. And, Mr. Wells, how many sites had
23 groundwater monitoring around their ash basins in the
24 1980s?

1 A. So yeah, what I'm referring to here is,
2 again, you've been -- I think Ms. Williams has kind of
3 walked through this whole evolution of '70s, '80s,
4 '90s, 2000s, and up to 2015 current state. So going
5 back to this time frame, and I think we're referring
6 early '80s time frame, the information that's out there
7 is indicating, at a national level, that there is a
8 potential for groundwater impacts. And the Company
9 initiated its study to understand that.

10 So your question is what's been looked at at
11 this time frame that you might determine that there's
12 no indication of a risk. At that time, the data would
13 have been the Allen study initiated in '78, which was
14 the full, you know, well network; the A. D. Little
15 study that was initiated in the early '80s and the data
16 that was coming in from that, both at Allen; and the
17 leachate studies that were done at all sites to -- so
18 this was the voluntary work by the Company at that time
19 to understand there's potential, what are we doing with
20 that, and they initiate this work. And this is beyond
21 what is, one, required, you know, which is a minimum,
22 what's required. You know, we always ensure
23 compliance, but it's beyond just compliance, it's
24 beyond what is also being done industry-wide. In other

1 words, we're operating at or above the industry
2 standard and cooperating with the agency to further the
3 knowl edge.

4 But at this point, that is what you're
5 seeing. You have data coming in from the site that is
6 representative of other sites, and site-speci fic
7 info -- information that's tied to the leachate studies
8 at all the ash basins throughout the Company.

9 Q. Okay. And just to clarify for the record,
10 Allen was the only site in the 1980s that had
11 groundwater monitoring wells around its ash basins; is
12 that correct?

13 A. Well, after the -- after that, you see
14 additional studies at Cliffside. And that's in the '87
15 time frame. And that's, again, voluntary work with
16 EPRI to understand what's going on. Or I'm sorry, it
17 was W.S. Lee. W.S. Lee. Cliffside wasn't until the
18 '90s. And then you also see some additional
19 groundwater monitoring in the '80s. I think you're
20 referring to some of the landfill-related monitoring;
21 Marshall, Belews, that's going in late '80s. But it's
22 also -- the landfills are located in an area where it's
23 also indicative of -- because the well location is also
24 adjacent to the basin. So those wells are also

1 providing information. So if you are beginning to see
2 an issue, it would be informative as to there is a
3 potential issue over here with the basins as well.

4 So groundwater monitoring in the '80s, I
5 think that's your specific question, it would have
6 included, at that point, Allen, self -- you know, the
7 stuff that -- monitoring the Company self-performed;
8 then there was the A. D. Little work at Allen; and then
9 there would have been at Marshall, Belews, wells going
10 in in the '80s; as well as the -- and the W.S. Lee work
11 with EPRI.

12 Q. And you had briefly mentioned the iron and
13 manganese exceedances at Allen, and I just wanted to
14 ask quickly, the 2L rules, they don't have an exemption
15 for iron and manganese, do they? Or did they at the
16 time?

17 A. What do you mean by exemption? I mean, they
18 were -- I believe they were standards at the time.
19 It's public standards for iron and manganese. And
20 remember, I mean, whenever you think of the 2L rule,
21 you have to also remember that it publishes a number
22 that applies to that particular element. So, in this
23 case, let's say it's iron, and it has a standard that's
24 listed -- and I don't remember the standard off my

1 head, but say it's 300. I don't remember. Then it has
2 the additional requirement that, if that element is
3 also naturally occurring, then the standard is above
4 background, upon determination of what background is by
5 DEQ.

6 So you have a published number. But if
7 that's also naturally occurring, that particular
8 parameter you're referring to, then the standard is
9 background, above background. You know, if you've
10 contributed to that. And that -- so that's important
11 part of when you analyze any of your data, is trying to
12 understand what is background, and that's a very --
13 obviously, very complex undertaking.

14 Q. And thank you, Mr. Wells. And on page 36 of
15 your testimony, you discuss the fact that the Company
16 has installed various air pollution control devices at
17 its coal-fired facilities in order to comply with air
18 emission standards.

19 And so would such devices include things like
20 FGD scrubbers, low nitrogen oxide burners, selective
21 catalytic reduction? Are those the types of things the
22 Company installed?

23 A. Yes.

24 Q. Okay. And did the installation of such air

1 pollution control devices change the way streams that
2 went into the coal ash impoundments?

3 A. I think in some instances it may have. I
4 mean, you got -- I mean, I would think -- I'll just
5 give a simple example in my mind. You know, scrubbers,
6 you suddenly introduce an additional waste stream to
7 remove, you know, the contaminants out of the air
8 provide, you know, water flushing through a scrubber
9 system, and then treating that. That water is
10 typically treated. And then, you know, whatever's
11 coming out of that treatment system end up in the
12 basin.

13 So I guess your question is did that
14 adjustment of air pollution control devices,
15 installation of those create additional waste streams,
16 ultimately were managed out of the basin as well, and
17 the answer is yes.

18 Q. And did the Company consider changing its
19 coal ash management practices when its waste streams
20 changed?

21 A. Well, without question, we would have looked
22 at this continuously. Meaning not just coal ash
23 management practices, but waste water management.
24 Always, you know, these are permitted facilities. They

1 are a five-year cycle. Every -- so in other words,
2 every five years we have to go back in front of the
3 agency and put together a very complex application that
4 lays out the entire water management system and a good
5 bit of detailed calculations as to what, if any, impact
6 this might have on the environment as it's
7 contemplated, in terms of what we believe the treatment
8 system will do, and what would end up being the
9 discharge, and the type of monitoring that we've done
10 to verify that.

11 So all of that is placed into this
12 application before we renew the permit. It ultimately
13 is issued by the state to authorize whatever we've --
14 what we've submitted in that application. So in this
15 instance, if we were to add any wastewater stream or
16 make any adjustments, we would have had to have gone
17 back in front of the agency and get that reviewed and
18 approved in the form of an authorized permit.

19 Q. All right. And thank you for that. On
20 page 46 of your testimony, lines 11 through 12 -- or
21 I'm sorry, lines 12 through 14.

22 A. I see that, yes.

23 Q. Okay. You state that:

24 "Under the CCR rule and CAMA, closure of all

1 of the Company's ash basins had already been triggered
2 before the 2017 rate case was filed and the triggering
3 factor was not groundwater impacts."

4 Now, Mr. Wells, weren't the closure deadlines
5 under CAMA and the required type of closure due in part
6 to groundwater impacts caused by the coal ash ponds?

7 A. The -- so the closure, I think -- I want to
8 make sure. I was -- as I'm reading this requirement,
9 it's saying that the requirement to close had already
10 been triggered before the rate case. I think that was
11 the point. So the requirement to close was built into
12 CAMA and already had those dates where we either -- you
13 know, again, high priority or low, medium, or high
14 risk. But you were -- regardless, all basins were one
15 of those four. And one of those four categories --
16 each of those four categories had a requirement to
17 close by a date certain depending on where you fell.

18 Q. Okay. And then, yes, so like you just
19 stated, the timeline and the type of closure was based
20 on -- one of the factors of groundwater contamination,
21 correct?

22 A. As I recall, it would have evaluated a number
23 of factors in -- you know, in a sense, evaluating risk,
24 and groundwater would have been one of them -- was one

1 of those factors.

2 Q. Okay. Now I'd like to discuss your testimony
3 regarding -- regarding seeps, and we can start out on
4 page 12 of your testimony.

5 A. Okay. I'm there.

6 Q. Sorry.

7 A. I'm there.

8 Q. Okay. All right. So on page 12, starting on
9 line 14, you state that:

10 "From 1967 until 2009, the Commission had the
11 sole authority to regulate utility dams, including all
12 of the dams that formed DE Carolinas' ash basins."

13 A. Yes.

14 Q. And on the next page, lines 2 through 4, you
15 state that:

16 "An important part of each inspection was
17 identifying, characterizing, and monitoring seeps that
18 may be emanating from the ash basins."

19 A. Yes.

20 Q. Did I -- but these inspections, they were
21 intended to assess dam safety and integrity, they
22 weren't intended to be water quality inspections; isn't
23 that right?

24 A. I think that's correct, yes.

1 Q. That type of oversight remained with DEQ; did
2 it not?

3 A. That's correct. Now, I do indicate in the
4 next line that these documents would have been shared
5 with DEQ for their review.

6 Q. Okay.

7 A. And I will say, I mean, this is a good
8 example, I think, of that evolution of, you know, I
9 speak to in my testimony. That things have evolved, in
10 terms of the environmental framework, the regulatory
11 approach, regulatory priorities, regulatory
12 interpretations. And really how, you know, the
13 environmental issues, such as these, are viewed as a
14 whole.

15 So if you think of seeps, you're right, I
16 mean, these are -- you're starting with a basin built
17 in 1950s that has this -- dam safety is king,
18 obviously. It's an engineered dam they want to ensure
19 is going to be solid, so they built the dam out of
20 soil. And then within that soil embankment there is,
21 you know, sand around a perforated pipe so that, if
22 water begins to permeate through that soil, there's a
23 release point for it, and it's collected, and then it
24 comes out through that engineered system and is

1 released at the toe, the base of the dam to allow a
2 relief.

3 But this is a dam safety feature, so it would
4 have been a major focus of the dam safety inspections
5 back then and up to today to ensure that those features
6 are operating correctly. And in part, they would also
7 look at any coloration of that water. If there is
8 water coming out, is it becoming higher or lower,
9 because that could be an indication that the integrity
10 of the dam is potentially at risk. So that would have
11 been a big, big part of those early discussions.

12 Now, as you know, in 2010 -- you keep
13 following this evolution, in 2010, as we discussed in
14 the last case at length, EPA came out with a memo that
15 said, you know, we need to take a look at these. Maybe
16 these should be permitted under the Clean Water Act.
17 They may be an NPDES related discharge. And there's a
18 lot that goes into that, and we can talk about that,
19 but that began a new view of these. And, of course,
20 the Company took a lot of actions based on that with
21 the regulator and up to the date that I've been walking
22 through this.

23 Q. So that's helpful. That leads me to my next
24 question, Mr. Wells.

1 Prior even to 2010, state law prohibited
2 discharges into waters of the state without a permit,
3 and these engineered seeps were not -- were not
4 permitted in any of the Company's NPDES permits, were
5 they?

6 A. The -- so you're talking about a prohibition
7 of a discharge under the Clean Water Act, which is
8 delegated to the state, right, via the NPDES permitting
9 program. The question is whether or not these are
10 discharges under the act. That was the question even
11 as of 2010. So the discharge -- you know, under the
12 act, again, you know, discharge is really a defined
13 term, and it looks for -- you know, you're talking
14 about a point -- you had to evaluate whether you had a
15 point source carrying pollutants to waters of the
16 United States. All three terms of art under the Clean
17 Water Act, right?

18 And there's case law from the '70s up to
19 today that is still trying to figure out what is a
20 point source in a lot of ways. The traditional point
21 source concept was a pipe, if you think of the early
22 '70s. It was clearly a pipe carrying those pollutants
23 out to the river, which is waters leave the U.S.,
24 navigable waters, and that was permitted.

1 Now, from that early time, there's a lot of
2 evolution of, well, what else does it mean; how -- what
3 is a point source. And it's broadened in terms of;
4 one, priorities; two, views by the agency on how they
5 interpret the rules. And a lot of things changed how
6 they would be interpreted today from what it would have
7 been in the '70s. In any event, in the 2000 time frame
8 when I was referring to these permit and the permit
9 applications, there's a water balance that goes before
10 the agency as part of that application. And in that
11 water ambulance diagram, it would identified -- it did
12 identify. I've seeing that they've identified these.

13 But the bigger point is -- and those would
14 have just been in drawings. The bigger point is when
15 the Hanlon memo came out, EPA came out in 2010 and said
16 these may be subject to permitting -- it was two
17 states, it wasn't to Duke, this was to all states
18 throughout the country saying, these type seeps may be
19 subject to permitting, and you should evaluate them and
20 see what's the appropriate steps and other things.

21 Duke, at that time, approached DEQ
22 specifically with data, pictures, other things to say
23 here's what we have, you know, come on out, visit the
24 site. We'll look through this. How do you want to

1 manage these? We believe permitting is an appropriate
2 step. And at the time, the agency determined it was
3 not. And, you know, that is represented in my
4 testimony, and I cite to, you know, Sergei Chernikov,
5 who was the permit writer. He's Ph.D., he's very
6 confident, very qualified permit writer out of DEQ, and
7 he tells you specifically the way the state was
8 approaching it. And that was they didn't see it as a
9 priority, they were very much concerned that this --
10 North Carolina was, like, in front of this issue. The
11 rest the country wasn't doing this, and that they were
12 going to be setting precedents.

13 So they were working back and forth with EPA
14 to understand what's the appropriate way to permit
15 these if they are subject to permit. And, in fact,
16 ultimately determined -- you know, they're looking to
17 protect the waters -- the receiving waters, and they
18 recognized they had a pipe coming out of the basin
19 which was direct water from the basin. Millions of
20 gallons per day under the permit, and surface waters
21 being monitored and verifying no impacts to the surface
22 waters from that discharge, but that's all permitted,
23 and that these seeps, in essence, were a small, small
24 fraction and orders and orders of magnitude below that,

1 and didn't carry the similar even concentration, you
2 know, because the water is filtering through the soil
3 bank before it even gets to this area.

4 In any event, that's what the -- DEQ was
5 looking at this to understand if this was a priority
6 that warranted permitting. At that time, they chose
7 not to. As you know, we've revisited in 2014, and
8 ultimately really pressed hard for some regulatory
9 clarity on this issue, which we felt was -- be a
10 permit. And by the way, in that interim, we were also
11 installing collection systems where we could to collect
12 those seeps and put them back into the basin while this
13 issue was being resolved. So in a number of areas, we
14 also spent money to take some action while we sought
15 this clarity.

16 And as you know now, those are all permitted.
17 We've now been managed to get all of those permitted
18 other otherwise resolved through the SOC's.

19 Q. Mr. Wells, at the time the seeps were
20 constructed -- and as you said, these are pipes
21 channeling wastewater directly from the coal ash
22 ponds -- did the Company know about the Clean Water Act
23 and the delegated state program prohibition on
24 unpermitted discharges?

1 A. So the -- I mean, if you look at the design
2 drawings, the drawings, these were built in the '50s
3 and '60s, so the water act didn't -- the Clean Water
4 Act didn't exist. State requirements didn't exist.
5 This concept that you're talking about didn't exist.

6 Now, the second piece, you say I represented
7 these as pipes carrying wastewater straight from the
8 basin. No, I was referring -- that was a reference to
9 the actual discharge pipe from the basin. Remember
10 these basins, they have a discharge pipe, a big one
11 that was permitted from the beginning of the Clean
12 Water Act. Lawful through that pipe, the basin water
13 goes out to the river and is sampled pursuant to the
14 limits and other things. And the compliance record
15 with that, with respect to that is very, very good.

16 What I was referring to is these pipes that
17 are built into the banks. So they're not touching the
18 basin water directly, they're designed to collect water
19 that may permeate through the dam, so now you have a
20 saturated soil. And by providing this typically sand
21 or other type area around a perforated pipe, it
22 provides a release from that soil pressure a lot of
23 that water to reach a pipe. So this is water that
24 flowed from the basin originally, but it's since flowed

1 through soil.

2 So then again, you're trying to ask once
3 it -- and then that water would typically go to the
4 foot, the toe of the dam, so it's not going straight to
5 the river. So that left the question of is it -- you
6 know, even after -- now, the Clean Water Act
7 subsequently comes along and other things. But then
8 you're asked, okay, now let's look at that water. Does
9 it meet the requirements that you just referred to?
10 Which is, you know, is it wastewater in the sense that
11 it's carrying pollutants? Is it a point source if it
12 were to reach water? And is it reaching -- is it, in
13 fact, reaching the waters of the U.S.? And waters of
14 the U.S., of course, are the -- there's a lot about
15 that as well, right, in terms of legal interpretations.

16 So the point is just that there was some
17 discussion on this, probably -- I mean, and as we got
18 with the agency and sought permitting, they thought we
19 may be -- I mean, in part, some of these begin to get
20 into these areas. There was some concern, as indicated
21 in the testimony, that there could be some precedent
22 set that would apply to everything. Not basins, but
23 they reference thousands and thousands of lagoons and
24 other things that are elsewhere that were creating some

1 concerns as to how this should properly be regulated.

2 Q. Okay. And with respect to the Company's
3 other seeps, their nonconstructed seeps, Duke Energy
4 Carolinas and Duke Energy Progress combined have
5 identified approximately 200 distinct seeps from their
6 impoundments; is that correct, in North Carolina?

7 A. That is not correct.

8 Q. No?

9 A. No. So we're going to go back to my 2017
10 testimony on this issue where this was considered in
11 front of the Commission and there's extensive
12 discussion on this point. In 2014, recognizing there
13 was no regulatory clarity on this issue, this idea of
14 toe drains and constructed seeps had already been
15 before the agency. And you can see, in the development
16 of the record, we are trying to get them permitted, and
17 the agency is not doing that.

18 One of the steps the Company took -- and this
19 is in my -- I was around at this time -- we initiated a
20 survey of the sites, comprehensive, anything that we
21 considered to be an area of wetness. So this was
22 just -- and in some instances, you know, at that time,
23 when we did that inspection, if there was any water, it
24 was identified as an area of wetness. And then we --

1 that's the number I think you're reflecting is those
2 areas of wetness. How many did we have? And we
3 submitted all of them to the state and said, we have to
4 get some clarity on this issue. Because without
5 regulatory clarity, we have risk. And as far as
6 managing this issue, we have no direction to go,
7 because we're -- there are wet spots all over. You
8 know, some are -- it could be a natural wetland.
9 Some could be a storm event. You know, a seasonal
10 issue where it's holding water for a period time in a
11 particular area.

12 Not all of these flowed. Not all of these
13 had any constituents. Not all of these even had even
14 enough water to pull a sample. But they were all
15 sampled, all identified by GPS coordinates, and all
16 submitted to the state and requested regulatory clarity
17 on how to manage these. And again, some we took
18 additional steps to collect and pump back to the basin
19 while we got the -- while we sought to get the clarity
20 we now had. So that's the good -- you know, really
21 good thing about where we're at.

22 There were a lot of issues here where we're
23 requiring some interpretation, and some resolution, and
24 some work with the agencies, and now we've achieved

1 that. You know, we're at a very good stead now. SOC's,
2 we created for the purpose of providing that regulatory
3 clarity, and those have all been executed. And we're
4 in full implementation. And we have also now received
5 revised permits for all those constructed -- the
6 constructed piece of the seeps. We have that clarity
7 we've been seeking, and we're fully compliant with them
8 moving forward.

9 Q. So I'll go back to several things you just
10 said, but first I wanted to -- and we can go to the
11 document if you would like, but I'm looking at the 2015
12 joint factual statement. And we can all go there, or I
13 can just read from it. But it's Hart Exhibit 3 in this
14 case.

15 A. I am familiar with it.

16 Q. Okay.

17 A. If I need to look at it, I'll let you know.

18 Q. Okay. So there's a sentence here that reads:

19 "The defendants have identified nearly 200
20 distinct seeps at the defendant's coal ash basins
21 throughout North Carolina in permit modification
22 applications filed in 2014."

23 So is -- so I read that to mean that there
24 were 200 distinct seeps at the two Company sites in

1 North Carolina; is that right?

2 A. Well, this was the area of wetness list that
3 was submitted to the state for purposes of determining
4 permitting.

5 Q. Okay. And you -- let's see. All right. You
6 had mentioned that the -- some of these areas were
7 seasonal. You had testimony along those lines. And I
8 would just really quickly like us to refer to, let's
9 see, Public Staff Cross Exhibit 73.

10 A. Okay.

11 Q. And that is the River Bend SOC.

12 A. I see that.

13 Q. And -- all right.

14 MS. LUHR: So, Chair Mitchell, we would
15 ask that Public Staff Cross Exhibit 73 be
16 identified as Public Staff Wells/Williams Rebuttal
17 Cross Examination Exhibit Number 6. And just --

18 THE WITNESS: I'm there. I'm at the
19 exhibit.

20 Q. Thanks.

21 A. Oh, I'm sorry.

22 CHAIR MITCHELL: All right. Ms. Luhr,
23 the document will be marked as Public Staff
24 Wells/Williams Cross Examination -- Rebuttal Cross

1 Examination Exhibit Number 6.

2 MS. LUHR: Thank you.

3 (Public Staff Wells/Williams Rebuttal

4 Cross Examination Exhibit Number 6

5 marked for identification.)

6 Q. So on looking at page 3 of this document,
7 make sure I have the correct line, which is -- here we
8 go. It's page -- I'm sorry, page 1 of the document,
9 which is page 2 of the PDF. And this is the first page
10 of the special order by consent.

11 A. Okay. I see it.

12 Q. And I would just -- I will read the first
13 sentence of paragraph 1-B, which reads:

14 "Duke Energy Carolinas is responsible for
15 unauthorized discharges of wastewater from the area
16 around River Bend seep station's coal ash surface
17 impoundments."

18 And then I will move to the last part of this
19 paragraph. We can read the whole thing if you would
20 like, but the paragraph, the part I'm focused on,
21 reads:

22 "Seeps are typical in earthen dams. Seeps
23 can be seasonal and/or transient in nature; however,
24 seepage can still constitute an unauthorized

1 discharge. "

2 Is that what that reads?

3 A. I see that, yes.

4 Q. Okay. So even if seeps are seasonal, they
5 still can be unauthorized discharges; isn't that right?

6 A. I think they can if they're unpermitted and
7 they meet all the criteria we previously set forth that
8 would constitute a discharge. You know, and the other
9 thing I may just reference, with respect to -- the SOC
10 is a big part of a special order and consent is this --
11 you know, you're looking to resolve an issue that isn't
12 clear. I mean, in this instance, an issue that isn't
13 clear. And this is a vehicle that can bring that
14 clarity as to how we do it.

15 And so now, for instance, the agency could
16 just as easily have put a lot of these straight into a
17 permanent, and they didn't, because they weren't sure
18 they required a permit or that it was proper to permit
19 some of these transient things that weren't squarely
20 falling in a point source-type hole. So they would
21 say -- so we had two vehicles that we looked at. And
22 one was permit, and we permitted those very clean ones
23 like the constructed seeps. And they didn't feel that
24 was creating a wrong precedent, and it was a good

1 approach.

2 The SOC's created another vehicle where there
3 was an opportunity where you know you have an issue
4 without a good path, a resolution, and alignment
5 between both us and DEQ on path forward. And also with
6 an eye toward; one, regulatory clarity, but also
7 ensuring adequate protection to the environment. We
8 want to ensure none of this was creating an issue. Our
9 data was saying that it's not, but what's the right
10 way. We expect the agency to clarify it.

11 So the SOC is the vehicle that allowed us to
12 do that. And so as we -- if you read -- as you read
13 through this, this was a -- this resolution was very
14 beneficial to the Company as well as the state to get
15 this done.

16 Q. Okay.

17 A. And I say that only because when you -- as
18 you read the stipulations, those are important
19 stipulations that are necessary to trigger authority
20 under the SOC for the state to enter.

21 Q. Thank you. And under the SOC's that the
22 Company entered into, did it agree to pay financial
23 penalties for its seeps?

24 A. Yes.

1 Q. Okay. And I just have a couple more
2 questions and then I will be finished. On page 12 of
3 your testimony, you discuss the Commission's authority
4 to regulate utility dams from 1967 until 2009. And on
5 page 13, lines 6 through 8, you state that:

6 "Not once during that time did the Commission
7 or the Public Staff ever determine or opine that the
8 continued use of surface impoundments to store CCR was
9 imprudent."

10 So here you're referring to the period
11 between 1967 and 2009, correct?

12 A. Correct. That's correct.

13 Q. Okay. And are you familiar with the Public
14 Staff's role?

15 A. In -- I would need some additional clarity on
16 that question.

17 Q. Of course. So the Public Staff's role is to
18 investigate the reasonableness of rates charged by
19 public utilities; isn't that right?

20 A. I'm not familiar with the Public Staff's
21 specific role. I would agree with that. But I
22 understand they look at a lot of things to understand
23 whether they agree with the costs and the rates that
24 the Company has applied for.

1 Q. Okay. And the first time that costs
2 associated with corrective action and closure of coal
3 ash impoundments came before the Commission was in 2017
4 for Duke Energy Carolinas; isn't that right?

5 A. I don't know that that was the first time. I
6 think what I was referring to here is that the dams --
7 now, the concept of the -- we have basins. This is how
8 we manage our basins. And we're doing inspections, and
9 there's a docket that's set up, and all those
10 inspections are being submitted. And there is some
11 involvement by the Public Staff, by the AG, by all the
12 parties today. There's involvement by the DEQ that was
13 evidenced, as I read the docket, where some of these
14 were shared, you know, saying by practice they share
15 them with DEQ who does have that environmental
16 authority.

17 The point is that -- the point of this
18 portion of the testimony is there is -- Duke has not
19 operated in a vacuum. This is not all, you know, 20/20
20 hindsight on everything that Duke's practices were. It
21 was intended to say, look, this has been the practice
22 of Duke, but in a very open way, this is how wastewater
23 and coal ash has been managed. Not just here at Duke,
24 but nationally. And we weren't in a vacuum. We had

1 the regulators involved. We had -- you know,
2 obviously, from the dam safety perspective, we've had
3 the Commission involved. The Commission was sharing
4 documents with others.

5 From the regulatory side, environmental,
6 DEQ's involved, they're permitting. We're engaged with
7 EPA on everything they do. We're engaged with EPRI
8 over the years. We do multiple studies at our sites on
9 this very issue. We're voluntarily engaging in a
10 broader level of USWAG. All of this is occurring over
11 the years.

12 And my point is, there seems to be this
13 concept that Duke's out on its own and now let's take a
14 hard look at what they did, and we don't have any onus
15 for this. My point was, this is how -- this is -- and
16 it's not that there was wrongdoing, it's that this was
17 the evolution of this practice, and we are where we are
18 today. And we're in a good place, and we're ready to
19 move forward. And that was my point, is that this
20 wasn't just -- there were others involved in
21 understanding how ash is managed.

22 Q. And who is it that's ultimately responsible
23 for the Company's ash ponds and compliance with
24 environmental regulations; would that be the Company,

1 or DEQ, or the Public Staff?

2 A. I believe the Company is responsible for
3 management of the ash and it's compliance.

4 Q. All right. Thank you, Mr. Wells. Those are
5 all my questions.

6 CHAIR MITCHELL: All right. At this
7 point, we have come to our lunch break. We will be
8 in recess until 2:30. Before we go off the record,
9 though, I would like to address Duke's request
10 related to witness McManeus. I have consulted with
11 my colleagues, and we have no further questions for
12 the witness, so she may be excused.

13 MR. ROBINSON: Thank you,
14 Chair Mitchell.

15 CHAIR MITCHELL: All right. Anything
16 else before we go off the record?

17 (No response.)

18 CHAIR MITCHELL: All right. Hearing
19 nothing, we will go off the record and back on at
20 2:30.

21 (The hearing was adjourned at 1:24 p.m.
22 and set to reconvene at 2:30 p.m. on
23 Thursday, September 17, 2020.)
24

CERTIFICATE OF REPORTER

STATE OF NORTH CAROLINA)

COUNTY OF WAKE)

I, Joann Bunze, RPR, the officer before whom the foregoing hearing was taken, do hereby certify that the witnesses whose testimony appear in the foregoing hearing were duly affirmed; that the testimony of said witnesses were taken by me to the best of my ability and thereafter reduced to typewriting under my direction; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this hearing was taken, and further that I am not a relative or employee of any attorney or counsel employed by the parties thereto, nor financially or otherwise interested in the outcome of the action.

This the 21st day of September, 2020.



JOANN BUNZE, RPR

Notary Public #200707300112

