

STATE OF SOUTH CAROLINA
IN THE COURT OF APPEALS

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SC Court of Appeals

APPEAL FROM THE ADMINISTRATIVE LAW COURT
Ralph King Anderson, III, Chief Administrative Law Judge

Docket No. 21-ALJ-07-0433-CC
Appellate Case No.2023-000006

Friends of Gadsden Creek,.....Appellant,

vs.

South Carolina Department of Health and Environmental Control, and

WestEdge Foundation, Inc., ...Respondents.

RECORD ON APPEAL
VOLUME II OF VI

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Foundation, Inc.*

1 A: Yes.

2 Q: And have you -- any of the work that you've
3 conducted or performed involved evaluation of
4 salt marsh geography and geomorphology?

5 A: Yes. Most of our work in that regard has been
6 for academic research. You know, either grant
7 funded or other pro- -- other, you know, source
8 -- just academic researchers or co-operators,
9 that then is informed in some of the consulting
10 work that we do.

11 Q: Are you familiar with the general concept of
12 salt marsh ecosystems?

13 A: Yes.

14 Q: And what does that mean to you?

15 A: The full range of, of plant and animal life and
16 microbial life within the salt marsh system and
17 the way they all sort of work together to
18 create the processes and -- that we st- -- that
19 we know lives in natural salt marsh.

20 Q: Okay. And do you do any work -- or does the
21 work that you do involve evaluating salt marsh
22 ecosystems?

23 A: We evaluate them for their physical parameters
24 and how they compare to a more natural salt
25 marsh system.



1 Q: And do you do any work with respect to salt
2 marsh ecosystem restoration?

3 A: Yes.

4 Q: And what kind of work do you do with respect to
5 that area of expertise?

6 A: To -- as I mentioned a moment ago, assessing a
7 degraded salt marsh and determining how much of
8 the natural function can be reclaimed. And
9 then developing strategies, whether it's, you
10 know, barrier removal or flow restriction, or
11 trading a new tidal channel, or manipulating a
12 tidal channel in some way to promote a more
13 natural hydrologic cycle in the salt marsh. It
14 also can involve something like restoring
15 oyster habitat for a living shoreline along
16 tidal creek or tidal river.

17 Q: Is that similar to the concept of aquatic
18 ecosystem functionality in your mind?

19 A: Yeah. That would be the global term that
20 describes aquatic ecosystems, fresh, salt
21 water, the whole range.

22 Q: And you have experience in that field?

23 A: Yes.

24 Q: The global field?

25 A: Yes.



1 Q: Does some of your work involve that?

2 A: Yes.

3 Q: Have you studied that concept, aquatic
4 ecosystem function?

5 A: Yes.

6 Q: All right.

7 **MR. CUNNINGHAM:** At this time, Your Honor, we'd
8 offer Mr. Robinson as an expert in civil and
9 environmental engineering, urban stormwater
10 management, tidal hydrology and hydrolics,
11 compound flooding, tidal creeks, salt marsh
12 hydrology and hydrodynamics, tidal
13 sedimentation, urban stream restoration and
14 renaturalization, salt marsh physical geography
15 and geomorphology, salt marsh ecosystem and
16 aquatic ecosystem functionality.

17 **MR. TRAYNHAM:** I'm gonna need that again, Your
18 Honor.

19 **MR. CUNNINGHAM:** Sure. That's why I've been very
20 deliberate about going through Mr. Robinson's
21 credentials, Your Honor. Civil and
22 environmental engineering, urban stormwater
23 management, tidal hydrology and hydrolics,
24 compound flooding, tidal creeks, salt marsh
25 hydrology and hydrodynamics, tidal



1 sedimentation, urban stream restoration and
2 renaturalization, salt marsh physical geography
3 and geomorphology, salt marsh ecosystem and the
4 restoration thereof and aquatic ecosystem
5 functionality.

6 **MR. TRAYNHAM:** Can we take a brief recess to consult
7 with our expert?

8 **THE COURT:** Yeah. Absolutely. He's given a lot
9 longer list than normal. I recognize that. I
10 think we could have done a more generalization
11 of those.

12 **MR. CUNNINGHAM:** Well I ---

13 **THE COURT:** The aquatic ecosystem -- the salt water
14 ecosystems and restorations was a subset of the
15 aquatic ecosystem.

16 **MR. CUNNINGHAM:** That's true, Your Honor.

17 **THE COURT:** Oh well. We're gonna take a short
18 break.

19 (Off the record 10:15 a.m. until 10:25 a.m.)

20 **THE COURT:** Y'all be seated.

21 **MR. TRAYNHAM:** Your Honor, if I may conduct some
22 voir dire.

23 **THE COURT:** You may.

24 **MR. TRAYNHAM:** Thank you.

25 **MR. ROBINSON - VOIR DIRE BY MR. TRAYNHAM:**



1 Q: Good morning, Mr. Robinson.

2 A: Good morning.

3 Q: Good to see you again. You would agree with me
4 that the scope of civil engineering is fairly
5 broad, wouldn't you?

6 A: Yes.

7 Q: No civil engineer practices every aspect of
8 civil engineering, correct?

9 A: That's correct, yeah. Engineers are required
10 to practice only within the area of their
11 expertise.

12 Q: So you're area of practice -- I don't want to
13 put words in your mouth or Mr. Cunningham's,
14 but it sounds like you specialize in
15 environmental engineering and hydrology and
16 hydraulic aspects of engineering, is that a
17 fair statement?

18 A: I'd say that's fair.

19 Q: Okay. Mr. Cunningham asked you about, you
20 know, whether you had any experience working on
21 infrastructure. I believe you said yes and
22 moved on. But you'd agree with me that
23 infrastructure is also a fairly broad term,
24 would you not?

25 A: It could be. I think of infrastructure as, you



1 know, different types of structures that are
2 beneath the ground. Most of those beneath --
3 underground infrastructures are piping systems
4 or, you know, which are to move water or waste
5 water of some kind.

6 Q: Okay.

7 A: So when I was talking about infrastructure I'm
8 thinking about infrastructure related to water,
9 the waste water system, stormwater systems,
10 things of that nature.

11 Q: Okay. So you have not for example designed
12 roads or bridges?

13 A: I've not designed bridges, right, correct.

14 Q: Okay.

15 A: I have designed roads.

16 Q: And I believe in your deposition we talked some
17 about the experience you and your firm have
18 had. You described your firm as a relatively
19 small firm, correct?

20 A: Seven, eight people, correct.

21 Q: Okay. I think you called it a sole source
22 provider. I'm not exactly sure what that term
23 means. But the gist I think that I gathered
24 was that you typically work as part of a larger
25 group, correct?



1 A: No, that's not correct. We often work as part
2 of a large team. But I think possibly what I
3 meant as a sole source provider is for example
4 when we work directly with a land developer or
5 directly with a property owner's association.
6 As their consultant we have a direct
7 contractual relationship. And then any other
8 sub-consultants or specialists we'll hire on
9 their behalf and coordinate all that work. So
10 the majority of our work is actually where we
11 work directly for a client and not part of a
12 large team.

13 Q: Okay. Your firm has not for example designed
14 or implemented reconstruction of a municipal
15 stormwater drainage basin?

16 A: Reconstruction of a municipal drainage basin?

17 Q: I should specify. On your own, your firm.

18 A: Could you define what you mean by
19 reconstruction of a municipal drainage basin?

20 Q: Let me ask it a different way. Would you agree
21 that your firm does not single-handedly handle
22 large infrastructure projects?

23 A: How would you define large?

24 Q: A road, bridge ---

25 A: I have designed roads. I've never designed a



1 bridge.

2 Q: How large a road have you designed?

3 A: In terms of length or lanes or ...

4 Q: Length and lanes?

5 A: In the capacity of a -- as a site civil
6 engineer working on, you know, different
7 project sites I would say I've designed roads
8 no more than a couple or three miles long and
9 several lanes wide.

10 Q: Would those be local roads or DOT projects?

11 A: The one I'm thinking of now would probably be
12 a county road. But we don't provide road
13 design services to the DOT for example.

14 Q: In discussing your experience as a urban
15 stormwater management, are you typically the
16 engineer or the entity -- is your firm the
17 entity that obtains the land disturbance permit
18 or are you working with other groups that ---

19 A: Sometimes we do. Sometimes other team members
20 do.

21 Q: Can you estimate as a percentage of your
22 stormwater projects when you were responsible
23 for obtaining the land disturbance permit
24 versus another part of the team?

25 A: I would estimate upwards of 75 percent, maybe



1 as high as 90 percent. We would also pursue
2 the land disturbance permit.

3 Q: You would be responsible for getting the land
4 ---

5 A: Right.

6 Q: With regard to your testimony on salt marsh
7 ecosystem and aquatic ecosystem functions, are
8 you a biologist?

9 A: No.

10 Q: Okay. When you discuss assessing salt marsh
11 and aquatic ecosystems, what I think of when
12 you say that is assessing the suitability of
13 habitat for all the species that live within
14 that area. Is that what you're describing?

15 A: Perhaps. But the way that ecosystem function
16 is typically thought of is that sometimes it's
17 thought of as a conceptual model of like a
18 pyramid where the base of the pyramid is the
19 physical processes. In an aquatic ecosystem
20 it'd be the hydrology. So the base of that
21 pyramid is the hydrology and the geology, the
22 overall setting of the landscape. And then
23 progressively as you move higher in that tier
24 there's the different creatures or, you know,
25 that live in that habitat.



1 Q: So are you an expert in the flora and fauna of
2 these habitats?

3 A: I'm not an expert in flora and fauna, no.

4 Q: Okay.

5 **MR. TRAYNHAM:** Your Honor, with that clarification
6 from voir dire and that clarification regarding
7 his civil experience and stormwater management
8 experience, I think we can stipulate to all but
9 the salt marsh ecosystem and aquatic ecosystem
10 specialty or expertise. Petitioners in this
11 matter named a biologist as an expert and was
12 never produced. I believe that those areas of
13 expertise are more suitable for a biologist
14 than they are for a professional engineer. He
15 can speak to the hydraulics and the hydrology
16 of ---

17 **THE COURT:** Yeah.

18 **MR. TRAYNHAM:** --- habitat function, certainly.

19 **THE COURT:** Well he talked about the base level.
20 But he also explained that he wasn't an expert
21 in flora or fauna.

22 **MR. TRAYNHAM:** Yes, Your Honor.

23 **THE COURT:** So I can qualify him as an expert in
24 everything you requested, Mr. Cunningham,
25 except -- and with salt water -- salt marsh



1 ecosystems in regard to only the aspect of
2 civil engineering and not anythings else.

3 **MR. CUNNINGHAM:** May I respond, Your Honor?

4 **THE COURT:** Yeah.

5 **MR. CUNNINGHAM:** Mr. Robinson talked about all his
6 biological training and experience. He's an
7 adjunct faculty. And part of that is training
8 in biology. Now he's not going to get into all
9 the flora and fauna ---

10 **THE COURT:** He just said he wasn't an expert ---

11 **MR. CUNNINGHAM:** No, no. He's not going to get into
12 the flora and fauna. We're talking about
13 generally the ecosystem functionality of it
14 without specific flora or fauna. And as far as
15 Mr. Traynham's point about disclosure. Well in
16 his deposition ---

17 **THE COURT:** I'm not worried about that.

18 **MR. CUNNINGHAM:** Okay.

19 **THE COURT:** I worry about what my job is right now.

20 **MR. CUNNINGHAM:** Sure.

21 **THE COURT:** So that's what I qualify him as an
22 expert in, as I just stated earlier.

23 **MR. TRAYNHAM:** Thank you, Your Honor.

24 **THE COURT:** All right.

25 **MR. CUNNINGHAM:** Just so I'm clear, Your Honor, the



1 only area that Your Honor declined to qualify

2 ---

3 **THE COURT:** Well, I didn't decline. I qualified his
4 qualifications.

5 **MR. CUNNINGHAM:** Okay. Fair enough, Your Honor.
6 Okay.

7 **MR. ROBINSON - DIRECT EXAMINATION BY MR CUNNINGHAM**
8 **(CONT.):**

9 Q: All right. Mr. Robinson, you grew up in
10 Charleston?

11 A: Yes.

12 Q: Attended college in Charleston?

13 A: The Citadel.

14 Q: And you worked in Charleston for how long?

15 A: I worked there for a short while during college
16 and then I, I worked elsewhere for a while and
17 moved back in 2011.

18 Q: Are you familiar with stormwater management in
19 your professional life along the -- or
20 throughout the Charleston peninsula?

21 A: Yes.

22 Q: Are you familiar with flooding conditions
23 throughout the Charleston peninsula?

24 A: Yes.

25 Q: Are you familiar with the Gadsden Creek area?



1 A: Yes.

2 Q: When did you first become familiar with Gadsden
3 Creek?

4 A: Having grown up in the area I recall, I recall
5 it, you know, as far back as possible. I beca-
6 -- became really familiar with it when I was a
7 cadet at The Citadel because it's a block away
8 from campus. So my jogging route would take me
9 around Hagood -- down Hagood and around Gadsden
10 Creek, Gadsden Green.

11 Q: In the 1990s, approximately?

12 A: Yeah, 1999 until 2003.

13 Q: All right. Do you recall what it looked like
14 at the time?

15 A: To the best of my memory it was very similar to
16 what it is like today in terms of the creek
17 itself.

18 Q: Did it have marsh present?

19 A: Yes.

20 Q: Did it have -- as early as you can recall, is
21 that in the '80s when you first saw it?

22 A: Yes.

23 Q: Does it -- was the marsh there?

24 A: Yes.

25 Q: Now, later did you ever go visit Gadsden Creek,



1 utilize it?

2 A: I have.

3 Q: And for what purposes?

4 A: I -- well, I live nearby and it's a natural
5 area I can go, you know, observe salt marsh or
6 birds at this kind of a natural area. It's
7 kind of the largest natural area in the City
8 that I can, you know, have a few moments of
9 quiet enjoyment.

10 Q: And you studied Gadsden Creek.

11 A: I have.

12 Q: And since when?

13 A: Probably the last six or seven years in, in
14 detail. But I was, you know, very aware of it
15 before I moved back to Charleston and I knew
16 that there were plans to, to build in the area
17 and there was talk of revitalizing the creek.
18 So I remember becoming very aware of it
19 probably around 2009 or 2010.

20 Q: What kind of study have you made at Gadsden
21 Creek?

22 A: We have measured the flow coming and going
23 through Gadsden Creek. We've measured cross
24 sections of the creek itself. I have observed
25 a number of different flooding events in the



1 creek, rainfall flooding and tidal flooding.
2 And the graduate students that I've worked with
3 have measured all sorts of different parameters
4 and different college classes have taken
5 samples of different kinds. I haven't done
6 those myself, but I have been involved in those
7 sampling efforts.

8 Q: Have you evaluated the creek's functionality?

9 A: Yeah, I would say I've evaluated physical
10 functionality and ecosystem functionality in
11 comparison with other tidal creeks that we're
12 studying at the same time.

13 Q: Okay. Are you familiar with the permitting
14 process as it relates to the Clean Water Act
15 permits?

16 A: Yes.

17 Q: 401/404?

18 A: Yes.

19 Q: Are you familiar with stormwater permitting?

20 A: Yes.

21 Q: Critical area permitting?

22 A: Yes.

23 Q: And that's in -- all in South Carolina?

24 A: Right.

25 Q: Coastal zone consistency certification?



1 A: Yes.

2 Q: Water quality certification?

3 A: Yes.

4 Q: Have you, y- -- y- -- have you been involved in
5 seeking permits for your clients with the
6 respect to any of those or all of those?

7 A: Ye- -- yes.

8 Q: All of them?

9 A: All of them, yes.

10 Q: Are you familiar with the permits and
11 certifications at issue in this matter?

12 A: I am.

13 Q: What materials have you reviewed other than the
14 permit as it relates to your opinions in this
15 matter?

16 A: I've reviewed a number of different reports,
17 studies going back to the 1970s. I've
18 reviewed, you know, a number of different
19 assessments by others. And, and then I've also
20 reviewed academic literature and case studies
21 of other projects. You know, there are places
22 other than municipalities with similar
23 conditions.

24 Q: Have you reviewed any of the Applicant or here
25 Respondent's materials that was submitted to



1 South Carolina DHEC?

2 A: I have.

3 Q: And the Corps of Engineers?

4 A: Yes.

5 Q: Do you recall what types of materials you've
6 reviewed of the Applicants?

7 A: I've reviewed the drawings associated with the
8 application and the stormwater drainage study
9 narrative modeling output results and the input
10 was attached to that document. There's several
11 different versions of the program application
12 through the years. So I have reviewed those --
13 those different versions.

14 Q: Do you review comment letters from other
15 resource agencies?

16 A: I have, yes.

17 Q: And have you reviewed historical information
18 with respect to the project area?

19 A: I have. I have reviewed historical aerial
20 photographs, historical photos of the site.
21 I've reviewed documents, various documents
22 during the time that the, the area was a
23 landfill in operation and then the closure
24 process. I've reviewed a number of those
25 documents.



1 Q: Those -- does that review, that documentation
2 inform your opinions in this matter?

3 A: Yes.

4 Q: Have you reviewed materials related to Gadsden
5 Creek and its utility for stormwater
6 management?

7 A: Yes.

8 Q: What kinds of materials have you reviewed on
9 that topic?

10 A: Well, the stormwater -- the Applicant's
11 stormwater drainage study I referenced a moment
12 ago and also the -- I've reviewed the
13 calculations and mapping studies that we've
14 done, that I've done and my team members have
15 done, to assess the stormwater storage
16 potential at Gadsden Creek and the tidelands.

17 Q: You, yourself, have done calculations related
18 to the stormwater storage capacity at ---

19 A: I have.

20 Q: --- Gadsden Creek, is that correct?

21 A: That's correct.

22 Q: And when did you perform this calculation?

23 A: I've done a variety of calculations throughout
24 the years but most recently it was during this
25 -- the -- in the fall of 2021. So about six or



1 eight months ago.

2 Q: Are you familiar with I think what's been
3 called either the 3x3 study or the 3x3x3 study
4 as it relates to Charleston stormwater
5 management?

6 A: Yes, I'm familiar with it. My firm put
7 together a, a report, an assessment, a critical
8 assessment of the Army Corp's study. I
9 submitted it during the public comment period
10 several years ago. Subsequently, Robinson
11 Design Engineers was asked to be part of the
12 consulting team hired by the City of Charleston
13 to review the EIS, Environmental Impact
14 Statement, associated with the 3x3 study.

15 Q: What is the 3x3 study?

16 A: It is a -- it's a study that's led by the Army
17 Corps of Engineers to assess flood risk on the
18 Charleston peninsula. And there's some sort of
19 cooperative agreement between the City of
20 Charleston and the local Army Corps Charleston
21 district. It's a several year process. It
22 follows several different steps. There's an
23 initial phase and there's the environmental
24 studies, then there's the preliminary
25 engineering design phase, which I believe the



1 project is moving into now or very soon.

2 Q: Is this related to this -- the proposed storm
3 surge wall or is that something different?

4 A: It, it is. That's one of the, that's one of
5 the things they contemplated and that's sort of
6 the idea they've landed on is a storm surge
7 barrier surrounding kind of a perimeter wall
8 around the City, the peninsula up to elevation
9 12.

10 Q: All right. You mentioned earlier the Dutch
11 Dialogues. What were or what was the Dutch
12 Dialogues effort?

13 A: Several years ago a group sponsored by the
14 Dutch Embassy and the Water Institute of the
15 Gulf came to Charleston for a series of
16 presentations and workshops leading to a very
17 intensive week-long design process called the
18 Dutch Dialogues. It's a registered trademark
19 of the Dutch Embassy, I believe, where they've
20 traveled to different cities and, and they
21 bring worldwide experts in flooding and
22 specifically how to deal with water in the
23 coastal environment in an urban, historic urban
24 area in particular. They bring Dutch experts
25 and experts from Louisiana who gained



1 experience after Hurricane Katrina in 2005, and
2 they collaborate with local practitioners and
3 local experts. So that happened in Charleston
4 several years ago. And myself and other of my
5 teammates at Robinson Design Engineers were
6 members or, or active participants in the Dutch
7 Dialogues collaborative process.

8 Q: You were -- you, yourself, were one of the
9 collaborators with these experts?

10 A: I was.

11 Q: Did the Dutch Dialogues result in the offering
12 of a final report to your knowledge?

13 A: There was. A comprehensive final report, which
14 was present to city council subsequently.

15 Q: Now, the document you just mentioned, the --
16 your participation in the 3x3 study of the
17 Dutch Dialogues, Army Corps, EIS related, are
18 you relying on those in fact forming your
19 opinions in this matter as well?

20 A: I am.

21 Q: Are those the sorts of materials that an expert
22 in your field would typically rely on when
23 evaluating or forming an opinion with respect
24 to these issues?

25 A: Well, I'm relying on them because there's a lot



1 of other experts, you know, who've contributed
2 to these two documents that provide a, you
3 know, a peer review or, or folks that have
4 worked in other areas and in really complicated
5 scenarios so, that's why I've relied on them.
6 And I think that broadly, you know, I know
7 other professionals who have relied on both the
8 3x3 study and also the Dutch Dialogues study
9 for a variety of different projects in the --
10 in this area and in other areas.

11 Q: Do you know, do you know whether or not the
12 Dutch Dialogues' final report has been
13 incorporated in any of the City's comprehensive
14 plans, the City of Charleston?

15 A: I know that the City of Charleston undertook
16 the comprehensive planning process as a
17 subsequent step to the Dutch Dialogues and
18 incorporated many of the recommendations. In
19 fact the, the, the main leaders of the Dutch
20 Dialogues team were the ones that were hired by
21 the City of Charleston to create the
22 comprehensive plan and Robinson Design
23 Engineers, my firm, was a part of that team
24 that did the comprehensive plan update and
25 worked to incorporate the recommendations of



1 the Dutch Dialogues into the required 10-year
2 comprehensive plan related to land and water
3 in, you know, in the City of Charleston.

4 Q: Do you know whether or not what is proposed
5 here, this proposed project, is consistent or
6 not with what was concluded in the Dutch
7 Dialogues?

8 A: To my review it is not consistent with the
9 Dutch Dialogues.

10 Q: Now, I'm going to ask you some questions about
11 your opinions in this case and I'd like you to
12 only provide me answers to these questions, if
13 you can provide an opinion to a reasonable
14 degree of scientific certainty. Is that okay?

15 A: Yes.

16 Q: All right. In your professional opinion, to a
17 reasonable degree of scientific certainty, does
18 the area of Charleston near the proposed
19 project experience flooding?

20 A: Yes.

21 Q: All right. Wha- -- why is that?

22 A: Well, there are three types of flooding that
23 area experiences. There's, you know,
24 stormwater-based flooding and by this area I
25 mean the area in question by the permit



1 application, but then also the surrounding
2 Gadsden Green west side community. stormwater
3 flooding because there's a upland topographic
4 drainage area of a couple hundred acres that
5 drains west towards the Ashley River, flows
6 through the site in question. There's also on
7 the extreme end storm surge flooding, which is
8 the major type of storm event, you know, where
9 a tropical activity would create a very large
10 swells. That would be the, the, the largest
11 type of storm event and that's the type of
12 storm event -- primary storm event, that the
13 Army Corps 3x3 study contemplates. And then
14 there's tidal flooding or, or sunny day
15 flooding that will -- when high --
16 exceptionally high tides will inundate the low-
17 lying areas of that part of the City.

18 Q: Do you have an opinion about what the cause is
19 of these types of flooding in the project area
20 and the area nearby?

21 A: Right. Well, flooding is a difficult term
22 generally. I mean, usually in cities or in
23 areas where we've built we think of flooding as
24 being water going places we don't want it to
25 go, you know. Flood planes naturally flood.



1 Salt marshes naturally flood. In terms of the
2 tidal flooding in the area we're discussing
3 now, it floods -- it, it currently experiences
4 flooding because it's all former salt marsh.
5 When it becomes all former salt marsh the water
6 is simply going to the -- its natural extents.
7 So years ago the, the historic homes that were
8 built in the upland areas adjacent to it, they
9 wouldn't have considered it to be flooding
10 because the water was just going where the
11 water was intended to go in the salt marsh.
12 But the area that's inundated by flood water
13 now is area that was formerly salt marsh but
14 filled.

15 Q: Now, you mentioned earlier understanding about
16 ---

17 **THE COURT:** Can you say where the water was intended
18 to go or the water has intentions. Do you
19 really mean where the water would naturally
20 flow?

21 A: Where the water would naturally flow. Yes,
22 sir. Those areas where the water would
23 naturally flow are the result of many, many
24 years of water and sediment reaching some sort
25 of equilibrium with the upland landscape.



1 **THE COURT:** Which is a component of topography,
2 right?

3 **A:** A component of topography and a component of
4 the watershed, the Ashley River watershed and
5 all the water and sediment that moves into the
6 Charleston Harbor. And that salt marsh can --
7 is comprised of fine grain sediments that are
8 laid down over long periods of time. And it's
9 a very, very thick layer of sediment, you know,
10 it could be a dozen or more feet thick
11 depending on location. But it's many, many
12 layers of fine grain sediment. And what we see
13 is the, the cordgrass salt marsh is just the
14 top layer of that. So with each tide that
15 comes and goes a fine level of sediment can
16 either be laid down or scoured away and that --
17 the salt marsh is a, a result of all those
18 processes. So salt marshes are continually
19 settling and new sediments are coming in to
20 keep pace with that subsidence over time, so.

21 **Q:** You mentioned where the marsh was with respect
22 to whether it causes the flooding in your
23 opinion in this area.

24 **A:** Right.

25 **Q:** Do you have an opinion about -- well, first of



1 all, are you familiar about -- with the areas
2 that existed approximately circa 1950 and do
3 you have an un- -- understanding about whether
4 or not there was a greater expanse of sal- --
5 salt marsh in this area at that time?

6 A: Yes, my understanding is it's something like
7 between 95 and 100 acres of the area, generally
8 west of Hagood, that was filled since the
9 1950s. All area that was formerly salt marsh,
10 it's -- was filled and is just continually sunk
11 -- subsided since that time.

12 Q: Do you have an opinion about whether the, the
13 marsh as it formally existed in the area
14 provided any protection from the flooding for
15 that community that resided in the area at that
16 time.

17 A: Yes, well, there would've been no tidal
18 flooding as I mentioned before because
19 everything outside of that would have been in
20 the uplands higher than the high tide level.
21 Stormwater flooding most likely was not a
22 concern because the couple hundred acres of
23 land that drained naturally into the salt marsh
24 or the area that was historically the full
25 expanse of Gadsden Creek, you know, that marsh



1 and the creek network had -- they offered
2 tremendous volume. That's one of the natural
3 functions of tidal creeks is to accept
4 stormwater runoff of the natural landscape. So
5 that, that marsh and the creek would've offered
6 tremendous storage potential of stormwater.
7 And then the other type of flooding I
8 mentioned, the storm surge, you know, from the
9 homes that would've been facing Ashley River
10 that, that -- the most exposed to the Ashley
11 River, you know, they would've been at least
12 over a hundred feet of salt marsh. And, you
13 know, salt marsh offers wave dampening effects
14 so a very moderate storm surge. That salt
15 marsh would've certainly dampened flood waters
16 moving on to the uplands from a, from a tidal
17 -- or excuse me, from a tropical storm surge.

18 Q: Do you recall the approximate shape of the
19 tidal creek that was extant in the area before
20 the filling began in the 1950s?

21 A: Yes, I've studied aerial photographs from the
22 1950s prior to the landfilling activities to
23 look at the shape and size of the, of the main
24 channel of Gadsden Creek and the other
25 tributaries of it.



1 Q: Was the shape you observed similar to your
2 observation about a tidal creek -- naturally
3 occurring ---

4 A: Yes.

5 Q: --- tidal creeks? And does that shape -- and
6 the, and the -- by the shape I mean how it
7 angulates but also the width of it, does that
8 relate to dampening the potential for tidal
9 flooding?

10 A: Yes. Tidal creeks are interesting in that, you
11 know, they receive water twice a day and so the
12 shape and size of the tidal creek in a natural
13 setting are the result of many, many years of
14 a balancing act between the flow of water
15 eroding sediment and the water moving in more
16 sediment. So the, the shape and size of the
17 channel determine how much water gets in and
18 ultimately how much water flows out. So the
19 different tidal systems have a different plan
20 form, which is to say some creeks and rivers
21 are very curvy. Some creeks are relatively
22 straight depending on the landscape. And
23 that's -- researchers think that's mostly a
24 function of the tides and other physical
25 forces, but tidal creeks in our re- -- in our



1 region tend to be very sinuous or very curvy
2 naturally. That has to do with the channel,
3 the creek, putting bends and curves to resist
4 the flow of water out. So it's a way to
5 balance out those erosive forces. So we tend
6 to have very curvy, sinuous tidal cha- -- tidal
7 channels and natural marshes.

8 Q: You mentioned awareness of tidal flooding in
9 the area, is that correct?

10 A: Yes.

11 Q: All right. Do you have an opinion about what
12 causes tidal inundation or flooding in this
13 area?

14 A: Yes. You know, the, the reports that I've seen
15 and also I, I recall visiting the site even a-
16 -- as an undergraduate engineering student and
17 professors explaining that this area had
18 settled because of landfilling activities, you
19 know, and so the reports that I've seen, that
20 area has settled as much as three feet in some
21 areas. And even now, if you -- if you're
22 looking across Hagood, across the historic
23 marsh of Gadsden Creek sort of towards Spring
24 or toward the -- across town you can see the
25 natural dip where the Gadsden Creek marsh once



1 was, but that -- all that land has continued to
2 settle and subside. So to someone walking
3 Hagood it may seem the flood water is getting
4 deeper but a big part of that is the ground is
5 literally sinker as all that former landfill is
6 compressing that large, thick level of, you
7 know, pluff mud, essentially under it. And so
8 it's sinking. As it sinks the water is just
9 beginning to return to it's natural extent.

10 Q: Okay. Now, other than settling is it your
11 opinion that the prior fill of the marsh also
12 has contributed to tidal inundation in the
13 project ---

14 A: Oh, sure. Yeah.

15 Q: Why is that?

16 A: Well, as I said before the -- originally,
17 historically, as recently as the mid-1950s the
18 marsh -- that area was -- the Gadsden Creek
19 channel had access to about 100 acres of salt
20 marsh. So if flood waters would move in it
21 would have 100 acres of land, you know, low-
22 lying marsh to spread out. And, again, the
23 creek channel, it sized itself to be
24 proportional to the size of marsh. 'Cause
25 that's another thing that this support of the



1 literature -- that we observe in our creeks and
2 the area is that the size of the creek adjusts
3 itself in size -- in proportion to the size of
4 the marsh. So an area with a lot of marsh has
5 to have a large tidal channel to push enough
6 water to sustain the marsh. So in areas where
7 there's small tidal channels, it only serves a
8 small area of salt marsh. So once those sort
9 of dynamics were interrupted and now instead of
10 100 acres of marsh we're down to let's just say
11 4 acres of marsh, plus the areas that are
12 settling, it's really just the, the, the
13 channel is bringing in tidal water to fill up
14 the appropriate amount of salt marsh that it
15 would need.

16 Q: Does -- and I think you were gesturing towards
17 this a minute ago. Does the size and the
18 current channel that is Gadsden Creek -- does
19 that have any effect on the tidal inundation in
20 the area?

21 A: Yes. Yeah, directly.

22 Q: What is that? How, how does that work?

23 A: Well, based on my review of the records from
24 the early 1970s when the final act, as far as
25 I can tell, where the, the original Gadsden



1 Creek channel had been manipulated and some of
2 the meander bends had been cut off and ditched
3 -- very common, all the urban creeks I've
4 worked in across the southeast, there's always
5 been historic meander bends that have been
6 ditched or straightened as a way to make room
7 for more land or just to -- the idea was to
8 make it more efficient so the water can get out
9 more quickly, cut off this big loop and build
10 on that and then have a straighter river. So
11 in this case, you know, in the early 1970s
12 there was an application of the Army Corps to
13 excavate the, the Gadsden Creek channel further
14 and make it into a trapezoidal engineered
15 section with riprap banks. And the riprap that
16 was specified was broken shards of concrete and
17 brick rubble. So the idea was that the City
18 would excavate a trapezoidal channel along the,
19 at that time, current alignment of the, of the
20 tidal creek, line it with, you know, stone and
21 rock material. And the size of it, the purpose
22 of it was to still permit outflow of all the
23 stormwater from the couple hundred acres
24 uplands to let it flow out to the river. But
25 within a short period of time of building that,



1 from my review of the records it seems like
2 there was an understanding that that was having
3 -- that sword cut both ways so to speak. It
4 would let the fresh water out more quickly, but
5 it would also invite more tidal f- -- water in.
6 The bigger channel let more water in so it
7 inundated areas that were unintended for
8 inundation. So that really confounded, you
9 know, stormwater managers in the City. For a
10 while it was -- enlarging the channel helped
11 get stormwater out faster but also let tidal
12 water get in faster. And so, you know, it's
13 two sides of the coin.

14 Q: Is it your understanding that the City
15 undertook the process by which Gadsden Creek
16 was channelized in the fashion you just
17 described?

18 A: Yes, that's my understanding.

19 Q: Now, are you aware of whether or not the City
20 undertook to change out the culvert through
21 which Gadsden Creek flows under Lockwood?

22 A: Yeah, my review of the documents ---

23 **THE COURT:** Did you say under Lockwood?

24 **MR. CUNNINGHAM:** Under Lockwood Boulevard.

25 **THE COURT:** You faded off a little.



1 **MR. CUNNINGHAM:** Sorry, Your Honor.

2 **THE COURT:** That's all right.

3 A: My review of the documents indicates that the
4 culvert that Gadsden Creek flows beneath, you
5 know, the culvert that contains Gadsden Creek
6 where it flows beneath Lockwood Boulevard and
7 then drains out in the Ashley River, that
8 culvert was enlarged in the late 90s based on
9 permit applications. I don't recall the
10 original size but it's significantly smaller
11 than the current large box culvert that's
12 there. And again, the idea being that the more
13 stormwater -- the stormwater need to be able to
14 leave through Gadsden Creek more quickly. But
15 again, it simply let more tidal water in much
16 more quickly as well.

17 Q: Is it your opinion that the enlargement of that
18 culvert allowed for greater tidal inundation in
19 the area?

20 A: Yes, absolutely.

21 Q: Do you have an understanding of whether or not
22 the City of Charleston undertook the culvert
23 change out that you referred to?

24 A: That's my understanding, yes.

25 Q: In your professional opinion, to a reasonable



1 degree of scientific certainty, are there
2 feasible alternatives to prevent tidal flooding
3 in this project area?

4 A: Yes.

5 Q: And what are those alternatives?

6 A: I can think of several. The simplest, most
7 common one is a measure that the City of
8 Charleston's implementing elsewhere on the
9 peninsula, which is simply to take the areas
10 where the water is spilling onto the roadway,
11 in this case it would be Hagood or Fishburne,
12 and building some sort of simple berm or site
13 wall just a couple of feet tall. This has
14 recently been done along East Bay Street in
15 Charleston and prevented, you know, flood
16 waters during large tides from spilling over
17 and onto the road. So that would be one
18 simple, simple measure. And this is something
19 that's being contemplated in different parts of
20 the City and other coastal cities, building
21 small walls or physical barriers that would
22 contain the water, you know, just for enough
23 time 'til the tide turns and goes back out. So
24 it's just holding the water temporarily,
25 keeping it from spilling over onto the road.



1 Again, the culvert under Lockwood as I
2 mentioned, it's so large to let stormwater out.
3 So it also lets a lot of tidal water in so
4 there are a lot of different ways to restrict
5 somewhat the flow of water in to that culvert
6 during exceptional tides. So during normal
7 tides waters would be able to flow impeded.
8 But there's a variety of different type of flow
9 restriction devices, different types of tide
10 gates that, that are -- have been developed
11 specifically for these sort of ecological cases
12 where ecosystems need to have normal hydrologic
13 exchange during most events, but then during
14 exceptional, large storms the valve needs to
15 limit the additional water that enters the
16 system. So some sort of system like that could
17 be implemented at the Lockwood culvert as it is
18 now or a new system could b- -- could be put in
19 place at the Lockwood culvert. There -- those
20 are -- there's many additional smaller ideas
21 nested within those two general concepts, but
22 those are ---

23 Q: What ---

24 A: --- so, yeah ---

25 Q: What are some of the other smaller ideas that



1 you consider ---

2 A: Well, for example, the, the, the apparatus --
3 there, there are several culverts along the
4 Gadsden Creek channel now, so flooding doesn't
5 occur along the whole length or perceived
6 flooding just occurs along Hagood and
7 Fishburne. So there could be some sort of
8 apparatus placed on those other culverts or
9 even on some sort of new culvert that we put in
10 place specifically to use ecological
11 engineering principles to limit the amount of
12 flood water that gets beyond a certain point,
13 to limit the flooding onto Hagood. And, and
14 obviously Hagood and Fishburne could be
15 elevated to -- they may continue to sink
16 several feet so something's got to be done in
17 the near term to elevate the roads so that they
18 don't flood. But so that would be -- you know,
19 one of the other alternatives is actually to
20 elevate the roads so that they're not causing
21 flooding and uptake the storm, storm pipe
22 system so they don't allow flood waters as
23 well.

24 Q: Are you aware of whether or not tide gates have
25 been proposed along the coast of South Carolina



1 that aren't being utilized?

2 A: Yeah, tide gates are used quite a lot. The
3 more -- the most common type of tide gate is
4 the type that shuts off tidal flow completely.
5 So it's basically like a one-way valve. But
6 more and more of different organizations, land
7 managers, resource managers have been
8 developing and implementing muted tide gates or
9 buoyancy-assisted tide gates. There's a lot of
10 different varieties, but it's again, that idea
11 of it's a, it's a gate that limits the flow of
12 water during exceptional tide. And those have
13 been used, you know, in the east coast and
14 different communities.

15 Q: Do you know whether, whether or not the use of
16 a tide gate in some form or fashion at the
17 culvert where Lockwood is, is that cons- -- is
18 that a concept consistent with your
19 understanding of the Army Corps' storm surge
20 proposal with respect to Charleston?

21 A: Yeah, my understanding of the storm surge
22 proposal is that they proposed at the current
23 outlet of Gadsden Creek at Lockwood a, a storm
24 gate they call it. So to their way of thinking
25 a storm gate would be operable during a large



1 storm surge that it would completely shut flow
2 from coming in at all. But they have already
3 recognized that as a major outlet point of that
4 large drainage area and would have to limit the
5 outfl- -- excuse me, limit the inflow at that,
6 at that place.

7 Q: And you mentioned earlier I believe studies in
8 the stor- -- the stormwater management plans as
9 it is the subject of this project ---

10 A: Yes.

11 Q: --- iteration, is that correct? Do you have an
12 opinion, to a reasonable degree of scientific
13 certainty, about whether the proposed
14 stormwater management plan will affect
15 stormwater flooding in the project area and the
16 surrounding area?

17 A: I do, yeah.

18 Q: What is that opinion?

19 A: I believe that it will worsen stormwater
20 flooding during some particular storm events.

21 Q: What is the basis of your opinion in that
22 regard?

23 A: The bas- -- the basis of my opinion on that is
24 the Applicant's modeling results, which
25 indicate slightly higher water levels at some



1 storm events, some tide -- combinations of
2 rainfall and tide along, along Hagood. And
3 then also our own independent study when where
4 we contemplated and analyzed the storage
5 capacity of Gadsden Creek itself and the
6 tidelands as it -- as they are now, the volume
7 that they offer for additional stormwater
8 runoff compared to the proposed condition
9 outlined in the application of storm sewage
10 piping and small basin. So we just compared
11 and just very basically the, the available
12 stormwater volume storage that the creek offers
13 compared to the, the proposal offers and found
14 that Gadsden Creek offers significantly more
15 storage volume than the proposed storm sewer
16 system. And furthermore, the -- because the
17 land development scheme wouldn't increase
18 slightly the impervious cover. In other words,
19 now that's, you know, a lot of gravel parking
20 and there's a few natural areas in it, there's
21 the tidelands. But in the fully built out
22 scheme, according to the application the runoff
23 would increase slightly, but it's over such a
24 large area that slight increase in runoff
25 really sort of adds up. So the proposed



1 condition would produce more runoff and offer
2 less area -- or less volume storage. And the
3 current condition is less runoff and more
4 volume storage. So just the kind of the basic
5 physics of that indicate that there's a lot of
6 potential for additional stormwater flooding
7 and, and the application and modeling results
8 would agree with that based on my opinion.

9 Q: Would you characterize the proposed stormwater
10 management plan as a closed system?

11 A: It's, it's closed insofar as it's not open to
12 the air. You know, it's, it's a pipe system
13 but it does discharge out into the river, so it
14 is still, to my understanding, you know, moving
15 by the flow of gravity. So I think in an open
16 system it's gravity, a closed system would be
17 in some sort of high pressure. So I don't, I
18 don't know if it's actually open or closed, but
19 it's all buried underground for the ma- --
20 excuse me, the majority of it's buried
21 underground based on my review.

22 Q: And the distinction between it being open as
23 opposed to buried underground, does that affect
24 the capabilities of handling stormwater?

25 A: In my view, yes.



1 Q: How so?

2 A: And again, from designing systems and also
3 inspecting and helping different land resource
4 managers maintain large stormwater
5 infrastructure over time, it's been my
6 experience that open systems are always much
7 more reliable in conveying water. Especially
8 during large storm events. During large storm
9 events, you know, large rainfall events, things
10 can often go wrong. And open conveyances can
11 drain -- can generally drain more quickly and
12 allow the water to move. If there's some sort
13 of clog, for example, or some sort of change
14 that, that open system can allow the water to
15 still move out under the influence of gravity.
16 But a closed system is subject to all sorts of
17 other potential issues. Especially when
18 there's a lot of water flowing through the
19 system. That's jus- -- there's not a lot of,
20 of -- not a lot of room for error.

21 Q: Now, you mentioned the storage capacity at
22 Gadsden Creek as it's currently -- in it's
23 current form. Does it have any storage
24 capacity when it's at high tide?

25 A: At high tide -- at a normal high tide it does



1 offer a, a little bit of additional storage
2 capacity. Yeah.

3 Q: How does that -- or, or what about mid-tide
4 first of all?

5 A: Mid-tide it offers a tremendous amount of
6 storage capacity, yeah.

7 Q: How does the storage capacity of Gadsden Creek
8 gets its tidelands at mid-tide compared to the
9 storage capacity that's proposed in the
10 stormwater plan at least as you're aware of it?

11 A: I mean, just conservatively I would say, say at
12 mid-tide Gadsden Creek and its tideland still
13 offers several times more storage capacity than
14 the proposed piping system. In, in, in the
15 current configuration without any sort of tide
16 regulation at all. You know, I've heard at
17 mid-tide and that half of the creek is
18 available for storage and all the tidelands are
19 available for extra water.

20 Q: Are you aware of whether or not the current
21 stormwater plan, which -- does that include
22 filling Gadsden Creek and its tidelands?

23 A: To, to my review, yes.

24 Q: An- -- and some excavation for stormwater
25 conveyance, is that correct?



1 A: Right, fi- -- filling the creek and the
2 tidelands in, excavating other areas of the
3 site to install large diameter concrete pipes.

4 Q: Is that consistent with your understanding of
5 the Dutch Dialogues recommendations?

6 A: No. My understanding of the Dutch Dialogues --
7 and I don't quote exactly, but I recall, you
8 know, they, they wrote that they can- -- they
9 can't recommend the filling of Gadsden Creek
10 but would recommend that it be revitalized and
11 used as a nature-based solution for water
12 management.

13 Q: Do you have an opinion, to a reasonable degree
14 of scientific certainty, about whether the
15 project area has experience settling due to its
16 past as a marsh and landfill?

17 A: Yes. Yeah, as I said before, based on the
18 review of some records and my own observation
19 I know that portions of it is settled at three
20 feet or more. I know the whole Hagood
21 corridor, Fishburne corridor has settled
22 significantly. Basically the whole perimeter,
23 Lockwood, Hagood, Spring, it's all settled and
24 has been continuously filled and re-paved and
25 it continues to settle over the last, you know,



1 20 or so years observing it closely.

2 Q: And I think you mentioned earlier the fact that
3 -- or at least in your opinion, the fact that
4 settling might have had on tidal inundation
5 potential.

6 A: Sure.

7 Q: What about -- do you have an opinion about
8 whether the settling that you observed, did it
9 affect stormwater on the site going forward?

10 A: I do. I mean I would have to presume that, you
11 know, the settling will continue. I know that
12 there are probably measures in place to
13 mitigate some of that settling in the proposal,
14 but the settling will continue simply because
15 there's additional weight being put on that
16 fill material and on the marsh sediments
17 beneath. So the settling will continue in that
18 whole region. And as it settles anything
19 that's buried beneath that material will also
20 be subject to potential settling. That's been
21 a problem with existing storm sewers and all
22 sort of stormwater systems in the City where as
23 sediments have settled and there's pipes within
24 them, it causes pipes to open up and leak or
25 causes sink holes as things settle



1 differentially. Some areas settle quickly,
2 some areas settle less so. And then you have
3 this structure that's in the middle of that
4 just sort of gets, you know, I- -- starts being
5 put under different types of pressures that are
6 hard to predict during the design process.

7 Q: Let me see if I understand you right, the basis
8 of your opinion. So there is some settling
9 going on right now, is that right?

10 A: Yes.

11 Q: And is it your opinion that you're worried
12 about an increased amount of settling given the
13 project proposal?

14 A: I am. And I don't know all the details of the
15 structural measures that have been put in
16 place. But, you know, just from reviewing the
17 application and discussing it with other folks
18 who have expertise in this area and
19 observations in other areas that have been
20 filled in recent memory, I would assume, you
21 know, presume that an overburden of additional
22 soil and materials, you know, pavements put on
23 top of that former landfill material, underlain
24 by marsh sediments it's going to continue to
25 degrade. You know, marsh sediments are always



1 settling. Fill put in a marsh sediment is
2 always settling. So additional fill on top of
3 that will just create additional weight,
4 additional burden, which will continue to press
5 down. Even if there are other measures put
6 into that soil matrix it's going to continue to
7 press the soil and, and cause settling.

8 Q: Do you have an understanding of whether or not
9 the proposed project it was structures located
10 in the project area are to be elevated or
11 raised on additional soil placement?

12 A: My understanding is the structures -- all the
13 large I- -- the large structures, vertical
14 structures, are going to be placed on, you
15 know, piles of pi-- pile foundations,
16 essentially, where some sort of pile will be
17 driven down pretty deeply to rest on some sort
18 of resisting layer probably the Cooper marl,
19 which is a really tight layer of dense clay
20 significantly deep. So the buildings would be
21 resting on those sort of driven piles, but then
22 any other at great infrastructure, roads,
23 sidewalks, things like that would be on soil.
24 Maybe with some structural support. I don't
25 know specifically. But that would all be



1 resting to some extent on that soil. That
2 would be the overburden soil on top of the
3 current landfill material.

4 Q: Do you have any concerns about water quality
5 issues and the constructability of the proposed
6 project?

7 A: I do.

8 Q: What is that?

9 A: Well, because a lot of our work is, is within
10 wetlands and streams and flowing rivers, you
11 know, one of the areas of expertise we've had
12 to develop is how to, how to build, for
13 example, a stream bank stabilization while the
14 river continues to flow. Or how to, how to
15 improve hydrology in a wetland when the wetland
16 is comprised of very soft marshy sediments.
17 Those are very specific types of construction.
18 I know from experience and having done a lot of
19 construction oversight that soft sediments that
20 are filled with water are very difficult to
21 build in and require special form work and
22 different types of tools and, and expertise,
23 so. In this case because part of the former
24 landfill would have to be excavated for, for
25 laying new stormwater pipes, that opens up the



1 old former landfill, opens up portions of the
2 landfill that are currently buried. They would
3 have to be opened up so the pipes could be laid
4 and that's a very difficult process because
5 the, the landfill material it's hard to predict
6 how it will respond. So that will take a lot
7 of care and caution. It'll also expose the
8 landfill itself. And then as I mentioned
9 before, those pipes that are laid within that
10 material, if there were any differential
11 settling or, you know, those pipes, for
12 example, they come in segments that are either
13 four feet long or maybe eight feet long. I
14 think it's concrete pipes that are proposed,
15 so. And each of those -- every place where a
16 segment of pipe meets another segment of pipe
17 there's a joint and that joint has to be sealed
18 off. So any differential settlement or any
19 changes could potentially open those gap in the
20 pipe where each -- you got to think several
21 hundred feet of pipe, every four to eight feet
22 there's a joint. So there's a lot of potential
23 for ground water, ground water that's currently
24 in the former landfill to leak directly into
25 the pipes. We're working, as I mentioned, on



1 the Smith Branch project before, we're
2 currently working nearby with large diameter
3 concrete pipes installed a few decades ago that
4 are leaking and they have joints every four
5 feet. It's a very common issue as, as concrete
6 pipes age and freeze and thaw and different
7 things like that, so. I'm concerned about
8 those changes over time, yes.

9 Q: Are you aware of whether or not the proposed
10 stormwater management plan for this project
11 proposes the creation of or the enhancement of
12 an outfall. I believe it's being called the
13 Fishburne ditch kinda to the north of the area?

14 A: Yes, my understanding is the current ditch,
15 Fishburne -- so that perpendicular to Fishburne
16 it drains north to a relic salt marsh area
17 behind the baseball stadium. That ditch will
18 be enlarged or somehow enhanced to receive more
19 stormwater flow than it does currently.

20 Q: Do you have an opinion about whether or not the
21 change in that structure, the enlargement and
22 enhancement, will introduce or have any
23 detrimental effect to that area where the
24 stormwater flows out?

25 A: Well, that -- firstly, that ditch that's



1 currently there is already excavated within a
2 former landfill. So if were enlarged, it's
3 also being enlarged within the footprint of the
4 former landfill. It's my understanding that
5 more stormwater volume will be discharged from
6 that point than is currently discharged and so
7 as I mentioned, that ditch drains into a relic
8 portion of a marsh behind the baseball stadium
9 and then flow through a straightened tidal
10 channel out through a berm and then out into
11 the Ashley River. So I know that, you know,
12 that area is already a complicated hydrologic
13 situation behind the baseball stadium so that
14 -- there -- a lot of care would have to be
15 taken to make sure that the water could flow
16 predictably and also know that in that area of
17 -- that is one area where the Army Corps is
18 currently contemplating aligning the storm
19 surge barrier. So in their current, preferred
20 alternative alignment that stormwater discharge
21 point would actually be behind the proposed
22 surge barrier. So that would require some sort
23 of other storm gate for the water to get out
24 through the storm surge barrier. But the
25 storm surge barrier was being planned and



1 parallels as it raises lots of questions.

2 Q: With respect to stormwater treatment in the
3 proposed plan, are you aware of what type of
4 devices are proposed and allowed for stormwater
5 treatment?

6 A: I know that there's a proposed some sort of
7 stormwater basin at the corner of Hagood and
8 Fishburne. I don't know if that's been
9 designed for stormwater treatment but I, I know
10 that that's one of the measures. And I know
11 that -- it's my understanding there's some
12 underground vault systems, oil grit separator
13 systems that would be installed to kind of
14 provide initial water quality treatment before
15 it flows directly out.

16 Q: And those what's referring to -- what may be
17 referred to as mechanical treatment device?

18 A: That's right, yeah.

19 Q: All right. And do you have an opinion about
20 whether or not those devices are efficient at
21 getting out all the pollutants from the
22 stormwater that flows through there?

23 A: When I was in graduate school, one of the
24 projects that funded my graduate research
25 assistantship was testing these underground oil



1 grit separators, mechanical separation devices
2 in the hydraulics lab. And they do remove, you
3 know, fats, oils, grease and stuff that's, you
4 know, that, you know, coming from oil drippings
5 from cars or overflows from grease traps at
6 restaurants and things like that. And they
7 also do a good job at settling out the sediment
8 and grit that's in the stormwater. Usually,
9 not always but almost always, there's not
10 really any sort of biological filtration that
11 would take out things like nutrients or other
12 types of contaminants, organic or inorganic.
13 It's mostly just -- it forces the settling of
14 oils and, and grit. It's mostly what those
15 mechanical separators do. And also, you know,
16 just leaves and trash. They tend to separate
17 that out.

18 Q: Now, you're aware of the proposed stormwater on
19 essentially on Hagood, is that ---

20 A: Yes.

21 Q: --- correct?

22 A: Yeah.

23 Q: And do you have an opinion about whether or not
24 that pond has the potential to have ecological
25 issues?



1 A: I don't know so much about it, but I know that,
2 you know, fresh water -- stormwater pond -- s-
3 -- s- -- stormwater ponds are riddled with
4 issues any- -- anywhere, especially if there's
5 urban drainage flowing directly to them. As I
6 said before, we do a lot of work with
7 stormwater pond managers or stormwater pond
8 owners to try to retrofit or improve stormwater
9 ponds because they can -- stormwater ponds
10 basically become a collection point for all
11 sorts of pollutants, whether it's oil, you
12 know, things from cars, brake fluid, you know,
13 antifreeze, things like that. Also, fecal
14 matter from birds or people walking with pets
15 and not picking up after their pets. Like they
16 become super concentrated receptacles for all
17 that material. So I know that's a big
18 challenge. Oftentimes in urban areas, you
19 know, something like a by or a retention basin
20 or a planter that involves a lot of wetland
21 vegetation is used to help filter that out
22 physically or also to bind up some of those,
23 some of those pollutants. So I, I believe that
24 some wetland vegetation is planned for that
25 stormwater management area, but I haven't,



1 haven't looked at it closely. But I know from
2 having designed a lot of, you know, biological
3 filtration type stormwater management features
4 in urban areas is -- it's a real challenge. It
5 takes a lot of care.

6 Q: You know, I think you mentioned earlier the
7 awareness that the, the basin through which --
8 the stormwater basin through which it drains
9 through Gadsden Creek, is that correct?

10 A: That's right.

11 Q: And I think you said, it might've been a little
12 of 200 acres or ---

13 A: I think so. Somewhere in that ballpark.

14 Q: All right. Are you aware of the Spring-
15 Fishburne tunnel project that is currently
16 underway in the City of Charleston?

17 A: I am.

18 Q: And do you know whether or not that project as
19 it's currently planned separate from this
20 proposal, will take out a portion of that basin
21 that currently drains through Gadsden Creek and
22 drains elsewhere?

23 A: Yes, that's my understanding. It'll -- it will
24 collect and circumvent a significant portion of
25 that stormwater runoff before it reaches



1 Gadsden Creek.

2 Q: Do you recall approximately how many acres of
3 the basin that would be converted?

4 A: I think it's roughly 100. It's, it's something
5 like half, I believe.

6 Q: Do you have an opinion, to a reasonable degree
7 of scientific certainty, about whether Gadsden
8 Creek could serve as an efficient stormwater
9 conveyance for the remaining acres in the
10 drainage basin itself?

11 A: Yeah, ---

12 Q: Without ---

13 A: --- sure.

14 Q: --- any other enhancement?

15 A: Yeah, I mean if it's already handling all of
16 that stormwater runoff currently, then if, if
17 a significant portion of the stormwater runoff
18 were removed then it would, it would handle the
19 remaining stormwater runoff easily or, you
20 know, significantly better than whatever volume
21 is currently being delivered to it without any
22 additional work, sure.

23 Q: Would that require the installation of one of
24 those tide mitigation devices?

25 A: Something like that would certainly help. It



1 would just make it even better, you know, if s-
2 -- if, for example, in that unlikely scenario
3 but it does happen, you know, where, you know,
4 exceptionally high tide and a really heavy
5 rainfall. If, you know, again if a lot of that
6 rainfall is not even making it's way to Gadsden
7 Creek but being diverted over into the
8 underground tunneling that Spring-Fishburne
9 pump system, then that would limit the volume
10 of stormwater runoff coming into the creek.
11 And then if there was some sort of tidal
12 control to just take the very top, you know, to
13 limit those exceptionally high tides from
14 reaching, then it would offer even more storage
15 potential. Or also some sort of berms or site
16 walls that would allow Gadsden Creek to rise
17 naturally, you know, th- -- there -- then there
18 would become an issue with the stormwater
19 outfalls draining into a system that's already
20 full. But, you know, there -- that would be an
21 engineering challenge, but it's certainly
22 possible.

23 Q: Now, we talked a little bit about one of the
24 outfalls that's proposed to this project that
25 the, the s- -- the Fishburne ditch kind of



1 north or perpendicular outfall, is that right?

2 A: Yes.

3 Q: Are there other stormwater conveyances that are
4 proposed as part of this project?

5 A: My understanding is there's the conveyance
6 there that you just mentioned, that the outlet
7 to Gadsden Creek under Lockwood will remain is
8 my understanding. And some of -- there will be
9 some sewer systems existing and then you put a
10 hose that will drain to that outfall point.
11 And it's my understanding there will be another
12 outfall point that will drain south along
13 Hagood, potentially connect to the Spring-
14 Fishburne tunnel system. It will divert some
15 of that water to kind of the eastern edge of
16 the project over itself.

17 Q: And do you have an understanding about what
18 area of the project is proposed to drain
19 through what is now the Gadsden Creek culvert?

20 A: My understanding is it's sort of a lower, kind
21 of a southwest portion of the site. It will
22 roughly drain through that.

23 Q: Mainly the project area where the construction
24 is?

25 A: The project area. Right, right.



1 Q: Now, do you have an opinion about let's say
2 Gadsden Creek -- Gadsden Creek is not filled
3 and the wetlands aren't filled. Do you have an
4 opinion about whether it could handle the
5 stormwater with the project site if, if that's
6 the case? Assuming it's not filled and the
7 rest of the project is built. The other
8 outfalls are not, are not constructed or
9 connected up.

10 A: Yeah, I mean I -- because of the storage
11 potential it offers it could, it could
12 certainly handle the stormwater runoff from the
13 site, even the additional runoff volume that's
14 part of the proposal. And, and then, you know,
15 measures like a tidal regulator, site walls,
16 things like that may, may be required in that
17 case, but maybe not. It's hard to say.

18 Q: Now, Gadsden Creek, I, I believe, is proposed
19 to be filled and in portions excavated, is that
20 right?

21 A: Right.

22 Q: All right. So does the fill and excavation of
23 Gadsden Creek, in your opinion, require the
24 addition of these outfalls in order to manage
25 the stormwater as it's -- as is proposed in the



1 project?

2 A: Yeah, absolutely. I mean the current channel,
3 you know, Gadsden Creek is, is handling runoff
4 from the s- -- what's, you know, from the
5 entire site and from the watershed, you know,
6 200 and some odd drainage acre -- acres of
7 drainage we just mentioned. So it seems to me
8 based on, you know, my review of the documents
9 that these other connections and outfall points
10 are required because Gadsden Creek is being
11 filled. The Gadsden Creek channel where it is
12 now is a natural low point in that valley, if
13 you recall with that. And that's where it's
14 been for a very long time. So it's a natural
15 low point. So once that's filled to make way
16 for new development that water has to go
17 somewhere. Some of it will go out of Gadsden
18 Creek, but it will have to go in other places
19 as well. So, so right. It seems to me that
20 the new storm sewer system and those things
21 are, are endeavoring to replace the functions
22 of Gadsden Creek is al- -- already performing.

23 Q: Do you have an opinion based on your review of
24 the documents and the plan of the stormwater
25 drainage model about whether or not if Gadsden



1 Creek and it's tidelands were filled and
2 excavated, the site without adding the
3 additional outfalls could sufficiently manage
4 stormwater?

5 A: Can you repeat that question one more ---

6 Q: Sure.

7 A: --- time?

8 Q: So I want you to assume that Gadsden Creek is
9 filled and excavated. So that, that, that
10 conduit for larger basins is stopped. They
11 still have the outfall for the project area.
12 Now, assuming that and none of the other
13 outfalls are constructed, the outfall at
14 Fishburne ditch and the outfall in the -- or
15 the connection to the Spring-Fishburne tunnel.
16 Now, assuming that there aren't these two
17 additional outfalls, is there a stormwater
18 problem on the site?

19 A: So we're assuming the Fishburne ditch is not --
20 the outfall is not existing.

21 Q: Correct.

22 A: We're assuming the connection to the pump
23 station is not existing.

24 Q: Correct.

25 A: And the only water that's flowing into Gadsden



1 Creek is the water from the site itself,
2 essentially, and the ---

3 Q: Correct.

4 A: --- there's an initial acreage. It's, it's
5 hard to say specifically, but, but I believe
6 that it, it provides a storage that would be
7 needed for the overall WestEdge site, yes.

8 Q: But not for the rest of the basin.

9 A: That's where it gets tricky.

10 Q: Right.

11 A: Not for the rest of the basin.

12 Q: All right. Do you have -- now you've been to
13 Gadsden Creek many times, right? Is that
14 correct?

15 A: Right.

16 Q: Do you have an opinion about whether or not
17 Gadsden Creek's water, surface water, has been
18 contaminated or polluted by the landfill?

19 A: I've reviewed a number of studies that have
20 been conducted through the years. You know,
21 there's certainly presence of some typical
22 metals and pollutants that would be expected in
23 a sanitary landfill. Especially from that
24 time, time period. I've seen a variety of
25 studies by others about the level of some of



1 these metals in the surface waters at Gadsden
2 Creek and none of them have, have been, you
3 know, raised concerns to my mind about levels
4 of, of contamination of the surface water at
5 Gadsden Creek. So, you know, certainly the
6 former landfill had metals and things that,
7 that landfills have, but based on the studies
8 that I've reviewed that have been done by a
9 variety of different folks through the years I
10 haven't seen any evidence of, of that, you
11 know, dangerous levels of contamination.

12 Q: Do you have an opinion about whether heavy
13 metals that may be detected in Gadsden Creek
14 are they more likely to enter through
15 stormwater or more likely to be the result of
16 landfill?

17 A: Right. That's -- we, we know that there are a
18 lot of heavy metals and pollutants entering
19 through stormwater runoff. That's well
20 documented through a variety of sources for all
21 urban drainages, you know, that's, that's,
22 that's part of what hap- -- what we expect with
23 automobiles and, and all those different things
24 that are part of the urban landscape. So
25 clearly those types of pollutants are being



1 washed into Gadsden Creek from the road
2 surfaces and the paved areas and all that, yes.

3 Q: All right. Now, you've had occasion to observe
4 the ecosystem in Gadsden Creek ---

5 A: Yes.

6 Q: --- is that correct? And the wetlands?

7 A: Right, right.

8 Q: Do you have an opinion about whether or not
9 that is, in your opinion, a functioning
10 ecosystem currently?

11 A: So going back to the sort of functional levels,
12 you know, oftentimes we're called in to assess
13 the hydrology and the sedimentation and the
14 function and how that's supporting or not
15 supporting the ecosystem. Oftentimes, though,
16 we actually have to look at the presence of
17 flora and fauna as evidence of whether the
18 baseline functions have been happening over a
19 long period of time. So here's a simple
20 example, if we're looking at a -- an inland
21 creek that appears to be incising and
22 downcutting or eroding but we see a 50-year-old
23 tree growing out of the bank, we can make a
24 reasonable assumption that the channel has been
25 in this place for the age of this tree. So it



1 helps -- it's sort of a way to, you know,
2 understand the history of the hydrology because
3 we know what conditions this particular tree
4 would grow in. And we know based on the shape
5 of the roots and, you know, what experts tell
6 us about that particular tree, we know
7 something. We can positively know something
8 about the waterway. So we've been studying a
9 number of degraded salt marsh systems. One of
10 them is directly across the Ashley River from
11 this site in, in the Ashleyville community.
12 For example, that site has lost a lot of its
13 cordgrass. A lot of its Spartina has been
14 dying because of a hydrologic problem. There's
15 not enough, there's not enough flow moving into
16 the system and it's killing off the grass. So
17 we know from the death of the sal- -- salt
18 marsh grass that there's a hydrologic problem.
19 And then we did the measurements and sampling
20 of hydrology problem and it matched what we
21 observed through the ecosystems. So using that
22 sort of logic, you know, I've observed the
23 ecosystem, the Gadsden Creek system, I've
24 observed the vegetations there, and I've
25 observed a lot of the species, the creatures



1 that are typical of salt marsh species. Most
2 or all of them are present in, in Gadsden
3 Creek, which to me indicates a l- -- a s- -- a
4 high level of health because if, if there were
5 a low level of health, a low level of function
6 then those creatures wouldn't be able to live
7 there. And it, you know, it's quite simply.
8 So we know something about the long-term health
9 and what's present there based on what we see
10 growing and thriving in that system.

11 Q: Now, in your study of the documents, are you
12 aware that the landfill was capped at some
13 point?

14 A: That's my understanding, yes.

15 Q: Do you have an opinion about whether the
16 landfill cap has eroded to a degree with
17 respect to this project area?

18 A: Well, I mentioned a bit ago about the lining of
19 the Gadsden Creek channel with the riprap
20 material. So that material is still obvious in
21 many parts of the channel. Some of that
22 material is probably eroded away. You know,
23 you can where some of it, for example, is
24 slumped from the bank and now is in the bed of
25 the creek, for example. So I think in that



1 sense the armoring of that channel, some of
2 that has washed away. But the cap itself, I
3 don't see any evidence of the cap itself
4 eroding. In fact, I see the opposite. I mean
5 there's a lot of areas where the salt marshes
6 has expanded or again, because the water has
7 been moving in or bringing in sediments. But
8 now you've got the cap and then on top of the
9 cap pluff mud, you know, marsh -- natural
10 sediments that have formed on top of the cap.
11 And then you have marsh vegetation growing on
12 that pluff mud, you know, you've got salt,
13 Spartina, cordgrass, glasswort. And in some
14 cases within the marsh mud you can see a brick
15 or, or, you know, some evidence of structural
16 material. But I don't see any evidence of
17 like the cap itself eroding other than those
18 two examples that I mentioned of the, the
19 channel armoring and then just seeing a few
20 things here and there.

21 Q: So there are a few things here and there where
22 the cap ---

23 A: Sure.

24 Q: --- did erode, is that right?

25 A: Sure.



1 Q: And with respect to the places where it has
2 eroded, do you have an opinion about whether or
3 not those areas can be restored and still keep
4 Gadsden Creek in the tidelands?

5 A: Yeah, I have no question about that.

6 Q: Okay. What's the basis of that opinion.

7 A: The basis of that opinion is that I've been
8 able to view that in other similar systems.
9 You know, notably just Smith Branch here in
10 Columbia. A very similar case, it was a, you
11 know, a dumping grounds for the hospital campus
12 for many years in that wetlands system. And
13 the banks were lined with concrete and brick
14 shards and all the same material. So there's
15 a few different ways it could be approached.
16 That material could be removed and, you know,
17 new soils could be put on, on the banks and
18 additional vegetation. There's all sorts of
19 natural erosion control methods that could be
20 used to, to protect the soft sediments of the,
21 of the stream banks while the vegetation is
22 growing in. Or in some areas it may need to be
23 armored. It may need some additional stone,
24 you know, where water is flowing in
25 particularly quickly or there's an outfall from



1 a pipe or something like that. But, yeah, it
2 could certainly be improved so that there's,
3 there's -- to limit the erosion that takes
4 place in the creek itself.

5 Q: Do you ever think about whether the restoration
6 you're referring to could be formulated and
7 conducted to avoid any risk of contamination of
8 the creek or the wetlands from the landfill?

9 A: Yeah, I think so.

10 Q: What's the basis of that opinion?

11 A: Well, I know that, you know, ev- -- even in the
12 Application there's a -- they're contemplating
13 how to separate the landfill from the proposed
14 stormwater feature at the corner of Fishburne
15 and Hagood with some sort of barrier, whether
16 it's an underground concrete wall or clay liner
17 or a sheet pile of some kind that would
18 basically be a, a vertical wall underground,
19 you can think of it that way, that would block
20 the flow of any potential contamination from
21 getting into the surface waters. That's my
22 understanding. So something similar could be
23 done there. Some sort of sheet pile system or
24 a buried vertical liner or membrane that would
25 prevent that water from moving into Gadsden



1 Creek.

2 Q: Do you have an opinion to a reasonable degree
3 of scientific certainty about whether or not
4 Gadsden Creek as it's currently functioning is
5 capable of ameliorating any pollutants that
6 enter the Ashley River through stormwater?

7 A: Yes, absolutely.

8 Q: What is that opinion?

9 A: Yeah, the salt marsh is, you know, nature's
10 best way to filter and clean pollutants.
11 That's one of its main functions. It deals
12 with all sorts of toxic materials from the
13 landscape or, you know, any- -- anything that
14 is introduced into the water system. That's
15 one of the main functions of the salt marshes,
16 the vegetation either makes those harmful
17 substances inert or it converts them to
18 chemical processes. So ironically one of the
19 best things to do for that former landfill site
20 would be to make it all salt marsh, you know.
21 Phytoremediation is an, is an actual active
22 part of landfill close out process where --
23 there's many communities that have taken former
24 landfills and planted them with wetland
25 vegetation or meadow vegetation and in some



1 cases large, woody vegetation, different
2 species that are very good at removing
3 pollution. So one of the best ways to
4 remediate, really one of the only ways to
5 remediate would be to put the type of plant
6 material that naturally breaks down those,
7 those toxic pollutants. There's no other way
8 to -- really no other way to do that. So ---

9 Q: Have you -- I'm sorry go ahead.

10 A: So the vegetation is there. The, you know,
11 four, four some odd acres. It's certainly
12 having a beneficial effect, whether it's
13 physically filtering out the pollution but also
14 before the water makes it to the Ashley River,
15 those pollutants are residing in contact with
16 the root zone and the leaf zone of those plants
17 and breaking down the harmful substances to
18 make the water cleaner before it leaves and
19 goes into the Ashley River.

20 Q: Have you employed this phytoremediation
21 techniques in your other work in other areas?

22 A: Right, that's the basis of green stormwater
23 infrastructure and nature-based solutions. I
24 mentioned that with the Smith Branch project
25 here. And, and, you know, many other projects.



1 That's the basis of in- -- installing
2 biologically engineered systems in urban creeks
3 and wetlands to allow stormwater runoff to be
4 filtered through vegetation.

5 **MR. TRAYNHAM:** Your Honor, I think we're deviating
6 somewhat from the areas he been qualified as an
7 expert. Phytoremediation sounds biological to
8 me.

9 **THE COURT:** I was going to ask what it was.

10 **MR. CUNNINGHAM:** I was about to, to clarify that.
11 I've, I've -- I think he's still within the
12 realm of his expertise in that he is using
13 these techniques to -- and, and is designing
14 projects ---

15 **THE COURT:** I'm going to let him clarify this and if
16 he doesn't sufficiently clarify it, I'm going
17 to withhold my ruling on your objection. And
18 I will strike this testimony as it, as it
19 doesn't relate to his expertise.

20 **MR. TRAYNHAM:** Thank you, Your Honor.

21 **THE COURT:** So let's just move a little farther down
22 the path.

23 **MR. CUNNINGHAM:** Thank you, Your Honor.

24 Q: And correct me if I'm wrong, did you just
25 testify that you employed phytoremediation



1 techniques in your design elements in other
2 projects?

3 A: Yes, phytoremediation is, is it- -- itself a
4 large field with phytoremediation of all sorts
5 of different pollutants. However, there are a
6 number of different design guidelines that
7 engineers often use that contemplate the amount
8 of contact time that certain vegetation related
9 to bioretention or biological filtration. So
10 oftentimes we use those design guidelines for
11 very specific areas of urban runoff and
12 contamination. But in this case, you know,
13 we're talking sort of broadly about does the
14 salt marsh provide a water quality benefit.
15 And it's -- I'm just simply communicating what
16 the well-documented in the literature and
17 studies by lots of researchers that I've read
18 about salt marsh generally removing all sorts
19 of pollutants from water. That's well
20 documented that it does that.

21 Q: Uh-huh.

22 A: So I'm not standing on my own authority to say
23 that salt marsh remediates pollutants. That's
24 one of its main functions.

25 Q: The literature that you referred to, is that



1 peer-reviewed?

2 A: Peer-reviewed literature. It's, it's -- yeah.
3 It's generally understood.

4 Q: And the engineering standards you were
5 referring to with respect to time for
6 remediation and, and how that, how that whole
7 process works in the engineering context, are
8 those regulations or standards you rely on in
9 your career as an environmental engineer?

10 A: Yes.

11 Q: Are you familiar with those?

12 A: Yes. Things like residence time, density of
13 plantings, the amount of plant material per
14 amount of gallons of runoff, those are all, you
15 know, equations and design guidelines that we
16 rely upon that are published by the agencies
17 and, you know, other professional societies.

18 Q: Do you have an opinion about whether or not the
19 proposed project will affect the ecosystem that
20 is currently in place in Gadsden Creek?

21 A: Well, my understanding is the ecosystem that's
22 currently in place is proposed to be totally
23 destroyed. So I think that would be s- -- be
24 an impact.

25 Q: One more question for you, may- -- maybe a



1 couple. Now, are you familiar with the
2 stormwater modeling that was done by the
3 applicant and that you reviewed in this
4 project?

5 A: Generally, yes.

6 Q: Okay. And the, the modeling is ICPR, is that
7 right?

8 A: I believe so, yes.

9 Q: All right. Have you had any experience
10 conducting modeling with that model program?

11 A: I don't have the modeling program but I've
12 reviewed a lot of model input and output of
13 ICPR through the years, yeah.

14 Q: Have you done any modeling with respect to
15 stormwater yourself?

16 A: Yes, yes. A variety of different types of
17 models.

18 Q: All right. And do you have an opinion about
19 whether or not it's necessary to calibrate
20 stormwater, stormwater model when there's
21 flooding in the area?

22 A: Generally on a land development site the
23 stormwater modeling is performed to compare the
24 existing conditions to proposed conditions to
25 make sure that the proposed conditions will not



1 worsen or, you know, they won't, for example,
2 create greater stormwater discharge flow rates
3 and things like that. In an area of known
4 flooding or where there's a very complicated
5 current flooding problem, it's my opinion, it's
6 also part of the American Society of Civil
7 Engineers guidelines, that hydrology and
8 hydraulic models should be calibrated and
9 verified before they're reliable to
10 comprehensively understand existing flooding
11 problems. And then how any proposed
12 alterations to that system may change those
13 flooding scenarios. So to put it more simply,
14 in a case without a known flooding problem
15 oftentimes models are used without calibration
16 just to compare existing conditions to proposed
17 conditions. But in a circumstance where
18 there's a known flooding problem, models should
19 be calibrated and verified so that we know the
20 model is accurately representing reproducing
21 what we observe in the field.

22 Q: And you mentioned verified, do you mean field
23 verified?

24 A: Field verified. I mean, you know, there's a
25 few different ways to do it. It can be



1 measuring the levels of water that occurred
2 during a certain storm event and then running
3 a model to, to those same conditions and seeing
4 if the model predicts the same water levels.
5 It could also be measuring a flow rate. We do
6 these, these types of operations pretty often
7 to calibrate or field verify models to be sure
8 the models are accurate. And oftentimes after
9 doing field measurements we have to make
10 significant changes to the model input to get
11 the model to, to, you know, accurately
12 represent what we're observing in the field.

13 Q: Thank you for your patience and your time.

14 **MR. CUNNINGHAM:** No more questions, Your Honor.

15 **THE COURT:** All right. How long are you going to
16 be? I'm trying to decide whether to take a
17 short break or a long break.

18 **MR. TRAYNHAM:** It will probably be a long cross-
19 examination, Your Honor. Maybe an hour.

20 **THE COURT:** All right. Y'all want to take a lunch
21 break now or a five minute break and then ...

22 **MR. CUNNINGHAM:** If the witness is ready to go on,
23 Your Honor, I don't mind taking a -- going on.

24 **MR. ROBINSON:** Okay. If I could have a five minute
25 restroom break I, I would come back, but.



1 **THE COURT:** You're going to get that one way or the
2 other.

3 **MR. ROBINSON:** Okay.

4 **MR. TRAYNHAM:** That's fine, Your Honor.

5 **THE COURT:** Which one?

6 **MR. TRAYNHAM:** I think we're all good with a five
7 minute break.

8 **THE COURT:** Okay. All right.

9 **(Off the record from 11:46 a.m. until 11:54 a.m.)**

10 **THE COURT:** All right. All be seated.

11 **MR. TRAYNHAM:** Thank you, Your Honor.

12 **MR. ROBINSON - CROSS-EXAMINATION BY MR. TRAYNHAM:**

13 Q: Mr. Robinson, I think I can still say good
14 morning for another few minutes.

15 A: Good morning.

16 Q: Mr. Robinson, would you agree with me that from
17 an engineering perspective the site that we are
18 discussing is complicated?

19 A: Yes.

20 Q: The area around the site, around the project
21 site rather, suffers from both stormwater and
22 tidal flooding as you testified, correct?

23 A: That's right.

24 Q: You used the term compound flooding to describe
25 the interaction of those two things?



1 A: True.

2 Q: The site is on formerly operating landfill,
3 correct?

4 A: Yes.

5 Q: You -- I wasn't sure that I completely
6 understood your testimony regarding the
7 landfill cap. I believe in your deposition you
8 told me that portions of the cap you can see in
9 the creek channel itself. You can see some
10 evidence of trash peeking through, correct?

11 A: True.

12 Q: That would be evidence of the degraded cap,
13 wouldn't it?

14 A: Right.

15 Q: Right. We also talked about the leachate
16 coming from the landfill. And you agree with
17 me in your deposition that the leachate from
18 the landfill mixes with stormwater in the
19 creek, correct?

20 A: That's right. Yeah, where there's a former
21 landfill there's going to be leachate that part
22 of that and it is based on the physics. The
23 way it works, there would be some of that that
24 would flow toward the creek.

25 Q: Right. And there's no real dispute that the --



1 th- -- th- -- this feature is a conduit for the
2 tidal flooding that is occurring in this area,
3 correct?

4 A: The creek does receive water from the Ashley
5 River and it allows that water to move into the
6 salt marsh area and area that were f- -- that
7 was formerly salt marsh. Correct.

8 Q: It's not the Ashley River itself that's
9 overrunning it's banks and causing flooding at
10 the intersection of Fishburne and Hagood, is
11 it? That water is coming through what's been
12 referred to as Gadsden Creek?

13 A: During tidal flooding, correct. Right. If
14 there is storm surge it would come from the
15 Ashley River directly, right. But during a
16 storm surge or, excuse me, during tidal
17 flooding it's flowing through Lockwood culvert
18 into Gadsden Creek and into the salt marsh area
19 that was once salt marsh.

20 Q: Fair enough. With regard to storm surge, you
21 agree that's associated with tropical storms
22 and hurricanes, ---

23 A: True.

24 Q: --- right? Far more difficult to engineer
25 around than your typical storm event?



1 A: Correct.

2 Q: All right. So what we're talking about when we
3 talk about compound flooding here is really
4 just the tidal flooding and the stormwater ---

5 A: That's right.

6 Q: --- correct? Do you agree that to the extent
7 that the landfill leachate is mixing with water
8 in the creek, when that creek floods it- -- its
9 banks, there's at least some potential for
10 public exposure to that leachate, correct?

11 A: I'll agree there is a potential that if
12 leachate reaches the creek and if the creek
13 overflows its banks into the road, that there
14 is a potential, yes, for there to be some
15 leachate in that water.

16 Q: And that may or may not cover the complexities
17 of the site, but as we said it's a complicated
18 site.

19 A: Right.

20 Q: I believe in our previous conversation you told
21 me that off-the-shelf solutions wouldn't work.
22 Is that still an accurate statement?

23 A: Yes.

24 Q: Would you agree that this is a site that calls
25 for some kind of c- -- solution?



1 A: Calls for what sort of solution?

2 Q: Some kind of solution. Let me ask it a
3 different way. Yesterday, I don't think you
4 were here, and I don't want to puts words in
5 any of the witness's mouth, but we heard
6 testimony from several fact witnesses that
7 leaving this creek in its current state is not
8 a solution to the problems that are there.
9 Would you agree with that statement?

10 A: Not entirely. There's a flooding problem on
11 Hagood and Fishburne and the Gadsden Green
12 community. That, that flooding problem clearly
13 needs to be addressed in those areas that were
14 formerly salt marsh, yes. And there's ways
15 that can be addressed. And there's -- in those
16 areas where the former armoring along the
17 channel banks has eroded away, those areas
18 should be fixed. But otherwise, I can't, I
19 can't say that something must be done except
20 for those, those two scenarios.

21 Q: But doing absolutely nothing with regard to the
22 creek leaves the area in its status quo regard
23 to flooding ---

24 A: Right.

25 Q: --- with regard to potential exposure from ---



1 A: Right. Something needs to be done.

2 Q: Right. Fair enough. Can you think of another
3 site in South Carolina that includes stormwater
4 flooding, tidal flooding, and an open landfill
5 all on the same site?

6 A: I can think of a lot of cases on the Charleston
7 peninsula that have landfills that are older
8 than this particular one, but this is unique in
9 that the landfill was conducted in recent
10 memory. So all the other tidal creek areas
11 that flood into the pre- -- areas of previous
12 salt marsh, those would all been landfill areas
13 as well just from a slightly older --
14 potentially slightly older time period.

15 Q: Have you ever worked on a site that involved
16 all three of these factors, stormwater, tidal,
17 and an open landfill?

18 A: I can't think of any.

19 Q: When we talked previously I think your, your
20 statement was that with regard to this project
21 you disagreed with the overall approach. Is
22 that still a fair statement?

23 A: Yes.

24 Q: But you -- in reviewing the application
25 materials you did find it to be prepared with



1 normal, professional engineering skills,
2 correct?

3 A: The stormwater report that I reviewed seems to
4 be prepared with ordinary sk- -- skill and
5 diligence, yes. The overall conception of
6 where the water was flowing seems to be beyond
7 the scope of that document, but yes, I believe
8 that the engineering calculations and modeling
9 were performed with ordinary skill and
10 abilities, yes.

11 Q: You also said that you reviewed the application
12 for the permit itself, correct?

13 A: That's right.

14 Q: Was that prepared with ordinary skill and
15 diligence to the best of your recollection?

16 A: To the best of my -- yes.

17 Q: You took no exception to the stormwater
18 drainage calculations that were re- -- prepared
19 by Thomas and Hutton ---

20 A: Correct.

21 Q: --- this project, correct? You have not
22 performed your own stormwater calculations with
23 respect to this project, correct?

24 A: I ---

25 Q: Outside of the storage volume calculations ---



1 A: Correct. We've not done any third party
2 stormwater modeling, correct.

3 Q: All right. And you agree that this proposed
4 project would alleviate tidal flooding in the
5 area, correct?

6 A: Yes, by filling Gadsden Creek it would
7 alleviate tidal flooding.

8 Q: I think you also agreed that it would improve
9 stormwater flooding under certain conditions,
10 is that accurate?

11 A: Under the conditions that are predicted in the
12 model result, based on that, yes. It seems
13 like it would improve stormwater flooding in
14 those s- -- s- -- specific scenarios. Those
15 specific combinations of rain and tide.

16 Q: Okay. The testimony just a few minutes ago
17 you, you stated that would -- project -- the
18 proposed condition I think you termed it,
19 would, in your opinion, worsen stormwater
20 flooding under certain conditions. Can you s-
21 -- tell us specifically what those conditions
22 are?

23 A: They're listed in the table in the stormwater
24 narrative. I don't have it in front of me, but
25 there's several conditions of medium or high



1 tides and stormwater of a certain magnitude,
2 stormwater ra- -- rainfall depth of a certain
3 magnitude that would increase water levels
4 along Hagood.

5 Q: But you don't recall what those conditions were
6 offhand?

7 A: I don't recall them specifically, no, no, no.

8 Q: And could you quantify whether it would
9 increase frequency, depth, to what degree what
10 it would worsen under those ---

11 A: Well ---

12 Q: --- conditions?

13 A: --- the stormwater model only contemplates as
14 is, as is common, a specific, statistical storm
15 event, a 10-year, 25-year, 50-year, 100-year
16 storm event, and matches or pairs the different
17 tidal conditions with the specific rainfall
18 depth. So if -- so we can make some -- we can
19 infer that if, if water levels are increased at
20 those specific events, then there would
21 probably be some other types of events that the
22 modeling didn't cover that it may also elevate
23 water levels in those areas as well. But,
24 there's no way to know based on that analysis
25 whether it would increase the magnitude, excuse



1 me, increase the frequency of flooding.

2 Q: You're familiar with stormwater permitting
3 requirements in ---

4 A: Yes.

5 Q: South Carolina generally, correct? And
6 typically is it your experience that when you
7 perform stormwater modeling you use the
8 regulatorily required storm events in that
9 model?

10 A: That's right.

11 Q: Does it typically be the most common types of
12 storm events?

13 A: No, not necessarily. They're the types of
14 storm events that are required by most
15 municipalities, again, are those synthetic
16 rainfall distributions and statistical
17 stormwater events. It's just sort of a, a
18 hypothetical scenario that most systems are
19 analyzed against. So, you know, it could be a
20 two-year storm -- a two-year rainfall depth
21 over a 24-hour duration or a 10-year storm
22 event over a 24-hour duration. Those are some
23 common types of storms events for stormwater
24 modeling.

25 Q: And in your experience in your own stormwater



1 projects, is modeling a fairly accurate way to
2 determine how a stormwater system is going to
3 -- a stormwater management system is going to
4 perform?

5 A: Well, again, the main purpose -- for land
6 development anyways, the main purpose of
7 stormwater modeling is simply to compare the
8 existing condition to the proposed condition.
9 So most of the time in permit-related
10 stormwater modeling the actual magnitude of the
11 output isn't really what's important. It's the
12 comparison of pre and post. So all things
13 being equal, the applicant has to show here's
14 the existing conditions or pre-development
15 conditions, here's the post-development
16 conditions and the, the proposed conditions
17 aren't going to make things any worse under the
18 required storm events. In some cases a
19 municipality may require that the applicant
20 can't worsen flooding for anything for the 25-
21 year occurrence interval storm and smaller.
22 But during the 50, 100-year, all bets are off.
23 Things like that, so. That's typically when --
24 the way modeling is done is just to compare the
25 pre and post.



1 Q: You're familiar with the City of Charleston's
2 stormwater requirements ---

3 A: Yes.

4 Q: --- correct? And those stormwater requirements
5 are typically applied at a point when an
6 applicant comes in for a land disturbance
7 permit, correct?

8 A: Well, each, each application is, is different
9 depending on the size and specific constraints
10 of, of the area. You know, wha- -- what I- --
11 whether it's a special protection area or not.
12 So it's not a, it's not a linear process.
13 There's a flow chart that, you know, determines
14 how these different reviews happen.

15 Q: Let me ask it a different way. Is it your
16 experience that regulators will not give a land
17 disturbance or construction permit for
18 stormwater purposes unless their specific local
19 requirements have been fulfilled?

20 A: Usually that's the case, ---

21 Q: Okay.

22 A: --- yes.

23 Q: Usually that's the case.

24 A: Usually.

25 Q: Has that generally been your experience with



1 the City of Charleston?

2 A: Usually that's the case. There's always
3 special exceptions and exemptions for one re-
4 -- reason or the other. But usually the
5 stormwater rules are -- the applicant is
6 endeavoring to fulfill the stormwater rules.

7 Q: To you knowledge, has this project received a
8 land disturbance permit from the City of
9 Charleston?

10 A: The overall project, no. My, my, my
11 understanding is we're in the initial phases,
12 phase zero or phase one or something for the
13 grocery store. There's been some small scale
14 land disturbance and a stormwater permit for
15 that scale. And maybe some review of the
16 overall master plan, but certainly not like a
17 blanket approval. That's my understanding.

18 Q: Would you agree that the proposed condition --
19 the proposed project will have to make
20 additional showings for submissions to the City
21 of Charleston, even if they are successful here
22 before receiving a land disturbance permit from
23 the City?

24 A: Yes, that's my understanding.

25 Q: Based on your experience with the City of



1 Charleston would you agree that their
2 stormwater management program requires a
3 showing that there is no exacerbation of
4 existing flood conditions?

5 A: Usually that's the case. But there are special
6 exceptions for that -- for those situations.

7 Q: Do you know if any special exceptions apply to
8 this situation?

9 A: Well, I know that part of the site would
10 probably be grandfathered in to the previous
11 rules, and then part of the site would be --
12 maybe would have to follow the new stormwater
13 rules. But based on my understanding of the
14 current stormwater rules in the City of
15 Charleston, there's really no way that the
16 current site plan could abide by the new
17 stormwater rules. So I see there being a
18 disconnect between the phasing of the project
19 and which phase would apply to which, you know,
20 -- or would, would be reviewed in light of
21 which version of the stormwater manual and
22 those sorts of things, so.

23 Q: You raise a good point. Part of this project
24 does fall under the new stormwater rules.
25 Would you agree with me that the new stormwater



1 rules actually require a showing that there is
2 an improvement in existing flood conditions?

3 A: In some scenarios, yes. In some scenarios it
4 does. I don't know if those scenarios apply
5 here. But, in some scenarios it does.

6 Q: In the old rule that you referenced is one --
7 is what requires a showing of no exacerbation,
8 is that accurate?

9 A: It's much more nuance than that. There's ---

10 Q: Fair enough. We'll have City witnesses later
11 who can testify to that, but. I think we've
12 covered that. With regard to the calculations
13 that you did do regarding stormwater volume
14 storage, can you quantify whether the proposed
15 condition or the current condition would have
16 more storage at normal high tide?

17 A: Can you say that a different way?

18 Q: At normal high tide, can you quantify whether
19 the creek that's there today or the proposed
20 stormwater management system would have greater
21 stormwater volume storage?

22 A: I can't quantify that now. But, there are a
23 lot of dependencies there. But if, if the
24 creek were full to the high tide level it would
25 offer some additional storage. I don't know if



1 that additional storage is equal to or less
2 than the proposed storm, stormwater piping
3 system.

4 Q: Can you quantify the difference in the flow
5 rate between the current condition and the
6 proposed project?

7 A: The flow rate -- volumetric flow rate is very
8 difficult to assess in those conditions. We
9 have measured volumetric flow rate in the
10 creek. I don't know if it would increase or
11 decrease the volumetric flow rate.

12 Q: And for the benefit of the Court, forgive me if
13 my lay interpretation is off. Is volumetric
14 flow rate essentially the speed at which water
15 or stormwater flows where it is intended for
16 off of the site?

17 A: Speed would be the velocity that the volumetric
18 flow where it would be the volume with respect
19 to time. So the ---

20 Q: Is there a relationship between those two
21 things?

22 A: Yes. The discharge would equal the velocity
23 times the flow area.

24 Q: And your understanding is that the proposed
25 condition, the proposed project, would have



1 three outfalls, correct? As opposed to the one
2 that is there ---

3 A: That's ---

4 Q: --- now?

5 A: --- my understanding.

6 Q: Currently, there's only the one outfall at
7 Lockwood, correct?

8 A: That's my understanding, yes.

9 Q: One of the concerns you raised during your
10 deposition was that there is a potential for
11 unintended or unforeseen consequences from ---

12 A: Yes.

13 Q: --- the stormwater system, correct? Would you
14 agree that by the very nature of that concern
15 you can't really quantify what those concerns
16 might be or, or how to deal with them?

17 A: That's true. There are some, some scenarios --
18 -

19 **THE COURT:** Say, say that again. I'm sorry. Ask
20 that question one more time.

21 **MR. TRAYNHAM:** My, my, my question, Your Honor, was
22 by the very nature of his concern regarding
23 unintended or unforeseen consequences, we can't
24 really deal with them or quantify them. I'll
25 strike the question, Your Honor. I don't think



1 it's necessary.

2 **THE COURT:** Especially since it was a statement
3 rather ... At least ---

4 **MR. TRAYNHAM:** --- There ---

5 **THE COURT:** --- the last ---

6 **MR. TRAYNHAM:** --- was a question on the end. But --
7 -

8 **THE COURT:** Okay.

9 **MR. TRAYNHAM:** --- I'll, I'll withdraw it, Your
10 Honor.

11 Q: Would you agree that a sufficiently detailed
12 and accurate stormwater model is intended to
13 minimize or serves to minimize unknowns for a
14 given stormwater system?

15 A: Just sort of generally in practice? I think it
16 goes back to what you s- -- you asked earlier
17 about whether the regulator is going to require
18 it or not. Whether any sort of sensitivity
19 analysis is required, for example. So I think
20 the general intent of stormwater modeling is
21 usually to make sure the project complies with
22 the permit. Because it's required it's gonna
23 be reviewed. But in terms of the sensitivity
24 of the model and different scenarios that -- at
25 -- a lot of times it's, it's not required by a



1 regulating agency.

2 Q: You've worked with Thomas and Hutton on
3 projects previously, correct?

4 A: We've proposed on projects together and we're
5 currently in the early stages of the project
6 where we'll work together in Charleston.

7 Q: And you're, you're familiar with Mr. Karkowski
8 who ---

9 A: I am.

10 Q: --- is involved in the stormwater design ---

11 A: Yes.

12 Q: --- in this project? And I believe you
13 testified in your deposition that Thomas and
14 Hutton are at least typical of the level of
15 skill and diligence that professionals usually
16 practice in the Charleston area, is that ---

17 A: Yes.

18 Q: --- accurate? All right. And again, you took
19 no exception to their stormwater modeling,
20 correct?

21 A: Correct.

22 Q: You discussed alternatives to the proposed
23 project that you consider to be feasible
24 alternatives ---

25 A: That's right.



1 Q: --- correct? You would agree with me that
2 feasibility in the context of the DHEC or Corps
3 permitting decision involves more than is
4 something that is technically feasible,
5 correct?

6 A: Could you clarify that question?

7 Q: Well, you can engineer -- I -- I've heard it
8 said that you can engineer anything. But
9 simply because something is technically
10 possible, does not make it a feasible
11 alternative in the context of the DHEC or Corps
12 decision, is that accurate?

13 A: For example, if the materials aren't
14 sufficiently available or something like that.

15 Q: You can't get a permit for it, for example.

16 A: I wouldn't go so far as to say that. I- -- I'm
17 not -- could you clarify the question further?

18 Q: Well, give me second.

19 **MR. TRAYNHAM:** Sorry, Your Honor.

20 Q: Are you familiar with the process of
21 identifying and exploring feasible alternatives
22 for a Corps permit?

23 A: Yes.

24 Q: All right. Do you understand that there are
25 definitions for feasibility within Corps



1 regulations and that DHEC applies those as
2 well?

3 A: Yes.

4 Q: Is economic feasibility a factor in determining
5 whether something is feasible or not?

6 A: Sometimes, yes.

7 Q: Is legal feasibility sometimes a factor in a
8 feasible alternative?

9 A: I would say if involves like land ownership or
10 acquisition of an easement. I would say that
11 is oftentimes an issue of feasibility.

12 Q: If something does not comport with an
13 applicable regulation, it would not be
14 feasible, correct?

15 A: Generally, yes. Although, most of the time
16 with feasibility studies and investigating
17 various alternatives, the presumption is that
18 only alternatives that would be -- that fit
19 within the, the regulatory framework would be
20 considered.

21 Q: Fair enough. So if it's not within the
22 regulatory framework, it's not a feasible
23 alternative.

24 A: In some cases, it, it really depends. I mean,
25 that's, that's one of the, the reasons why pre-



1 application meetings happen with projects and,
2 and during the feasibility process is to --
3 because there's, there's nuance and
4 interpretation with any sort of state or
5 federal rules. And so oftentimes the applicant
6 will come at, come at it a ver- -- a variety of
7 ways and, and discuss with the regulatory
8 officials to make sure their interpretation is
9 the same and to see how far -- how much
10 latitude there might be.

11 Q: One of the alternatives that you discussed is
12 the potential for rehabilitating or
13 renaturalizing the creek, correct?

14 A: Yes.

15 Q: And you said briefly I think in your, your voir
16 dire you said that that was the idea of
17 reclaiming the natural function of a stream.
18 I don't want to put words in your mouth. That-
19 -- that's my recollection. Is that
20 approximately correct?

21 A: Yes. Yeah, that's kind of the overall idea of
22 -- renaturalizing is assessing the functions
23 and seeing where those functions can be
24 reclaimed or restored -- restore functions back
25 to the system, yes.



1 Q: In the context of this particular water
2 feature, what is that going to look like on the
3 ground to you?

4 A: Well, it could take many different, many
5 different shapes and sizes. Getting back to
6 the driving variables, one, one of the
7 important aspects is what is the flow of the
8 creek itself. What's the flow regime. So as
9 I've stated before, the culverts and the
10 enlargement of the channel are out of
11 proportion with the salt marsh that's currently
12 there. In other words, there's about four
13 acres of tidelands and the channel is much too
14 large compared to those four acres of
15 tidelands. So the channel has been
16 progressively enlarged to allow the stormwater
17 to flow out. When as discussed earlier, a lot
18 of that stormwater is being diverted elsewhere
19 so that channel won't need to be as large
20 anymore. Meaning that also less tidal water
21 would need to come in. So in other words, a
22 salt marsh of four acres in a natural system
23 would have a significantly smaller tidal
24 channel itself. So ---

25 Q: So one -- not to interrupt, but just so I



1 understand, one potential for renaturalizing
2 this creek is to actually decrease the size of
3 the, the creek?

4 A: In some areas, sure. The trapezoidal section
5 that's perpendicular to the Lockwood flowing
6 into the culvert, it's an engineered section.
7 There's an Army Corps of Engineers permit for
8 where that was excavated to a deeper and wider
9 trapezoid and armored on the banks. That the
10 least natural of the whole area and that's the
11 area that kind of serves as that funnel point
12 to let the water in and out. So it's something
13 that doesn't have to be done there, but
14 something could be done there to improve the
15 natural hydrology. I personally measured
16 velocity in that area and found those
17 velocities to be very, very high water coming
18 in. Much higher than the natural tidal creek.
19 And it's because of that funneling effect of
20 the whole system being modified to let
21 stormwater out. So renaturalizing it -- a big
22 part of it would be to make that section
23 instead of a trapezoid, you know, no natural
24 creek is a trapezoid, it would, it would change
25 the proportions of it somewhat. They don't



1 have to be, but that would be one of the ways
2 it could be renaturalized.

3 Q: You would agree that that renatural- -- what
4 you were describing there would be wetlands
5 filled, a critical area filled, correct?

6 A: Sure, yeah.

7 Q: So it would require the same type of permitting
8 we're here for today.

9 A: It would require 401/404 permitting, but it
10 would, it would fall under a different section,
11 because I believe that based on what I've just
12 described that would be filled specifically to
13 enhance or restore natural function. And
14 there's specific types of permits geared toward
15 doing that restoration work, so. In those
16 cases, the fill placed in the wetland is -- to
17 put back material that was excavated by others
18 at a former time. So that's considered
19 restoration work. So it's a, it's a, it's a
20 diff -- it's the same, the same result in terms
21 of permit, but it's a much different regulatory
22 path.

23 Q: It would also require a critical area permit,
24 correct?

25 A: Yes, because it would be -- it would require



1 work in the critical area.

2 Q: Would you agree that any alteration to the
3 creek banks would require a critical area
4 permit?

5 A: Except for basic maintenance. I believe it
6 would probably -- an existing operating permit
7 for maintenance. For example, putting new
8 riprap on the banks, I think that may fall
9 under the existing operating permit. I don't
10 know. But, otherwise any changes from what was
11 already permitted or what's already in place
12 would certainly require some sort of additional
13 permitting, yes.

14 Q: Are there other concepts that fall within your
15 idea of rehabilitating or renaturalizing the
16 creek?

17 A: Well, we've -- I've just talked about restoring
18 the tidal hydrology or making it a more natural
19 hydrologic regime so that it's suitable for the
20 salt marsh that's available to it. You know,
21 the salt marsh itself is, is pretty healthy.
22 You know, the, the Spartina grass and the areas
23 where, where the marsh has appropriate
24 hydrology, it's, it's recovered very well and
25 it has a lot of the natural functions you would



1 expect from a salt marsh. Some of those could
2 be enhanced, but it would require, you know, a
3 detailed study to see if some of those areas
4 need to be enhanced. For example, if a new
5 sinuosity might need to be introduced within
6 that four acres of ---

7 Q: What's sinuosity?

8 A: Would be areas where the channel was
9 historically straightened. If maybe it could
10 -- new curves could be introduced so there's
11 deeper pools of water and then shallower
12 sections, which would be the natural way a
13 tidal creek would eventually create itself. So
14 there's pools of water so that during low tide,
15 you know, it provides habitat. There could be
16 some small manipulations like that to improve
17 the ecosystem function.

18 Q: And improving that sinuosity, if I'm using the
19 term correctly, would necessarily require some
20 degree of excavation, correct?

21 A: Most likely, yeah.

22 Q: Excavation within the landfill?

23 A: Somewhat, yes.

24 Q: So you have to dispose of that landfill waste
25 in some capacity as part of that project.



1 A: If -- yeah, if it's in an area where there's
2 landfill up against the banks, yeah, I would
3 say, you know, some simple test pits or borings
4 to indicate that, but.

5 Q: And necessarily as part of that excavation, the
6 landfill would be further exposed at least
7 during the period of construction, correct?

8 A: Yeah, I mean I, I would say if any work that
9 happens west of Hagood or s- -- anywhere in
10 that whole 100-acre zone is gonna involve
11 disturbance of some landfill. So any
12 installation of a stormwater pipe or
13 replacement of a stormwater pipe or any work in
14 that area is going to involve exposing
15 landfill. So just by that logic, yes if the
16 stream banks were graded or manipulated in any
17 way, it has the potential to expose landfill
18 debris. So certain precautions would have to
19 be taken in case that material is exposed,
20 sure.

21 Q: You've not prepared any engineer- --
22 engineering designs for this type of
23 restoration, have you? For this ---

24 A: I ---

25 Q: --- specific site?



1 A: --- have not, not for, not for Gadsden Creek.
2 No, not engineering designs.

3 Q: It's difficult to say sitting here today
4 precisely what would be involved in a
5 restoration or a renaturalization of Gadsden
6 Creek, correct?

7 A: Correct. And also, you know, there's lots of
8 different ways to do it. There's no one right
9 way to do it. There -- it would -- any project
10 like this, the one's that I've worked on, would
11 require collaboration with site planners, and
12 architects, and landscape architects, and, you
13 know, all the different factors that go to the
14 site to see what fits with the program. So
15 there w- there's no one right way to do it.
16 There are many different feasible alternatives.

17 Q: And necessarily, not knowing exactly what it's
18 going to look like, you have not prepared any
19 formal cost estimate for this proposal, have
20 you?

21 A: No. I have not prepared a formal cost
22 estimate, no.

23 Q: If this type of restoration cannot be conducted
24 by the WestEdge Foundation with TIF funding,
25 are you aware of any other public or private



1 entity that's willing or able to fund this type
2 of project?

3 A: There are a lot of f- -- federal funds
4 available now for doing just this type of work.
5 There, there are grants that the City of
6 Charleston and other municipalities that have
7 been applying for to restore and repair urban
8 ecosystems, specifically in communities that
9 have been neglected. There's lots of money
10 that's been earmarked. In fact, we just last
11 week worked with the DNR in the City of
12 Charleston to submit an application for several
13 million dollars to restore the salt marsh
14 directly across the Ashley River in the
15 Ashleyville community. So there are lots of
16 resources and funds that exist and for having
17 met and spoken to the folks that control those
18 purse strings I know they would be very
19 interested in potentially contributing to or
20 supporting some sort of restoration effort here
21 because of all the factors that we've
22 discussed.

23 Q: Are you aware of any entity that has sought
24 those grant funds for this project or a similar
25 project?



1 A: Would that entity be WestEdge? Are you asking
2 me if WestEdge ---

3 Q: I'm ---

4 A: --- has sought ---

5 Q: --- asking if you are aware of any entity that
6 has sought grant funding for restoration of
7 Gadsden Creek?

8 A: Well, see the, the grant funds require that
9 the, the either the landowner or someone who's
10 in control of the land is the primary applicant
11 or party to the application. So like -- no- --
12 not any- -- you know, no one can just apply
13 for a grant to do the restoration work without
14 the willing and active participation of the
15 landowner and the parties who are responsible
16 for the underlying land and the resource. So
17 from that perspective I don't know that anyone
18 has applied for them because I, I don't know
19 that there's been any interest.

20 Q: Have you had any conversations with anyone
21 involved with the City of Charleston about this
22 grant funding?

23 A: Sure, yeah.

24 Q: Anyone who is actively involved in getting
25 grant funding for stormwater projects?



1 A: Yes, I mean there was a breakout session during
2 the Dutch Dialogues specifically to this end of
3 building coalitions to, to seek grant funding
4 for restoration. I know that Gadsden Creek was
5 mentioned as were some other creeks, Church
6 Creek I mentioned earlier. And many of those
7 areas where the City has applied for solicited
8 grant funds, and in many cases has received
9 grant funds to do that type of restoration,
10 were on John's Island, West Ashley, other parts
11 of the city as far as I know.

12 Q: And for whatever reason, despite that
13 conversation, the City has not, to your
14 knowledge, sought this type of grant.

15 A: To my, to my knowledge, the City has not.

16 Q: To your knowledge, could the Friends of Gadsden
17 Creek fund this type of a restoration project?

18 A: Could you repeat the question?

19 Q: To your knowledge, could the Friends of Gadsden
20 Creek fund this type of a restoration project?

21 A: These types of -- if this were a grant-funded
22 project, like we were just discussing,
23 oftentimes there is a non-profit citizen group
24 that is an active stakeholder. Sometimes it's
25 required to have an active stakeholder group to



1 make the grant proposal very attractive. So in
2 that sense I could foresee a scenario where the
3 Friends of Gadsden Creek were a co-applicant
4 with the City or WestEdge or some -- you know,
5 some other group of stakeholders. That's
6 oftentimes the way it happens.

7 Q: To your knowledge has the Friends of Gadsden
8 Creek undertaken any effort to seek out a co-
9 application at this point?

10 A: I don't know.

11 Q: One of the other potential alternatives you
12 discussed is the idea of a tide gate. I think
13 the specific device that you spent most of the
14 -- most of your testimony on is what is
15 referred to as a muted tide gate, correct?

16 A: That's right.

17 Q: What is a muted tide gate?

18 A: A muted tide gate generally is a mechanical
19 system that's usually installed on an existing
20 culvert. It usually has some sort of --
21 there's really no way to explain it other than
22 using gestures. So to use it there's some sort
23 of a flap that opens and closes to let water in
24 and to control the water that comes -- to let
25 water out and to control the water that comes



1 into the tidal system. So a muted tide gate,
2 they're designed and calibrated to, to create
3 or to allow the greatest possible ex- -- extent
4 of natural tidal function. So usually in this
5 case, the tide, tide cycle would be measured
6 and then determine which part of the tide
7 exceeds certain thresholds of critical
8 infrastructure roads or whatever. And then the
9 muted tide gate could be throttled or
10 restricted so that full tidal exchange happens
11 during most events. But then during those
12 exceptional events that happen every few months
13 or, or whatever, depending on the scenario,
14 that that would sort of kick in to restrict any
15 additional tidal water coming in so there
16 wouldn't cause extreme flooding of like a sunny
17 day or king tide event.

18 Q: The installation of a muted tide gate would
19 similarly require a critical area permit,
20 correct?

21 A: Yeah, I would say so because it would res- --
22 it would alter the hydrology of the system.
23 Yeah.

24 Q: Similarly it would require a Corps 404 permit
25 water ---



1 A: Yeah, ---

2 Q: --- quality ---

3 A: --- I would say so.

4 Q: Do you have any personal experience
5 implementing or permitting muted tide gates in
6 South Carolina?

7 A: No, I don't have experience in permitting a
8 muted tide gate. But I have experiences with
9 working to permit alterations to, to tidal
10 systems to change the flow in salt marsh and
11 tidal creek. And, as I mentioned before, as a
12 part of the consulting team for the City of
13 Charleston we did explore regulations that
14 would govern storm gates as part of the storm
15 surge barrier. So there are not a lot of these
16 that have been built in South Carolina that I'm
17 aware, but there's been -- this is an active
18 topic of discussion. There's a lot of research
19 from federal agencies about these gates and how
20 they can be implemented as all the coastal
21 communities are really confronting compound
22 flooding and sunny day flooding. So it's very
23 much in the air and I've talked to regulators
24 about these types of concepts.

25 Q: A muted tide gate by itself would not do



1 anything to address the degraded landfill cap,
2 correct?

3 A: A muted tide gate -- well, actually it may. In
4 the case of the, the, the landfill cap where
5 it's eroded from the channel banks, part of
6 that is because of the flow of water through
7 the creek itself. So the muted tide gate would
8 limit the inflow of water during those
9 exceptionally high tides that really rush
10 through into that channel that cause the
11 erosion, unnaturally fast moving water. A
12 muted tide gate could slow that water down,
13 help it function more naturally. Which would
14 change the conditions and reduce the erosion of
15 the banks. So in that case, yeah, it could
16 actually help with the cap.

17 Q: Can you quantify how much of the erosion of the
18 landfill cap is due to those quote unnaturally
19 high tides versus standard tides?

20 A: Well, I think for my -- from what I've seen I'd
21 say all of it. Yeah, I mean those -- the --
22 and I'm not talking about the, the level of the
23 tide so much as I am -- when I say unnatural
24 tides I mean because that culvert is so large
25 and the marsh behind the culvert is so small,



1 that water is rushing in and the water flowing
2 through the channelized section is moving at a
3 very high rate, much more quickly than in a
4 natural tidal creek. It's that very high rate
5 of flow is what's causing erosion.

6 Q: I just want to be sure that I'm clear. Is it
7 your testimony that none of the erosion of the
8 landfill cap can be attributable to the normal
9 ebb and flow of ---

10 A: I ---

11 Q: --- standard tides?

12 A: --- have no way, I have no way of knowing that.
13 But my point is normal ebb and flow -- I would
14 ask the question normal for Gadsden Creek or
15 normal in terms of natural ebb and flow for a
16 four-acre salt marsh. Those are two different,
17 different questions.

18 Q: Do you have no way of knowing, correct?

19 A: Right, right. But it could be known.

20 Q: You testified that the current alignment of the
21 drainage feature was manmade, correct?

22 A: It's been manipulated and ditched, channelized.
23 Yes, it's certainly been manipulated through
24 the years.

25 Q: That -- and that was done after the landfill



1 was placed over Gadsden Creek, the historic
2 Gadsden Creek?

3 A: Based on my review of the aerial photos it
4 appears that the channel remained throughout
5 the landfilling process and it really was only
6 actively channelized in the very late stages of
7 the landfill, probably the mid to late '60s.

8 Q: So more in parallel to the construction of the
9 landfill?

10 A: In parallel and then segments of the creek were
11 straightened or ditched to make way for more
12 landfill to take the curves of that sinuosity
13 to take it out of the creek to make little
14 straight segments. So it happened, you know,
15 it was an ongoing process.

16 Q: Do you agree that Gadsden Creek is situated
17 within a city drainage easement? Or do you
18 know?

19 A: Based on my review of the records, I believe
20 there is a city drainage easement. At least
21 along a portion of it. And, and that was put
22 in place, you know, the current alignment of
23 Gadsden Creek has been in place since I believe
24 1973. So since 1973, it's been flowing, you
25 know, in the same way since, you know, for 50



1 years essentially. And I believe that drainage
2 easement was put on -- put in place right
3 around the same time that that final act of
4 channelization, the Corps permit was acquired
5 that I mentioned before. I think all that
6 happened around the same time frame to the best
7 of my recollection.

8 Q: Given your, your knowledge of urban streams,
9 you would agree that flood waters generally are
10 unsafe for public to come into contact with,
11 correct?

12 A: Generally because of the urban pollutants that
13 I mentioned before, most a- -- most agencies
14 advise that people don't come into contact with
15 water in urban streams. That's right.

16 Q: And urban streams themselves are generally not
17 safe for prolonged contact?

18 A: Generally, yeah that's advised against. Mostly
19 because of bacteria and metals and things like
20 that.

21 Q: Do you agree that tidal flooding in this
22 particular area creates an adverse impact on
23 residents and the public in the vicinity of
24 Hagood and Fishburne?

25 A: Yes, because of the issues I described earlier,



1 the settling at Hagood, the settling at
2 Fishburne. Those roads become inundated and
3 impassable in some cases. Yes.

4 Q: Would you agree that the elimination of tidal
5 flooding at that intersection would be a public
6 benefit?

7 A: I would say that if Hagood and Fishburne were
8 passable, even during a large tide, that would
9 be a public benefit.

10 Q: One of the other alternatives that you
11 mentioned was -- and I don't know that this was
12 a standing alone alternative, but you mentioned
13 the possibility of elevating the roads in the
14 vicinity ---

15 A: Yeah.

16 Q: --- at the site. Do you know how much those
17 roads have to be elevated?

18 A: Well, as I said before I think some of the
19 records indicate that the roads have settled by
20 around three feet, maybe greater or give or
21 take. So I would presume that -- and I know
22 that the, the City and DOT have undertaken
23 other projects that re-elevate them and they've
24 settled re- -- so my assumption is somewhere in
25 the order of three feet.



1 Q: Do you have any idea how expensive that would
2 be?

3 A: Right off the top of my head right now, no I
4 don't.

5 Q: Elevating the roadways alone has the potential
6 to cause impacts to the properties on either
7 side of the road, wouldn't it? You have to
8 engineer some additional controls ---

9 A: Yes.

10 Q: --- with that type of elevation. And some of
11 the roads in the vicinity, forgive me, I don't
12 remember which ones, are not controlled by the
13 City of Charleston, correct?

14 A: That sound right. Yeah, probably some of them
15 are controlled by DOT.

16 Q: I think Lockwood, specifically, may be a DOT
17 controlled road.

18 A: That would make sense, yeah.

19 Q: You mentioned that the overall construction on
20 the WestEdge project would slightly increase
21 the impervious surface in the vicinity. Can
22 you quantify how much of an increase we're
23 talking about?

24 A: I made that comment just on the basis of the
25 application and the stormwater narrative



1 itself.

2 Q: Okay.

3 A: I think it was, you know, between one and five
4 percent generally from my recollection. Based
5 upon -- it's a factor called the curve number
6 ---

7 Q: Right.

8 A: --- which is the combination of land cover and
9 underlying soils. And so based on the curve
10 number calculations that are imbedded within
11 the report, you take the site as a whole those
12 curve numbers go up slightly. And taken as a
13 whole that would increase the stormwater volume
14 by somewhere between zero and five percent, to
15 the best of my knowledge.

16 Q: The current conditions on the site, there's a
17 lot of parking area, gravel parking lots. You
18 would agree with me that what is there
19 currently is largely impervious surface, would
20 you not?

21 A: It's largely impervious, yes. Although a lot
22 of it is settled and I was just there at a
23 baseball game a few nights ago and there's just
24 vast areas of pond and stormwater that have
25 nowhere to go. They just sit until it



1 evaporates or soaks in. So it's impervious,
2 but it, it actually holds a lot of water to the
3 detriment of people leaving baseball games
4 after it rains.

5 Q: Okay. And if the construction on the site,
6 even if it maintains or slightly elevates the
7 impervious surface, would include elements of
8 green infrastructure, rainwater control, that
9 sort of thing, you want to control that sort of
10 thing. Could that potentially improve that
11 situation?

12 A: Sure, yeah. There are a lot of proposed
13 buildings with vast square footage. It's acres
14 -- acred -- excuse me, acres of rooftops. For
15 example, some basic green infrastructure like
16 green roofs or stormwater planters, things like
17 that could easily capture at least as much
18 stormwater as, as the proposed stormwater
19 piping system.

20 Q: You testified about the effect of subsidence or
21 settling of land with regard to tidal flooding.
22 Would you agree -- let me back up. Do you
23 agree that tidal flooding in the vicinity of
24 this project has increased in frequency over
25 the last couple of decades?



1 A: Yes.

2 Q: Okay. Is that documented in studies?

3 A: Yeah, I'd say, you know, water levels in the
4 Ashley River have been documented as
5 increasing. But I'd also point out the, the,
6 the culvert under Lockwood that was enlarged in
7 the late '90s, that's changed the hydrology and
8 hydrodynamics of that whole Gadsden Creek and
9 Gadsden Green area. So that was certainly a
10 big change. And then we've had several really
11 record breaking events in the last five to
12 seven years. So all those things have created,
13 you know, increasing flooding in that area.
14 Sure.

15 Q: Do you agree that sea level rise has also
16 contributed to the increase in tidal flooding?

17 A: Yeah, sure. Sea level rise is certainly
18 documented in the Charleston Harbor.

19 Q: With regard to the function of the salt marsh
20 in the vicinity of this site, you, you have not
21 personally conducted any water quality
22 sampling, correct?

23 A: I have not personally conducted water quality
24 sampling, no.

25 Q: And y- -- have you conducted any sediment



1 sampling in connection with the creek?

2 A: No. I've not personally conducted any sediment
3 sampling.

4 Q: With regard to the, the ecosystem assessment
5 that you made, would you agree with me that
6 there's a similar ecosystem directly across
7 Lockwood Avenue from this site?

8 A: Along Gadsden Creek, is that what you mean?

9 Q: Along Gadsden Creek towards Brittlebank Park,
10 all in that area.

11 A: Yeah, there's salt marsh and a tidal creek.
12 Yeah, on the west side of Lockwood, sure.

13 Q: Do you have any idea what the acreage is of
14 that salt marsh system?

15 A: I don't.

16 Q: I want to ask you a couple of questions about
17 the specific projects that you testified to.
18 Smith Branch daylighting is right up the
19 street from us, correct?

20 A: Yes.

21 Q: Bull Street development. There's no tidal
22 influence in Columbia, right?

23 A: Correct.

24 Q: But that is not a critical area project.

25 A: Not a critical area project.



1 Q: All right. Do you have any idea how much the
2 Smith Branch daylighting cost?

3 A: Yeah, yeah.

4 Q: How much?

5 A: It was in the order of just over a million
6 dollars, maybe within a few million dollars if
7 you take in different components of the park
8 and different things like that. But, yeah, in
9 the order of millions.

10 Q: With regard to the New Belgium project --
11 incidentally, have you been back to New Belgium
12 since ---

13 A: I have.

14 Q: --- it's been constructed. It's beautiful.

15 A: Yes, it is.

16 Q: I highly recommend the, the tour if you all
17 have the opportunity. It really is fantastic.
18 Do you have any idea how much New Belgium spent
19 specifically on the creek clean up and
20 restoration?

21 A: I don't specifically. I talked to the folks
22 that did the final construction drawings and I,
23 I know, again, that it's been an order of a few
24 million dollars, but it depends on if you
25 include the site walls and the bridge and all



1 those different things, but. Yeah, I would say
2 in the -- either in the hundreds of thousands
3 or maybe the low millions of dollars for that
4 restoration work.

5 Q: And, once again, like Columbia you would agree
6 that there's no tidal influence in Asheville,
7 North Carolina, correct?

8 A: There's no tidal influence at the New Belgium
9 site, however, because it discharges into
10 French Broad River oftentimes where small
11 creeks meet large rivers, the effects are very
12 similar to tidal inflow because those creeks
13 are consistently under the backwater of the
14 larger river. So in this case, the French
15 Broad River fluctuates by as much as 20 feet.
16 It's common that if fluctuates by, you know,
17 five to ten feet. So that five to ten feet of
18 fluctuation would drive water up into the
19 creek, into the New Belgium site. It wouldn't
20 happen twice a day like a tide would, but it's
21 a very difficult significant challenge from a
22 water resources engineering perspective.
23 'Cause the site had to be elevated above the
24 flood plane and the creek had to be engineered
25 to deal with a trickle of water during sunny



1 days and then maybe 15 feet of water deep when
2 the river is in flood because the French Broad
3 River drains, you know, many, many square miles
4 of land. So it's a similar condition, but it
5 is not a tide. Correct.

6 Q: And you would agree that the New Belgium site
7 was not subject to a critical area permitting
8 requirement, or whatever the equivalent is in
9 North Carolina, correct?

10 A: Sure, there's no, there's no coastal zone
11 consistency in Buncombe County so there's no
12 critical area, right. But it would've followed
13 the 401/404 regulatory process and any other
14 special provisions required by the French Broad
15 River since it's the receiving water body.

16 Q: With regard to your work on the Church Creek --
17 I don't have your, your CV in front of me. Y-
18 -- your work on Church Creek was a plan or
19 study document?

20 A: That's right.

21 Q: It was not an engineered design to be
22 implemented, correct?

23 A: We took that through conceptual design and then
24 handed over the conceptual design to the City.

25 Q: Okay. Now, my understanding is with regard to



1 Church Creek th- -- the City actually had to
2 buy out several residents because of the
3 flooding there, correct?

4 A: That's right. Further up in the watershed.

5 Q: Th- -- there were residents that were displaced
6 as a result of that? Yo- -- you testified that
7 opening up Church Creek caused flooding,
8 correct?

9 A: I don't, I don't know that I would go so far as
10 to say that. I think maybe what I said was
11 that some of the channelization and the
12 ditching connecting the head waters and the
13 tidal creek to the inland wetland system, that
14 invited tidal waters further into the landscape
15 than there would naturally be. So that
16 complicates matters. But the real source of
17 flooding was -- the entire watershed was
18 developed creating a lot more runoff.

19 Q: You also described Church Creek as a ditch.
20 How do you define that?

21 A: Well, Church Creek -- historically, Church
22 Creek was a tidal water body that was a
23 tributary of the Ashley River. And
24 historically, Church Creek, you know, ended.
25 There was a -- it went into a brackish system



1 then there was an area of uplands and on the
2 other side of that -- and it is a very low
3 uplands 'cause it's the Low Country, but on the
4 other side of those uplands was a vast
5 freshwater wetlands system. And those
6 freshwater wetlands would've been connected to
7 the saltwater system by, you know, underground
8 flow of that fresh water. And it was a s- --
9 a vast swamp. So say roughly a hundred years
10 ago that swamp was clear cut and there was
11 phosphorous mining and different things that
12 happened. In order to get rid of some of that
13 water landowners at the time dug a canal
14 connecting the freshwater wetlands to the salt
15 marsh creek. And in order to do that they
16 enlarged the creek and created a, a truly
17 manmade feature that connected the freshwater
18 wetlands to the saltwater creek. And that
19 manmade canal or ditch is -- happens to be
20 where our client Crosstowne Christian Church is
21 located on land, which was formerly kind of
22 uplands. But there was a ditch cut through the
23 uplands to allow those two systems to connect.
24 And then it, of course, created all these
25 impacts years later.



1 Q: You spoke a little bit about the Corps' concept
2 for a storm surge barrier in relation to your
3 opinions on Gadsden Creek. In your deposition
4 you talked very briefly about it. Do you have
5 an opinion on the advisability of that project?

6 A: Yeah, you know, it's, it's in flux, but my
7 general opinion, which I'm on the record having
8 produced the public comments and that, that
9 editorial in the Post and Courier. But my
10 general idea is that the storm surge barrier is
11 proposed for elevation 12, which would guard
12 against moderate storm surge, but it doesn't do
13 anything to protect against large storm surge.
14 And if it's constructed the way it's been
15 currently conceptualized, and there's a lot of
16 additional risks that could worsen flooding,
17 such as water being trapped behind the wall
18 creating all these funneling points and the
19 various pump stations that would have to be
20 built to get water from behind the walls. So
21 we could very easily end up with a Hurricane
22 Katrina scenario where the walls create a false
23 sense of security but then create essentially
24 a bath tub where water can't get out. That's
25 kind of the general broad strokes of our



1 opinion.

2 Q: Sounds like you think it's not a great idea.

3 A: I think some sort of storm surge barrier would
4 be really helpful, but I think that the current
5 conception of it -- it should either be made
6 quite a bit lower or quite a bit higher. But
7 this, yeah -- mid- -- middle of the road
8 creates more problems than it solves.

9 Q: How would you assess the likelihood that the
10 storm surge wall in its current proposed state
11 will actually be constructed?

12 A: That's a hard question. You know, it's
13 politically tenuous, but I'm convinced, you
14 know, based on meetings that I've been a part
15 of with the Army Corps and with the City that
16 some sort of storm surge barrier will be built
17 in the next decade or two. Yeah, no question
18 on my mind about that based on the, the
19 different economic studies that have been done,
20 the support, federal funding, and cost share
21 for the storm surge barrier.

22 Q: Indulge me. Mr. Robinson, I think I'm close to
23 done. I won't promise a number of questions,
24 but. You talked about the possibility of
25 settling of -- sediment settling and its affect



1 on infrastructure. Would you agree that
2 stormwater infrastructure can be designed to
3 diminish or, or mitigate that differential
4 settlement?

5 A: Yes, I- -- I've seen instances where storm
6 systems were supported on piles or piers or
7 some sort of system that would be like a deep
8 foundation system. I think that's feasible,
9 but again, all those would require a deep
10 excavating within -- a- -- as it applied to
11 this site, it would require a deep excavating
12 within the landfill material itself.

13 Q: Are you aware that the WestEdge Development is
14 designed to address differential settlement?

15 A: I'm not aware of that, no. I'm, I'm -- well,
16 let me qualify that. I'm aware about the
17 buildings and the roadway and all the
18 infrastructure of that nature. I'm not aware
19 of how the storm sewer system and
20 infrastructure would be designed to safeguard
21 against settlement.

22 Q: But other aspects of the WestEdge Development
23 -- the WestEdge Development, not the specific
24 project, you are aware that they ---

25 A: In buildings, roadways -- yeah, I'm generally



1 aware of some of the geotechnical engineering
2 methods, foundations that are being proposed
3 and implemented already. Sure.

4 Q: We already talked about the fact that the
5 proposed condition or proposed project includes
6 three outfalls.

7 A: Uh-huh.

8 Q: Would you agree that redundancy in an area with
9 known flooding is an acceptable practice?

10 A: Sure, yes.

11 Q: With regard to your participation in the Dutch
12 Dialogues, do you recall any recommendation for
13 or against raising Hagood Avenue within the
14 Dutch Dialogues or using berm walls?

15 A: Yeah, I know that one of the recommendations
16 was to install some sort of barrier like a site
17 wall, a wall that might be, you know, waist
18 high along Hagood to prevent tidal flooding
19 onto Hagood Avenue. I know that was one of the
20 conceptual renderings that was offered in the
21 Dutch Dialogues report.

22 Q: Do you know if the Dutch Dialogues specifically
23 recommended against raising Hagood Avenue?

24 A: I do not. I know that different groups have
25 been contemplating Hagood for a while. I don't



1 recall if it was on its final report.

2 Q: You talked about other historic landfills in
3 the Charleston area that experienced tidal
4 flooding. Are you aware of whether those
5 landfills are capped with concrete or road
6 materials?

7 A: I think it's something like half of the
8 Charleston peninsula is a landfill, former
9 landfill. So most of the, you know, most of
10 those areas have been capped. And based on
11 studies that I've read they're filled with old
12 construction debris, household waste, dead
13 animals, all sorts of things. And then covered
14 over and built upon with roads and buildings
15 and things, so. Based on my study and, you
16 know, other seminars and things that I've taken
17 part in, the areas on the peninsula of
18 Charleston that we know has flooding problems
19 are those areas that were formerly marsh.

20 Q: The City's actions in filling the marsh back in
21 the 1950s to '60s, whenever they ceased their
22 landfill construction, at the time it was done
23 it was legal, correct?

24 A: I don't know if it was fully legal. That's
25 still sort of nuanced or murky from my



1 perspective. It was certainly before the Clean
2 Water Act.

3 Q: So there was no violation of the Clean Water
4 Act ---

5 A: The ---

6 Q: --- by your view.

7 A: Right, the Clean Water Act was early 70s
8 following the closure of the landfill. I know
9 that there's some -- there were other
10 violations noted by the Army Corps of Engineers
11 related to the maybe Rivers of Harbors Act.
12 But I don't know specifically what violations
13 they were, but. Not Clean Water Act
14 violations, sure.

15 Q: All right. Are you a member of the Friends of
16 Gadsden Creek?

17 A: I am not currently a member, no.

18 Q: Have you been a member of Friends of Gadsden
19 Creek previously?

20 A: I've been involved with the group that
21 eventually became the Friends of Gadsden Creek,
22 but I'm not a member of the current non-profit
23 organization, to the best of my knowledge.
24 I've partaken in activity, creek clean ups and
25 things like that, but.



1 Q: And the alternatives that we have discussed
2 here today are all designs that are consistent
3 with what the Friends of Gadsden Creek wants to
4 happen here. Is that accurate?

5 A: I know that Friends of Gadsden Creek are
6 advocating for the preservation of the Creek
7 and, you know, some degree of enhancement or at
8 least continuing to enable access for the
9 Gadsden Green and west ed- -- west side
10 community. In terms of what happens beyond
11 preserving it I don't, I don't believe there's
12 any sort of widespread agreement on what needs
13 to happen. I know there's a lot of ideas that
14 have been talked about and all these different
15 reports that I- -- that I've mentioned, the
16 Dutch Dialogues and others. And in terms of
17 the unified vision about what needs to happen
18 other than preserving the creek, I- -- I'm not
19 aware of it.

20 Q: Okay. One more second. Thank you, Mr.
21 Robinson. I appreciate your time.

22 **THE COURT:** Mr. Churdar.

23 **MR. SMITH:** Your Honor, we have no questions for Mr.
24 Robinson.

25 **MR. CUNNINGHAM:** Very little.



1 MR. ROBINSON - REDIRECT EXAMINATION BY MR.

2 CUNNINGHAM:

3 Q: Mr. Robinson, in speaking with Mr. Traynham you
4 talked about some debris that could be seen in
5 the, in the creek, is that right?

6 A: Yes.

7 Q: And you mentioned that it could be trash. Is
8 that correct, from the landfill?

9 A: That's correct.

10 Q: And if it's bricks that were used to armor the,
11 the sides, would that be trash from the
12 landfill?

13 A: No, that would be the material that was
14 approved to be put in place.

15 Q: All right. And is it possible for trash to
16 enter the creek area from outside the immediate
17 bo- -- bounds of the creek and the tidelands?

18 A: Yes, certainly. The, the drainage area of 200
19 some odd acres has catch basins and storm
20 drains and those are often filled with trash
21 from everything from drink bottles to food bags
22 and things and those make their way to the
23 creek. So the, the creek does have a lot of
24 trash. I mentioned I was involved in some
25 creek clean ups. I know they do that



1 periodically. There's always lots of, lots of
2 trash and you can tell by the branding on the
3 packaging, you know, what age it was and it's
4 almost all very new from -- it's from, you
5 know, city trash.

6 Q: Not part of the past landfill?

7 A: Not part of the past landfill, no.

8 Q: One more question. You, you talked about
9 Thomas Hutton and their work in this project
10 and Mr. Traynham mentioned your deposition.
11 When you testified at your deposition were you
12 aware of whether or not the modeling that had
13 been done on this project had been calibrated
14 or field verified?

15 A: I, I, I assumed that it had not been. I don't,
16 I don't recall specifically at that time, but.
17 Yeah, I've -- I didn't see any evidence in the
18 application of any field measurements. I just
19 presumed that it hadn't been calibrated or
20 verified.

21 Q: You presumed it had been?

22 A: It had not been.

23 Q: Okay.

24 A: I presumed it had not been.

25 Q: Okay. And public benefit, you mentioned public



1 benefits to remove a tidal flooding from the
2 area. Is that your opinion?

3 A: I think I said that drainage conditions where
4 Hagood or Fishburne would still be passable
5 during tidal flooding. That would be a public
6 benefit. But, again, because of the definition
7 of flooding in this case it's -- and I, and I
8 want to go so far as to say stopping the tidal
9 flooding would be a public benefit because that
10 could also mean stopping the flow of the
11 Gadsden Creek, which would not be a public
12 benefit, so.

13 Q: That's what I was about to say. Are you
14 talking about public benefit in a context of in
15 a vacuum taking away flooding in this area
16 would be good ---

17 A: Correct.

18 Q: --- but then there's the other consideration of
19 what else has to happen to do that. Is that --
20 -

21 A: That's correct.

22 Q: --- correct?

23 A: Right.

24 Q: And before you could determine whether or not
25 it's an ultimately a public benefit, you'd have



1 to know, okay, what's -- wha- -- what all is
2 involved in removing tidal influence from this
3 area. Is that correct?

4 A: The pros and cons of, you know, all the
5 different alternatives. Sure.

6 Q: That's all I've got. Thank you.

7 **MR. ROBINSON - CLARIFICATION BY THE COURT:**

8 **THE COURT:** When you testified about -- well, I'm
9 trying to look at the feasible alternative
10 aspect of your testimony, 'cause that's
11 something I have to consider. And it seemed to
12 me there was four of them. Well, there was
13 build a berm or street wall, and that's kind of
14 one category. Then there's restrict the flow
15 of water through the culvert at Lockwood with
16 a muted gate. To elevate the roads and you
17 said you presume by three feet. And then
18 renaturalizing the creek, which would really be
19 conceptually decreasing the size of it?

20 A: That sound right. Yes, Your Honor.

21 **THE COURT:** Those are the four?

22 A: Generally, yes, sir.

23 **THE COURT:** What I need to understand is, okay, you
24 haven't prepared an engineering design. So are
25 those four individual feasible alternatives or



1 are they all collectively one? How, how does
2 that fit into me deciding if there was a
3 feasible alternative to the project that
4 they've proposed?

5 A: Sure. So each of those elements would be
6 designed or intended to address a specific
7 concern. So -- and different actions on the
8 whole site could change whether some of those
9 concerns are so much of the concern or not. So
10 for example, if Hagood and Fishburne were
11 elevated, then the site walls may not be
12 necessary anymore because the, the raising of
13 the road may do the same thing that the site
14 wall may do. On the other hand, if a muted
15 tide gate, for example, were installed on the
16 Lockwood culvert that regulated the amount of
17 tidal inflow, that may take care of the whole
18 problem of tidal flooding on its own. But, you
19 know, that opens -- questions some other
20 regulatory constraints and things like that.
21 So using other projects that I've worked on as
22 an example, it's usually working with the other
23 requirements of the site or with the budget, as
24 we mentioned working with the regulators to
25 find what combination of these different



1 measures, or other measures, would help satisfy
2 the concerns over tidal flooding and stormwater
3 flooding and other concerns related to
4 pollutants.

5 **THE COURT:** My, my concern is your testimony has a
6 if this, then that. If this, then that.
7 There's no sp- -- specific plan that you're
8 giving me and saying this is the, the plan that
9 is a feasible alternative. There's -- if this,
10 depending on money, depending on, you know, can
11 we elevate the roads, can we not. How can I
12 discern a specific feasible alternative from
13 what you just told me?

14 A: I think that -- to my mind the, the most
15 simple, structural feasible alternative would
16 be some sort of site wall or berm ---

17 **THE COURT:** Okay.

18 A: --- that would be built right at or just beyond
19 the limits of the tidelands in the critical
20 area.

21 **THE COURT:** So that's the specific one I should
22 consider.

23 A: That's one specific one. Whether that would be
24 feasible -- this has been implemented in other
25 parts of the City in similar conditions. And,



1 and again, that's embedded within other
2 documents such as the Dutch Dialogues report as
3 a feasible alternative. Also, a muted tide
4 gate I think is a stand alone feasible
5 alternative because the muted tide gate would
6 s- -- al- -- alter the hydrology in such a way
7 that could remove the concerns over tidal
8 flooding. So that would be a feasible
9 alternative to, to the tidal flooding concern.
10 Then the work in the channel itself, the
11 revitalization work -- you know, that, that
12 contemplates more about water quality and that
13 contemplates more about aesthetics or
14 ecological value, things like that that -- you
15 know, we haven't really talked so much about in
16 terms of things that would be lost with, with
17 filling the creek, but. So there's lots of
18 things that could be done in, in the creek to
19 revitalize or renaturalize it to, to help with
20 the water quality concerns. So that, that,
21 that's what I would say about the
22 renaturalization portion. That, that's not a
23 stand alone feasible alternative to just
24 renaturalize it on its own. It would require
25 one of these other structural measures because



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1 of the, the nature of the problem.

2 **THE COURT:** All right. Any follow-up to what I've
3 asked?

4 **MR. CUNNINGHAM:** No, Your Honor. I think he
5 clarified himself.

6 **THE COURT:** Okay.

7 **MR. TRAYNHAM:** None, Your Honor.

8 **THE COURT:** Okay. You may step down. Do you want
9 to call your next witness?

10 **MR. CUNNINGHAM:** If you're ready, Your Honor. It's
11 gonna be another long one.

12 **THE COURT:** Well, I think I'm gonna pass.

13 **MR. CUNNINGHAM:** I think I will, too, Judge.

14 **THE COURT:** All right. So 1:04 by this clock.
15 2:15?

16 **MR. TRAYNHAM:** 2:15, Judge.

17 **MR. CUNNINGHAM:** Thank you, Your Honor.

18 **THE COURT:** Is that good?

19 **MR. CUNNINGHAM:** That's fine. Thank you.

20 (Off the record from 1:05 p.m. until 2:11 p.m.)

21 **COURT REPORTER:** All rise.

22 **THE COURT:** Hey everybody. Y'all be seated.

23 **MS. MILTON:** Your Honor, at this time we would like
24 to call Mr. Gould to the stand.

25 **COURT REPORTER:** Will you raise your right hand



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1 please, sir? Do you solemnly swear the
2 following testimony to be the truth, the whole
3 truth, and nothing but the truth so help you
4 God?

5 **MR. GOULD:** I do.

6 **MARK GOULD,** having been duly sworn, testifies as
7 follows:

8 **MR. GOULD - DIRECT EXAMINATION BY MS. MILTON:**

9 Q: Good afternoon, Mr. Gould. Would you please
10 give the Court your full name?

11 A: Mark Gould.

12 Q: Okay. And could you tell the Court where you
13 live?

14 A: I live at the intersection of Ashley Avenue and
15 Crosstowne, two blocks from Gadsden Creek. The
16 mailing address is 25 Catfiddle Street.

17 Q: And how long have you lived in the Low Country?

18 A: 11 years.

19 Q: What brought you down there?

20 A: My son moved down five years prior and started
21 having a family and so we moved down and built
22 a house next door to his family. And then
23 built another building to be his office. He's
24 an architect.

25 Q: So do you have grand babies?



1 A: Yes, three grandchildren.

2 Q: And what's your educational background?

3 A: I have a Bachelor's Degree in electrical
4 engineering from Cornell University. Studies
5 in hydrology and fluid mechanics at the
6 University of Colorado. And a Master's in
7 Environmental Engineering from Northeastern
8 University.

9 Q: And what do you do for a living?

10 A: I'm retired from being an environmental
11 engineer.

12 Q: Could you walk through your work history a
13 little bit?

14 A: Yeah, I was mostly an environmental engineer.
15 I -- my primary focus was water and wastewater
16 treatment. And from there into developing
17 processes to convert organic waste materials
18 into compost and fertilizer, which got me into
19 a lot of air pollution control projects and
20 eventually greenhouse gas emissions modeling
21 for the fertilizer industry. I did a couple of
22 landfills caps and a lot of this and that as
23 well.

24 Q: What volunteer activities have you been
25 involved in since moving to the Low Country?



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1 A: Well, I founded the Charleston chapter of
2 Citizens Climate lobby, which advocates for
3 federal carbon tax legislation. Through my
4 membership in the Church of the Holy Communion,
5 I'm a member of the Charleston Area of Justice
6 Ministry, which has over 40 congregations in
7 the Charleston area who work together to
8 identify issues of injustice that can be fixed
9 with sufficient political will. And we bring
10 kind of the pressure of mass protests on our
11 elected leaders. I'm a member of the
12 Environmental Justice Steering Committee, which
13 is focused primarily on -- since we're
14 churches, it's focused primarily on care for
15 creation as well as environmental justice. And
16 our steering committee this year decided to
17 make saving Gadsden Creek our primary
18 initiative.

19 Q: And when did you first become aware of Friends
20 of -- of Gadsden Creek itself?

21 A: I love Brittlebank Park. I walk down in that
22 area several times a week, so. I've always
23 known the creek and loved it and seen gray fox
24 and egrets and all kinds of things there. So
25 I go down about three or four times a week.



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1 Q: And what is your affiliation with Friends of
2 Gadsden Creek?

3 A: I'm a member. I didn't -- I was not -- I had
4 forgotten this in my deposition, but I actually
5 signed up as a member in 2019.

6 Q: Okay. And when you were describing that you go
7 walking several times a week and that you've
8 seen some wildlife, could you discuss more your
9 experience in the Gadsden Creek area?

10 A: Well, a number of people who live in Gadsden
11 Green are my friends and neighbors. So I kind
12 of hang out there a lot. And I walk down to
13 the creek and I walk to Brittlebank Park. It's
14 like the nearest natural area to our
15 neighborhood, so I, I do a lot of sea kayaking
16 and salt marshes and stuff and I just like to
17 be outside.

18 Q: Would you say you enjoy those activities?

19 A: Yes.

20 Q: Now, living in the Gadsden Creek area, have you
21 ever observed flooding in the area?

22 A: Oh yes. The -- all different kinds of
23 flooding. But -- particularly dry weather high
24 tide -- extreme high tide flooding. It's very
25 pronounced at the corner of Hagood and



1 Fishburne. And my observation is it's not from
2 the overflowing creek but it's coming up
3 through the storm drains mainly.

4 Q: Okay.

5 A: We have a combination of high tides and heavy
6 rain, particularly on President's Street, that
7 area -- it's like dangerous, you know, it's
8 knee-deep, fast moving dirty water.

9 Q: And as to your recreational activities that you
10 referenced a minute ago, do you plan to
11 continue those activities in the area?

12 A: Yeah.

13 Q: Do you -- what is your understanding of the
14 purpose behind the permit that WestEdge is
15 seeking from DHEC in this matter?

16 A: To maximize real estate square footage. That's
17 what it appears to me.

18 Q: And what if, if any concerns do you have about
19 the project?

20 A: Well, I'm not an expert witness, but I, I have
21 read all the published reports with kind of an
22 engineer's eye, I should say. And I think
23 everything I was going to say today has pretty
24 much been said much more credibly and
25 eloquently by Joshua Robinson. I would like to



1 add just a couple points to that. One, is that
2 the, the proposed ditch or channel that runs
3 north to the, to the arm of the river, behind
4 the stadium, is -- will have a tide gate at
5 Fishburne and it appears to me that it will ---

6 **MR. TRAYNHAM:** Your Honor ---

7 **MR. GOULD:** --- completely reproduce the ---

8 **MR. TRAYNHAM:** Objection. This is getting into the
9 realm of expert testimony. I understand he's
10 got a background in it but he has not been
11 offered as an expert.

12 **THE COURT:** He can testify about his personal
13 observations.

14 **MS. MILTON:** And his personal concerns. Thank you,
15 Your Honor.

16 **THE COURT:** Uh, and ---

17 **MR. GOULD:** I am simply reporting what I read in
18 reports published by ---

19 **THE COURT:** Well, you can't give ---

20 **MS. MILTON:** Yeah ---

21 **THE COURT:** It starts going there is getting close,
22 so.

23 **MS. MILTON:** Yeah, and you can't, you can't super
24 discuss the reports but just your personal
25 concerns.



1 **MR. GOULD:** Yes. All right, thank you.

2 **THE COURT:** Observations, sir.

3 **MS. MILTON:** Observations.

4 A: My observation is that the land north of
5 Fishburne is at that same elevation and water
6 is going to come in there 'cause it's the same,
7 you know. It's just a matter of water, water
8 levels.

9 Q: And if this project is developed as it has been
10 permitted, would that affect your use and
11 enjoyment of the area?

12 A: I- -- if so, if so -- well, yeah. There would
13 be no more creek.

14 Q: I think that is all I have for you, Mr. Gould.
15 Please answer opposing counsel's questions.

16 **MR. TRAYNHAM:** No questions, Your Honor.

17 **MR. SMITH:** No questions, Your Honor.

18 **THE COURT:** I don't think I need to tell him to step
19 down.

20 **MR. CUNNINGHAM:** If the Court has any questions
21 you've got to ---

22 **THE COURT:** I'm sorry. You're fine. No, you're
23 fine, sir.

24 **MS. MILTON:** Yeah, I mean. We need to dismiss Mr.
25 Gould.



1 **MR. CUNNINGHAM:** You can be excused.

2 **MS. MILTON:** Yeah, you can be excused now.

3 **MR. CUNNINGHAM:** All right, Your Honor. Are we
4 ready? Am I ready, I don't know. Petitioner
5 calls Dr. Koester to the stands.

6 **COURT REPORTER:** Will you raise your right hand
7 please, sir? Do you solemnly swear the
8 following testimony to be the truth, the whole
9 truth, and nothing but the truth so help you
10 God?

11 **DR. KOESTER:** I do.

12 **COURT REPORTER:** Thank you.

13 **DR. MERRIE KOESTER,** having been duly sworn, testifies
14 as follows:

15 **DR. KOESTER - DIRECT EXAMINATION BY MR. CUNNINGHAM:**

16 Q: Please introduce yourself, Dr. Koester.

17 A: My name is Merrie Koester. My birth name is
18 Meredith Ann Koester. Born and raised in
19 Charleston, South Carolina. Presently living
20 at 11 Allgood Road, Charleston, South Carolina
21 29407.

22 Q: Thank you. And I believe you mentioned that
23 you are living in Charleston now and you were
24 raised there. Was there any -- have you lived
25 for a lengthy period of time of your life?



1 A: Born, raised in the same house west of the
2 Ashley. I was very, very, very privileged to
3 live in the neighborhood that backed up to the
4 salt marsh creek.

5 Q: What neighborhood is that?

6 A: It's called Farmfield. Rural in that it's just
7 a suburban neighborhood in Charleston. There
8 was an older couple that lived across the
9 street from us. They had no children and let
10 my sisters and I use their dock and the creek
11 as if it were our own. And I've never, ever
12 taken that for granted.

13 Q: Did that, that first initial connection to or
14 situation near that marsh inform your
15 relationship to marsh land in general in your
16 life?

17 A: So I, I think a key word in your question is
18 relationship. Because for me, my relationship
19 with the salt marsh is that it is a sacred
20 space. And I think it was my relationship with
21 the marsh that caused me to want to become a
22 biologist and an ecologist so that I could
23 deepen my understandings of the cause and
24 effect relationships and the many gifts that
25 this ecosystems affords us.



1 Q: You mentioned your profession. Can you talk a
2 little bit about your educational background?

3 A: Sure. I have a Bachelor's of Science in
4 Biological Science from Furman University with
5 a Minor in Chemistry. I have a Master's of
6 Science in Curriculum and Instruction. And a
7 Doctorate degree from the University of South
8 Carolina in Teaching and Learning. I have
9 specific training and expertise in
10 environmental science, water quality,
11 stormwater management. As especially as it's
12 related to impacts of unsustainable
13 development.

14 Q: What is your profession?

15 A: My profession, for the last 30 plus years, has
16 been as a science educator either in the
17 classroom, mostly middle and high school or
18 undergraduate, or as a science teacher
19 educator, someone who teaches an undergraduate
20 student how to be a science teacher. Or
21 currently, I am out in the field for the
22 University of South Carolina's Center for
23 Science Education as a science teacher
24 educator. And I work primarily in Title I
25 schools.



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1 Q: Where are the Title I schools you work with
2 located within the City of Charleston?

3 A: So for the -- since 2015, 2016, nearly all of
4 my work has been situated in the four Title I
5 schools in the Gadsden Creek watershed.

6 Q: What schools are those?

7 A: Those are Charleston Development Academy, which
8 is a K-8 school. That is Mitchell Elementary,
9 which is Pre-K to five. Simmons-Pinckney,
10 sixth, seventh, and eighth. And then Burke
11 High School, which is nine through 12.

12 Q: You mentioned you work with the University of
13 South Carolina, is that right?

14 A: That's correct.

15 Q: Do you have any other affiliations with any
16 other institutions of higher learning?

17 A: Oh, yeah. I do. I am an adjunct professor at
18 the College of Charleston Sustainability
19 Literacy Institute. And I also have a research
20 study that's being conducted in the Gadsden
21 Creek watershed that has been supported either
22 through in-kind or financial support from The
23 Citadel Stem Center for Excellence, the South
24 Carolina Sea Grant Consortium, the National
25 Weather Service, and the South Carolina



1 Association of Hazard Mitigation. In that
2 capacity, I also serve as a fellow for the
3 James Near Center for Science Ed Climate
4 Studies at The Citadel.

5 Q: Are you a member of any civic organizations?

6 A: Civic organizations -- yes, I'm a member of my
7 church. I am a member of Friends of Gadsden
8 Creek. I am an active member of I guess you
9 would say the South Carolina Marine Educators,
10 because we do a lot of civic work. But then if
11 you go into more of an academic area, I'm also
12 in the Environmental Educators of South
13 Carolina, the Association for Science Teacher
14 Educators, and the Association for Curriculum
15 and Instruction.

16 Q: With respect to Friends of Gadsden Creek, are
17 you just a member or do you have any other role
18 in that organization?

19 A: I would say I'm a founding member of Friends of
20 Gadsden Creek. I take my responsibility as an
21 ecoliteracy advocate for this organization
22 quite seriously. Primarily because I've been
23 given the privilege to create access to a salt
24 marsh and the affordances of wonder, joy, and
25 understanding that I had as a child. And we



1 now have hundreds of students from those
2 schools learning about salt marsh ecosystems.
3 Seeing a fiddler crab for the very first time,
4 being able to -- I have eighth grade -- eight-
5 year-olds who can tell you why it floods at
6 Hagood and Fishburne.

7 Q: Well, we'll get to that in a little bit. And
8 as the ecoliteracy advocate with Friends of
9 Gadsden Creek, what sort of jobs or duties do
10 you perform?

11 A: So that idea -- so a literacy specialist -- so
12 when you are a literacy specialist you work
13 with anybody of any age to question everything.
14 So if someone makes a claim this is a ditch,
15 the creek is polluted, the flooding is caused
16 by the creek, these are all claims that have
17 been widely disseminated by the media. So we
18 take those claims that come into the classroom
19 in the form of print media and we say, all
20 right, as a science literate citizen what is
21 the evidence to support that claim? So in --
22 regardless of what claim is made the students
23 will say, with due respect, what is the
24 evidence to support your claim. And keep an
25 open mind about, about everything.



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1 Q: As a member of Friends of Gadsden Creek, have
2 you ever had an occasion to utilize Gadsden
3 Creek for anything?

4 A: So Gadsden Creek is our outdoor classroom. It
5 is where our students have the opportunity to
6 engage and not only in problem-based learning
7 but placed-based learning, that leads into this
8 question of what is happening here. So we
9 look, we look at the claims. So the claim in
10 the paper is this is a ditch. It's not a
11 creek. All right. There's the claim. Let's
12 just sit with that. Now, let's go outside.
13 Let's take our cameras and let's look for
14 evidence to support the claim that this is a
15 fully functioning creek. And let's take with
16 us the South Carolina DNR manual on fully
17 functioning tidal creeks. Let's see how many
18 sentinel plants and animals we can find. Let's
19 start along the bank and let's walk through all
20 the zones of the marsh.

21 Q: All right. And, and we'll talk a little bit
22 more about your teaching in just a moment.
23 Other than teaching, have you ever had occasion
24 to use Gadsden Creek for any other uses in your
25 ---



1 A: Oh yeah.

2 Q: --- capacity of Friends of Gadsden Creek?

3 A: So just for myself -- again, remember I am
4 drawn to all salt marshes. They -- it's hard
5 to, it's hard to explain how deeply I care
6 about any harm that can come to this habitat.
7 So I will go there myself on a Sunday
8 afternoon. I make sure that I'm there in every
9 season, because as Mr. Buffum pointed out, this
10 is the season of the Sea oxeye daisy explosion.
11 And this is the season where you see the
12 pollinators doing their thing. And you hear
13 the migratory birds. So I go there just to
14 settle my own self and I also make myself
15 available to lead anyone to go out there. So
16 I've led groups as small as two and as large as
17 100. They could be church groups, school
18 groups, anybody who wants to learn a little bit
19 more about this habitat. I think one of the
20 most exciting things that I do is I partner
21 with the South Carolina Aquarium, who has
22 adopted Gadsden Creek as a habitat of concern
23 for plastics pollution. So I recently
24 collaborated with the South Carolina Aquarium
25 to lead over 70 people in to Gadsden Creek --



1 I mean out into the marsh, picking up litter,
2 documenting what we've found as a part of
3 keeping those plastics out of the digestive
4 systems of the animals in there.

5 Q: When was that?

6 A: Just a few weeks ago.

7 Q: Now, you mentioned your teaching a minute ago
8 and how you use Gadsden Creek as an outdoor
9 classroom essentially, is that right?

10 A: Yes.

11 Q: Now, do you -- is there a particular program
12 that you have founded or that you operate under
13 with the respect to the children you're helping
14 to educate in Gadsden Creek?

15 A: Yeah, so the name of the program that I founded
16 and -- in 2016, is called Kids Teaching Flood
17 Resilience. And I -- the idea for that program
18 emerged when I was invited to attend a Town
19 Hall meeting with the City of Charleston, who
20 had just released their 2015 Sea Level Rise
21 Strategy. And what they were calling for was
22 citizen participation in the clear and concise
23 communication of hazard risk. And what I
24 realized is that these are science standards.
25 Weather, cause and effect relationships,



1 pattens, change over time, how do you
2 inductively draw conclusions based on these
3 kinds of observations. This was pure science.
4 And so I went to the Center for Science
5 Education and I said, I think that we could
6 create an incredibly robust and meaningful
7 program inside our most flood prone schools in
8 Charleston as part of the science curriculum.
9 Low and behold, the most flood prone schools in
10 Charleston are our Title I schools, which
11 happened to be situated in filled salt marshes.
12 So they disproportionately bear the brunt of
13 unsustainable development in salt marshes.

14 Q: Now, I want to ask you a little bit of how
15 often do you use the curriculum of those
16 various scenarios. How often have you
17 conducted or participated in a creek clean up
18 of Gadsden Creek?

19 A: At least three times a year I lead formal creek
20 clean ups, whether it's with the Ocean
21 Conservancy and the South Carolina Sea Grant
22 Consortium or the South Carolina Aquarium or
23 with a church group. Or I may simply take a
24 classroom out there with grabbers and bags. So
25 they can be formally planned or informal. It's



1 time to clean up the creek again.

2 Q: How many years have you been doing that?

3 A: 2015.

4 Q: Since 2015?

5 A: Since, since 2015 we have been over there
6 creating an awareness of how very special this
7 habitat is.

8 Q: How many creek walks have you conducted or been
9 on?

10 A: I simply could not put a number on that.
11 Easily over a hundred.

12 Q: Since when, 2015?

13 A: Uh-huh.

14 Q: And how often do you visit the creek with
15 students?

16 A: Well, the pandemic shut us down a little bit
17 because, (coughs) excuse me, Charleston County
18 schools had to go into basically no visitors
19 allowed. And so I, as being a heart patient,
20 was also on severe restrictions on what I could
21 do and who I could interact with in terms of
22 vaccination status. So we have at -- the
23 pandemic created a little bit of a break in our
24 time. But then I began to take the teachers
25 out there to say all right, this is how you



1 read a creek walk. If we want to see the
2 sentinel plants and animals, let's talk about
3 what you find in the low gra- -- the low marsh,
4 the upland marsh. And so I now have a core
5 group of teachers, and actually students, who
6 could lead their own creek walk.

7 Q: Have you done any work with any professors at
8 the College of Charleston with respect to
9 Gadsden Creek at all?

10 A: Absolutely, I have. Because I am on the
11 faculty of the Sustainability Literacy
12 Institute and because the class that I teach at
13 the College of Charleston actually centers
14 Gadsden Creek, and the historical impacts in
15 this community of both from a justice
16 perspective and an environmental perspective.
17 We look at the triple bottom line impacts in
18 this community. And so I have had the, the
19 most wonderful opportunity to interface with an
20 entire faculty that now is talking about
21 Gadsden Creek ---

22 **MS. SHAHID:** Objection, Your Honor. That's hearsay.

23 **MR. CUNNINGHAM:** I don't think she's said anything.
24 She just said that they are talking. She
25 hasn't uttered the statements that are ---



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1 **THE COURT:** Yes, let's see.

2 **MS. SHAHID:** They are talking about.

3 **THE COURT:** Yeah, she was right there. Overruled.

4 A: So as part of my ---

5 Q: Let me just, let me just caution you to not
6 utter any statements that were made out of
7 court by someone else, okay?

8 A: I understand. Thank you.

9 Q: Okay. So you were talking about ---

10 A: So as part of our -- as part of my course at
11 the College of Charleston, we -- it involves
12 faculty meetings where we discuss specific
13 issues of impact in our community. And Gadsden
14 Creek is the case study from my course.

15 Q: Are you aware of any other College of
16 Charleston professors doing any research at
17 Gadsden Creek?

18 A: Yes. At least two. Dr. Tim Callahan and Dr.
19 Barbara Beckingham. Since coming into a
20 relationship with the situation and the creek
21 by inter- -- by interacting with me and my
22 students, now use Gadsden Creek as an outdoor
23 environmental science classroom themselves.

24 Q: Are you aware -- well, first of all before we
25 do that. I'm going to hand you what's been



1 marked Exhibit 5, Ms. -- Dr. Koester. Can you
2 take a look at that? Do you recognize that
3 photograph?

4 A: Yeah. These are my buds.

5 Q: What, what is that a photograph of?

6 A: These are my second grade friends at Mitchell
7 Elementary. So during the pandemic, their
8 teacher had heard of the work that I was doing
9 there and he said, Dr. Koester, could you ---

10 Q: Now, now, again ---

11 **THE COURT:** Yeah ---

12 A: I'm sorry, what did I do wrong?

13 Q: You can't, you can't repeat what someone else
14 said out of court. No, you can't ---

15 A: I received an e-mail -- please help me if I do
16 this wrong.

17 Q: She will.

18 (Laughter)

19 A: I received an e-mail from a teacher at Mitchell
20 asking me if I would teach ---

21 **MS. SHAHID:** Your Honor, I object.

22 **THE COURT:** I sustain that.

23 Q: It, it ---

24 A: Oh my gosh. I'm sorry.

25 Q: All right. It, it, it's ---



1 A: Okay. So, I full ---

2 Q: No, wait, wait, wait. You just need to wait on
3 me to ask a question.

4 **THE COURT:** Yeah ---

5 A: Okay. My bad.

6 **THE COURT:** --- listen to his questions and answer
7 those questions.

8 **DR. KOESTER:** You can tell I've never done this
9 before.

10 Q: All right. So was there occasion by which you
11 came to teach students at Mitchell Elementary
12 school?

13 A: Yes.

14 Q: Okay. And is that a picture of you and the
15 students you have at Mitchell Elementary ---

16 A: Yes.

17 Q: --- School? What -- approximately how long ago
18 was that picture taken?

19 A: Last year.

20 Q: All right. Does that fairly and accurately
21 depict you and the students at Mitchell that
22 you have taught at Gadsden Creek?

23 A: It does.

24 **MR. CUNNINGHAM:** Okay. We offer Exhibit 5 into
25 evidence at this time, Your Honor.



1 **MS. SHAHID:** No objection.

2 **MR. CHURDAR:** No objection.

3 **THE COURT:** It's admitted.

4 **(Petitioner's Exhibit Number 5 was admitted into**
5 **evidence.)**

6 **Q:** All right. Do you know approximately how many
7 students you have worked with and conducted
8 class or education or educational activities
9 with in the area that you've brought to Gadsden
10 Creek?

11 **A:** I can give you an approximation.

12 **Q:** Okay. How many is that?

13 **A:** We have approximately 190 students at Mitchell
14 Elementary who have all gone into Gadsden
15 Creek. The Charleston County School District
16 recently gave us recognition for that work.
17 Simmons-Pinckney has approximately 290
18 students. Every single one of these students
19 has studied Gadsden Creek as part of their
20 black history month awareness this year. That
21 was their number one focus was the history of
22 Gadsden Creek. And at Burke High School, the
23 entire ninth grade earth science curriculum now
24 features Gadsden Creek as well as their human
25 geography class.



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1 Q: Are you aware of a proposal to fill in and/or
2 excavate a portion of Gadsden Creek and its
3 wetlands?

4 A: Absolutely.

5 Q: When did you first become aware of that
6 proposal?

7 A: I first became aware of that in 2015/16.

8 Q: Did you ever have occasion to attend a public
9 meeting regarding the proposal to fill and or
10 excavate Gadsden Creek?

11 A: I have. I've been to two public meetings.

12 Q: Okay. Did you offer comments at those
13 meetings?

14 A: I did.

15 Q: How long did you have to offer comments at
16 those meetings?

17 A: Only a couple of minutes.

18 Q: Okay. In your opinion -- well, did you observe
19 other entities afforded more time at those
20 meetings?

21 A: Am I allowed to say the event that I was
22 speaking at?

23 Q: Sure, if you were there.

24 A: Yeah, I was there. So this was in August of
25 2019. And it was a South Carolina DHEC public



1 hearing in response to the permit that came out
2 before that requesting the destruction of the
3 creek to develop on top of it. And I reached
4 out to Blair, whose last name I forget.

5 Q: Blair Williams.

6 A: Thank you. To ask what the format of the
7 meeting was. And I was told that Mr. Maher
8 would have a podium, a microphone, and a
9 PowerPoint presentation and an opportunity to
10 present the Development's proposal.

11 Q: Was that was occurred at the public meeting?

12 A: That is what occurred at the public meeting.

13 Q: And do you recall approximately how long Mr.
14 Maher spoke at that public meeting?

15 A: A long time.

16 Q: Longer than you were afforded?

17 A: He had -- it seemed to be an unrestricted
18 amount of time.

19 Q: Now are you aware of whether or not DHEC has
20 issued the critical hearing permit
21 certifications that would allow for the filling
22 and excavation of Gadsden Creek?

23 A: I am aware this has in fact happened.

24 Q: And if the proposed project goes forward as
25 it's currently proposed, will you, as a member



1 of Friends of Gadsden Creek, be harmed?

2 A: Absolutely.

3 Q: How so?

4 A: I hardly know where to begin, but I'll do my
5 best. I think I began my response with an
6 appreciation of what it means to be given
7 access to a sacred space that is the salt
8 marsh. I am working with a group of mostly
9 African-American children who since Jim Crow
10 have historically been cut off from this exact
11 same access. I know that there are hundreds of
12 papers that specifically show ---

13 **MS. SHAHID:** Objection, Your Honor.

14 Q: No, you can, you can talk about your personal
15 concerns. If, if, if you want to say that
16 they're based on your research or your
17 understanding of certain papers. You can't
18 repeat the papers themselves.

19 A: Okay. Sorry.

20 Q: That's okay.

21 A: So ---

22 Q: You can continue.

23 A: Okay. So what I, what I know to be true from
24 working with these students is that I witnessed
25 firsthand the joy and the wonder of what



1 happens when they say, why did nobody tell us
2 this before. How do we not know this was here.

3 Q: Do you have an understanding about whether or
4 not the students you work with, will be
5 positively or negatively impacted by the
6 destruction of Gadsden Creek?

7 A: So just as has been the case since the
8 beginning of this, not only was the creek
9 buried but the history of the creek was buried,
10 too. And that's what the Friends of Gadsden
11 Creek has daylighted. It's been well archived
12 and now more people know. I'd like to quote if
13 I can be allowed to do so ---

14 **MS. SHAHID:** Objection, Your Honor.

15 Q: You can't, I'm afraid.

16 A: I can or I can't?

17 Q: No.

18 A: All right.

19 Q: I'm ---

20 A: Then ---

21 Q: --- afraid not.

22 A: --- I will -- what I will try to say is as an
23 educator, what I know to be true -- am I
24 allowed to say that?

25 **THE COURT:** We'll find out.



1 (Laughter)

2 A: Okay. What I know to be true is that a student
3 will not say they want to protect something or
4 love something that they don't know about. But
5 when a student comes to understand, say a salt
6 marsh, they go, oh, that's why it matters. And
7 it's through the act of teaching and learning
8 and coming into a relationship with this thing
9 called the salt marsh, that that feeling of
10 love for an affinity arises.

11 Q: Do you have any other concerns now if, if this
12 project goes forward? Any other personal
13 concerns?

14 A: I have some significant personal concerns as
15 they relate to my own expertise and training as
16 a biologist and ecologist and water quality
17 specialist.

18 Q: And what are those concerns?

19 A: My concerns are what is, are what has already
20 been laid out in the expert testimony.

21 **MS. SHAHID:** Your Honor, I object. She's not been
22 qualified as an expert witness. I don't think
23 this Court needs for her to recite what was
24 laid out in the testimony that we received this
25 morning.



1 **MR. CUNNINGHAM:** I don't think she's going down --
2 she's going to say -- well, you tell me. I
3 think she's just gonna say that they've already
4 been conveyed.

5 A: Right. That's all. I was going to say I
6 didn't need to even say those things.

7 **THE COURT:** Okay.

8 A: So I guess one of my biggest concerns is this
9 proposal to put in a freshwater wetland, which
10 I've studied in great detail with my own
11 expertise. And I know ---

12 **MS. SHAHID:** Objection, Your Honor. I don't believe
13 she's ---

14 **THE COURT:** She studied with her expertise.

15 **MR. CUNNINGHAM:** Well ---

16 **THE COURT:** Yeah.

17 **MR. CUNNINGHAM:** She can say that she's concerned
18 about it maybe because of it, but you can't
19 tell exactly why ---

20 **THE COURT:** But that was -- let's go back to what we
21 started earlier with the -- her just testifying
22 to her personal observations.

23 **MR. CUNNINGHAM:** I, I think she ---

24 **THE COURT:** And I don't, I don't want to tell you
25 how to ask your questions.





1 im- -- impervious surface removing the, the
2 filtration of pollutants that would occur in a
3 wetland.

4 Q: Okay. All right. Now, ---

5 A: And I am significantly concerned about the
6 psychological costs ---

7 **MS. SHAHID:** O- -- o- -- objection, Your Honor. I
8 don't think she's qualified to testify about ---

9 A: To my students ---

10 Q: Hold on. She made an objection.

11 **THE COURT:** I don't know that that requires
12 expertise. She's just expressing her concerns
13 about -- I'll overrule that.

14 **MR. CUNNINGHAM:** Thank you, Your Honor.

15 Q: You, you ---

16 A: So I'm very worried about my students because
17 I have students at Burke that say, Dr. Koester,
18 nobody cares about us. And then I have to
19 stand before them as an adult to say, you know
20 what. We got to keep trying. Nothing changes
21 if nothing changes. So I do worry about my
22 students.

23 Q: That's one of your concerns that ---

24 A: Yeah.

25 Q: --- this project ---



1 A: As, as, as a mother and as a teacher -- in, in
2 South Carolina, the teachers are in parentis
3 loci [sic]. We stand in place of their parents
4 when we are there with them.

5 Q: Now, you -- are you aware of any flooding in
6 the project area?

7 A: I am.

8 Q: And have you seen or witnessed the effects of
9 flooding on your students?

10 A: Yeah. For sure.

11 Q: Okay. And what have you observed in that
12 regard?

13 A: The students call it the nasty water. There's
14 a -- what happ- -- there's a storm -- excuse
15 me, a sewage system right next to the
16 stormwater removal on Fishburne and it's gross
17 there when it -- when this -- when that thing
18 all comes together. It, it is nasty.

19 Q: Do you -- would you like to see flooding
20 addressed in this area?

21 A: Oh, yes. Definitely.

22 Q: At the cost of the creek?

23 A: No. That wouldn't make sense.

24 Q: Thank you very much, Dr. Koester.

25 **DR. KOESTER - CROSS-EXAMINATION BY MS. SHAHID:**



1 Q: Good afternoon, Dr. Koester.

2 A: Hi.

3 Q: You live in the 20407 zip code, correct?

4 A: That's correct.

5 Q: That's several miles from the project site,
6 correct?

7 A: It is.

8 Q: You've never lived in the west side of
9 Charleston or anywhere around the project site,
10 correct?

11 A: No, ma'am.

12 Q: And I took your deposition and -- or I was
13 present for your deposition. One or the other.
14 I remember you expressing concern that racially
15 segregated schools bear a disproportionate risk
16 of flooding. Is that a position that you take?

17 A: It's not only a position, it's been borne out
18 in literature.

19 Q: Okay. And we're talking about Title I schools
20 like Burke, like the Charleston Development
21 Academy where I think you do some work, all in
22 the vicinity of WestEdge.

23 A: If I might be allowed to expand ---

24 Q: Yes.

25 A: --- James Simons, Sanders-Clyde, have the exact



1 same kind of sunny day flooding for the same
2 reasons.

3 Q: Schools on the peninsula.

4 A: That's correct.

5 Q: And that's a -- you would agree that's a
6 negative for residents and students in that
7 area.

8 A: I would say sunny day flooding is a negative
9 for any child or parent trying to come to and
10 from school on the Charleston peninsula. And
11 that it is not unique to the Gadsden Creek
12 schools.

13 Q: And you also expressed concerns about flood
14 risks specifically for African-American
15 citizens who may not have the same swimming
16 skills as other citizens. Do you remember
17 that?

18 A: Absolutely. Am I allowed to expand on my ---

19 Q: Sure.

20 A: --- answer? So Jim Crow laws cut off access to
21 African-Americans to pools, access to swim
22 instructions, and beaches. And now we have the
23 U.S. Swim Foundation. We have seven times
24 greater risk of accidental drowning deaths
25 among black children and youth than white. And



1 so, yes, that is a significant part of the
2 resilience work that we're doing is to create
3 more opportunities for water safety instruction
4 for all students.

5 Q: And you would agree with me that flood waters
6 in a community where there might be a lack of
7 swimming schools could be a negative effect.

8 A: Absolutely.

9 Q: And I believe you s- -- stated earlier when we
10 took your deposition that you were aware that
11 there's approximately a hundred acres that was
12 filled by the City with municipal waste, is
13 that correct?

14 A: It is my understanding that not only was the
15 Gadsden Creek watershed filled with municipal
16 waste but so were virtually all other salt
17 marshes on the peninsula of Charleston.

18 Q: Okay. But you understand, and in this
19 particular instance, at the WestEdge project
20 site there's still exposed waste.

21 A: It is my understanding and my observation that
22 I have walked every inch of that creek and I've
23 seen a few areas where there are eroded spots.
24 And in those spots is where the creek is the
25 narrowest and if you under- -- if -- the



1 physics will tell you that where a channel is
2 narrow, you have much more force of the fluid
3 through it. So where the channel is narrowest
4 you're gonna have the greatest erosional force.
5 So yes, in specific spot areas I've seen some
6 tires and shoes and bottles sticking out of
7 edge of the cap.

8 Q: And I don't think that you would disagree with
9 the statement that flood waters have some level
10 of contamination.

11 A: All flood waters in Charleston, South Carolina
12 have contamination.

13 Q: And the flooding is significant enough in the
14 project area that you avoid areas of the
15 peninsula when there's significantly high
16 tides.

17 A: I try not to go down to the peninsula when
18 there's signafly [sic] -- significantly high
19 tide.

20 Q: But you would agree with me that Gadsden Green
21 residents and west side residents can not avoid
22 it as easily as you can.

23 A: Nor can the residents on the east side avoid
24 it.

25 Q: Hold on just a minute. I'm going to consult



1 with my co-counsel. That's all I have. Thank
2 you.

3 **MR. CHURDAR:** I have just a couple, Your Honor.

4 **THE COURT:** Okay.

5 **DR. KOESTER - CROSS-EXAMINATION BY MR. CHURDAR:**

6 Q: Good afternoon ---

7 A: Good afternoon.

8 Q: --- Dr. Koester. My name is Brad Churdar and
9 I am one of the attorneys with DHEC with OCRM,
10 so. I just have a couple follow-up questions.
11 This, this may have been obvious or assumed,
12 but it would be -- would it be fair to say that
13 your background is in the educational field,
14 particularly in teaching science and in ---

15 A: I have an advanced degrees in biology.

16 Q: Okay. But, but I guess what I'm getting at is
17 you're not -- y- -- you don't have any degrees
18 in, in engineering or stormwater management or
19 anything like that.

20 A: I have specific training and certification in
21 water quality and in some cases stormwater
22 management. I also have specific training from
23 the National Disaster Preparedness Center on
24 coastal hazard risk. And a lot of these topics
25 sort of intersect with that.



1 Q: Okay.

2 **THE COURT:** You ---

3 A: So I ---

4 **THE COURT:** --- need to answer this question though.

5 **DR. KOESTER:** Did I not?

6 Q: Well, I, I had specifically said y- -- you do
7 not -- my understanding is you do not have a
8 degree in engineering or ---

9 A: I do not have a degree in ---

10 Q: --- or an official license or anything ---

11 A: I ---

12 Q: --- in stormwater management or anything like
13 that.

14 A: I do not.

15 Q: Okay. And in your deposition you had testified
16 that Gadsden Green is going where it has always
17 gone. Is it your testimony that Gadsden Green
18 -- excuse me, Gadsden Creek, that is what I
19 meant. Is it your testimony that Gadsden Creek
20 is in its original location right now where it
21 is?

22 A: So what is left of Gadsden Creek I would say is
23 where it's always been.

24 Q: Okay. We've talked about your -- what you've
25 reviewed -- the documents you've reviewed.



1 Other than the -- for, for this project. Other
2 than the water quality studies provided as part
3 of this permit application, would it be fair to
4 say that you're unaware of any other wal- --
5 water quality studies?

6 A: Water quality studies in Gadsden Creek?

7 Q: Correct.

8 A: Am I unaware of -- so I have personally
9 reviewed two water quality studies of Gadsden
10 Creek. If there are more than two, then no, I
11 don't know of them.

12 Q: And, and those are the ones associated with
13 this project that we're -- correct?

14 A: I have reviewed the, the Terracon site that was
15 submitted to city council and I have thoroughly
16 reviewed the Dell site that was presented at
17 city council.

18 Q: Okay. And, and my question was beyond those,
19 you've not reviewed any other water quality ---

20 A: No, ---

21 Q: --- studies ---

22 A: --- sir. I have not.

23 Q: Okay. Now, as far as what you have done or I-
24 -- I- -- used for your own personal
25 recreational enjoyment of Gadsden Creek, would



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1 it be fair to say that what you, what you do
2 would be going and enjoying or just -- I don't
3 know, you said settling yourself. I mean,
4 like, you don't do fishing or kayaking or
5 anything like that, correct?

6 A: I'm an avid kayaker. I ---

7 Q: In Gadsden Creek?

8 A: Not in Gadsden Creek. I do not have the
9 physical strength to carry my boat across four
10 lanes of highway on Hagood. But I would if I
11 could.

12 Q: Okay.

13 A: 'Cause I think it would be super cool to do
14 that.

15 Q: So your, your, your recreational activities
16 would, would not include fishing or kayaking,
17 true?

18 A: If I could some- -- get somebody to help me
19 with my kayak I would be in there in a minute.

20 Q: That's all the questions I have. Thank you.

21 A: You're welcome.

22 **MR. CUNNINGHAM:** No follow-up, Your Honor. May you
23 excuse -- may we excuse Dr. Koester?

24 **THE COURT:** Yep.

25 **MR. CUNNINGHAM:** Any objection?



1 **MS. SHAHID:** No objection.

2 **MR. CUNNINGHAM:** Thank you, Your Honor. Thank you,
3 Dr. Koester. Your Honor, can we take about a
4 10-minute break to get the next witness set up?
5 She's going to require some tech support and
6 we're gonna have to ---

7 **THE COURT:** Okay.

8 **MR. CUNNINGHAM:** --- manage around here.

9 **THE COURT:** I wasn't sure what you meant. Okay.
10 Thank you.

11 **MR. CUNNINGHAM:** Thank you, Your Honor.

12 **(Off the record from 2:57 p.m. until 3:14 p.m.)**

13 **THE COURT:** I said y'all could be seated.

14 **MR. CUNNINGHAM:** Okay, Your Honor. Petitioner calls
15 Christina Butler to the stand.

16 **COURT REPORTER:** Could you raise your right hand,
17 please. Do you solemnly swear the following
18 testimony to be the truth, the whole truth, and
19 nothing but the truth, so help you God?

20 **MS. BUTLER:** I do.

21 **CHRISTINA BUTLER,** having been duly sworn, testifies
22 as follows:

23 **MS. BUTLER - DIRECT EXAMINATION BY MR. CUNNINGHAM:**

24 **Q:** Good afternoon, Ms. Butler. Please state your
25 name for the record.



- 1 A: Christina Rae Butler.
- 2 Q: Where do you live?
- 3 A: 6 Hampton Court, Charleston, South Carolina
- 4 29403.
- 5 Q: How long have you resided in Charleston?
- 6 A: Since 2004.
- 7 Q: Always downtown?
- 8 A: Always downtown.
- 9 Q: How are you employed?
- 10 A: I'm a professor of historic preservation and
- 11 architectural history at American College of
- 12 the Building Arts. I'm an adjunct professor of
- 13 historic preservation at College of Charleston.
- 14 And I own a small preservation consulting
- 15 business doing historic property research.
- 16 Q: Can you give me a little brief snippet of your
- 17 educational background?
- 18 A: Yes. Initially went to trade school for
- 19 construction and then had some course work in
- 20 civil engineering before switching majors. My
- 21 undergraduate work is in historic preservation
- 22 and my master's is in American history.
- 23 Q: Where did you receive your master's?
- 24 A: The Citadel.
- 25 Q: What was your thesis? Master's thesis?



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1 A: My thesis was called Prejudicial to the Public
2 Health: A History of Land Reclamation and
3 Drainage in Charleston 1836 to 1940.

4 Q: Are you a member of any professional
5 organizations?

6 A: I am. Preservation Society, National Trust for
7 Historic Preservation, South Carolina
8 Historical Society, Association for
9 Preservation Technology. A host of similar
10 preservation organizations.

11 Q: And what courses do you teach in your role as
12 a professor at the American College of Building
13 Arts and the College of Charleston?

14 A: I teach architectural history. So survey
15 courses from pre-history to the present. And
16 then as a historic preservation professor, I
17 teach a research methods class, helping
18 students document the history of the built
19 environment and communities. I teach
20 preservation theory and practice, which looks
21 at preservation law, pulling permits, community
22 development. I teach building pathology, which
23 is specific to how buildings were built and
24 material analysis. And vernacular
25 architectural history.



1 Q: So as part of your teaching duties, you teach
2 students how to do historical research, is that
3 right?

4 A: Yes, sir.

5 Q: And documentation of that research?

6 A: Yes, sir.

7 Q: And specifically wh- -- what all is entailed in
8 that methodology?

9 A: So the methodology for historic preservation is
10 typically a deep dive into first secondary
11 research, what's already been said about a
12 building or a community. And the answer is
13 usually pretty perfunctory. So next, the
14 students are required to dig into primary
15 source research. So typically we look at
16 sources like deeds, historic maps, plats,
17 occasionally city council records, manuscript
18 records left my businesses, family documents,
19 genealogical records like the census, city
20 directories.

21 Q: And there are others that you investigate.
22 That's ---

23 A: Yes.

24 Q: --- not an exhaustive list.

25 A: Those are the main ones.



1 Q: Have you published any articles?

2 A: I have. Let's see. Can I mention the book
3 first?

4 Q: Well, we're gonna get to that.

5 A: Okay. Okay. So ---

6 Q: What about your articles first.

7 A: Ha- -- articles -- so I published a series of
8 non peer-reviewed articles for a blog for a
9 real estate company. And basically the gist of
10 those is highlighting different neighborhoods
11 in Charleston, you know, amenities, what's it
12 like to live there today, but more importantly,
13 the history of those communities. So analyzing
14 the architecture, when those places were first
15 developed.

16 Q: What about any books?

17 A: So the principal book of relevance to this case
18 is called *Low Country at High Tide* and it's a
19 deep dive into the history of land reclamation,
20 drainage, and flooding in Charleston. And the
21 time period for that is 1680 to the present.
22 That book is with the University of South
23 Carolina Press, published June 2020 and it is
24 an academic press so that book was peer-
25 reviewed by engineers, historians, people of



1 relevance in those fields.

2 Q: Do you know whether or not that book has been
3 used by the Army Corps of Engineers in any
4 educational courses?

5 A: It has. Army Corps Charleston District used it
6 last summer, yeah, 2021 as part of their summer
7 study course work. So they had their members
8 purchase the book and then they asked me to put
9 together study questions so that they could do
10 field walks in downtown Charleston and look at
11 cause and effect of flooding and
12 infrastructure.

13 Q: Have you ever been invited to lecture regarding
14 your findings or conclusions of that book?

15 A: I have. I've spoken at preservation
16 conferences that specifically deal with rising
17 sea levels and their impacts on the built
18 environment. I've lectured at MUSC for public
19 histories -- I'm sorry, public health students,
20 at College of Charleston for public history
21 students. I've spoken to NOAA, Charleston
22 Chapter. And a host of other just community
23 groups who are interested in learning more
24 about the city we live in.

25 Q: And just for the record NOAA is?



1 A: I'm sorry. National Ocea- -- I can never --
2 Oceanic Atmospheric Administration.

3 Q: Correct.

4 A: Ugh.

5 Q: You got it.

6 **THE COURT:** She didn't speak to the other Noah
7 related to floods.

8 **MR. CUNNINGHAM:** Well, that's why I wanted the
9 record to be clear, Your Honor.

10 Q: So let's talk about the research that went into
11 that book. How long did that take?

12 A: About 12 years.

13 Q: 12 years. And what kind of sources did you
14 consult and rely upon in authoring that?

15 A: So it, it was an interesting book in that it's
16 a history book, but I had to look at a lot of
17 engineering sources as well to be able to make
18 sense of what was done in the past. So one of
19 the most useful sources was city council
20 minutes. I looked at about 180 years of those
21 for discussion of flooding, sea walls,
22 drainage, filling streets, compelling private
23 owners to fill areas that were at risk of
24 flooding. City engineer documents that are
25 held by the City of Charleston. Those include



1 city engineer's plats, day books from their
2 survey work at different parts of the city in
3 the past. I looked at contracting records for
4 private firms that the City contracted with,
5 like Simmons Mayrant, Coral Big Brothers.
6 Those are historic, historic records that the
7 South Carolina Historical Society -- and I did
8 a lot of demographic research as well to look
9 at who lived in communities and how people were
10 impacted disproportionately by flooding
11 improvements.

12 Q: Okay. Did your demographic research spread out
13 across the entirety of the peninsula of
14 Charleston?

15 A: It more so looked at specific areas but areas
16 throughout the peninsula.

17 Q: Was one of the areas that you looked at the
18 area where this proposed project is situated?

19 A: It was.

20 Q: That's the Gadsden Creek, Gadsden Green
21 community?

22 A: Yeah, west side, Gadsden Green area.

23 Q: And since the public -- well, first of all,
24 the, the sources you consulted that you just
25 mentioned, are those the types of sources that



1 a historian typically consults when you're
2 trying to determine historical currents and
3 draw conclusions historically speaking about
4 events that occurred in the past?

5 A: They are. We typically use them for area
6 character, appraisals. We use them when we're
7 doing house histories, urban planning
8 documents, and historical studies.

9 Q: And also historical studies like your book, is
10 that correct?

11 A: Yes, sir.

12 Q: Since the publication of the book, have you
13 researched further any of the community
14 components or practices of the west side
15 communities living in proximity to Gadsden
16 Creek with historical aspects of that?

17 A: I have done some. I hope to do a second volume
18 of this 30 years from now so I continue to do
19 research and looking at current projects. And,
20 of course, in preparation for this testimony I
21 went back in my notes because the book is about
22 250 pages long, but I have thousands of pages
23 of notes. So I did go back through and pull
24 things specific to our target area that I had
25 researched in preparation for the book.



1 Q: And are those notes that you relied upon in
2 forming your opinions here? Were those based
3 upon a concentration of the sources you just
4 mentioned earlier?

5 A: Yes, sir. The same sources that I used for the
6 book research.

7 Q: Have you done any informal or formal consulting
8 for the City of Charleston or other entities?

9 A: I have. I do consulting for development firms,
10 real estate agents. I also do a lot of just
11 pro bono consulting. So the City of Charleston
12 will occasionally send an e-mail and ask do you
13 have a plat, do you know anything about this
14 part of the city. I recently consulted with a
15 preservation society for NoMo, which is the
16 upper peninsula district. I'm probably going
17 to blank on the name of the engineering firm
18 that's currently working on the drainage
19 infrastructure upgrade between Cannon and
20 Spring, but they were running into debris when
21 they were driving piles and they asked, do you
22 know why. And I shared documents with them.

23 Q: Now, does -- you mentioned that one. Now, you
24 live downtown. Have you made personal
25 observations about flooding that you've seen in



1 downtown since you reside there?

2 A: Yes.

3 Q: Has that been since 2004?

4 A: Yes.

5 Q: And you've also researched historically where
6 you -- where other incidences of flooding have
7 been documented?

8 A: Yes. I think most people flee areas that
9 flood. I'm a cyclist so I bike to them so I
10 can take pictures for documentary purposes. So
11 pretty much from moving here in 2004, I've been
12 researching flooding and reclamation.

13 Q: Have you on occasion to be near the proposed
14 project area?

15 A: Yes, just passing through, you know, as a
16 cycling commuter.

17 Q: Have you observed flooding in that area?

18 A: I have.

19 Q: Have you observed any- -- anybody doing -- any
20 enjoying Gadsden Creek in any fashion?

21 A: I have.

22 Q: What have you observed people doing with
23 respect to Gadsden Creek?

24 A: Like myself, just stopping when walking or
25 biking and viewing the creek, enjoying the



1 water. I've seen people fishing there.

2 **MR. CUNNINGHAM:** All right. At this time, Your
3 Honor ---

4 Q: Well, I'm going to hand you Exhibit 2. Take a
5 look at that. Have you seen Exhibit 2 before?

6 A: Yes, it's my CV.

7 Q: Okay. Is that fairly and accurately recount
8 your professional experience and education?

9 A: It does. And I was nervous when we started and
10 forgot to mention some articles of relevance.
11 So I'm gonna ---

12 Q: Okay. Well, let me, let me ask you ---

13 A: Okay.

14 Q: Are there, are there other articles listed in
15 your CV that you rely upon for your opinions in
16 this matter?

17 A: There are.

18 Q: And what articles have you written?

19 A: I've written short articles for Kiawah Legends
20 and for Charleston City Paper about historic
21 filling in Charleston.

22 **MR. CUNNINGHAM:** Okay. All right. At this time we
23 offer Exhibit 2 -- well, first of all -- yeah
24 -- or whenever that -- we offer Exhibit 2 into
25 evidence at this time, Your Honor.



1 **MS. SHAHID:** No objection.

2 **MR. CHURDAR:** No objection.

3 **THE COURT:** Admitted.

4 **(Petitioner's Exhibit Number 2 was admitted into**
5 **evidence.)**

6 **MR. CUNNINGHAM:** And at this time we'd offer
7 Professor Butler as an expert in cultural,
8 historical and societal aspects of filling
9 practices and consequences therefrom in the
10 City of Charleston.

11 **MR. TRAYNHAM:** What were those?

12 **MR. CUNNINGHAM:** An expert in cultural, historical
13 and societal aspects of filling practices and
14 consequences therefrom in the City of
15 Charleston.

16 **MS. SHAHID:** Voir dire, Your Honor?

17 **THE COURT:** Yeah.

18 **MS. BUTLER - VOIR DIRE BY MS. SHAHID:**

19 Q: So the what -- the way I understand this, Ms.
20 Butler, is -- that you published a book about
21 the practice of filling through the development
22 of Charleston itself over many years, correct?

23 A: Yes. The book covers about 350 years.

24 Q: Okay. And you based that on your review of
25 public historical records?



1 A: Yes, ma'am.

2 Q: Okay. And Mr. Cunningham has offered you as an
3 expert in cultural and societal aspects of
4 filling and the consequences of filling,
5 correct?

6 A: Yes.

7 Q: Okay. And as you understand your role, and
8 I've seen a PowerPoint presentation that you
9 put together, you're going to be showing the
10 Court different historical documents that may
11 or may not reflect your description of them in,
12 in terms of filling and building.

13 A: The PowerPoint is intended to show examples of
14 areas that have been filled in the past and
15 that subsequently flood.

16 Q: Okay. And you consider yourself a historian.

17 A: Yes.

18 Q: All right. And you're familiar with the South
19 Carolina State Historic Preservation Officer?

20 A: Yes.

21 Q: And that's with the South Carolina Department
22 of Archives and History?

23 A: Yes.

24 Q: Okay. And you understand the role in
25 permitting that the SCHPO or the preservation



1 officer performs?

2 A: I do.

3 Q: And that they review all permits for the Corps
4 and for DHEC and if they've got any objections,
5 they file them with the Corps and DHEC?

6 A: In theory, yes.

7 Q: Okay. And on a regulatory basis that's the
8 resource that regulators rely on. Would you
9 make an understanding of that?

10 A: Yes.

11 Q: Okay. And I've read, read your book. I have
12 a copy of it here. And what's interesting is
13 when I go to the index, there's no reference in
14 this book to culture. This book wasn't really
15 -- and this research wasn't really directed at
16 culture, was it?

17 A: You can't divorce the humans who live in a
18 community and their culture from the built
19 environment and its obliteration or alterations
20 over time. The two go hand-in-hand.

21 Q: Is this an accurate definition of culture, the
22 customs, the art, the social institutional, and
23 the achievements of a particular social group?
24 Does that how you would understand culture?

25 A: I would.



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1 Q: Okay. You don't live in the west side.

2 A: I don't. I live in the east side.

3 Q: You don't live in the Gadsden Green community.

4 A: I do not.

5 Q: You haven't met all of the residents of Gadsden
6 Green.

7 A: I've met some but not all by any stretch.

8 Q: And you're not familiar with -- when you speak
9 of culture, are you limiting it to the culture
10 that you have determined from historical
11 records? Are you trying to extend that culture
12 to the community today?

13 A: Mostly historic. I mean, that's what I am.
14 I'm a historian. I'm not an anthropologist
15 who's interviewing people in the community
16 today. But I can make visual observations of
17 people still utilizing that waterway, you know,
18 cultural historic maritime activities still
19 taking place.

20 Q: And basically you're gonna show histories of
21 land transactions and old plats and old maps?

22 A: Yeah, I, I didn't put any deeds in because no
23 one wants to read those, but I have visuals.
24 Things like maps and plats to help non-
25 Charleston folks understand which parts of the



1 peninsula have been altered over time.

2 **MS. SHAHID:** Your Honor, is this the appropriate
3 time for me to address you about her
4 qualifications or do you want to wait for Mr.
5 Churdar?

6 **THE COURT:** Mr. Churdar?

7 **MR. CHURDAR:** Your Honor, I don't have any voir dire
8 but ---

9 **THE COURT:** Okay.

10 **MR. CHURDAR:** --- I d- -- I did have ---

11 **THE COURT:** Okay. I'll ---

12 **MR. CHURDAR:** --- I'll just wait for you to make your
13 ---

14 **THE COURT:** I'll hear your objections and then ...

15 **MS. SHAHID:** Okay. First of all, Your Honor, if you
16 look at the rule, which I just had open in
17 front of me and then closed. I don't believe
18 that she -- that the facts that she is
19 discussing require expert opinions to be
20 presented. It's -- these are -- there's,
21 there's nothing about these -- this set of
22 facts that needs to be explained. There's a
23 history of filling. There's a history of
24 flooding. There's a history of many people
25 being affected by it. I don't understand the



1 need or the appropriateness for expert
2 testimony on this issue. But if this court
3 determines that this is appropriate topic for
4 expert testimony, and she's the appropriate
5 expert, I do not believe she's qualified based
6 on my voir dire to speak to any cultural
7 aspects of the community around the WestEdge
8 project as it exists today.

9 **THE COURT:** Mr. Churdar?

10 **MR. CHURDAR:** And, Your Honor, this runs fairly
11 parallel to what Ms. Shahid has said. But I--
12 -- I'm, I'm not sure what the societal aspects
13 of filling practices would be. I, I am not
14 quite sure what that is. I think that the
15 history is, is just a lot, a lot of experience
16 involving qualifications on that, but I don't
17 know what societal aspects of filling practices
18 would be. So I would object just based on, on
19 that.

20 **MR. CUNNINGHAM:** All right. Your Honor, first to
21 addre- -- address Ms. Shahid's comment about
22 how this isn't top pere- -- expert testimony
23 now -- I- -- I- -- I- -- it's not -- and we
24 have to have someone -- a time traveler --
25 because she has to review documents -- and



1 that's what she pressed about to -- that she
2 reviews documents, as historians normally do,
3 to find out about fill practices that happened
4 well before she was born ---

5 **THE COURT:** You're -- if I could stop you a second.
6 She can come in and testify about, about the
7 documents she's found. Maybe being an expert
8 gives her credibility as to the documents she's
9 found. But the whole purpose of having someone
10 qualify as an expert is to testify in the form
11 of an opinion, or otherwise -- I don't know
12 what otherwise is, but that's what the rule
13 says. So where -- what would she be giving her
14 opinions about in this case?

15 **MR. CUNNINGHAM:** I'm happy to address that, Judge.
16 She would be giving opinions about based on her
17 historical research, filling has occurred in
18 this area and there were ---

19 **THE COURT:** That's a -- need to be a fact. That's a
20 ---

21 **MR. CUNNINGHAM:** Well, she's giving an opinion about
22 -- based upon that th- -- that filling
23 occurring here was later documented that showed
24 flooding in that same area where the filling
25 was.



1 **THE COURT:** Well, I don't think I've heard any
2 expertise on that. She can give the filling
3 has occurred in this area and based on the
4 documents that I have reviewed, I have seen
5 flooding on the areas. So that would follow
6 the lines of what she is -- has observed on the
7 documents. But it would not, should not be an
8 opinion. It should be factual.

9 **MR. CUNNINGHAM:** Well -- okay, okay, yeah.

10 **THE COURT:** So keep on going. If you've got another
11 one ---

12 **MR. CUNNINGHAM:** Well, that's essentially -- I- --
13 I- -- it's, it's still evidence. All of it's
14 evidence.

15 **THE COURT:** Yeah.

16 **MR. CUNNINGHAM:** If you, if you -- it's opinion
17 versus fact, you know. It's factual, that's
18 great. Facts are wonderful for us.

19 **THE COURT:** Actually, they're stronger.

20 **MR. CUNNINGHAM:** Exactly, Your Honor. So, you know,
21 I don't really have a problem, but I, I do
22 think that Professor Butler's expertise is
23 necessary in order to one, determine which
24 documents am I going to review and are these
25 the kinds that normally are relied upon ---



1 **THE COURT:** I'll grant you that.

2 **MR. CUNNINGHAM:** And then to draw from that
3 conclusions based upon those particular
4 documents to -- okay. These other documents
5 also show flooding. And also her own personal
6 observations living in Charleston. She, she
7 can connect up where she has observed flooding
8 based upon the historical record as well.

9 **THE COURT:** All right. So what do you want to
10 qualify as an expert, again?

11 **MR. CUNNINGHAM:** Cultural, historical, societal
12 aspects of filling practices and consequences
13 therefrom in the City of Charleston.

14 **THE COURT:** I don't know about cultural? That's --
15 whether she is -- I guess if her -- I don't
16 know if I've heard enough ex- -- testimony
17 about the cult- -- culture aspect that this
18 cre- -- filling practices and resulting
19 flooding. I'll qualify her as an expert in
20 history in that area.

21 **MR. CUNNINGHAM:** Thank you, Your Honor.

22 **THE COURT:** Cultural, let's just move down the path
23 and see what happens.

24 **MR. CUNNINGHAM:** So is Your Honor withholding ruling
25 at this point ---



1 **THE COURT:** Yeah.

2 **MR. CUNNINGHAM:** --- on it? Okay, Your Honor. I
3 think it will be pretty clear in the course
4 exactly what we're talking about when we're
5 talking about ---

6 **THE COURT:** That's all that matters.

7 **MR. CHURDAR:** Your Honor, on- -- one question of
8 clarification. Mr. Cunningham talked about
9 when she gives testimony as to fill that has
10 been done -- and I don't know what your, what
11 your ruling was as to whether she can go on
12 the cause and effect as that's the cause of
13 flooding here. Did, did ---

14 **THE COURT:** My, my diatribe with him was that -- it
15 should indicate that I don't think that that
16 would be something that would be within her
17 expertise.

18 **MR. CHURDAR:** Okay.

19 **MR. CUNNINGHAM:** Exactly, Your Honor. And that's
20 not what she's going to testify to the cause of
21 the -- she's gonna as- -- testify this is where
22 filling occurred historically and historically
23 speaking, this is where fill -- or flooding has
24 been reported in relation to it.

25 **MR. CHURDAR:** Okay. Thank you.



1 **MR. CUNNINGHAM:** Mr. Robinson already ---

2 **THE COURT:** Hence ---

3 **MR. CUNNINGHAM:** --- testified ---

4 **THE COURT:** --- the ---

5 **MR. CUNNINGHAM:** --- about that ---

6 **THE COURT:** --- comment ---

7 **MR. CUNNINGHAM:** --- anyway.

8 **THE COURT:** Hence the conversation about the facts
9 being stronger.

10 **MR. CUNNINGHAM:** Exactly.

11 **THE COURT:** All right.

12 **MS. BUTLER - DIRECT EXAMINATION BY MR. CUNNINGHAM**

13 **(CONT.) :**

14 Q: All right, Professor Butler. Now, did you
15 prepare slides to help you present your
16 testimony today?

17 A: I did.

18 Q: Okay. And do we have the first slide up on the
19 screen?

20 A: We do.

21 Q: Okay. Let's go to the first slide. All right.
22 What does this slide depict?

23 A: Yes, this is the outline of what I'm going to
24 be speaking to.

25 Q: Okay. And, and what is that? Generally, what



1 topics are you going to address?

2 A: So I'll begin with an overview of areas of
3 Charleston that have been filled. And we'll
4 talk about what materials were used and what
5 some of the motivations were over time for
6 filling and reclamation in Charleston. We'll
7 then look at those same areas and flooding
8 obstacles in those areas historically and
9 today. And then I plan to speak about the
10 historic cultural make-up of Gadsden Green
11 area.

12 Q: Do you have an opinion, to a reasonable degree
13 of professional, historical acc- -- or
14 certainty, about whether there is a history in
15 Charleston of employing various materials to
16 fill marsh and water resources to create land?

17 A: Yes.

18 Q: And what is that opinion?

19 A: Charleston has experienced extensive land
20 reclamation and drainage. Almost 50 percent of
21 the peninsula has been altered by human
22 habitation and filling.

23 Q: Okay. And what is the basis of that, do you
24 know?

25 A: The basis of that is looking at historic maps



1 and plats and government records for the past
2 350 years, and lining up those plats with the
3 physical landscape that exists today.

4 Q: Okay.

5 **MR. CUNNINGHAM:** And can we go to the next slide,
6 please?

7 Q: I think we just -- is that your opinion also?

8 A: It is.

9 Q: All right.

10 **MR. CUNNINGHAM:** Let's go to the next.

11 Q: Now, what does this slide depict?

12 A: So this is called the Halsey Map. It's widely
13 used by preservationists and historians. It's
14 -- was originally published in 1942 by a city
15 engineer called Joseph Needle. And in 1949,
16 1950, other engineers including Mr. Halsey took
17 that map and overlaid historic information onto
18 it. And we won't be speaking to any of that,
19 but the sort of squiggle lines are showing
20 trajectories of fire damage, fortifications,
21 historic events. But what makes it relevant
22 for our purposes is you can see the peninsula
23 roughly as it exists today. This is a circa
24 1950 outline of the peninsula in blue. You can
25 see the Cooper and the Ashley River on each



1 side. And then the colored portion of the map,
2 which is much more amorphous and irregular,
3 shows you roughly what the peninsula looked
4 like in 1680 when people first created Charles
5 Town as an urban settlement. So you can see
6 that there's copious wetlands, salt marshes,
7 tidal creeks across the peninsula.

8 Q: The peninsula no longer looks like that
9 anymore, does it?

10 A: It does not. Most of those are gone.

11 Q: Okay.

12 **MR. CUNNINGHAM:** Let's go to the next slide, please.

13 Q: Okay. Do -- in your research into how filling
14 was conducted historically in Charleston, did
15 you determine what kinds of materials were
16 used?

17 A: I did. Materials vary depending on the time
18 period and material accessibility. Whether
19 there was a railroad to bring materials in or
20 not. And it also varied heavily based on
21 available taxes and price point of different
22 parts of the peninsula. So this slide intends
23 to speak to some of the primary motivations for
24 filling in the City's history. The obvious
25 one, which is still much the case today, is



1 development for profit for more buildable land.
2 That included speculative developments --
3 private speculative developments, but it also
4 included City of Charleston initiatives like
5 Murray Boulevard, which I have a illustration
6 of shortly. It included things like parks as
7 well, such as White Point Garden. That's
8 reclaimed. That was a City project intended to
9 essential create a public amenity.
10 Transportation, because as most of us who have
11 driven in the city know that when it floods
12 it's very difficult. So from the moment of
13 incorporation in 1783, when we became the City
14 of Charleston a municipal entity, one of the
15 main filling motivation became trying to raise
16 road beds and causeways. Both for rail and for
17 carriages and eventually for cars. And also
18 public health, which is much less an issue now
19 that we have sewage treatment facilities. But
20 historically, there was concerns about low
21 lands and mosquitos and, you know, unsanitary,
22 stagnate water.

23 Q: Is there information in the historical record
24 about what types of materials were used to fill
25 land in Charleston?



1 A: There is.

2 Q: And what are those types of materials?

3 A: So the, the basic list is literally anything
4 and everything that was available. Especially
5 if it was available cheaply. Charleston's
6 section of the coast doesn't actually have any
7 made of stone. So when we needed to fill in
8 the past we had to either bring in materials or
9 use organics that were available. So by the
10 20th century, late 19th century, the City was
11 using dredge spoils, you know, pluff mud,
12 dredging for the jetties and basically pumping
13 that onto the peninsula to make made land.
14 They were also using sanitary fill, which is
15 essentially city garbage with, you know,
16 carcasses and some of the more offensive
17 organics pulled out. In the colonial and
18 antebellum era, city refuse included animal
19 carcasses, slaughterhouse remains, you name it.
20 And all of that was deposited into low lands as
21 was saw dust, rice chaff, pretty much anything
22 you couldn't eat or use in another way.

23 Q: Was there a difference, historically speaking
24 as to where certain types of fill were used
25 around different areas of Charleston?



1 A: There was.

2 Q: And what was that based upon to your research
3 and your understanding?

4 A: Based typically on class and tax revenue.

5 **MR. CUNNINGHAM:** Let's go to the next slide.

6 Q: Oh, here we go. Is this just what you were
7 just referring to?

8 A: Yeah, so this is a quick visual example of
9 White Point Garden. That's the picture on the
10 right. So that's an 1830s city-funded
11 reclamation. And next to that on the left is
12 a section plan from 1855 of the battery sea
13 wall after it was needing to be repaired
14 because of a hurricane. So that part of the
15 city, historically south of Broad or ward one,
16 had one of the highest tax revenues. And
17 historically, unlike taxation practices today,
18 if a project was deemed to be beneficial to the
19 entire city, say Broad Street that literally
20 everyone coming and going would need to use,
21 those projects would be paid out of the general
22 revenue. But individual projects that only
23 benefitted specific homeowners or certain areas
24 were paid for basically by assessing homeowners
25 in that area. And what -- and Charleston



1 wasn't unique in that. That's pretty common
2 practice in the 19th century and before. So
3 what that typically meant was if there was a
4 low-lying area that was working class that had
5 low tax assessments, it was frequently not
6 possible to generate enough revenue to use
7 quality materials and do the reclamations
8 correctly. Whereas White Point, which we're
9 looking at pictures of, was reclaimed with
10 clean earth that was shipped in on barge and
11 utilized stone that had to be shipped in from
12 outside as well.

13 Q: Th- -- the distinction of materials at least in
14 your research of the historical record having
15 an e- -- have an effect on how long the fill
16 lasted as far as combating flooding?

17 A: Yes, absolutely. The organics -- and this is
18 something that's played out again and again,
19 the organics will settle more quickly and
20 differentially. Whereas compacted earth or
21 solid stone is going to behave in a more
22 uniform fashion.

23 **MR. CUNNINGHAM:** Go to the next slide, please.

24 Q: This slide is entitled Gadsdenboro, a.k.a.
25 Rottenboro. What's the significance of that?



1 A: So not to be confused with Gadsden Green. The
2 next few slides are just intended to show parts
3 of the city that have been reclaimed or filled
4 over time. Gadsdenboro is one of the first
5 areas to be filled by speculative developers.
6 It's a 1760s iteration and then was completed
7 in the 1780s. It's located -- was located at
8 the east end of Calhoun Street and that
9 neighborhood basically ran from where the
10 Aquarium is today to the Harris-Teeter Concord
11 Washington Street. So what we're looking at is
12 a McCrady plat. He was a surveyor but he also
13 collected plats in the 20th century. So that's
14 a pretty standard citation, but we're looking
15 at the original subdivision plat for a creek
16 and a marsh that were filled by the Gadsden
17 family. And at the top you can see there's a
18 lumber wharf and that the historic creek had
19 been turned into a canal.

20 **MR. CUNNINGHAM:** Let's go to the next slide, please.

21 Q: Is this another example of historic filling
22 essentially?

23 A: It is. So jumping about five or six blocks to
24 the north, Hampstead Village, where I live,
25 which has flooding problems historically was



1 called Hampstead Village. Today it's know as
2 the east side. It, too, was a speculative
3 development, late Colonial era by Henry
4 Laurens. And one of the selling points for
5 this area, interestingly, was waterfront
6 access. And historic newspaper advertisements
7 mention, you know, docks, water access. But to
8 orient you, you can see sort of a square in the
9 middle. That square still exists today, it's
10 called Hampstead Mall and the big road going
11 across the middle is America Street. And the
12 road running down the center on the y-axis is
13 Columbus Street. So you can see a large creek
14 on the right and the larger creek off to the
15 left labeled creek is called Vardel's Creek.
16 Most of those wetlands have been filled and are
17 obliterated but do still vestigially return
18 when it rains.

19 **MR. CUNNINGHAM:** Let's go to the next slide.

20 Q: And again, is this ---

21 A: So ---

22 Q: --- another example?

23 A: It is. So the east side is a fairly large
24 neighborhood. Vardel's Creek is on the
25 northern end close to Lee Street, Shepard



1 Street, Huger Street. So Charleston's original
2 development started, not surprisingly, on high
3 ground close to the Cooper River. And over
4 time as the population grew, development sort
5 of spread or filled in every direction. And by
6 the late 19th century, early 20th, development
7 was moving north. And so the former low lands
8 at the north end of the east side were filled
9 beginning in the 1980s and then right up to
10 post-World War II. And part of that project,
11 what you see on the screen is a city engineer's
12 plat showing Vardel's Creek and a planned
13 channelization or culvertization of that creek.

14 **MR. CUNNINGHAM:** Okay. Let's go to the next slide.

15 A: Okay. Jumping to the ---

16 Q: What is ---

17 A: --- other ---

18 Q: --- this?

19 A: Harleston Village. So jumping to the west side
20 of the peninsula, Harleston is a large, large
21 neighborhood. It includes College of
22 Charleston and extends all the way to the
23 Ashley River. This is an 1872 map. It's a
24 common standard historic source for
25 preservationists. It's digitized and available



1 through Library of Congress. And what you're
2 looking at at the top of the screen are
3 basically rice ponds and lumber ponds, mill
4 ponds if you will, that would've dotted
5 Harleston and the west side, which we'll talk
6 about a few slides up, well into the early 20th
7 century.

8 **MS. SHAHID:** Your Honor. At this point and I
9 haven't had much time with this video. I was
10 running through it on our break, but at, at
11 this point it occurs to me I don't think
12 anything is relevant as relates to the west
13 side or the north side, you know, until we talk
14 about areas in the project area. I believe
15 none of this is relevant to the proceeding.

16 **THE COURT:** I know, I was trying to figure out how
17 any of this could be relevant to the
18 proceeding. Can you, can you ---

19 **MR. CUNNINGHAM:** Sure.

20 **THE COURT:** --- clarify that?

21 **MR. CUNNINGHAM:** Absolutely, Your Honor. What we're
22 talking about right now is Charleston, the
23 city's, history of filling in on the peninsula.
24 And, of course, Your Honor is already aware of
25 filling took place later on in the project



1 area. And that is -- I mentioned in my opening
2 statement yesterday the fact that the City, and
3 we're going to get to this in a moment, the
4 City is aware that when you fill there is
5 flooding that necessarily occurs because the
6 fill doesn't -- it's not -- it's some- -- you
7 just create land and then there's a problem.
8 So what we're talking about now is a history of
9 filling and then flooding and exac- -- that's
10 exactly what happened in this project area.
11 And again, as, as I also mentioned in my
12 opening, there's this, there's this contention
13 of a provision of public benefit. An our
14 contention is the City knew there was a problem
15 with filling and, and did it anyway. And what
16 was well aware of the issues of filling and
17 attempting to take water resources from an
18 area. And that all the issues that stem from
19 Gadsden Creek's fill and the tidelands fill was
20 well known and caused by the City. The City
21 knew this and did it anyway and that's part of
22 the problem with the public benefit argument at
23 this, this whole case.

24 **MS. SHAHID:** All right. The City's not a party in,
25 in any sense.



1 **MR. CUNNINGHAM:** The City's intimately related with
2 the WestEdge Foundation.

3 **MS. SHAHID:** All right. The City is a supported
4 agency to the WestEdge Association -- WestEdge
5 Foundation. I ---

6 **THE COURT:** Just from what I've heard so far, I've
7 -- the decision I have to make is given where
8 this -- the status of what this land is at this
9 point in time, is there a public benefit. So
10 I'm -- based on mistakes that have occurred in
11 the past, I don't think it's the Court's
12 business to concern itself with the mistakes
13 that have occurred in the past in determining
14 whether or not the issue of permit for now.
15 Because it, it might even be much more of a
16 public benefit if, if we correct mistakes in
17 the past. So I, I could see this argument
18 working against you. But how about let's just
19 move more toward the -- let's just skip a
20 little bit of this and move to the specific
21 area that we're concerned with.

22 **MR. CUNNINGHAM:** All right. I don't know if Your
23 Honor wants me to address the content, Your
24 Honor, ---

25 **THE COURT:** Yeah.



1 **MR. CUNNINGHAM:** --- and just the public benefit
2 and, and before we move on ---

3 **THE COURT:** Yeah, 'cause I'm saying that I'll hear
4 your response to it.

5 **MR. CUNNINGHAM:** Oh, thank you. Well, Your Honor,
6 as, as I mentioned yesterday, the whole idea
7 about whether or not you can provide a public
8 -- wh- -- what qualifies as a public benefit,
9 y- -- you necessarily have to look at who are
10 the actors and what they did beforehand because
11 you can't say oh, this is a public benefit when
12 you're just cleaning up a mess you made.
13 That's our, that's our contingent anyway.

14 **THE COURT:** Let me stop you -- I don't want to
15 interrupt you 'cause I don't want you to lose
16 your private thought, but you, you started
17 getting -- to get, get into who are the actors.
18 Well, the actors were a hundred years ago.
19 They're dead. So ---

20 **MR. CUNNINGHAM:** The City of Charleston isn't dead.

21 **THE COURT:** I know, but -- so there's a City of
22 Charleston ---

23 **MR. CUNNINGHAM:** But we're not attempting to hold
24 the actors and the city officials ---

25 **THE COURT:** Yeah, because ---



1 **MR. CUNNINGHAM:** --- liable, we're just saying the
2 City did this. The City is involved in this
3 project and this ci- -- this project is
4 purporting to remedy issues the City created
5 and the City is involved in this project.

6 **THE COURT:** Yeah.

7 **MR. CUNNINGHAM:** That's, that's -- and, and as far
8 as relevance goes that's certainly relevant.

9 **THE COURT:** Yeah. I'm more concerned about what the
10 current City people or actors are doing at this
11 point in time.

12 **MR. CUNNINGHAM:** Well, the past informs the present.

13 **THE COURT:** I ---

14 **MR. CUNNINGHAM:** And, ---

15 **THE COURT:** --- get ---

16 **MR. CUNNINGHAM:** --- and ---

17 **THE COURT:** --- that ---

18 **MR. CUNNINGHAM:** --- it's ---

19 **THE COURT:** --- from a history standpoint, yeah.

20 **MR. CUNNINGHAM:** A history, but also and, and as far
21 as the determination of the public benefits
22 will, Judge, because the City, the City does
23 this filling and leaves it be, doesn't do
24 anything and then, you know, here we go with --
25 the City's coming in to fix this problem that



1 it created through the, through the creation of
2 the WestEdge Foundation.

3 **THE COURT:** You need to look at ...

4 **MR. CUNNINGHAM:** I don't know. Oh, so.

5 **THE COURT:** Well, even along those lines, let's just
6 move to the current area that we're dealing
7 'cause that's more in -- I think you're getting
8 to more probative evidence that leads there.

9 **MR. CUNNINGHAM:** I, I, I gr- -- I grant at, at a --
10 I think I under appreciate the wearing of the
11 Court's patience. Especially at this late hour
12 ---

13 **THE COURT:** Yeah.

14 **MR. CUNNINGHAM:** --- of the day. So we, we can move
15 along.

16 **THE COURT:** Okay.

17 **MR. CUNNINGHAM:** But. but I, I, I don't want to ---

18 **THE COURT:** Well, ---

19 **MR. CUNNINGHAM:** --- say ---

20 **THE COURT:** --- I'm ---

21 **MR. CUNNINGHAM:** --- too ---

22 **THE COURT:** --- not ---

23 **MR. CUNNINGHAM:** --- much ---

24 **THE COURT:** --- foreclosing ---

25 **MR. CUNNINGHAM:** --- exceed ---



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1 **THE COURT:** I'm not foreclosing you, I'm ---

2 **MR. CUNNINGHAM:** Okay.

3 **THE COURT:** --- just saying to you, we're going to
4 move to the current area and then proceed down
5 that path.

6 **MR. CUNNINGHAM:** Let's, let's move on then. The
7 west side of the peninsula. That, that is the
8 west side. That is the southern area of the
9 west side.

10 **THE COURT:** All right.

11 **MR. CUNNINGHAM:** So it's, it's not the immediate
12 project area but, you know, there's another
13 example of filling.

14 **THE COURT:** Okay.

15 **MR. CUNNINGHAM:** The southwestern peninsula.

16 Q: Let me ask you, Professor Butler, is the -- is
17 what is depicted here going on the southwestern
18 peninsula -- first of all, what is depicted
19 here with regard to the southwestern peninsula?

20 A: So the southwestern end of the peninsula to the
21 south or Harleston historically was low lands,
22 small farms, and people doing maritime
23 activities, wharfs, lumbar mills, semi-
24 industrial shrimpers, fisherman. And the City
25 of Charleston deemed to reclaim that area in



1 1911 as part of the Boulevard Improvement
2 Project. And essentially that reclamation
3 project transformed the social makeup of that
4 community. It went from being integrated and
5 working class to being predominantly white and
6 elite. And that's borne out in the tax
7 records.

8 Q: Okay. Well, let me, let me just ask you about
9 the activities that were going on with respect
10 to the maritime activities, lumber and that
11 sort of thing. Does -- were the activities
12 that are documented here with respect to the
13 southwestern area of the peninsula, were they
14 similar to the activities you've found in your
15 research as relating to Gadsden Green area?

16 A: They were, but the types of land use, the
17 occupations, the demographics of the residents,
18 maritime connections were very similar. Right
19 down to baptisms taking place in the creeks in
20 both of those parts of the city.

21 Q: And, and that included the Gadsden Green,
22 Gadsden Creek area?

23 A: Yes, sir.

24 Q: Okay.

25 **MR. CUNNINGHAM:** Let's move on to the next slide.



1 A: So that's a plat showing the original high
2 water line, and then all of the uniformed new
3 city, city logs, which the City of Charleston
4 sold and used the proceeds to pay for the
5 paving and the infrastructure in that part of
6 the city. So that reclamation essentially cut
7 off water access to people who previously had
8 waterfront access.

9 Q: It's -- that's in the southwestern section of
10 Charleston on the ---

11 A: Yes, sir.

12 Q: --- west side?

13 A: That would be Murray Boulevard and South
14 Battery Extension today.

15 Q: All right. Just give me a moment. All right.
16 All right. 20th Century, Lockwood Boulevard
17 and sanitary fill. Do you have an opinion --
18 first of all, to a reasonable degree of
19 professional, historical certainty, about
20 whether or not there has been a history of
21 flooding observed in the locations where the
22 City of Charleston used fill materials to
23 remove marsh water resources to create upland?

24 A: Yes.

25 Q: What is that opinion?



1 A: That the precedent occurs over and over again.
2 That reclaimed and filled areas -- whether it
3 was the City of Charleston or private
4 developers given permits by the City of
5 Charleston, that those areas frequently flood.

6 **MR. CUNNINGHAM:** Let's skip to the next one. And I
7 think this is ---

8 A: This is ---

9 Q: Is ---

10 A: --- a few examples that speak to that, so. The
11 previous slides showed the historic makeup of
12 those areas and those areas which were
13 reclaimed still flood today. Which includes,
14 you know, west side, Gadsden Green, east side,
15 Colonial Lake area, Harleston, etcetera.

16 Q: Okay. Let's move on. I think we already
17 discussed the, the flooding issues related to
18 poor flow material already?

19 A: Yeah.

20 Q: All right.

21 A: So these are illustrations that line up with
22 some of the visuals we've seen earlier. They
23 -- the young man in the little fishing boat,
24 that's the intersection of Reid Street and
25 America Street. That is a 2012 photograph that



1 was not a hurricane event. That was a hard
2 rain that occurred at high tide. And the image
3 on the other side is probably circa 2010. It's
4 actually a photograph from one of the FEMA
5 flyers that they mail to coastal homeowners and
6 that is the western end of Harleston Village,
7 Barre Street, Wentworth Street area.

8 Q: Okay. Let's move on. East side -- okay, this
9 is east side flooding, is that right?

10 A: Uh-huh.

11 **MR. CUNNINGHAM:** You can move on.

12 Q: All right. Recent development of -- oh, I
13 guess this is the question for you with respect
14 to this slide. Is, is there still recent
15 development in the build or is there attempted
16 development in Charleston?

17 A: There is. Both on the east side and obviously
18 the west side and the project area. And
19 further up the neck in the NoMo area. There's
20 areas that were filled with subpar organic
21 materials and those areas are not being
22 redeveloped with, you know, larger buildings
23 even closer to the wetlands. So this is just
24 examples of those in the east side. A prime
25 example being the original bridges, the



1 Grayson, Peterman bridges over the Cooper that
2 got replaced by the big Ravenel bridge. Those
3 on ramps used to come down into the Vardel's
4 Creek area and flooded regularly, and that area
5 is currently being redeveloped both by the City
6 of Charleston Initiative Project and by private
7 development.

8 Q: Okay. East side flooding, again. We can move
9 on from there.

10 A: Yeah, so this photograph is at least a year
11 old, but interestingly the City has just put in
12 a small berm on the right that's supposed to
13 help alleviate that flooding.

14 Q: Okay. And this is ---

15 A: This is East Bay and that's Sanders-Clyde,
16 which is one of the Title I schools I think
17 that was mentioned earlier. So that's the
18 vestiges of Vardel's Creek there.

19 Q: Okay. We can move on from there. Are these --
20 is this slide -- it depicts any current
21 flooding issues associated with past filled
22 areas?

23 A: Yes, this is current uses in what used to be
24 Gadsdenboro or Rottenboro, which is one of the
25 first examples we discussed. That area was



1 redeveloped with slum clearance and public
2 housing in 1940, much like our project area.
3 And then it flooded pretty severely in 1989
4 after Hurricane Hugo. And the City since has
5 demolished that public housing, sold off tracts
6 to SPA private developers to put in a city
7 park. So this is just a list of current uses
8 of that part of the city, which regularly still
9 floods. Which is the next, next slide.

10 Q: Okay.

11 A: So ---

12 Q: It's still flooding.

13 A: It's still flooding.

14 Q: Okay.

15 A: So that's the SPA facility and you're looking
16 at Concord, Washington Street area. And that
17 brick building in the background is the
18 vestiges of one of the rice mills that used to
19 be waterfront that's been pretty much
20 landlocked by the reclamations we've been
21 talking about.

22 Q: Okay. Is an area where there's fill?

23 A: It is and much like Gadsden Green, this was a
24 working class area that was cleared with slum
25 clearance. A working class filled low-lying



1 area. It was cleared, redeveloped with public
2 housing, and continues to have flooding issues.

3 **MR. CUNNINGHAM:** Okay. We can go on from there.

4 Q: Newmarket Creek, again, a development near a
5 filled creek or a portion thereof?

6 A: Yeah, so we're looking at the on-ramps to 26.
7 So Huger and Meeting Street area and you can
8 see what's left of Newmarket. And Gadsden
9 Creek, Longborough Creek, which is a good bit
10 further north and Newmarket are really the only
11 vestigial tidal creeks that remain in the City.
12 So the purpose of these was just to show
13 precedent between areas that were filled and
14 areas that still flood, which there's a picture
15 of on the next slide, too.

16 Q: And this is that same area?

17 A: Yeah, that's that same area, Newmarket Creek
18 just coming out of the tidal drains
19 essentially.

20 Q: All right. Well, let me ask you this before I
21 get to this slide. Do you have an opinion, to
22 a reasonable degree of historical certainty,
23 about whether there is a history with respect
24 to the west side area of the Gadsden Green
25 community utilizing Gadsden Creek?



1 A: Yes.

2 Q: And what is that opinion?

3 A: That residents in that part of the city did use
4 the creek for recreation, for foodways, for
5 cultural activities like baptisms,
6 historically.

7 Q: And what is that opinion based upon?

8 A: That's based upon historic documents,
9 photographs, maps, newspaper records,
10 complaints from residents to city council that
11 are city council minutes.

12 Q: And you relied on all those documents to form
13 your opinion?

14 A: Yes, sir.

15 **MR. CUNNINGHAM:** Let's go to the next slide.

16 A: So this is just a few slides on basically the
17 early history of, of the west side or Gadsden
18 ---

19 Q: Okay.

20 A: --- Green. Okay to summarize?

21 Q: Yeah.

22 A: So Gadsden Green historically would've been
23 outside of the city limits. That part of the
24 city, the west side, the upper wards wasn't
25 incorporated until 1850. So its early



1 iteration when it's subdivided by Thomas
2 Gadsden into 225 residential lots, that's a
3 private speculative development. The early
4 plats show Gadsden Creek and all of the lots
5 kind of surrounding the creek. We can see a
6 list of some of the streets in that part of the
7 city still today. Interestingly Flood Street,
8 which floods a lot, was actually supposed to be
9 spelled differently for the name of the family
10 that owned that land. But now, historically,
11 it was an integrated neighborhood. About two-
12 thirds African-American. And when I say
13 historically I mean y- -- from the point of
14 development right up to the development of
15 Gadsden Green. People in ---

16 Q: The development of Gadsden Green occurred in --
17 -

18 A: 1941. So people who lived in that part of the
19 city typically here, and the east side, chose
20 those places because they were affordable,
21 because they were low-lying. And city
22 directories that show people who lived in that
23 part of the city and their occupations do give
24 evidence to fisherman, ship chandlers, ship
25 painters, those sorts of maritime activities



1 that you would expect in Charleston in a
2 waterfront area.

3 Q: Is other evidence of water use in the Gadsden
4 Green area historically?

5 A: It is. And again, this quick list is based on
6 historic documents like newspapers, obviously
7 not eyewitness accounts except today, walking
8 and seeing people fishing. But we know that
9 there was an active bridge landing even before
10 the current Ashley River Bridge that's there
11 today. There was small lumbar wharves. There
12 was butcher pens in the area that used the
13 creek to sort of naturally flush waste away in
14 the past, in the 1850s, for example. You know,
15 maritime activities, wharves, recreational
16 fishing and recreational boating, sailing and
17 rowing.

18 Q: What about bathing?

19 A: And bathing. So the newspaper illustration on
20 the screen is mentioning that despite the fact
21 that there was some industrial activity in that
22 part of the city, that the City of Charleston
23 designated Gadsden's Creek as one of the legal
24 places for public bathing.

25 Q: What's this depict?



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1 A: So this is a historic photograph that's labeled
2 Negro Baptism and the penmanship on the side
3 says April 1st, 1867, Gadsden Green. And it's
4 showing basically a communal baptism taking
5 place in, in Gadsden Creek in Charleston.

6 Q: I'm going to show you Exhibit 16. Is that
7 depicted on the screen?

8 A: It is.

9 Q: Have you seen that document before in your
10 research?

11 A: I have.

12 Q: All right. And in what context did you find
13 that document?

14 A: So this photograph is held by the Charleston
15 Archive, which is at -- located at Charleston
16 County Public Library. So that's a public
17 institution. Any member of the public,
18 including non-Charleston County residents can
19 come in and use those resources any time. But
20 this one is also digitized and available online
21 through a multi-archive initiative called
22 Lowcountry Digital Library. And it's a place
23 where Historical Society, Charleston Museum,
24 you name it, upload historical documents like
25 this so that the public can use them and view



1 them. And when they're digitized they'll tell
2 you the holding institution, the date of the
3 image if they know it, there's metadata that
4 tells you when it was digitized and by whom.

5 Q: Now, has this document been in existence for
6 over four years?

7 A: Absolutely, it's dated 1867. It's a historic
8 document.

9 Q: Okay. And we offer Exhibit 16 into evidence at
10 this time, Your Honor.

11 **MS. SHAHID:** No ---

12 **MR. CHURDAR:** No ---

13 **MS. SHAHID:** --- objection.

14 **MR. CHURDAR:** --- objection.

15 **THE COURT:** It's admitted.

16 **(Petitioner's Exhibit Number 16 was admitted into**
17 **evidence.)**

18 Q: All right.

19 **MR. CUNNINGHAM:** Move on to the next slide, please.

20 Q: What ---

21 A: These ---

22 Q: --- does this depict?

23 A: These are city engineer plats from a citywide
24 series that was done in 1882 by a surveyor
25 called Charles Lambley, and they show you some



1 of the historic residences that exist along
2 Gadsden Creek, in the historic iteration of
3 Gadsden Green. So the one on the left at the
4 top of the screen is Spring Street, and you can
5 see that sort of undulating, original
6 trajectory of the creek and that's Chestnut
7 Street that's running on the y-axis, and then
8 Ashton and Allway. So you can see sort of the,
9 the scale of the houses in that part of the
10 city. I know, they're kind of tiny, but
11 they're one-story and two-story. Pretty much
12 all of them are wood-framed construction. And
13 you can see that they're next to the water.
14 There's not a sea wall. There's really no
15 barrier of access or protection between those
16 residences and the creek. And then the image
17 on the other side is just from that same plat
18 series showing another little section of the
19 creek in that same Gadsden Green area.

20 Q: Okay.

21 **MR. CUNNINGHAM:** Next slide.

22 Q: Historically speaking, was there ever an
23 understanding of whether or not Gadsden Creek,
24 as it existed then, provided any benefits to
25 the community that was living there at the



1 time?

2 A: Yes, there was. Both Gadsden Creek and other
3 tidal creeks, you know, city council regularly
4 made plans to fill them and then had to deal
5 with the flooding problems after the fact. So
6 I mentioned earlier that in the Antebellum era,
7 the Gadsden Green area, the west side is one of
8 the places that was designated as a legal place
9 to slaughter animals. So butcher pens would've
10 been located there because there was natural,
11 you know, wetlands that would carry away that
12 offal and, and refuse. By the 1850s, and I cut
13 these slides, but in the 1850s, the City of
14 Charleston undertook a five year massive
15 drainage infrastructure program. And this is
16 basically when they installed most of the brick
17 tidal drains, subterranean drains that still
18 flow through the city today. They historically
19 worked kind of similar to -- well, a modern
20 tidal drain with a gate where tidal influence
21 could come into those drains or you could close
22 the flood gates to keep water in or out,
23 depending on, you know, the time of the tide.
24 And so city council and its engineers like
25 Charles Parker regularly mention the importance



1 of that creek as part of that tidal drain.
2 Essentially that's one of the outfalls of that
3 historic drain system.

4 Q: Okay. Civic neglect. Is there historical
5 record of civic neglect in this area?

6 A: There is. The reason being, we spoke to this
7 a bit, taxation issues, you know, low price
8 point method. It was very difficult to
9 generate revenue to do proper improvements. So
10 as early as the 1880s, some of that private
11 fill that had occurred in the Antebellum era
12 had settled and residents were petitioning city
13 council for upgraded drainage, which doesn't
14 seem to have happened because I never found
15 follow-up in the city council records. And
16 then in 1912, 1913, there was already a
17 material shortage issues because of, you know,
18 the pending World War disaster. And do the
19 City of Charleston was dumping ash fill into
20 the Fishburne basin area. And the complaints
21 were that it not only kept flooding but it was
22 also pushing soot up into people's yards and
23 homes. The 1915 complaint mentioned --
24 interesting, because Archie Gadsden -- that's
25 how he spelled it, by the way, had complained



1 to city council about garbage dumping on the
2 back of his property. He lived on Norman
3 Street on the edge of the marsh, and he wasn't
4 getting any satisfaction, so he hired a white
5 attorney to write a letter to the City and,
6 you know, that letter survives in city records.
7 And his complaint was animal carcasses, organic
8 fill, blocking access to his property,
9 essentially.

10 Q: The Gadsden Green housing project, we, we
11 already gestured to this earlier -- this is
12 directed at its completion. And what is
13 depicted here?

14 A: So we're looking at a Sanborn Fire Insurance
15 Map. Sanborn is -- was a national insurance
16 company and when they would issue policies,
17 they would do city-wide surveys. And they're
18 a really common resource for preservationists,
19 cultural historians, etc., because they show
20 the built environment really clearly. And
21 they're color coded so everything in yellow is
22 wood-frame and everything in pink is some kind
23 of masonry. So at the top of the screen we're
24 looking at the area that the Charleston Housing
25 Authority with federal money did slum clearance



1 of privately owned, predominantly African-
2 American houses in Gadsden Green, and we're
3 looking at the modern improved housing
4 projects. Gadsden Green basically how it
5 exists today. And then below that, you can see
6 privately owned houses and the vestiges of the
7 Creek, which at that point still had some of
8 those natural, undulating bends.

9 **MR. CUNNINGHAM:** Let's go to the next slide.

10 Q: Is there a history of filling and creek
11 diversion with respect to Gadsden Creek?

12 A: There is. Mr. Robinson spoke to that very well
13 earlier so I will just hit some of the high
14 points.

15 Q: Sure.

16 A: So in the 1930s is when the City first proposed
17 extending what's now Lockwood Boulevard. So as
18 early as the 1880s, the city council had hoped
19 to have a continuous boulevard that ran from
20 East Battery all the way around White Point,
21 and then all the way northwest to where The
22 Citadel is today. And due to tax shortages,
23 wars, etcetera, that project took decades to
24 finish and happened kind of in fits and starts.
25 So in the 1930s, there was discussion of that



1 chunk of Lockwood that didn't actually happen
2 until the 1970s. By that point there was
3 already flooding in Gadsden Green area and we
4 know this because of resident complaints and
5 city documents. And then right around that
6 time, late 1930s, 1940, is when the
7 redevelopment begins for Gadsden Green housing
8 estate.

9 Q: There's a picture of the area at the time?

10 A: Yeah, so you can see Harmon Field off to the
11 right, which historically was a burial ground
12 because it was low-lying land, which meant it
13 was cheap. And then you can see suggested
14 Hagood Avenue up there at the top of the
15 screen. Again, that project didn't happen in
16 1934, it, it took some time, but this shows the
17 City's plans to start developing that area,
18 extend roads further out into the creeks and
19 marshes.

20 Q: Next slide, please. 20th century alterations
21 to the Gadsden Creek after ---

22 A: Yes, so again, Josh spoke to some of this
23 earlier, but 1970s is when the City picked up
24 that Lockwood extension project in earnest and
25 came up with the funding. A lot of that was



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1 done with bond revenue. And interestingly, in
2 the 1970s, residents complained. Over 700
3 residents complained to the City because the
4 original trajectory of Lockwood wouldn't have
5 had that bend that connects to Fishburne. It
6 was supposed to continue uninterrupted
7 northward towards The Citadel, kind of a, a
8 gentle curve north. But in 1970s, people were
9 -- it's the beginning of the environmental
10 movement. People were more cognizant of, you
11 know, impacts to marshes whether it was
12 ecologically or culturally, and they complained
13 and were successful in getting Lockwood's
14 trajectory altered to the way that it exists
15 today. Around that same time the City and Army
16 Corps granted permits to a development company
17 called Ashley Square, and that was on top of
18 some of that sanitary landfill we've been
19 talking about, which was a city landfill.
20 Brittlebank Park was completed, on fill around
21 that same time. And then in 1980s, kind of on
22 the back end of that late 1970s recession, more
23 developers came forward to build along Lockwood
24 Boulevard. So there's hotels in that area
25 today, police department in that area today.



1 And residents and the coastal council
2 complained or were concerned about the
3 precedent of allowing people to further alter
4 the marsh.

5 Q: Okay.

6 **MR. CUNNINGHAM:** Next slide, please. All right.
7 Let -- you -- you're familiar with various
8 policies that are enshrined in South Carolina
9 critical area statutes and Coastal Zone
10 Management Program document, is that correct?

11 A: I am.

12 Q: And some of those policies went to
13 consideration of historical, cultural, societ-
14 -- societal significance in that area before
15 issuing the permit or certification.

16 A: Yes.

17 Q: All right. And is it your opinion that there
18 are certain historical considerations of the
19 community that were not taken into account in
20 this permitting?

21 A: Yes.

22 Q: And what are those -- what is the basis of that
23 opinion?

24 A: Ho- -- the basis is the historic documents
25 we've discussed that shows the relationship of



1 the built environment in that part of the City
2 to the waterfront. The basis also is the fact
3 that people still use the creek. You can bike
4 by it, drive by it, see people still using the
5 creek. And arguments that have been made that
6 Brittlebank Park is close by, but ---

7 Q: Right.

8 A: --- as a city resident who cycles, good luck
9 getting across Lockwood Boulevard to try and
10 use that resource. Most people who use
11 Brittlebank -- it's a lovely park, but most
12 folks either drive or are already at a ball
13 game and then sort of trickle out. I mean
14 Gadsden Creek as it exists today, even in its
15 altered state, is one of the only tidal creeks
16 left in this City. Which, -- not even speaking
17 to the cultural makeup of the community today.
18 Historically speaking it's important that we
19 keep the few that we have. Secondly, the
20 creek, as it exists today, is right next to the
21 community. There's not yet a sea wall.
22 There's not a multi-lane barrier between the
23 people and the water the way there is for those
24 people to try and get to the Ashley.

25 Q: Just generally speaking -- historically



1 speaking, how -- Charleston -- fill is starting
2 out early in Charleston?

3 A: Pretty much from the moment of documented
4 English settlement.

5 Q: And how soon after fill is attempted initially
6 is -- in during the course of history of
7 Charleston have there been flooding reports?

8 A: Almost instantly.

9 Q: There's ---

10 A: In fact, that's one of the first complaints
11 from residents who moved to Carolina despite
12 the heat, was just concerns about flooding and
13 storms and just lack of buildable land.

14 Q: Where there -- excuse me. Where there reports
15 in the historical record about flooding in
16 areas that had been filled in Charleston or on
17 the Charleston peninsula prior to 1950?

18 A: Absolutely.

19 Q: Many?

20 A: Many, many.

21 Q: Nothing further, Your Honor.

22 **THE COURT:** Let's just take a short break. Five
23 minutes.

24 **(Off the record 4:21 p.m. until 4:30 p.m.)**

25 **THE COURT:** Y'all please sit.



1 **MR. CUNNINGHAM:** We can't help it, Your Honor.

2 **THE COURT:** Go ahead.

3 **MS. BUTLER - CROSS-EXAMINATION BY MS. SHAHID:**

4 Q: Ms. Butler, I'm going to jump around a little
5 bit. 'Cause I've got multiple notes here, but.
6 I think that you might have testified that
7 Gadsden Creek was the last tidal creek
8 available on the peninsula. Is that your
9 position?

10 A: One of the last.

11 Q: Okay. So there are others.

12 A: There are.

13 Q: Okay. I know that there's Newmarket Creek,
14 correct?

15 A: Right. Newmarket Creek and Longborough Creek,
16 which are also altered, but. Yeah, those are,
17 those are the three. That and Gadsden.

18 Q: And as far as you know, there's no plan on the
19 part of WestEdge Foundation to displace
20 existing residents at the Gadsden Green
21 community or within the west side.

22 A: Not to my knowledge.

23 Q: Okay. And you -- in your course -- in your
24 historical research you discovered some baptism
25 photos doc- -- documenting baptisms.



1 A: Yes.

2 Q: You would agree with me that those were taken
3 centuries to -- or many decades ago.

4 A: Yes, they're historic documents.

5 Q: And you found research or you talked about
6 Gadsden Creek. Most of your testimony was the
7 Gadsden Creek as it existed in its natural form
8 prior to the landfill, correct?

9 A: Yes.

10 Q: Obviously, there's lot of fud- -- flooding on
11 the peninsula.

12 A: Yes.

13 Q: Okay. And that's because of the efforts over
14 the centuries to create more land.

15 A: Yes, that's because humans intervened and got
16 rid of natural waterways.

17 Q: And one area that floods is just as bad as any
18 other area that floods.

19 A: I think that's a relative statement. Some
20 areas flood worse than others. Some residents
21 are impacted more than others.

22 Q: Okay. And any effort to address that condition
23 would be an appreciated effort, wouldn't you
24 think?

25 A: I think it would depend on the price one had to



1 pay, not just financially but what the impact
2 of that improvement would be on the way people
3 use a community or its resources.

4 Q: I understand that. Putting that aside for a
5 minute, correcting some of the -- some or all
6 of the flooding problems that you demonstrated
7 in your presentation on the peninsula would be
8 a desirable result.

9 A: Sure. Living in a dry communy- -- community
10 that didn't flood would, of course, be ideal.

11 Q: And you found in your historical research a
12 document entitled Negro Baptism. Would you
13 agree with me that the writing on the side said
14 Gadsden Green?

15 A: Yes.

16 Q: Okay. And Gadsden Green itself didn't exist
17 until much later into the 20th century,
18 correct?

19 A: The housing estate didn't, but the community
20 was known as Gadsden Green before the housing
21 estate was built.

22 Q: And if you recall that photo, that baptism was
23 in a very wide body of water?

24 A: It's hard to tell. It looks like there's some
25 kind of built structure. So there must be a



1 bank there.

2 Q: Uh-huh. What I'm saying is that photo looks
3 like a river, not so much like a creek.

4 A: I think it's adjacent to the river. I don't --
5 I can't say it's in the river.

6 Q: Okay. The ---

7 A: But ---

8 Q: --- baptism ---

9 A: --- yeah, there is a building there. I mean
10 there's people standing on ground.

11 Q: Okay. Got you. But adjacent to the Ashley
12 River.

13 A: Yes.

14 **MS. SHAHID:** Okay. I'm sorry, Your Honor. I lost
15 my notes and I'm relying on Mr. Traynham's
16 laptop. So I need a little tech support ---

17 **THE COURT:** Right.

18 **MS. SHAHID:** --- right now to get back to my notes.

19 Q: You don't live in the west side community or on
20 the west side.

21 A: Right.

22 Q: You pur- -- you've never used the creek for
23 recreation other den- -- then to look at it.

24 A: Right. I've never fished.

25 Q: Okay. Have you reviewed the Coastal Zone



1 Management Proc- -- Program Document, which
2 includes policies and procedures?

3 A: I have.

4 **MS. SHAHID:** Your Honor, do you mind if I stay
5 seated while I do this?

6 **THE COURT:** Nope.

7 **MS. SHAHID:** Thank you.

8 Q: Are you familiar with the acronym GAPC?

9 A: I am, but I'm not going to be able to recall.

10 Q: Geographic Area of Particular Concern?

11 A: Yes.

12 Q: And do you understand that with regard to
13 protecting historic resources, his- -- historic
14 areas of significance, archeological areas of
15 significance, have been identified in the pro-
16 -- program document as GAPCs?

17 A: Yes.

18 Q: Okay. And there's also about a three or four
19 page list of these areas that need to be
20 protected when your looking and permitting.
21 Have you seen that list?

22 A: That you put -- that your client put together
23 for this project?

24 Q: No, it's in the program document. A list of G
25 ---



1 A: Oh, ---

2 Q: --- APCs.

3 A: --- yes, yes.

4 Q: And Gadsden Green community is not on that

5 list, correct?

6 A: Not to my knowledge.

7 Q: And you, yourself, avoid tidal flooding areas

8 when you commute?

9 A: Actually I don't. I seek them out so ---

10 Q: Oh ---

11 A: --- I can look at how severe they are for

12 research purposes.

13 Q: And I believe your research has indicated that

14 obliteration of creeks across the peninsula

15 have caused the flooding?

16 A: Yes, there's a cause and effect between getting

17 rid of wetlands, whether it's creeks or marsh

18 or reclaiming sections of the river and the

19 corresponding flooding.

20 Q: Okay. And I think you would also agree that

21 anything that mitigates flooding is also a

22 benefit to the community?

23 A: Again, it's relative. Every, every situation

24 is different.

25 Q: And I think -- is it your position that



1 flooding is just a fact of life that we have to
2 adapt to?

3 A: I think when we live in a coastal community
4 it's unavoidable that there will be some
5 flooding. There will be a hurricane, again.
6 I mean it's a historic fact. Should we live
7 with it? To a degree I think we have to. Can
8 we do things to improve our quality of life?
9 Of course.

10 Q: Are there other historic reasons for drainage
11 not being very effective in areas on the
12 peninsula?

13 A: There ---

14 Q: Other ---

15 A: --- are.

16 Q: --- than creeks?

17 A: There are.

18 Q: Would that include insufficient infrastructure,
19 pipes that are too small, undersized drainage
20 systems?

21 A: It would. And it would include pipes that have
22 heaved or failed either because of fill on top
23 of them or because of seismic movement. It
24 would include blocking outfalls or terminus by
25 later development or causeways for rail that



1 alter natural water flow on the edge of the
2 peninsula.

3 Q: And isn't it also true that had there existed
4 more engineering knowledge at the time these
5 creeks were filled, they could've done a better
6 job designing a drainage system that would
7 replicate the creek function?

8 A: I mean, I don't have a time machine to know
9 that, but I can say as, as recently as the
10 1970s when they filled part of Lockwood, it has
11 sunk almost three foot. So clearly, you know,
12 engineering is, is difficult in a coastal area.
13 I do think people would avoid using garbage,
14 historically, if they had rock close by,
15 definitely.

16 Q: But my point is, there's filled land, there's
17 filled creeks, but there's also other
18 limitations that can cause these flooding and
19 drainage problems based on old infrastructure,
20 correct?

21 A: Yes. Old infrastructure in filled areas,
22 typically.

23 Q: Thank you. If I could just consult for a
24 minute. Do you think an effort to reclaim land
25 in order to provide housing for a demographic



1 that, at the time, couldn't afford to purchase
2 their own home, i.e. public housing. Do you,
3 do you consider that a malicious act by the
4 City?

5 A: I don't think the City did it with malicious
6 intent. I think the impacts of various city
7 infrastructure and development programs in the
8 past have absolutely had a detrimental impact
9 on working class residents. And statistically,
10 African-American residents because low-lying
11 lands are cheaper, historically. And
12 disenfranchised people typically live where
13 it's cheap because they have to.

14 Q: But building a new hou- -- housing project for
15 an under served community in and of itself is
16 not a bad motive on the part of the City.

17 A: No, of course not.

18 **MS. SHAHID:** That's all I have, Your Honor.

19 **THE COURT:** Mr. Churdar.

20 **MR. CHURDAR:** Your Honor, just -- I just have one
21 question.

22 **MS. BUTLER - CROSS-EXAMINATION BY MR. CHURDAR:**

23 Q: So, Dr. Butler, in your review of the historic
24 records, you would agree that the creek --
25 Gadsden Creek is at -- where it's currently



1 located is not in it's historical location?

2 A: The footprint of what's left of those wetlands
3 is where it has been, but the path of the creek
4 within that has been regularized. So it's less
5 circuitous than it was. It's more regularized
6 through human intervention.

7 Q: Would you agree that the, the mouth of the
8 creek in its original location was up -- what
9 were -- what is now Brittlebank Park?

10 A: I think it's moved some, but probably not that
11 far. I would have to look closely at the plats
12 again and really compare.

13 Q: That's all I have.

14 **MS. BUTLER - REDIRECT EXAMINATION BY MR. CUNNINGHAM:**

15 Q: I'm gonna go ahead and start on the left side.
16 The public housing at Gadsden Green, are you
17 familiar with that?

18 A: Yes.

19 Q: That was not built from fill materials, is that
20 correct?

21 A: It was not. So there was privately owned
22 housing there previously. Single family, wood-
23 framed buildings, one-story, two-story. The
24 City of Charleston used eminent domain to buy
25 those. There's newspaper advertisements for



1 them selling the lumbar and then building the
2 new public housing. Gadsden Green extension
3 was also done with some, some slum clearance.
4 I know the City didn't fill that tract. Strike
5 that. Part of the extension is on some of the
6 city landfill, the sanitary fill.

7 Q: But not the initial Gadsden ---

8 A: Correct.

9 Q: --- project?

10 A: Correct.

11 Q: Nothing further.

12 **THE COURT:** Re- -- recross?

13 **MS. SHAHID:** No.

14 **THE COURT:** You may step down.

15 **MR. CUNNINGHAM:** May Professor Butler be excused,
16 Your Honor?

17 **THE COURT:** She's excused.

18 **MR. CUNNINGHAM:** Thank you. We have one witness who
19 is not here today. He will be here tomorrow
20 morning ---

21 **THE COURT:** Okay.

22 **MR. CUNNINGHAM:** --- because of a transportation
23 issue. It will not take very long.

24 **THE COURT:** Okay.

25 **MR. CUNNINGHAM:** I think everybody else knows Mr.



1 Flowers and so that's -- we're almost -- that's
2 pretty much our case, Judge.

3 **THE COURT:** Okay. Well, then we're gonna take a
4 break today?

5 **MR. CUNNINGHAM:** Yes, Your Honor.

6 **THE COURT:** Okay. 9:30 tomorrow?

7 **MR. CUNNINGHAM:** That's fine with us. Thank you,
8 Your Honor.

9 **THE COURT:** Okay. Thank y'all.

10 **(DAY TWO of the hearing adjourned at 4:44 p.m.)**

11 **(DAY THREE - WEDNESDAY, JUNE 8, 2022. The hearing**
12 **reconvened at 9:26 a.m.)**

13 **MR. CUNNINGHAM:** At this time, the Petitioner calls
14 John Flowers. Mr. Flowers, if you want to step
15 up to the witness stand.

16 **COURT REPORTER:** Sir, would you raise your right
17 hand for me please? Do you -- there -- do you
18 solemnly swear the following testimony to be
19 the truth, the whole truth, and nothing but the
20 truth, so help you God?

21 **MR. FLOWERS:** I do.

22 **COURT REPORTER:** Thank you.

23 **JOHN K. FLOWERS,** having been duly sworn, testifies
24 as follows:

25 **MR. FLOWERS - DIRECT EXAMINATION BY MR. CUNNINGHAM:**



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1 Q: Good morning, Mr. Flowers. Will you state your
2 name for the record, please?

3 A: John K. Flowers.

4 Q: Okay. Where do you live?

5 A: Charleston, South Carolina in the Gadsden Green
6 Community.

7 Q: Okay. What's your address?

8 A: 10B Allway Street.

9 Q: Okay. And are you familiar with Gadsden Creek
10 and its wetlands?

11 A: Yes, sir. I live right across from it.

12 Q: Okay. How far approximately?

13 A: Approximately two blocks, two and a half blocks
14 maybe.

15 Q: Okay. How long have you lived in the Gadsden
16 Green Community?

17 A: About 15 years.

18 Q: 15 years. How do you -- how does -- how does
19 that living find you, do you like it?

20 A: Oh, it's -- it's a nice community.

21 Q: Okay. Are you a member of any organizations?

22 A: Yes. Among them, let's see I'm a member of, I
23 -- I'm so old I can't go through all them.

24 Q: That's okay. But you can ---

25 A: But I remember Friends of Gadsden Creek. I'm



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1 a -- Saint Stephen A.M.E. Church and a few
2 others.

3 Q: Okay. And as a member of Friends in Gadsden
4 Creek, have you ever had occasion to attend any
5 meetings or gatherings?

6 A: Yes. We have a meeting at least once a month.
7 Sometimes once every three months. But we meet
8 on a regular basis.

9 Q: Okay. Have you ever had occasion to attend any
10 community events with Friends ---

11 A: Oh, yes. Quite -- quite a few of them.

12 Q: Okay. Let me -- I'm going to show you -- or
13 I'm actually going to show you up on the ELMO
14 if I can, what's been entered into evidence as
15 Exhibit 12. Let's see. All right. Do you
16 recognize this photograph at all?

17 A: Yes. I do.

18 Q: Now, are you pictured in it?

19 A: Yeah. I can see the back of my bald head.

20 Q: What are you doing in this photograph?

21 A: We are touring the -- the creek and
22 surrounding, and I don't see all of the kids.
23 We had a group of kids with us and we were
24 trying -- I think Cyrus, he was trying to
25 explain to them what a lot of the vegetarian



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1 word, what they meant or what purpose they
2 served along the creek. And maybe -- a lot of
3 them had a wonderful time.

4 Q: Okay.

5 A: I mean, it's much more to it than we can see
6 there.

7 Q: Oh, sure. Of course. And -- and I want to
8 show you this picture too. Are you -- is -- do
9 you recognize that photograph?

10 A: Yes. Yes. That -- they were at different
11 times.

12 Q: Is that ---

13 A: And there's goes Cyrus.

14 Q: Are you pictured in that photograph?

15 A: Yes.

16 Q: Okay. And is this one of the creek walks you
17 went on?

18 A: I beg your pardon?

19 Q: One of the creek walks you went on, is this --
20 isn't it right before you went on a creek walk?

21 A: Yes. Yes.

22 Q: Now, as a member of Friends of Gadsden Creek,
23 do you ever make use of Gadsden Creek?

24 A: The creek is just a part of the community. I
25 mean, if you like water and nature, you can't



1 help but make a use of it, even you just like,
2 you know, the scenery and the changing of the
3 tides, and the wild birds you might see and
4 other animals, you know. It's a -- it's a --
5 it's a nice scenic walk.

6 Q: Do you take that walk?

7 A: Often.

8 Q: How often approximately?

9 A: Oh, wow. At least six or seven, maybe ten
10 times a week.

11 Q: Okay. And what time of day do you go?

12 A: It's all times of the day, but I like going
13 early in the morning because the tide is
14 usually high early in the morning and it -- the
15 creek looks like a river during that time, and
16 I'll be looking for birds or something to pop
17 up. You know, I've seen a racoon families down
18 there and unfortunately, I saw the most
19 beautiful squirrel down there one day. Not a
20 squirrel. A fox.

21 Q: Okay.

22 A: It looked like it was well kept, like it went
23 to the vet every week and it -- the fur was
24 just so gorgeous, but someone had -- it must
25 have been down there eating or drinking and it



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1 ran out in the street and someone hit it. But
2 I said it was so -- so unfortunate. I would
3 have loved to have seen it alive. And so,
4 these are the kind of things I look for when I
5 go down there.

6 Q: Okay. Now, have you seen other members of the
7 community utilizing Gadsden Creek?

8 A: Yes. We -- we -- all of us walk the creek, you
9 know, one time or another. Especially now that
10 we have the grocery store down there where --
11 where a lot of people didn't go. The path to
12 the grocery store runs along beside the creek.

13 Q: Okay. You go to the grocery store that route
14 sometimes?

15 A: Yes.

16 Q: Okay. Now, are you aware of a proposal to fill
17 Gadsden Creek and ---

18 A: Yes. Yes, I am.

19 Q: All right. Are you aware that DHEC has issued
20 a permit to allow for the fill and excavation
21 of Gadsden Creek?

22 A: Yes.

23 Q: If that proposed project goes forward, will you
24 be harmed as member of Friends of Gadsden
25 Creek?



1 A: I think the whole community would be because I
2 think it acts as a drainage for the flooding
3 when it do occur. And you don't know when the
4 flood is going to occur. You know, they say
5 it's not going to come back like it used to,
6 but if anyone remembers who lived there in 2000
7 -- 2015, we had an awful flood there where the
8 water didn't recede for days. And the only
9 reason why we got relief as soon as we did
10 because the tide would go out and the water in
11 our community would go into the creek.

12 Q: You -- you observed that yourself?

13 A: Yes. But not only that, even the city used to
14 set up a pump on the corner of -- I think
15 that's Beauregarde and Norman Street, which is
16 about two blocks from where I live. I live in
17 the middle of the street about two blocks from
18 Allway Street and about two blocks -- not quite
19 two blocks from Norman. But they would set the
20 pump up there. And they would leave the hose
21 probably 50 feet from where I live, which is
22 about middle ways of the block. And they
23 didn't have to run in all the way to the creek,
24 they just laid it on the street and pumped the
25 water from the place near President Street, and



1 it would automatically flow into the creek.
2 So, that's one of the reasons why I don't
3 understand why would anyone think about
4 covering it up.

5 Q: The water that you're talking about getting
6 pumped to the creek, was that from a rain
7 event?

8 A: It's from the rain. You know, we don't -- it
9 don't flood that often, but it -- in summers
10 month, you know, we get the big rains. When it
11 rains two hours and it's heavy, it's going to
12 flood. Maybe not my part of the property, but
13 a little beyond it. Going back up toward
14 downtown part of Charleston.

15 Q: What about you as a -- not just a community --
16 well, first of all, do you count yourself among
17 the community that would be harmed in your
18 opinion if -- if the creek was filled due to
19 flood relief? Are -- are you mem- -- member of
20 that community as well? That's one of your
21 concerns?

22 A: I beg your pardon?

23 Q: Are -- are one of your concerns related to the
24 creek being filled, that -- what it might do
25 with the flood relief?



1 A: Oh, yeah. The flooding. The flooding is
2 enough. Well, I like the creek. I wouldn't
3 like to see it covered up from my personal
4 point of view. But then as a community, I
5 don't see how anyone could think about covering
6 the creek up because they know that it serves
7 a water reliever for us when we get floods.

8 Q: What about you personally, would you be able to
9 go on your creek walks and observe nature at
10 the creek were it covered up and ---

11 A: Of course not. I mean, that's one of the
12 problem we have now. Like I said, the fox that
13 got killed because we are squeezing them out of
14 their habitats, you know, one day at a time.
15 And you know, if he didn't have to cross the
16 street where we have occupied for the last 50
17 years or so, you know, he would've lived. But
18 -- but these -- this is one of the things about
19 destroying nature. You just don't hurt -- I --
20 the -- the humans or the people of the
21 community always have an effect on the wildlife
22 there also.

23 Q: And wildlife and in prox- -- having wildlife in
24 proximity to where you live, is that important
25 to you?



1 A: I think so. I mean -- I mean, that's a part of
2 our ecosystem. We need -- it's there for a
3 reason. It just didn't drop out of thin air
4 because, you know, that's the way God said for
5 it. It's there for a reason.

6 Q: Okay. Thank you very much, Mr. Flowers.

7 A: Yep.

8 **MR. TRAYNHAM:** No questions, Your Honor.

9 **MR. CHURDAR:** I don't have any either.

10 **THE COURT:** You may step down.

11 **MR. CUNNINGHAM:** Thank you, Mr. Flowers. You can
12 step down. May he be excused, Your Honor?

13 **MR. TRAYNHAM:** No objection, Your Honor.

14 **MR. CHURDAR:** No objection.

15 **THE COURT:** He's excused.

16 **MR. CUNNINGHAM:** Thank you, Mr. Flowers. Your
17 Honor, before we go a little bit further, I've
18 got page and lines marked for Maher's
19 deposition and just in case there is confusion,
20 I've got our page and lines that we've filed.
21 I'm going to submit those to the Court
22 Reporter.

23 **THE COURT:** And do they have copies?

24 **MR. CUNNINGHAM:** Yeah. They -- they've already been
25 served.



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1 **MR. TRAYNHAM:** We've gotten the designations, Your
2 Honor.

3 **THE COURT:** Oh, okay.

4 **MR. CUNNINGHAM:** So, I just want to give to the
5 Court Reporter if that's okay. So, it will be
6 entered in ---

7 **THE COURT:** That's fine.

8 **MR. CUNNINGHAM:** --- to the record, so.

9 **THE COURT:** All right.

10 **MR. CUNNINGHAM:** All right.

11 **THE COURT:** Mark it.

12 **COURT REPORTER:** What number does it need to be?

13 **MR. CUNNINGHAM:** Let's see. We're -- that would be
14 -- let's mark that as Plaintiff's Exhibit 75 or
15 Petitioner's really. Thank you. And with
16 that, Petitioner rests, Your Honor.

17 **(Petitioner's Exhibit Number 75 was marked for**
18 **identification purposes and admitted into evidence.)**

19 **THE COURT:** Well, all right. You've rested. I --
20 before we proceed to their case.

21 **MR. CUNNINGHAM:** Yes, Your Honor.

22 **THE COURT:** Can you just give me a list of the
23 factual issues.

24 **MR. CUNNINGHAM:** Let's see here.

25 **THE COURT:** Or you can do it later if you want.



1 **MR. CUNNINGHAM:** I was about to say. Okay. I'll --
2 I'll try and do that later, Your Honor.

3 **THE COURT:** Because I -- I -- I like it whenever you
4 can conveniently do it, just where I'll see
5 there side of the case more clearly.

6 **MR. CUNNINGHAM:** Okay. I'll -- I'll do my best,
7 Your Honor.

8 **THE COURT:** All right. Your best is always a good
9 thing to try for. All right.

10 **MR. TRAYNHAM:** Your Honor, just so the Court is
11 aware kind of the order of operations here.
12 Mr. Karkowski, one of our experts, is limited
13 in his availability later this week, so the
14 parties have agreed to take him this morning.
15 DHEC will be putting up their witnesses
16 following Mr. Karkowski before we proceed with
17 any of our other witnesses.

18 **THE COURT:** Okay.

19 **MR. TRAYNHAM:** All right. With that, Your Honor,
20 WestEdge would call Mr. Rick Karkowski.

21 **THE COURT:** Okay.

22 **COURT REPORTER:** Would you raise your right hand
23 please, sir? Do you solemnly swear the
24 following testimony to be the truth, the whole
25 truth, and nothing but the truth, so help you



1 God?

2 **MR. KARKOWSKI:** I do.

3 **COURT REPORTER:** Thank you.

4 **RICHARD KARKOWSKI**, having been duly sworn, testifies
5 as follows:

6 **MR. KARKOWSKI - DIRECT EXAMINATION BY MR. TRAYNHAM:**

7 Q: Morning, Mr. Karkowski.

8 A: Good morning.

9 Q: Could you describe your educational background
10 for the Court?

11 A: Yes. I have -- I graduated from University of
12 Florida with a Bachelors of Science in Civil
13 Engineering. I took some Master's degree level
14 programs at the University of South Florida.

15 Q: Are you a professional engineer?

16 A: I'm a professional engineer, originally
17 licensed in the State of Florida and I
18 currently hold licenses in Florida, Georgia,
19 South Carolina, and North Carolina.

20 Q: Do you have any other professional
21 certifications or licenses?

22 A: I do. I'm a professional hydrologist as
23 certified by the American Institute of
24 Hydrology. I'm a certified professional
25 stormwater quality. And then, I'm a diplomat



1 of water resources engineering through the --
2 the Academy of Water Resources Engineers, which
3 is an academy inside of the American Society of
4 Civil Engineers.

5 Q: What -- what is involved in being a
6 professional hydrologist?

7 A: A professional hydrologist, you have to take a
8 certification test and demonstrate a certain
9 amount of experience in hydrology.

10 Q: Okay. And what is hydrology?

11 A: Hydrology is the study or the science of -- of
12 how rainfall is converted to runoff,
13 essentially.

14 Q: Okay. And does hydrology have a relationship
15 to hydraulics?

16 A: Hydrology and hydraulics are normally talked in
17 the -- in the same -- in the same vein as once
18 the runoff is on the ground -- once rainfall is
19 on the ground as runoff, it flows across the
20 ground and has to be either moved in natural or
21 manmade systems. So, the -- the study and the
22 design of those systems is hydraulics.

23 Q: Okay. You utilize the science of hydrology and
24 hydraulics in your daily practice?

25 A: I do.



1 Q: What is being a certified professional in
2 stormwater quality entail?

3 A: Similar to a professional hydrologist, it is a
4 certification that requires a -- a testing and
5 demonstration of certain level of experience.
6 And both of those, just to step back a little
7 bit, also requires annual -- annual education,
8 call them PDHs. So, we have to have
9 professional development hours in certain
10 fields, so hydrology, hydrology water quality,
11 water quality. PEs also have to do the same
12 thing.

13 Q: And does being a professional in stormwater
14 quality involve any examination or knowledge of
15 contaminants that are common to stormwater or
16 control of those contaminants?

17 A: It does.

18 Q: You touched on it briefly, but could you
19 explain in a little more detail how hydrology
20 and hydraulics relate to stormwater and
21 stormwater management?

22 A: Yeah. Well, yes. Stormwater and stormwater
23 management basically is hydrology and
24 hydraulics in -- on a certain scale, you know.
25 So, the rain -- you know, we -- we are



1 practicing and designing stormwater management
2 systems or analyzing stormwater. So, we use
3 hydrology to understand how stormwater is
4 generated, the amounts, the volumes, the rates.
5 And then on the hydraulic side, how the water
6 flows across the ground in wells, ditches,
7 pipes, culverts. So, we're using those all the
8 time to study that and then also, there's a
9 component of storage and -- and volume in there
10 that -- that is also part of the analysis.

11 Q: Are you a member of any professional
12 organizations?

13 A: I am a member of many professional
14 organizations and I will try to recall them
15 from -- from memory. American Society of Civil
16 Engineers. Of course, the Academy of Water
17 Resource Engineers. American Institute of
18 Hydrology. The South Carolina Association of
19 Stormwater Managers. The Southeastern
20 Association of Stormwater Managers, which is a
21 regional group that -- that you know, meets
22 about stormwater issues in the southeast
23 region. I'm a member of the Amer- -- South
24 Carolina Association of Hazard Mitigation,
25 which is basically, you know, mitigating and



1 preparing for natural disasters, including
2 flooding. And then, I'm also a member of the
3 American Society of Flood Plain Managers, which
4 is natio- -- national organization that manages
5 flood -- flood plains and studies, and -- and
6 mitigates flooding.

7 Q: Do you actively participate in all these ---

8 A: I do.

9 Q: --- professional organizations, contributing
10 time?

11 **THE COURT:** You said -- you said you were a
12 diplomat?

13 A: Yes, sir.

14 **THE COURT:** In what again?

15 A: In Water Resources Engineering.

16 **THE COURT:** Okay.

17 A: So -- an that's a ---

18 **THE COURT:** Is that an organization or is that just
19 ---

20 A: No. You -- you're invited to become a
21 diplomat. So, it's -- it's -- at a certain
22 level of -- of experience and participation and
23 activity, you know, through your -- your --
24 your work in the society, certain levels with
25 your experience levels and education, you're



1 invited to become a diplomat.

2 **THE COURT:** Do you get medals or badges if ---

3 A: You -- I don't have a medal, but I think I have
4 a certificate.

5 **THE COURT:** Okay. Very good.

6 Q: Will you please describe your employment
7 history?

8 A: Okay. Yes. So, I graduated in December of
9 '89, and so in the beginning of 1990, I started
10 with a firm, Dyer, Riddle, Mills and Precourt
11 in Tampa, Florida, as suchly would -- would be
12 a called junior engineer or staff engineer. We
13 -- we were a consultant for various
14 municipalities, counties in -- in Florida. And
15 that phase, I did some road design and some
16 stormwater management. That's kind of when I
17 started to get into this field of -- of water
18 resources engineering. Two years after that,
19 I went to a firm called Dames and Moore, which
20 was a national firm, again in Tampa. I worked
21 for them in their water resources department,
22 so I, you know -- within a year and a half or
23 two years, I specialized in this field of water
24 resources engineering. So, through Dames and
25 Moore for eight years in Tampa, I did -- again,



1 that's a consulting firm. I worked for -- they
2 have what are called stormwater management
3 districts in -- in Florida. Works for the
4 various -- there's seven or nine of them.
5 Worked for the counties. Worked for the
6 cities. Some private development, not a lot.
7 Dames-Moore was bought by URS, an international
8 firm, so I basically continued on with that
9 firm. I did have a small stint in Charlotte
10 for three years. And then in '01, 2001, I
11 moved to Charleston with a firm called Jordan,
12 Jones, and Golding. All those times, I'd been
13 practicing and working in stormwater
14 management, flood control, and -- and various
15 things like that. Environmental water quality,
16 we did a lot of water quality consulting. And
17 then in -- 15 years ago, I joined Thomas and
18 Hutton. And I've been working with Thomas and
19 Hutton ever since.

20 Q: All right. In what capacity are you currently
21 employed with Thomas and Hutton?

22 A: So, at Thomas and Hutton, I'm a principal of
23 the firm and I -- my title is Water Resource
24 Department Manager.

25 Q: Is that your first position at Thomas and



1 Hutton or have you held others?

2 A: No. I -- I've held others. I -- I kind of
3 came up through the ranks in the 15 years. I
4 -- I believe I entered as a project engineer,
5 became a project manager. I became a group
6 leader of the water resources group that is in
7 the particular office as I -- I am in -- I --
8 I am in. And then, I moved in to this
9 management role of the water resources
10 department, which is a companywide and
11 throughout the whole company, I manage the
12 whole department in all the other offices also.

13 Q: How large an organization is Thomas and Hutton?

14 A: I think we're currently over like 425
15 employees.

16 Q: Do you have locations in multiple states or
17 offices?

18 A: We have offices in Georgia, South Carolina,
19 North Carolina and Tennessee.

20 Q: How large is your department?

21 A: My department is 16 persons.

22 Q: Spread throughout the entire organization?

23 A: Spread through the entire organization.

24 Q: And -- and you oversee that department?

25 A: I do oversee that department.



1 Q: You work collaboratively with other employees
2 within your department?

3 A: I do.

4 Q: And do you work collaboraty -- collaboratively
5 with other engineers within your firm outside
6 of your department?

7 A: I do.

8 Q: As projects demand, do you work collaboratively
9 with consults outside your firm on the same
10 project?

11 A: Very often. Yes.

12 Q: How long have you been in your current capacity
13 as department head?

14 A: Seven, eight years.

15 Q: And what generally are your duties in your
16 current capacity?

17 A: So, I -- you know, again, as a manager, I -- I
18 oversee the entire department. You know,
19 staffing, training, mentoring, workload
20 balancing, assigning projects. I have -- so
21 far the people that manage like groups, but
22 then they all report to me and I'm make sure
23 all -- everything kind of goes straight. But
24 the also as -- as my current duties, I manage
25 projects. I work on calculations. I work on



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1 models. I write proposals. I, you know,
2 prepare scopes and -- and work plans. Things
3 like that.

4 Q: Okay. So, you're not a pure manager. You're
5 also directly working on projects.

6 A: Yeah. I'm -- you know, we -- I actively work
7 on projects every day.

8 Q: Do you work on or work with clients on
9 conceptual aspects of various projects?

10 A: Yes.

11 Q: Do you actually perform the engineering design
12 on projects?

13 A: I do.

14 Q: Do you do the cost estimating on those
15 projects?

16 A: I do.

17 Q: Where necessary, bid the projects out?

18 A: Yep.

19 Q: Do you work directly with construction con- --
20 contractors to build the project?

21 A: I do.

22 Q: Where appropriate, do you work with clients to
23 obtain grant funding?

24 A: I do.

25 Q: Where needed, do you assist clients in



1 obtaining permitting necessary for projects?

2 A: I do.

3 Q: Fair to say you see the projects from concept
4 all the way through final implementation?

5 A: That's correct.

6 Q: Have you been involved in a publication of any
7 guidance pertaining to stormwater management?

8 A: I have. Over the years, I've been involved in
9 several. Some of the most recent, I served on
10 a technical advisory committee to the South
11 Carolina Department of Natural Resources, where
12 they developed low impact development manual in
13 the Low Country. So, in -- in tidal regions.
14 So, I served on that committee to develop that
15 document.

16 Q: Okay. And to be clear, your -- your role in
17 the technical advisory committee, you were not
18 writing the document, but commenting and
19 advising on it?

20 A: Correct.

21 Q: Okay. What is low impact development?

22 A: Low impact development is -- is the -- the --
23 I -- you can call it field or -- or -- or
24 practice of -- of using techniques to, you
25 know, have a lower impact on the environment



1 when you do development projects, so.

2 Q: Does low impact development practice require
3 the use or professional judgement to determine
4 the best available practice or technology in
5 stormwater design?

6 A: Yes.

7 Q: Beyond providing technical advise on the
8 publication of the guidance document, do you
9 have experience implementing low impact
10 development practices in your projects?

11 A: I do. I do. You know, and in my course of --
12 of my 30 years of -- of work, we've -- we've
13 designed several projects using various low
14 impact development techniques and -- and, you
15 know, whether from the conceptualization
16 through, you know, the mitigation of -- of the
17 impact of the project.

18 Q: Have you also been involved in some capacity in
19 the publication or drafting of the City of
20 Charleston Stormwater Design Manual?

21 A: I -- I did, again, I served on a technical
22 advisory committee for that where we would meet
23 periodically to talk about various, you know,
24 initiatives and -- and regulations that they
25 would want to include in their design manual.



1 Talk about the appropriateness of it. The --
2 the -- the issues that would be faced to -- to
3 -- to implement them. So, yes, I did serve on
4 that -- that committee.

5 Q: Fair to say you're familiar with the City of
6 Charleston's stormwater requirements?

7 A: Very.

8 Q: Were you selected to participate in the Dutch
9 Dialogues?

10 A: I was.

11 Q: What was your role?

12 A: Similar to -- to Mr. Robinson. You know, I was
13 asked, you know, since I'm a fairly active
14 practitioner of -- of stormwater management and
15 -- and development in -- in the Charleston
16 region, to -- to contribute my time in a
17 working group as -- as one of the projects.

18 Q: You familiar with the outcome of that process?

19 A: I am.

20 Q: In talking about your -- your direct project
21 experience, in how many projects, and you can
22 ballpark if necessary, have you been involved
23 in the design or construction stormwater
24 management infrastructure in your career?

25 A: Hundreds to thousands.



1 Q: How many of those projects require your
2 knowledge of hydrology and hydraulics?

3 A: Almost all of them.

4 Q: Were any of these projects located in areas
5 subject to periodic stormwater flooding?

6 A: Many of them were.

7 Q: Were any of those projects located in areas
8 subject to tidally influenced flooding?

9 A: Most of them.

10 Q: In those cases, was the stormwater management
11 system designed to mitigate or address the
12 flooding issues?

13 A: Yes.

14 Q: Is it fair to say that stormwater management
15 and flooding mitigation are strongly related?

16 A: Yes.

17 Q: Can you give us some examples of your
18 experience designing projects for flood prone
19 areas?

20 A: In -- in -- yes, I can. In -- in my practice
21 now, we -- we currently have as clients that we
22 are working on drainage improvements or have
23 worked on and im- -- implemented drainage
24 improvements. Most of the municipalities and
25 counties in the coastal region of South



1 Carolina -- so, starting on the south, Beaufort
2 County, Jasper County is a current client.
3 City of Charleston, we're actively working on
4 a Phase II of a drainage improvement project
5 that Phase I was put in the ground about seven
6 years ago, and now we're finally moved onto the
7 second phase. I work for the town of Mount
8 Pleasant. We're currently implementing a 10
9 million dollar drainage improvement project in
10 the old village. Worked for Charleston County.
11 Have done several drainage improvements and
12 flood mitigation projects. Worked for the town
13 of James Island on a drainage improvement
14 project. Currently, working for Georgetown
15 County on a -- a stormwater master plan for the
16 Waccamaw neck, which is the area between the
17 Atlantic, the Waccamaw River, Georgetown and
18 then the line with Horry County. We also
19 currently work for Horry County, working on a
20 flood mitigation job for the Socastee area and
21 the Bucksport area. And I've worked on
22 probably 10 to 12 projects that have been built
23 in Horry County to address flood mitigation or
24 drainage. That's a summary of kind of what's
25 going on now. But there's many others before.



1 Q: So, those are current projects?

2 A: Those are current projects.

3 Q: Have you done an work with federal agencies
4 related to flood management?

5 A: I have. I have. In -- in my practice and in
6 my group's practice, we -- we have several
7 occasions where we would have to work
8 collaboratively with FEMA to refine, revise or
9 -- or otherwise predict flood plains and -- and
10 -- so, there's -- there's a lot of acronyms
11 involved here. So, I'm going to try to avoid
12 them. But there's the Flood Insurance Studies,
13 where they study all the flooding in a county
14 or -- or a municipality. And then they produce
15 flood insurance rate maps, FIRMs, that shows
16 these areas of flooding. Sometimes, they --
17 they -- they didn't study it correctly or it's
18 -- it's not defined enough or they didn't study
19 the flood hazards in a certain area. And we
20 would come in, generally working for a -- a --
21 another party and apply to revise the floods --
22 flood hazard maps to have better mapping or
23 have mapping in areas that they haven't mapped
24 before. And all that work must go through FEMA
25 to be approved. And then it's adopted by FEMA



1 and that becomes the -- the -- the flood hazard
2 map for that community. So, I've done that --
3 in the last 10 years, we've probably done that
4 20 to 30 times.

5 Q: Does that kind of work require knowledge of
6 hydraulic or hydrologic modeling?

7 A: Yes.

8 Q: Have you been involved with projects requiring
9 critical area permitting?

10 A: I have.

11 Q: Approximately how many?

12 A: A hundred -- up to a hundred.

13 Q: Are you fairly familiar with the requirements
14 for critical area permitting in South Carolina?

15 A: I am.

16 Q: Have you been involved with projects requiring
17 401 or 404 permitting?

18 A: I have.

19 Q: And to be clear, that's the state water quality
20 certification under Section 401 and of course,
21 404, wetlands fill permits.

22 A: Yep.

23 Q: Approximately how many projects have you been
24 involved in with those?

25 A: Slightly more than critical area, so probably



1 in the 200 range.

2 Q: Fairly familiar with those requirements as
3 well?

4 A: I am.

5 Q: Are you familiar with state requirements
6 related to stormwater management?

7 A: I am.

8 Q: You've already testified that you're familiar
9 with the local stormwater requirements within
10 the city of Charleston, correct?

11 A: Correct.

12 Q: Do you regularly advise your clients as to
13 state and local, and possibly even Federal
14 requirements related to land disturbance,
15 stormwater management and flood control?

16 A: I do.

17 Q: Do you commonly work with regulators on behalf
18 of clients?

19 A: I do.

20 Q: Do you work with DHEC?

21 A: I do.

22 Q: You work with the Corps?

23 A: I do.

24 Q: Work with the local regulators?

25 A: I do.



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1 Q: Do you regularly assist clients in attaining a
2 land disturbance permit?

3 A: Yes.

4 Q: And just to be clear, what is a land
5 disturbance permit?

6 A: So, a land disturbance permit is probably a
7 more -- it might be a little bit an older term,
8 but the -- the -- the current term I would use
9 is the NPDES permit, which is a -- a permit --
10 NPDES permit for construction activity, so.
11 And that generally takes the form of a CGP, so
12 the Construction General Permit. So we're
13 applying to do our work per the permit. And --
14 and -- and to be clear, every project, whether
15 it's for a public entity or a private entity
16 that disturbs land over a certain amount, but
17 generally you're over that amount, has to have
18 one of these permits. So, it's not just
19 associated with development. It's associated
20 with drainage improvement projects, road
21 projects, and other infrastructure projects.
22 But yes. That's ---

23 Q: And depending on the area the project is
24 located in, the regulator that's issuing that
25 permit might change, correct?



1 A: That's correct. There -- there's two -- two
2 levels. So, with the -- with the federal NPDES
3 program, many of the regulatory duties has been
4 delegated to the local authority. So, the
5 local authority generally do a review that --
6 that we call an MS4 review. So, they're called
7 the Municipal Separate Storm Sewer System
8 Entity, so that -- that's an MS4. So, that's
9 four Ss. And -- and we get a -- they do a
10 review and then they issue an approval or a
11 concurrence under the MS4 program and then that
12 goes to the state. And then the state approves
13 it under the NPDES program and the -- that --
14 which is again, a federal program.

15 Q: Okay. In the City of Charleston, who issues
16 the land disturbance or NPDES permit?

17 A: So, again, the MS4 part of that is the City of
18 Charleston.

19 Q: Okay. What kind of clients do you generally
20 advise?

21 A: So, like I -- like I spoke before, my group and
22 -- and I -- my -- my -- personally, we work for
23 both what would be called public and -- and
24 then private clients. I -- my group is -- is
25 heavily more in the public arena. So, we're --



1 we're generally working for local governments
2 or local -- you know, whether it's city, towns,
3 counties. We do periodically work for some
4 state agencies and sometimes we do -- we have
5 done work for the -- the federal government.
6 But generally, it's -- it's local cities and
7 municipalities, and counties. And then we also
8 have a role to help some of our private
9 development clients on larger stormwater
10 management and -- and issues like that on their
11 projects.

12 Q: And you -- you mentioned several of your
13 municipal clients earlier in your testimony.
14 Any of those projects you would consider to be
15 large infrastructure projects?

16 A: Yes. Several of them are -- are very large.
17 Like I said, at -- you know, currently, Royal
18 Avenue project for the town of Mount Pleasant
19 is a -- essentially, a 10 million dollar
20 drainage improvement project. Something like
21 14,000 linear feet of pipe system. The -- the
22 City of Charleston, Forest Acres, which I said
23 Phase I was completed, and that was about a 9
24 million dollar Phase I. And then Phase II was
25 just bid as 10 million dollar job. That has



1 several improvements with culverts, channels
2 and other infrastructure. So, fairly large
3 projects. Let's -- you know, bunch of -- lot
4 of -- lot of small ones too.

5 Q: Is most of your work along the coast of South
6 Carolina?

7 A: Yes.

8 Q: Are stormwater and flood concerns different in
9 coastal counties as opposed to non-coastal
10 counties?

11 A: Generally, yes. There's the -- the added
12 complication or -- or consideration of the --
13 the tidal influence on -- on drainage.

14 Q: Is elevation at coastal county also a factor?

15 A: Yeah. Low -- low elevation, so thus you have
16 low slope and not -- by not having that slope,
17 you -- you don't have the -- the elevation to
18 -- to drive the water out of the land.

19 Q: Can you describe some of the coastal flood
20 concerns you've dealt with in your practice?

21 A: We -- I have done a -- you know, a lot of
22 consulting to address, you know, flooding,
23 whether it's from rainfall, from sea level
24 rise, you know, from the tides moving in and
25 being higher, or the combination of the two.



1 One, you know -- one, that comes to mind real
2 quick is on the Isle of Palms, we -- we're
3 currently implementing two outfall projects on
4 the -- the backside of the Isle of Palms.
5 There's -- there was two large channels that
6 would flow into the Intracoastal Waterway and
7 those channels had become over time, less and
8 less effective due to the rise of -- of the
9 seas and the heavier rainfall. So, we've
10 implemented back -- back flow check valves in
11 those outfalls to manage the stormwater better.
12 So, that's one of the big projects that -- that
13 -- addressing both of them.

14 Q: Talking about the interaction of stormwater
15 flooding and -- and tidal influence or tidal
16 flooding, I believe the term compound flooding
17 has been used previously in this matter. Are
18 you familiar with that term?

19 A: I am.

20 Q: Are you experienced in dealing and designing
21 around compound flooding?

22 A: I am.

23 Q: And again, just for clarity, could you define
24 compound flooding in this context?

25 A: So, compound flooding is -- is generally when



1 you have a rain event occurring during a tidal,
2 a -- a high tide or a, you know, say a -- what
3 we -- is -- a lot of people call it king tide,
4 but the correct term is perigeal tide or a
5 higher moon phase tide. When these two types
6 of events are coincident and then you'll have
7 compound flooding.

8 Q: And again, you're experienced in designing
9 around that?

10 A: I -- yes.

11 Q: In designing projects in -- in the low country
12 along the coast, are impacts on wetlands a
13 concern that comes up frequently?

14 A: Absolutely.

15 Q: Do you have to assess the potential impacts on
16 wetlands in your practice?

17 A: I do.

18 Q: Do you have to assess whether wetlands are
19 functioning from a hydraulic or hydrologic
20 perspective in your practice?

21 A: I do.

22 Q: Do you have experience in doing so in your
23 projects?

24 A: I do.

25 Q: Are you familiar with the mathematical models



1 typically used to model flood conditions?

2 A: I am.

3 Q: And to model stormwater flow and drainage?

4 A: Yes.

5 Q: You regularly utilize these and similar models?

6 A: Almost every project involves some type of
7 model.

8 Q: How do these models help you?

9 A: These models -- so, yeah. Hydrology and
10 hydraulics are a very complicated study and it
11 involves the -- you know, the -- kind of -- it
12 does break down to the -- the basic physics in
13 the conservation of mass. You have -- you have
14 an amount of rainfall and it could either be
15 stored or run off or flow. And so, these
16 models help us. And then it's generally a
17 dynamic situation. So, there's -- there's a
18 time -- time component of it. So, we use these
19 mathematical models to look at all of the
20 different physical and -- and characteristics
21 and including time and -- and study the system
22 generally in a predevelopment condition and in
23 a post-project condition. And -- and compare
24 the effect of our -- you know, our proposed
25 designed on a system.



1 Q: Have you found your modeling predictions to
2 generally be accurate in your projects?

3 A: Yes.

4 Q: Do you have experience in dealing with water
5 quality issues as they relate to stormwater
6 design and management?

7 A: I do.

8 Q: What kind of projects have you dealt with
9 dealing with stormwater quality?

10 A: So, some of the projects in -- in -- in my past
11 jobs, one of them was fairly interesting in --
12 in my early career in Florida. We worked for
13 the Southwest Florida Water Management
14 District. And I was on a team that built a
15 system to marry two different models. One --
16 one was a runoff model that predicted runoff
17 rates and also runoff pollutant loads. And
18 then that married to a water body model that
19 predicted the effect of those pollutant loads
20 on that water body. And it had a -- it had a
21 mathematical prediction of how pollutant loads
22 would affect algae and settling with, you know,
23 how it would fall out and stuff like that. So,
24 we built that system generally to address fresh
25 water lakes in Florida. So, that was one



1 program. Another program in my early life and
2 this dates back to before -- and this kind of
3 dating myself. But before the NPDES program
4 that we spoke about before, right when it was
5 coming into -- into existence, the Phase I part
6 of that program required many communities to do
7 testing to understand their water quality of
8 their stormwater runoff in -- in their
9 environment. So, again in Florida, in the
10 Saint Pete area, I was on the team that -- that
11 collected samples during rainfall events, so we
12 could understand what were the -- what were the
13 pollutants, what were the various loads, what
14 influences, whether, you know, if it rained the
15 day before, there might be less loading. It if
16 didn't rain for, you know, a month, there might
17 be more loading. Things like that. So, very
18 familiar with stormwater and water quality with
19 stormwater.

20 Q: Okay. Have you done any work with respect to
21 the Charleston Harbor and water quality?

22 A: Yes. So, more recently, as -- as some of you
23 might know, the Charleston Harbor was recently
24 deepened for -- to allow the -- the larger
25 ships, the Panamex ships to call and -- and be



1 served by the port. One of the issues with
2 that deepening was the concern of the affect on
3 the water quality of Charleston Harbor. I
4 served on the team. My company was on the team
5 that -- that did mathematical modeling and
6 looked at -- did water quality sampling to look
7 at the effects of that harbor deepening on the
8 water quality of Charleston Harbor in its
9 various envi- -- you know, like the Wando,
10 Cooper, and Ashley rivers.

11 Q: Do you have any experience with projects
12 designed to keep existing contaminants on a
13 property out of the stormwater system?

14 A: Yes.

15 Q: What -- what experience is that?

16 A: So, nearly every stormwater management system
17 that is designed for a project is mainly, you
18 know, development of projects are designed with
19 a water quality component. And those
20 components, there's state standards that are --
21 are required to -- to be met for the water
22 quality of a project's, you know -- of a
23 project. So, we are designing various systems,
24 various, what we call best management
25 practices, BMPs, to address the -- the water



1 quality effects.

2 Q: Have you ever worked on a superfund site?

3 A: I have worked on a superfund site. I've worked
4 on at least two. One here in Char- -- well,
5 one down in Charleston, since we're in
6 Columbia. The -- I call it the Koppers site.
7 It was originally a Koppers site. I think it's
8 more recently known as the Magnolia site.
9 Heavily impacted by creosote. They used to
10 treat telephone poles there and their way of
11 managing the creosote was they would pressuring
12 the -- the poles in a vat -- in a -- in a
13 pressure vessel, and then they would just roll
14 them out and drip dry. And all that creosote
15 went right in to the ground. And so, we -- we
16 worked on a team. I was part of the team that
17 worked on -- on that superfund site to clean it
18 up and cap it to a level that was required. I
19 also designed a stormwater management system
20 for that area that was fully encapsulated. So,
21 there was to be no interaction with the
22 groundwater because that groundwater still
23 impacted. And so, we didn't want that
24 potential contaminant to enter the stormwater
25 system and flow out into the Ashley River.



1 Q: Are there models typically used by engineers to
2 predict water quality impacts from stormwater?

3 A: There are.

4 Q: Have you used them?

5 A: I have.

6 Q: Regularly?

7 A: Yes.

8 Q: You already testified that you have experience,
9 at least in your early career with collecting
10 water quality samples and you understand the
11 process involved with that.

12 A: I do.

13 Q: You understand the procedures to make sure that
14 samples are accurate and not tainted.

15 A: Right. There -- there are various requirements
16 for, you know, ways to have clean vessels and
17 how you're supposed to collect it. You know,
18 certain procedures and then there's a chain of
19 custody and a certified lab that has to analyze
20 it and things like that.

21 Q: Do you in your current duties review water
22 quality sampling results?

23 A: I do.

24 Q: For what purpose?

25 A: Various purposes. You know, we -- we get data



1 on -- on certain symptoms that we -- we have
2 designed and we're -- we're checking or we --
3 we're looking at results, you know, from -- a
4 lot of times, we have to design to certain
5 standards based upon the water quality of the
6 water body in the area. And so, we -- we look
7 at that data.

8 Q: Does that have anything to do with TMDLs?

9 A: It has a lot to do with TMDLs and that's one of
10 the -- the -- the -- so, water bodies generally
11 impaired -- partially impaired water bodies
12 will be studied and a total maximum daily load
13 would be assigned to that water body that
14 basically says, well, this water body is
15 capable of potentially absorbing this amount of
16 pollutants, whether it's natural or -- you
17 know, manmade. And so, if -- if a body has a
18 -- if a water body is you know, impaired and
19 has a TMDL, we generally have to design our
20 projects to a higher standard of treatment to
21 make sure that -- that we are not exceeding
22 that total maximum daily load to that water
23 body.

24 Q: So, you have experience designing stormwater
25 systems to limit the levels of such pollutants



1 leaving the site?

2 A: I do.

3 Q: Are you familiar with regulatory water quality
4 standards?

5 A: I am.

6 Q: What water quality standards do you typically
7 employ in your work?

8 A: So, you know, the state water quality standards
9 related to, you know, sediment removal, the --
10 the TMDL standards we look at. A lot of times
11 -- a lot of -- in coastal water, TMDLs
12 generally are associated with bacteria loading,
13 whether it's E. coli or -- or other ones. You
14 know, again, there's -- there's nutrient driven
15 TMDLs. There are nitrogen and phosphors. So,
16 we're looking at -- at various things like
17 that.

18 Q: Do you have experience with stream restoration
19 projects?

20 A: I do.

21 Q: What are some of the projects you've worked
22 with regards ---

23 A: We currently have a project going on right here
24 in Columbia on Eight Mile Branch where we -- we
25 were hired by the City of Columbia to study the



1 watershed in and around Eight Mile Branch and
2 identify its problems, screen alternatives, and
3 then recommend to the -- the city various
4 solutions or projects to address the -- the --
5 the issues in -- in -- in the watershed. And
6 then, we are currently designing like three or
7 four of the large components of that -- that
8 project and one of those components is a stream
9 restoration of a good part of Eight Mile
10 Branch.

11 Q: Do you have experience working on grant funding
12 for projects?

13 A: I do.

14 Q: What -- what are some of those projects?

15 A: So, more recently we -- we've been working with
16 the South Carolina Office of Resiliency. That
17 have a fairly aggressive grant program. That's
18 generally restricted to the Pee Dee Region that
19 -- that office. There's grants that go through
20 the South Carolina Office of Envi- -- EMD,
21 Emergency Management Division. There's also
22 projects straight from FEMA under the Hazard
23 Mitigation Grant program. I've worked in that.
24 There's the rural infrastructure, RIA, Rural
25 Infrastructure Association or Bank grants. So,



1 there -- there's several of those grants that
2 we've participated in -- in pursuing. And some
3 of them we've been successful and have
4 garnered.

5 Q: Have you ever testified before?

6 A: I have.

7 Q: In what court?

8 A: I have testified in this court.

9 Q: What kind of case or cases?

10 A: To the best of my knowledge it was two cases,
11 generally associated with stormwater permits.

12 Q: Were you qualified as an expert?

13 A: I was.

14 Q: Do you recall what field or fields the court
15 concluded you were an expert in?

16 A: Not off the top of my head, but I suspect it
17 has something to do with stormwater management.

18 Q: Poten- -- potentially engineering?

19 A: And engineering.

20 Q: All right.

21 **MR. TRAYNHAM:** Your Honor, at this time, we would
22 offer Mr. Karkowski as an expert civil engineer
23 with expertise in hydrology and hydraulics,
24 stormwater management and design, stormwater
25 quality, and flood mitigation including design



1 in flood prone areas.

2 **THE COURT:** I figure you're not going to ---

3 **MR. CHURDAR:** No objection, Your Honor.

4 **THE COURT:** Yes. That's what I figured.

5 **MR. CUNNINGHAM:** I'm trying to make sure I've got
6 all this -- I know I don't have an objection to
7 stormwater management, stormwater quality and
8 I presume hydrology and hydraulics as it
9 relates to stormwater management?

10 **MR. TRAYNHAM:** We can caveat that.

11 **MR. CUNNINGHAM:** Okay. That's okay. Civil
12 engineering, I guess my -- my only concern
13 there, Your Honor, is I deposed Mr. Karkowski
14 and we certainly talked about stormwater and we
15 talked a little bit about water quality too,
16 but we didn't talk about I think a more broader
17 area, civil engineering. And then in -- at the
18 end of the deposition, I asked him if we've
19 talked about the all the areas he's going to
20 testify to and he said yes. So, I guess that's
21 my concern. To the extent civil engineering
22 relates to stormwater management, I don't have
23 an objection, but otherwise ---

24 **THE COURT:** Isn't civil engineering ---

25 **MR. CUNNINGHAM:** It's very broad.



1 **THE COURT:** Very broad and this comes under the -- a
2 broader ---

3 **MR. CUNNINGHAM:** Exactly. And that's why I don't to
4 open the door to all these other areas of civil
5 engineering by agreeing to that. Now, civil
6 engineering as it relates to stormwater
7 management, I don't have an objection to.

8 **MR. TRAYNHAM:** Your Honor, his primary testimony is
9 going to be geared toward stormwater
10 management. There's no question about that.
11 But there are tangential elements of his civil
12 engineering experience related to stormwater
13 projects that we would also like him to be able
14 -- and I'm happy to continue voir dire on that.

15 **THE COURT:** Well, from my understanding most
16 engineers, mechanical, civil, chemical, and I
17 could go on down the list, but -- structural --
18 well, structural may be under mechanical.

19 A: What's that?

20 **THE COURT:** Structural, is it separate from
21 mechanical?

22 A: Absolutely. Yes.

23 **THE COURT:** Okay. And then, so then you hit one of
24 the branches, I'm -- I'm a civil engineer, but
25 ---



1 **MR. CUNNINGHAM:** Well, here's the -- here's the
2 issue, Your Honor, really. It's not so much
3 about Mr. Karkowski's qualifications. It's
4 about our not being -- having disclosed those
5 -- that area of expertise that he will be
6 testifying about prior to right now.

7 **THE COURT:** Okay.

8 **MR. TRAYNHAM:** Your Honor, he had full opportunity
9 to depose Mr. Karkowski. Mr. Karkowski
10 testified to the best of his knowledge at the
11 time. But we're not trying to ambush anyone
12 here. But to the extent that Mr. Karkowski has
13 experience dealing with road projects or the
14 differential settlement that we heard about
15 yesterday, that is not strictly a stormwater
16 issue, but it is related to his experience in
17 stormwater projects. And we would like Mr.
18 Karkowski to be free to testify to that.

19 **THE COURT:** All right.

20 **MR. CUNNINGHAM:** May -- may I respond to that
21 briefly, Your Honor? I did have a chance to
22 depose Mr. Karkowski and in that de- --
23 deposition, Mr. Karkowski swore under oath that
24 we had talked about the areas of testimony he
25 was going to give.



1 **THE COURT:** Yeah.

2 **MR. CUNNINGHAM:** And they didn't include roadways.
3 They call -- we talked about stormwater and --
4 and I will grant you hydraulics and hydrology
5 as that relates to that and in the areas it
6 relates to that.

7 **THE COURT:** Yeah.

8 **MR. CUNNINGHAM:** But we didn't talk about a much
9 more broader area. And in fact, Mr. Karkowski
10 said, I -- I believe I'm going to talk about
11 the stormwater report essentially, primarily as
12 part of his testimony.

13 **THE COURT:** Would that include differential sediment
14 -- settling?

15 **MR. CUNNINGHAM:** I don't that -- well, I don't know
16 that it directly does, Your Honor. I think as
17 it relates to modeling in the stormwater ---

18 **THE COURT:** Yeah.

19 **MR. CUNNINGHAM:** --- report. That's fine.

20 **THE COURT:** Yeah.

21 **MR. CUNNINGHAM:** But that -- that's what I'm talking
22 about. That we're getting into an area far
23 beyond what Mr. Karkowski talked about in his
24 deposition.

25 **THE COURT:** I don't know if it's far beyond, but ---



1 **MR. CUNNINGHAM:** Beyond enough that ---

2 **THE COURT:** Far ---

3 **MR. CUNNINGHAM:** --- I was not -- I'd be surprised.

4 **THE COURT:** Far beyond is structural engineering or
5 that ---

6 **MR. CUNNINGHAM:** Fair enough, Your Honor. But
7 beyond enough that, I'm, you know, that's
8 different than what he said earlier.

9 **THE COURT:** You're objecting?

10 **MR. CUNNINGHAM:** Yes, sir.

11 **MR. TRAYNHAM:** Your Honor, he's a professional
12 engineer. I think that this falls within the
13 scope of his deposition. I'm happy to sidebar
14 on what exactly he's testified to in the
15 deposition, but I think this is well within the
16 scope of expertise. And it's not an unfair
17 surprise for him to talk about what has related
18 to the stormwater projects he has been involved
19 in.

20 **THE COURT:** Right. I'm going to qualify him as an
21 expert in everything that you've requested
22 regarding -- except for civil engineering. The
23 -- I mean, he is an expert in civil
24 engineering. So, I'd qualified him as such.
25 Whether or not the Petitioner has been notified



1 of his testimony, I will allow you to object,
2 if you think he ventures outside of that
3 territory.

4 **MR. CUNNINGHAM:** Thank you, Your Honor.

5 **THE COURT:** How -- is that a proper resolution
6 today?

7 **MR. CUNNINGHAM:** I think so, Your Honor.

8 **MR. TRAYNHAM:** Thank you, Your Honor.

9 (Coughing)

10 **THE COURT:** Don't get all choked up about that.

11 Q: Mr. Karkowski, your voir dire was -- was long.
12 Are you okay to continue or you need a break?

13 A: Yeah. I'm good.

14 Q: All right. I'll endeavor to ask in those
15 instance we come to it, but where I ask for
16 your judgement or opinion, please assume I'm
17 asking for your opinion to a reasonable degree
18 of engineering certainty. Fair enough?

19 A: Fair enough.

20 Q: Before we -- we begin, kind of a 30,000 foot
21 caveat, do you as an engineer deal in
22 absolutes?

23 A: I do not.

24 Q: Do you make guarantees?

25 A: Never.



1 Q: I think in one of our previous discussions, you
2 said there's always a storm event you can't
3 design for.

4 A: Correct.

5 Q: Correct? So, you're not here today to testify
6 that this project is going to solve every
7 potential flooding event or storm event that
8 could possibly hit the Charleston peninsula,
9 correct?

10 A: That's correct.

11 Q: All right. But are you experienced in modeling
12 stormwater projects for -- to -- to meet or
13 exceed regulatory standards and to improve
14 stormwater conditions that are present at the
15 site when you come to it?

16 A: That -- that has been my practice for nearly 30
17 years of my career.

18 Q: With that caveat, Mr. Karkowski, are you
19 familiar with the project you're here about
20 today?

21 A: Very familiar.

22 Q: And with the stormwater infrastructure
23 associated with the previous phases of the
24 WestEdge project?

25 A: I am.



1 Q: And -- and just to be clear, what is currently
2 at WestEdge?

3 A: So, WestEdge as the -- the various parts of the
4 project that have been constructed to date is
5 10 WestEdge, which is the building on the
6 corner of Lockwood and Spring Street, which
7 houses the Publix. I think that's been
8 referred to several times. The -- the road
9 that is just to the north of that. And then
10 behind -- behind that -- and when I say behind
11 that, I mean going farther inland into the
12 peninsula, there's 22 WestEdge, which is a
13 large glass building, that I believe houses a
14 pharmaceutical company that's part of the MUSC.
15 And then, on the -- and then on the western
16 edge of the project, there's -- it used to be
17 called 99 WestEdge, but it's not called the
18 Caroline. And that's a multi- -- multi-use
19 building kind of across from the Joe Riley
20 Stadium. I believe that's the -- and then the
21 road that goes adjacent to that has been
22 improved.

23 Q: And you're familiar with the stormwater
24 infrastructure associated with the development
25 thus far?



1 A: I am. Yes.

2 Q: What has been your role with respect to the
3 WestEdge development?

4 A: So again, personally and in my group, we -- we
5 had worked collaboratively with other engineers
6 in our office to -- to design the stormwater
7 management system and also master plan the
8 stormwater management system for the future
9 phases and expansion of the project.

10 Q: Is it fair to say that other parts of your
11 company have a different role with regard to
12 WestEdge?

13 A: Yes.

14 Q: That yours has been focused on stormwater
15 design master planning and specific permitting
16 for previous phases?

17 A: Correct. Correct. But there's -- there's --
18 there's a high, high degree of coordination and
19 collaboration in -- in that area.

20 Q: All right. Are you familiar with the history
21 of the site?

22 A: Familiar.

23 Q: Is that relevant to your considerations in
24 designing stormwater ---

25 A: It is.



1 Q: All right. Was this site previously used as a
2 landfill?

3 A: Yes.

4 Q: Have you physically observed the site?

5 A: I have physically observed the site.

6 Q: Have you observed the condition of the landfill
7 cap?

8 A: I have in -- in several locations.

9 Q: Have you observed trash in and around the
10 drainage feature there?

11 A: Absolutely. I've seen evidence of -- of buried
12 trash, you know, exposed on the surface.

13 Q: Have you heard the testimony previous to today
14 from other witnesses regarding the condition of
15 the cap and presence or lack thereof of trash
16 attributable to the historic landfill?

17 A: You know, again, I -- I think there's been some
18 -- some mention in that there's trash coming in
19 from -- from the surrounding neighborhood or
20 the surrounding area and that's -- that's true,
21 but that doesn't negate the fact that there is
22 buried trash exposed in the -- in the water way
23 that is the channel there.

24 Q: Have you worked on landfills before?

25 A: I have worked on landfills before. Several --



1 worked on several stormwater management
2 projects in and around landfills. Some here,
3 Dorchester County, one up in Moncks Corner and
4 -- and then one in West Virginia.

5 Q: Do you know how modern, permitted landfills are
6 intended to operate with respect to leachate
7 and stormwater?

8 A: Yes. So, in -- in -- in a nutshell, a modern
9 landfill is kind of, you -- you dig a hole, you
10 line that hole, and that -- that lining is to
11 capture the leachate, any liquids that are
12 flowing through the -- which are put in the
13 landfill to the bottom of that lining. And
14 generally, there is a pump or a collection
15 system. So, there's a leachate collection
16 system. And then that leachate collection
17 system is taken generally to a -- a wastewater
18 treatment plant because the leachates always
19 have a high concentration of some type of
20 pollutants in it. And then once you fill up
21 that landfill, you cover it with a cap and the
22 purpose of that cap is to keep rainwater from
23 penetrating to it and adding to that leachate.
24 So, again, the management of that runoff and
25 maintaining that cap is very important to that



1 landfill. And so, you keep -- and then the --
2 that purpose there is to keep the leachate
3 separate from the stormwater.

4 Q: And are the conditions at this site different
5 from what you observed at other modern
6 permitted landfills?

7 A: Yes.

8 Q: How so?

9 A: There -- there is no leachate collection
10 system. There was probably lining of -- of
11 this -- of the system. The -- the cap, you
12 know, in my opinion is not a pervious cover, so
13 it -- it allows rainwater to penetrate and --
14 and mingle with the -- the system and ---

15 **THE COURT:** You said the cap was not a pervious or -
16 - or impervious?

17 A: The -- the cap is not impervious. I'm sorry.
18 Yes.

19 **THE COURT:** Okay.

20 A: Yes. Or it's probably ---

21 **MR. CUNNINGHAM:** Same thing.

22 A: You know, it's probably ---

23 **THE COURT:** Oh, that's the same thing?

24 **MR. CUNNINGHAM:** I was wondering. I -- I was
25 wondering the same thing, Your Honor.



1 **THE COURT:** Well ---

2 **MR. TRAYNHAM:** Pervious and not impervious.

3 **THE COURT:** Well, im- -- if it's ---

4 **MR. TRAYNHAM:** If it is pervious, it's not ---

5 **THE COURT:** Impervious, it would not be allowing
6 rainwater to go through it and so therein ---

7 A: Correct. It's my -- it's my

8 **THE COURT:** --- is my question.

9 A: It's my understanding there was like -- there
10 was no like thought of, you know, generally a
11 modern landfill would have the use of clay or
12 a clay liner. Then that -- that would be
13 compacted to -- you know, that would be put in
14 at a -- a depth or a thickness in a compaction
15 that would make it less pervious or impervious.

16 **THE COURT:** Okay.

17 A: And that would keep the water out of landfill.
18 And in this case, I -- I -- I have no -- you
19 know, I didn't study the records or you know,
20 look at the -- any construction drawings if
21 there were, but you know, I -- it would be my
22 opinion that nobody really -- we're just cover
23 it. We're not going to really have any thought
24 to -- trying to keep the stormwater out of the
25 -- out of the landfill.



1 Q: And does some of the stormwater that enters
2 this landfill exit as leachate?

3 A: Yes. There's -- there's evidence and I -- I've
4 seen evidence personally, independent, and you
5 know, read reports of this evidence.

6 Q: Are you comfortable with the idea of people
7 wading through this creek?

8 A: Absolutely not.

9 Q: We've already talked about it, so I'll assume
10 that you're familiar with the drainage feature
11 running this project site?

12 A: That's correct.

13 Q: It's been referred to by Petitioners as a
14 creek. We won't belabor this subject, but
15 would you use that term to describe it?

16 A: I -- I generally wouldn't. You know, but it's
17 my -- you know, my understanding that -- that
18 the area has been heavily manipulated was --
19 was filled in as a -- as a landfill to -- to
20 create land to -- to -- to build on, you know,
21 res- -- residential, commercial whatever, to
22 create land. And they -- they used the -- the
23 trash to create that land and they dug this
24 ditch or channel around the edge to maintain
25 the drainage that was coming out of the



1 existing uplands before they filled it. And
2 so, it -- that ditch has no -- you know,
3 unfortunately has no relation back to the
4 original chan- -- or creek that was there.

5 Q: I'd like to show you a document that's been
6 pre-marked as Respondent's Exhibit 33. Are you
7 familiar with that document?

8 A: Yeah. This is a -- the -- the plat for the
9 drainage easement that the channel is in.

10 Q: Who holds that drainage easement?

11 A: I guess the City of Charleston.

12 Q: And what does this -- the fact that a drainage
13 easement exists over this feature indicate to
14 you?

15 A: That there's a drainage infrastructure located
16 in that easement.

17 Q: Does it indicate that it was constructed for
18 that purpose?

19 A: Yes.

20 Q: So, to be clear, when there's a reference in
21 your testimony to a creek, when I -- when I
22 asked about the creek, this manmade drainage
23 feature is what we're referring to, correct?

24 A: That -- that's correct.

25 Q: All right.



1 **MR. TRAYNHAM:** Your Honor, at this time, we would
2 ask that Exhibit 33, the drainage easement plat
3 be moved into evidence.

4 **MR. CHURDAR:** No objection.

5 **MR. CUNNINGHAM:** No objections.

6 **THE COURT:** It's admitted.

7 **(Respondent's Exhibit Number 33 was admitted into**
8 **evidence.)**

9 **MR. TRAYNHAM:** Thank you.

10 **THE COURT:** So, when you say this is a -- the
11 drainage easement, the drainage ditch was
12 created, did that created structure intermingle
13 at all with the previous Gadsden Creek?

14 A: I have no -- I have no way of saying that.

15 **THE COURT:** Oh, well ---

16 **MR. CUNNINGHAM:** And I was ---

17 **THE COURT:** That's fine. If you want to object, if
18 I ---

19 **MR. CUNNINGHAM:** I was going to object to his
20 qualifications on that and Mr. Karkowski ---

21 A: Yeah.

22 **MR. CUNNINGHAM:** --- anticipated that.

23 A: Yeah. I -- I -- I mean, I -- I haven't studied
24 the historical photographs. Some I have, but
25 -- but in my observation, I mean, it's not a



1 natural feature. It's definitely a manmade
2 channelized feature. You know, understanding
3 of how the project was -- was brought about.
4 I -- I don't believe it's -- it's -- it has
5 anything to do with what was the physical
6 feature of Gadsden Creek back before all this
7 happened.

8 Q: I think you heard some testimony yesterday
9 regarding Church Creek, a water body in another
10 part of Charleston, which was described as a
11 ditch and some of the reasons why that term
12 applies to Church Creek. Do you think those
13 circumstances would apply to this water body as
14 well?

15 A: I think it's very similar.

16 Q: So, how does stormwater collect and flow into
17 this water feature as it currently exists?

18 A: So, the -- the -- there's a series of drainage
19 and -- were we going to put an exhibit or?

20 Q: I'll tell you what.

21 **MR. TRAYNHAM:** Can we turn on the ELMO? This is a
22 general aerial that we've used previously.

23 Q: Would this help in describing ---

24 A: It -- it -- it does.

25 Q: Okay.



1 **MR. TRAYNHAM:** And how do you get the thing to ---

2 A: Okay. So, at this intersection here, there's
3 a large drainage system that's coming down
4 Fishburne and there's a large basin, this is
5 the 100/200 acre basin that was -- was
6 discussed. So, there's -- there's a large
7 basin that goes off here. And it enters this
8 corner right here and a -- and a -- there's a
9 relatively small box culvert, two by two, two
10 foot by two foot box culvert. It flows in this
11 channel area here to a culvert under -- this is
12 Line Street, so under a culvert here. This is
13 a relatively small culvert, a 42 inch pipe.
14 There's also at this area, there's some local
15 drainage in small pipes collecting from these
16 side streets, say 15 inch pipes. And they come
17 in at various locations here. It flows
18 channelized through here to there and this is
19 Lockwood culvert. So, that's a five by eight
20 concrete box culvert underneath Lockwood
21 Boulevard. And then it flows out this
22 remaining channel to -- this is the Ashley
23 River.

24 Q: All right. Does the tide flow into this water?

25 **THE COURT:** Wait a second, the basin to the right -



1 --

2 A: Yes, sir.

3 **THE COURT:** --- that looks to -- is that -- when you
4 say a basin, what do you mean?

5 A: Well, the contributing drainage areas. So, the
6 ---

7 **THE COURT:** Is that what you mean by ---

8 A: Yeah -- yes, sir. So, there's a -- there's a
9 large amount -- as -- as part of our site,
10 there's a large amount and -- and you know, in
11 our -- in my -- my job, we have to not only
12 deal with the stormwater from -- from our site,
13 which our site is this red outline is the --
14 the greater, you know, WestEdge project. But
15 we also have to address all of the offsite
16 drainage. And there's a large offsite drainage
17 area. You know, in -- in addition to those
18 small area -- small areas on -- on the bottom
19 center, but to the bottom right, there's a
20 large drainage area that extends up into -- and
21 we could -- we could another exhibit here later
22 that ---

23 **THE COURT:** Oh, your -- you've answer my question.

24 A: Yeah. Okay.

25 Q: Does the tide enter this water feature?



1 A: The -- the tide does enter this water feature.
2 So, the Ashley River being a -- a tidal creek
3 or tidal river in -- in the Charleston area,
4 twice a day the tide enters through the
5 Charleston Harbor into the Ashley River. And
6 then here at the mouth, the tide proceeds up
7 through these systems into the -- into the --
8 into the area.

9 Q: Can you think of any other project you've been
10 involved with where stormwater drainage and
11 tide flow through and open landfill?

12 A: I -- I don't recall a project like this.

13 Q: Is that the case here?

14 **MR. CUNNINGHAM:** I'll object to the open landfill
15 characterization, Your Honor.

16 Q: Can you think of any other project you've been
17 involved with where ---

18 **THE COURT:** He hadn't -- has he answered the
19 question?

20 **MR. TRAYNHAM:** He had answered the question.

21 **MR. CUNNINGHAM:** I'm sorry, Your Honor. I'm too
22 late if he answered it.

23 **THE COURT:** Well, I ---

24 **MR. TRAYNHAM:** I'm happy to rephrase it, Your Honor.

25 **THE COURT:** Just strike the open landfill and let's



1 just start all over.

2 **MR. TRAYNHAM:** All right.

3 **THE COURT:** How about that?

4 **MR. TRAYNHAM:** Sure.

5 **MR. CUNNINGHAM:** Thank you, Your Honor.

6 **MR. TRAYNHAM:** Sure.

7 Q: Can you think of any other project you have
8 been involved with where stormwater drainage
9 and tide flow throw -- flowed through a
10 historic landfill with a degraded cap?

11 A: No. I -- I have not seen a situation like this
12 before.

13 Q: Is that the case here?

14 A: That is the case here. Yes.

15 Q: Are you aware of any place in Charleston County
16 other than this where drainage and tide flow
17 through a landfill with a degrade cap and into
18 a receiving water body?

19 A: No. Not that I know of.

20 Q: Do you consider this to be a unique condition?

21 A: A very unique condition.

22 Q: You touched on it briefly earlier, but can you
23 describe what has been done on the broader
24 WestEdge development thus far with respect to
25 stormwater infrastructure?



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1 A: So, the -- can I do a clear?

2 **THE COURT:** Well before you hit clear.

3 A: Want to see this?

4 **THE COURT:** I have a questions.

5 A: Yes, sir.

6 **THE COURT:** All right. Where you were showing the
7 tidal inflows and you to the arrowhead, where
8 is that in relation to what we've been calling
9 Gadsden Creek, what you call -- what are you
10 calling it? A ---

11 A: Channel, ditch ---

12 **THE COURT:** Okay.

13 A: --- creek.

14 **THE COURT:** Channel.

15 A: I mean, you know, we can use them all, but ---

16 **THE COURT:** Okay. Where is that in relation to ja-
17 -- Gadsden Creek channel?

18 A: Okay. So ---

19 **THE COURT:** All in between.

20 A: So, you know, the -- this water body. That --
21 the -- that blue line is -- is ga- -- Gadsden
22 Creek or the Gadsden Creek channel, whatever.

23 **THE COURT:** The whole thing?

24 A: Let me see if I can change my color.

25 **THE COURT:** You can.



1 A: So ---

2 **MR. TRAYNHAM:** Just don't use red.

3 **THE COURT:** Engineers always work my system better.

4 A: Don't use red.

5 **MR. TRAYNHAM:** We've already got a red line. I
6 don't want any ---

7 A: Okay.

8 **MR. TRAYNHAM:** --- confusion.

9 A: Gadsden Creek channel, there's a culvert.
10 There's -- there's a portion of it here. It
11 goes up to here and it goes like that. Sorry.
12 And then there.

13 **THE COURT:** All right. Well, you said culvert.

14 A: There ---

15 **THE COURT:** Culvert wouldn't necessarily be exposed,
16 would it?

17 A: Well, so there's in -- as part of the Gadsden
18 Creek system, which is -- you know, drainage
19 system would be creek or channel, culvert,
20 creek or channel, culvert, you know, as you
21 move down. So, there's at least two culverts
22 in the system. One at Line Street and then one
23 at Lockwood.

24 **THE COURT:** Okay.

25 **MR. TRAYNHAM:** It's not a continuous feature, Your



1 Honor.

2 **THE COURT:** That's what I'm asking about.

3 A: Is it not a continuous ---

4 **THE COURT:** The culvert is going to ---

5 A: It's ---

6 **THE COURT:** --- create a break in the system.

7 A: There's -- there's two breaks.

8 **THE COURT:** Or a channel.

9 **MR. CUNNINGHAM:** But ---

10 A: Two breaks in the channel.

11 **THE COURT:** If I'm hitting something wrong. Go
12 ahead.

13 **MR. CUNNINGHAM:** I -- I would say, it's -- it's
14 still continuous. It just flows through the
15 culvert.

16 **THE COURT:** It's not -- well, what I was trying to
17 figure out is it's -- is it opened.

18 **MR. CUNNINGHAM:** Oh, I -- I think their ---

19 **THE COURT:** That ---

20 **MR. CUNNINGHAM:** --- their witness has testified
21 there are many areas that are closed besides
22 just the culvert.

23 **THE COURT:** That -- well, that's what I was trying
24 to figure out is all I'm -- it's an open
25 channel and all of a sudden it's not. But I



1 was trying to figure out where it's opened.

2 A: It's opened in those light blue areas and then,
3 if I have to ---

4 **THE COURT:** I think you can hit undo.

5 Q: Before you do that Mr. Karkowski, just for
6 clarity of the record, a portion of the creek
7 that you highlighted in the upper left portion
8 on the opposite side of Lockwood, that is not
9 included in the project?

10 A: That is not in the project area.

11 Q: Correct.

12 A: Correct.

13 **THE COURT:** Okay.

14 **MR. TRAYNHAM:** Just wanted that on the record, Your
15 Honor.

16 **THE COURT:** All right. I think I got -- getting a
17 clear picture.

18 A: Okay. You got it.

19 Q: Now, getting back to the existing phases of the
20 WestEdge development, can you -- can you
21 describe what's been done there with respect to
22 stormwater infrastructure?

23 A: Correct. So, in -- in -- we have modified
24 slightly the -- the culvert here that's under
25 Lockwood. We've extended it slightly. And



1 then, in the road that has been built, there's
2 a -- a large culvert that we put in there in --
3 in anticipation of the rest of the project. So,
4 again, you know, this -- this site has been
5 master planned. Some of the infrastructure
6 that has been put in, has been put in in an
7 anticipation of the master plan, you know,
8 coming -- coming through. There's -- you know,
9 again, each one of these sites -- so this is 10
10 WestEdge. I forget the address. But that's
11 where the Publix is. This is 22 WestEdge. And
12 then this is the Caroline. So, there's a --
13 there's some drainage that's been managed here
14 and then, of course, you know, some drainage
15 that's been managed with these that are tied
16 into this drain system here and they flow
17 towards Lockwood and out the -- the culvert.

18 Q: Is there a master plan for the overall
19 development ---

20 A: There ---

21 Q: --- from a stormwater perspective?

22 A: There is a master plan for the overall
23 development at the site. And with -- even
24 including offsite improvements.

25 Q: Is that master plan been reviewed by the City



1 of Charleston?

2 A: It has.

3 Q: And approved?

4 A: Yes.

5 Q: What does the master plan entail?

6 A: So, the -- the master plan entails a -- a
7 fairly aggressive system where we have created
8 not only the one outfall that -- that is
9 existing at Lockwood. And I guess, do you want
10 me clear that or?

11 **THE COURT:** You can run the show on that right now.

12 A: Okay.

13 **THE COURT:** If you want to clear it, clear it.

14 A: Yeah. So, as -- as you know, as we just
15 described, there's the current outfall here and
16 the -- the master plan is to -- to maintain
17 that outfall and have the area that's going to
18 it currently, most -- well -- well, a good
19 portion of the area that's going to it
20 currently will still go to it. So, there'd be
21 a -- a collection system, something like this
22 that would -- would serve the area. We're
23 going to have a -- a second outfall that
24 connects to a -- this is -- connects over to
25 Spring Street and in Spring Street, there's the



1 City of Charleston's Spring-Fishburne Tunnel.
2 So, we are tying this are into the tunnel, but
3 it's only going to accept drainage from a
4 limited area in -- you know, like -- generally
5 like -- in something like that. And then,
6 we're going to create a third outfall that is
7 going to go parallel to Fishburne and then out
8 this area here to there. And this is going to
9 take a -- it's going to be tied to the major
10 drainage line that we talked -- that was going
11 down here. It'll take a good amount of that
12 flow, kind of like off our site and out -- out
13 of this one outfall and put into that -- that
14 new third outfall.

15 **THE COURT:** And that arrowhead is what? You said
16 into that.

17 A: This is a -- you know, into the marshes of
18 Ashley River.

19 **THE COURT:** Okay.

20 **MR. TRAYNHAM:** And, Your Honor, at this time, I'd
21 like to show the witness what has been marked
22 as -- premarked as Respondent's Exhibit 10.

23 Q: Mr. Karkowski, are you familiar with that
24 document or documents?

25 A: Yes. I -- I've seen this document before.



1 Q: What did that -- what does that document
2 depict?

3 A: So, these are some exhibits that were created
4 to -- to convey our -- our plans, stormwater
5 management plans for the site.

6 **MR. TRAYNHAM:** Your Honor, at this time, we would
7 ask that Exhibit 10 be admitted into evidence?

8 **MR. CUNNINGHAM:** No objection.

9 **MR. CHURDAR:** No objection, Your Honor.

10 **THE COURT:** It's admitted.

11 **(Respondent's Exhibit Number 10 was admitted into**
12 **evidence.)**

13 Q: And briefly, Mr. Karkowski, I'll put this up on
14 the ELMO so the Court can kind of see a little
15 better what you're talking about.

16 **MR. TRAYNHAM:** Your Honor, I apologize. This
17 reorients the site somewhat.

18 Q: But, Mr. Karkowski, if you don't mind, just go
19 through that again with this exhibit.

20 A: Okay.

21 **THE COURT:** Blow that up a little bit. Just the
22 people.

23 **MR. TRAYNHAM:** Clearly I need Ms. Shahid over here
24 for tech support.

25 **THE COURT:** Thank you.



1 A: Good enough? So, just to reor- -- reorient you
2 again, this is Fishburne. This is Hagood. So,
3 these -- those lines. And then, this down here
4 is the Lockwood culvert and the outfall, the
5 current outfall to the Ashley River. The
6 current alignment of the -- you know, the
7 Gadsden Creek channel is something like that.
8 So, what -- what we propose to do is instead of
9 relying on this one outfall in concentrating
10 all our flow through the eight -- five by eight
11 box culvert at Lockwood, again, we -- we're
12 going to take a redundant design system of
13 having three outfalls where we take a portion
14 of the drainage through the Lockwood outfall,
15 a portion of the drainage to the Spring Street
16 outfall. And then a portion of the drainage to
17 this -- you know, we're calling the -- the
18 second Fishburne outfall there. That gives the
19 site, you know -- it -- it -- it was designed
20 that way because of -- of various reasons. One
21 is to reduce and manage flooding offsite of --
22 of the site.

23 Q: And, Mr. Karkowski, the second page, is this --
24 back it up just a little bit. Does this
25 describe the current and proposed drainage



1 basement -- basin pre and post-construction?

2 A: It -- it does, so again, kind of to the larger

3 -- so, on the -- on the left is what we be

4 called an existing or a -- you know, a pre-

5 development type drainage system map. So,

6 again, this -- this area where it says, Gadsden

7 Creek, President Street, this is that large

8 offsite area. And it -- and it's -- and it's

9 a little bit complicated in that under existing

10 conditions, the -- the systems are -- are tied

11 together. So, the majority of it does go this

12 way. But there's also a secondary connection

13 that way under existing conditions. So, it --

14 but you know, we've -- we've modeled that area

15 in how that drainage splits. But it -- it ma-

16 -- the majority of it is coming through our

17 site and -- and we are still managing for that.

18 So, we have all that drainage and then -- you

19 know, then this green and red area kind of

20 shows how the tide would -- would come here and

21 then, you know, exit out on -- on every tide.

22 Now, on the right is -- are system, you know,

23 stylized representation of the system here to

24 represent what we plan to build. And -- and

25 also, some other conditions that are -- that



1 are -- are ongoing. So, again, going back up
2 to this area here, and it's been already
3 mentioned that a portion of the basin is going
4 to be diverted off of our site and into the
5 Spring -- you know, the deep tunnel system of
6 the Spring-Fishburne project. And so, this
7 roughly 125 acres, President Street area is
8 going to be tied in. There's -- there's a --
9 already a drop shaft here and already a tunnel
10 that comes over to the main tunnel that goes
11 down here. That's going to take that drainage
12 and it's going to go out through a stormwater
13 pump station. And those tunnels are, you know,
14 150 feet underground. So, that area goes off.
15 But we still have a certain area to manage, so
16 you know, we will have this area and these
17 areas off site to manage. And so, our system
18 fully is -- is -- is accepting that drainage
19 and moving on and through our site and also,
20 improving the conditions in the area. So,
21 again, there's our three outfalls. We have
22 this -- the existing going out through the
23 existing outfall. We will take drainage in--
24 in, you know, this blue line is what we call a
25 -- a basin, which it has this 36.8 acres. This



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1 -- this label down here, Gadsden Creek, 36.2
2 acres. The -- then we'll have this -- I think
3 I called this one the second outfall to Spring
4 Street. We'll take these 12.7 acres, and that
5 -- we've already coordinated that tie-in with
6 the City of Charleston. There's a -- a stub
7 out into the -- into the tunnel system that's
8 waiting for this project for us to proceed.
9 And then, the third -- third outfall is here to
10 this -- this wetland system over here. And
11 this is the Fishburne Street too outfall, 38.2.
12 And then there's a -- there's a small area of
13 our site right here that -- excuse me -- is
14 going to remain to go out through this --
15 there's a small drainage system there. But
16 that's the -- that's the plan with the design.
17 That's master planned. Many of the components
18 have been implemented for its -- for its
19 implementation.

20 Q: We're skipping ahead a little bit, but since
21 you mentioned the Spring-Fishburne deep tunnel
22 project, would you agree that's a fairly
23 significant stormwater undertaking by the City
24 of Charleston?

25 A: It's a -- I -- I would say it's probably the



1 largest stormwater, you know, remediation
2 project that the City has undertaken.

3 Q: Do you know why the Spring and Fishburne tunnel
4 system is not directly tackling the drainage
5 issues at the project site?

6 A: Right. You know, we -- we coordinated with the
7 City and you know, my background knowing, you
8 know -- being around and -- and working with
9 them on -- on various projects, the concern
10 there is that this -- this -- the -- the -- the
11 project area has a heavy tidal influence. And
12 the Spring-Fishburne project relying on pumps,
13 we don't want to recirculate tidewater in the
14 system. So, any tidewater that could get into
15 the system is just taking up capacity for the
16 rainwater that the system is designed for. So,
17 we don't want any tidewater to enter that
18 Spring-Fishburne system. So, if we located in
19 -- in -- you know, this area, any tunnel shaft
20 or anything, it -- it would be, you know, due
21 to the low elevations in the project area and
22 -- and in the surrounding area. It would be
23 overcome in a -- in a -- you know, a king tide
24 or perigeal tide. And that tidewater would --
25 would take up all the capacity of the tunnel



1 system and adversely affect the rest of the
2 design. So, that's why they have not included
3 this area in the Spring-Fishburne project.

4 Q: Okay. And again, what -- what's depicted here
5 is what has been master planned for the
6 project, correct?

7 A: Correct.

8 Q: This phase has not been specifically permitted
9 by the city for land disturbance or NPDES
10 purchases?

11 A: That's correct.

12 Q: So, that will come later, presumably after, you
13 know, if -- if we are successful here?

14 A: That's correct. There's a -- there's going to
15 be a large and significant coordination with
16 the city to -- to design the -- the rest of the
17 components of this master plan.

18 Q: So, it is not finally designed at this time?

19 A: It is -- it is not finally designed.

20 Q: There are still details to be worked out?

21 A: Several details to be worked out. Yes.
22 Correct.

23 Q: In your experience, does the City of Charleston
24 grant these NPDES or land disturbance permits
25 to project that have not satisfied the city's



1 requirements?

2 A: I've never been able to get them to like not
3 apply their regulations.

4 Q: Do you any expectation this project will be
5 different?

6 A: I -- I fully expect this to get the full
7 attention and effort of the city to -- to make
8 sure that this done to their standards.

9 Q: And among other requirements, does the city
10 stormwater manual require a showing that a
11 proposed project will not worsen conditions on
12 neighboring properties?

13 A: That is a -- that is a major component and a
14 major focus of the city's permitting effort.

15 Q: Is it your understanding that the WestEdge
16 Foundation intends to go well beyond the will
17 not worsen showing ---

18 A: That is correct. We -- we are actually
19 planning to improve some of the offsite
20 drainage.

21 Q: You stated earlier that you've worked on
22 projects which require 401 certifications and
23 404 permits, correct?

24 A: Yes.

25 Q: As well as projects that require the critical



1 area permits?

2 A: Yes.

3 Q: You had a role in obtaining those
4 authorizations, correct?

5 A: Correct.

6 Q: And you're familiar with the requirements for
7 those authorizations generally?

8 A: I am.

9 Q: In your experience, does stormwater permitting
10 typically come after those authorizations have
11 been obtained?

12 A: In almost every case.

13 Q: So, it's not unusual at this state of a
14 permitting process not to have every detail
15 worked out ---

16 A: That's correct.

17 Q: Are you familiar -- well, you -- you've more or
18 less described it, but are you familiar with
19 the current stormwater hydrology project site?

20 A: I'm very familiar.

21 Q: And is that what you described in these
22 exhibits that we've been discussing?

23 A: It is.

24 Q: Are you familiar with the stormwater and
25 tidally influenced flooding issues in the



1 vicinity of the project?

2 A: I am.

3 Q: Could you describe the extent and severity of
4 those flooding issues?

5 A: Yes. So, I have, you know, personally observed
6 either in pictures or in person the -- the
7 tidal or sunny day flooding in the -- in the
8 area. And generally, what is happening is --
9 again, as the tide comes up the Ashley River,
10 it'll come up the -- the Gadsden Creek
11 channel/ditch into -- into this area would --
12 would fill this area. This area in here is
13 very low. So, this is the area that's going to
14 flood first. So, this is the -- again, if --
15 to orient the Court, this is Hagood and then
16 this kind of line is Fishburne. So, that
17 intersection of Hagood and Fishburne is one of
18 the lowest in the area. That's starts to see
19 flooding first and then towards Line Street --
20 so, Line Street is in this general area. As it
21 -- as it could get worse, it impacts into the
22 parking lots that -- that -- where MUSC's
23 employees park. This gets so bad that they
24 have large -- you know, call them duck vehicles
25 to go pick them up and transport them through



1 all the flood waters over to the hospital, so
2 they can get to work. It also extends up into
3 Line Street. Starts -- starts en- --
4 encroaching on the -- the Gadsden Green area.
5 It -- it -- it gets into Harmon Field. Heads
6 up Hagood a little bit that way. So, it's more
7 or less in -- in this -- you know, this area.

8 Q: Do you know how frequently the flooding is
9 occurring in that area?

10 A: It -- it's become very frequent in my opinion.
11 You know with -- with the tides that -- it --
12 with sea level and -- and it just seems like
13 the -- the king tides are -- are just so much
14 more frequent and so much more often. So, I --
15 you know, every, you know -- we get them worse
16 in October, November, and then there's a --
17 there's a spring series. But -- but it's been
18 happening in the summer. It's been happening
19 in the -- in the, you know, late winter. And
20 so, it -- it -- where it impacts and shuts down
21 the road, I -- I'm thinking -- I'm hearing
22 something like 10 or 12 or 15 times a year. In
23 -- on our calculations, where it starts
24 impacting the road is 80 times a year. That
25 area is so low, the -- the tides are high



1 enough that you get into that first lane of
2 traffic 80 times a year.

3 Q: Is the frequency of flooding events in that
4 area increasing?

5 A: It is increasing.

6 Q: Do you know why?

7 A: So, there's -- there's -- there's two
8 conditions that are -- are driving it. So, sea
9 level rise and then sea level rise could be --
10 there's a lot of things that drive that, but
11 sea level rise is -- there's -- our climate is
12 changing. A lot of the sea ice is melting.
13 That sea ice is filling up the oceans and so,
14 the sea levels are rising. And then as -- as
15 been talked, in the area or been talked
16 previously, the area is -- is -- is a landfill
17 was -- the -- the material that was placed was
18 -- was not the best. And that material is
19 compacting and -- and subsiding. So, the --
20 the ground is actually moving down and the seas
21 are moving up. So, that's -- that's making it
22 worse in two ways.

23 Q: Is the fre- -- is the increasing frequency of
24 flood events attributable to perigeal tides, is
25 that increase documented somewhere?



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1 A: Yes. We are fortunate here in Charleston that
2 we've had a -- a tide gage since say like the
3 late 1800s. So, we have a fairly contiguous
4 record from say 1890, 1880, something like that
5 to now, so 2020. So, you know, that's --
6 that's over a hundred years of -- of documented
7 tide and it's a very noticeable trend upwards
8 and it's -- and you can actually see it's
9 accelerating. So you ---

10 Q: So, you expect it to continue to increase in
11 frequency?

12 A: It would continue to increase in frequency and
13 to get worse and worse.

14 Q: In your professional opinions to a reasonable
15 degree of engineering certainty is the water
16 body referred to as Gadsden Creek a conduit for
17 tidal flooding in the vicinity of this project?

18 A: As illustrated here, that's how the -- the tide
19 water moves from the Ashley River to this
20 internal area and -- and flood -- floods the
21 streets of the areas around there.

22 Q: And in your judgement to reasonable degree of
23 engineering certainty does the tidal influence
24 in water body restrict the ability of
25 stormwater to drain from the area under certain



1 tidal conditions?

2 A: It does.

3 Q: Could that contribute to stormwater flooding,
4 again under certain circumstances?

5 A: It -- it can and that kind of goes to that
6 compound flooding phenomenon.

7 Q: Can you explain in a little more detail how the
8 tidal influence contributes to stormwater
9 flooding?

10 A: Yes. So -- so, you know there's -- we -- we
11 tried to -- so, we're -- we're designing to
12 conservative worst -- what somebody might call
13 worst case scenario. So, one of the worst case
14 scenarios that we would look at is a -- a
15 higher tide and a rainfall event coincident.
16 So, as we -- as we talked before, either under
17 existing conditions, rain that falls in -- in
18 the watershed is collected, moves through the
19 culvert and in -- into the Gadsden Creek
20 channel, ditch, whatever. And if a -- a tide
21 is coming up the Ashley River, it'll -- it'll
22 continue into there. So, we have water trying
23 to move out through the creek and we have tide
24 entering in through the creek. And those, you
25 know -- so, this takes up -- the tide is a --



1 a fairly strong force. So, it -- it takes up
2 all the storage and all the capacity for the
3 system to drain.

4 Q: Have you heard some of the testimony previously
5 in this matter that new development has
6 contributed to stormwater flooding in the area?

7 A: I have heard that.

8 Q: And do you have any opinion to what extent new
9 development contributes to stormwater flooding
10 in the WestEdge drainage basin?

11 A: So, it's -- it's my opinion that -- that the
12 WestEdge drainage basin is -- is generally, you
13 know, going up -- is -- is a fully developed
14 basin. So, there's a -- there's been the --
15 the -- the runoff generating surfaces are
16 essentially the same from what is the current
17 today and with our -- some of the new
18 infrastructure and new buildings that are there
19 to what was there beforehand. There was
20 parking lots that had impervious surfaces. And
21 so, the -- the volume and rates of runoff that
22 have been generated by the surfaces as they
23 have changed have not significantly changed, so
24 it changed it a little bit, but not
25 significantly. What has changed are the



1 changing -- the changing, you know, tides, the
2 -- the changing rainfall patterns. You know,
3 we have these higher and higher frequency and
4 -- and volumes of rainfall. That was what is
5 -- in my opinion, is what people are saying is
6 -- it is getting -- you know, there's more
7 flooding.

8 Q: Mr. Karkowski, I want to show you what's been
9 previously marked as Respondent's Exhibit 37.
10 Have you seen these documents before?

11 A: Yes.

12 Q: Do you know what they depict?

13 A: If I'm not mistaken it's the -- the -- the
14 locations of the different witnesses that have
15 testified is their home -- home addresses.

16 Q: Based on their testimony in their depositions?

17 A: Yes, sir.

18 Q: And to the best of your knowledge, does that
19 accurately reflect the addresses they gave in
20 their deposition testimony?

21 A: To the best of my knowledge, yes.

22 Q: All right.

23 **MR. TRAYNHAM:** Your Honor, we would ask to admit
24 Exhibit 37 at this time.

25 **MR. CHURDAR:** No objection.



1 **MR. CUNNINGHAM:** No objection.

2 **THE COURT:** It's admitted.

3 **(Respondent's Exhibit Number 37 was admitted into**
4 **evidence.)**

5 Q: And, Mr. Karkowski, I'm putting this up for the
6 limited purpose of asking you to describe where
7 in relationship to the witnesses residences the
8 extent of flooding related to the WestEdge
9 basin occurs. Let me know if that is large
10 enough?

11 **MR. TRAYNHAM:** Your Honor, I apologize that the copy
12 here is difficult to read the names of the
13 witnesses, but we can clarify that as needed.

14 Q: So, here depicted in this dogleg and this --
15 looks like an Monopoly house or hotel is the
16 WestEdge project site itself. The individual
17 hotel looking symptoms throughout depict the
18 residences of various witnesses. Mr. Karkowski,
19 can you describe for the Court where the
20 flooding attributable to the WestEdge site or
21 the Gadsden Creek drainage basin extends?

22 A: Right. So again, we -- you know, the tide is
23 moving in this way. The main drainage outfall
24 is here coming down Fishburne Street and then
25 outfalling in this area. And so again, the



1 flooding is -- is worse at the -- at the
2 intersection into the parking lots, down to
3 Line Street, and then into the Gadsden Green
4 area, kind of like that. That -- that's my
5 understanding of -- and -- and our modeling and
6 our, you know, study of the topography is -- is
7 what we're predicting as the -- the area of
8 flooding and where it's been most documented.

9 Q: And the symbol closest to the site, I believe
10 is Mr. Flowers' residence, is that your
11 understanding?

12 A: That is my understanding.

13 Q: Okay. And it's clear that the Gadsden Green
14 community is impacted by the flooding. Would
15 you -- would you agree?

16 A: Ask that one more time. I'm sorry.

17 Q: It's clear that the Gadsden Green community is
18 affected by the flooding.

19 A: That's correct.

20 Q: All right. But to the extent any of the other
21 witnesses have testified to experiencing
22 flooding of their own residences, would it be
23 your opinion that that's associated with other
24 drainage issue or flooding issues throughout
25 the city?



1 A: That is correct.

2 **MR. CUNNINGHAM:** Objection. Leading.

3 **MR. TRAYNHAM:** I'll -- I'm not sure it was.

4 **THE COURT:** It was close. I ---

5 **MR. TRAYNHAM:** I'll rephrase.

6 **THE COURT:** I'm going to overrule that one. I mean,
7 I don't know if it suggested an answer.

8 **MR. CUNNINGHAM:** He -- he did. But Your Honor's
9 ruling.

10 **THE COURT:** Well, here, just rephrase it.

11 **MR. TRAYNHAM:** I'll rephrase it, Your Honor. It's -
12 - it's ---

13 Q: To the extent that the other witnesses have
14 testified to experiencing flooding at or near
15 their own home, what would you conclude with
16 regard to the connection ---

17 (Phone rings.)

18 **THE COURT:** Oh, gosh.

19 Q: --- to the project site?

20 **THE COURT:** Whose -- whose phone is that?

21 **PUBLIC MEMBER:** That was me, Your Honor. I
22 apologize.

23 **THE COURT:** Apology ain't going to make it. Sorry.
24 How about bring your phone up here and just sit
25 it up here. Might want to turn it off. There



1 you go. That's good enough. Thank you. Okay.
2 Go ahead.

3 Q: Mr. Karkowski, what would you conclude about
4 any flooding that other witnesses have
5 experienced at their home as a result of your
6 understanding with the extent of the Gadsden
7 Creek flooding?

8 A: So, to -- to the -- to the extent that I
9 understand the -- the drainage basin that is
10 part of our project and close to our site, none
11 of the other witnesses are part of that basin
12 and part of that flooding system. They're part
13 of other systems inside the city and -- and
14 that's not necessarily related to the project
15 or the -- the creek at hand.

16 Q: I believe you -- in one of our previous
17 discussions, talked about their being sort of
18 a -- a ridge through the Gadsden Creek or --
19 excuse me, the Gadsden Green community. Would
20 you talk a little bit about how that plays into
21 the drainage ---

22 A: So ---

23 Q: --- that's intended here?

24 A: Right. So, talk about -- so, you know, there's
25 our basin, which -- which is this -- this area



1 here. So, all this area, again as we say,
2 flows down and out this way. The area over
3 here is -- flows into the Spring-Fishburne
4 tunnel that goes out here. So, this line here
5 is -- is a ridge where this water goes that
6 way, drainage and this drainage goes that way.
7 So, everybody this side of the ridge -- and it
8 -- and in -- in engineering and -- and
9 hydrology and, you know, topography, you know,
10 ridge is a very liberal term in -- in
11 Charleston. You know, ridge is a foot or two.
12 So, again -- so, you know, we're not talking
13 about, you know, what -- what some people might
14 say, that's not a ridge. But it's -- it's a
15 drainage divide where the drainage goes one or
16 the other. So again, everybody to the right of
17 that line drains out towards -- this -- I
18 believe it's President Street where this line
19 is and then that gets collected in the Spring-
20 Fishburne project and out. And everybody on
21 this side drain towards the Gadsden Creek
22 system and then out through there.

23 Q: Thank you, Mr. Karkowski. What kind of
24 contaminants are you typically concerned about
25 controlling for in designing stormwater



1 management systems?

2 A: So, stormwater management systems, we -- we
3 generally -- a sediment is -- is the largest
4 one. Sediment is -- could be looked as a -- I
5 want to say a harbinger -- harbinger or --
6 sediment is -- has a bunch of other stuff and
7 it's just not sediment. A lot of -- a lot of
8 sediments have particles that are charged, so
9 some things attached to sediment. So, there
10 might be other -- other pollutants, metals, a
11 lot of times that attach themselves to
12 sediment. So again, we -- we deal a lot with
13 controlling sediment in stormwater management.
14 We also look at oil and greases. We also look
15 at floatables, which is essentially trash
16 moving through the system. And then in more
17 advanced or more, you know, in some -- some
18 special considerations, we -- we do look at
19 other pollutants like, you know, metals,
20 bacteria, nutrients, phosphors and nitrogen.
21 Things like that.

22 Q: Are you familiar with any water quality data
23 associated with the water body or the landfill
24 itself?

25 A: I -- I am familiar with some of the -- the



1 sampling.

2 Q: What data or analysis have you reviewed?

3 A: There's been at least two sampling proto- --
4 protocols as part of this project. There's --
5 so, those two samplings I kind of look at.

6 Q: Okay. What contaminants do you recall being
7 detected that are not typical of stormwater
8 runoffs?

9 **MR. CUNNINGHAM:** I'll object on hearsay for that.
10 He can certainly rely on them for his opinions,
11 but not give the results of the studies
12 themselves.

13 **THE COURT:** Well, can't contaminants -- do you ---

14 **MR. TRAYNHAM:** What contaminants were detected that
15 are not typical.

16 **THE COURT:** Were detected. Okay.

17 **MR. TRAYNHAM:** That are not typical of stormwater
18 runoff. I believe this does call for his
19 opinion as an expert.

20 **MR. CUNNINGHAM:** Well, he -- he's getting into ---

21 **THE COURT:** You said ---

22 **MR. CUNNINGHAM:** I'm sorry.

23 **THE COURT:** I -- well, I'm speaking for you.

24 **MR. CUNNINGHAM:** I -- I know.

25 **THE COURT:** He's -- he's not saying that he -- you



1 can't given an opinion on it. He's just saying
2 that there's aspects of the questions that are
3 -- are relying upon hearsay information. Is
4 that ---

5 **MR. CUNNINGHAM:** In communicating the hearsay
6 directly. But he can ---

7 **THE COURT:** Right.

8 **MR. CUNNINGHAM:** --- rely it. But he can't just be
9 a conduit for hearsay in his ---

10 **THE COURT:** So, you want to ask the question again.
11 I'll listen to it.

12 **MR. TRAYNHAM:** All right.

13 Q: Mr. Karkowski, in -- in your review of the
14 analytical data, were there any contaminants
15 that you reviewed that were not typical of
16 stormwater runoff?

17 A: Yes.

18 Q: Do you recall if any of those contaminants were
19 above specific regulatory standards?

20 A: Yes.

21 Q: What contaminants?

22 **MR. CUNNINGHAM:** I'll object on hearsay on that
23 ground, Your Honor.

24 **THE COURT:** All right. Now, you can respond to
25 that.



1 **MR. TRAYNHAM:** I'm not sure how his -- his expertise
2 in what contaminants are common in stormwater
3 runoff is -- is hearsay. He -- he is relying
4 on ---

5 **THE COURT:** He's relying on a study or -- or ---

6 **MR. TRAYNHAM:** He's relying laboratory analysis of
7 water quality, which he testified in his voir
8 dire, he reviews regularly to determine the
9 water quality.

10 **THE COURT:** No. He hadn't testified to that yet.

11 **MR. TRAYNHAM:** I can ---

12 **THE COURT:** Commonly relied up on by an expert in
13 his field.

14 **MR. TRAYNHAM:** I will -- I will lay the proper
15 founda- -- foundation, Your Honor.

16 **MR. CUNNINGHAM:** Even if he does, Judge, that
17 doesn't get the actual data from these studies
18 in. Now, he can rely on it. That's good. And
19 if he -- if he wants to lay that foundation for
20 his reliance that's fine, but ---

21 **THE COURT:** You're correct in that the -- the
22 testimony about commonly relied up on by an
23 expert in the field is -- gives you the
24 associative or right to give the opinion of on
25 there. But then, there's the disclosure of the



1 actual evidence that you relied upon. And we
2 had a case recently, State versus Jenkins. I
3 don't know if y'all read it. It was a criminal
4 case. And they dealt with, you know,
5 introducing the data into evidence. And -- and
6 the -- for me to do that, I have to evaluate
7 the importance of that data to his opinion and
8 the prejudicial effect upon the other side.
9 And somebody's back there shaking their head.
10 Please don't respond to my analysis plus I
11 don't really need it because I can figure out
12 the law. But -- so, that's going to be my test
13 when I get to it.

14 **MR. CUNNINGHAM:** Okay. Okay. I -- I'll stand on
15 our objection.

16 **THE COURT:** Well, you -- in other words, I -- I
17 would allow him to ask the question until he
18 gets to the point of trying to disclose the
19 data itself. And then at that point, we're
20 going to have to address the issue.

21 **MR. CUNNINGHAM:** Okay. I think that's where we are
22 because I think he's already asked for his
23 opinion on this.

24 **THE COURT:** Okay.

25 **MR. CUNNINGHAM:** This topic. Now we're to that



1 point.

2 **THE COURT:** Is that where we are?

3 **MR. TRAYNHAM:** I asked Mr. Karkowski if he could
4 identify the contaminants in the analysis that
5 were not common in stormwater runoff.

6 **THE COURT:** All right. So, now we're going to the
7 data -- identify the data. So, you wish to
8 respond to ---

9 **MR. TRAYNHAM:** I'll rephrase the question, Your
10 Honor.

11 **THE COURT:** All that to rephrase it.

12 **MR. TRAYNHAM:** All that -- all that to rephrase the
13 question.

14 **THE COURT:** Okay.

15 **MR. TRAYNHAM:** All right.

16 Q: Mr. Karkowski, I believe you already testified
17 -- I've lost track of the questions I've asked
18 -- that in your review of the analysis, there
19 were contaminants present you would not expect
20 to see in the stormwater runoff, is that
21 correct?

22 A: That's correct.

23 Q: Okay. Do you regularly review water quality
24 analyses in the course of your practice?

25 A: I do.



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1 Q: Are they documents commonly relied upon by
2 professionals in your field to determine
3 stormwater quality and how a system is
4 functioning?

5 A: Yes.

6 Q: Okay. Based on your review of the -- those
7 analyses, do you have any opinion about where
8 those unnamed contaminants are coming from?

9 A: I do.

10 Q: And what is that opinion?

11 A: I believe there's an influence on the water
12 quality in the Gadsden Creek and potentially
13 into the Ashley River from the leachate coming
14 out of the unlined landfill.

15 **MR. TRAYNHAM:** And here's the question, Your Honor.

16 Q: What were the contaminants that you identified
17 that are not common to stormwater runoff?

18 **MR. CUNNINGHAM:** I'll object. Hearsay.

19 **THE COURT:** All right. Do you wish to explain ---

20 **MR. TRAYNHAM:** I believe that it is ---

21 **THE COURT:** Here. Let me pull up that case.

22 **MR. TRAYNHAM:** --- relative.

23 **THE COURT:** Hold on a second. Pull up that case
24 pretty quickly. I'll make notes of -- all
25 right. So, they were doing the Rule 703



1 analysis that we're discussing. And the Court
2 -- it's -- Supreme Court case. The information
3 -- it was a jury trial, obviously. But the
4 information may be -- may be disclosed to the
5 jury upon objection only if the trial court
6 finds that the probative value of the
7 information in assisting the jury, which would
8 be me here, to evaluate the expert's opi- --
9 opinion substantially outweighs its prejudicial
10 effect. That is the standard in -- the opinion
11 number is 28089. You want to look it up later?
12 Je- -- State v. Jenkins. So ---

13 **MR. TRAYNHAM:** Sounds like it's your call, Judge.

14 **THE COURT:** Well, do you want ---

15 **MR. TRAYNHAM:** As it usually is.

16 **THE COURT:** Do you wish to make an argument on it is
17 what ---

18 **MR. TRAYNHAM:** I believe that ---

19 **THE COURT:** I'm giving y'all the standard so by
20 knowing the standard, you'll be able to respond
21 to that which I have to decide.

22 **MR. TRAYNHAM:** Certainly, Your Honor. I believe
23 that it's more probative than prejudicial
24 because we've heard extensive testimony, albeit
25 lay testimony, previous in this case, that what



1 has been observed coming out of the creek is
2 nothing more than what is typically seen in the
3 stormwater runoff. I believe the specific
4 examples Mr. Karkowski has observed in the
5 laboratory analysis is pertinent to rebutting
6 that testimony. I don't see how it is
7 prejudicial.

8 **THE COURT:** Well that's why I'm having you ---

9 **MR. CUNNINGHAM:** Mr. Kar- -- well, first of all, it
10 has to be -- it has to substantially outweigh
11 the pre- -- it's not just a balancing. It's --
12 -

13 **THE COURT:** Yeah.

14 **MR. CUNNINGHAM:** We got a weight on our side
15 already. But Mr. Karkowski didn't do any of
16 these analyses. He's already testified about
17 the ultimate conclusion related to them. So,
18 that really the probative value is very little.
19 We're talking about the individual
20 constituents.

21 **THE COURT:** Well, I'm going to sustain the
22 objection.

23 **MR. TRAYNHAM:** Thank you, Your Honor. I'll just
24 move on.

25 **Q:** From a hydrological point of view, whatever



1 those contaminants were that you concluded are
2 coming from the landfill and -- and mixing with
3 the stormwater, would you expect that some
4 concentration of those contaminants is going to
5 flow wherever the stormwater out of the creek
6 goes?

7 A: Yes.

8 Q: And if the flow is the Ashley River, some of
9 that contamination is getting to the Ashley
10 River, correct?

11 A: Correct.

12 Q: If the water body is overflowing at the time,
13 would you expect some concentration of those
14 contaminants to be present in the flood water?

15 A: Absolutely.

16 Q: I think it's been established ad nauseam, but
17 the project proposal does call for filling this
18 drainage feature, correct?

19 A: That's correct.

20 Q: Now, among other things, that would allow
21 restoring the cap on the landfill, correct?

22 A: That is correct.

23 Q: And -- and where will the stormwater that would
24 otherwise drain through this feature flow?

25 A: Well, flow through an engineered drainage



1 collection system.

2 Q: And three separate outfalls as opposed ---

3 A: In -- in three ---

4 Q: --- to one?

5 A: In -- in three separate outfalls instead of
6 one.

7 Q: Okay. And what impact will filling this
8 drainage feature have on the tidal flooding
9 currently occurring in the vicinity project?

10 A: So, it would prevent the -- the tidal flooding
11 from penetrating into the -- into the area and
12 -- and causing that flooding.

13 Q: I think we've heard several general statements
14 that filling wetlands increases flooding. Have
15 you heard that?

16 A: We -- we've heard that several times.

17 Q: Why wouldn't that be the case here?

18 A: So, there's -- so, there's -- in -- in -- in
19 hydrology and hydraulics, there's -- there's
20 two components to, you know, stormwater
21 management. There's the storage of stormwater
22 and then the flow of stormwater. So, we have
23 to look at -- and then there's the time issue.
24 So, there's -- you got to look at them
25 altogether. You just can't say, okay, it's all



1 -- you've got to have more storage, got to have
2 more storage. You -- if we offset the loss of
3 storage with the creation of more capacity to
4 flow, which we have here with the three
5 outfalls, you -- you overcome and then also,
6 add to the -- the capacity to flow. So, then
7 you add -- it could flow out -- you know, as it
8 arrives and it doesn't need to be stored as a
9 flood water.

10 Q: And to be clear, there's no dispute that marsh
11 and other wetlands have stormwater storage
12 potential, correct?

13 A: That is correct.

14 Q: But this plan -- will this plan compensate for
15 the storage lost due to filling in the creek?

16 A: It will even to the affect of part of the
17 master plan as -- as envisioned, the loss of
18 that flooding storage, you know, above the
19 ground in the area of the project. So, we've
20 compensated for the loss of that -- that
21 storage in our stormwater calculations. That
22 -- that would have been stored as a flood water
23 on our site, which, you know, our site is going
24 to be modified, slightly raised, so that's
25 storage would be removed from the system, but



1 professional seal
2 and signature.

3 Q: And this is not the entire study, correct?

4 A: No. This is not the entire study. The -- the
5 -- the document itself is quite a bit more
6 expansive with various inputs and outputs of --
7 of -- of models, various figures and diagrams
8 that are not included in this several pages.

9 Q: And just in your opinion, would those
10 additional diagrams and calculations that are
11 omitted mean anything to a non-engineer?

12 A: No. They -- they are generally summarized in
13 this -- this -- this front part about the
14 various procedures and findings of the study.

15 Q: So ---

16 A: No. They would not add to a non-engineer.

17 Q: So, does the -- the narrative and the drawings
18 included in that portion of the study fairly
19 and accurately reflect the conclusions and the
20 conduct of the study?

21 A: It does.

22 Q: All right.

23 **MR. TRAYNHAM:** Your Honor, at this time, we would
24 ask that Respondent's Exhibit 26 be admitted
25 into evidence.



1 **MR. CUNNINGHAM:** No objection.

2 **MR. CHURDAR:** No objection.

3 **THE COURT:** It's admitted.

4 **(Respondent's Exhibit Number 26 was admitted into**
5 **evidence.)**

6 **MR. TRAYNHAM:** Thank you.

7 Q: In your deposition, you described the modeling
8 that you conducted as conservative or including
9 conservative assumptions. What does that mean?

10 A: Correct. So, it's a common practice in --
11 well, it should be a common practice in
12 engineering to -- to -- to build conservative
13 assumptions and -- and other, you know, worse
14 case scenarios, if you will into a design to --
15 to -- to mitigate the unknown. So, like
16 essentially provide for an over design of the
17 system.

18 Q: Okay. Stormwater modeling includes numerous
19 input, correct?

20 A: Correct. So, various inputs would be say, the
21 -- the runoff coefficients and I think we
22 mentioned in previous testimony someone said
23 something about a curve number. So, curve
24 number has been used here as one of the inputs.
25 We would look at an area or assess an area and



1 say, well, you know, that's -- that's an X
2 number, but let's make it an X plus five number
3 to be more conservative. So again, that would
4 -- would product more runoff and thus we're
5 designing a system to handle more run -- more
6 rainfall than, you know, we would have had if
7 we didn't put in that conservative assumption.

8 Q: And does modeling using conservative
9 assumptions generally involve that kind of
10 conservatism in all or most of the model
11 inputs?

12 A: It -- it -- it is. Like, so there's -- there's
13 other -- other inputs, roughness of pipes,
14 roughness of channels, weird coefficients,
15 tidal inputs. We -- we assume higher tides.
16 Various things like that. Continue -- give it
17 various levels of conservative assumptions and
18 -- and it leads to, you know, a -- a very
19 conservative design.

20 Q: Yesterday, we heard some testimony regarding
21 the import of calibrating and validating
22 stormwater modeling.

23 A: Right.

24 Q: First, are you familiar with those terms?

25 A: Very familiar.



1 Q: What is calibrating mean?

2 A: So, calibrating is the procedure. So, you --
3 you build a model, you -- you make all your
4 assumptions and then you collect data. So,
5 like say in this case, we might collect
6 flooding elevations. We might collect flow at
7 certain locations during an event. And then
8 compare that data to the results of our model.
9 And how well our model predicted that real
10 world result. And then we would calibrate or
11 adjust various factors in the model to -- to,
12 you know, change our assumptions, lower, raise,
13 whatever, to more reflect what was measured on
14 the ground.

15 Q: So, calibration is about reflecting the reality
16 on the ground?

17 A: That's correct.

18 Q: Supposed to making conservative assumptions,
19 which built in -- build a safety factor above
20 and beyond what is likely there ---

21 A: That is ---

22 Q: --- is that fair?

23 A: That is correct.

24 Q: What does validating mean in the context of
25 modeling?



1 A: Validating is a second set of -- of data that
2 we collected and once a calibration is done,
3 you look at another independent set of data to
4 validate that your calibration was done
5 correctly.

6 Q: Okay. Was the Thomas and Hutton model
7 calibrated and validated?

8 A: It was not.

9 Q: Why not?

10 A: It -- it's typical to not do that. And again,
11 by building in our conservative design
12 parameters and assumptions, we -- we removed
13 the requirement to have a calibrated or a
14 validated model.

15 Q: Do you typically utilize conservative
16 assumptions and modeling for stormwater
17 projects?

18 A: For design, all the time.

19 Q: Have you ever personally had a project perform
20 less efficiently than the modeling predicted?

21 A: No. I have not.

22 Q: In lay terms, what does that modeling study
23 tell you about how this drainage system
24 perform?

25 A: So, we looked at various scenarios of -- of



1 tides, various scenarios of rainfall conditions
2 and then, comparing our pre-project scenario to
3 our post-project scenario, we were confident in
4 saying that the project is not going to have a
5 detriment to the surrounding area. That --
6 that the stormwater management system is going
7 to be able to manage the stormwater on our site
8 to -- to the standard that we have chosen and
9 is documented in the report. And it's not
10 going to have a detrimental effect on the
11 surrounding, and, in fact, in certain cases,
12 it's going to be able to improve the drainage
13 conditions in -- in some -- in particularly
14 that Fishburne-Hagood area.

15 **THE COURT:** All right. Is now an okay time to take
16 a break?

17 **MR. TRAYNHAM:** I'm fine with that, Your Honor.

18 **THE COURT:** Okay. Let's just take a five -- five
19 minute, maybe a little bit longer because I've
20 got to deal with one issue.

21 **MR. TRAYNHAM:** Okay.

22 **(Off the record from 11:34 a.m. until 11:43 a.m.)**

23 **THE COURT:** All right. Go ahead.

24 **MR. TRAYNHAM:** Thank you, Your Honor.

25 **Q:** I neglected to note exactly where I left, Mr.



1 Karkowski. If I'm repeating myself, forgive
2 me. Bottom line, does your modeling show that
3 the proposed project will alleviate stormwater
4 flooding?

5 A: It -- it does. In -- in two cases the
6 modeling, you know, the -- the design is going
7 to interrupt that sunny day flooding, so at
8 least those 80 times where it partially floods
9 and then the 10 to 20 times that it ma- -- has
10 major flooding, that's going to be prevented.
11 And then, the system has been shown to reduce
12 flooding in that area as compared to similar
13 conditions under the existing conditions for
14 various rainfall events, and -- and other
15 conditions.

16 Q: What tidal elevation results in sunny day
17 flooding in that location?

18 A: You know, our there -- so, the -- you know, so
19 sunny day flooding is -- is -- is relative to
20 the ground. So, you know where you know, it
21 could be -- it could be one area could have
22 sunny day flooding, and some area can't. So,
23 but out there I know in -- in the datum that we
24 like to use, which is an NAVD-88, the elevation
25 of the edge of the pavements around say three,



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1 and that's high tide. And normal high tide is
2 elevation three. So, it ---

3 Q: So, a normal -- normal high tide, it comes
4 right up to the ---

5 A: It comes right up to the road.

6 Q: Okay. Anything over normal high tide?

7 A: We -- we've got sunny day flooding to some form
8 or fashion.

9 Q: Okay. What does sunny day flooding do to the
10 exposed cap in the landfill?

11 A: Again, twice a day, the -- the -- the area is
12 exposed to the tidewater. It saturates it and
13 then picks up whatever is there or come -- came
14 out and then takes it wherever it's going to
15 go, either back to the Ashley or up into the
16 road.

17 Q: Is the ebb and flow of the tide one of the
18 reason the cap is eroding?

19 A: It's part of the reason. Correct.

20 Q: Is tidal flooding one of the reasons for the
21 eroding cap?

22 A: Yes.

23 Q: And if this drainage feature is not filled,
24 will it continue to be a conduit of tidal
25 flooding?



1 A: Yes.

2 **THE COURT:** If the what's?

3 **MR. TRAYNHAM:** If the drainage feature ---

4 **THE COURT:** Drainage. Oh, I'm sorry. I didn't
5 catch that.

6 **MR. TRAYNHAM:** The creek, Your Honor.

7 **THE COURT:** Okay.

8 Q: If the creek is not filled, will it continue to
9 be a conduit of tidal flood?

10 A: It will.

11 Q: You testified earlier that tidal flooding
12 frequency is predicted to increase as time goes
13 on, correct?

14 A: That's correct.

15 Q: And at the -- if the creek remains open, can it
16 handle that increase in terms of capacity?

17 A: It's not handling it right now, so it's only
18 going to get worse.

19 Q: And what about stormwater flow, if the drainage
20 features remains open, would it handle
21 stormwater in the future?

22 A: In our calculations, we -- we think that system
23 is undersized and needs to be augmented as we
24 have designed.

25 Q: We heard testimony yesterday that once a



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1 portion of the drainage basin that is being
2 directly diverted to Spring-Fishburne, is so
3 diverted that the creek should be sufficient to
4 handle the remaining stormwater drainage. Do
5 you recall that testimony?

6 A: I do.

7 Q: Do you agree that the creek, as it sits today
8 is sufficient to handle the remaining
9 stormwater flow?

10 A: I do not.

11 Q: And why not?

12 A: I mean, you know, our -- our modeling is
13 showing that -- that the system in and you
14 know, the various conditions that we have
15 modeled is insufficient. And it needed to be
16 augmented.

17 Q: So, based on your modeling, you do not believe
18 that the creek can handle the stormwater?

19 A: No. Even -- even after the diversion.
20 Correct.

21 Q: Have you seen any contrary modeling?

22 A: I have not seen any -- any other modeling.

23 Q: We heard some testimony yesterday about
24 proposed alternatives. First of all, do you
25 have an understanding of what is required for



1 an alternative to be feasible in the context of
2 DHEC or Corps permitting decision?

3 A: Yes. I think there's various factors, three
4 techno- -- technolo- -- technology, financial
5 and logistics.

6 Q: Techno- -- it has to be technologically
7 feasible?

8 A: Correct.

9 Q: It has to be logistically feasible?

10 A: Correct.

11 Q: And -- and cost is a valid consideration ---

12 A: It is.

13 Q: --- in feasibility as well? All right. Do you
14 have experience in conducting alternatives
15 analysis for DHEC and Corps permitted projects?

16 A: I do.

17 Q: Is it your understanding that the intent of the
18 alternatives analysis is that an applicant
19 exhaustively design engineer and cost estimate
20 every conceivable idea might contribute in some
21 fashion to achieving part of the project goal?

22 A: That's not my understanding.

23 Q: Is it fair to say that some ideas may come up
24 in a project's concept that's so clear don't
25 meet one of this criteria for feasibility that



1 it's not worth that level of engineering
2 consideration?

3 A: That's correct.

4 Q: In your experience, does the absence of one or
5 more of these ideas from a formal -- formal
6 alternatives analysis submittal to a regulator
7 make the analysis deficient?

8 A: Ask that again.

9 Q: Sure. In your experience, does leaving one of
10 those ideas we just described off of the formal
11 submittal of alternatives analysis as part of
12 the permitting process, does that make the
13 analysis deficient in the eyes of regulator?

14 A: No.

15 Q: I want to talk briefly about some of the
16 alternatives that were discussed yesterday.
17 Restoration or renaturalization of the creek,
18 first of all, what is your understanding of
19 what would be involved with this?

20 A: I mean, to -- to -- to fully, you know, meet
21 what -- what we have set out to be the -- the
22 project goals, which are manage stormwater, you
23 know, address flooding, have a project, you --
24 you know, we -- we -- we're here about
25 development, and address the -- the landfill



1 cap. In my opinion, the restoration would be
2 something along the orders of you would put
3 some sinuosity in there. You'd probably have
4 to over excavate the area so we could build a
5 sufficient cap. Put some sinuosity into the
6 system. I believe ---

7 **THE COURT:** What is sinuosity?

8 A: Sinuosity is -- you know, right now it's
9 straight, but it comes -- co- -- you know, so
10 and then, a natural -- some natural streams
11 have a -- have a natural sinuosity to them. I
12 don't know. Or curviness to it. And then, so
13 to do that, and then also, I believe Mr.
14 Robinson said that he would -- would -- would
15 want a smaller channel. Which in, you know, my
16 opinion that's going in the opposite direction
17 of -- of what we're trying to do, which is, you
18 know, promote drainage and prevent flooding.
19 So you know, again, that's going to impair
20 rainfall from discharging from the site. But
21 that in my opinion would be what that would do,
22 but it still would not address just at a- --
23 alone would not address the -- the tidal
24 flooding. So, there -- it -- it would only --
25 might only meet of the three go- -- you know,



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1 of the three goals, it only let's the project
2 go forward. It doesn't address flooding. It
3 doesn't address the landfill cap.

4 Q: Is this site at all similar to the stream
5 restoration projects you've worked on
6 previously?

7 A: No. I -- I've never really seen a -- a tidal
8 creek restoration. I don't believe there's
9 been any tidal creek restorations to what I
10 believe has been proposed here. I have not
11 seen any -- anything like that in -- in the --
12 South Carolina. In South Carolina.

13 Q: You ever restored a stream in a landfill site
14 with a degraded cap?

15 A: I have not seen it and I would definitely
16 advise against it.

17 Q: You have any ideas as to the level of work or
18 cost that would be involved in restoring the
19 creek as has been suggested?

20 A: We had some -- some general calculations that
21 we did. I'm -- and I believe they were in the
22 tens of millions of dollars to -- to implement
23 something like that.

24 Q: Why so high?

25 A: Again, it -- it has to do with managing the --



1 the landfill cap. Well, not the cap. The --
2 the landfill material. If -- if we've -- if --
3 doing excavation, you -- you can't put it back
4 in. You have to haul it off. And that's a
5 very expensive and -- and complicated maneuver,
6 particularly, you know, saturated former
7 landfill material.

8 Q: Would a restored creek allow you to
9 successfully implement your other drainage
10 improvements, such as the connection to Spring-
11 Fishburne project?

12 A: No. It would see -- so, if it remains a
13 tidally influenced system, they -- they're not
14 going to -- it would be inadvisable to bring
15 those two systems into close proximity as we
16 had planned. So, again, we would lose the --
17 one of the outfalls that we have proposed.

18 Q: In your opinion, to a reasonable degree of
19 engineering certainty, is renaturalizing the
20 creek a feasible alternative to the project?

21 A: In -- in my opinion, no.

22 Q: Another alternative that was suggested was the
23 use or construction of berms. First of all, to
24 your knowledge, has anyone affiliated with the
25 Friends of Gadsden Creek suggested that as an



1 alternative prior to the testimony you heard
2 yesterday?

3 A: I have never heard that that would -- no. I'm
4 -- I've heard nobody propose that.

5 Q: To your knowledge, did it come up in public
6 comment?

7 A: As far as I know, no.

8 Q: Have you given any consideration to this
9 alternative?

10 A: In the -- in the limited time since I believe
11 yesterday, I've looked at a couple situations.
12 Number one, just looking at the -- the extent
13 of -- of the berming or slash -- and again, in
14 -- in my cases, I don't believe we could do a
15 berm due to some other limitations. You know,
16 again, being an engineer, I know some of these
17 limitations. We're talking roughly 4,600 feet
18 of berm and/or wall to -- to fully encase the
19 -- the creek. There's limited space on the --
20 the Hagood side. You know ---

21 Q: Let me just pause you.

22 **MR. TRAYNHAM:** Can we bring up the ELMO again? I
23 think we've still got the site map there. It
24 may help in describing where -- where we're
25 talking about here.



1 Q: Is that ---

2 A: Yeah.

3 Q: --- oriented well? All right. And you were
4 saying, there is limited space.

5 A: So, particularly along -- along Hagood. So,
6 this -- this is Hagood. This area right here,
7 as we had stated that the -- the creek goes
8 right up to the edge of pavement and there's
9 really no space to put a berm in. So, if we
10 say we're going to put a berm or a wall, we
11 would either have to encroach on the -- the
12 wetland, have an impact, or move or lose the
13 outside lane of Hagood Road. Hagood Street.
14 And you know, we have similar -- you know, we
15 would have to encapsulate the whole system in
16 a -- in a wall, something or -- or berm to
17 that. Again, that's 4,600 linear feet.
18 There's all kinds of issues with offsite
19 drainage coming this way. We'd have to make
20 sure -- some of this drainage gets there by
21 overland flow. So, any drainage that's
22 collected along the outside of the berm and
23 outside the wall, that could be brought through
24 the wall or under it somehow and into the --
25 the system. There's engineering there.



1 Q: How high would the berm have to be?

2 A: Again, that -- that's going to -- that's going
3 to be limited -- it's going to be driven by how
4 much -- you know, how long in the future we
5 want it to last, but you know, to -- to meet
6 the objectives that we've kind of set out, it's
7 -- in this area, along this edge, it has to be
8 in the area of five feet tall that -- with a
9 little bit of a freeboard, which again is that
10 safety factor build into the system.

11 Q: Would that impact the view of the creek?

12 A: It would heavily impact the view of the creek.

13 Q: Would that impact access to the creek?

14 A: It would heavily impact access to the creek.

15 Q: And in those areas where the critical area
16 abuts the right-of-way, do you know whether
17 City of Charleston controls the right-of-way in
18 all instances?

19 A: So, you know, having worked in the area, the
20 City of Charleston, I think only controls the
21 roads interior to the -- the site, like Line
22 Street in here. But Hagood remains a South
23 Carolina Department of Transportation road.
24 Fishburne is a South Carolina Department of
25 Transportation road.



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1 Q: More to the point, does WestEdge Foundation
2 control any of these right-of-ways?

3 A: No.

4 Q: In order to hold back that much head, how wide
5 a wall are we talking about?

6 A: It -- it would have to be fairly large. I
7 mean, again, you know, I -- I -- I don't -- I
8 wouldn't like to -- to -- to guess at that.
9 There's a lot of things that go into. The
10 competency of the soils. You know, the
11 foundation and all that. But it would have to
12 be a significant berm. And then if we went to
13 a wall system, it would -- it would be some
14 type of cantilever wall. And so, it would have
15 to driven into the ground very deep.

16 Q: Can you estimate what something like this might
17 cost?

18 A: Thousands of dollars per foot. So, you know --
19 you know, one to two thousand.

20 Q: For 4,600 linear feet?

21 A: For 4,600 linear feet. I mean, we're talking
22 multi-mi- -- you know tens of millions of
23 dollars.

24 Q: Okay. Do you have any other concerns about
25 this as an alternative?



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1 A: You, the -- there again, there's -- there's
2 some issues with, you know, the -- the
3 infrastructure that's there. You know, there's
4 an active -- you know, there's a road, Line
5 Street. You know, so again, that street would
6 have to go up and over or be somehow
7 incorporated in the system. There's -- there's
8 a plan connection here. So, this -- this area
9 would have to be addressed. It -- to me it's
10 -- it's -- you know, those are some of my
11 concerns.

12 Q: Do you have any opinion regarding feasibility
13 of this alternative?

14 A: I -- I can't see that being a feasible
15 alternative.

16 Q: Raising the street, I assume here we're talking
17 about Hagood and Fishburne, was also raised as
18 a possibility.

19 A: It -- it was.

20 Q: Do you know what the present elevation of those
21 impacted streets is?

22 A: Right. So, as I -- as I -- I think we talked
23 about before, we know this area along here is
24 -- it's approximately elevation three in our
25 datum that we were working with, which is



1 approximately high tide in -- the normal high
2 tide in Ashley River. So, and then -- and
3 then, but you know, these areas probably
4 elevation four is all these roads in here below
5 elevation four or something like that.

6 Q: How high would it need to be to address the
7 tidal flooding?

8 A: Well, again, to -- to -- to create a -- an
9 impediment to flooding off -- off -- out of the
10 creek or out of the system, I mean, we would
11 estimate in there it would have to be, you
12 know, roughly five feet tall, particularly in
13 this area, it probably would get shallower as
14 you move out. But again, they would have to be
15 fairly large in these areas.

16 Q: To be clear, are you talking about raising it
17 five feet or taking it from elevation three to
18 elevation five?

19 A: No. It would -- it would have to be -- you
20 know, again, we -- we are -- current design
21 standard for -- for city of Charleston is all
22 roads need to be seven and a half feet on our
23 -- that -- that datum. So again, that's -- so,
24 it's four and a half feet, so make it -- make
25 it five feet.



1 Q: Five feet for ---

2 A: So -- so raising it five feet to roughly
3 elevation, seven and a half or eight.

4 Q: All right. And in your opinion to a reasonable
5 degree of engineering certainty, is this a
6 feasible alternative?

7 A: I don't believe that's a feasible alternative.

8 Q: Why not?

9 A: The -- the -- the cost of -- of raising a four-
10 lane road and all the -- the infrastructure.
11 There's -- there's sewer. There's a bunch of
12 other utilities. We have several other
13 considerations, you know. It only addresses,
14 you know, flooding on the road. It doesn't,
15 you know, address any flooding on Line Street
16 or up, you know, Fishburne this way, or even --
17 even into the roads that are in -- internal for
18 the site. Plus it does nothing to address the
19 -- the -- the cap.

20 Q: Did you say -- do you have an estimate
21 regarding how much it would cost to raise these
22 streets?

23 A: You know, again, back to the envelop type thing
24 since, you know, we're -- we're kind of just
25 working on a half page here that -- I think we



1 were looking at something in the neighborhood
2 of 30 million dollars just to raise like a --
3 a section of road in here.

4 Q: All right. And again, these streets are not
5 controlled by WestEdge Foundation?

6 A: They are not controlled by WestEdge.

7 Q: They are not controlled by the city either?

8 A: They are not controlled by the city.

9 Q: Do you have any experience getting DOT
10 encroachment permits?

11 A: I do.

12 Q: What are those?

13 A: So, I -- I work a lot in -- in around doing
14 what could be called a retrofit project and a
15 lot of the projects we need to do improvements
16 along or through or around DOT roads. And so,
17 we would have to apply and work with the DOT to
18 get that work permitted through the DOT. And
19 that's -- that then through a process called an
20 encroachment permit.

21 Q: Okay. And are those difficult to obtain?

22 A: The DOT has a lot of standards that -- that are
23 -- are very complicating. So, yes, it's --
24 it's a very difficult process.

25 Q: Does raising a street in these circumstances by



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1 this much raise any concerns for you with
2 regard to adjacent properties?

3 A: It does. It does. I mean, there's significant
4 issues with you know -- you know, we're --
5 we're cutting off these area over here and even
6 in -- into the Gadsden Green community. That
7 would put that road elevation several feet
8 above the -- the doorways of -- of some of
9 these -- these homes here, and then -- you
10 know, in the field. So, there -- there may be
11 some issues with, you know, as water drains
12 through there, we've got to make sure that it
13 -- it could be managed and you know, again,
14 there might have to be -- I don't know. I --
15 I don't know how you would manage that.

16 Q: So again, in your opinion, not a feasible
17 alternative?

18 A: No.

19 Q: All right. We heard some testimony as well
20 about some tide control devices and
21 specifically muted tide gates yesterday. Did
22 you hear that testimony?

23 A: I was here. Yes.

24 Q: Are you familiar with muted tide gates?

25 A: I am familiar with muted tide gates.



1 Q: What are they?

2 A: So, muted tide gate is a -- is a -- is a
3 mechanical device that's usually installed at
4 the end of a culvert between one system of
5 water and -- and a tidal system. And they are
6 generally designed to allow tide water to move
7 through that culvert in -- in -- you know, as
8 it normally would to a certain elevation. And
9 then the -- the gate closes at a certain
10 elevation and the tide can't move on the
11 upstream side anymore once the gates close.
12 So, that's -- that's what a tide gate is, a
13 muted tide gate.

14 Q: Where are they commonly utilized?

15 A: So, in -- in our experience and you know, I
16 believe they came from the -- the west coast.
17 They were start using kind of like in fisheries
18 management. And they've been adapted over
19 time. But you know, in the west coast where
20 they have, you know, kind of like the
21 northwest, they -- they have tidal swings like
22 in the 20-foot range. Where, you know, we're
23 in the 6-foot range. So, they -- they're
24 trying to manage those really, really large
25 tides. There has been talk as -- as Mr.



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1 Robinson talked yesterday about some -- some
2 moving to the east coast. But you know, I know
3 they came from the -- from the west coast.

4 Q: Okay. From a hydrologic standpoint, to control
5 the tidal influence in this creek, would a
6 muted tide gate need to be located at the
7 Lockwood outfall?

8 A: Yeah. That would be the place that you would
9 install those---

10 Q: That's ---

11 A: --- muted tide gate.

12 Q: That's where the tide is flowing into the water
13 body, correct?

14 A: Correct.

15 Q: All right. How large is that outfall?

16 A: That outfall is -- is an eight foot wide by
17 five foot tall concrete box culvert.

18 Q: Have you ever heard of a muted tide gate being
19 applied to a box culvert?

20 A: I have not.

21 Q: Where are they typically applied?

22 A: Generally, I've seen them applied to relatively
23 large, you know, 48-inch diameter pipes.
24 They're usually square in size and I've not --
25 I haven't seen them above like that 48-inch



1 diameter application on upper pike.

2 Q: So, you've never seen a muted tide gate large
3 enough to accommodate that outfall?

4 A: I have not.

5 Q: Are you generally familiar with stormwater
6 infrastructure like muted tide gates and their
7 dimensions?

8 A: I am.

9 Q: Are you aware of any even manufactured at the
10 size that would be required?

11 A: As far as I know, I -- I haven't see anybody
12 that would offer a -- a gate that -- that
13 large.

14 Q: Would that make this alternative infeasible
15 simply based on existing technology?

16 A: It -- it would.

17 Q: From a regulatory standpoint, a muted tide gate
18 would still be considered a critical area
19 wetland impact, correct?

20 A: That is correct.

21 Q: And would still require the same permits and
22 authorization that are required for this
23 proposed project?

24 A: It would.

25 Q: Why would a muted tide gate require the



1 critical area permit?

2 A: In my opinion, essentially two -- two -- two
3 conditions. I mean, number one, you know,
4 you're -- you're addressing -- you're affecting
5 the hydrologic, you know, conditions in there.
6 And I know it -- that any change in the
7 hydrologic condition in a critical area
8 requires a critical area permit. Secondly, as
9 -- as we kind of stated before, the normal high
10 tide goes up to the edge of this pavement. But
11 knowing, you know, we're -- we're going to want
12 to put some factor of safety in there. So, we
13 might want to restrict the tide to maybe like
14 within half of foot of that edge of pavement.
15 So -- but that's -- that affecting critical
16 area. So, we're actually taking critical area
17 -- you know, we're -- we're taking area that
18 gets inundated and we're taking that out of
19 being inundated. That's an impact that would
20 have to be permitted and possibly mitigated.

21 Q: You have any knowledge of how muted tide gates
22 are received by resource agencies when they are
23 ecological features upstream?

24 A: Yes. I have had some early discussions with --
25 with Army Corps, OCRM, and some resource



1 agencies. And they're not looked at very well.

2 Q: Are you generally familiar with the permitting
3 challenges associated with a muted tide gate?

4 A: Correct. You know, kind of speaking to what we
5 were -- we were just talking about, the -- the
6 impacts of the critical area and that we could
7 -- you know, by the very fact of, you know,
8 reducing that footprint of the tide, that's a
9 large area you have to -- to address.

10 Q: Do you have any opinion, to a reasonable degree
11 of engineer certainty on the likelihood such a
12 device could be permitted for the outfall?

13 A: I -- it's very -- very doubtful.

14 Q: Okay. Assuming you get over the technological
15 hurdle and the regulatory hurdle, a large
16 enough muted tide gate were available and you
17 could get a permit, would a muted tide gate
18 standing alone address all of the engineering
19 challenges on this site?

20 A: It would not.

21 Q: Would it address stormwater flooding?

22 A: It would not address stormwater flooding.

23 A: Would it address landfill exposure?

24 A: It would not address landfill exposure.

25 Q: Can you explain to the Court how a muted tide



1 gate would not address the stormwater flooding
2 problem?

3 A: So again, in our analyses, we believe the --
4 the site needs more capacity to -- to -- to
5 move water and so, we would have to have a- --
6 again, we -- we not have an eight by four box
7 culvert outfall, we have multiple, I believe
8 it's 48-inch outfall to the -- to the Fishburne
9 area and then 42-inch pipe outfall to the
10 Spring. So, that capacity would have to be
11 made up some place else. So, that -- that would
12 have to be implemented in this even larger tide
13 gate. Muted tide gate.

14 Q: Muted tide gate. Are there other types of tide
15 gates?

16 A: Yeah. I mean, there's -- there's in line -- I
17 mean, like in line check valves or flat gates
18 that -- that are either opened or their closed.
19 So, if the tide -- if the water is flowing out,
20 they're open. If the tide starts coming back
21 in, they close immediately.

22 Q: Why would that not be an option at Gadsden
23 Creek?

24 A: That would essentially change the salt water
25 marsh to a fresh water system, which is an



1 impact which would require permits and
2 mitigation.

3 Q: And again, your overall opinion on the
4 feasibility of a muted tide gate as an
5 alternative for this project.

6 A: Yeah. I -- I don't believe it's -- it doesn't
7 meet all the goals or -- goals and requirements
8 of the project.

9 Q: Have you ever been asked to solve the problem
10 of this nature for WestEdge project, low
11 elevations and sunny day flooding, close
12 proximity to a tidal river, and a landfill with
13 a degraded cap?

14 A: I've done all of those up to where you throw in
15 the landfill cap. That's -- that's just -- you
16 know, that's -- I never had to dealt -- deal
17 with it at this type -- you know, I've dealt
18 with tidal flooding and compound flooding and
19 all that, but when -- on a -- on a landfill
20 site, we have not -- I have not had to deal
21 with that.

22 Q: In your more than 30 years of professional
23 practice, you would consider this to be a
24 unique situation?

25 A: Absolutely a unique situation.



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1 Q: There's been a lot of discussion about the
2 city's responsibility. If the city had to
3 address this situation, would it entail the
4 same permitting that we're seeking here?

5 A: Correct. Ev- -- every, you know, private or
6 public entity we all have to live by the same
7 permits and -- and regulations, so they would
8 have to obtain all the same permits.

9 Q: And given the fact that you've spent all
10 morning testifying in a fight over this permit,
11 has this permit been difficult to get?

12 A: The -- this is a very difficult permit.

13 Q: If the city were doing this, would it require
14 the same degree of design and engineering that
15 Thomas and Hutton has provided?

16 A: It would.

17 Q: Could you estimate what it would cost the city
18 in public funds if they were to undertake this
19 project?

20 A: You know, into the tens of millions of dollars.

21 Q: It is your understanding that WestEdge
22 foundation will use TIF funds for this project?

23 A: That is my understanding.

24 Q: It's been suggested that grant funding might be
25 an alternative. You have experiencing applying



1 for grants for municipal projects, correct?

2 A: I do.

3 Q: And are those processes competitive?

4 A: Yes. All -- generally, all grants are -- are
5 competitive, you know, whether at the state or
6 the federal level.

7 Q: Are you ever assured of grant funding?

8 A: You are never assured of grant funding.

9 Q: It was suggested previously that stormwater
10 infrastructure constructed in certain materials
11 can fail over time. Do you recall that
12 testimony?

13 A: I do.

14 Q: And this is known as differential settlement?
15 That's one term for it.

16 A: Yeah. Yeah. Sure.

17 Q: Okay. What -- what ---

18 A: Yes. It is.

19 Q: What do you understand differential settlement
20 to mean?

21 A: So, differential settlement -- so, again ---

22 **MR. CUNNINGHAM:** I'm going to object first, Your
23 Honor. I think we're getting into the areas
24 that -- civil engineering that we at least
25 talked about some settling already no the



1 field, but I think we're going further than
2 what we aware of in his deposition.

3 **THE COURT:** All right.

4 **MR. TRAYNHAM:** I'm happy to address that, Your
5 Honor. Mr. Robinson brought this subject up
6 yesterday. He did not bring this up in his
7 deposition despite some of the same questions
8 about the extent of his testimony. We are the
9 Respondents, and I think our engineer has an
10 opportunity to rebut his testimony.

11 **MR. CUNNINGHAM:** I think -- I don't know that it was
12 asked that these are all the alternatives
13 you're talking about or these are all the
14 basings, so it's a little bit different, Your
15 Honor. Now, he certainly -- his topics of
16 testimony that he talked about yesterday were
17 all mentioned in his deposition.

18 **THE COURT:** Do differential settlement was ---

19 **MR. CUNNINGHAM:** No. No. Just the topics of his
20 expertise.

21 **THE COURT:** Well, I'm going to ---

22 **MR. CUNNINGHAM:** But they didn't say okay or have we
23 ta- -- asked you everything about what you're
24 testify.

25 **THE COURT:** All right. I'm going to let him just



1 testify in response to Robinson's testimony.

2 **MR. TRAYNHAM:** Thank you, Your Honor.

3 Q: Again, what's your understanding of
4 differential settlement?

5 A: So, differential settlement is where, you know,
6 do to settlement of -- of unsuitable or poor
7 materials, it settles at different rates. So,
8 the -- like this side could settle a foot and
9 this side could settle six inches, and anything
10 that's transitioning from those two areas will
11 get shifted. So, you know, it could lead to
12 pipes breaking or, you know, dips in the road.
13 Things like that.

14 Q: Can this issue be compensated for or mitigated
15 against?

16 A: It -- it can. And -- and it's -- it's a common
17 practice in civil engineering to -- to design
18 for these things. I mean, we -- we have been
19 building -- we -- engineers, I'm just using the
20 big word we, have been designing systems in the
21 peninsula for hundreds of years.

22 Q: Have the previous phases of the WestEdge
23 project compensated or mitigated against that
24 risk?

25 A: It -- it has. So, we're using a fairly



1 innovative program of building, they're called
2 con- -- they're called stone piles and
3 essentially, they're a system where we drill
4 into the ground, all the way down to the Cooper
5 marl, which I believe was mentioned before and
6 we bed those stone columns in the -- in the
7 Cooper marl and then extend them all the way up
8 to the surface and then -- and then we're -- we
9 do those on like a pattern of every ten feet,
10 you know, like a grid. And then we build a
11 surface on top of that and everything else is
12 built on that. The roads are built on that and
13 the drainage is built on that. The sanitary
14 sewer is built on that. The communication is
15 all built on it. This is separate from all the
16 buildings being on piles. But that systems is
17 used. I've also used just straight up timber
18 piles that could be driven into the ground and
19 in support our systems and not had differential
20 settlement.

21 Q: Will the proposed project similarly mitigate or
22 protect against this risk?

23 A: It will. So, you know, every -- everything
24 we're planning on this site is going to be --
25 is -- is addressing the poor material that this



1 site is located on.

2 Q: There was testimony yesterday regarding the use
3 and effectiveness of mechanic treatment
4 systems. Do you recall that testimony?

5 A: I do.

6 Q: Will this project utilize mechanical treatment
7 systems for stormwater?

8 A: It -- it will.

9 Q: Can you describe how those work?

10 A: So, in -- in my opinion, there's generally two
11 types of -- of mechanical treatment devices.
12 There's -- there's the -- the more basic and --
13 type system, which is either a -- a vortex
14 system that stormwater flows into one side, has
15 some type of vortex where it separates oils and
16 greases, and floatables to a chamber on the
17 top, and then sediments and more heavy
18 materials are brought to the bottom. And then
19 the -- the stormwater is discharged out the --
20 the other side. These systems are built with
21 high flow bypasses. So again, we've -- you
22 know, they're designed to a certain storm
23 event, maybe a two-year or a five-year event.
24 But if we get a large like rain event, there's
25 a bypass system to allow these larger events to



1 go around it. Mainly from our -- our
2 understanding of water quality for stormwater
3 runoff, most of the pollutants are in those
4 early lower flows. So again, if we're
5 capturing this earlier, lower flows, we're
6 doing a pretty good job of treating the
7 stormwater runoff. That's one type of system.
8 There's a second, more complicated system that
9 in -- involves filters. They -- they're
10 vaulted systems, generally larger. They have
11 cartridges of filters and they -- they -- those
12 types of systems have more advanced treatment,
13 whether it's bacteria, they can treat for
14 bacteria. They have -- they can treat for
15 metals, small particulates, in addition to oils
16 and greases, and floatables and sediment.

17 Q: I don't want to mistake prior testimony, but my
18 recollection is that we have heard that
19 wetlands are perhaps more effective at removing
20 pollutants than these mechanical treatment
21 systems. Do you recall any such testimony?

22 A: I -- I -- I do.

23 Q: Tell me, is it permissible to design a system
24 that uses wetlands to treat stormwater?

25 A: So, it is prohibited by state and federal law



1 that, you know, natural systems, wetlands,
2 cannot be used to treat stormwater.

3 Q: So, these mechanical systems treat the
4 stormwater before it enters the ---

5 A: That's correct.

6 Q: Do you recall some testimony regarding how this
7 proposed stormwater system will interact with
8 a possible storm surge wall proposed by the
9 Corps of Engineers?

10 A: I do recall that.

11 Q: Can you explain to the Court how the system
12 will actually function in relationship to that
13 project, if it comes into being?

14 A: I can. I believe -- and then I could maybe ---

15 Q: You need me to shrink it?

16 A: Yeah. Maybe shrink it just a little bit. And
17 as was indicated, I believe yesterday, there's
18 the -- there's still some fluctuation on -- on
19 the alignment in the -- the form or shape of
20 this wall, but generally it's going to be a
21 perimeter wall around the entire peninsula
22 from, you know -- from White Point Gardens, you
23 know, all the way up the Ashley River side and
24 all the way the Cooper River side. And then,
25 to a certain distance, but it definitely passed



1 our site. So, from what I've seen the
2 alignment of that wall is generally parallel to
3 Lockwood and if I'm not mistaken, it goes out
4 something like that. That is going to be the
5 alignment of the wall. The wall is going to
6 have penetrations that are always going to be
7 open because the wall is a surge protection
8 wall. It -- it just is there to protect the
9 peninsula from a hurricane surge. That the
10 Army Corps cannot include any other, you know,
11 benefits other than that in the design. So,
12 they're going to leave areas open in -- in
13 certain areas. I take that back because this
14 -- this one actually went -- goes across. And
15 I -- I think I got that wrong. Something like
16 that. And there's going to be an opening out
17 there for -- for that and the -- when the surge
18 -- when a hurricane is approaching, they're
19 going to, you know, mobilize and go out and
20 they're going to put gates at these areas. And
21 that's going to prevent water -- so, you know,
22 under normal operating conditions, you know,
23 water tides could go back and forth. But when
24 they put the gates up, that's going to not
25 allow the storm surge to go to penetrate into



1 the interior of the peninsula. You know, we --
2 we've looked at the plans. We've coordinated
3 with the Corps, you know, since our project is
4 right on the alignment in -- in looking at
5 that. So, again, we're very familiar with it.
6 We know how it's going to interact with our
7 project.

8 Q: In your opinion, to a reasonable degree of
9 engineering certainty, will this stormwater
10 system at this project continue to perform as
11 modeled and intended, even if this wa- -- wall
12 is built?

13 A: Yes. It would still continue to work. The
14 three outfalls would still be there. They'll
15 still continue to work as designed.

16 Q: Mr. Karkowski, are you charged with protection
17 of life, health, property and promotion of
18 public welfare in your practice as a
19 professional engineer?

20 A: I am. As an engineer, we -- I particularly
21 take -- take this -- this charge very
22 seriously. I -- showing everybody last night,
23 I wear a ring on my right pinky finger all the
24 time. This is to remind me of my duty to -- to
25 protect the public and -- and be aware that



1 anything I'm doing is -- is to -- to protect
2 the public and not cause any harm. So, yes,
3 I'm familiar. That's actually part of our
4 licensing. Those words are in most every
5 license -- you know, every state's license
6 requirements.

7 Q: And is determining the effect on life, health,
8 property and the public welfare in your project
9 part of what you do regularly?

10 A: Regularly. Correct.

11 Q: Do you believe that preserving this water body
12 in its present condition comports with that
13 duty?

14 A: I absolutely do not think it does.

15 Q: Why not?

16 A: The -- the exposure to what -- what is, you
17 know, at the sanitary landfill to -- to the
18 public is -- is -- you know, to me is -- is
19 unconscionable. You know, we -- we -- this
20 needs to be addressed. And -- and the -- the
21 system as -- as proposed is addressing it. And
22 -- and to remain to have exposure, to actually
23 encourage persons, children, to get into this
24 system as it currently exists is -- is to me a
25 -- a harmful -- potentially, a harmful



1 condition and goes against what -- what an
2 engineer is -- is supposed to do.

3 Q: Does the flooding itself present safety issues
4 from your perspective?

5 A: Absolutely. You know, we -- we -- you know, as
6 discussed yesterday, this -- this area is --
7 has children that -- that are less likely to
8 know how to, you know, swim and -- and move
9 around water. So, again, by allowing this con-
10 -- to continue as it is, it's only a -- it's
11 only -- you know, it's going to -- has the
12 potential to harm the public.

13 Q: In your mind, are there legitimate health and
14 safety risks associated with the present
15 conditions at the site?

16 A: I ab- ---

17 **MR. CUNNINGHAM:** Objection. That's beyond his
18 expertise as far as that goes.

19 **THE COURT:** Any response?

20 **MR. TRAYNHAM:** I -- I think he's testified that he's
21 charged with that duty as a civil engineer. He
22 does ---

23 **THE COURT:** Charged with a duty to protect the
24 public, but your question is are there any
25 health -- what as the phrase?



1 **MR. TRAYNHAM:** In your mind, are there legitimate
2 health and safety risks.

3 **THE COURT:** Health and safety risks.

4 **MR. TRAYNHAM:** Associated with the present
5 conditions.

6 **THE COURT:** No. You have to lay a foundation for
7 him to understand that. So, I overrule the
8 question as asked.

9 **MR. TRAYNHAM:** You mean you sustain the objection,
10 Your Honor?

11 **THE COURT:** Oh, excuse me. I sustain the objection.

12 **MR. TRAYNHAM:** Just -- just ---

13 **MR. CUNNINGHAM:** Thank you, counselor.

14 **MR. TRAYNHAM:** You're welcome, counselor. I'm just
15 making sure I'm clear, Your Honor. Mr.
16 Karkowski has testified that he is charged with
17 protecting the life, health and property. Is
18 the issue the term safety or should I just
19 reask the questions?

20 **THE COURT:** Are you asking it to me or him?

21 **MR. TRAYNHAM:** I -- I was asking it to you, Your
22 Honor. What -- I'm -- I'm not clear on what
23 his objection was to the question.

24 **THE COURT:** He's setting -- or -- I -- I don't want
25 to speak for him. So, I -- I'll let you speak



1 for yourself on that.

2 **MR. CUNNINGHAM:** Mr. Karkowski has his own duties
3 personally, but we're talking his expertise
4 here and that is beyond anything he's qualified
5 on, beyond anything we were aware of as far as
6 health and safety risks of his testimony.

7 **THE COURT:** I -- I would go with a little different
8 version of that because he's got his own
9 duties. He said personally. He's got on his
10 duties -- he's got his duties as a engineer.
11 Now, whether he has the knowledge of what
12 health and safety risks at -- resulting from
13 exposure to the landfill is something that I
14 haven't heard is within his purview.

15 **MR. TRAYNHAM:** Fair enough, Your Honor.

16 **THE COURT:** That's why I said, I originally
17 overruled that -- why I said sustain the
18 objection at -- at this point because the
19 foundation hasn't been laid.

20 Q: Mr. Karkowski, does your -- does the proposed
21 project in your opinion comport with your duty
22 to protect life, health, property and promotion
23 to public welfare?

24 A: I do.

25 Q: Thank you, Mr. Karkowski.



1 **MR. TRAYNHAM:** I have no further questions.

2 **MR. CHURDAR:** No questions for Mr. Karkowski.

3 **MR. CUNNINGHAM:** All right.

4 **THE COURT:** You need a break or are you ready?

5 **MR. CUNNINGHAM:** Give me maybe just five minutes to

6 ---

7 **THE COURT:** Okay.

8 **MR. CUNNINGHAM:** --- maybe ten. We don't have to

9 leave the room or -- unless anybody wants. But

10 it won't take too long.

11 **THE COURT:** All right. How long is your cross going
12 to be?

13 **MR. CUNNINGHAM:** It's not going to be super long,
14 Your Honor.

15 **THE COURT:** Okay.

16 **(Off the record from 12:29 p.m. until 12:32 p.m.)**

17 **THE COURT:** Proceed.

18 **MR. CUNNINGHAM:** All right. Thank you, Your Honor.

19 **MR. KARKOWSKI - CROSS-EXAMINATION BY MR. CUNNINGHAM:**

20 Q: Mr. Karkowski, good afternoon.

21 A: Hi.

22 Q: Exhibit 26 is a portion of the drainage study
23 you and other contributed to, is that correct?

24 A: That's correct.

25 Q: And this is dated -- the last date here is



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1 revised April 11th, 2019, is that your
2 understanding?

3 A: That's correct.

4 Q: All right. And this is the last drainage study
5 that -- this is the last version of it, is that
6 right?

7 A: As far as I know, yes.

8 Q: All right. And this is what you were relying
9 in offering your opinions today, part of -- in
10 part?

11 A: In part.

12 Q: And the numbers are what they are in here, is
13 that right?

14 A: Right.

15 Q: Okay. And I think you testified in your
16 deposition that there isn't with respect to the
17 modeling results a plus or minus range. It's
18 just the numbers are the numbers, is that
19 right?

20 A: That's correct.

21 Q: And I think you also testified you didn't do
22 any sensitivity analysis?

23 A: No.

24 Q: No you did or ---

25 A: I did not do ---



1 Q: Okay.

2 A: --- any sensitivity analysis.

3 Q: And you wouldn't say it's been field verified,
4 I think ---

5 A: It has not been field verified.

6 Q: And ---

7 A: Well, field verification as to the input data?

8 Q: Yes. Yes.

9 A: I mean, it's based upon survey and -- and field
10 collected data. So, I mean, it is field
11 verified. We -- we're not -- we didn't work in
12 a vacuum. We -- we had survey of the pipe
13 inverts, the topography and all that.

14 Q: Well, I think you testified and correct me if
15 I'm wrong, that it's not -- you're not going to
16 say it's been field verified, but there's been
17 some input in the data that's come from the
18 field, is that accurate?

19 A: Yes.

20 Q: Okay. And as far as the assumptions that are
21 made, I don't -- I believe you testified that
22 there was no particular factor of safety.
23 There was just conservative, is that ---

24 A: That's correct.

25 Q: All right. And it -- I believe when you -- at



1 least when I spoke to you in your deposition,
2 you didn't recall any particular bit of data.
3 It's just data and ---

4 A: Right.

5 Q: Okay. And I think you've said Ms. -- Ms. Aton
6 helped you?

7 A: That is correct.

8 Q: And she was the one who's actually running the
9 models.

10 A: I believe so, yes.

11 Q: And inputting data in the models.

12 A: Yes.

13 Q: All right. And I believe you testified that
14 you often would speak with Ms. Aton about
15 input, but you -- you didn't know whether or
16 not all the data she input was just from you,
17 is that right?

18 A: That's -- that's correct.

19 Q: Okay. And I believe in your deposition, I
20 think today you also confirmed, you looked at
21 a lot of alternatives for stormwater
22 management. You don't recall one in which the
23 creek and tide would remain on site, is that
24 correct?

25 A: I don't recall considering that one.



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1 Q: And you would agree there is some storage for
2 stormwater capacity for Gadsden Creek and its
3 tidelands?

4 A: Under certain conditions, yes.

5 Q: So, I wanted to make sure -- well, it's in the
6 record anyway, but -- keep this together. And
7 the image on the right is the -- the project at
8 - at least as it relates to stormwater
9 management currently, is that correct?

10 A: That's correct.

11 Q: All right. And the basin measurements that are
12 reflected here, those are your understanding of
13 all the basin measurements that are in
14 actuality in place in this area?

15 A: Correct.

16 Q: And in the -- in the measurements with respect
17 to the areas that will relate to any particular
18 outfall, their acreage is attached to those,
19 right?

20 A: That's correct.

21 Q: All right. And that -- that's your
22 understanding about how -- what acreage is
23 diverted to what outfall, is that right?

24 A: Correct.

25 Q: All right. With respect to where water is



1 going in any particular outfall, now, we'll --
2 we'll start over here and I'll -- I'll point to
3 it. This is the Lockwood outfall currently,
4 right?

5 A: That's correct.

6 Q: And that would be kept as -- as part ---

7 A: That -- that's correct.

8 Q: And most of the stormwater that discharges out
9 of that is from -- is onsite on the WestEdge
10 project site, is that right?

11 A: That's correct.

12 Q: All right. And most of the water that
13 discharges out of the Fishburne, this kind of
14 northern discharge point, that's mostly
15 offsite, right?

16 A: That's correct.

17 Q: And most of the drainage that discharges at
18 Spring Street, the -- the vast majority is
19 offsite, is that correct?

20 A: That's correct.

21 Q: Where it's originating offsite, presumably, is
22 that correct?

23 A: I wouldn't -- presume -- presumably, I mean,
24 like we looked at the topography, we ---

25 Q: That's the expected discharge.



1 A: Right.

2 Q: Yeah.

3 A: Right.

4 Q: The origin is expected to be from offsite.

5 A: That's correct.

6 Q: Okay. And -- well, let me just do this. And
7 since you are interrupting this conveyance of
8 stormwater as it currently from this larger
9 basin, you -- you -- you were necessarily
10 required to find ways to reroute that
11 stormwater, is that right?

12 A: I wouldn't say we were like necessarily to find
13 ways. We were -- we are charged with developing
14 a system that meets the -- the -- the goals and
15 the design of the project. And -- and that is
16 the -- the solution that we arrived at.

17 Q: No. I'm just -- I understand that. I -- I'm
18 talking about since you're -- well, first of
19 all, you're interrupting -- when -- when the
20 project, if it goes forward as proposed, this
21 -- this conveyance of stormwater from this
22 large basin would be interrupted because there
23 wouldn't be any tideland to funnel it through
24 from this basin because the -- the project area
25 is taken that outfall, is that right?



1 A: The project area goes there right now.

2 Q: Right. Well, no. I'm talking about they --
3 the stormwater outside the project area
4 couldn't get there, if the project goes forward
5 as proposed.

6 A: The -- again -- not again, but it was -- it
7 wasn't like a purposeful like separation of
8 onsite-offsite. It was a system that we
9 believe could be implemented feasibly to manage
10 onsite and offsite stormwater management.

11 Q: I'm not ascribing any intent. I'm just saying
12 that necessarily because you're interrupting
13 this conveyance for the offsite areas, that
14 water has to go somewhere and instead of going
15 through the creek, you're diverting it up to
16 Fishburne and down here to Spring Street,
17 right?

18 A: I mean, we're really not interrupting the --
19 the -- the system is going to -- there's still
20 going to drainage in here. We could've chosen.

21 Q: And -- and I -- I'm sorry. I can't -- you're
22 -- you might be pointing to something on the
23 screen, but I can't see it.

24 A: Okay.

25 Q: Doesn't make it over at the ELMO. If you want



1 to put your screen on, that would be ---

2 A: Is that ---

3 Q: Well, I know that is ---

4 **THE COURT:** He's marking ---

5 A: Isn't that it?

6 **THE COURT:** He had marked it. I don't know if you
7 saw it.

8 **MR. CUNNINGHAM:** Okay. I -- I can't see it. Let's
9 see. All right. Mr. Karkowski.

10 **THE COURT:** It -- it's clear from start.

11 A: I'll clear it and we can get started again if
12 you'd like.

13 Q: Oh, yeah. I -- I couldn't see it from over
14 here.

15 A: So, we're ready?

16 Q: Yeah. Go ahead.

17 A: Okay. I mean, the -- the -- for various
18 reasons and -- and various iss- -- there --
19 there is still a system as proposed in -- in
20 the future. We could've chosen to keep this
21 system connected to it, but for redundancy and
22 capacity, we -- we decided that -- that we
23 would have multiple outfalls and that it was,
24 you know, part of the engineering, we -- we
25 wanted to have that outfall or -- or design



1 that outfall and kept this one. I mean, again,
2 we -- we could have had it that way, but our
3 engineering would've said we would need more
4 capacity through the site and through Lockwood,
5 and that that expense was weighed against the
6 expense of building this and it was decided to
7 go that -- that way.

8 Q: Okay. So, in other words, that -- that
9 stormwater could be funneled through in -- into
10 the Lockwood culvert, is that ---

11 A: With a -- with a significant amount of work,
12 yeah.

13 Q: Yeah. And I think you testified just now that
14 you had to deal with stormwater from the site
15 and address offsite drainage as well in your
16 proposal, right?

17 A: That's correct.

18 Q: And it's a large amount stormwater in that
19 basin to -- to deal with, is that right?

20 A: Yeah.

21 Q: Now, the stormwater that is proposed to go
22 through the Fishburne outfall, that's -- it's
23 substantially more than is going through there
24 now, is that right?

25 A: That's correct.



1 Q: And let me ask the -- the -- just so we're
2 clear on the record. The drainage study that
3 -- that you did and the modeling you did that's
4 been entered into the exhibit, that's -- that's
5 of the system as proposed, right, with all the
6 -- all the three -- the three outfalls?

7 A: Correct. Close to existing conditions model.

8 Q: Right. Right. There are different steps along
9 the way, is that ---

10 A: Right. Yeah. There is phases. Yeah. And
11 that would ---

12 Q: And -- and for -- for our purposes, for this
13 project, that would be -- when you look at the
14 column that's full, build out, is that right?

15 A: I -- I would think so. Yeah.

16 Q: No. We -- we can confirm it ---

17 A: Sure.

18 Q: --- if you want to. What number is that, the
19 drainage study? It's the big one right there.
20 I think it says build out model. Is that
21 right? That's -- that's the column.

22 A: Right. It -- it appears that we've documented
23 two phases and then a build out model, and
24 comparing that back to an existing conditions
25 model.



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1 Q: Right. And -- and -- there are some
2 intermediate phases and that's what the project
3 site is right now, right?

4 A: I believe so, yes.

5 Q: Do you know what intermediate phase the project
6 is in currently as it relates to that ---

7 A: I -- I ---

8 Q: --- model result?

9 A: --- couldn't be certain without going -- diving
10 into a lot.

11 Q: Less than full build out obviously?

12 A: Less than full build out.

13 Q: Okay. All right. That's -- I just want to
14 make sure that's clear. I'm going to -- but
15 this project in the stormwater results related
16 to it in that model, related to the full build
17 out, the -- the one in the far right hand
18 corner.

19 A: That's correct.

20 Q: Okay. You mentioned in your direct testimony
21 about modeling related to diverting the Spring-
22 Fishburne tunnel and whether or not if -- if
23 the -- the -- that portion of the basin, I
24 believe, is about 120 acres. The current basin
25 is there at Spring-Fishburne, whether or not



1 the -- the remainder could be able handled at
2 Gadsden Creek, right?

3 A: Right.

4 Q: And -- and the modeling you did, pre- --
5 presumed that there was still a tidal influence
6 at Gadsden Creek for that purpose, is that
7 right?

8 A: I don't understand that question.

9 Q: Oh, well.

10 A: Can -- can you ask again, please?

11 Q: Sure. So, you're doing some modeling
12 stormwater and -- and basins and what basins
13 can handle what amount of stormwater and you
14 said, I believe in your testimony that the
15 modeling you said -- or -- or that you
16 conducted indicated that the -- the remainder
17 of that basin would not be able to flow through
18 -- the stormwater could not be handled just by
19 Gadsden Creek alone, is that right?

20 A: It -- you know, I -- I don't like the word
21 handled.

22 Q: Okay.

23 A: Handled is a very non- -- non-technical.

24 Q: Not an engineering word?

25 A: Yeah. And -- and -- and to say -- and to say



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1 -- so, like handled -- so, wouldn't have met
2 the -- what we were trying to attain.

3 Q: Yeah. I understand that. My -- my only point
4 is is that the modeling you did with respect to
5 that particular scenario, Gadsden Creek as it's
6 model there, still has a tidal inflow, is that
7 right?

8 A: It -- it -- in -- in our build out condition?

9 Q: No. No. It -- the -- well, let's -- let me
10 clarify that.

11 **MR. CUNNINGHAM:** I -- I guess we can get the things
12 in back again. So, we can have it all -- yeah.
13 That one right there. That's fine. Exhibit
14 10.

15 Q: So, this will be easier to kind of talk about,
16 I think, the drainage basins. Okay. So, it's
17 my understanding, and correct me if I'm wrong,
18 that your testimony was that you would have
19 tried to model after this portion of the basin
20 is diverted to Spring-Fishburne tunnel, whether
21 or not the remainder of that basin, if the
22 stormwater could be effectively -- effectively
23 shunted through Gadsden Creek into the Ashley
24 River, is that right?

25 A: I -- I don't if I said that. What I -- what --



1 you know, I don't -- you know, and I -- you
2 know, I know we don't have a documented
3 scenario in -- in our report that would --
4 would envision that as an alternative, you
5 know.

6 Q: Okay.

7 A: So, this is not corresponding alternatives
8 analysis. It's a -- it's a design study
9 report, so -- but knowing that for what --
10 knowing that we -- what I know about the system
11 and the need for additional outflow capacity,
12 we know that that Lockwood culvert, in its --
13 in its current form, could not handle that area
14 because we have built more capacity into the
15 outfall. So, yes.

16 Q: That's -- that's all I wanted ---

17 A: Okay.

18 Q: --- clarification on. And it's -- the modeling
19 you did related to that scenario was based upon
20 the Lockwood culvert in its current form, is
21 that right?

22 A: That's correct.

23 Q: Okay. That's -- that's all I wanted to -- and
24 I think we've been talking around each other,
25 but that's all I'm trying to get to. I think



1 I'm actually done with that now. Now, you
2 mentioned, muted tide gates. At -- in -- in
3 your deposition you said, that if it's properly
4 maintained in size that a muted tide gate is
5 capable of stunting the tidal flow and
6 precluding day flooding, is that right?

7 A: It -- yeah. In -- in I guess some cases.

8 Q: In this case.

9 A: If -- if it could be built big enough, I guess
10 a muted tide gate could shunt ---

11 Q: All right.

12 A: --- sunny day flow.

13 Q: And -- and the size of the culvert matters.
14 Culverts can be changed, is that right?

15 A: That's right.

16 Q: All right. You can change culverts. And --
17 and this culvert was changed, as you're aware.
18 I think we talked about that in your deposition
19 testimony. Is that right?

20 A: I think you brought it, but ---

21 Q: Yeah.

22 A: --- I -- I agreed that you showed me a permit
23 and it had a smaller culvert and they put in a
24 larger culvert.

25 Q: Right. So, they changed it -- they -- they



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1 expanded the culvert, the city did, in 1995
2 approximately ---

3 A: Right.

4 Q: --- is that right? To allow for increased flow
5 of stormwater out, is that right?

6 A: Sure.

7 Q: That -- that's your recollection?

8 A: Yeah. That's my recollection.

9 Q: Okay. Talk a little bit about excavation. If
10 we can just talk a little -- well, first of
11 all, before we do that, you mentioned I your
12 testimony that there are portion of the area,
13 the Gadsden Creek where you -- you believe the
14 landfill cap is eroded to some degree, is that
15 correct?

16 A: Yes.

17 Q: That's not the entirety of the area, is it?

18 A: No.

19 Q: That's just a few portions of it here or there,
20 is that right?

21 A: Some areas. Correct.

22 Q: All right. All right. And this project
23 already proposes excavation of Gadsden Creek to
24 almost an acre in the -- starting from the
25 corner of Hagood going subtly -- at Fishburne-



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1 Hagood going subtly along Hagood, is that
2 right?

3 A: Correct.

4 Q: And that would require excavation of the
5 landfill that was ---

6 A: It would.

7 Q: --- about an acres worth, is that right?

8 A: Plus or minus.

9 Q: Yeah. Approximately.

10 A: Yeah.

11 Q: And ---

12 **THE COURT:** Can I stop you?

13 **MR. CUNNINGHAM:** Yes, sir.

14 **THE COURT:** Because y'all keep talking about it.
15 What is the excavation for?

16 A: Well, the -- the ---

17 **THE COURT:** I'm mean, I was assuming ---

18 A: The -- the ---

19 **THE COURT:** --- it was the stormwater retention
20 pond. I just ---

21 A: And it's really not a stormwater retention pond
22 and -- and it's kind of. I would like to maybe
23 correct that. It -- it ---

24 **THE COURT:** No. I said I assumed that.

25 A: Yeah.



1 **THE COURT:** Because y'all been talking about filling
2 in the wetlands and then excavating portions of
3 it and I don't think I've ever heard what's
4 what and for what reasons. So, I'm trying to
5 fig- -- find that out right now.

6 A: Can I explain what's what?

7 **THE COURT:** Yeah. That's why I'm asking.

8 A: Okay. So, the -- the ---

9 **THE COURT:** Are you okay with that?

10 **MR. CUNNINGHAM:** Yes, sir.

11 A: The -- the plan in the overall scheme of things
12 is -- let me see I've got this. This area
13 right here is going to be excavated and -- and
14 -- to create a -- we -- we're calling it a
15 conveyance. And it's not going to be like full
16 of water. It's not going to have like a -- a
17 surface water the whole time. And we -- we
18 wanted to keep some -- you know, a -- a natural
19 feature and -- and there was a lot of input by
20 different stakeholders that -- that -- that
21 valued that and so we -- we -- we're going to
22 have that in there. And it's -- it's a feature
23 to manage drainage in this direction, but it's
24 not going to be a -- it's not designed as
25 detention. So, it's not going to have a normal



1 water, like it's not going to be wet the whole
2 time. It's going to be fairly dry. We're
3 going to plan on having like, you know, a
4 system and some -- some part features around it
5 and then that connects to -- to buried pipes to
6 there to there, and then it would drain out
7 that way. And so, water essentially just flows
8 through it, but it's open -- open area. But
9 they would ---

10 **THE COURT:** That's ---

11 A: And then, so to make that happen, we want it to
12 be a little bit deeper. That area is very
13 shallow. We're very -- I mean, not shallow,
14 but it -- it -- you know, to -- to -- to create
15 the area for the water to maybe stage up into,
16 we need to excavate it a little bit.

17 **THE COURT:** So, that's the area of excavation on
18 that?

19 A: That -- that is the area of excavation.

20 **THE COURT:** The remaining portion of the -- the
21 creek or channel would be covered?

22 A: That's correct.

23 **THE COURT:** All right.

24 Q: And -- and I think, Mr. Karkowski, in your
25 deposition, you -- you characterize that basin



1 as a structural component at the stormwater
2 management plan, is that right?

3 A: That's right.

4 Q: All right. And I believe initially, there was
5 the -- the thought that you would have a muted
6 tide gate along the Fishburne ditch area to
7 allow tidal influence at that area, is that
8 right?

9 A: That -- that was -- you know, some of the
10 stakeholder input was -- like, we would
11 possibly like to see this area to remain as a
12 tidally influenced area. But again, from
13 various reasons it's -- it was not going to be
14 allowed.

15 Q: All right.

16 A: Couldn't be engineered that way.

17 Q: Well, in any event, check valves are proposed
18 there now, is that right?

19 A: That's correct.

20 Q: And that's not because the muted tide gate
21 couldn't effectively handle the tide there, is
22 that right? It's other concerns.

23 A: Again, I -- I don't know the exact like what
24 the sequence of events and how that design came
25 about, but it -- it was thought that we could



1 add something tidal, but -- and then various
2 agencies and stakeholders said no, you know, we
3 -- we need that not to be tidal, so we have a
4 full inline check valve at that location to
5 prevent the tide from coming in.

6 Q: And my point was, it had nothing -- the change
7 in that had nothing to do about whether or not
8 the tide gate there would be efficacious. It
9 -- it would still work. It's just there are
10 other concerns, so you put a check valves
11 there?

12 A: I don't -- again, the term work is -- is a pet
13 peeve of mine and I don't allow my engineers to
14 say it. So, I -- I don't make anything work.
15 I design a system to make it function to the
16 parameters that I've given. So, we never like
17 make stuff work. It -- it -- it's designed to
18 meet a standard or a goal. So, to say, you
19 know, there -- to make it work, I don't know,
20 we didn't really get into that much. So, it --
21 it may, I'll give you that, but you know, we
22 never researched it past the -- the -- you
23 know, sketching on a paper and then saying no,
24 that's not going to be -- that's going to be a
25 -- a saltwater feature.



1 Q: Well, I'm just -- are you disputing that in
2 your deposition that the change from a tide --
3 from tide gate to check valves had anything to
4 do with the efficacy of the tide gate at that
5 location?

6 A: I -- I would say, no, it did not anything to do
7 with that. But just all the other ---

8 Q: It had ---

9 A: --- all the -- all the other things that as
10 engineers we must consider. It had everything
11 to do with that.

12 Q: I'm just talking about that one aspect of that.
13 And -- and all I'm -- all I'm asking you is
14 that it had nothing to do about, hey, the muted
15 tide gate won't function properly -- We're not
16 going to say work -- as opposed to the check
17 valves, which will. They both would have and
18 you just elected to do check vales, correct?

19 A: Right. Right. And -- correct. And it would
20 negate the whole system as we have designed
21 because again, one of the -- one of the
22 outfalls is the Spring-Fishburne and having
23 this area of tidally in -- in contact with this
24 area would -- would throw that out and we'd --
25 we'd go back to the drawing board. So again,



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1 there, you know, not only the efficacy of -- of
2 a muted tide gates, but the entire system and
3 -- and issues and problems and design
4 parameters that we were trying to address.

5 Q: If the check valves that are proposed to be
6 installed there malfunction, then it's capable
7 of causing sunny day flooding in that area?

8 A: That's correct. Yeah.

9 Q: All right. Now, you mentioned in your
10 testimony about if a muted tide gate is
11 installed at the Lockwood culvert, that could,
12 in your opinion, result in the diminishment of
13 an area of critical area in -- that is Gadsden
14 Creek and its tidelands, is that right?

15 A: That's correct.

16 Q: All right. That diminishment would no reach
17 the level of filling or excavating the entirety
18 of the creek, is that correct?

19 A: No.

20 Q: That's not correct?

21 A: It -- no, it doesn't involve filling or
22 excavating the creek.

23 Q: I'm not talking about that. I'm talking about
24 relatively speaking. If you have a muted tide
25 gate and in your opinion it decreases the area



1 over which the creek flows and the tidelands
2 are present, that is not in the same order of
3 filling and excavating the entirety of that?

4 A: That is a correct statement.

5 Q: With respect to the current proposal, you
6 agreed in your deposition -- I think you agreed
7 today, it's possible for a tide's interrupted
8 discharge of stormwater through the Lockwood
9 culvert, is that right?

10 A: That's correct.

11 Q: And I think you agreed that there's always
12 going to be a storm that occurs that's greater
13 than the system's capacity to handle, is that
14 correct?

15 A: That's correct.

16 Q: And this system is designed for 25-year storm
17 events ---

18 A: That's correct.

19 Q: And above that threshold, the system will be
20 greater, more and more overloaded, is that
21 right?

22 A: That's -- that's right.

23 Q: And once it gets overloaded, you don't know
24 exactly where that water is going to go, other
25 than presumably to -- from a higher area to a



1 lower area?

2 A: That's correct.

3 Q: Now, you mentioned in your deposition 100-year
4 storms are becoming more frequent.

5 A: They are.

6 Q: And 50-year storms are.

7 A: They area.

8 Q: 25-year storms.

9 A: Right and ---

10 Q: Are ---

11 A: So, like -- so, they're not 50 years, 100-year
12 storms, they're something more frequent than --
13 -

14 Q: Right.

15 A: So, they would become the 99-year storm or the
16 98-year storm.

17 Q: Right. And -- and I thin that the -- the
18 function of that is is they increase in
19 frequency, you have to find a new way to
20 characterize them, is that right?

21 A: Correct.

22 Q: All right. Now, there will be necessarily some
23 need to excavate landfill materials during the
24 construction of the stormwater pipes and system
25 on site, is that right?



1 A: That's right.

2 Q: All right. And how large an area, aside from
3 the excavation of the Hagood basin area, how --
4 how much volume are we talking about
5 excavating? Are you -- or do you know?

6 A: We know the -- I could speak to -- it comes to
7 mind that the system along Fishburne Street, so
8 it's a dual 48, I believe 48-inch pipe. So,
9 you know, those four -- maybe like a 15-foot
10 corridor in -- in that area plus a -- a -- some
11 -- excavation there to finish that off.

12 Q: I believe you testified -- I believe it's still
13 the case that if Gadsden Creek is not filled or
14 excavated, you don't -- you don't have --
15 currently, you don't have formulated a
16 secondary stormwater plan, is that right?

17 A: That's right.

18 Q: And you haven't been asked to come up with one?

19 A: That's correct.

20 Q: All right. With the respect to water quality
21 issues, you haven't attempted to characterize
22 or quantity any level of contamination of
23 Gadsden Creek currently, that's right?

24 A: Not personally.

25 Q: Okay. And all the information you have is from



1 other studies, is ---

2 A: That's correct.

3 Q: And those studies were conducted in 2020, is
4 that right?

5 A: Plus or minus.

6 Q: Maybe 2019, 2020 to the best of your knowledge?

7 A: Yeah. I don't remember the dates.

8 Q: Tho- -- those would have occurred after some
9 phases of this development had already been
10 built?

11 A: If -- if the timeline -- sounds about right.

12 Q: You wouldn't dispute that?

13 A: I would not.

14 Q: Now, with respect to water quality issues and
15 I believe you testified about typical
16 contaminants you'd find in stormwater, at least
17 you're familiar with those, right?

18 A: Yeah.

19 Q: And you had testified in your deposition about
20 the character of the parking lots that you can
21 see there on the screen and because they're
22 compacted limestone, that you have oils,
23 greases, break linings, other -- other
24 contaminants that maybe washed into the Gadsden
25 Creek and its tidelands through the stormwater



1 flow, is that right?

2 A: That's right.

3 Q: And -- and stormwater that goes into the creek
4 from other areas outside can bring contaminants
5 or pollutants as well, wouldn't it? Is that
6 right?

7 A: That's right.

8 Q: All right. And we've talked a little bit about
9 the wall, the proposed storm surge that the
10 Corps is contemplating, the city is
11 contemplating right now. Now, the wall if it
12 projects back behind the Joe Riley Stadium to
13 the north, that's going to impede the -- the
14 flow of that water even if there is a -- a
15 little gate in that area, is that right?

16 A: I don't know if impeded, but you know, we would
17 certainly work with them to properly size that
18 opening to -- to make sure it -- it does -- you
19 know, meets the -- the design that we were
20 trying to get.

21 Q: I'm not talking about -- I'm just talking
22 comparing the -- the current situation versus
23 where some portion of that is walled up. Even
24 if there is a gate, that's going to not allow
25 the flow to reach the levels it is now, is that



1 right?

2 A: I would say that's -- that's probably correct.

3 Q: And you are aware that as part of the storm
4 surge wall, there is a gate proposed at the
5 Lockwood culvert, is that right?

6 A: It is my understanding that -- that there's one
7 proposed there and then one proposed for the
8 area to the north.

9 Q: And -- and -- and that would be a gate to
10 minimize tidal flow in Gadsden Creek and it's
11 wetlands beyond a certain point, is that right?

12 A: So, it's -- it's a tide gate. It's a surge --
13 it -- it's part of the surge protection. So,
14 it's only in place and only operated in -- in
15 the approach of a storm. So, it -- it -- it --
16 you know, I don't know. Like I don't think
17 there's any designs for these gates yet. It's
18 just like there's going to be a gate. And --
19 and it -- it's a temporary feature that for
20 example, just hypothesizing of what -- how
21 things are going to work, there's a -- what did
22 we say? An eight by five box culvert. There
23 would be a eight by five hole left there and
24 then when a storm comes, they'll run out and
25 put a gate in front of that eight by five foot



1 opening to not allow that storm surge to
2 penetrate through that culvert behind the wall
3 and into the eastern part of the -- western
4 part of the peninsula.

5 Q: Eastern. That's a sluice gate, I think is how
6 they refer to it, correct?

7 A: I -- I don't think it's -- I -- I don't believe
8 I would characterize it as a sluice gate. It
9 -- it's a storm gate. You know, a sluice gate
10 is always there. I -- and -- and I don't know
11 their designs. So, again, I -- I -- I can't
12 say and if it -- if it is, you know, I can read
13 from the report, but.

14 Q: No.

15 A: You know, if -- if it's like opened up and then
16 they cranked it down, it's -- someone's got to
17 go out or they got to push a button or they got
18 to have to centers of whatever. But yeah, it's
19 -- it's cranked up and then cranked down.

20 Q: Well, in any event, there -- there is a gate
21 proposed there and e- -- even if they don't
22 have it sized yet, engineers are innovative and
23 they can work it out, right?

24 A: There -- yeah. There -- there's going to -- a
25 lot more work on that one too.



1 Q: Right. Sure. And -- and you know, muted tide
2 gates you can innovate as far as the sizes of
3 those, right?

4 A: You can.

5 Q: Okay. And you talked a little bit about
6 wetlands and their ability to filter or
7 attenuate pollution, is that right? Your --
8 your testimony isn't that they -- they can,
9 right? They -- they can. It's ---

10 A: They can. They do. They can and they do.
11 They're a natural, but they can't be used in
12 conjunction with development as a -- as a --
13 say a best management practice.

14 Q: Sure. Well, and only to that effect because
15 you don't want to overburden those wetlands and
16 then -- you can't just depend on them to only
17 do that work. You want other -- other aspects
18 of it, right?

19 A: Right. There's natural pollution that they're
20 there to handle.

21 Q: Right. Okay.

22 A: And there's that word again.

23 **MR. CUNNINGHAM:** That's it, Your Honor.

24 **THE COURT:** Redirect?

25 **MR. TRAYNHAM:** Very briefly, Your Honor. I think



1 everybody's getting hangry at this point. All
2 right. I think it's 16. Yeah. Right there on
3 top. 10.

4 **MR. KARKOWSKI - REDIRECT EXAMINATION BY MR. TRAYNHAM:**

5 Q: Mr. Karkowski, you were asked a little bit
6 about the excavation there at the corner of
7 Hagood and Fishburne. You didn't discuss it
8 earlier, but is that excavation depicted
9 somewhat in this Exhibit 10?

10 A: It is. It -- it's -- it's something and -- and
11 that is -- that's a fair representation. I
12 would -- I would beg that's it a little too
13 blue. It's not going to be that wet.

14 Q: Sure.

15 A: But -- but it's a fair representation of what
16 the plan is.

17 Q: And it -- it's fair to say that there's still
18 a lot of details to be worked out about what
19 this going to look like?

20 A: That's correct.

21 Q: Correct? But it is your understanding that the
22 intent is for this not only to serve practical
23 purpose, but also to be a public amenity and a
24 water feature?

25 A: It is.



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1 Q: All right. And again, this is just a
2 conceptual design of what that will look like,
3 correct?

4 A: It is.

5 Q: Mr. Cunningham asked you about the potential
6 for shrinking the culvert at Lockwood or -- or
7 replacing it with a smaller pipe, something
8 that would, you know, fit with traditional
9 muted tide gates. If you do that, what does
10 that do to stormwater flow getting out?

11 A: It -- it reduces the capacity.

12 Q: And it was your testimony that even at its
13 present size, if you put a muted tide gate,
14 that couldn't handle the stormwater situation,
15 is that accurate?

16 A: Not all are the same. And -- and again, that
17 -- that word handle, but it couldn't meet the
18 objectives of our project.

19 Q: I think cou- -- both counselor are falling into
20 the same trap here. We don't know the
21 engineering terms, but -- but the -- the -- a
22 muted tide gate at the present Lockwood box
23 culvert would be insufficient to handle
24 stormwater drainage?

25 A: That's correct. The -- the box culvert itself



1 is insufficient and so, the box culvert fitted
2 with a tide gate is insufficient.

3 Q: And a smaller culvert or a smaller pipe would
4 be further insu- ---

5 A: Be further insufficient. Correct.

6 Q: Okay. You were also asked about contaminants
7 coming off the gr- -- crushed limestone,
8 parking lots that are in the area. Again, in
9 your review of water quality analyses to
10 leachate analyses, did you see contaminants
11 that you would not expect to see running of in
12 stormwater from a limestone re- ---

13 A: I have noted contaminants to be named that are
14 not usually in stormwater.

15 Q: And your conclusion was that those were coming
16 from the landfill itself?

17 A: That -- that is a very strong almost I can't
18 say certainty. And I admit to you like I said,
19 I -- certainty, but -- but there's a very easy
20 -- well, I'll ---

21 Q: To a reasonable ---

22 A: According -- no. I'll take this back. It --
23 I mean, I would have to say almost certainly
24 because the way that the sampling was
25 conducted.



1 Q: At least to a reasonable degree of engineering
2 ---

3 A: Reasonable.

4 Q: --- certainty? And finally, with regard to the
5 design of the system to handle 25-year storms,
6 how is the present condition handling 25-year
7 storms?

8 A: It does not handle and it -- it does not
9 function under the 25-year storm event. It --
10 it is woefully inadequate.

11 Q: And if 25-year storms as we currently know them
12 become more frequent, would you expect those
13 conditions under the present circumstances to
14 worsen?

15 A: Absolutely.

16 Q: Thank you, Mr. Karkowski.

17 A: You're welcome.

18 **MR. CUNNINGHAM:** Nothing further.

19 **THE COURT:** You may step down.

20 **MR. TRAYNHAM:** Your Honor, given Mr. Karkowski's
21 limitations, we -- we would ask that he be
22 excused at this time.

23 **THE COURT:** Well, anything?

24 **MR. CUNNINGHAM:** No objection there.

25 **MR. TRAYNHAM:** All right. No objections.



1 **THE COURT:** You're excused.

2 A: Thank you.

3 **THE COURT:** When we going to come back?

4 **MR. CUNNINGHAM:** What time is now? 2:20.

5 **THE COURT:** 2:20 is fine.

6 **MR. TRAYNHAM:** 2:20 works for us, Your Honor.

7 **THE COURT:** Okay.

8 **MR. CUNNINGHAM:** Thank you, Your Honor.

9 **(Off the record from 1:10 p.m. until 2:17 p.m.)**

10 **MR. CHURDAR:** All right. Your Honor, the Department
11 calls Mr. Blair Williams to the witness stand.

12 **COURT REPORTER:** Would you raise your right hand
13 please. Do you solemnly swear the following
14 testimony to be the truth, the whole truth, and
15 nothing but the truth, so help you God?

16 **MR. WILLIAMS:** I do.

17 **COURT REPORTER:** Thank you.

18 **BLAIR WILLIAMS,** having been duly sworn, testifies as
19 follows:

20 **MR. WILLIAMS - DIRECT EXAMINATION BY MR. CHURDAR:**

21 Q: Mr. Williams.

22 A: Yes, sir.

23 **THE COURT:** Mr. Williams, your name has al- -- has
24 already been bandied about, so.

25 A: Been what?



1 **THE COURT:** Bandied about.

2 A: Yes, sir.

3 Q: All right. Mr. Williams, I think it's quite
4 obvious where you work, but I want to just go
5 through your edu- -- your -- well, your --
6 well, first, before we go through your
7 employment, can you please tell the Court about
8 your educational background?

9 A: Yes. I received my Bachelor's of Science and
10 Master's of Forest Resource Management at
11 Clemson University.

12 Q: Okay. And can you tell the Court where your
13 employed?

14 A: I'm employed a the South Carolina Department of
15 Health and Environmental Control, Office of
16 Ocean and Coastal Resource Management.

17 Q: Okay. And how long have you been employed at
18 -- by DHEC?

19 A: Approximately 17 years.

20 Q: Okay. And what about particularly OCRM, how
21 long have you been employed at that ---

22 A: I would say 14 ---

23 Q: --- program area?

24 A: Yeah. 14 years.

25 Q: Okay. And what is your title or your position



1 at OCRM?

2 A: I'm the manager of the critical area permitting
3 section.

4 Q: Okay. And -- and how long have you been the
5 manager of the critical area permitting
6 section?

7 A: Approximately 14 years.

8 Q: Okay. I'm sorry about that. So, what were you
9 doing with DHEC in the other years that you
10 were not the -- a manager.

11 A: I worked in the shellfish program as well as
12 the stormwater permitting division.

13 Q: And as section manager, were you involved in
14 the permitting decision for the WestEdge
15 project?

16 A: Yes.

17 Q: And could you please tell the Court what your
18 involvement was in that decision?

19 A: Yes. So, I assigned the project to Tess
20 Trumbull, who is the project management for
21 OCRM and I work with closely with her in
22 evaluating that permit application and in
23 reaching a permit decision.

24 Q: Okay. And what is -- what is the -- the
25 decision-making criteria for when you become



1 involved in a permitting decision like you did
2 in this one?

3 A: Typically, if it's a project that is high
4 profile or potentially complex or
5 controversial, having been involved with the --
6 one of the first submittal, I think in 2015,
7 and going through a public hearing, and in the
8 -- the recent submittal, and going through that
9 public hearing again. I was involved from the
10 beginning.

11 Q: Okay. And that was when the -- the -- the
12 prior permit, although it was the same project,
13 was -- permit application was submitted by
14 Horizon, is that correct?

15 A: The original one, yes.

16 Q: Okay. All right. And before we get into the
17 details of the Department's permitting
18 decision, can you just please tell the Court
19 what the applicant proposed to do with this
20 project, where the sites located, the history
21 of the site, and some of the other issues using
22 the -- the aerial image that we've had up there
23 for prior testimony this morning?

24 A: Yes. The applicant, WestEdge, had submitted a
25 proposal to excavate tidelands critical area as



1 well fill tidelands critical area at a project
2 site location located in Charleston, South
3 Carolina, directly adjacent to the Ashley
4 River. We discussed that several times today.
5 And this site, as you can see on the screen, is
6 the boundary limits of that site is in red.
7 The drainage system known as Gadsden Creek
8 within that boundary limit is in this manner.
9 This drainage system was -- as you can see, is
10 -- is disconnected from the Ashley River. It's
11 only connected by a set of pipes. You have a
12 four-lane highway here, Lockwood. And then you
13 have Hagood and Fishburne on the other sides of
14 it. It's completely surrounded by development
15 and road systems. The drainage systems itself,
16 at the closure of the landfill, it was a -- a
17 municipal landfill run by the city. Was
18 relocated to the perimeter of the landfill to
19 act as a drainage system for that landfill.
20 And ---

21 Q: The ---

22 A: The -- sorry. Go ahead.

23 Q: I was just going to say, can I jump in. The --
24 the -- the red -- the red line that is the
25 perimeter is representing ---



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1 A: That's the project limits of the -- I mean,
2 that's the limit -- boundary limits of the
3 project.

4 Q: Okay. Okay. And do you recall when the
5 landfill was closed?

6 A: I believe around the early '70s. I think there
7 was a -- there was an after-the-fact permit by
8 the Army Corps, I believe, in 1971.

9 Q: Okay. And -- and as part of that closing, what
10 -- what was done in an effort to contain what
11 was the landfill?

12 A: There is a -- again, the drainage system known
13 as Gadsden Creek was reestablished along the
14 perimeter of those -- were you see it now. And
15 there was an environmental cap that was placed
16 on top of the material.

17 Q: Okay.

18 A: The landfill material.

19 Q: Okay. And when you said it was rerouted,
20 you're -- you're familiar with where the
21 original location of Gadsden Creek is, correct?

22 A: I'm familiar where the original location of
23 Gadsden Creek once was. Yes.

24 Q: Right. Once was. And -- and are -- would you
25 be familiar enough that you could give a rough



1 approximation of where it was on that map?

2 A: There's many aerials submitted as part of the
3 -- the permit -- during the permit review that
4 better dictates that.

5 Q: Okay.

6 A: But I -- I can -- it would be -- it would be
7 hard with this orientation on here for me to
8 kind of ---

9 Q: Okay. That -- that ---

10 A: --- draw that at.

11 Q: Never mind. That's fine.

12 A: But I -- I can say the -- based on the current
13 location of the drainage system, known as
14 Gadsden Creek, that -- and I believe the Judge
15 asked the question earlier today, the only
16 location that's really the original location is
17 the mouth of Gadsden Creek in this area right
18 here. And then there's -- there's some other,
19 I think, maybe two or three sections that cross
20 perpendicular, based off of that sinuosity of
21 the original creek along the drainage system.
22 But again, the -- the only original location,
23 again, would be at the mouth of the creek where
24 it meets the Ashley River.

25 Q: Okay. Now, you have had a chance to look at



1 Petitioner's Exhibit 35, which has already been
2 admitted into evidence. That's the critical
3 area permit, costal zone, consistency, water
4 quality certification, that the Department
5 issued to WestEdge. So, what supporting
6 documentation did the Department consider in
7 making its decision?

8 A: The Department reviewed all the material that
9 was submitted that was part of the application
10 itself. There was a feasible alternative
11 analysis that was submitted that was
12 considered. There was public comments that
13 were considered. There was many -- not many,
14 but there was comments that were issued to the
15 applicant requesting them to address public
16 comments, to address Department and resource
17 agency concerns. We reviewed all those
18 responses. We requested additional information
19 such as, you know, on -- we didn't feel like
20 onsite alternatives were vetted enough. They
21 resubmitted additional onsite alternatives for
22 us to evaluate. The -- the drainage study.
23 And that's all I can really think of right now.

24 Q: Okay. We ---

25 A: Or I can recall.



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1 Q: I've heard mentioned this morning a -- a -- two
2 reports, the GEL report and the Terracon
3 report?

4 A: Yes.

5 Q: Those were considered in the Department's ---

6 A: Yes. The -- the sampling reports that were
7 conducted by GEL and Terracon were considered
8 during the permit application review as well.

9 Q: Okay. And what regulations did the Department
10 focus on in determining the permit would be
11 issued?

12 A: As it relates to the regulations, the
13 Department evaluated the project based on the
14 general fur- -- further guidelines found under
15 30-11, as well as the dredging and filling
16 provisions found under 30-12-G. And then non-
17 water dependent structures found under 30-12-M.

18 Q: Okay. So, you -- you have mentioned
19 particularly at the end of your answer looking
20 at and considering 30-12-G and 30-12-M. And
21 can you please walk us through the Department's
22 application of these regulatory standards in
23 this permitting decision?

24 A: Yes. So again, this is a proposal for a mixed
25 use development that -- that requests to dredge



1 and fill critical area tidelands. And so,
2 looking at the specific project standards that
3 are applicable, we looked at 30-12(G)(1) and 2.
4 In looking at the specific project standards,
5 30-12(2)(A), it talks that creation of
6 commercial and residential lots, strictly for
7 private gain is not a legitimate justification
8 for the filling of wetlands. It goes on to say
9 that the -- the permit application for filling
10 of wetlands and submerged lands for these
11 purposes shall be denied, except for erosion
12 control or boat ramps. All other dredge and
13 fill activities not in the public interest will
14 be discouraged. And then, 2(b) states dredging
15 and filling wetland areas should on- -- should
16 be undertaken only if the activity is water
17 dependent and there are not feasible
18 alternatives.

19 Q: Okay. That's ---

20 A: And so, looking at the actual request before us
21 and the purpose of the project, the Department
22 determined that the activity is not water
23 dependent. And so, therefore, that left us
24 with no feasible alternatives analysis under
25 30-12(2)(b).



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1 Q: Let -- if I could -- if I could just back first
2 to the -- to the first issue that's underlined
3 there under 30 -- under 2(a).

4 A: Yes.

5 Q: The -- the strictly for private gain. How did
6 the Department decide that the WestEdge project
7 was not strictly for private gain?

8 A: Well, one of the purposes of the project is to
9 -- is to provide a public benefit or public
10 interest or a public need part of the -- the
11 component. And it talks about improving the --
12 the -- the cities, neighborhoods and -- and the
13 commu- -- surrounding communities of WestEdge.
14 And so, the applicant demonstrated to us that
15 in addressing the potential harm to the public
16 based on the contaminants that are found
17 through the leachate samples, that could --
18 could be spread to the public either them
19 utilizing the creek like we heard the past
20 couple days or either through flood waters
21 coming up on over the roads, up near the
22 Gadsden communities. In addressing that, but
23 also addressing the flooding, not only onsite,
24 but offsite flooding in an area that frequently
25 floods, that is a public benefit. The -- the



1 need that the city demonstrated the -- needs to
2 be completed for the benefit of the public. In
3 -- in addition, the city -- I mean, sorry. The
4 applicant had dedicated over 7 million dollars
5 to workhouse afford- -- affordable workhousing
6 and then, also they created a TIF in order to
7 generate funds in which they can utilize to
8 dedicate towards public infrastructure projects
9 including pub- -- public schools.

10 Q: Okay. Can -- you had mentioned just in -- in
11 -- in passing sunny day flooding. And I don't
12 know that we've seen a picture of that.

13 **MR. CHURDAR:** Can you put that up on the screen?

14 Q: Is -- is that what you're talking about?
15 That's what sunny day flooding looks like right
16 there?

17 A: Yeah. So, this is -- again, is a good example
18 of a sunning -- sunny day flooding event that
19 the flood water have gone beyond the drainage
20 system of Gadsden Creek.

21 Q: And can you identify where the drainage system
22 approximately is or ends on that image?

23 A: Yeah. So, the -- the drainage system in here
24 is you know, going up here to Fishburne and
25 Hagood. Runs along Hagood Avenue and then it



1 -- then it doglegs down back towards Lockwood.

2 Q: Okay. Okay.

3 A: Another -- another public benefit is by
4 managing the flood waters, you can see vehicles
5 there as the -- the city had stated that they
6 wanted to make sure that roads are good for
7 transportation. Also, for emergency response
8 vehicles as the police station is right nearby.

9 Q: Okay. As -- as far as one of the public
10 benefits you had mentioned, that the eroding
11 landfill be permanently capped as a result of
12 this project. What public benefit would come
13 as result of that?

14 A: By reestablishing the cap on the eroding
15 landfill, again, it's been documented to the
16 Department that through surface samples,
17 there's potential hazardous contaminants that
18 is leaching out from the landfill. And that
19 not only getting into the environment by waters
20 going from Gadsden Creek to the Ashley River,
21 but also on sunny day flooding events coming up
22 over into the roads, as we just saw on that
23 picture. Potentially exposing the public to
24 those hazardous contaminants.

25 Q: Okay. Will there -- will there be -- and is



1 one of the considerations that -- for public
2 benefit, did the Department consider the
3 proposal as having enhanced stormwater storage
4 capacity?

5 A: Yes. As far as the project, the -- from what
6 we heard earlier today as well, the applicant
7 is going to implement a stormwater management
8 plan that creates essentially three outfalls to
9 manage the flood waters, which would help
10 alleviate, eliminate sunny day flooding as well
11 as manage those flood waters at kind of Hagood,
12 Fishburne area that come from offsite from --
13 from storm events.

14 Q: Okay. And that -- and you heard what Mr.
15 Karkowski said about -- about connecting the
16 existing Gadsden Green and Ashton Street
17 drainage systems to this Spring-Fishburne deep
18 tunnel system?

19 A: Yes.

20 Q: Okay. And -- and was that a consideration that
21 the Department made?

22 A: Yes.

23 Q: Okay. You had mentioned some of the -- I'd
24 call them non-quality of life benefits. You
25 mentioned, the -- the TIF. Is there -- are



1 there any other things that are more economic,
2 I -- I -- that the Department considered as far
3 as the public benefit. You -- you mentioned
4 the TIF. I -- I'm sorry. You didn't you
5 mention the -- the 7 million dollar ---

6 A: Yes. I mentioned the 7 million dollars.
7 That's being contributed to the affordable
8 workhousing.

9 Q: Okay. Okay. Did you cover all of the non-
10 quality of life improvements or public
11 benefits, I -- in your answer? I just want to
12 give you a chance to -- to flesh out the
13 Department's consideration of that.

14 A: Yes. We spoke about addressing the potential
15 contamination from the existing landfill that's
16 -- that's seeping, as well as addressing the
17 flooding through the -- this project.

18 Q: Okay. All right. So -- so, that was the first
19 of the three considerations for the project
20 standards under 30-12(g). The second one is
21 the issue of water dependency. And I'd like to
22 talk to you about that requirement under 30-
23 12(g)(2)(b). This regulation says that the
24 dredging and filling in the wetland area should
25 be undertaken only if it's actively -- is it --



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1 if that activity is water dependent. In
2 determining whether the WestEdge project was or
3 was not water dependent, did DHEC apply that
4 definition of water dependence found in the
5 regulatory definitions section of our regs?

6 A: Yes.

7 Q: Okay. And that regulation, which is 30-1-D(53)
8 defines water dependence as a facility which
9 can demonstrate the dependence on use of or
10 access to coastal waters as essential to the
11 functioning of its primary activity. That --
12 that's correct?

13 A: Yes.

14 Q: Okay. So, did DHEC determine that the WestEdge
15 product -- project was not water dependent per
16 that regulatory definition?

17 A: Yes. We determined that it was not water
18 dependent?

19 Q: Okay. So, is the non-water dependent status of
20 this project the end of the Department's
21 analysis in determining whether or not the
22 permit is issued?

23 A: No.

24 Q: Okay. And can -- and why -- what -- what do
25 you do next in making the permitting decision?



1 What do you consider next, what regulation?

2 A: Yeah. Well, can we go back down please?

3 Q: Yeah.

4 A: Before we get there and understanding how you
5 transition from 30-12-G to 30-12-M, in looking
6 at -- that we determine that it's non-water
7 dependent, we -- we're going back and we're --
8 we're looking at the language under 30-12(b).
9 There is an exception that directs you to look
10 at the non-water dependent provisions. It's
11 basically, it says under 30-12-G(1), that there
12 are cases, however, where such unavoidable
13 environmental effects are justified if
14 legitimate public needs are to be met.

15 Q: Okay.

16 A: And in looking that, then since it's non-water
17 dependent, we go to the non-water dependent
18 provisions, specific project standards, which
19 is under 30-12-M.

20 Q: Okay. So -- so, then what was the -- what the
21 application of 30-12-M in making the permitting
22 decision?

23 A: So, this project, again, it's -- it's a multi-
24 use project that calls for the reestablishment
25 of a cap on a settling and eroding landfill.



1 And that -- that uses fill to reestablish that
2 cap. And so, in looking at the non-water
3 dependent structures, there's a three-prong
4 test as to whether or not that we can allow that
5 non-water dependent structure. And so, that
6 test is that there's significant environmental
7 impact, there's an overriding public need that
8 can be demonstrated and that there's no feasible
9 alternatives that exist.

10 Q: Okay. And before we get to that three-prong
11 test for non-water dependent structures under
12 30-12-M, I want to ask you about that language
13 above that that says, quote, otherwise placed
14 in or over tidelands and coastal water critical
15 areas. Will the non-water dependent structures
16 associated with this permit be, to use that,
17 placed in or over tidelands and coastal waters
18 critical areas? Will -- will ---

19 A: What was the question?

20 Q: Will the -- the non-water dependent structure
21 associated with this permit be placed in or
22 over tidelands and coastal water critical
23 areas?

24 A: Yes.

25 Q: Okay. And what -- what structure is that that



1 you're referring to?

2 A: The structure that I'm referring is the fill,
3 which is the environmental cap -- to
4 reestablish that environmental cap on the
5 eroding, settling landfill.

6 Q: Okay. So -- and I think I -- it's obvious, but
7 just so that's it not me talking, but it's you.
8 So, you view the fill serving as the cap for
9 the eroding landfill as the structure that the
10 ---

11 A: Yes.

12 Q: --- reg is talking about?

13 A: Yes.

14 Q: Okay. If the tidelands are being filled as
15 part of the WestEdge project, is it fair and
16 accurate to say that the critical area will no
17 longer exist?

18 A: Yes.

19 Q: Then how can the proposed vertical structures
20 that are associated with this project be placed
21 in or over tidelands in coastal water critical
22 areas that are filled or no longer exist?

23 A: They wouldn't be.

24 Q: Okay. And so -- so, what is the -- what is the
25 -- why do you answer that way?



1 A: Well, I mean, the fill that's being put in
2 there is -- is primarily being placed in there
3 to re- -- to reestablish the cap for the
4 landfill. This is an eroding, settling
5 landfill and so, as part of this mixed use
6 development, the city has demonstrated that
7 they want to address this -- this environmental
8 issue of an eroding landfill. That's, again,
9 leaching potential contaminant -- hazardous
10 contaminants as well as addressing a flooding
11 issue. And the -- and the information that we
12 read and reviewed this fill is serving as the
13 environmental cap would pretty much provide a
14 solution for that.

15 Q: Okay. Now, as part of Mr. Cunningham's
16 argument to this Court that 30-12-M does not
17 apply, he's pointed out that this regulation
18 does not contain the word dredge or fill. Does
19 the absence of these two words impact the
20 applicability of 30-12-M to this permitting
21 decision?

22 A: No.

23 Q: Okay. And -- and why do you say no?

24 A: The non-water dependent structure, especially
25 where they list out such, like for ex- --



1 example, 30-12-M, non-water dependent
2 structures including building, houses or
3 offices that float shall be prohibited. So, it
4 uses the word including. It's not an all
5 comprehensive list. And an example with that
6 be -- would be like a -- like a road that's
7 being, that's fill. That's filling the
8 tidelands critical area. That is -- is a -- is
9 a structure. And so, but that's not
10 encompassed here under non-water dependent
11 structures. So, it's -- it's not all
12 encompassing list and going back to the --
13 their dredging a fill -- filling regulation.
14 It talks about otherwise if there's -- could
15 you go back to that again, please? It's say
16 there are cases, however, where such
17 unavoidable environmental effects are justified
18 if legitimate public needs are to met. And
19 this fill serving as an environmental cap, I
20 believe this would be a pretty good case as to
21 why there unavoidable environmental effects
22 that are justified based on the demonstration
23 by the applicant that they are addressing and
24 environmental -- a potential environmental
25 impact, not only to the environment, to the --



1 to the public health. But also the flooding,
2 which will address a significant issue for the
3 public.

4 Q: Okay. I'd like to ---

5 **MR. CHURDAR:** Can you back to ---

6 **THE COURT:** Can I stop you here? If -- if the state
7 of South Carolina was building a roadway, what
8 provision would you use to determine if they
9 could build a roadway through the wetlands?

10 A: That's a great question. Historically, we use
11 30- -- the transportation provision.

12 **THE COURT:** Right. So, this would be separate.
13 Okay.

14 A: Yes, sir.

15 **MR. CHURDAR:** So -- can you back to M.

16 Q: So, I'd like to go through those three criteria
17 with you under 30-12-M(2). The first prong of
18 the -- that three-prong test for non-water
19 dependent structures or status under 30-12-M(2)
20 is not significant environmental impact. Did
21 WestEdge satisfy this requirement?

22 A: Yes.

23 Q: Okay. And -- and can you elaborate on what you
24 -- the basis that you determine that there was
25 no significant enviro- -- environmental impact?



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1 A: Yes. And you know, again, this -- this wasn't
2 an easy decision for the Department, but in
3 evaluating this, it's -- we're looking at the
4 potential harm as it relates to -- again, this
5 is a very unique situation where you have a
6 drainage system that was man-manipulated, more
7 than once. And it's -- and it was originally
8 a perimeter dike for the landfill. This
9 landfill is not eroding and -- and seeping
10 different types ---

11 **THE COURT:** You said it was originally a perimeter
12 dike?

13 A: A ditch. I'm sorry.

14 **THE COURT:** A ditch.

15 A: Perimeter ditch.

16 **THE COURT:** Okay.

17 A: Yes, sir.

18 **THE COURT:** All right.

19 A: And so, not only is this system, I guess,
20 acting as a conveyance to transport potential
21 harmful contaminants into the public and the
22 community through flood waters, but it's also
23 taking out into the water. But also, the ---

24 **THE COURT:** When you say take it out to the water,
25 you mean Ashley ---



1 A: Ashley River. Yes, sir.

2 **THE COURT:** All right.

3 A: And then, the system itself, as I understand it
4 and through testimony today, that it's lost its
5 capacity to manage tidal water at high or
6 higher tides. And so, in looking at no
7 significant environmental impact, the -- in
8 weighing the -- addressing those environmental
9 issues versus filling this system, which is a
10 -- a manmade system. Although it has
11 naturalized, it's a manmade system. And -- and
12 putting conditions on the permit which restrict
13 the fill to months of lower biological
14 activity, we felt like the -- the -- the impact
15 has been minimized and it -- it's a great
16 benefit to address the leaching and the
17 potential contaminants exposure to the public
18 and the flooding versus the filling of the
19 wetland.

20 Q: And the -- the contaminant that you're talking
21 about, and the leaching, did -- what -- what
22 document did the applicant provide that you
23 took into account in -- in drawing that
24 conclusion?

25 A: There was a sampling that was done along the



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1 drainage system in Gadsden Creek. In two
2 different instances. One by Terracon, I think
3 they -- they coordinated with a company called
4 Shealy Environmental. And then more recently,
5 it was a report that was conducted by GEL
6 Engineering.

7 Q: Okay. Now, as far as -- as far as that first
8 prong, the no significant environmental impact
9 -- never mind. I think you've already -- you've
10 already covered what I was just about to ask
11 you. Okay. So, let's move onto the second
12 prong of that three-prong test, the overriding
13 public need can be demonstrated. Did WestEdge
14 satisfy this requirement?

15 A: Yes.

16 Q: And -- and can you please expand on how -- how
17 you drew that conclusion?

18 A: Yeah. This kind of goes hand in hand with the
19 balance -- balancing decision as it relates to
20 environmental impact. But in addressing the
21 flooding issue, both tidal flooding, as well as
22 -- as a storm event flooding, and the -- the
23 potential exposure of contaminants to the
24 public by filling this drainage system and
25 addressing the settling and eroding, a cap --



1 by reestablishing that cap with this fill, that
2 you know, directly a public benefit is being
3 provided in addressing those two issues. And
4 then in addition to that, indirectly, again as
5 we talked about the TIF that is being
6 established to help fund infrastructure
7 projects, roadway projects, and such, and also
8 providing funding for schools, as well as the
9 donation of over 7 million dollars or -- or
10 donation up to 7 million dollars to affordable
11 workhousing, there's a public benefit there.
12 And then, while addressing the flooding issues
13 and stuff, it -- it alleviates a lot of the
14 burdening on the traffic moving in and out of
15 the area, as well as mer- -- emergency response
16 personnel.

17 Q: Okay. And -- and the -- the traffic in that
18 area, are you talking about the -- the flooding
19 impacting the -- the citizens that lived in
20 Gadsden Green community be able ---

21 A: Yes.

22 Q: --- get to their homes? Okay. And -- and you
23 talked about emergency responses. Is that --
24 are you referring to the fact that the police
25 department is right around this area where the



1 -- the sunny day -- all the flooding occurs?

2 A: Yes.

3 Q: Okay. All right. The third of the three-prong
4 test for non-water dependent status under 30-
5 12-M(2) is no feasible alternatives exist. Did
6 WestEdge satisfy this requirement?

7 A: Yes.

8 Q: Okay. And what -- what did they -- just
9 broadly speaking, and then we'll get into
10 details of each of the three options, but what
11 did -- what did they present to the Department
12 in their feasible alternatives proposals?

13 A: Originally, it was a off -- two offsite
14 alternative analysis, as well as an onsite al-
15 -- I mean, I'm sorry -- no action alternative.
16 And then we got -- well, the information was
17 supplemented as it relates to onsite
18 alternative analysis.

19 Q: Okay. And again, before -- before we get into
20 the details of each one of those alternatives,
21 who sets the success criteria for a development
22 project?

23 A: The applicant does.

24 Q: Okay. And what were some of the success
25 criteria that they established for a successful



1 project for this particular project?

2 A: So, again, it goes back to the project purpose
3 and there -- there was a concept of live, work,
4 play, community and the -- the project purposes
5 to -- to develop -- have a multi-use
6 development which enhanced the medical
7 district, but also provided economic stability
8 for the area. And that improved the city's
9 neighborhoods and the community, and the
10 surrounding and -- area providing that public
11 benefit.

12 Q: Okay. And -- and do you -- do you recall off
13 the top of your head what the geographic
14 proximity was, the outer limits of the
15 geographic proximity of the project to MUSC in
16 order for it to be a -- a successful project?

17 A: Yeah. I believe it had been within three
18 miles.

19 Q: Okay. Okay. So, let -- let's go through each
20 one of the alternatives that -- that were
21 presented and the Department looked at in
22 making this decision. The first one is the
23 Laurel Island site located by the Ravenel
24 Bridge, adjacent to Town Creek. Can you tell
25 the Court what -- what your analysis was or



1 what -- when you read it, what your agreement
2 was with regard to whether this is feasible or
3 not feasible?

4 A: You know, I'm looking at the Laurel Island
5 site, the applicant demonstrated the -- the --
6 it met the location and size criteria. But
7 there's other criteria, such as property
8 availability that it did not meet. And I think
9 it was conformity to the land use. Use of
10 accessibility and proximity to -- I think
11 that's all I recall right now.

12 Q: Okay. And -- and what was -- do you recall
13 what the -- as to whether or not the Laurel
14 Island site would meet the requirement to
15 enhance the medical district and the medical
16 university?

17 A: It did not.

18 Q: Okay. So, I think of all the things that
19 you've said and correct me if my summary is
20 wrong, that -- that the Laurel Island site only
21 met the location and the size criteria?

22 A: That's correct.

23 Q: Okay. The second non-feasible alternative that
24 was presented to the Department was the state
25 port's authority site at Union Pier Terminal in



1 Charleston. Can you talk a little bit about
2 that site and -- and why you accepted -- why
3 the Department accepted the port's at the state
4 port's authority site is a non-feasible
5 alternative as well.

6 A: Yeah. So again, the Union Pier down at the
7 sports ter- -- at the -- at the port's
8 terminal, the site one I believe was
9 unavailable. It did meet the size and the
10 location criteria. However, it ---

11 Q: And I think -- did -- did it meet the
12 geographic proximity to MUSC criteria?

13 A: Yes.

14 Q: Okay. And other -- other than that, did the
15 port's authority side at Union Pier terminal
16 satisfy the other criteria for a successful
17 development?

18 A: Say that again.

19 Q: Okay. So -- well, it -- it's close enough.

20 A: Right.

21 Q: It -- it's 1.1 miles from MUSC.

22 A: Right.

23 Q: So, it satisfies that. And you had -- you had
24 said that it did not satisfy the -- the -- the
25 other -- well, I -- I don't want to put words



1 in your mouth, but I think that you had said it
2 did not satisfy the other criteria that they
3 had said this would -- this is what we need to
4 have a successful project.

5 A: That's correct.

6 Q: Okay. The non-feasible alternative number 3
7 was a no action alternative. And can you just
8 explain to the Court what a no action
9 alternative would be?

10 A: A no action alternative is just simply not to
11 do anything with the site and let the site stay
12 the way it is. And the -- and so, with the
13 site just stays the way it is, there's no
14 opportunity to provide a public benefit. And
15 that was another criteria in each one of the
16 criteria set forth by the applicant, if they
17 want it to have a project that provided a
18 public benefit, the -- the two site we just
19 described didn't have the opportunity to that.
20 And I think another think was cost. It would
21 be costly as a way -- as it relates to
22 acquiring a property, whereas the -- the
23 property that they -- WestEdge, they currently
24 have ownership. But -- say that again.

25 Q: Well, I think -- I guess what -- what -- and --



1 and you -- you -- what -- what I -- what I'm
2 hearing is that the -- with the no action
3 alternative, these -- these stormwater
4 measures, that the flooding issues, they --
5 they just with ---

6 A: Right.

7 Q: --- no action, nothing would be done.

8 A: Right. So, on a no action, nothing would be
9 done. The site would sit the way it is. There
10 still would be potential exposure or hazardous
11 contami- -- contaminants to the public. The
12 flooding issue would not be addressed.

13 Q: All right. So, going hand in hand with the
14 critical area permit, the Department also
15 issued a coastal zone or OCRM at least, issued
16 a coastal zone consistency certification. Can
17 you please explain what a -- CZC is the
18 shorthand -- CZC certification is in relation
19 to a critical area permit?

20 A: Yes. So, under the Coastal Tidelands and
21 Wetlands Act, we have direct permitting
22 authority and indirect permitting authority.
23 Under our direct permitting authority, we
24 evaluate all projects that alter coastal
25 tidelands, coastal waters, beaches and beach



1 dune systems. Under the Coastal Zone
2 Management Program document and that's our
3 indirect permitting authority, that charges us
4 with certifying all state and federal permits
5 consistent with that program document. And
6 again, this project, it not only had a critical
7 area permit issues, obviously, but it also had
8 the associated coastal zone consistency
9 certification.

10 Q: And did the Department -- the Department issued
11 a CZC certification with the critical area
12 permit for this ---

13 A: Yes.

14 Q: --- case? Okay.

15 **MR. CHURDAR:** Can you -- can you ...

16 Q: In making the CZC certification decision, did
17 DHEC determine whether the WestEdge project was
18 consistent with the commercial development
19 policies of the program document as part of
20 that CZC certification?

21 A: Yes.

22 Q: Okay. How did the Department find this project
23 to be consistent with those policies?

24 A: Similar to the dredging and filling
25 regulations, under the policies for commercial



1 development, there's two sections. Could you
2 scroll up a little bit?

3 **MS. POOLE:** I'm going to the wrong way.

4 **A:** So, this states, in the coastal zone council
5 review and certification of a permit
6 application, commercial buildings will be based
7 on the following policies. And that's talking
8 about the coastal zone. That's the eight
9 coastal counties. And what's highlighted here,
10 it talks about commercial par- -- proposals,
11 which require fill or other permit alteration
12 of salt, brackish or fresh water wetlands will
13 be denied unless no feasible alternative exist
14 and the facility is water dependent. If you
15 scroll on down again, this -- this requires
16 kind of similar to the dredging and filling,
17 that it must -- there's no feasible alter- --
18 alternatives and that the facility is water
19 dependent.

20 **MR. CHURDAR:** Go on down.

21 **A:** And if you scroll down further in that same
22 section under section 2 of commercial
23 development policies, it talks about specific
24 activities in the critical areas of the coastal
25 zone. And the policy of that is that -- it



1 states, non-water dependent structure such as.
2 Again, it's not all -- it's not a comprehensive
3 list. As parking garages, apartments,
4 restaurants, shops have built in the past on
5 pilings over wetlands, such construction
6 presents unnecessary encroachment on aquatic
7 ecosystem and shading out underlying
8 vegetation. Non-water dependent structures
9 shall be discouraged from being sited over
10 and/or wetland areas. Then it goes on to say
11 and provides an exception for those activities
12 in the critical areas of the coastal zone for
13 non-water dependent structures and states, only
14 when public need is demonstrated and no
15 feasible alternative sites are available should
16 consideration be given towards approval of the
17 proposed structure and sites the critical are
18 permitting regulations are 30-12-M. And so,
19 that takes us back to the higher regulatory
20 test under 30-12-M on that three-prong test.

21 Q: And -- and so -- and ---

22 **MR. CHURDAR:** Janet, go back up to -- to one. Right
23 -- well, before you do, right there it says
24 under 2, in the critical area of the coastal
25 zone, and then scroll back up. And -- and ---



1 **MS. POOLE:** Tell me when to stop.

2 **MR. CHURDAR:** Under 1, it just says, in the coastal
3 zone.

4 **Q:** And -- and just so I'm understanding. That
5 distinction that 1 and 2 have between each
6 other, in order to -- to fall under 2, there is
7 a higher standard, is that what you're saying?

8 **A:** Yes. I mean, it -- it -- the -- number 1 calls
9 out the coastal zone and talks about no
10 alternatives and water dependent. And then,
11 under 2, it's very specific, just don't speak
12 to critical areas of the coastal zone and
13 provide that exception for non-water dependent
14 structures under 30-12-M.

15 **Q:** Okay. Now, underlined right there in red under
16 1-B is water dependent. Is the CMP glossary
17 definition of water dependent, which DHEC
18 applied in its CZC certification decision, is
19 that consistent with the water dependent
20 definition in the critical area regs that we
21 talked about earlier?

22 **A:** Yes.

23 **Q:** Okay. And so ---

24 **THE COURT:** What page is that on?

25 **MR. CHURDAR:** It -- you can -- you can flip that --



1 can you put the definition up there?

2 **THE COURT:** I you don't know right off, I'll find
3 it.

4 **MR. CUNNINGHAM:** It's in the glossary.

5 **MS. POOLE:** It's in the glossary.

6 **THE COURT:** Oh, it's in the glossary.

7 A: Yes.

8 **MR. CHURDAR:** She'll -- she's putting it up right
9 there. So, just scroll down. Keep going.
10 Keep going. Right there.

11 Q: And that the same language as the reg?

12 A: Yes.

13 Q: Okay. So, and I can't remember if I -- if I
14 just asked you this or not, but so -- so DHEC
15 concluded that the project was non-water
16 dependent -- no. I did already ask you that.
17 Scratch that. Now, the Petitioner asserts that
18 the CZC certification was improperly issued
19 because the WestEdge project fails to comply
20 with the water dependent requirement of the
21 CMP's commercial development policies, and so
22 the fill and expl- -- excavation of the
23 tidelands is prohibited. You -- you may have
24 touched on this to the extent that you are --
25 are complete, but do you have any other



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1 response to that assertion that you've not
2 already given?

3 A: No. Again, I -- I think it's pretty clear that
4 it allows for that exception once those -- that
5 that higher test under 30-12-M has been met.

6 Q: Okay. Now, I'd also like to ask you about the
7 petitioner's assertion that DHEC relied on CMP-
8 3-C-342-A to find that the proposed project was
9 consistent with the commercial policies,
10 including 1-B that's cited above. And
11 particularly -- and we've talked about this a
12 little bit, but the Petitioner asserts in -- in
13 their summary -- in sum- -- their summary
14 judgement motion that this practice is contrary
15 to the plain language, not only of 1-B, which
16 restricts wetland filler alterations through
17 the coastal zone, but is also contrary to the
18 plain language of 2-A, which like 30-12-M is
19 designed to limit the situations in which com-
20 -- commercial development may be located in or
21 over wetlands. So, do you have any additional
22 response beyond what you've already given to
23 that question?

24 A: No.

25 Q: Okay. Finally, the Petitioner asserts that the



1 CZC certification was improperly issued because
2 the Department failed to consider CMP-3-C-3-7.
3 That's the -- which that requires an analysis
4 of the possible long range cumulative effects
5 of the project when reviewed in the context of
6 other possible development and the general
7 character of the area. And what is your
8 response to that?

9 A: I would -- I would say that this is a very
10 unique project. That it has very specific
11 characteristics to it being that the request to
12 reestablish a cap -- an environmental cap to
13 this settling and eroding landfill. That this
14 system is completely surrounded by a ro- --
15 public infrastructure, roads, development. And
16 that in addressing an environmental harm to
17 allow for this fill and -- and -- and the
18 applicant is able to pay for most of that or --
19 or contribute to that by doing a development
20 that the specific characteristics of this
21 particular project in this particular area,
22 that it's unrepeatable in the future.

23 Q: Okay.

24 A: It would be highly unlikely that something like
25 this would be permissible, unless it's meets



1 the same exact characteristics that we're
2 discussing today.

3 Q: Okay. Okay.

4 A: And the development itself is in keeping with
5 the general character of the area.

6 Q: Okay.

7 **MR. CHURDAR:** I have no further questions.

8 **THE COURT:** Ms. Shahid.

9 **MS. SHAHID:** Yes.

10 **MR. CHURDAR:** I'll give you that back.

11 **MR. WILLIAMS - CROSS-EXAMINATION BY MS. SHAHID:**

12 Q: Good afternoon, Mr. Williams.

13 A: Good afternoon.

14 Q: Just a few questions. You talked about your
15 knowledge of a 1971 permit that the Corps of
16 Engineers issued to the city of Charleston
17 related to the landfill. It -- was it your
18 testimony that that permit required capping of
19 the landfill?

20 A: My understanding is yes.

21 Q: Okay. And have you seen a copy of that permit?

22 A: Yes. I've seen it.

23 Q: Okay. Do you recall language in the Corps
24 permit requiring a two foot cap over the
25 landfill?



1 A: Yes, ma'am.

2 Q: Okay. And do you agree with representations
3 made in this courtroom by other witnesses that
4 that cap has eroded?

5 A: Yes, ma'am.

6 Q: Okay. And would you call the degree of erosion
7 significant based on the areas of erosion?

8 A: I would -- I would say that's it eroded enough
9 to where there's seepage of -- of -- of
10 hazardous materials.

11 Q: Okay. And you mentioned ---

12 **THE COURT:** Well, is that significant or not?

13 A: Yeah. I mean, I -- I would that that is
14 because it -- it presents a -- a potent- -- a
15 pretty real potential harm to the public.

16 Q: Thank you. And you mentioned on site
17 alternatives. And an evaluation of
18 alternatives would require an -- an evaluation
19 of the project purpose, correct?

20 A: Yes, ma'am.

21 Q: Okay. And I imagine you've seen the permit
22 application that Terracon submitted to the
23 Department, correct?

24 A: Yes, ma'am.

25 Q: And you've reviewed that application?



1 A: Yes, ma'am.

2 Q: And do you recall in describing the project
3 purpose that Terracon and WestEdge set out some
4 guiding principles?

5 A: Yes, ma'am.

6 Q: Okay. One of those principles was that they
7 needed to create sort of an innovation hub or
8 research center because that would enhance
9 their tie to the Medical University, do you
10 recall that?

11 A: Yes, ma'am.

12 Q: Okay. And one of those principles was that
13 they needed to create facilities, residences,
14 restaurants, shops, etcetera because that would
15 draw people into the area supporting the
16 Medical Universities, being medical students,
17 doctors and researchers?

18 A: Yes, ma'am.

19 Q: They needed to create an attractive place for
20 people. And one of those principles was to
21 address the insufficiency of the existing
22 infrastructure, do you recall that?

23 A: Yes, ma'am.

24 Q: And based on the testimony that we've had in
25 that courtroom, what we understand to be



1 insufficient infrastructure is the existing
2 drainage system, correct?

3 A: Yes, ma'am.

4 Q: And you don't have any -- you would agree that
5 that is an area subject to significant tidal
6 flooding?

7 A: Yes, ma'am.

8 Q: Okay. And you mentioned the police station
9 being nearby. That -- you're talking about the
10 City of Charleston police station?

11 A: Yes, ma'am.

12 Q: With the -- where all the police cars are
13 parked.

14 A: Yes, ma'am.

15 Q: And where the police are located when they're
16 contacted.

17 A: Yes, ma'am.

18 Q: Okay. And why was that notable for you?

19 A: Well, in the -- you know, some of the
20 documentation we looked at, one of the -- the
21 justifications and -- and being -- having a
22 public benefit is to alleviate flooding in the
23 roadway system, so that emergency personnel has
24 the ability to respond without any type of
25 interference from flood waters.



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1 Q: Okay. And does -- do the ten general
2 considerations set forth in 48-39-150 require
3 you to consider historical -- historic and
4 cultural aspects of a project?

5 A: Yes, ma'am.

6 Q: Okay. And is your consultation based on -- is
7 -- is your review based on consulting with the
8 State Historic Preservation Officer and
9 Archives and History?

10 A: Yes, ma'am. And -- and typically, the State
11 Historic Perseveration Office will submit
12 comments to us as it relates to the -- the --
13 any permit application.

14 Q: Okay. Was there any concern expressed by the
15 SHPO regarding this project?

16 A: No, ma'am.

17 Q: Okay. And who is Robert Hodges?

18 A: Robert Hodges is a coworker in our Bureau Land
19 Waste Management Program in -- in DHEC.

20 Q: What type of work does he do?

21 A: He manages the Brownsfield section.

22 Q: Okay. And the Brownsfield section is the
23 section that reviews con- -- contaminated
24 property to see if it qualifies for a VCC,
25 Voluntary Clean-up Contract?



1 A: Yes, ma'am.

2 Q: Okay. And based on your knowledge of Robert
3 Hodges' function within the Department, is he
4 familiar with contaminants at our site, the
5 WestEdge site? Is he familiar with the site?

6 A: Yes, ma'am.

7 Q: Okay. And you consulted with him in issuing
8 this permit, correct?

9 A: Yes, ma'am.

10 Q: Okay. And did he agree with you that the
11 permit should be issued?

12 A: Yes, ma'am. He agreed that the environmental
13 cap ought to be reestablished.

14 Q: Okay. The judge was asking you about if
15 somebody wanted to build a road through
16 critical area, you -- you explained that was a
17 different regulation. But isn't it true that
18 that portion of our 30-12 also requires some
19 kind of feasible alternative analysis to show
20 ---

21 **MR. CUNNINGHAM:** Objection.

22 Q: --- that critical area can't -- I'm sorry.

23 **MR. CUNNINGHAM:** Sorry. Objection. Leading. I
24 just wanted to stop you in case you got
25 through. Isn't it true that?



1 **MS. SHAHID:** Am I cross-examining?

2 **THE COURT:** Well ---

3 **MR. CUNNINGHAM:** You're not adverse.

4 **MS. SHAHID:** Well, I'm still cross-examining.

5 **THE COURT:** Yeah. She's ---

6 **MR. CUNNINGHAM:** Okay. Well.

7 **THE COURT:** It's not a witness called by her.

8 **MR. CUNNINGHAM:** Yeah. Well, okay. Sorry.

9 **MS. SHAHID:** It's okay.

10 Q: 30 -- 30-12 has its own section governing
11 transportation regs, correct?

12 A: Yes, ma'am.

13 Q: And it also requires a demonstration, even for
14 a road project that the only way you can get
15 there is through the critical area. You've got
16 to use the -- it's got to be -- you've got to
17 avoid critical area to the maximum extent
18 feasible, is that an accurate statement?

19 A: That's -- that's accurate. It al- -- also goes
20 -- it does go through a feasible alternative
21 analysis and also, in determining whether you
22 know, even -- even looking at -- at bridging
23 rather than filling. So, we go through that --
24 that analysis that is similar.

25 Q: Okay. And there were certain sites identified



1 in the alternatives analysis that were on the
2 peninsula and potentially had some acreage,
3 enough acreage to satisfy the project. The
4 Laurel Island site and maybe the Union Pier
5 terminal site.

6 A: Yes, ma'am.

7 Q: Okay. And if the site is not available for
8 sale, is it an alternative?

9 A: No, ma'am.

10 Q: Okay. And it was your understanding the Laurel
11 Island site is not available for sale?

12 A: Yes, ma'am.

13 Q: Okay. Do you also have understanding that the
14 SPA has sold or is in the process of selling
15 the Union Pier's terminal site to a developer?

16 A: Yes, ma'am.

17 Q: And if that's the case, that site wouldn't be
18 available, correct?

19 A: Yes, ma'am.

20 Q: And basically, what you've clarified in your
21 examination regarding the coastal zone program
22 document is that your authority is twofold.
23 You've got direct perming -- permitting
24 authority in the critical area and outside the
25 critical area, you have review authority to



1 which you applied policies to issue coastal
2 zone consistency certifications.

3 A: Yes, ma'am.

4 Q: But your per- -- your -- your regulations, your
5 critical area regulations only govern in the
6 critical area?

7 A: Yes, ma'am.

8 Q: Okay. And those regulations trump your coastal
9 zone consistency policies when you're in the
10 critical area?

11 A: As it's laid out under the commercial
12 development policies, as is we explained under
13 one and two. Yes.

14 Q: Okay. I've got a document to show you. See if
15 you recognize this document because I'm not
16 sure I saw it when I combed through your agency
17 file.

18 A: Okay.

19 Q: Okay. And I've marked that WestEdge Exhibit 7.
20 Do you recognize that?

21 **MR. CUNNINGHAM:** What page are you ---

22 A: I believe it says 9.

23 Q: Okay.

24 **MR. CUNNINGHAM:** Can I see that? Where ---

25 **MS. SHAHID:** Oh, I'm sorry.



1 A: It's 9.

2 **MS. SHAHID:** I thought -- yeah. I'm sorry. It's
3 WestEdge 9. It's the Mayor's letter in our
4 exhibits.

5 **MR. CUNNINGHAM:** 9. Thank you.

6 **MS. SHAHID:** Sorry about that.

7 Q: And this letter is addressed to you and to Ms.
8 Stevens.

9 A: Yes, ma'am.

10 Q: And it's addressed referencing the WestEdge
11 permit application.

12 A: Yes, ma'am.

13 Q: And did you receive this letter as prior to
14 rendering a permit decision?

15 A: Yes, ma'am.

16 Q: Okay. And what was the mayor's position as
17 expressed to you on behalf of the city?

18 **MR. CUNNINGHAM:** Objection. Hearsay.

19 Q: Is -- are -- is this a comment letter ---

20 **THE COURT:** Wait ---

21 **MS. SHAHID:** I'm sorry.

22 **THE COURT:** He objected to hearsay.

23 **MS. SHAHID:** Okay.

24 **THE COURT:** Are you -- you ---

25 **MS. SHAHID:** I was trying, but I ---



1 **THE COURT:** Oh, you -- are you laying the foundation
2 or ---

3 **MS. SHAHID:** I was trying.

4 **THE COURT:** Oh, okay. You can ---

5 **MS. SHAHID:** But -- yeah.

6 Q: You have -- you received public comments ---

7 A: Yes, ma'am.

8 Q: --- regarding projects and you take those into
9 account when you make a permit decision?

10 A: Yes, ma'am.

11 Q: And in this case, you received many public
12 comments, correct?

13 A: Yes, ma'am.

14 Q: And it would be your testimony that you took
15 them into account in arriving at a permit
16 decision.

17 A: Yes, ma'am.

18 Q: And was that also something you took into
19 account, that letter from the City of
20 Charleston?

21 A: Yes. We reviewed the letter.

22 Q: Okay. And did that letter reinforce your
23 conclusion to issue the permit?

24 A: Yeah. I mean, we -- we -- yes, ma'am.

25 Q: Okay. And in that letter, does the Mayor not



1 speak to public benefit?

2 A: Yes.

3 Q: And does that reinforce your conclusion to
4 issue the permit?

5 A: Yes, ma'am.

6 Q: Okay. Thank you.

7 **MS. SHAHID:** I need to offer Exhibit 7 into
8 evidence.

9 **MR. CUNNINGHAM:** I'll object still to hearsay.

10 **MS. SHAHID:** I mean, 9. 9.

11 **MR. CUNNINGHAM:** And it's offered for the truth.

12 **THE COURT:** Yeah. Well, are you offering for the
13 truth.

14 **MS. SHAHID:** No. He took into consideration making
15 his decision.

16 **THE COURT:** Yeah. I'm going to let it in only for
17 that which he considered, but not for the truth
18 of the matter asserted. But I mean, I don't
19 know if there's any truth of the matter
20 asserted ---

21 **MR. CUNNINGHAM:** Well, I think the truth is ---

22 **THE COURT:** --- in there ---

23 **MR. CUNNINGHAM:** --- this is the statements the
24 Mayor made and he is taking them to account as
25 truthful statements is our problem, Judge.



1 It's not just the Mayor made a statement. It's
2 these statements ---

3 **THE COURT:** Well, I haven't ---

4 **MR. CUNNINGHAM:** --- that he made.

5 **THE COURT:** --- read it. Did he say -- if he said
6 there is a public benefit.

7 **MR. CUNNINGHAM:** Yeah.

8 **THE COURT:** I will not take that to the truth of the
9 matter asserted. I will only take that for the
10 fact that he made that statement and for
11 verification of what the Department considered
12 in reviewing that.

13 **MS. SHAHID:** That's fine, Your Honor.

14 **THE COURT:** Well, I figured you say that.

15 **MS. SHAHID:** That's what I intended.

16 **THE COURT:** What do you say to that?

17 **MR. CUNNINGHAM:** I -- I'd stand on my objection, but
18 I understand ---

19 **THE COURT:** Okay.

20 **MR. CUNNINGHAM:** --- Your Honor's ruling.

21 **THE COURT:** Well, I overrule it and I allow it in.

22 **(Respondent's Exhibit Number 9 was admitted into**
23 **evidence.)**

24 **MS. SHAHID:** Thank you.

25 **THE COURT:** You're welcome. I overrule your



1 objection under my caveat, so -- and let it in.

2 **MS. SHAHID:** Just got to go through my documents,
3 Your Honor.

4 Q: Mr. Williams, what is a response to request for
5 final review?

6 A: That is -- when we issue permit decisions, all
7 of our permit decision are appealable and in
8 the process, there's a -- the -- anyone who
9 feels like they've been affected by the
10 Department's decision can appeal it and it's by
11 way of a request review before our board at
12 DHEC. And so, that -- they have to submit a
13 written filing, which is that request for
14 review with a fee in order to challenge staffs
15 permitting decision.

16 Q: Okay. And I'm going to show you WestEdge's 27.
17 Did you have a role in the drafting and -- and
18 transmittal of the request for final review
19 responding to these Friends of Gadsden Creek's
20 request for board review?

21 A: Yes, ma'am.

22 Q: Okay. And does this appear to be that
23 document, WestEdge 27?

24 A: Yes, ma'am.

25 Q: Okay. And -- and were you directly involved in



1 the preparation of this document?

2 A: Yes, ma'am.

3 Q: Okay. And does this document reflect your
4 position as you've stated it today with regard
5 to this permit?

6 A: Yes, ma'am.

7 Q: Has anything changed about your position with
8 regard to this permit since this document was
9 drafted in 2021?

10 A: No, ma'am.

11 **MS. SHAHID:** Okay. Your Honor, I would offer
12 Exhibit 27 into evidence?

13 **MR. CUNNINGHAM:** Objection. It's hearsay. It's a
14 litigation document and Mr. Churdar wrote part
15 of it.

16 **MS. SHAHID:** Well, Mr. -- Mr. Williams said he had a
17 role in it, Your Honor and he's ---

18 **THE COURT:** I know he had role in it, Your Honor ---

19 Q: Well, who -- who writes the document?

20 A: The project manager and myself wrote that
21 document.

22 **THE COURT:** This document was written after the
23 decision?

24 **MS. SHAHID:** Yes. It was written in response to the
25 request for board review.



1 **THE COURT:** Well, I -- I sustain that unless you get
2 -- you want to give me a little more
3 information. Right what I hear now is -- I'd
4 have to find the -- there was -- there's case
5 law along -- you know, submitting -- like Mr.
6 Cunningham said, the legal responses in support
7 of your position, courts have inherently said,
8 no.

9 **MS. SHAHID:** Okay. Your Honor, this is a -- a
10 response that they do with every permit
11 challenge. It's required and it's always a
12 part of the agency's record. That doesn't
13 help?

14 **THE COURT:** No.

15 **MS. SHAHID:** Okay. I'll withdraw it, Your Honor.

16 **THE COURT:** Well you don't have to withdraw it, I
17 just don't -- don't agree with you on that.

18 **MS. SHAHID:** Okay. Well, I -- I don't think I have
19 a choice if you don't agree with me.

20 **THE COURT:** Well, you can submit it for offer of
21 proof, but.

22 **MS. SHAHID:** Yeah. That's all right. I can just
23 use to help me examine Mr. Williams.

24 **Q:** And, Mr. Williams, prior to issuing the permit,
25 you reached the conclusion that during flood

