

BEDMINSTER TOWNSHIP  
LAND USE BOARD

IN THE MATTER OF: : TRANSCRIPT  
: :  
CASE: LUB# 12-015 (BOA) :  
KDC Solar SA55 LLC : OF  
Solar Project :  
Country Club Road :  
Block 71.02, Lot 1 : PROCEEDINGS  
Block 62, Lot 10 :  
Block 69, Lot 4 :  
\_\_\_\_\_X

Thursday, February 12, 2015  
Municipal Building  
One Miller Lane  
Bedminster, New Jersey  
Commencing at 7:01 p.m.

BOARD MEMBERS PRESENT:

LANCE BOXER, Chairman  
NICK STRAKHOV  
CAROL GUTTSCHALL  
LOUIS DiGIOVINE  
DORN STEWART  
GEORGE RODELIUS

ALSO PRESENT:

JANINE DeLEONE, Board Secretary  
FRANK BANISCH, Board Planner  
PAUL W. FERRIERO, Board Engineer

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A P P E A R A N C E S:

THOMAS F. COLLINS, JR., ESQ.  
Attorney for the Board

McCARTER & ENGLISH, LLP  
BY: GARY T. HALL, ESQ.  
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Attorney for the Objectors - Stop Somerset Hills  
Power Plant

RICHARD M. SASSO, ESQ.  
Attorney for the Objectors - Steve and Sabina Forbes

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1 (Roll call is taken.)

2 CHAIRMAN BOXER: Good evening. And tonight  
3 we have one applicant which has been part of the plan,  
4 KDC. We'll go through public comments first. Anybody  
5 in the audience that would like to come up and address  
6 the committee that's not related to KDC so this is the  
7 time you can come up and make a statement or ask  
8 questions about anything that's not on the agenda this  
9 week. (No response.)

10 Okay. Seeing none. We'll just go right  
11 to, let's see, pending applications. So we have one,  
12 Mr. Ferriero, Land Use Board 14-015.

13 (The Board discusses other matters.)

14 CHAIRMAN BOXER: All right. So we'll get  
15 right to it. Continuing on hearing LUB 12-015, which  
16 is KDC. Nice to see you, Mr. Hall.

17 MR. HALL: Good evening. Gary Hall for the  
18 applicant, KDC Solar SA55. We have our geotech  
19 engineer to testify tonight.

20 CHAIRMAN BOXER: Okay.

21 MR. SASSO: Mr. Chairman, if I could I  
22 would like to address the Board.

23 CHAIRMAN BOXER: Sure, Mr. Sasso.

24 MR. SASSO: Mr. Chairman, this application  
25 has obviously a lengthy history, but the things I

1 wanted to note tonight before we take on this testimony  
2 is basically a notation that what was agreed to by the  
3 applicant in this case has not been followed. There  
4 was a request by Mr. Hall that I spend money and have  
5 Mr. Forbes pay for the engineer to have a meeting with  
6 Mr. Ferriero, as well as the applicant's engineer. I  
7 have the testimony or the comments in a record of Mr.  
8 Hall saying this is better. This will eliminate all  
9 these questions, hopefully, if the engineers can reach  
10 an agreement.

11 So in the spirit of cooperation I do  
12 something that's unusual for an objector. All right,  
13 we'll pay for the engineer to go and see if we can have  
14 a meeting of the minds in terms of incomplete data.  
15 That was done. There was a request at the same time  
16 that I even produce a written report before the meeting  
17 and provide it to everyone, namely, Mr. Ferriero in  
18 advance. I promised that I would do what the applicant  
19 hasn't done in this case and share it directly with the  
20 applicant's attorney, which I did, and I did what I  
21 said I was going to do.

22 We then come up with, after spending a  
23 substantial sum of money, the report that was filed  
24 with the Board dated January 8, 2015. I just ask that  
25 that be marked for Identification.

1 MR. COLLINS: We'll make  
2 that Identification number 0 -- I don't have a number.

3 (Exhibit OF-3, report dated 1/8/2015, was  
4 received and marked.)

5 MR. SASSO: So OF-3 is the lengthy report  
6 that I provided to everyone, and then we had the  
7 meeting. And after the meeting Mr. Hall noted at one  
8 of our last meetings, look, the engineers all got  
9 together, and they did. And as usual Najarian  
10 Associates went to the meeting fully prepared to agree  
11 upon the testing that was to be done. We have Mr.  
12 Ciliberto who's also here, who's been at most of the  
13 meetings, as well as Vajira Gunawardana, the chief  
14 engineer.

15 They then reach an agreement with the  
16 applicant in front of Mr. Ferriero to what data we all  
17 needed before we again went into this area of  
18 stormwater management, so that we wouldn't continue to  
19 go in circles. They reached that agreement, and time  
20 goes by until this hearing. As the Board knows there  
21 was a prior hearing that was adjourned, et cetera, due  
22 to the weather so we got this new date. I kept  
23 checking and checking with the Board secretary, where  
24 are the new submissions? Where is the new data? Where  
25 is the new -- I don't have anything. I don't have

1 anything. I don't have anything.

2 I have no idea who's going to be produced  
3 here tonight, and I find out yesterday that we have a  
4 geotechnical specialist and the applicant's engineer is  
5 going into stormwater management. And I wonder how  
6 this happened? In other words, my objection, none of  
7 the new data that was agreed to by this applicant has  
8 been provided. None of the testing that everyone on  
9 the Board said, well, we really need high water table,  
10 et cetera, my engineer says you can't design a  
11 stormwater management without knowing what the high  
12 water table is. And we don't have that to this day,  
13 but here I am tonight after spending a lot of money and  
14 I have no additional data, and yet we're going forward  
15 with these witnesses. To say that I was shocked  
16 yesterday would be an understatement. I'm just making  
17 these statements for the record because that's what  
18 your record bears out. And I did what I said I was  
19 going to do, and I spent a lot of money. We identified  
20 the testing and it was never done. Here I am supposed  
21 to cross-examine someone without the data. Thank you.

22 CHAIRMAN BOXER: Mr. Sasso, I appreciate  
23 it.

24 Mr. Hall, do you have a comment? And I'd  
25 like an explanation.

1 MR. HALL: Yeah, well, I disagree with what  
2 he said. There was a meeting, and I know they've met  
3 with -- our engineers have met with Mr. Ferriero. The  
4 geotech information was filed in a report in September,  
5 and then in December it's not that we were surprising  
6 you with information that the reports went to Mr.  
7 Ferriero. I assume Mr. Sasso got a copy. It was  
8 available. And my understanding from the engineer is  
9 that it reached a point where let's just move ahead.  
10 We know Najarian will never be happy with everything.  
11 It was considered.

12 And I'll defer to Mr. Ferriero, he's the  
13 engineer. I mean, if he wants us to do more we'll do  
14 more, but our understanding was that we had addressed  
15 the questions and it was time to move ahead. I mean,  
16 there was no intentional misrepresentation, no sleight  
17 of hand. I mean, I wasn't involved. The engineers  
18 have been dealing with Mr. Ferriero, et cetera, and  
19 this has gone on for a number of months now.

20 CHAIRMAN BOXER: Right.

21 MR. HALL: And certainly if there are any  
22 issues we'll address that, but I think we've provided a  
23 lot of information and a lot of discussion, and I don't  
24 see a problem.

25 CHAIRMAN BOXER: Ms. Donato just got here,

1 and I'm sure they'll have something to say as well, Mr.  
2 Sasso as well. Look, a couple of comments and maybe  
3 Mr. Sasso and Ms. Donato if you have anything further  
4 to say you can come up again.

5           There are four issues here, right, and  
6 there will be probably more as this night goes on. You  
7 know, I've had conversations with Mr. Collins and Mr.  
8 Ferriero about the completeness of the application,  
9 specifically stormwater. And I believe, and we'll have  
10 Mr. Ferriero confirm it, but he does believe that it's  
11 adequate and that it should proceed. It doesn't mean  
12 it's perfect, but it is adequate in our professional's  
13 mind, which leads me to believe that we have to give  
14 the applicant, whether it's right or wrong, or whether  
15 we like the way case progresses, the applicant has the  
16 right to present this case in an order that they seem  
17 fit. It would be nice if it was orderly and if it was  
18 agreed to in advance. I'm not sure whether we can ever  
19 get to that point, but I do think that with the  
20 township engineer agreeing that certainly at the most  
21 minimal level if the report is adequate to proceed then  
22 we have a right and we have an obligation to let the  
23 applicant proceed.

24           The truth is that the Najarian report,  
25 which was introduced tonight, it hasn't been presented,

1 and I'm sure it will be by the Objectors at some point,  
2 and at that point that report will go on the record and  
3 they will have a chance to present it and give -- the  
4 applicant will certainly have a chance to  
5 cross-examine. And at some point we'll have to  
6 determine where the truth lies and whether we can get  
7 our professionals to render some opinions on the  
8 accuracy of both reports.

9 I'm not sure what else we can do with this  
10 stage. I know that in a perfect world this application  
11 would be complete in everybody's mind, but at the  
12 moment it's certainly the prerogative of the applicant  
13 to present in any form or sequence that they want and  
14 certainly with the professionals agreeing that it does  
15 meet minimum standards. It's just not something -- we  
16 don't have the discretion to not allow the case to  
17 continue.

18 So, I just want to make that comment, and  
19 allow Ms. Donato and Mr. Sasso then to come back up and  
20 certainly for any other comments or statements we would  
21 appreciate you at this point, whatever, Ms. Donato. I  
22 know you came in late and I just want to make sure we  
23 give you the opportunity to speak.

24 MS. DONATO: Thank you very much, Mr.  
25 Boxer. I come from a far distance, and I had snow the

1 entire way up. Usually I'm Mario Andretti, but it's  
2 when it's like snow I have a considerable degree of  
3 trepidation

4 CHAIRMAN BOXER: I understand. I'm glad  
5 you're here safely.

6 MS. DONATO: Thank you. I hope I can get  
7 home safely because it's snowing heavily.

8 There is no question as one searches back  
9 to the various correspondences that were exchanged  
10 toward the November and December of 2014, including  
11 those from the applicant's attorney, that they  
12 recognize the need to provide additional information in  
13 order to have what is really a fundamental element of  
14 any compliant stormwater management plan, and that is,  
15 where is the seasonal high.

16 This Board has tried. You've given enough  
17 warning. Certainly we've given enough warning. And if  
18 the applicant wants to proceed with the information  
19 that it has then we, you know, will certainly, you  
20 know, understand that, and don't agree with it, but  
21 because it's really been delaying everything. In the  
22 long run you made the right decision back in June that  
23 this is only causing us to go around and around. And  
24 it's particularly bothersome because it was very much  
25 understood that there was going to be some response.

1 There was an agreement that they were going to have  
2 more tests done and that there was going to be a  
3 response after the, you know, the summer of additional  
4 tests that were done. And not having that response  
5 received I was really, really surprised today to learn  
6 that this application was moving forward on stormwater  
7 management. I, you know, we all had to scramble and if  
8 nothing it's -- it's probably not in consideration,  
9 it's probably a deliberate strategic move to try to get  
10 us off our persistence that this is an important issue,  
11 but we won't forget, so, thank you.

12 CHAIRMAN BOXER: Look, I understand, again,  
13 this process will allow you and Mr. Sasso and anybody  
14 else who chooses to question witnesses or cross-examine  
15 evidence to take your best shot at that. And this  
16 applicant, again, has the right to present in their own  
17 form and sequence. So as much as we'd like perfection  
18 it may not happen and we have to give the applicant  
19 some latitude to present in a way that they feel is  
20 correct.

21 If the Najarian report in this case is  
22 completely -- is in conflict with their report you guys  
23 are going to have plenty of opportunity, as Mr. Hall  
24 will, to look at it, submit it, and cross-examine it.  
25 And hopefully the process will bear out on what is, in

1 fact, the truth and what we can look at as a Board to  
2 make a decision.

3 So, Mr. Ferriero, I just want to confirm  
4 with you, do you agree with my statement? Do you have  
5 any other comments to make?

6 MR. FERRIERO: I think the most significant  
7 thing that I can say is that there is a very big  
8 difference between a complete application and one that  
9 is fully technically sufficient and meets all the  
10 standards. The information has been submitted. There  
11 is certainly some discussion and debate as to the  
12 validity of that information and whether or not it  
13 complies with all the standards. I've read everything  
14 that's been submitted. Frankly, I think there's more  
15 testimony that at least I need to hear to make any  
16 judgment on this. And, you know, as you said it's the  
17 applicant's case to make. And if they feel that  
18 they've submitted enough information to address the  
19 issue then I suppose that what they do is they submit  
20 the testimony to say why it does. And if it does or it  
21 doesn't that's ultimately for the Board to determine.

22 CHAIRMAN BOXER: Thank you, Mr. Ferriero.  
23 Mr. Collins, any comments?

24 MR. COLLINS: No, Mr. Chairman. I think we  
25 should do as you indicated you will do, which is

1 proceed with the next witness.

2 CHAIRMAN BOXER: Thank you. Mr. Hall?

3 MR. HALL: If we can have the witness  
4 sworn.

5 MR. COLLINS: I don't think he was sworn.  
6 Sir, please raise your right hand. Do you swear or  
7 affirm to tell the truth, the whole truth, and nothing  
8 but the truth so help you God.

9 MR. LOH: I do.

10 MR. COLLINS: Please state your name and  
11 your business address for the record.

12 CHAIRMAN BOXER: Sir, you'll have to speak  
13 into the microphone.

14 MR. LOH: My name is Dennis C. Loh, L-o-h.  
15 My business address is 14-B Worlds Fair Drive,  
16 Somerset, New Jersey.

17 D E N N I S C. L O H, having been duly sworn,  
18 testifies as follows:

19 MR. COLLINS: Thank you, sir.

20 DIRECT EXAMINATION BY MR. HALL:

21 Q. Mr. Loh, can you tell the Board your  
22 professional background and experience and  
23 qualifications?

24 A. Certainly. I received my bachelor of  
25 science in civil engineering from the University of

1 Maryland in 1983. At that time upon graduation I was  
2 employed by Melick-Tully and Associates, a  
3 geotechnical engineering firm in New Jersey, and I  
4 worked with Melick-Tully until January of 2003 when I  
5 was employed by Geo-Technology Associates, Inc.

6 I am currently vice president and principal  
7 in charge of GTA's Somerset, New Jersey office. I am a  
8 professional engineer licensed in New Jersey, New York,  
9 and Connecticut.

10 Q. And as a professional engineer is there an  
11 area in which you particularly practice?

12 A. Yes. Since graduation I've been practicing  
13 geotechnical engineering on a full-time basis.

14 Q. Can you just briefly tell us what  
15 geotechnical engineering is?

16 A. Geotechnical engineering is, as the name  
17 applies, 'geo' having to do with soil, but it's really  
18 the structural properties of soil, evaluating the  
19 structural properties of soil and how they interact  
20 with structures. So it's related to foundation design,  
21 retaining wall design, floor design, and other  
22 components of construction.

23 It also has to do with what we're  
24 testifying here tonight about, is soil and groundwork  
25 conditions, bedrock conditions and such.

1 Q. And have you testified as an expert on such  
2 matters before Land Use Boards such as this one?

3 A. I have.

4 Q. Have you ever been before this Board, by  
5 the way?

6 A. I have not.

7 Q. And have you been accepted as an expert  
8 witness?

9 A. Every time.

10 MR. HALL: Okay. I would offer Mr. Loh as  
11 an expert witness as a geotechnical engineer.

12 CHAIRMAN BOXER: Okay.

13 MR. COLLINS: Mr. Chairman, we should open  
14 to the attorneys for questions just on voir dire on the  
15 witness' qualifications.

16 CHAIRMAN BOXER: Thank you. Mr. Sasso?

17 MR. SASSO: I do not have any questions,  
18 Mr. Chairman.

19 MS. DONATO: I don't either.

20 UNIDENTIFIED PUBLIC MEMBER: We can't hear.

21 CHAIRMAN BOXER: You guys can't hear?  
22 We'll make sure that Mr. Loh speaks into the  
23 microphone. Thanks.

24 MR. COLLINS: So, Mr. Chairman, I recommend  
25 that the Board find that Mr. Loh is qualified as a

1 professional engineer and as an expert in geotechnical  
2 engineering.

3 CHAIRMAN BOXER: Thank you very much, and  
4 we'll accept the witness.

5 MR. HALL: Thank you.

6 BY MR. HALL:

7 Q. Mr. Loh, can you start off by telling the  
8 Board your relationship to the project that's before  
9 the Board?

10 A. Certainly. I think it might be helpful to  
11 all to understand when and how GTA became involved with  
12 this project. To do that I think I need to speak a  
13 little bit about soil classification. The U.S.  
14 Department of Agriculture has maps in near surface  
15 soils throughout the state based on the soil  
16 mineralogy, gradation, and drainage properties. The  
17 mapping units are called soil series. And there's  
18 about 200 different soil series throughout New Jersey.  
19 There are four different soil series at this site;  
20 namely, Penn shaley silt loam, Penn silt loam, Norton  
21 loam, and Klinesville shaley loam.

22 The various soil series, the 200 of them,  
23 are further categorized into four different hydrologic  
24 soil groups A through D. Group A is the most permeable  
25 type of soil, and Group D is the least permeable soil.

1 Three of the soil series at this site are identified as  
2 Group C, and one of them is identified as Group D on  
3 the USDA mapping. Prior explorations performed by  
4 Birdsall --

5 CHAIRMAN BOXER: Mr. Loh, can I ask a  
6 question, please? When you say three of "C" and one of  
7 "D," what about proportionately against the size of the  
8 property? In other words, does the one soil in Group D  
9 make up a larger portion of the property?

10 THE WITNESS: No, sir. Group D is  
11 generally through the center of the property, maybe a  
12 little bit towards the east. I don't know an exact  
13 percentage of the area of the site. I would guess that  
14 it's about 20 percent would be a rough ballpark.

15 CHAIRMAN BOXER: All right. 20 percent,  
16 approximately. Thank you very much.

17 THE WITNESS: So prior explorations were  
18 performed by Birdsall and Gladstone Design. And all of  
19 those explorations indicated clay or silty soils below  
20 the topsoil, and the clay and silty soils were  
21 underlain by shale. Because of this it was considered  
22 likely that the soils throughout the site could have  
23 the characteristics of Group D, as opposed to Group C,  
24 which was the predominant soil type according to the  
25 mapping.

1                   So the New Jersey Department of  
2 Environmental Protection provides a way to test the  
3 soil to evaluate if the mapping unit may be incorrect  
4 and maybe should be revised. So KDC retained GTA to  
5 perform an exhaustive study to determine if the soils  
6 throughout the site are Group D. And we started that  
7 work in August of 2014.

8                   When we started to do that work, which  
9 included some infiltration testing, some of the  
10 infiltration tests came back with rates that were  
11 slightly higher than the rates that are identified as  
12 Group D soils. So early on in the process we advised  
13 KDC that it's probably not realistic that we're going  
14 to be able to revise the soil mapping to Group C --  
15 rather, to Group D throughout the site. So we shifted  
16 gears at that point.

17                   Since Group "C" soil conditions were  
18 present at some locations --

19                   CHAIRMAN BOXER: Mr. Loh, can I ask a  
20 question?

21                   THE WITNESS: Yes.

22                   CHAIRMAN BOXER: Can you just explain  
23 what's the relevance of shifting gears? What would --  
24 if you were able to align more with Group D what would  
25 that have done for the application or not?

1 THE WITNESS: Group D soils are considered  
2 impermeable. And so many of the stormwater regulation  
3 requirements such as infiltrating water into the ground  
4 would have been waived by DEP.

5 CHAIRMAN BOXER: Interesting. Okay.

6 THE WITNESS: So we perform some test pits  
7 in the area that appear favorable in the initial  
8 testing. We perform infiltration in some of those  
9 areas. And Gladstone performed a preliminary  
10 stormwater management design based on that initial  
11 round of testing. Then we went back to the site and  
12 performed additional testing in the infiltration basin  
13 areas for Gladstone's final design.

14 So to summarize the subsurface conditions  
15 encountered in GTA's test pits we performed 43 test  
16 pits in August and September of 2014. Test pits range  
17 from about one-and-a-half- to 9-feet deep. The general  
18 subsurface profile was about 4 to 12 inches of topsoil  
19 at the surface. The topsoil was underlain by silty and  
20 clay soils. They're residual soils that extended to  
21 depths of about one-and-a-half- to 9-feet deep where we  
22 hit weathered shale rock.

23 We encountered slight seepage in two of the  
24 test pits at depths of two and a half feet, and four  
25 and a half feet below the ground surface. Mottling,

1 soil mottling was observed in eight of the test pits at  
2 relatively shallow depths. The materials below the  
3 mottled soils were not mottled. So GTA --

4 BOARD MEMBER STRAKHOV: Could we get an  
5 explanation of mottled? I'm not sure I know what the  
6 relevance of that is.

7 THE WITNESS: Sure. The groundwater level  
8 typically fluctuates seasonally anywhere on any site.  
9 Soil mottling is the result of a color change of some  
10 of the soil particles, typically iron, due to prolonged  
11 saturation causing an anaerobic condition. They're  
12 starved of air.

13 So, through a long and arduous process that  
14 involves lots of stuff, generally the colors tend to  
15 pale, to become more pale over time in that condition.  
16 When the groundwater level rises it causes saturated  
17 soil particles to pale and become -- and that's the  
18 term called 'mottling.' Some of the soil particles  
19 were pale, some weren't. So it appears as a marbling  
20 effect.

21 So when the groundwater level rises and  
22 causes soil mottling that is an indication of a  
23 seasonal high groundwater level. But it's not always  
24 -- soil mottling is not always an indication of the  
25 seasonal high groundwater level. Water that -- rain

1 water that infiltrates, seeps through the topsoil,  
2 seeps through the underlying soils, can get held up or  
3 perched on top of relatively impermeable soil layers.  
4 So those soil layers, those soils are saturated, not as  
5 a result of a rising groundwater level, but rather as a  
6 result of water seeping through and becoming trapped on  
7 top of that impervious layer. So those soils can  
8 become mottled, but that mottling is not an indication  
9 of a seasonably high groundwater level.

10 CHAIRMAN BOXER: Mr. Loh, I apologize,  
11 because I know you're on a pace here and I don't want  
12 to get you too distracted, but there's a great deal of  
13 debate in this room for many months over the  
14 materiality of doing the testing during high water  
15 times. Can you comment on, you know, in your  
16 professional opinion doing the tests whether I think  
17 you said 43 in the August/September time frame, would  
18 there be a difference in your testing if you did it  
19 during the high water season?

20 THE WITNESS: The difference would be, in  
21 the high water season you may see a groundwater level  
22 that wasn't seen before at the deeper levels. The  
23 groundwater level will fluctuate maybe a few feet in --  
24 on a site like this maybe a few feet over the course of  
25 the year. It may go up and down 2 or 3 feet on that

1 order of magnitude, not 10 or 20 certainly.

2 So when soil becomes saturated it becomes  
3 mottled, most soils do, not all, most soils do. The  
4 soils at this site do. So in the dry season, the  
5 season -- I'll say it the other way, there is a wet  
6 season identified as defined by DEP. That's the time  
7 of the year from January 1st to April 1st. That is  
8 called the wet season. During the wet season a  
9 determination of the seasonal high groundwater level  
10 can be made simply and only by looking at the observed  
11 groundwater level. But outside of the wet season soil  
12 mottling can be used, is allowed to be used, according  
13 to DEP, as an indicator of what the seasonally high  
14 groundwater level is. I hope that answered your  
15 question.

16 CHAIRMAN BOXER: It was. Thank you. I  
17 appreciate that.

18 THE WITNESS: So we observed mottling in  
19 eight of our 43 test pits at relatively shallow depths,  
20 generally within the clay and silty soils underlying  
21 the bedrock. And as I said the material below the  
22 mottled soils was not mottled, which is a very good  
23 indication that the mottling was caused by a perched  
24 groundwater condition, rather than a rising groundwater  
25 condition.

1           So for that reason GTA provided an opinion  
2           that the soil mottling at this site, at least in the  
3           areas where we observed it in those test pits, is not  
4           indicative of the seasonally high groundwater level.

5           So then we performed infiltration testing.  
6           We did infiltration tests at 28 locations, not across  
7           the site -- well, across the site. Most of them were  
8           done within the areas proposed for infiltration,  
9           stormwater infiltration. They were all done at  
10          relatively shallow depths within the silty and clay  
11          soils.

12          Infiltration testing was not performed by  
13          GTA within the rock. Five infiltration tests were done  
14          by Gladstone prior to GTAs involvement with the site,  
15          and all of those tests indicated the rock was not  
16          permeable. So it was previously determined that the  
17          rock could not be relied on for stormwater  
18          infiltration, which is why we limited our infiltration  
19          testing to the shallow soils overlying the rock.

20          We obtained zero infiltration, zero inches  
21          per hour in 11 of our test areas. And some  
22          infiltration was measured at 17 of the test locations.  
23          So the general results of the infiltration testing  
24          confirmed that the soils throughout the site, or at  
25          least in the areas tested, should be categorized as

1 Group D soils as the mapping suggests.

2 And so based on all of that GTA provided an  
3 opinion that the soils in the areas proposed for  
4 infiltration are suitable for infiltration provided  
5 those rates are incorporated in the design. And with  
6 that I'll take a question.

7 CHAIRMAN BOXER: Are you complete with this  
8 witness, Mr. Hall?

9 MR. HALL: Let me just ask a couple just to  
10 close the loop.

11 BY MR. HALL:

12 Q. The seasonal high groundwater how is that  
13 significant for someone preparing a stormwater  
14 management plan?

15 A. Thank you for asking that. DEP requires  
16 that the level of infiltration be maintained at least 2  
17 feet above the seasonal high groundwater level, or  
18 observed seepage, whichever is higher.

19 Q. So in designing the basin you have to be 2  
20 feet above?

21 A. Above the seasonal high groundwater level,  
22 yes.

23 Q. And the infiltration that's a requirement  
24 or goal in stormwater at infiltration; is that correct?

25 A. I'm sorry?

1 Q. Where you have infiltration versus where  
2 you don't have infiltration how is that significant or  
3 relevant?

4 A. It's certainly possible, and in fact it did  
5 occur in some areas within the same infiltration basin  
6 where we got some readings of zero, and yet we're  
7 proposing infiltration for those areas. DEP also  
8 allows for soil replacement in that circumstance. You  
9 can remove the impermeable soils for a depth of 2 feet,  
10 or shallow if you have permeable soils below, and  
11 replace those impermeable soils with granular materials  
12 that will allow infiltration and soil seepage.

13 Q. But you don't design stormwater, you did  
14 the testing and provide the results to another  
15 engineer; correct?

16 A. Correct.

17 CHAIRMAN BOXER: I do have one follow-up  
18 question, Mr. Loh. You said that eight of the -- eight  
19 of the 43 test pits you observed mottling?

20 THE WITNESS: Yes.

21 CHAIRMAN BOXER: Is there a threshold in  
22 which mottling will be considered negative? If you  
23 were to observe mottling in 40 of the 43 test pits, is  
24 that a problem? In your professional opinion is that a  
25 problem if you see mottling in a large majority of test

1 pits?

2 THE WITNESS: It would enter my thought  
3 process about evaluating whether or not the mottling  
4 was indicative of the seasonal high groundwater level.  
5 And it's a good point, Chairman, that only eight of the  
6 test locations had a mottling at all.

7 CHAIRMAN BOXER: I agree. And just one  
8 question, Mr. Loh. If you were to do the testing  
9 during the high water season is it possible that you  
10 would discover mottling in more of the pits?

11 THE WITNESS: No. No. Once soil becomes  
12 mottled it stays mottled.

13 CHAIRMAN BOXER: I see. Okay. Thanks.  
14 That was helpful. Let me turn over --

15 MR. FERRIERO: Mr. Chairman, if I could  
16 just ask a couple of questions maybe?

17 CHAIRMAN BOXER: Absolutely.

18 MR. FERRIERO: You talked a little bit  
19 about, in fact, that it's your opinion that the  
20 mottling was indicative of a perched condition. I'm  
21 assuming that anything you've talked about really is  
22 the testing protocol from N.J.A.C. 7:9A, which is the  
23 septic regulations that outlines how all this testing  
24 is done. In 9A how do you demonstrate a perched water  
25 condition?

1 THE WITNESS: I'm reading from 9A. 9A,  
2 it's 7:9A-5.8(b). "The upper limit of the zone of  
3 saturation, which is the seasonally high groundwater --  
4 high water table, shall be determined by one of the  
5 following means: Where mottling is observed, at any  
6 season of the year, the seasonally high water table  
7 shall be taken as the highest level at which mottling  
8 is observed, except when the water table is observed at  
9 a level higher than the level of the mottling.

10 "Where mottling is not observed the  
11 seasonally high water table shall be determined based  
12 upon either of the following methods: The first one is  
13 during the months of January through April. The second  
14 one is during other times of the year the depth to the  
15 seasonally high water table may be obtained from the  
16 Soil Conservation Service report based on soil  
17 morphology, including mottling."

18 MR. FERRIERO: Okay. But I asked how do  
19 you determine that mottling is related to a perched  
20 water condition and not a seasonally high water  
21 condition?

22 THE WITNESS: Well, Mr. Ferriero, as I  
23 explained before, I looked at soil mottling with  
24 respect to seasonally high groundwater determination  
25 from the viewpoint of did -- was the soil mottling

1 caused by a rising groundwater table? And if so then  
2 the mottling is indeed indicative of the seasonally  
3 high groundwater table. But when the soils including  
4 the shale below it are not mottled at all that suggests  
5 to me that the soils became mottling from above, not  
6 from below.

7 MR. FERRIERO: In the -- in the septic code  
8 it talks about separations between hydraulically  
9 restrictive Horizons, which basically are the clay  
10 soils that don't have permeability and the mottling.  
11 In the testing that you did was there a separation  
12 between the hydraulically restricted Horizons and the  
13 mottling? Was all the mottling in the clay  
14 non-permeable material?

15 THE WITNESS: I believe all the mottling  
16 was in the clay material.

17 MR. FERRIERO: Is it possible that the  
18 mottling could have been the result of an Artesian  
19 groundwater condition?

20 THE WITNESS: I don't believe so. An  
21 Artesian groundwater condition requires a head of  
22 water. It requires a relatively significant,  
23 typically, variation in topography where water is  
24 traveling through the soil from uphill into downhill  
25 where it's trapped at an underlying depth from a

1 hydraulically restrictive layer. And when you remove  
2 that hydraulically restrictive layer the groundwater  
3 level rises because it's under pressure. I don't  
4 believe we have that condition at this site.

5 MR. FERRIERO: Is there a way to  
6 demonstrate whether or not that exists?

7 THE WITNESS: Absolutely. One can drill  
8 borings and put in groundwater monitoring wells, and  
9 screen off the restrictive layer and see if the  
10 groundwater level rises over time with the new material  
11 underneath it.

12 MR. FERRIERO: In the case of the soil logs  
13 here, I think in virtually all of the ones that you  
14 did, once you got to the bottom you hit backhoe  
15 refusal. You basically were hitting the rock below?

16 THE WITNESS: Correct.

17 MR. FERRIERO: How does that relate to  
18 finding the seasonally high groundwater table in the  
19 absence of mottling?

20 THE WITNESS: I'm not sure that I  
21 understand the question completely. Although I will  
22 say that the shale bedrock will mottle as well when  
23 it's saturated over a prolonged period. Does that  
24 answer your question?

25 MR. FERRIERO: Well, it does, but it

1 doesn't. I mean, if you -- you said you found the  
2 mottling at relatively shallow depths, 2 feet plus or  
3 minus?

4 THE WITNESS: Roughly.

5 MR. FERRIERO: And the soil logs went down  
6 to about 9 feet in some cases?

7 THE WITNESS: Correct.

8 MR. FERRIERO: If you went down 9 feet and  
9 you found no mottle what would your conclusion be  
10 relative to the seasonally high group water table?

11 THE WITNESS: If I found no mottling and no  
12 groundwater seepage was observed my conclusion is that  
13 the seasonally high groundwater level is below the  
14 bottom of the test pit below the extent of the test  
15 pit.

16 MR. FERRIERO: Even if that bottom of that  
17 test pit was not permeable?

18 THE WITNESS: Sure. Yeah.

19 MR. FERRIERO: Okay. That's all, Mr.  
20 Chairman.

21 CHAIRMAN BOXER: Let me just check with my  
22 Board here. Any questions? Comments?

23 BOARD MEMBER RODELIUS: I have a couple.  
24 You mentioned there was about 200 soil types on the  
25 maps, is that what you said?

1 THE WITNESS: Throughout New Jersey.

2 BOARD MEMBER RODELIUS: Right. And you  
3 said that the four in this location are all able to  
4 be -- they can get mottling. That's what you just  
5 said, right?

6 THE WITNESS: That's correct.

7 BOARD MEMBER RODELIUS: So which ones can't  
8 get mottling? I'm just trying to get a feel for --

9 THE WITNESS: There are soils in South  
10 Jersey called Gluck und Nicht soils that have a certain  
11 mineral in them that is used to be resistive to  
12 mottling. Generally, as I said, mottling typically is  
13 as a result of observation of iron particles in the  
14 soil. So any soil that has iron, an iron particle  
15 component would become mottled.

16 BOARD MEMBER RODELIUS: And did you test  
17 for iron in this soil?

18 THE WITNESS: No.

19 BOARD MEMBER RODELIUS: Do you have any  
20 pictures that you can show us of the mottling?

21 THE WITNESS: Not with me.

22 BOARD MEMBER RODELIUS: Okay. Do you have  
23 them someplace else?

24 THE WITNESS: Sure. I can provide them to  
25 you, if you'd like.

1 BOARD MEMBER RODELIUS: If you wanted to  
2 determine the high water, seasonal high water, would  
3 you prefer to do it through the mottling or through the  
4 January to April 1st window that DEP recommends?

5 THE WITNESS: I would prefer to do it  
6 during the January to April window. It creates less  
7 confusion. I will say that several of the test pits  
8 that Gladstone Design performed were performed within  
9 that wet season. They performed eight test pits on  
10 January 8, 2014, where they had slight seepage between  
11 eleven and a half and 14.2 feet in three of those eight  
12 test pits. They also performed 13 test pits on March  
13 26th and 27th, 2014. And observed seepage, slight  
14 seepage at depths between 5 feet to seven and a half  
15 feet in eight of those 13 test pits.

16 BOARD MEMBER RODELIUS: Okay. But you  
17 didn't do that; right?

18 THE WITNESS: We did not do that, no.

19 BOARD MEMBER RODELIUS: Thank you.

20 CHAIRMAN BOXER: All right. Thank you, Mr.  
21 Loh.

22 Mr. Sasso, Ms. Donato, I'd like to turn it  
23 over to you and see if there are any questions.

24 MS. DONATO: Thank you, Mr. Boxer.

25 CHAIRMAN BOXER: Mr. Loh, you're still

1 going to have to talk into the mic. So between you and  
2 Ms. Donato, she's probably going to have to talk into  
3 the mic, but if you want to turn around and maybe sit  
4 the other way --

5 MR. HALL: The reporter probably needs to  
6 see.

7 CHAIRMAN BOXER: All right. A lot to  
8 figure out. That will be fine. That will be perfect,  
9 actually. Thank you, Mr. Loh.

10 CROSS-EXAMINATION BY MS. DONATO:

11 Q. Good evening, Mr. Loh. My name is Michelle  
12 Donato, and I'm the attorney for Stop Somerset Hills  
13 Power Plant, which is a group of citizens that are  
14 opposing this application.

15 Now, I'd like to just verify, when were you  
16 first retained?

17 A. It was in, I believe, July. I don't know  
18 if I have a date, the exact date.

19 Q. Okay. July of 2014?

20 A. Of 2014, yes.

21 Q. And the test pits that were then -- or the  
22 test -- soil tests that were performed during the  
23 summer of 2014 they were prepared under your direction?

24 A. Yes.

25 Q. And have you received any information from

1 the Planning Board engineer, Mr. Ferriero, with his  
2 comments regarding the issues that he has raised  
3 concerns about with respect to the stormwater  
4 management plan?

5 A. At that time?

6 Q. Yes?

7 A. No.

8 Q. And when did you first receive any  
9 information about what concerns had been expressed here  
10 with regard to the soils and stormwater management?

11 A. I don't recall, Ms. Donato, that there was  
12 ever an indication made to me specifically about the  
13 Board's or anyone's concerns about certain issues. It  
14 was really only relayed to me that there was -- there  
15 were exhaustive test pits done prior that there was a  
16 feeling that the soil group mapping could potentially  
17 be revised. And that's the premise that my company was  
18 retained.

19 Q. And are you then not aware of the fact that  
20 this Board directed the applicant to go out and get  
21 comprehensive set of data so that a meaningful  
22 stormwater management plan could be --

23 MR. HALL: I object to the form. I'm  
24 sorry.

25 MS. DONATO: You object to the form of the

1 question?

2 MR. HALL: Right. Because I don't agree  
3 with the factual predicate that the Board directed  
4 anything. There were concerns about -- questions about  
5 can he get more information.

6 BY MS. DONATO:

7 Q. Okay. Are you aware of the fact or were  
8 you told that this Board wanted more information about  
9 stormwater management?

10 A. No.

11 Q. And did anyone tell you that this Board had  
12 expressed, or the Board engineer, any concern about  
13 trying to remap soils to see if they were all Class  
14 "D," rather than "C"?

15 A. I was never told that that directive came  
16 from the Board.

17 Q. Were you told that there were any issues  
18 with respect to the soil testing of permeability that  
19 had been arrived at by some of the previous testing  
20 that had been performed by KDC?

21 A. Only that Gladstone had performed five  
22 infiltration tests, basic flood tests in the shale, and  
23 that those tests indicated the shale was not suitable  
24 for infiltration.

25 Q. So you were really -- I think you said in

1 the beginning you were really hired to try to change  
2 the soil types to a "D" so that you wouldn't have to  
3 have, or the applicant would not have to have  
4 infiltration?

5 A. Yes. Let me expand slightly.

6 Q. There's no question pending. Your attorney  
7 can ask you on redirect.

8 A. All right.

9 Q. Okay. So you reviewed all of the  
10 previously conducted test pits, am I right?

11 A. Which ones?

12 Q. All of the previously conducted test pits,  
13 those done by Birdsall and those done by Gladstone?

14 A. I reviewed those boring logs.

15 Q. And did you at any time tend to correlate  
16 the location of those soils tests with respect to the  
17 location of the detention basins that were proposed?

18 A. To some degree, yes.

19 Q. Okay. And you are -- I see you reference  
20 the stormwater management regulation. So you're aware  
21 of the requirement of the New Jersey Stormwater  
22 Management Regulation?

23 A. I am.

24 Q. You don't design the sites, though, you  
25 just do the soil work; right?

1 A. Correct.

2 Q. So, did you look at the plan to see if the  
3 requisite soil testing was done in each of the basins  
4 based on the type of basin that was proposed?

5 A. After the first round of testing that  
6 indicated some areas were potentially favorable for  
7 infiltration a preliminary stormwater design was  
8 performed by Gladstone. Then we went back out to those  
9 areas and performed additional testing keeping in mind  
10 the stormwater regs.

11 Q. Do you know when that additional testing  
12 was performed?

13 A. The additional round of testing?

14 Q. Yes?

15 A. The second round of testing by GTA was  
16 performed in September of '14.

17 Q. So you didn't perform any testing, or you  
18 weren't asked to perform any testing during the wet  
19 season?

20 A. Correct.

21 Q. Now, you mentioned -- let me just get my  
22 notes in this -- now, you mentioned that there were  
23 some tests that were performed during the wet season.  
24 You said there was some test performed in January, and  
25 some in March?

1 A. Yes, by Birdsall.

2 Q. By Birdsall?

3 A. I'm sorry, I'm sorry, by Gladstone.

4 Q. By Gladstone. Okay. So do you know  
5 whether or not those January tests, these were tests  
6 for infiltration; right?

7 A. No.

8 Q. For permeability?

9 A. No.

10 Q. They were not?

11 A. No.

12 Q. So what were these tests for, the January  
13 and March tests, they were just straight out soil  
14 testing, not permeable?

15 A. They were test pits to observe the  
16 subsurface conditions.

17 Q. Okay. And did you know the location of  
18 those January tests?

19 A. Yes.

20 Q. Okay. Were any of those tests performed in  
21 the basins?

22 Do you want to pull up your materials?

23 A. I think that's a good idea.

24 Q. I think so, too.

25 A. Ms. Donato, I don't know if I can

1 specifically answer your question.

2 MR. HALL: I think we're going to need a  
3 microphone.

4 CHAIRMAN BOXER: Mr. Loh, you're going to  
5 have to use a mic, because we're going to have to get  
6 there for the stenographer.

7 THE WITNESS: I don't know if I can  
8 specifically answer your question about which test pits  
9 on the plan would perform during the wet season. What  
10 I can do, though, is show you all of the test pits that  
11 were done at the site.

12 MR. HALL: I think we need to mark that.

13 BY MS. DONATO:

14 Q. Because I just want to know what was the  
15 location? You mentioned that there were tests that  
16 were performed in the wet season?

17 MR. COLLINS: Let's -- let's mark this,  
18 because it is being observed, and it's apparently going  
19 to be used. So this will be an "A" Exhibit, and there  
20 is an "A" Exhibit number.

21 (Exhibit A-21, Test Pit location map, was  
22 received and marked.)

23 MR. COLLINS: A-21. And can you just  
24 identify what it is, Mr. Loh?

25 THE WITNESS: A-21 is titled "Test Pit

1 Location Exhibit."

2 BY MS. DONATO:

3 Q. So, can you please go to your notes so that  
4 you can -- because you may need to refresh your  
5 recollection in this, is whether those January tests  
6 were performed in any of the proposed basins?

7 All right. If the witness is going to be  
8 coached -- I think the witness should be able to  
9 testify on his own. Mr. Moschello will have an  
10 opportunity to testify.

11 A. I'm looking at Gladstone Design soil logs  
12 dated January 8th, and it will just take me some time  
13 to --

14 Q. What year is that?

15 A. 2014.

16 CHAIRMAN BOXER: Do you want to just take a  
17 couple of minutes, Mr. Loh? Would that be helpful to  
18 you?

19 THE WITNESS: That will be helpful.

20 CHAIRMAN BOXER: Why don't we take a five-  
21 or 10-minute break, let the stenographer take a little  
22 rest and then it will give you a chance to look at the  
23 plans. So maybe 8:10 promptly. Thank you.

24 (A recess is taken at 7:59 p.m.)

25 (Back on the record at 8:11 p.m.)

1 CHAIRMAN BOXER: Ladies and gentlemen, if  
2 we can get started I would appreciate it. We have a  
3 lot to cover tonight.

4 All right. We have a quorum up here.  
5 Everybody's settling down. So why don't we go back on  
6 the record and we'll have Mr. Loh and Ms. Donato was up  
7 here with some questions. So if you could proceed, Ms.  
8 Donato.

9 MS. DONATO: Yes.

10 BY MS. DONATO:

11 Q. Yes. Mr. Loh, during the break you had an  
12 opportunity to confer with Mr. Moschello from  
13 Gladstone?

14 A. He helped me locate the test pits on the  
15 plan, because there's so many of them.

16 Q. Well, you mentioned that there were test  
17 pits that were performed in the wet season. So why did  
18 you say that?

19 A. I said that as a matter of clarity  
20 regarding the whole discussion of should test pits be  
21 done during wet season or not.

22 Q. Well, where are test pits supposed to be  
23 performed to determine seasonal high water with respect  
24 to stormwater management?

25 A. Any time of the year.

1 Q. Where?

2 A. Where? I'm sorry. They're supposed to be  
3 performed within the stormwater management basins.

4 Q. And also underneath any hazmat or practices  
5 like infiltration swales, too, is that right?

6 A. If it's designed for infiltration then  
7 there needs to be a test document.

8 Q. Okay. So, now my question to you had been,  
9 where were those January test pits performed?

10 A. Well, there were test pits performed in  
11 January, as well as in March.

12 Q. Okay. Let's stick to January for the  
13 moment.

14 A. So, first let me discuss this plan since  
15 it's only been put up here for the first time.

16 Q. And this is a plan that's marked as A-21  
17 and was prepared by Gladstone Engineering; right?

18 A. Correct.

19 Q. And it shows all of the test pits from  
20 Birdsall, from Gladstone, and then there's your  
21 company?

22 A. Correct.

23 MR. COLLINS: What is the date on that  
24 plan?

25 THE WITNESS: February 12, 2015.

1 MR. COLLINS: Fresh off the presses, so to  
2 speak.

3 THE WITNESS: So the test performed in  
4 January, are these tests that start SL, whatever,  
5 123456 and so on - 10/8/14 is the date?

6 BY MS. DONATO:

7 Q. Okay. So you have --

8 A. So, here, here, here, here, mostly this  
9 front.

10 Q. Okay. Are any of those test pits  
11 underneath a proposed stormwater basin?

12 A. None of those are.

13 Q. So, if you want to measure the seasonal  
14 high of a basin those January tests don't help at all,  
15 do they?

16 A. By virtue that they're not located within  
17 the basin.

18 Q. So they just show you you shouldn't have  
19 one there, you should not have a basin where those  
20 January -- or wherever you show seasonal high you  
21 should not have a basin, right?

22 A. No.

23 Q. If you can't get the separation -- well, if  
24 you don't have the 2-foot separation I'll clarify.

25 A. If you don't have 2 feet of separation then

1 that would be a problem.

2 Q. Right. So you want to know whether you can  
3 meet that requisite distance, that's part of the  
4 regulations; is it not?

5 A. Yes.

6 Q. So are any of those January tests performed  
7 in a basin?

8 A. No.

9 Q. Okay. And are there any -- how many of the  
10 tests in March of 2014 are under a basin?

11 A. One.

12 Q. One?

13 A. There's one within basin one, and then  
14 there's another one a little bit beyond basin 2D.

15 Q. And it's not under the basin and in the  
16 location that the regulations would require?

17 A. That's right.

18 Q. All right. So, of all of the tests that  
19 were performed during the wet season that you refer to  
20 there's only one of them that was under a basin?

21 A. Correct.

22 Q. And do you know how many -- there's  
23 different number of test pits that are required based  
24 on the size of the basin; right?

25 A. That's right.

1 Q. Is there a minimal number of tests that the  
2 DEP requires under a basin?

3 A. Two.

4 Q. Now, do you know when this application was  
5 filed?

6 A. No.

7 Q. Would you be surprised to know it was filed  
8 in December of 2012?

9 A. Okay.

10 Q. Can you explain why 2013, 2014, and this  
11 year we don't have tests performed in the wet season to  
12 avoid confusion, as you stated?

13 A. No. Certainly matters to me to determine  
14 when my firm gets involved in the project.

15 Q. Well, you're not here to testify as to  
16 whether or not this plan meets the requirements of the  
17 stormwater management regulations; am I right?

18 A. I believe so, yes.

19 Q. What do you believe so, that you are not  
20 here to say that this plan is compliant with the  
21 stormwater management regulations?

22 A. I'm not here to state that this design,  
23 this plan is compliant with the stormwater management  
24 regulations.

25 Q. And are you here to testify that the

1 testing that has been done to date Birdsall, Gladstone,  
2 and your own, are sufficient to satisfy the  
3 requirements of the stormwater management regulations?

4 A. I believe the testing performed meets the  
5 general criteria, the flavor of the Appendix "E" of the  
6 stormwater management regulations.

7 Q. Maybe I'm getting a little confused, but  
8 didn't you just agree that the stormwater management  
9 regulations require a minimum of two tests in every  
10 basin and maybe more depending on the size of the  
11 basin?

12 A. That's correct.

13 Q. So how do you meet the flavor of the  
14 regulations if you don't really have one test that's in  
15 a basin --

16 A. No, that's not true.

17 Q. -- test for 'in the wet season'?

18 A. Okay. But the tests don't have to be  
19 performed in the wet season.

20 Q. All right. But let me just -- I want to  
21 just go back over this. I'm asking you a question  
22 about the wet season right now, because you did raise  
23 the fact that they did all these tests in the wet  
24 season, didn't you?

25 A. I was just stating for the record the

1 previous tests that were done.

2 Q. Okay. So, of all of these tests that  
3 you're referring to one of them --

4 MR. HALL: I object. This has all been  
5 asked and answered. We're wasting time.

6 MR. COLLINS: The objection should be over  
7 ruled, but the questions should focus on the word "test  
8 pit" or phrase "test pit" not the word "test." I have a  
9 problem with the way it's being asked.

10 MS. DONATO: We're talking about soil, so I  
11 just took an abbreviation.

12 MR. COLLINS: I think we have a problem  
13 with using the word "test pit," or the phrase "test  
14 pit," so --

15 MS. DONATO: I'll use the word "test pit"  
16 from now on.

17 MR. COLLINS: Well, use both because it  
18 might matter which, I think.

19 BY MS. DONATO:

20 Q. I'm asking for his permeability tests. I  
21 understand. So you're saying that the tests for the --  
22 during the wet season, you said, did you not, that  
23 tests during the wet season avoid a lot of confusion?

24 A. To some.

25 Q. Well, you said that, you didn't say "to

1 some"?

2 A. Well, now I'm saying "to some." Apparently  
3 some people here are confused.

4 Q. Well, that's because you rely on mottling,  
5 right, is that it? Is that what you're saying?

6 A. Mottling is an accepted method of  
7 evaluating seasonal high water.

8 Q. I want to just back up a second. I want to  
9 make sure that I understand. When you prepared your  
10 report what test pits did you rely on?

11 A. Primarily our own. To some degree we  
12 looked at the results of other test pits that were done  
13 within the basin locations.

14 Q. Did you look at the test pits that were  
15 performed by Birdsall Engineering?

16 A. Yes.

17 Q. Okay. And did you find those test pits to  
18 be reliable?

19 A. Sure.

20 Q. Do you realize that those test pits are not  
21 signed?

22 A. No.

23 Q. Is there a requirement that the test pits  
24 be signed?

25 A. I don't believe so.

1 Q. So it just gets some anonymous person  
2 putting some test pit information and there's no, like,  
3 check to see that the test pits are signed?

4 A. You know, I think that the Birdsall  
5 information was given to me as a matter of information.  
6 This is, as I think I said before, this is used as a  
7 guidance to understand what the soil conditions at the  
8 site are. Birdsall was a reputable engineering company  
9 when they were in business. And to me as a  
10 geotechnical engineer I think that I can look at those  
11 soil logs or test pits and have a relatively good level  
12 of comfort that the subsurface conditions shown on  
13 those test pits are true and factual.

14 Q. Even though they're not signed?

15 A. Yes.

16 Q. All right. And did you also happen to  
17 notice that there were many test pits that were  
18 performed by Birdsall where they mention that there was  
19 bucket refusal, where they stopped attempting to  
20 determine where the water was?

21 A. Well, bucket refusal, yes, I notice that  
22 there was bucket refusal in test pit logs, yes.

23 Q. And those test pits were used to show that  
24 there was no seasonal high water that would be  
25 problematic. In fact, if you look at the area where

1 the January test pits were performed by Gladstone isn't  
2 it true that there was a previous stormwater management  
3 basin right in that location?

4 A. I don't know that.

5 Q. Oh, okay. Okay. Now, you also indicated  
6 that you had eight test pits that revealed mottling; is  
7 that correct?

8 A. Yes.

9 Q. All right. Now, I'm trying to dispel a  
10 considerable degree of confusion on my part about  
11 mottling. Okay. So you'll need to correct me because  
12 I may have misunderstood what you stated. Okay. Did  
13 you say that when mottling occurs that the colors  
14 become pale?

15 A. Yes.

16 Q. So you're saying that where the staining  
17 from the water level is that that area shows pale?

18 A. Yes. Some of the soil particles become  
19 pale in color.

20 Q. Oh, some of them do?

21 A. Yes.

22 Q. Do some of them turn another color?

23 A. Typically, no. It's the soil -- the  
24 original soil color is typically retained in the  
25 mottling, in the mottled zone.

1 Q. So you've never heard of the mottling  
2 showing up as a red stain from the iron?

3 A. That can sometimes happen.

4 Q. Oh, it can sometimes happen. That's not  
5 always just pale?

6 A. That can happen in some instances that I  
7 can't explain right now, but it's typically linear when  
8 that happens.

9 Q. What does that mean, "linear"?

10 A. It's horizontal to the -- it's relatively a  
11 horizontal plain. It's a -- it looks more like a line  
12 as opposed to a zone of mottling.

13 Q. Okay. And you have to use a Munsell color  
14 chart, right, to analyze the soil when you're trying to  
15 determine whether or not -- if you're trying to  
16 determine seasonal high water by mottling rather than  
17 by observance of actual water; right?

18 A. You don't have to use a Munsell soil color  
19 chart to observe mottling.

20 Q. Don't you need to use the Munsell chart to  
21 determine the difference in the coloration of the soil?

22 A. The Munsell color chart defines the color  
23 of the soil.

24 Q. Right. And isn't it the different color  
25 that the mottling would reveal that is critical in

1 terms of accurately determining where the mottling  
2 begins?

3 A. No. I think you're mixing up what the  
4 purpose of the soil -- of the Munsell color chart is.  
5 It's just to define the color, but it doesn't mean that  
6 you can't observe that soil as mottled.

7 Q. Isn't part of the determination of the  
8 mottling the ability to determine the differentiation  
9 between the underlying soil color, which is the soil  
10 color, and where the mottling exists?

11 A. The Munsell color chart defines the color  
12 of the mottles, and the other soil particles for that  
13 matter, yes.

14 Q. All right. That's why I asked you about  
15 it. Then, yes, you use the Munsell color chart to see  
16 the distinctions and that helps you to define the  
17 mottle, am I right?

18 A. Yeah, but you don't need a Munsell color  
19 chart to see that soil is mottled.

20 Q. I understand that. You can see it when you  
21 look at it.

22 May I have this marked for Identification?  
23 It's a photograph.

24 (Exhibit O-1, photograph, was received and  
25 marked for Identification.)

1 BY MS. DONATO:

2 Q. Okay. I'm going to show you this  
3 photograph which is marked O-1. Okay. And you see  
4 this, it's a photograph of soil, right?

5 A. It looks like it.

6 Q. And you see the reddish coloration?

7 A. In the middle?

8 Q. Yes.

9 A. Yes.

10 Q. So can you identify what you think this is?

11 A. In terms of what?

12 Q. In terms of the discussion of mottling, do  
13 you think this shows mottling?

14 A. It appears that that soil is -- was  
15 previously saturated judging from the pale grays.

16 Q. So what do you think the mottling is in  
17 this picture, the red or the white?

18 A. It's hard. I can't tell you that without  
19 seeing the rest of the soil pit.

20 Q. Okay. And you wouldn't -- this comes from  
21 like a treatise about how to identify mottling?

22 A. Okay.

23 Q. So you don't think that that red stuff is  
24 mottling?

25 A. I didn't say that.

1 Q. You didn't say that?

2 A. I said I think that I would need to look at  
3 the rest of the soil pit to evaluate which color is the  
4 mottled.

5 Q. Well, you wouldn't honestly think that the  
6 white is the mottle, because there's white below the  
7 red, isn't there, wouldn't that be very strange?

8 A. The picture that you're handing me is a  
9 clump of soil on the ground surface.

10 Q. Yes, with a red coloration?

11 A. Yeah.

12 Q. And below the red coloration is white; is  
13 it not?

14 A. Above it and to the sides of it and below.

15 Q. Yes. So why would you think that the  
16 mottling is the white rather than the red?

17 A. It typically is the whiter pale color,  
18 typically.

19 Q. And on this photograph do you think that  
20 the white is the mottled?

21 MR. HALL: I would object. It's too far  
22 afield from his testimony.

23 MS. DONATO: No, it isn't. We're talking  
24 about the observed mottling.

25 MR. HALL: He didn't say he looked at

1 pictures to observe mottling, he looked at soil.

2 MR. COLLINS: She can continue. It's an  
3 appropriate area on cross-examination.

4 BY MS. DONATO:

5 Q. So you see that there's white below the  
6 red?

7 A. I see that there's white surrounding the  
8 red.

9 Q. Surrounding the red. So how could you have  
10 the white being the mottling and the red being the  
11 soil?

12 A. If the white part of that soil clump had  
13 iron-type material in it, minerals in it, then that  
14 would become the mottled part of it, but I would have  
15 to see the whole soil pit --

16 CHAIRMAN BOXER: Ms. Donato, can we just --

17 THE WITNESS: -- to see which color is  
18 mottled.

19 CHAIRMAN BOXER: Just pass it around.

20 BY MS. DONATO:

21 Q. So what color is shale, the shale that's on  
22 this property?

23 A. It's red/brown.

24 Q. So if the mottling was red, as Exhibit O-1  
25 for Identification, would you be able to observe it in

1 the shale?

2 A. When shale models the models are white,  
3 typically.

4 Q. Typically, again, we have this typically,  
5 do you know what exists here?

6 A. At this site?

7 Q. Yes.

8 A. Yes, you would see typically gray mottle.

9 Q. I didn't ask you "would." Did you see  
10 mottling in any of the shale?

11 Did you try to look at mottling in any of  
12 the shale on this property?

13 I'm not asking you typically, I'm not  
14 asking you --

15 A. I'd have to look at our test pit logs to  
16 see if any of them had mottling in the shale. And  
17 furthermore, I would be relying on my soil scientist  
18 who logged the rolls. I didn't log the rolls  
19 personally.

20 Q. Okay. So that's interesting. Okay.

21 Now, you said that of the test pits that  
22 your firm performed eight of those test pits showed  
23 mottling; am I correct?

24 A. Yes.

25 Q. Okay. Can you tell me how many of those

1 eight test pits showing mottling are under stormwater  
2 basins?

3 A. I don't believe any of them are, but let me  
4 check the map. (The witness reviews exhibit.)

5 None of those soil logs, none of those test  
6 pits that show mottling are within the basin  
7 infiltration areas.

8 Q. So what is needed in order to have a  
9 compliant stormwater management plan for an  
10 infiltration basin based on the New Jersey Department  
11 of Environmental Protection stormwater management  
12 regulations?

13 A. Well, in terms of number of test pits  
14 within the basins?

15 Q. Yes.

16 A. The stormwater regs require two test pits  
17 for the first 10,000 square feet of basin infiltration  
18 area, and then one additional test pit for each  
19 additional 10,000 square feet of basin infiltration  
20 area.

21 Q. Did you also perform any of the -- the  
22 permeability tests that are required for infiltration  
23 basins?

24 A. We did.

25 Q. You did perform those? So you got a

1 certain rate that -- so let's go over -- I'd like to do  
2 that first.

3 Now, because this is a little bit  
4 disjointed, but I just want to make it clear. You did  
5 not design the system, so you're not talking about the  
6 design of the system and how it's put together, you're  
7 only talking about the soils and how they relate to the  
8 basins?

9 A. Correct.

10 Q. Now, I have to grab the other report. Just  
11 be patient for just a moment.

12 Now, you are advising the applicant whether  
13 or not the test pits in totality will be able to be  
14 used to design a compliant stormwater management plan;  
15 right?

16 A. Right.

17 Q. Okay. Are you confident that all of these  
18 test pits are taken to the requisite depths in order to  
19 assure the location of the seasonal high water table?

20 A. Appendix "E" says that the test pits should  
21 extend to a depth of 8 feet below the depth of  
22 infiltration, or twice the depth of water that's in the  
23 basin below the depth of infiltration, whichever is  
24 greater.

25 So, in this case these shallow basins, the

1 8-foot below the depth of infiltration would be the  
2 standard. Now, you are incorrect in saying that the  
3 reason for that depth requirement is for seasonal high  
4 ground water evaluation.

5 Q. Well, I didn't say that was the sole  
6 reason. It also relates to permeability, does it not,  
7 if you're going to have recharge?

8 A. Yes.

9 Q. Is that what I was incorrect about?

10 A. Yes.

11 Q. I was breaking the question down. I was  
12 trying to do the seasonal high first and then the  
13 infiltration, because obviously if you have a high  
14 water table you can't put the basin there, you need a  
15 2-foot separation, and the water wouldn't infiltrate  
16 anyway, because there's too much water, right? You'd  
17 have a pond, a permanent pond?

18 A. Correct.

19 Q. And the DEP doesn't want a permanent pond;  
20 right?

21 A. Correct.

22 Q. Why?

23 A. I don't know.

24 Q. So, is it one of the primary purposes of  
25 the basin to make sure that water is recharging back

1 down to the ground?

2 A. Yes.

3 Q. And is it another difficulty that occurs  
4 with infiltration that if the basin doesn't drain that  
5 you end up having mosquitos and other undesirable  
6 insects that will prevail in a basin that doesn't  
7 drain?

8 A. Sure.

9 Q. And isn't it also true that it would be  
10 rather unattractive to have a lot of mud holes that  
11 aren't draining on the property?

12 A. I suppose.

13 Q. You do know what zone this property is  
14 located in?

15 A. Why don't you enlighten me.

16 Q. So you're unaware of the fact that this  
17 township engaged in extensive litigation to get one of  
18 the leading cases --

19 MR. HALL: I object. That's totally  
20 irrelevant to his testimony.

21 MS. DONATO: Well, he's saying these basins  
22 are okay. And if he's saying they will be testing to  
23 be okay then that would mean that the basins are okay,  
24 and if the basins are okay but we don't know where the  
25 water table is then we have a mud hole. He's already

1       agreed to that.

2                   MR. HALL:   That's nothing to do with  
3 zoning, though.

4 BY MS. DONATO:

5           Q.       Well, won't you think that having a mud  
6 hole in the middle of this conservation, agricultural  
7 conservation zone that this township I don't know how  
8 many hundreds of thousands of dollars have been spent  
9 to litigate the leading case --

10                  MR. HALL:   I object.  She's testifying.

11                  MS. DONATO:  -- don't you think that helps?

12                  MR. HALL:   He's testifying about soil  
13 testing and you're talking about zoning.  That has  
14 nothing to do with it.

15 BY MS. DONATO:

16           Q.       Okay.  So the idea that these basins would  
17 be a potentially unsightly and unhealthy condition was  
18 not something that you took into consideration?

19           A.       Correct.

20           Q.       Okay.  Thank you.  Now, with respect to  
21 mottling, okay, I want to go back to that subject.  
22 Have you ever heard a soil engineer take the position  
23 that mottling shows up primarily as a reddish stain on  
24 the soil?

25           A.       It can happen.

1 Q. Okay. And it could happen with shale, too,  
2 couldn't it?

3 A. Typically it doesn't.

4 Q. But it could?

5 A. I haven't seen that.

6 Q. You haven't seen it -- I'm talking about  
7 this piece of property, though, did you happen to ever  
8 have any -- did you look at anything or see anything  
9 that would indicate whether there was a red stain on  
10 this shale? The stain is from iron, is it not?

11 A. The stain is from oxidation of iron,  
12 leaching.

13 Q. And in anaerobic condition. So if you had  
14 a red stain of this shale would you be able to notice  
15 it, because the shale was red?

16 A. The shale does not mottle red, shale  
17 mottles gray.

18 Q. You said typically shale mottle gray?

19 A. Yes.

20 Q. You don't how shale mottles?

21 A. Well, I did see a few test pits and none of  
22 the test pits that I witnessed myself personally had  
23 mottling in the shale.

24 Q. How many did you witness?

25 A. I don't know. Maybe six or eight.

1 Q. And where were they located?

2 A. Within the infiltration basin locations.

3 Q. Okay. Were -- all right.

4 Now, in your doing that, okay, you  
5 completed -- I want to refer you -- this is detention  
6 basin number one. Detention basin number one there is  
7 one test pit by Gladstone that showed groundwater at 68  
8 inches, am I right?

9 A. Yes.

10 Q. Now, that was the one test pit that was  
11 performed in March, right?

12 A. Correct.

13 Q. And in all the others observed groundwater  
14 there is none, right, none observed?

15 A. In all of the other --

16 Q. Test pits?

17 A. Test pits?

18 Q. For that detention basin number one?

19 A. For that basin, yes.

20 Q. Okay. And in that particular test pit they  
21 actually observed seepage at that time of year; right?

22 A. Correct.

23 Q. Now, can you tell me why the first test  
24 pit, SL-47313 where it says "observed groundwater" it  
25 says "none provided"?

1           A.     That would be an indication that  
2 groundwater was not observed.

3           Q.     Okay.  And what's the difference between  
4 "none provided" or the language with the test pits that  
5 you have, or the geo test pits that say "none  
6 encountered" is there a difference?

7           A.     I don't believe so.

8           Q.     Okay.  I'm kind of confused about the test  
9 pit from Gladstone SL-132614.  That test pit, can you  
10 tell me what -- that one is the one that has the 68  
11 inches observed groundwater; right?

12          A.     Yes.

13          Q.     Okay.  There's no infiltration rate on  
14 either of those two, is there?

15          A.     No, they did not perform an infiltration  
16 test.

17          Q.     Of the test pits that we have in detention  
18 basin one, other than TP-209 can you tell me how deep  
19 the pits were?

20          A.     I'll have to take a moment to review my  
21 logs.  (Witness reviews his notes.)

22                   Those test pits performed by GTA in basin  
23 one extended to depths ranging from about 2 to 5 -- I'm  
24 sorry, to 6 feet -- 2 to 6 feet below the existing  
25 grades.

1 Q. Okay. And I don't want to ask you a  
2 question twice for fear of objection, but did I  
3 understand you correctly to say that you had to go down  
4 8 feet with the NJDEP?

5 A. That's what the Appendix "E" suggests, yes.

6 Q. So you didn't do what Appendix "E"  
7 suggests?

8 A. We encountered refusal with our excavator  
9 at shallow depth.

10 Q. What size of a piece of equipment did you  
11 have?

12 A. It was a small-track hoe. Some of them are  
13 performed with a Caterpillar 313B excavator, and some  
14 of them were performed with a Kobelco 135 KRX.

15 Q. Okay. And once that you had bucket refusal  
16 what was the equipment you used with that --

17 A. Both of those machines.

18 Q. Are they large machines, are they able to,  
19 you know, get a larger machine to deal with the bucket  
20 refusal?

21 A. Are there larger machines than those, is  
22 that the question?

23 Q. Yes.

24 A. Yes, there are larger machines.

25 Q. So if you encounter bucket refusal do you

1 kind of say, well, I encountered bucket refusal, I  
2 don't look any further?

3 A. We encountered bucket refusal in relatively  
4 hard shale. The geology of the area is that the shale  
5 continues.

6 Q. Continuous underlying this entire site;  
7 right?

8 A. Yeah, for, you know, being down thousands  
9 of feet.

10 Q. So you didn't go down the requisite depth.  
11 And in every instance that you didn't it was because of  
12 bucket refusal?

13 A. That's correct.

14 Q. And does the DEP allow you to just say, oh,  
15 I can't go any further so I don't know why I didn't go  
16 any further?

17 A. The DEP does provide latitude in my  
18 experience on other sites where there is bucket refusal  
19 on shallow depths on rock, because rock is also  
20 considered a hydraulic and restrictive layer, and you  
21 need to stay 2 feet above it.

22 Q. Is that in the regulation, Mr. Loh?

23 A. No.

24 Q. It is not. And if you said that you didn't  
25 observe mottling in the shale; right?

1           A.     Correct.

2           Q.     How far -- did you have a problem with not  
3 being able to penetrate the shale in those locations?

4           A.     Well, I just told you I had bucket refusal.

5           Q.     So if you had bucket refusal and you  
6 couldn't observe the shale then how do you know if  
7 there's mottling in the shale?

8           A.     The mottling could be in the shale at  
9 deeper depths.

10          Q.     At deeper depths, the requisite depth that  
11 the DEP would require by its regulations to have those  
12 test pits?

13          A.     The DEP requires the 2-foot separation  
14 between seasonal high groundwater level, as identified  
15 by mottling, and the seepage level. These tests meet  
16 that requirement.

17          Q.     The DEP requires that you go down 8 feet,  
18 does it not?

19          A.     Yes.

20          Q.     And you did not, is that correct?

21          A.     Yes.

22          Q.     Thank you. Now, I'd like to direct your  
23 attention to your -- I'm still on basin one. And I'm  
24 referring to the infiltration rates for the basin. So  
25 you show that the rates range from zero to 1.4 inches

1 per hour; is that correct?

2 A. Yes.

3 Q. Okay. Now, are you aware of the fact that  
4 the DEP requires a design to incorporate a margin of  
5 safety that you have to increase that figure?

6 A. I am aware of that.

7 Q. So does that infiltrate -- that  
8 infiltration test, does it meet the design standard  
9 that the DEP will apply?

10 A. I believe the DEP suggests that a minimum  
11 infiltration rate of 1 inch per hour is advisable, and  
12 then to apply a factor of safety of two on top of that.

13 Q. Okay. And does it meet that?

14 A. It would meet that.

15 Q. It would?

16 A. The one rate they decided would. The ones  
17 that are below one inch per hour would not.

18 Q. And how many did you get that do not meet  
19 the infiltration requirement?

20 A. I believe six.

21 Q. What are you going to do with those basins?  
22 You're just giving the information and let somebody  
23 else draw the conclusions, is that it?

24 A. Yes.

25 Q. And how many tests pits would be required

1 in this basin? How big is basin number one, by the  
2 way?

3 A. I don't know the area of the infiltration  
4 off the top of my head.

5 Q. All right. I'm going to next direct your  
6 attention to detention basin 2D. That's a recharge  
7 basin, right?

8 A. Yes.

9 Q. What's the size of that basin?

10 A. I don't know off the top of my head.

11 Q. So you don't know how many tests would be  
12 required?

13 A. Well, I did know that at one point and we  
14 did the minimum required number of test pits for that.

15 Q. Isn't the basin 34,000 square feet?

16 A. I don't know.

17 Q. So how could you say that you did the  
18 required amount if you don't know the --

19 MR. HALL: Objection. He said he knew it  
20 before, he doesn't know it now. He also answered your  
21 question.

22 BY MS. DONATO:

23 Q. He also stated, did you not, that you did  
24 the requisite number of tests?

25 A. That's right. Remember the area of

1 infiltration in that basin.

2 Q. I knew that.

3 MR. COLLINS: I don't find it very helpful  
4 to hear an answer that says I don't know off the top of  
5 my head, because it implies that you know it from some  
6 document. So rather than have to go back over this  
7 later, could you just look at whatever document would  
8 help you figure out how much infiltration area there is  
9 in that basin?

10 CHAIRMAN BOXER: Mr. Loh, do you need a few  
11 minutes to get that up?

12 THE WITNESS: We may have it right here.

13 MR. FERRIERO: Mr. Chairman, if I could  
14 while the witness is looking that up, I would like to  
15 try to give the Board some information maybe to help  
16 clarify some of this issue on mottling, because  
17 mottling is a complicated issue. I've dealt with it  
18 for many, many years. I've actually spent more than my  
19 appropriate time in court dealing with the issue, but  
20 what I would like to do is read the definition of  
21 mottling from 7:9A. It says, "Mottling means a color  
22 pattern observed in soil consisting of blotches or  
23 spots of contrasting color. The term 'mottle' refers  
24 to an individual blotch or spot. Mottling is an  
25 indication of seasonal, or periodic, and recurrent

1 saturation."

2 Most important part of that in the context  
3 of the testimony, I think, in the question that you've  
4 heard is blotches or spots of contrasting color,  
5 because I think Ms. Donato is trying to get -- trying  
6 to make a point that there might be red mottling in red  
7 shale. The fact of the matter is by definition it is  
8 not mottling. Mottling has to be a contrasting color.

9 MS. DONATO: And I would beg to differ with  
10 you on that because of the fact that you may have --  
11 you could have water rise in shale. Shale is red;  
12 mottling is red. It might not meet the textbook  
13 definition, but it doesn't mean that it's not with  
14 seasonal high. It might not be mottling, but it  
15 doesn't mean that the seasonal high hasn't reached to  
16 that level.

17 MR. FERRIERO: I'm not arguing that point.  
18 The point I'm making is that mottling is not the same  
19 color as the native soil.

20 MS. DONATO: And I am trying to address  
21 that as well, because I understood it's a contrast, but  
22 I appreciate that. Thank you.

23 CHAIRMAN BOXER: Mr. Loh, do you have that  
24 material?

25 THE WITNESS: Not yet.

1           CHAIRMAN BOXER: All right. Why don't we  
2 just take five minutes while Mr. Loh finds this.

3           Let's just take five-minutes and we'll try  
4 to get right back.

5           (A recess is taken at 8:58 p.m.)

6           (Back on the record at 9:04 p.m.)

7           CHAIRMAN BOXER: Okay. Ms. Donato, are you  
8 ready to go? Why don't we continue with Ms. Donato's  
9 cross-examination?

10          THE WITNESS: Ms. Donato, you asked me if  
11 the number of test pits that we performed in each of  
12 those infiltration areas met the requirement --

13          Q. Well, the number, yes, that's correct.

14          A. The answer is, yes.

15          Q. Well, what's the size of the basin?

16          A. The size of the sand infiltration area for  
17 basin one is 15,000 square feet. So according to  
18 Appendix "E" you would need two test pits for the first  
19 10,000, and one test pit for each additional 10,000.

20          Q. I didn't ask you one. I asked you about  
21 2D. "D" as in David?

22          A. 2D?

23          Q. Yes.

24          A. The sand infiltration area is 23,000 square  
25 feet. So according to Appendix "E" you should do four.

1 Q. Okay. Can you tell me who provided you  
2 with the sand infiltration area, who provided you with  
3 that number?

4 A. Gladstone Design.

5 Q. Is it something that's indicated on a plan  
6 in any location so that someone could double-check that  
7 information?

8 A. I don't know that.

9 Q. So somebody told you that tonight?

10 A. Yes.

11 Q. So if the Board engineer wanted to check  
12 this would he be able to do so?

13 A. Well, the area is indicated on the plan by  
14 the dotted line, so he could go in and figure out what  
15 that area is by looking at the plan.

16 Q. As a high standing mathematician, it's a  
17 irregular shape; right?

18 A. Yes.

19 Q. So it's not easy to calculate; correct?

20 A. It's doable.

21 Q. But you would have to have pretty good  
22 mathematical skills?

23 A. It's doable.

24 Q. But is there anything on the plan anyplace  
25 along -- and now I'm up to two big brief indications,

1 anywhere that indicates that's the size of the sand  
2 infiltration pit?

3 A. It's not indicated as a number on the plan,  
4 but you can figure it out easily enough.

5 Q. Okay. So now there were four tests that  
6 were performed on 2D. Okay. TP-201 performed by your  
7 firm?

8 A. Yes.

9 Q. Does that meet the required infiltration  
10 rate?

11 A. I will point out one other thing.

12 Q. No, could you answer my question, please?

13 A. I will point out one other thing.

14 Q. Could you please answer my question?

15 MR. HALL: I think he can answer your  
16 question how he chooses to.

17 MS. DONATO: No. I think he answers my  
18 question and not another one.

19 A. But you misuse the word "required."

20 Q. Didn't you -- wouldn't you agree that the  
21 DEP regulation requires certain number of test pits,  
22 two minimum, plus additional numbers based on the size  
23 of the basin?

24 A. Right. What I'd like to point out is that  
25 Appendix "E" is a guidance document, it's not a

1 regulation.

2 Q. I know that some contend Appendix "E" is  
3 not a regulation. On the other hand if you want to get  
4 something through the DEP have you ever tried to do it  
5 without complying with Appendix "E"?

6 A. Yes.

7 Q. Oh, okay. Good, so we're not going to  
8 comply with Appendix "E". Okay. Thank you.

9 MR. HALL: He didn't say that.

10 BY MS. DONATO:

11 Q. So assuming that you don't need to comply  
12 with Appendix "E," let's look nevertheless at TP-201.  
13 Are you saying that the one inch per hour required  
14 infiltration rate is not required?

15 A. I'm saying -- all I said was it's not a  
16 regulation, it's a guidance document. That's all I  
17 said.

18 Q. So the DEP you're telling me has no  
19 requirement for the one inch per hour permeability that  
20 is used by engineers throughout the state of New  
21 Jersey?

22 A. I don't know that that's a requirement by  
23 law.

24 Q. You don't know?

25 A. That's what I said.

1 Q. Okay. So who gave you that idea?

2 A. I don't know his name.

3 Q. So let me just make sure I understand  
4 something, because I feel that I'm getting deeper into  
5 the muck.

6 Let's just do the following. When you are  
7 asked to do soil testing do you use Appendix "E" in  
8 order to do so?

9 A. Absolutely.

10 Q. And is Appendix "E" where the one inch per  
11 hour is contained?

12 A. That's right.

13 Q. And if you didn't have one inch per hour  
14 permeability, okay, and water was placed in the basin,  
15 would the basin drain?

16 A. If you didn't have the required  
17 infiltration rate that the basin was designed for then  
18 you could loosen the soils, remove them and replace  
19 them. There's some things that you can do besides not  
20 building a basin.

21 Q. That was not my -- I'm asking you a  
22 question. Will you design a basin that has less than  
23 the one inch per hour, which you don't think is  
24 required by Appendix "E"? If you designed a basin, you  
25 said you could get away with that at the DEP. You've

1 gotten away with it. So you design a basin and it's  
2 not one inch per hour permeability, what happens?

3 A. What happens is you loosen the soils and --

4 Q. No, I didn't ask you what you could do to  
5 rectify the condition. You're saying the one inch per  
6 hour is guidance and it's not required. My question to  
7 you is the following: If you don't have one inch per  
8 hour minimum permeability and you build the basin with  
9 that information, you don't change the soil, you don't  
10 put a sand bed, you don't do anything else, what  
11 happens to that basin?

12 A. Assuming all the other test pits and  
13 infiltration tests were also -- were at one inch per  
14 hour at the maximum?

15 Q. Let's assume you have all -- let's just say  
16 you needed two permeability tests and both permeability  
17 tests was less than one inch per hour?

18 A. And if the basin --

19 Q. You don't do any mitigating, you don't put  
20 in a sand bag, you don't do anything because it's not  
21 required and you've got the DEP look the other way?

22 A. And if the basin was designed based on a  
23 higher infiltration rate then it would retain water.

24 Q. And it would retain water, it wouldn't  
25 drain, right?

1           A.     It would retain water longer than the  
2 design expects.

3           Q.     So would that be good engineering practice  
4 to ignore the one inch per hour minimum based on  
5 somebody's advice that it's not required?

6           A.     What's good engineering practice is to fix  
7 issues when they arise.

8           Q.     So you're saying that you would let the  
9 basin be built with less than one inch per hour, water  
10 would be accumulating, it would be a mud hole. It's  
11 after the two-year maintenance guarantee or something  
12 from the town, what is the town, maybe it's during the  
13 performance guarantee, so the town's going to go  
14 against the surety to collect to get this basin fixed?

15          A.     No, not at all. What you do is during  
16 construction you do additional testing to evaluate if  
17 the materials at the basin infiltration level are in  
18 accordance with the design, and if they're not then you  
19 deal with it.

20          Q.     All right. You're not answering the  
21 questions that I ask, and I'm trying to understand your  
22 answer regarding Appendix "E". Okay.

23                   Did you or did you not say that you don't  
24 think that Appendix "E" is required?

25          A.     I said that Appendix "E" is a guidance

1 document.

2 Q. Okay. So that -- and the next correlarity  
3 is that the -- that the provision, I won't say  
4 requirement, in Appendix "E" of a minimum permeability  
5 rate of one inch per hour is not required. So would  
6 you design a basin that had, let's say it needed two  
7 tests, two permeability tests for that basin and they'd  
8 all meet the one inch per hour, would you design a  
9 basin like that without mitigating factors, without  
10 changing the underlying soils, without putting in the  
11 sand and doing all of those things?

12 A. I don't design basins. I test the soil.

13 Q. Okay. So you're going to go to someone who  
14 asks you to do soil work and one of your test pits has  
15 an infiltration of 0.2, as TP-201 does, and you're not  
16 going to say to them, gee, you've got a test pit here  
17 that doesn't meet the correct required infiltration  
18 rate? Are you going to tell them what they want?

19 A. No, of course I'd point it out to them, as  
20 well as point out that the other two infiltration rates  
21 of six and seven and a half.

22 Q. Well, don't -- so what are you going to do,  
23 average numbers on something, is that it?

24 A. No, you don't average them, but perhaps we  
25 can go out and do another test at some point in time

1 like during construction.

2 Q. Okay. So you don't say here's the  
3 information and do what you want, you don't do that?  
4 You don't say it's not required, Appendix "E" really  
5 doesn't require it, so we'll just let it go at this?

6 A. The designer is also well familiar with the  
7 Appendix "E".

8 Q. So. All right. But right now, as I  
9 understand it, this is the stormwater data that this  
10 applicant is presenting to this Board and asking for  
11 approval. And on this particular basin we know we have  
12 one test pit that's significantly lower than the  
13 minimum required; am I right?

14 A. That's right.

15 Q. So are they going to get more test pits, or  
16 are we going to be here, that's it, they're just going  
17 to leave it at that, is that it?

18 A. That's not up to me.

19 Q. Thank you. Is there anything unusual to  
20 you as a soil scientist to find that you would have  
21 these four rates with significant differences in  
22 permeability?

23 A. They're really not that significant when  
24 you think about it. It's not even an order of  
25 magnitude.

1           Q.     Well, one is .2 at the lowest, which  
2 doesn't meet the requirement, or as you would say, the  
3 guidance. And the highest is 7.5. That doesn't make a  
4 difference to you?

5           A.     It's not something that I would raise my  
6 eyebrows at and say, wow, that's really weird. As I  
7 started off in my testimony tonight I said that the  
8 soils throughout the site are only moderately  
9 permeable. They're not very good for infiltration, but  
10 some areas are good enough, and we identified those  
11 areas, I think. And if additional tests need to be  
12 done or deemed to be needed I'm sure that the applicant  
13 will do that. And in my opinion that testing can  
14 happen during construction --

15          Q.     There's no question pending.

16          A.     I was finishing my answer.

17          Q.     You understand that the requirements of  
18 stormwater management regs require that this Board when  
19 they are addressing something make certain that the  
20 regulations are satisfied?

21          A.     Of course.

22          Q.     So you don't wait until they get an  
23 approval and then start digging and find that there's  
24 not enough infiltration, do you, is that what you're  
25 suggesting?

1           A.     What I'm suggesting is that additional  
2 testing can be done. It should be done during  
3 construction.

4           Q.     And if the testing that's before the Board  
5 when the Board is being asked to evaluate the  
6 stormwater management system doesn't show compliance  
7 with this recommended infiltration rate, as you  
8 described it, then you're saying the Board should  
9 approve it and let you go to the construction stage and  
10 then design the basin?

11          A.     They can certainly always excavate and  
12 replace. That's always an option and it will always  
13 work.

14          Q.     Do you know anything about bonding,  
15 performance bonds under the Municipal Land Use Law?

16          A.     No.

17          Q.     So you don't know that performance bonds  
18 are the plans that design basins, not something that  
19 you're trying to after the fact retrofit?

20          A.     I don't know.

21          Q.     Okay. And you wouldn't think that a town  
22 would want to approve an infiltration basin if the  
23 infiltration rates aren't satisfied knowing that they  
24 might end up having a mud hole?

25          A.     I think the design engineer can answer to

1 that.

2 Q. Now, I want to direct your attention to  
3 detention basin number two. Do you know what the sand  
4 area of detention basin number two is?

5 A. No.

6 Q. And Mr. Chairman --

7 A. Two, that's not an infiltration basin, is  
8 it?

9 Q. Well, I'm sorry. I stand corrected. It's  
10 just attenuation. But don't you still need to know the  
11 bottom of the basin still has to be a certain distance  
12 from the seasonal high water level; is that right?

13 A. I don't believe that's true.

14 Q. No one foot requirement on an attenuation?

15 A. Perhaps there could be a foot requirement.

16 Q. It's not two, it's one; is that correct?

17 A. That's correct.

18 Q. Do you know whether this basin will be an  
19 excavated basin?

20 A. Basin two?

21 Q. Yes.

22 A. I'm sure the design engineer can answer  
23 that question.

24 Q. Okay. Now, let me just double-check to see  
25 if I've got all of the -- do you know whether -- I'm

1 going to direct your attention to detention basin  
2 number three. Do you know whether that's an excavated  
3 basin?

4 A. It looks like the northeastern portion of  
5 the basin might be excavated a foot or two.

6 Q. All right. Do you know how big that basin  
7 is?

8 A. No, I don't.

9 Q. I'm loath, Mr. Chairman, to keep taking  
10 breaks and the witness has to consult -- I mean, you've  
11 been very, very patient, so --

12 A. That's not an infiltration basin either, I  
13 believe.

14 Q. I'm sorry. It's an attenuation basin.

15 MS. DONATO: I think I'm just going to  
16 defer to our witness' testimony when the time comes. I  
17 just find it to be very difficult because it seems that  
18 the witness has a very narrow focus and --

19 BY MS. DONATO:

20 Q. You're not testifying that all of the tests  
21 that the DEP would require to determine seasonal high  
22 water table and infiltration have been completed for  
23 these basins, are you?

24 A. The number of tests?

25 Q. Yes.

1           A.     I am.

2           Q.     Okay.  So you're saying, you're saying that  
3     the number of tests comply.  I'm a little confused if  
4     you don't know the size of the basin.  Then I have to  
5     ask him the question.

6           A.     When we were evaluating how many test pits  
7     should be done in each basin we did know that number  
8     and we did comply with that number.

9           Q.     Do you agree that seasonal high water table  
10    is very essential to the design of a stormwater  
11    management system?

12          A.     Yes.

13          Q.     Without having at least -- the test pits  
14    going down a minimum of 8 feet how can you assure  
15    anyone that you have an accurate reflection of seasonal  
16    high?

17          A.     Because mottling is not present at depths  
18    of at least 2 feet below the level of infiltration.

19          Q.     But you couldn't penetrate, you had bucket  
20    refusal.  So how could you have observed mottling if  
21    you didn't get into the shale?

22          A.     The test pits extended it to a depth of at  
23    least 2 feet below the level of infiltration.

24          Q.     That's not the point.  8 feet is required,  
25    is it not?

1 A. That's right.

2 Q. That was my question. You're saying that  
3 you didn't see mottling?

4 A. The purpose of --

5 Q. You -- did you go into the shale?

6 A. I'm sorry?

7 Q. Did you go into the shale in these  
8 locations?

9 A. Yes.

10 Q. You went into the shale. You didn't have  
11 bucket refusal?

12 A. We had bucket refusal in the sale.

13 Q. So how did you get -- as you went into the  
14 shale a certain depth and then encountered bucket  
15 refusal?

16 A. Correct.

17 Q. But you didn't -- still didn't go down the  
18 8 feet?

19 A. Correct.

20 Q. When someone relies on mottling is that as  
21 accurate as observed seasonal high, or water seepage?

22 A. I wouldn't say it's as accurate or not as  
23 accurate. For instance, what if there is a  
24 particularly dry winter and the groundwater level does  
25 not rise to levels that it has risen before?

1 Q. Okay. There's a provision in the  
2 regulations for that, though, isn't there, where there  
3 are climactic conditions that might alter what would be  
4 the ordinarily apparent seasonal high?

5 A. That's not taken into consideration when  
6 observing groundwater levels in the winter.

7 Q. You've never seen that provision in the  
8 regulations?

9 A. I have not.

10 Q. Oh, okay. I'll send it to you.

11 A. I appreciate it.

12 Q. So, mottling is -- here you're saying  
13 mottling is pale, and some other people say mottling is  
14 red stained. And the photograph I showed you shows a  
15 red stain and you didn't want to commit to what it was.  
16 So mottling has an element of a judgment call to it,  
17 doesn't it?

18 A. No. Mottling does not have an element of  
19 judgment. Evaluation of seasonal high groundwater has  
20 an element of judgment.

21 Q. Well, have you ever seen engineers who have  
22 failed to see mottling that other people have seen?  
23 You've never seen a debate among engineers as to  
24 whether soil contains mottling?

25 A. Are you asking me if engineers debate

1 whether or not soil is mottled? I don't understand the  
2 question.

3 Q. Have you ever heard engineers have a  
4 difference of opinion on a particular observation of  
5 soil, same exact soil as to where the mottling is,  
6 where it begins?

7 A. Yes.

8 Q. You've seen a difference of opinion?  
9 You've seen a difference of opinion on the seepage as  
10 well?

11 A. No, seepage is observed. It is where it  
12 is. You measure it with a ruler.

13 Q. So, I really did misunderstand your  
14 statement before. So let me just make sure.

15 So seepage is accurate, you see it, but you  
16 could debate mottling?

17 A. Yes.

18 Q. Thank you. I have no further questions.

19 CHAIRMAN BOXER: Mr. Sasso?

20 CROSS-EXAMINATION BY MR. SASSO:

21 Q. Mr. Loh, I apologize in advance if I go  
22 over something.

23 There's no question that when you were  
24 first retained in this particular case your job was to  
25 determine if all the property was basically in the "D"

1 Classification; correct?

2 A. That's right.

3 Q. And then if it was in the "D"

4 Classification the benefit to the applicant would have  
5 been then infiltration is not an issue?

6 A. I suppose so, yes.

7 Q. I mean, that's what would happen?

8 A. Yes.

9 Q. But you weren't able to do that because  
10 that wasn't accurate based on your observation?

11 A. Correct.

12 Q. And you did use the Birdsall test results  
13 as part of your report; correct?

14 A. They were attached to the report.

15 Q. And they were attached for a reason. You  
16 utilized them in part in coming up with your report; is  
17 that fair to say?

18 A. That's not fair to say in terms of the  
19 design of the stormwater management basin, the  
20 infiltration basins.

21 Q. No, sir. Please. I'm not limiting myself  
22 to that. Just listen to the question.

23 If you don't understand it tell me. Is it  
24 fair to say the reason why you attached it to your  
25 report is because in part you relied upon the test

1 results?

2 A. Yes. To give me a general indication of  
3 subsurface conditions that were not explored.

4 Q. Right. You told us already that Birdsall  
5 was a great organization and you had no reason to doubt  
6 any of the test results; correct?

7 A. Correct.

8 Q. But you didn't know that you came here to  
9 testify tonight that some of those logs aren't even --  
10 and test reports aren't even signed, that's what you  
11 told us?

12 A. Right.

13 Q. Let's talk about what you call guidance.  
14 When push came to shove with Ms. Donato you were saying  
15 Appendix "E" was just guidance; is that right?

16 A. I just simply stated that fact that I have  
17 been told by somebody from DEP.

18 Q. Okay. So let's go to your report, okay, if  
19 you don't mind. I'd like to go to page four where you  
20 talk about infiltration testing, because this is really  
21 what we're talking about, right? This is what matters  
22 in terms of a geotechnologist because you're not  
23 designing the system. The question is the soil samples  
24 and the ability for these basins or the berms that are  
25 designed, right, it's not just the basins, to take the

1 water and recharge it; correct?

2 A. Correct.

3 Q. All right. So, you told us in answer to a  
4 question a minute ago about accuracy of finding the  
5 seasonal high water table that if it was a dry winter  
6 then direct observation perhaps would not be the more  
7 accurate method, that was your answer a minute ago?

8 A. I said that it wouldn't be the indication  
9 of the seasonal high water level necessarily.

10 Q. But you agree that in terms of the Appendix  
11 and 9A the regulation that the reason why DEP specifies  
12 a time period for the tests between January and April,  
13 and based on an observation by the testing person of  
14 the high water table, that that's more accurate, is it  
15 not? And that's why it's in the regulation?

16 A. No.

17 Q. Why is it then, sir, that the DEP would  
18 take the time to specify a specific time period between  
19 January and April and put that in as the direct  
20 observation as the high water table meeting the  
21 regulation?

22 A. Absent soil mottling the only way to  
23 evaluate seasonal high groundwater level is during the  
24 wet season.

25 Q. Well, let's talk about this case. I'm glad

1       you said that.

2                       In this case in terms of the basin when you  
3       were asked before the test pits didn't show mottling;  
4       correct?

5               A.     Correct.

6               Q.     So you just told us then that there's no  
7       way because there's no mottling to determine where the  
8       high water table would be in the area that's been  
9       designed by Gladstone as a detention basin, would you  
10      agree with me?

11              A.     The high water table is below the depths of  
12      the test pit.

13              Q.     But you don't know that, do you?

14              A.     Yes, I do.

15              Q.     First of all, we need to talk about that  
16      time period of January to April, which is specifically  
17      set forth in the regulations. She started asking you  
18      earlier about the time period that has gone on for this  
19      particular application. Now, the DEP time period is  
20      January through April; correct?

21              A.     Yes.

22              Q.     And that's the season for direct  
23      observation of the high seasonal water table; correct?

24              A.     Yes.

25              Q.     And she asked you, the application which

1 the Chairman can verify, was signed on December of  
2 2012. Now, if I wanted to give this Board the direct  
3 observation information about the high groundwater,  
4 seasonal high water table, I could have done it if I  
5 was going to use that method in 2012/2013; correct?

6 A. Well, sir, I'm not going to --

7 Q. I'm asking you a factual question, sir. I  
8 know you don't like answering the question.

9 A. I'm not going to answer something that  
10 should my client have done something without knowing  
11 any of the time tables or any of the project or  
12 anything else.

13 Q. I'm not asking you whether you should have  
14 or not, I'm asking you based on what you reviewed as  
15 the expert here today. Did you see any direct  
16 observation information for that time period?

17 A. In GTA's test pits?

18 Q. No, sir. Please. Come on, please.

19 A. I'm asking you, I'm sorry.

20 Q. Let's face it, I can summarize it for you.  
21 You relied on Birdsall. You relied on some pits that  
22 Gladstone Design did, and you relied on your own?

23 A. Yes, that's right.

24 Q. And in coming up with a decision on whether  
25 or not the soils were proper you were given information

1 or not given information; correct?

2 A. We obtained information as well.

3 Q. So let's go back to my very simple  
4 question. Were you given any information about the  
5 results of direct observation of the seasonal high  
6 table for the period of January of 2013 through April?

7 A. No.

8 Q. How about the following year, which would  
9 be -- then we're talking January of 2013 through April,  
10 again, the DEP said period of time --

11 MR. HALL: I think you meant '14.

12 BY MR. SASSO:

13 Q. '14. Were you given any information from  
14 that period of time?

15 A. Yes.

16 Q. In terms of direct observation, do you  
17 remember the question?

18 A. Direct observation during the wet season?

19 Q. During the wet season?

20 A. Yes.

21 Q. And are you talking about the Gladstone  
22 Design test pit?

23 A. Yes.

24 Q. Some of which the date that was given in  
25 January are somewhere in the front field, not where the

1 basin is located; is that correct?

2 A. Yes.

3 Q. Let's go to page four again of your report.  
4 -- let me go back a second. None of the January tests  
5 are in any basin area; correct?

6 A. Correct.

7 Q. Now, you just testified before that these  
8 regulations, they're just guidance. They're not really  
9 a regulation, right, is that what you're telling us?

10 A. Yes.

11 Q. Let's go to your report. Infiltration  
12 testing is the section, do you see it?

13 A. Yes, I do.

14 Q. Okay. Now, if it was just guidance would  
15 you agree with me that you would never have said that  
16 you "must" do something? For instance, you must dig 8  
17 feet down, because you certainly didn't in this case,  
18 would you agree? That you may dig down to 8 feet  
19 below, but not "must," would you agree with me?

20 A. I would agree that that's a poor choice of  
21 words, yes.

22 Q. No, let's talk about your report. You got  
23 paid to do the report; right?

24 A. Yes.

25 Q. And that's the report you gave all of us;

1 right?

2 A. That's right.

3 Q. Well, read the second sentence.

4 A. "According to Appendix "B" of the New  
5 Jersey Stormwater BMP Manual --"

6 MR. SASSO: You're going too fast. She's  
7 got to take it down. Loud and go slow.

8 THE WITNESS: "According to Appendix "E" of  
9 the New Jersey Stormwater BMP Manual test pits and  
10 infiltration tests must be performed within each SWM  
11 basin location."

12 BY MR. SASSO:

13 Q. You signed that report, right, at the end?

14 A. I did.

15 Q. Let's face it, as an engineer you're before  
16 us here, you understand that really Appendix "E" are  
17 really standards, aren't they, for DEP? Otherwise, you  
18 can do one test pit for a 60,000-square foot basin;  
19 right? They give you some level of minimum standards  
20 that you have to follow?

21 A. That is what the BMP is, and it's the  
22 standard of the industry, I'll admit, but however --

23 Q. There's no "however," sir. In this case,  
24 in this report you admit that you did not comply with  
25 the standards, right in your report; correct?

1 A. Yes.

2 Q. All right. As you go further down the  
3 page, and you can help me because I was very good in  
4 PolySci, I wasn't too good in the sciences like you.  
5 The chart that we have, it says "Summary of  
6 infiltration test results." Does that chart reflect  
7 the depth of the test?

8 A. Yes.

9 Q. And in those minimum standards that the DEP  
10 has in Appendix "E" they talk about 8 feet below what?

11 A. The depth of infiltration.

12 Q. Let's go through the depths. Give us the  
13 test pit location and tell us the furthest down you  
14 went from that particular test?

15 A. Test pit TP-2.

16 Q. Again, nice and slow for her, okay. You  
17 can read off mine, if you need to.

18 A. That doesn't contain the information as far  
19 as how deep the test pit went.

20 Q. Well, I'm asking you about this chart?

21 A. The depth that's in the chart is the depth  
22 of the infiltration test, not the depth of the test  
23 pit.

24 Q. That's why I'm asking you the question.

25 A. I thought you said what was the depth of

1 the test pit.

2 Q. Is that number different than what we have  
3 in the chart?

4 A. Yes.

5 Q. Okay. Where do you have the list of the  
6 total depth for the test pit?

7 A. They're on the test pit logs.

8 Q. So, let's go through, for instance, TP-2  
9 and tell us the furthest you went down?

10 A. Test Pit 2 went to a depth of 3 feet below  
11 the existing ground surface.

12 Q. Not close to 8 feet; right?

13 A. It's 5 feet off.

14 Q. Well, not only 5 feet off, because that's  
15 not really accurate, because we know that in terms of 8  
16 feet you told us already it's 8 feet from where the  
17 basin is tied in?

18 A. I stand corrected. The 8 feet below the  
19 level of infiltration, yes.

20 Q. Yes. So let's talk about this. So go  
21 ahead, what's the next one?

22 A. Test pit 8.

23 Q. Go ahead.

24 A. Test pit 8 extended to a depth of 6 feet  
25 below the existing ground surface.

1 Q. That one doesn't comply; right?

2 A. Right.

3 Q. Okay. Next one. Go through them.

4 A. Test pit 9 extended to a depth of six and a  
5 half feet below the ground surface.

6 Q. That didn't comply; correct?

7 A. Correct. Test pit 18 extended to a depth  
8 of five and a half feet below the ground surface.

9 Q. That didn't comply, correct, is that right  
10 sir? Is that right, sir?

11 A. I'm sorry?

12 Q. That did not comply?

13 A. That did not extend to 8 feet below the  
14 level of infiltration.

15 Q. Next one. Same thing for all of them. I  
16 don't want to hold the Board up. Let's just go through  
17 the -- if you know what I'm asking, tell us.

18 A. I'm searching for it. Test Pit 18 extended  
19 to a depth of five and a half feet below the ground  
20 surface.

21 Q. Not in compliance?

22 A. Test Pit 28 --

23 Q. Correct, sir, not in compliance? At the  
24 end of you telling us the level tell us whether or not  
25 it complied or --

1 MR. HALL: I object. We all know the  
2 difference between five and eight. He doesn't have to  
3 say that every time.

4 MR. SASSO: I have to say that, too. Go  
5 ahead.

6 THE WITNESS: Test Pit 28 extended to a  
7 depth of five and a half feet below the ground surface.

8 Test Pit 30 extended to a depth of 1 and a  
9 half feet below the ground surface.

10 Test Pit 32 extended to a depth of 4 and a  
11 half feet below the ground surface.

12 Test Pit 39 extended to a depth of 2 and a  
13 half feet below the ground surface.

14 Test Pit 101 extended to a depth of eight  
15 and a half feet below the existing ground surface.

16 BY MR. SASSO:

17 Q. And that's one so far right?

18 A. Yes.

19 Q. And that's ground surface, not what you  
20 told us which was it had to be from the bottom of the  
21 basin, you're saying from the ground surface. From the  
22 ground surface is not the correct description of the  
23 regulation. The basin is lower and you have to be 8  
24 feet below the detention basin; correct?

25 A. Yes, eight.

1 Q. Okay. Go ahead. Next pit?

2 A. Test Pit 103 extended to a depth of 6 feet  
3 below the ground surface.

4 Test Pit 104 extended to a depth of 5 and a  
5 half feet below the ground surface. Test pit 105  
6 extended to a depth of 6 feet below the ground surface.

7 Test Pit 106 extended to a depth of 5 feet,  
8 I'm sorry, below the ground surface.

9 Test Pit 107 extended to depth of 4 feet  
10 below the ground surface.

11 Test pit 110 extended to a depth of three  
12 and a half feet below the ground surface.

13 Test pit 113 extended to a depth of two and  
14 a half feet below the ground surface.

15 Q. Can I just stop you there? And I want to  
16 get back to this, but I'm a little confused because you  
17 just told me earlier that in the graph that you have,  
18 not the graph, but the columns that you have here that  
19 it doesn't show the depth and then you're reading to me  
20 all the depths right in the same chart --

21 A. I stand corrected.

22 Q. -- that I have?

23 A. I stand corrected yet again.

24 Q. All right.

25 MS. DONATO: Pretty good for a guy that

1 doesn't know science.

2 BY MR. SASSO:

3 Q. Go ahead.

4 A. Test Pit 116 extended to a depth of 5 feet  
5 below the ground surface.

6 Test Pit 118 extended to a depth of two and  
7 a half feet below the ground surface.

8 Test Pit 119 extended to a depth of four  
9 and a half feet below the ground surface.

10 Test Pit 120 extended to a depth of five  
11 and a half feet below the ground surface.

12 Test Pit 121, 3 feet below the ground  
13 surface.

14 201, two and a half feet below the ground  
15 surface.

16 203, 3 feet below the ground surface.

17 205, three feet below the ground surface.

18 206, 2 and a half feet below the ground  
19 surface.

20 207, two and a half feet below the ground  
21 surface.

22 208, two and a half feet below the ground  
23 surface.

24 And Test Pit 209, 2 feet below the ground  
25 surface.

1 Q. Okay. Good. Now, looking at my chart, I  
2 mean, I have one, only one out of all those tests that  
3 are 8.5 feet from the surface of the ground, not the  
4 surface of the basin, would you agree with me?

5 A. Yes.

6 Q. Okay. I want you to go to, again, to that  
7 page four again that I have. That's the infiltration  
8 testing on the report that you signed. Just read for  
9 the Board the balance of the paragraph after 8 feet of  
10 the basin, bottom level in the middle of the paragraph.  
11 Just tell us what the report -- what you wrote down for  
12 the balance of the paragraph?

13 A. "Therefore, the test pits must extend at  
14 least 8 feet below the planned level of infiltration.  
15 The test pits performed by GTA did not extend at least  
16 8 feet below the planned level of infiltration as  
17 bucket refusal with a relatively small backhoe and  
18 excavator used for the study on weather chilling and  
19 confidentiality of depths. However, several test pits  
20 previously performed by others were able to be extended  
21 to at least 8 feet below the planned level  
22 infiltration. A summary of infiltration test results  
23 included in the following table: Details of the  
24 infiltration testing are included in Appendix "E".

25 Q. Okay. And, again, those are the numbers,

1 the depths that we just went through in the chart that  
2 follows that; right?

3 A. Yes.

4 Q. Well, you tell us in the report that there  
5 was a reason why you couldn't get through that shale;  
6 right?

7 A. Yes.

8 Q. But you also told us before that it matters  
9 to look for mottling in the shale to determine where  
10 the seasonal high is located; correct?

11 A. What I said is that it matters if the  
12 seasonal high groundwater table is within 2 feet of the  
13 level of infiltration.

14 Q. And if you hit shale at 2 feet and stop  
15 there and there's mottling below that you would have no  
16 way of knowing as you stand here tonight; correct?

17 A. Correct. Although the level of  
18 infiltration is above that depth, most likely.

19 Q. True. Let's talk about the small equipment  
20 you had there. I assume from what you're saying that  
21 these were units that you hired as part of your package  
22 of getting paid by KDC; correct?

23 A. That's right.

24 Q. I mean, we even know who you rented them  
25 from, Heritage Construction; right?

1           A.     Right.

2           Q.     And Heritage Construction has equipment  
3 bigger than the two units that you have noted in your  
4 report, don't they?

5           A.     They probably do.

6           Q.     And I mean, when Ron Kennedy did the test  
7 results we had pictures of his huge trackhoe of a  
8 Japanese name, or maybe it was Volvo, I stand  
9 corrected. It was Volvo. Did you ever, after you  
10 experienced the inability to break through the shale  
11 ever go back to this site with bigger equipment since  
12 the equipment that you brought was small, a small  
13 backhoe and excavator? Did you ever bring bigger  
14 equipment back to break through the shale so that you  
15 could see what existed below the shale?

16          A.     No, because you can't break through shale.  
17 It's just more shale.

18          Q.     And that's why you made a notation that you  
19 couldn't do the test because the equipment was small.  
20 It really didn't matter if it was small or if it was  
21 gigantic, that's what you're telling us?

22          A.     Right.

23          Q.     A small backhoe and a large, large trackhoe  
24 have the same power, that's what you're telling us here  
25 today?

1           A.       That's not at all what I said.

2           MR. SASSO:   Okay.   That's all I have.

3           CHAIRMAN BOXER:   Thank you, Mr. Sasso.

4   Let's see.   It's ten to ten, but I think it might be  
5   worthy of maybe just opening up a couple of questions  
6   in the audience if there are anybody -- we'll have to  
7   just see what time is like, but I'm thinking maybe 10,  
8   15 minutes.   So if there's anybody in the audience that  
9   would like to cross-examine this witness I would urge  
10   you to come up now.

11           MR. YINGLING:   Good evening.   Jeff  
12   Yingling, previously sworn in as well.   A few questions  
13   for you, Mr. Loh.

14   J E F F   Y I N G L I N G, having been previously  
15   sworn, testified as follows:

16           MR. YINGLING:   How many samples did you use  
17   to determine the soil types on the site.

18           THE WITNESS:   I'm sorry?

19           MR. YINGLING:   How many samples were taken  
20   to determine the soil types on the site?

21           THE WITNESS:   Well, GTA performed 43 test  
22   pits, and Birdsall performed also 43 test pits.   I  
23   think Gladstone Design performed, am I answering your  
24   question?

25           MR. YINGLING:   I'm looking specifically for

1 soil types.

2 THE WITNESS: Then I don't understand your  
3 question.

4 MR. YINGLING: You indicated that there  
5 were four soil types out of the 200 found in the state  
6 of New Jersey?

7 THE WITNESS: Oh, I'm sorry.

8 MR. YINGLING: How many tests were dug on  
9 the site to determine what soil types were on this  
10 property?

11 THE WITNESS: We didn't determine the soil  
12 type in terms of whether it's Penn shaley silt, for  
13 instance, and others. That's a USDA soil series  
14 classification. It's not an engineering  
15 classification. So I did not do testing, USDA soil  
16 testing to determine if it was Penn shaley silt loam  
17 than the others.

18 MR. YINGLING: So what methods did you use  
19 to make those determinations?

20 THE WITNESS: Well, the hydrologic soil  
21 Groups A through D have to do with --

22 MR. YINGLING: And the specific types, the  
23 actual names of the soils that you indicated?

24 THE WITNESS: That I looked up on the soil  
25 survey.

1 MR. YINGLING: So geologic soil survey?

2 THE WITNESS: On the Somerset County soil  
3 survey.

4 MR. YINGLING: So no specific core samples  
5 were actually dug on the site to determine that?

6 THE WITNESS: No testing was done to  
7 determine whether the material categorized as Penn silt  
8 loam. What I was saying was that those four soil types  
9 that are shown in the county soil survey for this site  
10 fall under two hydrologic soil groups "C" and "D".

11 Now, those soil groups "C" and "D", "E"  
12 have engineering properties.

13 MR. YINGLING: Essentially what I'm trying  
14 to find out is, did you yourself or your firm do tests  
15 on the site to determine those classifications or did  
16 you rely on the information provided by others to  
17 indicate what's on that site?

18 A. No, we did that testing, the infiltration  
19 testing.

20 MR. YINGLING: Not infiltration. The  
21 specific soil types -- you indicated that there were  
22 four soil types on the site out of 200 towns in state  
23 of New Jersey. What method did you use to make that  
24 determination?

25 THE WITNESS: I looked it up on the soils

1 map.

2 MR. YINGLING: So there are no bore samples  
3 or tests done to indicate the soils by your firm or  
4 Birdsall?

5 THE WITNESS: Right.

6 MR. YINGLING: Right. How many samples  
7 were done to determine the water levels on the  
8 property, how many were --

9 THE WITNESS: GTAs 43, plus Birdsall's 43,  
10 plus Gladstone's 20.

11 MR. YINGLING: So roughly a hundred tests  
12 on a 120-plus acre site?

13 THE WITNESS: Pardon me. Gladstone had 29  
14 test pits, sorry.

15 MR. YINGLING: So less than 80 then on a  
16 hundred-plus acre site?

17 THE WITNESS: Right.

18 MR. YINGLING: Okay. Were you --

19 THE WITNESS: No, no. Forty-three and 43,  
20 and 29.

21 MR. YINGLING: Forty-three, 43, and 29.

22 Were you physically present when those  
23 samples were taken?

24 THE WITNESS: Just on six or eight of the  
25 test pits.

1 MR. YINGLING: So out of the 43 you only  
2 visibly saw 6 to 8 that were done?

3 THE WITNESS: Personally.

4 MR. YINGLING: So you're relying on the  
5 information provided by others to make this  
6 determination?

7 THE WITNESS: By my soils engineer for the  
8 test pits that we did.

9 MR. YINGLING: Just curious, because there  
10 seems to be a lot of questions that you weren't able to  
11 answer directly. And it didn't seem like you were  
12 involved with the actual tests that were done on the  
13 site. It looks like you were relying on information  
14 from others to make this determination.

15 THE WITNESS: No. Engineering personnel  
16 from my company, my employees, were at the site logging  
17 our test pits, doing in-filling, and making groundwater  
18 observations and so on.

19 MR. YINGLING: But it didn't seem like you  
20 had accurate knowledge of test location. You had to  
21 refer back to notes and refer back to locations to the  
22 size --

23 THE WITNESS: Well, that was for test pits  
24 done by others.

25 MR. YINGLING: Well, that was always done

1 by your firm. Questions about the size of the basin  
2 you didn't have those answers. You referred back to  
3 information provided by the scientists within your  
4 firm?

5 THE WITNESS: Well, the size of the basin  
6 have come from Gladstone Design, and that information  
7 was provided to us early on in the process to figure  
8 out how many test pits we need to be doing within each  
9 of those basin areas, and I just didn't have that  
10 number at the top of my head.

11 MR. YINGLING: You indicated that the test  
12 met the flavor of the criteria required by the DEP in  
13 the state. Would that be a bland flavor, spicy flavor?  
14 How would you indicate those results?

15 THE WITNESS: I'm sorry. Say that again.

16 MR. YINGLING: Are they bland in there?  
17 Are the basins absolute minimum's required, or are they  
18 spicier where they meet the requirements?

19 MR. COLLINS: Try to make it less  
20 sarcastic, sir.

21 THE WITNESS: I really don't understand  
22 your question.

23 MR. YINGLING: That's okay. We can skip  
24 that one.

25 Question: The applicant indicated that in

1 the left-hand portion of the property there's  
2 approximately, I'm guesstimating 20 to 30 acres of area  
3 of tree, forest area that are going to be removed under  
4 the proposal. How will that affect the water table on  
5 the property in your calculations that were determined  
6 by yourself or Birdsall or Gladstone?

7 THE WITNESS: Calculations were not to  
8 determine water level. Those determinations were made  
9 by observation within each test pit.

10 MR. YINGLING: Within those test pits if  
11 you removed 20 to 30 acres wooded area that is  
12 currently -- groundwater that's on the property, would  
13 that not then increase the water tables on the property  
14 so that your observation would be more visible as  
15 opposed to test pits that are coming up empty?

16 THE WITNESS: I think it's probably fair to  
17 say that tree roots, big tree roots absorb more water  
18 than grass roots.

19 MR. YINGLING: Correct. So would your  
20 calculations then change, and the determination of the  
21 location of particular basins or suggested areas of  
22 basins also change?

23 THE WITNESS: No. Well, there's no  
24 calculations, again, for determining the seasonal high  
25 water or observing the groundwater level. It is what

1 it is right now. And there's no way that you can  
2 calculate what that potential possible rise in  
3 groundwater level would be.

4 MR. YINGLING: Wouldn't there be some type  
5 of standard or calculation used to determine how much  
6 water is at a particular tree based on the caliber of  
7 that tree?

8 THE WITNESS: I'm not aware of that.

9 MR. YINGLING: Okay. Thank you.

10 CHAIRMAN BOXER: So it is 10 o'clock. I  
11 think it's been a long night for this witness and I  
12 think we at least owe him a little bit of rest over the  
13 next meeting. I'm not sure we're done with you yet. I  
14 think the citizens may have some additional  
15 questioning, but we'll have to see how that goes.

16 Just maybe by a show of hands of the people  
17 that are here, is there anybody else that may want to  
18 question this witness? Okay. Just you, sir?

19 UNIDENTIFIED VOICE: I just have one  
20 question.

21 CHAIRMAN BOXER: If you have one question  
22 we'll let you come up.

23 UNIDENTIFIED VOICE: It's a quick one. I  
24 promise. Collin Hickey, and I've been sworn in  
25 previously.

1 C O L L I N H I C K E Y, having been previously  
2 sworn, testifies as follows:

3 MR. HICKEY: Just a quick question.

4 Mottling would appear to be a subjective  
5 measure, as opposed to direct observation which would  
6 be an objective measure, would that be correct? When  
7 you're determining the high groundwater or the high  
8 level of groundwater?

9 THE WITNESS: Evaluating the high ground  
10 water is based on mottling can be subjective.

11 MR. HICKEY: So how often is there a  
12 discrepancy between the observation of mottling, which  
13 I would say is a subjective measure, and sticking a  
14 ruler in a hole and observing the actual?

15 The reason I ask that is because you  
16 mention before there's a degree of confusion based on  
17 observation of mottle, because somebody could believe  
18 that it's mottle, somebody else would say it's not.  
19 Would that be correct?

20 THE WITNESS: I think that mottling is  
21 mottling. It's something that everybody here could see  
22 soil that's mottling and say ah, that's mottled soil.  
23 The subjectiveness of it comes from evaluating whether  
24 or not that soil mottling is indicative of a seasonal  
25 high groundwater level.

1 MR. HICKEY: Okay. How often then is there  
2 a discrepancy between observation of mottling and  
3 actually doing the objective measure of measuring with  
4 a stick as you described before, the ruler, and  
5 actually observing directly that seasonal high water?

6 Meaning, it sounded to me that the latter  
7 was the gold standard, and lacking that I could observe  
8 mottling as a pretty good measure, but the gold  
9 standard was actually direct observation. Would that  
10 be correct?

11 THE WITNESS: Direct observation doesn't  
12 always tell you what the seasonal high groundwater  
13 level is, though. There still is a level of  
14 subjectivity, whether or not the seasonal high water  
15 level is above that level of the seepage level, the  
16 groundwater level. All right.

17 MR. HICKEY: I guess I'm still going back  
18 to how often do the two measures disagree, or are they  
19 always in agreement? I'm just trying to get a degree  
20 of accuracy.

21 THE WITNESS: Yes. Again, even in the wet  
22 season you could go and see where the seasonal high --  
23 you could see where the seepage is coming from and you  
24 could measure that depth below the ground surface, but  
25 then in the same pit if you see mottling extending up

1 above that seepage then that's probably a pretty good  
2 indicator that that mottling was caused by a rising  
3 groundwater level.

4 MR. HICKEY: And how often would I not see  
5 the mottling -- I'm flipping in reverse now where I see  
6 mottling to a certain level, but I don't get mottling  
7 even though the groundwater has exceeded that level of  
8 mottling, does that happen?

9 THE WITNESS: Some soils are not very prone  
10 to mottling.

11 MR. HICKEY: Would these soils be prone to  
12 mottling?

13 THE WITNESS: Absolutely these soils are  
14 prone to mottling.

15 MR. HICKEY: I just want to go to my  
16 original question. Is there a discrepancy between the  
17 direct observation or the mottling, or are they always  
18 in agreement?

19 THE WITNESS: Well, again, if you see water  
20 seeping out of the test pit, right, and you determine  
21 that that water is groundwater, it's because it  
22 continues seeping all the way down to the bottom of the  
23 test pit. Sometimes there's perched water. That water  
24 is seeping out of a test pit at a higher level, and  
25 then below that isolated seepage the rest of the test

1 pit is dry. So that is not a groundwater level, that's  
2 perched water, and that perched water can cause  
3 mottling, because it's not caused -- because the water  
4 is just hung up on that impervious layer, right. So  
5 the soils below it are not mottled and then you keep  
6 digging and perhaps you see seepage at some much deeper  
7 depth. In that case you can't correlate, you shouldn't  
8 correlate, in my opinion, the mottling with that deeper  
9 groundwater level, if that answers your question.

10 MR. HICKEY: That answered my question.  
11 Thank you.

12 CHAIRMAN BOXER: All right. So thank you  
13 very much, Mr. Loh. I appreciate it. Mr. Loh, we  
14 appreciate your patience and hanging in there for a  
15 very long discussion.

16 When do we have the scheduled next --

17 MR. FERRIERO: We don't, Mr. Chairman.  
18 March 5th is booked. The next one will be March 12th.

19 MR. HALL: Excuse me. It doesn't sound  
20 like I had a choice. I was hoping to get back to first  
21 Thursdays, but if the 5th is booked then --

22 CHAIRMAN BOXER: March 12th it is.

23 MR. HALL: Hopefully for April you can  
24 clear the first Thursday.

25 MR. FERRIERO: I'll be out of town

1 April 2nd, so the Board will have to determine what  
2 they do.

3 MR. HALL: Just looking ahead.

4 CHAIRMAN BOXER: All right. Thank you very  
5 much. Okay.

6 MR. COLLINS: This case, KDC's application  
7 will be carried without additional notices to  
8 March 12th at 7 p.m., same place.

9 CHAIRMAN BOXER: Thank you you very much.  
10 Appreciate it, everyone. Motion to adjourn?

11 BOARD MEMBER RODELIUS: So moved.

12 (The Board adjourns at 10:05 p.m.)

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C E R T I F I C A T E

I, IRIS LA ROSA, a Notary Public and Certified Shorthand Reporter of the State of New Jersey, do hereby certify that the foregoing is a true and accurate transcript of the testimony as taken stenographically by and before me at the time, place, and on the date hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

IRIS LA ROSA, CSR, RPR  
Certificate No. 30XI 00162800

Dated:

<b>A</b>				
<b>abbreviation</b> 48:11	<b>addressed</b> 8:14	<b>alter</b> 88:3	9:15,23 10:4	73:12 82:10,11
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